CEDAR ROAD ELEMENTARY SCHOOL ADDITION

Chesapeake Public Schools

Bid Number: 48-1920

Project Manual

April 24, 2020

HBA Project 18061.11

Contractors: due to the COVID-19 pandemic, your bid response must be submitted utilizing DemandStar’s E-Bidding platform. Bids submitted by any other method will not be accepted.

During the pandemic, disregard references to bid mailing instructions, submitting duplicate copies of bid, and envelope/envelope template requirements.

THE DOCUMENTS ARE COMPLEMENTARY AND WHAT IS REQUIRED BY ONE SHALL BE AS BINDING AS IF REQUIRED BY ALL. IN CASE OF A CONFLICT, DISAGREEMENT, OR AMBIGUITY, PROVIDE THE BETTER QUALITY. IN CASE OF A CONFLICT, DISAGREEMENT, OR AMBIGUITY, PROVIDE THE GREATER QUANTITY.
CEDAR ROAD ELEMENTARY SCHOOL

ADDITION

CHESAPEAKE PUBLIC SCHOOLS
Chesapeake, Virginia

Bid Number: 48-1920
HBA Project 18061.11

ARCHITECT
HBA ARCHITECTURE & INTERIOR DESIGN
One Columbus Center, Suite 1000
Virginia Beach, Virginia  23462
757-490-9048

PLUMBING, MECHANICAL & ELECTRICAL ENGINEER
HICKMAN AMBROSE
825 Greenbriar Circle - #A
Chesapeake, VA 23320
757-420-3595

STRUCTURAL ENGINEER
SPEIGHT MARSHALL FRANCIS P. C.
1228 Perimeter Parkway, Suite 201
Virginia Beach, VA 23454
757-427-1020
SECTION 000030

PROJECT DIRECTORY

Owner: Chesapeake Public Schools
Address: 312 Cedar Road
         Chesapeake, VA 23322

POC: Greg Hanson
Phone: (757) 547-0013
Fax: (757) 547-0142
Email: greg.hanson@cpschools.com

Address: One Columbus Ctr., Suite 1000,
         Virginia Beach, VA 23462-6797

POC: Jack Hasten, Jr., AIA
Phone: (757)490-9048
Fax: (757) 490-7081
Email: jackh@hbaonline.com

Engineer (PME): Hickman Ambrose
Address: 825 Greenbriar Circle - #A
         Chesapeake, VA 23320

POC: Tim Jones
Phone: 757-420-3595
Fax: 757-420-424-1940
Email: tjones@hickmanambrose.com

Engineer (Structural): Speight Marshall Francis, P.C.
Address: 1220 Perimeter Parkway, Suite 201
         Virginia Beach, VA 23454

POC: David Carter
Phone: 757-427-1020
Fax: 757-427-5919
Email: dpc@SMANDF.com

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CHESAPEAKE PUBLIC SCHOOLS
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CHESAPEAKE PUBLIC SCHOOLS
BID 48-1920

SECTION 002000

ADVERTISEMENT/INVITATION TO BID

BID NUMBER: 48-1920

BID TITLE: CEDAR ROAD ELEMENTARY SCHOOL ADDITION

Cedar Road Elementary School
1605 Cedar Road, Chesapeake, VA 23322

Contractors, please note that due to the COVID-19 pandemic, your bid response must be submitted utilizing DemandStar’s E-Bidding platform. Bids submitted by any other method will not be accepted. During the pandemic, disregard references to bid mailing instructions, submitting duplicate copies of bid, and envelope/envelope template requirements.

Bids are invited by Chesapeake Public Schools, Chesapeake, Virginia (owner) in accordance with the following:

BID DESCRIPTION: The project includes the interior renovation and expansion of the Cafeteria including: structural modifications, interior finishes, exterior masonry walls, windows, doors, light fixtures replacement with associated electrical system modifications and mechanical system ductwork modifications.

BID TIME AND PLACE: Sealed bids in duplicate will be received by Kisha Allen, Director of Purchasing, Chesapeake Public Schools until 2:00PM, local prevailing time on May 27, 2020, via DemandStar E-Bidding (www.demandstar.com). ABSOLUTELY NO BIDS WILL BE ACCEPTED AFTER THE ABOVE LISTED HOUR. Bids will be opened and read aloud at 2:05 p.m. via Zoom Meeting. Phone in for audio at 1-646-558-8656; when prompted enter meeting ID: 959 7240 8634. Anyone interested in attending this opening will be welcome. It is requested all attending be on time.

BID WITHDRAWAL OR REJECTION: Chesapeake Public Schools reserves the right to cancel the bid opening or to reject any or all bids in whole or part when it is in the best interest of Chesapeake Public Schools. The right to waive any and all informalities and to determine responsibility of all bidders is reserved to Chesapeake Public Schools. The Owner reserves the right to negotiate any aspect of this bid with the lowest responsible and responsive bidder. No bid or any part thereof may be withdrawn or canceled or modified for 90 days after the bid opening, with the exception that bids may be withdrawn after opening in accordance with the procedures for Withdrawal of Bids, Section § 2.2-4330 of the Code of Virginia.

Prior to the time and date designated for receipt of Bids, Bids submitted early may be modified or withdrawn only by notice to the party receiving Bids at the place and prior to the time designated for receipt of Bids. Such notice shall be in writing over the signature of the Bidder, or on official company letterhead, signed by an authorized agent, and must have been mailed and postmarked on or before the date and time set for receipt of Bids. It shall be so worded as not to reveal the amount of the original Bid.

BID SECURITY: A bidder’s bond or certified check will be required in the amount of not less than five percent (5%) of the Base Bid.

EXAMINATION OF DOCUMENTS: DemandStar website www.demandstar.com

CONTRACTORS REGISTRATION: Bidders’ attention is invited to the requirements of Chapter 11 of the Code of Virginia pertaining to registration. The Commonwealth of Virginia Contractor Registration Class and Number are required on the bid envelope.
PRE-BID CONFERENCE: A non-mandatory Pre-Bid Conference will be held at Cedar Road Elementary School on May 7, 2020, beginning at 10:00 a.m. at the Project Site, 1605 Cedar Road, Chesapeake, VA 23322. All attending will be required to sign up for a time slot, in advance, on the Chesapeake Public Schools Purchasing Department webpage. Safety guidelines related to COVID-19 will be enforced.

By order of
Chesapeake Public Schools

End of Section 002000
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INSTRUCTIONS TO BIDDERS

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ARTICLE 1 - DEFINITIONS

1.1 Bidding Documents include the Advertisement for Bids, Instructions to Bidders, the Bid Form, and the Contract Documents including any Addenda issued prior to receipt of bids.

1.2 All definitions set forth in the Contract General Conditions for Chesapeake Public Schools or in other Contract Documents are applicable to the Bidding Documents.

1.3 Addenda are written or graphic instruments issued by the Architect/Engineer or Owner prior to the execution of the Contract, which modify or interpret the bidding documents by addition, deletions, clarifications, or corrections.

1.4 A Bid is a complete and properly signed proposal to do the Work or designated portion thereof for the sums stipulated therein supported by data called for by the Bidding Documents.

1.5 Base Bid is the sum stated in the Bid for which the Bidder offers to perform the Work described as the base, to which Work may be added or deducted 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 project scope or materials, equipment, or labor described in the Contract Documents is accepted.

1.7 A Unit Price is an amount stated in the Bid as a price per unit of measurement for a measured quantity of materials, equipment, and complete labor in place including, all overhead and profit for work as described in the Contract Documents.

1.8 ALLOWANCE: An amount established in the Contract Documents for inclusion in the Contract Sum to cover the cost of prescribed items not specified in detail.

1.9 ESCROW: An amount retained by the Owner for warranty, service, or maintenance as specified and included in the Contract Sum.

1.10 A Bidder is one who submits a Bid for a prime Contract with the Owner for the Work, Equipment, Materials, or Labor, described in the Contract Documents.
A Sub-bidder is one who submits a bid to a Bidder for equipment, materials, or labor for a portion of the Work.

ARTICLE 2-BIDDER’S REPRESENTATION

2.1 By entering into a Contract with the Owner, the Contractor represents and warrants the following, together with all other representations and warranties in the Contract Documents:

2.1.1 That he is experienced in and competent to perform the type of work required and to furnish the plant, materials, supplies, or equipment to be so performed or furnished by him;

2.1.2 That he is financially solvent, able to pay his debts as they mature, and possesses sufficient working capital to initiate and complete the Work required under the Contract;

2.1.3 That he is familiar with all Federal, State, City laws, ordinances, permits, regulations, and resolutions which may in any way affect the Work of those employed therein, including but not limited to any special laws or regulations relating to the Work or any part thereof;

2.1.4 That such temporary and permanent work required by the Contract Documents which is to be done by him will be satisfactorily constructed and fit for use for its intended purpose and that such construction will not injure any person, or damage any property;

2.1.5 That he has carefully examined the Bidding Documents and the site of the Work and that from his own investigations, he has satisfied himself and made himself familiar with:

2.1.5.1 the nature and location of the Work,

2.1.5.2 the character, quantity of surface and subsurface materials likely to be encountered including, but not limited to, all structures and obstructions on or at the project site, both natural and man-made;

2.1.5.3 the character of equipment and other facilities needed for the performance of the Work;

2.1.5.4 the general and local conditions including, without limitation, its climatic conditions, the availability and cost of labor and the availability and cost of materials, tools, and equipment;

2.1.5.5 the Quality and Quantity of all materials, supplies, tools, equipment, labor, and professional services necessary to complete the work in the manner required by the Contract Documents;

2.1.5.6 all other matters of things, which could in any manner, affect the performance of the Work.

2.1.6 That he will fully comply with all requirements of the Contract Documents, including any addenda.
2.1.7 That he will perform the Work consistent with good workmanship, sound business practice, and in the most expeditious and economical manner consistent with the best interests of the Owner;

2.1.8 That he will furnish efficient business administration and experienced superintendence and an adequate supply of workmen, equipment, tools, and materials at all times;

2.1.9 That he has carefully reviewed the Work required and that the Work can be planned and executed in a normal and orderly sequence of Work and reasonably scheduled so as to ensure completion of the Work in accordance with the Contract Documents, allowing for normal and reasonably foreseeable weather, labor, and other delays, interruptions, and disruptions of the Work;

2.1.10 That he will complete the Work within the Contract Time and all portions within any required Contract milestones; and

2.1.11 That his Contract price is based upon the labor, materials, systems, and equipment required by the Contract Documents, without exception.

2.1.12 That his Contract price is inclusive of any and all state and local permits and licenses required to do business in the City of Chesapeake.

ARTICLE 3-BIDDING DOCUMENTS

3.1 CONSTRUCTION DOCUMENTS: Construction Documents will be available for review and download from the Chesapeake Public Schools Purchasing website (http://www.cpschools.com/purchasing/current-bids) by clicking on the “Current Bids” tab or on DemandStar (http://DemandStar.com).

3.1.1 Examination of documents: DemandStar (http://DemandStar.com)

3.1.2 Complete sets of Bidding Documents shall be used in preparing bids. Neither the Owner nor the Architect/Engineer assume any responsibility for errors or misinterpretations resulting from the use of incomplete sets of Bidding Documents.

3.1.3 The Owner or Architect/Engineer in making copies of the Bidding Documents available on the above terms, do so only for the purpose of obtaining bids on the Work and do not confer a license or grant for any other use.

3.2 INTERPRETATION OR CORRECTION OF BIDDING DOCUMENTS

3.2.1 Bidders shall promptly notify the Architect/Engineer, in writing, of any ambiguity, inconsistency or error, which they may discover upon examination of the Bidding Documents or of the site and local conditions.

3.2.2 Bidders requiring clarification or interpretation of the Bidding Documents shall make a written request, using the required form indicated in section 003100a, to the Architect/Engineer, with copies provided to the Owner as indicated on the form, to reach him at least three (3) days prior to the date for receipt of bids.
3.2.3 Any clarification, interpretation, correction, or change of the Bidding Documents will be made by Addendum. Clarification, interpretations, corrections, or changes of the Bidding Documents made in any other manner will not be binding, and Bidders shall not rely upon such clarification, interpretations, corrections, and changes.

3.3 ADDENDA

3.3.1 Addenda will be available for review and download from the Chesapeake Public Schools Purchasing website (http://www.cpschools.com/purchasing/current-bids) by clicking on the “Current Bids” tab or on DemandStar (http://DemandStar.com).

3.3.2 Copies of Addenda will be made available for inspection at the Chesapeake Public Schools Purchasing Office.

3.3.3 All materials, equipment, or systems required by the specifications to have pre-bid approval shall be approved only by Addenda.

3.3.4 No Addenda will be issued later than forty-eight (48) hours prior to the time for receipt of bids except an Addendum, if necessary, postponing the date for receipt of bids or withdrawing the request for bids.

3.3.5 Each Bidder shall ascertain, prior to submitting his bid, that he has received all Addenda issued, and he shall acknowledge their receipt on their Bid Form. Failure to provide such acknowledgment shall render the bid non-responsive. The Owner reserves the right to waive informalities in bids.

ARTICLE 4-BIDDING PROCEDURES

4.1 FORM AND STYLE OF BIDS

4.1.1 Bids shall be submitted in duplicate on the forms provided in the Contract Documents.

4.1.2 All blanks on the bid form shall be completed in ink or by typewriter.

4.1.3 Where so indicated by the makeup of the bid form, sums shall be expressed in both words and figures, and in case of a discrepancy between the two (2), the amount expressed in words shall govern.

4.1.4 Any interlineation, alteration, or erasure must be initialed by the signer of the Bid. All alterations shall be made on the Bid Form only. Alterations by attachment or on the envelope shall not be accepted.

4.1.5 Where there are two (2) or more major items or work for which separate pricing has been requested, Bidder may state his refusal to accept less than whatever combination of the items he stipulates.

4.1.6 Bidder shall make no additional stipulations on the bid form nor qualify his bid in any other manner.
4.1.7 Each copy of the Bid Form shall include the legal name of Bidder and a statement whether Bidder is a sole proprietor, a partnership, a corporation, or any other legal entity, Contractor’s license number, and classification. 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 agent’s authority to bind the Bidder.

4.2 BID SECURITY

4.2.1 Each bid shall be accompanied by a Bidder’s bond issued by a surety licensed to conduct business in the Commonwealth of Virginia, U.S. Department of Treasury, a Certified Check or AIA Form A310 Bid Bond, in an amount equal to not less than five percent (5%) of the total amount of the Base Bid (entire work), made payable to Chesapeake Public Schools. The bid bond shall be accompanied by a certified copy of the power of attorney for the surety attorney-in-fact. A copy of the AIA form A310 Bid Bond is attached at the end of this section.

4.2.2 Said bid security shall be left with the Owner, subject to the conditions specified herein, as a guarantee of good faith on the part of the Bidder that if the bid is accepted, the Bidder shall execute the Contract.

4.2.3 The Owner shall hold the bid security of the four (4) lowest Bidders until execution of the Contract. All other bid security shall be returned within 30 days after opening of bids.

4.3 SUBMISSION OF BIDS

4.3.1 Sealed bids in duplicate will be received via DemandStar E-Bidding (www.demandstar.com). ABSOLUTELY NO BIDS WILL BE ACCEPTED AFTER THE ABOVE LISTED HOUR. Bids will be opened and read aloud via Zoom Meeting.

4.3.2 The following additional executed documents shall accompany the Bid Form, Section 003100 and the Bid Security to establish a valid bid package:

4.3.2.1 Vendor’s Authorization to Transact Business in the Commonwealth, Section 003110.
4.3.2.2 Anti-Collusion and Non-Discrimination Affidavit, Section 004100.
4.3.2.3 Certificate of Compliance, Code of Virginia § 22.1-296.1, APPENDIX A.
4.3.2.4 Certification of Compliance With Immigration Laws and Regulations, Code of Virginia § 40.1-11.1, APPENDIX B.

4.3.3 If the Bid is sent by mail, the sealed envelope shall be enclosed in a separate mailing envelope with the notation “BID ENCLOSED” on the face thereof.

4.3.4 Bidders shall assume full responsibility for timely delivery and registration of his bid at the location designated for receipt of Bids.

4.3.5 Bids shall be deposited at the designated location prior to the time and date for receipt of bids indicated in the Advertisement/Invitation to Bid, or any extension thereof made by
addenda. Bids received after the time and date for receipt of bids will be returned unopened.

4.3.6 Bids received after the date and time for receipt of bids will not be considered.

4.3.7 Oral, telephonic, or telegraphic Bids are invalid and will not receive consideration.

4.4 MODIFICATION OR WITHDRAWAL OF BID

4.4.1 Chesapeake Public Schools reserves the sole right to determine whether a Bidder constitutes a responsive and responsible Bidder.

4.4.2 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 except as provided in paragraph 4.4.6, and Bidder so agrees in submitting his Bid.

4.4.3 Prior to the time and date designated for receipt of Bids, Bids submitted early may be modified or withdrawn only by notice to the party receiving Bids at the place and prior to the time designated for receipt of Bids. Such notice shall be in writing over the signature of the Bidder, or on official company letterhead, signed by an authorized agent, and must have been mailed and postmarked on or before the date and time set for receipt of Bids. It shall be so worded as not to reveal the amount of the original Bid.

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

4.4.5 Bid security shall be in an amount sufficient for the Bid as modified or resubmitted.

4.4.6 Errors in Bidding: Bids submitted may be withdrawn after the bid opening, without penalty or forfeiture of bid security, due to errors in bidding as follows:

4.4.6.1 The procedure for withdrawals of bids shall be as indicated in Section § 2.2-4330 of the Public Procurement Act of the Code of Virginia. The Bidder shall give notice in writing of his claim of right to withdraw his bid within two (2) business days after the conclusion of the bid opening procedure and shall submit original work papers with such notice. Bidders who fail to submit their original work papers, documents, and materials used in the preparation of their bid, as provided herein, waive all rights to claim an error.

ARTICLE 5-CONSIDERATION OF BIDS

5.1 OPENING OF BIDS

5.1.1 Unless stated otherwise in the Advertisement/Invitation to Bid, the properly identified Bids received on time will be opened publicly and will be read aloud, and an abstract of the amounts of the Base Bids and major Alternates, if any, will be made available to Bidders.

5.2 REJECTION OF BIDS
5.2.1 Chesapeake Public Schools reserves the sole right to cancel the bid opening or to reject any or all bids in whole or in part when it is the best interest of Chesapeake Public Schools.

5.2.2 Chesapeake Public Schools reserves the right to reject any or all bids, in whole or in part, to waive informalities and to delete items prior to making the award, whenever it is deemed in the sole opinion of Chesapeake Public Schools to be in its best interest.

5.3 ACCEPTANCE OF BID (AWARD)

5.3.1 It is the intent of the Owner, if he accepts any base bids noted, to accept them in the order in which they are listed in the bid form; however, the Owner shall have the right to accept base bids in any order or combination.

5.3.2 It is the intent of the Owner to award a Contract to the lowest responsive and responsible Bidder provided the Bid has been submitted in accordance with the requirements of the Bidding Documents, is judged to be reasonable, and does not exceed the funds available.

5.3.3 All other factors being equal such as quality, service, cost etc., award preference shall be given in the following order: Chesapeake City firms, area firms, state firms and out-of-state firms, if such a choice is available: otherwise, a tie shall be decided by a random drawing. Whenever any Bidder is a resident of any other state and such state under its laws allows a resident contract of that state a preference, a like preference may be allowed to the lowest responsive and responsible Bidder who is a resident of Virginia.

5.3.4 Under the circumstances where no add or deduct alternatives are included on the Construction Documents, the low Bidder shall be determined by the Owner based upon a comparison of the base bid amounts set forth on such forms.

5.3.4.1 In the event that one (1) or more alternates are included in the Construction Documents, the low Bidder shall be determined by the Owner’s Representative and the Architect/Engineer based upon the aggregate amount of: (i) the base bid less (ii) any deductive alternates selected by the Owner’s Representative and the Architect/Engineer. Alternates shall be selected based upon its authorized construction budget and the Owner’s needs and requirements at the time of the bid opening. The Owner reserves the right, in its sole discretion, to select or accept any or all of the deductive alternates included in the Construction Documents.

5.3.4.2 When one (1) or more alternates are included in the Construction Documents, the Owner shall determine the low Bidder by means of a “blind” bid review process which shall operate generally as follows:

5.3.4.2.1 A designated member of the Owner’s Purchasing Department shall complete two (2) bid tabulation sheets, the first of which shall identify each Bidder by name and the second of which shall omit the names of the Bidders and shall refer to each Bidder by a generic term such as “Contractor A” and “Contractor B”. Individuals having official responsibility as defined in the Virginia Public Procurement Act section § 2.2-4367, including the Owner’s Representative and the Architect/Engineer, shall not attend the bid opening.

5.3.4.2.2 Following the bid opening, the Purchasing staff shall submit only the second, anonymous bid tabulation sheet to the Owner’s Representative and the Architect/Engineer for review.
and consideration. They shall determine the low Bidder based on the aggregate amount of the base bid and any selected deductive alternates set forth on the second anonymous bid tabulation sheet, and shall circle and initial their choices on such form. Once the Owner’s Representative and the Architect/Engineer’s selections have been made, the two (2) tabulation sheets shall be compared and the identity of the low Bidder shall be revealed.

5.3.5 An “Intent to Award” letter will be sent to the apparent low Bidder following the bid opening, prior to presentation to the School Board, to allow the Contractor to begin preparation of his “Post Bid submittals.”

5.3.6 Following acceptance of the Bid by the School Board, a “Notice to Proceed” letter preceding the “Agreement between the Owner and the Contractor” shall be forwarded to the successful Contractor to allow him to obtain the required Performance and Payment bonds.

5.3.7 Award and Notification shall be posted on the Chesapeake Public Schools Purchasing website (http://www.cpschools.com/purchasing/current-bids) under the “Current Bids” tab or on DemandStar (http://DemandStar.com).

ARTICLE 6-FUNDING OUT CLAUSE

6.1 Failure of the School Board to fund or City Council of Chesapeake to appropriate sufficient funds in any year for payment in full required by this contract or any other provisions herein during the term of the contract shall, at the District’s option, permit the District to terminate this Contract at any time and render it null and void, without any further liability on the part of the District of any kind whatsoever, except for its obligation to pay for the products and materials already in inventory as of the time of termination. This Contract shall not constitute a debt of the City of Chesapeake or the District, within the meaning of any limitations or indebtedness of the District or the City of Chesapeake, under the Constitution or laws of the Commonwealth of Virginia, including the Charter of the City of Chesapeake.

ARTICLE 7-POST-BID INFORMATION

7.1 SUBMISSIONS

7.1.1 The successful Bidder shall, within ten (10) days of the receipt of the “Notice to Proceed”, submit the following information to the Architect/Engineer:

7.1.1.1 A designation of the Work to be performed by the successful Bidder with his own forces;

7.1.1.2 The proprietary names and the suppliers of principal items or systems of material and equipment proposed for the Work;

7.1.1.3 A list of names of the Subcontractors or other persons or organizations (including those who are to furnish materials or equipment fabricated to a special design) proposed for the principle portions of the Work and copies of their agreements with the successful Bidder;
7.1.1.4 A preliminary Schedule, in time-scaled diagram form, defining in detail the successful Bidder's planned operations during the first 30 days shall be submitted to the Architect/Engineer for review and approval. The successful Bidder shall also provide in time-scaled summary, his general approach and preliminary schedule for the balance of the project;

7.1.1.5 All required performance and payment bonds, insurance certificates, permits, and other documentation that successful Bidder is required to submit for Owner approval, prior to commencement of Work on site;

7.1.1.6 Evidence and references from other projects demonstrating to the Owner's satisfaction that the Contractor's Project Manager(s) and Superintendent(s) assigned to this project successfully have completed at least three (3) projects that had renovation and new addition work involved in the same project that were similar in size, cost, and scope of the proposed project.

7.1.1.7 The successful Bidder will be required to establish to the satisfaction of the Architect/Engineer and the Owner the reliability and responsibility of the proposed subcontractors to furnish and perform the work described in the section of the specifications pertaining to such proposed Subcontractors’ respective trades.

7.1.1.8 The successful Bidder will be required to provide a valid Certificate of Insurance, acceptable to Chesapeake Public Schools, and must meet the requirements set forth in the General Conditions of Bid contained herein. No work may commence until a certificate is provided. Chesapeake Public Schools must be listed as an additionally named insured party with respect to the scope of this bid.

7.1.2 EXPERIENCE: The Contractor shall submit evidence and references that the Contractor's Project Manager(s) and Superintendent(s) that are assigned to this project have completed at least three (3) renovation and new additions projects, of similar size, cost, and scope of the proposed project.

7.1.2.1 The Owner reserves the right to require the Contractor to replace the Contractor's Project Manager(s) and Superintendent(s) that are assigned to this project to the extent that such Project Manager(s) and Superintendent(s) do not possess the requisite experience set forth above in paragraph 7.1.1.6 without any additional cost to the Owner or any additional time for the performance of the Work. The successful Bidder's failure to comply with the experience requirements for Project Manager(s) and Superintendent(s) to the Owner's satisfaction after the Bidder has been provided an opportunity to replace its originally proposed Project Manager(s) and Superintendent(s) may result in the Owner declaring the successful Bidder non-responsible.

7.1.3 The successful Bidder will be required to establish to the satisfaction of the Architect/Engineer and the Owner the reliability and responsibility of the proposed Subcontractors to furnish and perform the Work described in the Section of the Specifications pertaining to such proposed Subcontractors’ respective trades.

7.1.4 Prior to the award of the Contract, the Architect/Engineer will notify the successful Bidder, in writing, if either the Owner or the Architect/Engineer, after due investigation, has
reasonable and substantial objection to any person or organization on such list. If the Owner or Architect/Engineer has a reasonable and substantial objection to any person or organization on such list, and refuses in writing to accept such person or organization, the successful Bidder may submit an acceptable substitute Subcontractor. If the successful Bidder refuses to submit an acceptable substitute Subcontractor, the Owner may declare the successful Bidder non-responsible. In the event the successful Bidder is deemed non-responsible under this Subparagraph, bid security will not be forfeited, notwithstanding anything to the contrary in Paragraph 4.4.1.

7.1.5 Subcontractor(s) and other persons and organizations proposed by the successful Bidder and accepted by the Owner and the Architect/Engineer must be used on the Work for which they were proposed and accepted and shall not be changed except with the written approval of the Owner and the Architect/Engineer. Successful Bidder shall remain fully liable and responsible for the Work to be performed by its Subcontractor(s) and shall assure compliance with all requirements of the Contract.

7.1.6 The Owner and the Architect/Engineer reserve the right to inspect the Successful Bidder's physical facilities, prior to the award of the Contract, to satisfy questions regarding the successful Bidder's capabilities.

ARTICLE 8-PERFORMANCE BOND AND LABOR AND MATERIAL PAYMENT BOND

8.1 The successful Bidder shall furnish bonds covering the complete and faithful performance of the Contract and the payment of all obligations arising thereunder.

8.1.1 The successful Bidder shall deliver the required bonds to the Owner not later than the date of execution of the Contract, or if the Work is commenced prior thereto in response to a letter of intent. The Successful Bidder shall, prior to commencement of the Work, submit evidence satisfactory to the Owner that such bonds will be furnished.

8.1.2 The bonds shall be written in the required forms, in an amount equal to or no less than the total Contract amount, from surety licensed to do business in the Commonwealth of Virginia and U. S. Department of Treasury. The surety providing the Performance Bond shall be liable for all obligations of the successful Bidder to the Owner including, but not limited to, the two (2) year guarantee period following acceptance of the Work and shall be subject to the same statutes of limitation that govern actions by the Owner against the successful Bidder.

8.1.3 The successful Bidder shall require the Attorney-In-Fact that executes the required bonds on behalf of the surety to affix thereto a certified and current copy of his Power of Attorney.

8.1.4 The bonds shall be written on forms provided as part of the Project Manual or on AIA Document A312, Performance and Payment Bond.

ARTICLE 9-FORM OF AGREEMENT BETWEEN OWNER AND CONTRACTOR
9.1 Unless otherwise provided in the Construction Documents, the Agreement for the Work will be written on the Chesapeake Public Schools’ Agreement between Owner and Contractor, a sample of which is included under Section 005000.

ARTICLE 10-NEGOTIATION WITH LOWEST RESPONSIVE AND RESPONSIBLE BIDDER

10.1 Unless canceled or rejected, a responsive bid from the lowest responsible Bidder shall be accepted as submitted, except if the bid from the lowest responsible Bidder exceeds available funds. Chesapeake Public Schools may negotiate with the apparent low Bidder to obtain a Contract within available funds in accordance with the following procedures:

10.1.1 Within seven (7) days of the opening of bids, the Owner shall notify the low Bidder of its desire to negotiate a Contract, which will not exceed funds available for the project and will schedule a negotiation session with the low Bidder.

10.1.2 The low Bidder, the Owner, and the Architect/Engineer shall endeavor at the negotiation session to obtain a revised bid within available funds based upon changes to the Contract Documents, which would result in cost reductions. If, in the judgment of the Owner, the Owner and the low Bidder cannot successfully negotiate a revised bid within available funds, the Owner may, at any time, end the negotiating procedure.

10.1.3 If negotiations are successful, the Architect/Engineer shall make necessary changes to the Contract Documents and issue them as addenda to be incorporated in the Contract Documents within ten (10) days after the completion of the negotiation session.

10.1.4 Based upon the issuance of addenda by the Architect/Engineer, the low Bidder shall confirm in writing his revised bid within five (5) days of the issuance of the Addenda.

10.1.5 The Owner shall be allowed five (5) days after receipt of the low Bidder’s revised bid to determine whether it will be accepted.

ARTICLE 11-DEBARMENT AND PROHIBITED CONTRACTS

11.1 In accordance with § 2.2-4321 and § 4321.1 of the Code of Virginia, a prospective Contractor may be debarred or prohibited from contracting for particular types of supplies, services, insurance, or construction for specific periods of time. The following sets forth the purpose, causes, and procedures for debarring a prospective Contractor, and the reinstatement of a Contractor.

11.1.1 Purpose of debarment is to protect the District from risks associated with awarding Contracts to a Contractor having exhibited an inability or unwillingness to fulfill contractual requirements and/or the unsatisfactory performance of a Contract and to protect the interest and integrity of the procurement process. The seriousness of the Contractor’s acts or omissions showing non-responsibility; the ability and willingness of the Contractor to promptly correct them; any mitigating factors; and the public interest should be considered in making any debarment decision. Contractors meeting the above may be debarred for a period of (1) one year or (1) one bid period cycle whichever is longer.
11.1.2 Causes for debarment may include, but are not limited to, the following acts:

11.1.2.1 Conviction of or civil judgment against the Contractor or any of its principals or affiliates within the last five (5) years for:

11.1.2.1.1 Commission of fraud or a criminal offense in connection with (i) obtaining, (ii) attempting to obtain, or (iii) performing a public contract or subcontract;

11.1.2.1.2 Violation of federal or state criminal statutes or civil antitrust, false claim, or procurement laws;

11.1.2.1.3 Commission of embezzlement, theft, forgery, bribery, falsification, or destruction of records, making false statements, receiving stolen property or other offense involving moral turpitude;

11.1.2.1.4 Commission of any other offense indicating a lack of business integrity or business honesty that seriously and directly affects the present responsibility of a government Contractor or Subcontractor.

11.1.2.2 Failure to have an effective business ethics and compliance training and reporting program in place for officers and employees.

11.1.2.2.1 Listing on the Excluded Parties List (EPLS) maintained by the General Services Administration: https://www.acquisition.gov.

11.1.2.2.2 Subcontracting with a business concern, organization, entity, or person that has been debarred by any Agency or Department of the Commonwealth of Virginia or which is listed on the EPLS.

11.1.2.2.3 Failure to collect and/or remit taxes may result in prohibition from contracting with the District as set forth in § 2.2-4321.1.

11.1.3 Procedures governing the debarment decision making process are designed to be consistent with principles of fundamental fairness.

11.1.3.1 The Director of Purchasing, shall notify the Contractor by certified mail, return receipt requested, that debarment is being considered. This notice shall include:

11.1.3.1.1 The reasons for the proposed debarment in terms sufficient to put the Contractor on notice of the circumstances upon which it is based;

11.1.3.1.2.1 The procedures the Contractor may take to examine evidence of the proposed debarment;

11.1.3.1.3 The Contractor may submit to the Director of Purchasing, within 30 calendar days after receipt of notice, written information and argument to the proposed debarment, including any additional specific information that raises a genuine dispute over a material fact.

11.1.3.1.4 The Contractor may also submit information and materials showing (i) that it had an effective business ethics and compliance training and reporting program in place for
officers and employees; (ii) the steps it has taken to address the conduct giving rise to the proposed debarment including, but not limited to, disciplinary action, restitution, restructuring, and additional internal controls and training; and (iii) its cooperation with government authorities and investigators.

11.1.3.1.5 Prior to the issuance of a written determination of debarment, the Director of Purchasing shall (i) notify the Contractor in writing of the results of the evaluation, (ii) disclose the factual support for the determination. The Contractor shall have ten (10) business days for rebuttal.

11.1.3.1.6 The Director of Purchasing shall issue its written determination of disqualification based on all information in the possession of Chesapeake Public Schools, including any rebuttal information, within ten (10) business days of the date the Director of Purchasing received such rebuttal information.

11.1.3.1.7 Debarment shall commence upon notification.

11.1.4 Scope of Debarment. Debarment extends to all Districts or other organizational elements of the Contractor and to affiliates of the Contractor unless otherwise specified. As used herein, “affiliates” includes business concerns, organizations, entities or persons sharing common (or with overlapping) management, ownership, facilities, equipment, employees and/or assets and includes family members having an identity of economic interest with a person that was debarred or proposed for debarment. “Affiliates” also includes businesses or entities organized following the debarment or proposed debarment of a Contractor which has the same or similar management, ownership, or principal employees as the Contractor that was debarred or proposed for debarment.

11.1.5 Reinstatement of a Contractor may occur if, it is determined that the action taken was arbitrary or capricious, or not in accordance with applicable state law or regulations. The sole relief shall be restoration of eligibility. A debarred Contractor can apply for reinstatement after being debarred for a period of (1) one year or (1) one bid period cycle whichever is longer. The request for reinstatement must be in writing to the Director of Purchasing citing actions taken to remedy the reason for debarment or prevent recurrence of the situation that caused the debarment action to be taken and otherwise indicating that lifting or suspension of the debarment would be in the best interest of Chesapeake Public Schools. The Director of Purchasing shall provide a written response to the debarred Contractor within 30 calendar days either reinstating the Contractor or denying the request with the reasons cited. The Contractor shall have ten (10) business days to respond. The Director of Purchasing shall have ten (10) business days to respond to the Contractor’s response.

11.1.6 The decision of the Director of Purchasing shall be final.

Contractors, please note that due to the COVID-19 pandemic, your bid response must be submitted utilizing DemandStar’s E-Bidding platform. Bids submitted by any other method will not be accepted. During the pandemic, disregard references to bid mailing instructions, submitting duplicate copies of bid, and envelope/envelope template requirements.

END OF SECTION 002100
CEDAR ROAD ELEMENTARY SCHOOL ADDITION
CHESAPEAKE PUBLIC SCHOOLS
BID 48-1920

SECTION 003100

BID FORM

GENERAL CONTRACT

Each bidder shall use this form for his bid. See Instructions to Bidders and execute this form in duplicate in compliance therewith.

Date: ________________________________

BID TO: Chesapeake Public Schools
School Administration Building
312 Cedar Road
Chesapeake, Virginia 23322

ATTN: Kisha Allen, Director of Purchasing
Department of Purchasing

BID FROM: ___________________________________
Bidder's Name
_________________________________
Bidder's Address

GENTLEMEN:

Having examined the premises and the conditions affecting the Work, the undersigned proposes to provide all equipment, material, and labor in accordance with the Contract Documents, the Instructions to Bidders, the General Conditions, Drawings, Specifications, and Addenda Prepared by HBA Architecture & Interior Design, Inc.

Complete this Bid Form in blue or black ink or by typewriter.

Submit two (2) copies of the bid form.

For: CEDAR ROAD ELEMENTARY SCHOOL ADDITION
CHESAPEAKE PUBLIC SCHOOLS BID NUMBER: 48-1920

The undersigned proposes to provide all equipment, materials, and labor to perform all Work in accordance with the Contract Documents. The bid price must be entered in numbers and words. In case of variation between the two (2), the price written in words shall prevail.

BASE BID

The price for the entire Work, complete in accordance with the Contract Documents, but excluding Work herein described and priced separately as an alternate bid, if any.

Price: Dollars ($____________________________) (numerical)

________________________________________________________________________ Dollars (written)

The undersigned Contractor acknowledges verifying the referenced quantities above in the field and represents that these costs are adequate to perform the work required included in the Base Bid.
BACKGROUND CHECKS:
The Architect, Contractor and any and all Subcontractors shall certify that no employee (i) has been convicted of a felony or any offense involving the sexual molestation or physical or sexual abuse or rape of a child; and (ii) has been convicted of a crime of moral turpitude. Refer to Appendix A.

IMMIGRATION:
The Federal Immigration Reform and Control Act makes it unlawful for a person or other entity to hire, recruit, or refer for a fee for employment in the United States, an alien, knowing the alien is unauthorized to work in the United States. Chesapeake City Code requires that any person or entity doing business with the City of Chesapeake, including its boards and commissions, shall provide a sworn certification by the contractor or vendor of compliance with all federal immigration laws and regulations. Refer to Appendix B.

VENDOR'S AUTHORIZATION TO TRANSACT BUSINESS IN THE COMMONWEALTH:
Specification Section 003110 which shall be completed and returned with the bid response.

ANTI-COLLLUSION AND NON-DISCRIMINATION AFFIDAVIT:
Specification Section 004100 which shall be completed and returned with the bid response.

CHANGES IN THE WORK:
Where changes or alterations are authorized by the Owner involving cost for where estimates authorized by the Owner are submitted for extra work, the cost to the Owner will be based on provisions of Section 012600 Contract Modification Procedures and per guidelines set forth in Section 007000 General Conditions.

The Undersigned also agrees to Substantially Complete the work in accordance with the contract documents within 105 days after the receipt of the authorized purchase order.

The work shall begin upon receipt of award letter and / or signed hard copy of authorized purchase order and shall be completed by no later than the date of Substantial Completion. The Undersigned further agrees, if awarded the contract, to execute and deliver Performance and Labor and Materials Payment bonds on AIA Document A312 for 100% of Contract amount.

The Undersigned acknowledges and agrees to the liquidated damages specified in the General Conditions.

The Undersigned further agrees that the certified check or Bidder's bond, payable to Chesapeake Public Schools, Chesapeake, Virginia, accompanying this proposal is left in escrow with Chesapeake Public Schools, that its amount is the measure of liquidated damages which the Owner will sustain by the failure of

The undersigned to execute the Agreement if notified of award or in furnishing the Bonds within ten (10) days after written notification of the award of the Contract to him, then the check, or the amount of the bond, shall become property of the Owner; but if this proposal is not accepted within 90 days after the bid opening, or if the Undersigned executes and delivers said agreement and Bonds, the check or bond will be returned to him upon receipt thereof.

Contractors, please note that due to the COVID-19 pandemic, your bid response must be submitted utilizing DemandStar's E-Bidding platform. Bids submitted by any other method will not be accepted. During the pandemic, disregard references to bid mailing instructions, submitting duplicate copies of bid, and envelope/envelope template requirements.

Very truly yours,
CEDAR ROAD ELEMENTARY SCHOOL ADDITION
CHESAPEAKE PUBLIC SCHOOLS
BID 48-1920

Company
____________________________________________________________________________

Address
____________________________________________________________________________

City/State/Zip Code
____________________________________________________________________________

Registered Virginia Contractor No. ______________________________________________

Signed: ______________________________________________________________________

END OF SECTION 003100
CEDAR ROAD ELEMENTARY SCHOOL ADDITION
CHESAPEAKE PUBLIC SCHOOLS
BID 48-1920

SECTION 003100a
PRE-BID QUESTION FORM

The Architect and Owner shall not be responsible for oral clarifications and interpretations. Bidders and Sub-bidders requiring clarification of the Bidding Documents shall complete and submit this form which must reach the Architect at least three (3) calendar days prior to the date scheduled for receipt of bids. Use separate form for each question submitted.

DATE: ______________________________________

CEDAR ROAD ELEMENTARY SCHOOL ADDITION

The following question concerns Drawing (number)__________________:
____________________________________________________________________________________
____________________________________________________________________________________
____________________________________________________________________________________

The following question concerns Specifications Section (number)__________________, page ________, article ________________:
____________________________________________________________________________________
____________________________________________________________________________________
____________________________________________________________________________________
____________________________________________________________________________________

Interpretations, corrections and changes of the Bidding Documents will be made by written Addendum, and will be posted on Chesapeake Public School’s Purchasing and DemandStar websites. Interpretations, corrections and changes of the Bidding Documents made in any other manner will not be binding, and Bidders shall not rely on them.

Questions submitted by: ________________________________________________________________
Name of Organization: __________________________________________________________________

Telephone No. ___________________________ Email Address: ________________________________

E-mail Form To: Chesapeake Public Schools, Purchasing Department, Attention: Ms. Kisha Allen, kisha.allen@cpschools.com, 312 Cedar Rd., Chesapeake, VA, 23322

Copies of the question shall be sent to: jackh@hbaonline.com.

END OF SECTION 003100a
Dear Contractor:

Effective July 1, 2006, amendments made to the *Code of Virginia § 22.1-296.1* require that prior to awarding a contract, the contractor and the contractor’s employees who may be in direct contact with students in the performance of the contract certify that both the contractor and the contractor’s employees have not been convicted of a felony or any offense involving the sexual molestation or physical or sexual abuse or rape of a child. For the purpose of implementation Chesapeake Public Schools defines “direct contact with students” as a contractor working at a school site between the hours of 6:00 a.m. and midnight during normal school days in lieu of a school facility such as the Warehouse or Transportation Department where students are not expected to be present.

Enclosed please find a certification (Certificate of Compliance) that is **required to be completed and submitted prior to awarding your contract and / or issuing your purchase order. This form must be updated every 12 months for the duration of the contract / agreement period.** Should there be a change to the certification of your officers, or any individuals assisting in the performance of the contract between the 12 month periods, Chesapeake Public Schools must be notified immediately and an updated certification must also be provided to Chesapeake Public Schools within five (5) days of such change. Failure to complete all certifications accurately may result in the award of the contract / agreement being revoked without recourse against Chesapeake Public Schools.

Please feel free to contact the school / department, which is responsible for finalizing your agreement, with any questions you may have, or call the Purchasing Department at 547-0265.

Sincerely,

Chesapeake Public Schools

*The Chesapeake Public School System is an equal opportunity school system.*

*The School Board of the City of Chesapeake also adheres to the principles of equal opportunity in employment and, therefore, prohibits discrimination in terms and conditions of employment on the basis of race, sex, national origin, color, religion, or disability.*
Certificate of Compliance

Code of Virginia §22.1-296.1

I, the undersigned certify that no individual holding an office in the company and/or corporation has been convicted of a felony or any offense involving the sexual molestation or physical or sexual abuse or rape of a child.

List Officers and Titles (Please use full, legal names):

________________________________________________________________________

________________________________________________________________________

________________________________________________________________________

Further, the following individuals will, on behalf of my firm, assist in the performance of this contract and they have not been convicted of a felony or crime as described above.

Listing of individuals assisting in the performance of this contract (Please use full, legal names):

________________________________________________________________________

________________________________________________________________________

________________________________________________________________________

________________________________________________________________________

Attach additional names to this form if the space is not adequate.

I understand that should there be any change to this certification of officers, or individuals assisting in the performance of this contract, during any time of this contract, the Chesapeake Public Schools’ central office / school issuing this contract / PO will be notified immediately, and an updated certification will be provided to them within five (5) days of such change.

Company

Print Name

Signature

Date

For Office Use Only

Acknowledged by: ___________________________ Date: ___________________________

If Applicable:

Project Name: ___________________________ PO Number: ___________________________
Dear Contractor:

The Federal Immigration Reform and Control Act makes it unlawful for a person or other entity to hire, recruit, or refer for a fee for employment in the United States, an alien, knowing the alien is unauthorized to work in the United States. Section 40.1-11.1 of the Code of Virginia makes it unlawful for any employer to knowingly employ an alien who cannot provide documents indicating that he or she is legally eligible for employment in the United States. These laws place an affirmative duty on employers to ensure that aliens have proof of eligibility for employment. In addition, Section 54-72.2 of the Chesapeake City Code requires that any person or entity doing business with the City of Chesapeake, including its boards and commissions, shall provide a sworn certification by the contractor or vendor of compliance with all federal immigration laws and regulations.

Enclosed please find the certification document (Certificate of Compliance With Immigration Laws and Regulations) that is required to be completed and submitted for all contracts with a total value of $50,000 or more. This certificate shall be attached to the contract document, if applicable. For instances, where a purchase order will serve as the contract, this certificate shall be completed and returned to Chesapeake Public Schools. The Contract/Purchase Order will not be issued prior to submittal of a completed Certificate of Compliance With Immigration Laws and Regulations. No performance may take place until the completed certificate is provided to the school/department responsible for finalizing your agreement. This form must be updated every twelve (12) months for the duration of the contract/agreement period. Should there be a change to the certification between the twelve (12) month periods, Chesapeake Public Schools must be notified immediately and an updated certification must also be provided to Chesapeake Public Schools within five (5) days of such change. Failure to submit a certificate shall render the pending contract and/or purchase order void.

Please feel free to contact the school/department responsible for finalizing your agreement with any questions you may have, or call the Purchasing Department at 547-0265.

Sincerely,

Chesapeake Public Schools

Enclosure
Certificate of Compliance
With Immigration Laws and Regulations

***For Transactions That Total More Than $50,000***

Return this form to the school/department responsible for finalizing your agreement.

VENDOR: FORM MUST BE NOTARIZED PRIOR TO SUBMISSION

The Federal Immigration Reform and Control Act makes it unlawful for a person or other entity to hire, recruit, or refer for a fee for employment in the United States, an alien, knowing the alien is unauthorized to work in the United States. Section 40.1-11.1 of the Code of Virginia makes it unlawful for any employer to knowingly employ an alien who cannot provide documents indicating that he or she is legally eligible for employment in the United States. These laws place an affirmative duty on employers to ensure that aliens have proof of eligibility for employment. In addition, Section 54-72.2 of the Chesapeake City Code requires that any person or entity doing business with the City of Chesapeake, including its boards and commissions, shall provide a sworn certification by the contractor or vendor of compliance with all federal immigration laws and regulations.

This certificate shall be attached to the contract document, if applicable. In any case where a purchase order will serve as the contract, this certificate shall be completed and returned to the Chesapeake Public Schools. The Contract/Purchase Order will not be issued prior to submittal of a completed Certificate of Compliance With Immigration Laws and Regulations. No performance may take place until the completed certificate is provided to the school/department responsible for finalizing your agreement. Failure to submit a certificate shall render the pending contract and/or purchase order void.

Type or print legibly when completing this form.

Legal Name of Contractor or Vendor (Note: This is your name as reported to the IRS. It should match your Social Security card or Federal Identification Number.)

Type of Business Entity
Check one (attach additional pages to this form if the space below is not adequate):

- [ ] Sole Proprietorship—provide full name and address of owner
- [ ] Limited Partnership—provide full name and address of all partners
- [ ] General Partnership—provide full name and address of all partners
- [ ] Limited-Liability Corporation—provide full name and address of all managing members
- [ ] Corporation—provide full name and address of all officers

Full Name

Address

City, State and Zip

Business Telephone #

Business Fax #
Doing Business As (If Applicable)
(Note: This is the name that appears on your invoices, but is not used as your reporting name.)

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<tr>
<th>Name and Title of Person Completing this Certificate</th>
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<td>Physical Business Address</td>
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<thead>
<tr>
<th>Number of Employees</th>
<th>Are All Employees Eligible for Employment in the United States?</th>
</tr>
</thead>
</table>

Under penalty of perjury, I declare on behalf of the contractor/vendor listed above that to the best of my knowledge and based upon reasonable inquiry each and every one of the contractor’s employees is eligible for employment in the United States as required by the Federal Immigration Reform and Control Act of 1986 and Section 40.1-11.1 of the Code of Virginia. I further declare on behalf of the contractor/vendor that due care and diligence shall be used to ensure that all employees hired in the future will be eligible for employment in the United States and that I agree to remain in compliance throughout the duration of the contract. I affirm the information provided herein is true, correct, and complete. I also agree to permit the Chesapeake Public Schools to inspect records and documentation to ensure that all persons hired by the contractor/vendor are eligible for employment under the laws referenced in this certificate when deemed necessary by Chesapeake Public Schools. I agree that the contractor/vendor will fully cooperate in any such audit.

Sworn this ______ day of ____________, 20___
on behalf of _______________________________________
(Name of Contractor/Vendor)
as evidenced by the following signature and seal:

Name of Contractor/Vendor: _______________________________________
Printed Name of Signatory: _______________________________________
Signature: _______________________________________
Date: _______________________________________

SWORN TO AND SUBSCRIBED BEFORE ME:

City/County of ________________________________
Commonwealth/State of __________________________
The foregoing instrument was acknowledged before me this ______ day of ____________, 20___.

Registration No.: ____________________________
My commission expires: _________________________

For Office Use Only: __________________________
PO #: __________________________
Bid/RFP Project Name: _________________________

58-1819 APPENDIX B – CERTIFICATE OF COMPLIANCE WITH IMMIGRATION LAWS AND REGULATIONS 3
SECTION 003110

VENDOR’S AUTHORIZATION TO TRANSACT BUSINESS IN THE COMMONWEALTH

Please complete and return with bid response.

To the extent the Contractor is organized as a stock or nonstock corporation, limited liability company, business trust, or limited partnership or registered as a registered limited liability partnership, such entity shall be authorized to transact business in the Commonwealth as a domestic or foreign business entity by the State Corporation Commission. Any such business entity shall not allow its existence to lapse or its certificate of authority or registration to transact business in the Commonwealth to be revoked or cancelled at any time during the term of this contract. The Owner may void any contract with a business entity if the business entity fails to remain in compliance with the provisions of Virginia Code Section 2.2-4311.2.

Any bidder or offeror organized or authorized to transact business in the Commonwealth pursuant to Title 13.1 or Title 50 shall include in its bid or proposal the identification number issued to it by the State Corporation Commission. Any bidder or offeror that is not required to be authorized to transact business in the Commonwealth as a foreign business entity under Title 13.1 or Title 50 or as otherwise required by law shall include in its bid or proposal a statement describing why the bidder or offeror is not required to be so authorized.

State Corporation Commission Identification No.: __________________________

or

Describe why the bidder or offeror is not required to be authorized by the State Corporation Commission:

___________________________________________________________________________
___________________________________________________________________________
___________________________________________________________________________

________________________________________________________
THE FOLLOWING ANTI-COLLUSION AND NON-DISCRIMINATION AFFIDAVIT SHALL BE SIGNED AND MUST ACCOMPANY BID DOCUMENTS TO RECEIVE CONSIDERATION:

ANTI-COLLUSION CLAUSE:

In the preparation and submission of this bid, said bidder did not either directly or indirectly enter into any combination or arrangement with any person, firm or corporation, or enter into any agreement, participate in any collusion, or otherwise take any part in the restraint of free, competitive bidding in violation of the Sherman Act (15 USC Section 1), Sections 59.1-9.1 through 50.1-9.17 or Sections 59.1-68.6 through 59.1-68.8 of the Code of Virginia.

The undersigned bidder hereby certifies that this agreement, or any claims resulting therefrom, is not the result of, or affected by, any act of collusion with, or any act of another person or persons, firm or corporation engaged in the same line of business or commerce, and that no person acting for or employed by Chesapeake Public Schools has an interest in or is concerned with this proposal, and that no person or persons, firm or corporation other than the undersigned have or are interested in this proposal.

NON-DISCRIMINATION CLAUSE:

Employment discrimination by Contractors shall be prohibited.

1. During the performance of this Contract, the Contractor agrees as follows:
   a. In the solicitation or awarding of Contracts, the Contractor will not discriminate against a bidder or offeror, any employee or applicant for employment because of race, religion, color, sex, national origin or age, disability, or any other basis prohibited by state law relating to discrimination in employment. The Contractor agrees to post, in conspicuous places available to employees and applicants for employment, notices setting forth the provisions of this non-discrimination clause.
   b. Whenever solicitations are made they shall include businesses selected from a list made available by the Department of Minority Business Enterprise.
   c. The Contractor, in all solicitations or advertisements for employees placed by or on behalf of the Contractor, will state that such Contractor is an equal opportunity employer.
   d. Notices, advertisements, and solicitations placed in accordance with federal law, rule, or regulation shall be deemed sufficient for the purpose of meeting the requirements of this section.

   BY (BIDDER): _______________________

   TITLE: _____________________________

   COMPANY: __________________________

   ADDRESS: ___________________________

   BIDDER’S SIGNATURE NOTARIZATION:

   Subscribed and sworn to before me this _____
day of ________________, 20__.

   ____________________________________
INFORMATION DISCLOSURE:

License Class A Virginia Contractor No. ______________________________________

City of Chesapeake Business License No. ______________________________________

Bidder ________________________________________________________________

Title ________________________________________________________________

Address of Bidder's Principal Office: ______________________________________

Phone No. ___________________________

List of Principal Officers of Company:

President: ________________________________

Vice President: ________________________________

Treasurer: ________________________________

Secretary: ________________________________

List Major Stockholders:

_____________________________________________________

_____________________________________________________

_____________________________________________________

State of Incorporation: __________________________________________
(If corporation)
SECTION 00500

CHESAPEAKE PUBLIC SCHOOLS
SAMPLE AGREEMENT BETWEEN OWNER AND CONTRACTOR

AGREEMENT made as of the __________ day of __________________ in the year of 2020

BETWEEN the Owner: Chesapeake Public Schools
312 Cedar Road
Chesapeake, Virginia 23322

and the Contractor: ________________________________
______________________________
______________________________

The Project: CEDAR ROAD ELEMENTARY SCHOOL ADDITION
CHESAPEAKE, VIRGINIA
BID: # 48-1920

The Owner and the Contractor agree as set forth below.

ARTICLE 1

THE CONTRACT DOCUMENTS

The Contract Documents consist of this Agreement, the Conditions of the Contract (General, and other
Conditions), the Drawings, the Specifications, all Addenda issued prior to and all Modifications issued
after execution of this Agreement. These form the Contract, and all are as fully a part of the Contract as if
attached to this Agreement or repeated herein.

ARTICLE 2

THE WORK

The project includes the addition/expansion of the existing cafeteria.

ARTICLE 3

TIME OF COMMENCEMENT AND SUBSTANTIAL COMPLETION

The Work to be performed under this Contract shall be commenced within 14 days after the date upon
which the Contractor receives the Notice to Proceed and, subject to authorized adjustments. Substantial
Completion and issuance of a Certificate of Substantial Completion shall be achieved no later than 105
days after the issuance of the Purchase Order. Project Final Completion shall be achieved no later than
135 days after the issuance of the Purchase Order.

Liquidated damages for delay shall be assessed against the Contractor in accordance with the General
Conditions at the rate of One Thousand Dollars ($1,000.00) per day, until Substantial Completion is
achieved. And, if the punch list is not complete within thirty days (30 days), liquidated damages for delay
shall be assessed at the rate of Two-Hundred and Fifty Dollars ($250.00) per day, until Final Completion
is achieved.

ARTICLE 4
CONTRACT SUM

The Owner shall pay the Contractor in current funds for the performance of the Work, subject to additions and deductions by Change Order as provided in the Contract Documents, the Contract Sum of

\[ \text{\$} \, \text{written} \quad \text{\$} \, \text{numbers} \]

ARTICLE 5

PROGRESS PAYMENTS

Based upon Applications for Payment submitted to the Owner’s Architect/Engineer by the Contractor and Certificates for payment by the Owner’s Architect/Engineer, the Owner shall make monthly progress payments on account of the Contract Sum to the Contractor as provided in the Contract Documents.

Payments due and unpaid under the Contract Documents shall bear interest from the date payment is due at the rate of one percent (1%) per month.

ARTICLE 6

FINAL PAYMENT

Final payment, constituting the entire unpaid balance of the Contract Sum, shall be paid by the Owner to the Contractor when the Work has been completed, the Contract fully performed, and a final Certificate for Payment has been issued by the Architect/Engineer.

PAYMENTS TO SUBCONTRACTORS

The Contractor shall make payment to his Subcontractors in accordance with the Code of Virginia § 2.2-4354.

The Contractor shall pay within seven (7) days, each Subcontractor, upon receipt of payment from the Owner, out of the amount paid to the Contractor on account of such Subcontractor’s work, the amount to which said Subcontractor is entitled, reflecting the percentage actually retained, if any, from payments to the Contractor on account of such Contractor’s work.

If payment is not made within seven (7) days, the Contractor must, in writing, notify the Subcontractor of his intention to withhold all or a part of the Subcontractor’s payment and the reason for non-payment.

The Contractor and his Subcontractors and their lower-tier Subcontractors must provide the Owner with their social security numbers. Proprietorships, partnerships, and corporations must provide federal employer identification numbers.

The Contractor shall pay interest to the Subcontractor on all amounts owed by the Contractor that remain unpaid after seven (7) days following receipt by the Contractor of payment from the Owner for work performed by the Subcontractor under the contract, except for amounts withheld as allowed under Code of Virginia § 2.2-4354. Unless otherwise provided under the terms of the Contract, interest shall accrue at the rate of one percent (1%) per month.

The Contractor shall, by an appropriate agreement with each Subcontractor, require each Subcontractor to make payments and interest requirements with respect to each lower-tier Subcontractor.

The Contractor’s obligation to pay an interest charge to a Subcontractor pursuant to the payment clause in this section shall not be construed to be an obligation of the Owner. A contract modification shall not
ARTICLE 7

MISCELLANEOUS PROVISIONS

Terms used in this Agreement, which are defined in the Conditions of the Contract, shall have the meanings designated in those Conditions.

The Contract Documents, which constitute the entire agreement between the Owner and the Contractor, are listed in Article 1 and, except for Modifications issued after execution of this Agreement, are enumerated as follows:

<table>
<thead>
<tr>
<th>Documents</th>
<th>Dated</th>
</tr>
</thead>
<tbody>
<tr>
<td>Project Manual</td>
<td>April 24, 2020</td>
</tr>
<tr>
<td>Drawings</td>
<td>April 24, 2020</td>
</tr>
<tr>
<td>Addenda</td>
<td>TBD</td>
</tr>
</tbody>
</table>

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

OWNER 

CONTRACTOR

Superintendent
Chesapeake Public Schools

312 Cedar Road
Chesapeake, Virginia 23322
SECTION 006000

SAMPLE OF PERFORMANCE BOND

Bond No. _______________
Amount _______________

KNOW ALL PERSONS BY THESE PRESENT, that ______ (CONTRACTOR NAME AND ADDRESS), hereinafter called the Contractor (Principal), and ______ (SURETY NAME AND ADDRESS), a corporation duly organized and existing under and by virtue of the laws of the State of ________________, hereinafter called the Surety, are held and firmly bound unto ______ (OWNER NAME AND ADDRESS), the Owner (Obligee), in the sum of: ______ (CONTRACT AMOUNT), lawful money of the United States of America, for the payment of which, well and truly be made to the Owner, the Contractor, and the Surety bind themselves and each of their heirs, executors, administrators, successors, and assigns, jointly and severally, firmly by these present as follows:

THE CONDITION OF THE ABOVE OBLIGATION IS SUCH THAT

WHEREAS, the Contractor has executed and entered into a certain Contract with the Owner, dated ________________, which is incorporated by reference herein, for:

__________________________________________________________________________

NOW, THEREFORE, if the Principal shall at all times duly, promptly, and faithfully perform the Work and any alteration in or addition to the obligations of the Contractor arising thereunder, and shall assure all warranties against defective workmanship and materials, including the warranty period following Substantial Completion by the Contractor and comply with all of the covenants therein contained in the Specifications, Drawings, and other Contact Documents required to be performed by the Contractor, in the manner and within the times provided in the Contract Documents, and shall fully indemnify and save harmless the Owner from all costs and damage which it may suffer by reason or failure so to do, and shall fully reimburse and repay it all outlays and expenses which it may incur in making good any default, and reasonable attorneys, consultant, and expert witness fees incurred in the prosecution of or defense of any action arising out of or in connection with any such default, then this obligation shall be void; otherwise to remain in full force and effect.

Any action under this Performance Bond shall be filed within five (5) years after the later of: (a) termination of the Contract prior to Final Completion; (b) Final Completion of the Project; or (c) breach of the Contract by the Contractor. Any action under this Performance Bond shall be filed in a court of competent jurisdiction in the City of Chesapeake, Virginia which shall be the exclusive venue for such actions.

PROVIDED, HOWEVER, that the Surety, for value received, hereby stipulates and agrees that no change, extension of time, alteration, or addition to the terms of the Contract Documents or to the Work to be performed thereunder, shall in any way affect its obligation on this bond, and it does hereby waive notice of any such change, extension of time, alteration, or addition to the terms of the Contract Documents.
PROVIDED, FURTHER, that no final settlement between the Owner and the Contractor shall abridge the right of any beneficiary hereunder, whose claim may be unsatisfied.

IN WITNESS WHEREOF, the above parties bounded together have executed this instrument this ___ day of ___________, the name and corporate seal of each corporate party being hereto affixed and those presents duly signed by its undersigned representative, pursuant to authority of its governing body.

(CONTRACTOR)

_________________________________
By____________________________(Seal)

Attest

(SURETY)

_________________________________
By____________________________(Seal)

Attest

NOTE: Date of bond must not be prior to date of Contract.

IMPORTANT: The Surety named on this bond shall be one who is licensed to conduct business in the Commonwealth of Virginia and is named in the current list of Companies Holding Certificates of Authority as Acceptable Sureties on Federal Bonds and as Acceptable Reinsuring Companies, as published in Circular 570 (amended) by the Audit Staff Bureau of Accounts, U. S. Treasury Department. All bonds signed by an agent must be accompanied by a certified copy of the authority to act for the Surety at the time of the signing of this bond.

1733992
SECTION 007000
GENERAL CONDITIONS

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ARTICLE 2: CONTROL OF WORK
ARTICLE 3: PROSECUTION AND PROGRESS
ARTICLE 4: MISCELLANEOUS PROVISIONS
ARTICLE 5: PAYMENT

ARTICLE 1 - DEFINITIONS

1.1 OWNER: The "Owner" is Chesapeake Public Schools and is referred to throughout the Contract Documents as if singular in number and neuter in gender. The term Owner" means the Owner or his authorized representative. Chesapeake School Board and similar references shall mean the Owner.

1.2 ARCHITECT/ENGINEER: The term "Architect/Engineer" means the person or organization identified as such in the Contract Documents. The Architect/Engineer is referred to throughout the Contract Documents as if singular in number and neuter in gender. The term includes the Architect/Engineer or his authorized representative.

1.3 CONTRACTOR: The "Contractor" is the person or organization identified as such in the Contract Documents and is referred to throughout the Contract Documents as if singular in number and neuter in gender. The term "Contractor" means the Contractor or his authorized representative.

1.4 ACCEPTANCE: The formal written acceptance by the Owner.

1.5 ADDENDA: Written interpretations or revisions to any of the Contract Documents issued by the Architect/Engineer before the Bid opening.

1.6 BID: Offer of the Bidder for the Work when made out and submitted on the prescribed Bid Form, properly signed and guaranteed, and which includes the schedule of Bid items.

1.7 BID GUARANTEE: Cashier's Check or Bidder's Bond accompanying the Bid submitted by the Bidder, as a guarantee that the Bidder will enter into a Contract with the Owner for the performance of the Work and that it will file acceptable bonds and insurance if the Contract is awarded to the Bidder.

1.8 BIDDER: Any individual, firm, partnership, corporation, or combination thereof, submitting a Bid for the Work contemplated, acting directly or through a duly authorized representative.

1.9 CHANGE ORDER: An order authorized by the Owner and issued to the Contractor by the Architect/Engineer amending the Contract Documents.

1.10 THE CONTRACT DOCUMENTS: The Contract Documents consist of the Owner-Contractor Agreement, the General Conditions, the Drawings, the Specifications, and all Addenda issued prior to 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 (as defined in 3.10.5); (4) a written interpretation issued by the Architect/Engineer; or (5) a written order for a minor change in the Work issued by the Architect/Engineer. The Contract Documents do not include
Bidding Documents such as the Advertisement for Bids, the Instructions to Bidders, sample forms, the Contractor's Bid or portions of Addenda relating to any of these, or any other documents, unless specifically enumerated in the Owner-Contractor Agreement. The Contract Documents do not include any other documents including, but not limited to, soils, geotechnical, or other reports, surveys, and analyses, which may be printed, bound, or assembled with the Contract Documents, or otherwise made available to the Contractor for review or information under this Contract, unless specifically enumerated and directly incorporated by reference in the Owner-Contractor Agreement.

1.11 THE CONTRACT: The Contract Documents form the Contract for Construction. This Contract represents the entire and integrated agreement between the parties hereto and supersedes all prior negotiations, representations, or agreements, either written or oral. The Contract may be amended or modified only by a Modification as defined in 1.10. The Contract Documents shall not be construed to create any contractual relationship of any kind between the Architect/Engineer and the Contractor and any Subcontractor or Sub-subcontractor, but the Architect/Engineer shall be entitled to performance of obligations intended for his benefit, and to enforcement thereof. Nothing contained in the Contract Documents shall create any contractual relationship between the Owner or the Architect/Engineer. The Contract Documents shall be interpreted so as to eliminate inconsistencies or conflicts. In the event of a clear conflict between provisions of the Contract Documents, precedence shall be governed by 1.11.1. The Contract shall be signed in not less than duplicate by the Owner and Contractor.

1.11.1 The following order of precedence of the Contract Documents shall govern:

1.11.1.1 Modifications to the Contract
1.11.1.2 The Owner-Contractor Agreement
1.11.1.3 Addenda
1.11.1.4 The General Conditions
1.11.1.5 Drawings and Specifications: Drawings govern Specifications for quantities and locations; Specifications govern Drawings for quality and performance in the event of ambiguity in quantity or quality; the greater quality and the better quantity shall govern.

1.11.2 Within individual portions of the Contract Documents listed in 1.11.1, typewritten or handwritten language shall prevail over printed language.

1.12 CONTRACT DRAWINGS: The official plans, profiles, typical cross sections, general cross sections, elevations, and details listed or referenced in the Specifications or amendments thereto and supplementary drawings approved by the Owner, which show the locations, character, dimensions, and details of the Work to be performed. Work may be detailed in diagrammatic format and require field layout and coordination with other trades. Do not proceed with work of any trade until coordinated with other trades. Conflicts due to layout will be resolved at the Contractor’s expense. All work shall be done according to dimensions and notes on the drawings. Do not scale drawings.

1.12.1 The drawings are schematic, and in some cases are not to scale. All Work shall be performed according to dimensions and notes on the drawings and not by scaling them.

1.13 PERIOD OF PERFORMANCE: The period of performance is the period of time allowed in the Contract Documents for completion of the Work. Acceptance of any or all bid
alternates will not change the Contract time requirements as stated in the General Conditions.

1.14 EXTRA WORK: Work determined by the Architect/Engineer as not being covered by the Contract.

1.15 PROVIDED: As used in the Contract Documents in reference to Work to be performed by the Contractor, "provided" shall mean "furnished and installed complete in place."

1.16 SUBMITTALS: Submittals are defined in 2.5.

1.17 BID DOCUMENTS: A set of documents issued by the Owner for the intended Work, which includes the Instruction to Bidders; Bid Form; Conditions of the Contract; Contract Drawings; Technical Specifications; and any Addenda.

1.18 WORK: The Work is comprised of the completed construction required by the Contract Documents performed to the complete satisfaction of the Owner, and includes all labor necessary to produce such construction, and all materials and equipment incorporated or to be incorporated in such construction.

1.19 MATERIALS AND EQUIPMENT: All materials and equipment used in the Work shall be new, unused, and in current production or manufacturer, and not of such age or so deteriorated as to impair their usefulness or safety, unless specifically requested by the bidding documents.

1.20 SUBSTANTIAL COMPLETION: Substantial Completion occurs when the Work is sufficiently complete to allow the Owner full benefit and use of the Contract Work for its intended purpose, and such items of Work that remain to be done are minor in nature and amount and can be accomplished without any interference with the Owner's full use of the Contract Work. If, in the opinion of the Owner or the Architect/Engineer, an excessive number of Work items remain to be done, the Work shall not be considered to be substantially complete, even if all the remaining Work items are minor in nature. Upon Substantial Completion of the Work and upon application by the Contractor and certification by the Architect/Engineer, the Owner shall make payment, except retainage, held pursuant to 5.4.6, for such Work, as provided in the Contract Documents.

1.21 The Owner, at their sole discretion, may reduce liquidated damages from the said amount when the Contractor provides early Substantial Completion to any or all of the critical areas.

1.22 FINAL ACCEPTANCE: Final Acceptance of the Work occurs when the Work is fully, completely, and finally accomplished in full, absolute, and in strict compliance with the Contract Documents. The Contractor will be given written notification of the date of Final Acceptance.

1.23 WRITTEN NOTICE: Except as otherwise specified in the Contract Documents, all notices required under this Contract shall be in writing. Written notice shall be deemed to have been duly served if hand-delivered or if sent by registered or certified mail to the Owner, Architect/Engineer, or the Contractor, as the case may be.

1.24 DAY(S): Except where expressly provided otherwise, the term "day(s)" shall mean "calendar" day(s).

1.25 SUBCONTRACTOR: A Subcontractor is a person or organization who has a direct Contract with the Contractor to perform any of the Work at the site. The term
Subcontractor is referred to throughout the Contract Documents as if singular in number and masculine in gender and means a Subcontractor or his authorized representative.

1.25.1 SUB-SUBCONTRACTOR: A Sub-subcontractor is a person or organization who has a direct Contract with a Subcontractor to perform any of the Work at the site. The term Sub-subcontractor is referred to throughout the Contract Documents as if singular in number and masculine in gender and means a Sub-subcontractor or an authorized representative thereof.

1.25.2 Nothing contained in the Contract Documents shall create any contractual relation between the Owner or the Architect/Engineer and any Subcontractor or Sub-subcontractor.

1.26 FURNISH: Furnish or supply materials, equipment, parts, etc., means supply and deliver to the project site, ready for unpacking, assembly and installation by the Contractor. Furnish shall mean to be furnished by the Contractor unless specifically stated otherwise.

1.27 PRODUCTS: The term “Product” as used in these Contract Documents includes materials, systems, and equipment.

1.28 PROJECT MANUAL: The term “Project Manual” is the volume, which includes the Bidding Requirements, General Conditions of the Contract, and the Specifications.

1.29 PROVIDE, INSTALL, OR INSTALLATION: Provide and install in place and in operating order all equipment and materials which are shown, or which are reasonably inferable from the Drawings and Specifications as being necessary for the completion of the Work.

1.30 ALLOWANCE: An amount established in the Contract Documents for inclusion in the Contract Sum to cover the cost of prescribed items not specified in detail.

1.31 ESCROW: An amount specified and retained by the Owner to cover the cost of required warranty, service, or maintenance.

1.32 PUNCH LIST: A comprehensive list of items to be completed or corrected and submitted by the Contractor along with the request for Certificate of Substantial Completion.

ARTICLE 2 - CONTROL OF WORK

2.1 ADMINISTRATION OF THE CONTRACT

2.1.1 AUTHORITY: The Architect/Engineer has the responsibility to administer the Contract so that the completion thereof may be accomplished in accordance with the Contract. If the Architect/Engineer determines that the performance of the Contractor (including the quality of his Work or materials furnished), does not meet the standards specified, then the Architect/Engineer may take such measures, as he deems necessary to enforce compliance with Contractual requirements.

2.1.2 CONTRACT ADMINISTRATION: The Architect/Engineer shall administer and inspect the performance of this Contract by the Contractor as herein described and shall exercise such authority as the Owner may delegate by written notice. A copy of delegations of authority will be furnished to the Contractor.

2.1.2.1 The Architect/Engineer will be the Owner’s representative during construction and until the issuance of the Final Certificate for Payment. The Architect/Engineer will have authority to act on behalf of the Owner to the extent provided in the Contract Documents.
unless otherwise provided by written instructions, a copy of which will be provided to the Contractor. All instructions to the Contractor shall be issued by the Architect/Engineer.

2.1.2.2 The Owner may assign various inspectors to inspect the progress and quality of the Work. Any inspector of the Owner, and the Architect/Engineer, shall, at all times, have access to the Work whenever it is in preparation or progress. The Contractor shall provide safe facilities for such access so the Architect/Engineer and the Owner’s inspectors may perform their functions under the Contract Documents.

2.1.2.3 The Architect will not be responsible for any communication, either written, verbal, or otherwise, issued by the Owner directly to the Contractor or by the Contractor directly to the Owner.

2.1.3 ARCHITECT/ENGINEER RESPONSIBILITIES: The responsibilities of the Architect/Engineer include, but are not limited to, the following:

2.1.3.1 The Architect/Engineer will participate in general administration of the Contract, including performance of the functions hereinafter described.

2.1.3.2 The Architect/Engineer will endeavor to guard the Owner against defects and deficiencies in the Work of the Contractor.

2.1.3.3 All interpretations and decisions of the Architect/Engineer shall be consistent with the intent of the Contract Documents.

2.1.3.4 The Architect/Engineer's decisions in matters relating to aesthetics will be final if consistent with the intent of the Contract Documents.

2.1.3.5 The Architect/Engineer will be the interpreter of the requirements of the Contract Documents. The Architect/Engineer will, after consultation with the Owner and within reasonable time, render such interpretations as may be necessary for the proper execution or progress of the Work. The Architect/Engineer's decisions in such matters shall be final.

2.1.3.6 The Architect/Engineer will prepare all Change Orders. The Architect/Engineer will transmit all Change Orders to the Contractor and will receive the Contractor's proposals.

2.1.3.7 The Architect/Engineer will evaluate proposed Change Orders with the Contractor, the Owner, and the Owner's consultants, if any. After a Change Order has been issued, the Architect/Engineer will administer the implementation of the Change Order by the Contractor.

2.1.3.8 The Architect/Engineer will not be responsible for and will not have control or charge of construction means, methods, techniques, sequences, or procedures, or for safety precautions and programs in connection with the Work, and he will not be responsible for the Contractor's failure to carry out the Work in accordance with the Contract Documents. The Architect/Engineer will not be responsible for or have control or charge over the acts or omissions of the Contractor, Subcontractors, or any of their agents or employees, or any other persons performing any of the Work.

2.1.3.9 The Architect/Engineer shall make the Final Inspection regarding Final Acceptance set forth in 4.8, "Acceptance of the Work.”

2.1.3.10 Nothing in the above paragraphs shall be deemed to relieve the Contractor from any responsibilities or obligations set forth elsewhere in this Contract.
2.2 CONTRACT DRAWINGS AND SPECIFICATIONS

2.2.1 ADDITIONAL PLANS AND SPECIFICATIONS: Upon award of the Contract, the Contractor will be given ten (10) complete sets of Plans and Specifications. Additional sets required shall be purchased from the Architect/Engineer at his billed cost multiplied by a mark-up factor of 1.20.

2.2.2 OWNERSHIP OF DOCUMENTS: All Contract Documents, including but not limited to, all Drawings, Specifications, and copies thereof furnished to the Contractor are and shall remain the Owner’s property. Upon request, the documents are to be returned to the Owner within ten (10) days.

2.2.3 TRANSMITTAL: All correspondence, reports, and transmittals of Shop Drawings and Samples from the Contractor shall be delivered to the Architect/Engineer with one (1) transmittal copy to the Owner in a timely manner.

2.2.3.1 The Contractor shall provide the Owner with one (1) set of all shop drawings for review concurrent with shop drawings submitted to the Architect/Engineer for review.

2.2.4 REQUESTS FOR CLARIFICATION: The Contractor shall submit requests for clarification or information to the Architect/Engineer and to the Owner’s project manager in the following manner:

2.2.4.1 Each request shall be numbered consecutively and dated.

2.2.4.2 Each request shall note the relevant sections of the Contract Documents.

2.2.4.3 Each request shall briefly explain the nature of the request.

2.2.4.4 Each request shall indicate the date by which a response is needed.

2.3 EXAMINATION OF SITES AND DOCUMENTS: The Contractor shall have inspected all conditions (including, but not limited to, site, legal, market, and transportation conditions) relating to the Work described in the Drawings, in the Specifications and other Contract Documents prior to the submission of his Bid. The Contractor’s failure to acquaint himself with such conditions shall not constitute grounds for modifying the Contract price or time.

2.3.1 The Contractor shall verify all grades, lines, levels, and dimensions as indicated and he shall report any errors or inconsistencies to the Architect/Engineer before commencing Work. The physical characteristics and utility locations for the site as indicated on the Contract Documents are approximate and based on the Owner’s best knowledge. The Contractor shall be responsible and pay for verifying existing physical characteristics, property lines, utility locations, and measurements of the Work. Failure to do so shall obligate the Contractor for repair or replacement of damaged physical characteristics of the site and utilities.

2.3.2 The Contractor shall employ a licensed Professional Engineer to lay out the project including the placement of center lines for structural elements, place permanent reference marks, establish bench marks, and give levels of floors to which all measurements shall be referred.

2.3.3 The Contractor shall be responsible for documenting, through video, the existing building conditions. The intent of the video is to identify existing conditions and to highlight areas that demonstrate portions of the building where cracking or disturbed building conditions are currently present. Copies of the video should be distributed to the Owner’s representative.
2.4 APPROVAL OF SUBSTITUTIONS

2.4.1 Unless otherwise specifically provided in the Contract Documents, the following procedures shall be in effect for approval of substitutions. For convenience in designation on the Contract Drawings or in the Specifications, certain articles or materials to be incorporated in the Work may be designated under trade names or the names of manufacturers and their catalog information. Except in those instances where the product is designated to match others in use in a particular improvement, either completed or in the course of completion, the use of a substitution article or material which the Contractor represents to be of at least equal quality and of the required characteristics for the purpose intended will be permitted, subject to each of the following requirements:

2.4.1.1 The products, materials, and equipment of manufacturers referred to in the Specifications and on the Drawings are intended to establish the standard of quality and design required by the Architect/Engineer. However, products, materials and equipment of manufacturers, other than those specified, may be used, if not specifically restricted in the Instructions to Bidders and Substitution Sections and if equivalent and approved by the Architect/Engineer and Owner subject to requirements set forth in the Instructions to Bidders and Division One Section “Substitutions” Specifications.

2.4.1.2 It is deemed that the term "or the approved equal" is included after all products, materials and equipment referred to in the Specifications or on the Drawings, but is subject to any restrictions and requirements set forth in the Instructions to Bidders and Division One Section “Substitutions” Specifications, and the approval of the Owner and Architect/Engineer.

2.5 SHOP DRAWINGS, PRODUCT DATA AND SAMPLES

2.5.1 Shop Drawings are drawings, plans, lists, catalogs, diagrams, other details, charts, calculations, and data necessary to the Work adequately prepared and submitted by the Contractor or any Subcontractor, manufacturer, supplier or distributor to illustrate some portion of the Work. Reproduction of Contract Documents, or any portion thereof shall not be permitted.

2.5.2 Product Data are illustrations, standard schedules, performance charts, instructions, brochures, diagrams, and other information submitted by the Contractor to illustrate a material, product, or system for some portion of the Work.

2.5.3 Samples are physical examples submitted by the Contractor, which illustrate materials, equipment, or workmanship and establish standards by which the Work will be judged.

2.5.4 The Architect will review and take appropriate action upon the Contractor's submittals such as Shop Drawings, Product Data and Samples, but only for conformance with the design concept of the Work and with the information given in the Contract Documents. The Architect's review of a specific item shall not indicate approval of an assembly of which the item is a component.

2.5.5 Before submitting shop drawings and samples, the Contractor shall review all shop drawings and samples for the completeness and accuracy. Shop Drawings and samples shall be submitted in a timely and orderly sequence to the Architect/Engineer with one (1) copy to the Owner simultaneously. At the time of submission, the Contractor shall direct, in writing, specific attention to any and all deviations in the Shop Drawings or Samples from the requirements of the Contract Documents. Any and all deviations must be clearly

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marked on all shop drawings, product data, and samples. All submissions shall be made within 15 days of the Notice to Proceed.

2.5.6 By submitting shop drawings and samples, the Contractor thereby represents that it has determined and verified all field measurements, field construction criteria, materials catalog numbers, and similar data, and that it has checked and coordinated each shop drawing and sample with all his Subcontractors involved in the Work and with the requirements of the Work and of the Contract Documents.

2.5.7 Any Shop Drawing, Product Data, or Sample submitted by the Contractor shall include the following statement: “In conformance with the Contract Documents,” and be signed and dated by the Contractor. The Architect/Engineer will return submittals made without the required statement to the Contractor for his review, revision, and resubmission.

2.5.8 The Contractor shall not be relieved of responsibility for any deviation from the requirements of the Contract Documents by the Architect/Engineer’s review of Shop Drawings, Product Data, or Samples unless the Contractor has specifically informed the Architect/Engineer in writing of such deviation at the time of the submissions and the Architect/Engineer has given written approval of the specific deviation. The Contractor shall not be relieved from responsibility for errors or omissions in the Shop Drawings, Product Data, or Samples by the Architect/Engineer’s review thereof.

2.5.9 The Contractor shall direct specific attention, in writing or on resubmitted Shop Drawings, Product Data or Samples, to revisions other than those requested by the Architect/Engineer on previous submittals.

2.5.10 No portion of the Work requiring submission of a Shop Drawing, Product Data, or Sample shall be commenced until the submittal has been reviewed by the Architect/Engineer. All such portions of the Work shall be in accordance with approved submittals.

2.5.11 No Shop Drawings, Product Data, or Samples shall be issued to the field without the Architect’s/Engineer’s Approval Stamp affixed thereto.

2.5.12 See Division One Section 013300 “Submittals” for complete description of submittal process.

2.6 REVIEW OF CONTRACT DOCUMENTS

2.6.1 The Contractor shall at once notify the Architect/Engineer in writing of any error, inconsistency, or omission he may discover in the Contract Documents.

2.7 SATISFACTORY PERFORMANCE

2.7.1 All Work required by the Contract Documents shall be performed to the complete satisfaction of the Architect/Engineer and the Owner.

2.8 TESTS AND INSPECTION

2.8.1 RIGHT OF INSPECTION: If the Contract Documents, laws, ordinances, rules, regulations, or orders of any public authority require any Work to be inspected, tested, or approved, the Contractor shall give the Owner, Architect/Engineer, and Commissioning Agent timely notice of readiness therefor and shall furnish the Architect/Engineer certificates of inspection, testing, or approval. If such Work required to be inspected, tested, or approved is covered up without prior written approval of the Architect/Engineer, it must, if directed by the Architect/Engineer, be uncovered at the Contractor’s expense. Cost of all such inspections, tests, or approvals shall be borne by the Contractor unless
otherwise noted in the Contract Documents. The Owner will engage, at his expense, the services of an independent agency or agencies to perform field quality control testing unless otherwise and specifically indicated in the Contract Documents.

2.8.2 ADDITIONAL INSPECTION: If, after the commencement of the Work, the Owner or the Architect/Engineer determines that any Work requires additional inspection, testing, or approval which is not included herein, the Architect/Engineer may instruct the Contractor to order such additional inspection, testing, or approval. Upon receipt of such instruction, the Contractor shall give the Architect/Engineer timely notice of the date arranged for such purpose so that the Owner and Architect/Engineer may observe the inspection, testing, or approval. If any Work has been covered which the Architect/Engineer had not requested to observe prior to being covered, or if the Architect/Engineer considers it necessary or advisable that covered Work be inspected or tested by others, the Contractor, at the Architect's/Engineer's request, will uncover, expose, or otherwise make available for observation, inspection, and testing that portion of the Work.

2.8.3 GOVERNMENT INSPECTION: Authorized representatives of the federal, state, and local governments shall have access to the site of construction and shall have the right to inspect the project Work.

2.8.4 Certain structural components of the Project will be subject to the requirements for special inspections as defined in the current edition of the International Building Code as adopted and amended by the Virginia Uniform Statewide Building Code. Special inspections will be applicable to the specification sections specified in Division One Section “Quality Control Services”:

2.8.5 Specific requirements for special inspections are noted in the technical sections of the specifications itemized in Section “Quality Control Services”.

2.8.5.1 POINT OF CONTACT: The Contractor shall designate a representative (the Superintendent or an Assistant to the Superintendent) who shall be the direct point-of-contact for the Special Inspector during each phase of the work. Discrepancies noted during the progress of the work will be reported to the Contractor's representative for corrective action. Communications given by the Special Inspector to the Contractor's representative shall be as binding as if given to the Contractor.

2.8.5.2 NOTIFICATION: Contractor shall notify the Owner, Architect/Engineer, and Special Inspector 24 hours in advance of all tests and inspections.

2.8.5.3 Two (2) weeks prior to all demonstrations (Kitchen Equipment, Mechanical Commissioning, Electrical, Plumbing, PA System, TV System, Fire Alarm, etc.), the Owner shall be furnished all related manuals. Manuals shall be delivered to the Architect/Engineer for distribution to the Owner.

2.8.5.4 The Architect/Engineer and Owner shall be present at all demonstrations of all equipment and systems. The Owner and Architect/Engineer shall be contacted one (1) week prior to these demonstrations.

2.9 CORRECTION OF WORK

2.9.1 INSPECTION AND ACCEPTANCE: Except as otherwise provided in the Contract Documents, inspection and testing by Owner of material and workmanship required by the Contract Documents shall be made at reasonable times and at the site of the Work, unless the Architect/Engineer determines that such inspection or testing of material, which is to be incorporated in the Work, shall be at the place of production, manufacture, or shipment of such material. To the extent specified by the Architect/Engineer at the
time of determination to make off-site inspection or test, such inspection or test shall be conclusive as to whether the material involved conforms to the Contract requirements. Such off-site inspection or test shall not relieve the Contractor of responsibility for damage to or loss of the material prior to acceptance, nor in any way affect the continuing rights of the Owner after acceptance of the completed Work under the terms of 2.9.7 of this Article except as hereinafove provided.

2.9.2 DUTY TO CORRECT OR REPAIR: The Contractor shall, without charge, or extension of time, replace any material or correct any workmanship found by the Architect/Engineer not to conform to the Contract requirements unless, in the public interest, the Owner consents to accept such material or workmanship with an appropriate adjustment in Contract price. The Contractor shall promptly segregate and remove rejected material from the premises.

2.9.3 FAILURE TO CORRECT OR REPAIR: If the Contractor does not promptly replace rejected material or correct rejected workmanship, the Owner may: (1) by Contract or otherwise, replace such material or correct such workmanship and charge the cost thereof to the Contractor; or (2) terminate the Contractor’s right to proceed in accordance with 3.8 of these General Conditions.

2.9.4 INSPECTION AND TESTS: The Contractor shall furnish promptly, without additional charge, all facilities, labor, and materials reasonably needed for performing such safe and convenient inspection and tests as may be required by the Architect/Engineer, Owner, Commissioning Agent, or public authority.

2.9.5 EXAMINATION OF COMPLETED WORK: Should it be considered necessary or advisable by the Owner at any time before acceptance of the entire Work to make an examination of Work already completed by removing or tearing out same, the Contractor shall, on request, promptly furnish all necessary facilities, labor, and material.

2.9.6 If such Work is found to be defective or nonconforming in any material respect due to the fault of the Contractor or its Subcontractors, the Contractor shall pay all the expenses of such examination and of satisfactory reconstruction. If, however, such Work is found to meet the requirements of the Contract, an equitable adjustment shall be made in the Contract price to compensate the Contractor for the additional services involved in such examination and reconstruction, and, if completion of the Work has been delayed thereby, the Contractor shall, in addition, be granted a suitable extension of time.

2.9.7 ACCEPTANCE OF INSPECTED WORK: Unless otherwise provided in this Contract, acceptance by the Owner and Architect/Engineer shall be made as promptly as practicable after completion and inspection of all Work required by this Contract. Acceptance of all Work is contingent upon final approval of the Architect/Engineer. Acceptance shall be final and conclusive, except in cases of latent defects, fraud, or such gross mistakes as may amount to fraud or which may affect the Owner’s rights under any warranty or guarantee.

2.10 SUPERVISION AND CONSTRUCTION PROCEDURES

2.10.1 SUPERVISION AND CONSTRUCTION PROCEDURES: The Contractor shall supervise and direct the Work, using its best skill and attention. The Contractor shall be solely responsible for all construction means, methods, techniques, sequences, and procedures and for coordinating all portions of the Work under the Contract.

2.10.2 SUPERINTENDENT: The Contractor’s Superintendent shall be satisfactory to the Architect/Engineer and to the Owner. The Superintendent shall not be changed except with the consent of the Architect/Engineer and of the Owner, unless the Superintendent
2.10.3 The Contractor shall submit evidence and references from other projects demonstrating to the Owner’s satisfaction that the Contractor’s Project Manager(s) and Superintendent(s) that are assigned to this project have completed at least three (3) projects that had renovation and new addition work involved in the same project that were of similar size, cost, and scope to the proposed project.

2.10.3.1 The Owner reserves the right to require the Contractor to replace Project Manager(s) and Superintendent(s) that are assigned to this project to the extent that such Project Manager(s) and Superintendent(s) do not possess the requisite experience set forth above in paragraph 2.10.3 or fail to perform in accordance with the Contract Documents without any additional cost to the Owner or any additional time for the performance of the Work.

2.11 CONTROL OF MATERIALS AND EQUIPMENT

2.11.1 HANDLING AND STORAGE: All materials and equipment shall be delivered, handled, stored, installed, and protected to prevent damage and ensure preservation of quality and fitness for the Work in accordance with best current practice in the industry, in accordance with manufacturers’ specifications and recommendations, and in accordance with Contract Document. The Contractor shall store packaged materials and equipment in their original and sealed containers, marked with the brand and manufacturer’s name, until ready to use. The Contractor shall deliver materials and equipment in ample time to facilitate inspection and tests prior to installation. The term “delivery” in reference to any item specified or indicated, means the unloading and storing with proper protection at the project site. Damaged materials or equipment will be rejected.

2.11.2 VERIFICATION PRIOR TO ORDERING: Before ordering materials, or equipment, and before performing Work, the Contractor shall verify indicated dimensions. If a discrepancy exists, the Contractor shall notify the Architect/Engineer of the discrepancy immediately in writing. The Architect/Engineer will then clarify the intended design to the Contractor. The Contractor shall take field measurements required for the proper fabrication and installation of the Work. Upon commencement of any item of Work, the Contractor shall be responsible for dimensions related to such item of Work.

2.12 OWNER’S RIGHT TO PERFORM WORK AND TO AWARD SEPARATE CONTRACTS

2.12.1 The Owner reserves the right to perform Work related to the Project with his own forces, and to award separate Contracts in connection with other portions of the Project or other Work on the site.

2.12.1.1 The Owner’s separate Contractors shall provide initial protection of their Work and the Contractor shall maintain protection of installed items until the spaces are turned over to the Owner.

2.12.2 When separate Contracts are awarded for different portions of the Project or other Work on the site, the term Contractor in the Contract Documents in each case shall mean the Contractor who executes each separate Owner-Contractor Agreement.
2.12.3 The Owner will provide for the coordination of the Work of his own forces and of each separate Contractor with the Work of the Contractor, who shall cooperate therewith as provided in 2.12.4 through 2.12.7.

2.12.4 The Contractor shall afford the Owner and separate Contractors reasonable opportunity for the introduction and storage of their materials and equipment and the execution of their Work, and shall connect and coordinate his Work and theirs as required by the Contract Documents.

2.12.5 If any part of the Contractor’s Work depends on proper execution or results upon the Work of the Owner or any separate Contractor, the Contractor shall, prior to proceeding with the Work, promptly report to the Architect/Engineer any apparent discrepancies or defects in such other Work that render it unsuitable for such proper execution and results. Failure of the Contractor so to report shall constitute an acceptance of the Owner’s or separate Contractors’ Work as fit and proper to receive his Work, except as to defects, which may subsequently become apparent in such Work by others.

2.12.6 Any costs caused by defective or ill-timed work shall be borne by the party responsible therefor.

2.12.7 Should the Contractor wrongfully cause damage to the Work or property of any separate Contractor, the Contractor shall, upon due notice, promptly attempt to settle such with other Contractors by agreement, or otherwise to resolve the dispute. If such separate Contractor sues the Owner on account of any damage alleged to have been caused by the Contractor, the Owner shall notify the Contractor who shall defend such proceedings at the Contractor’s expense, and if any judgment or award against the Owner arises therefrom the Contractor shall pay or satisfy it and shall reimburse the Owner for all attorney’s fees and court costs which the Owner has incurred.

ARTICLE 3 - PROSECUTION AND PROGRESS

3.1 CONTRACTOR PARTICIPATION: The Contractor shall, within ten (10) days of notification of announcement of decision to Award a Contract for the Work, submit the following information to the Architect/Engineer and Owner:

3.1.1 A designation of the Work to be performed by the Contractor with his own forces;

3.1.2 The proprietary names and the suppliers of principal items or systems of material and equipment proposed for the Work;

3.1.3 A list of names of the Subcontractors or other persons or organizations (including those who are to furnish materials or equipment fabricated to a special design) proposed for the principal portions of the Work and copies of their agreements with the Contractor.

3.1.4 The Contractor shall be prepared to review and discuss the schedule and sequence of operations at the pre-construction meeting.

3.1.5 A preliminary schedule in time-scaled diagram form, defining in detail the Contractor’s planned operations during the first 30 days shall be submitted to the Architect/Engineer. The Contractor shall also provide in time-scaled summary, his general approach and preliminary schedule for the balance of the project.
3.1.6 All required performance and payment bonds, insurance certificates, permits, and other documentation that Contractor is required to submit for Owner approval prior to commencement of Work on site.

3.2 DESIGNATION OF SUBCONTRACTORS: The Contractor shall have set forth in accordance with 3.1, a listing of the name and location of the place of business of each Subcontractor who will perform work or labor or render service to the Contractor in performance of the Contract and the portion of the Work, which will be done by each Subcontractor. The Contractor shall not, without the written consent of the Owner and the Architect/Engineer, either substitute any Subcontractor in place of the Subcontractor designated in the original designation of Subcontractors, or permit any such subcontract to be assigned or transferred or allow it to be performed by anyone other than the original Subcontractor listed in the designation of Subcontractors.

3.3 ASSIGNMENT: This Contract shall not be assignable in whole or in part by the Contractor without the written consent of the Owner and the Architect/Engineer. No assignment of any claim or proceeds under this Contract shall be binding without the written consent of the Owner and the Architect/Engineer.

3.4 PROGRESS MEETINGS: During the construction period, progress meetings chaired by the Architect/Engineer will be held with representatives of the Owner, Architect/Engineer, major Subcontractors, and such other Subcontractors or material suppliers whose presence may be deemed necessary or desirable. The purpose of these meetings shall include, without limitation, expediting the Work, coordination of various phases of the Work, and scheduling of Work. Progress meetings shall be held bi-monthly, unless otherwise directed by the Architect/Engineer. The time and place of meetings will be determined by the Contractor who shall give all persons expected to attend the meeting at least one (1) days’ notice of the date, time, and place of the meeting. The Architect/Engineer shall keep and distribute copies of minutes to all parties.

3.5 TIME

3.5.1 NOTICE TO PROCEED: The Owner will furnish the Contractor written direction to commence performance of Work hereunder entitled “Notice to Proceed” after receipt by Owner of all required documentation which Contractor is required to submit for Owner approval prior to commencement of Work under this Contract. The Contractor shall submit all such documentation to the Owner within ten (10) days after receiving notice of the award of the Contract. The Owner shall not be responsible for any costs of any type whatsoever incurred by the Contractor prior to the issuance of the Notice to Proceed. The date of the Notice to Proceed shall be the official date from which all scheduled activities and requirements are computed.

3.5.2 COMMENCEMENT AND EXECUTION: The Contractor will be required, and agrees, to commence Work on site under this Contract on or before a date to be specified by the Owner in a written “Notice to Proceed”, to execute said Work diligently, and to complete the entire Work ready for use as specifically set forth in the Contract.

3.5.2.1 SUBSTANTIAL COMPLETION: The Contractor agrees to substantially complete all Work as follows:

Substantial Completion for the work: shall be 105 days beyond the issuance of the Purchase Order.

3.5.2.2 PROJECT FINAL ACCEPTANCE: Final Project Acceptance of the Work shall occur within 30 calendar days following Project Substantial Completion. The Contractor shall notify the Architect/Engineer and the Owner in writing that the punch list has been
completed and is ready for re-inspection. Concurrently, within this 30 calendar day period, the Contractor shall complete the transfer of the approved Record Documents, the approved Warranty Manual, and approved Operation and Maintenance Manuals and a copy of the Final Inspection Card to the Architect/Engineer. If the Contractor fails to complete any of these items within this 30 calendar day period, liquidated damages will be assessed.

3.5.2.3 Project Final Acceptance Date: shall be 135 days beyond the issuance of the Purchase Order.

3.5.2.4 It is expressly understood and agreed between the Contractor and Owner that the Contract time for the completion of the Work to be done under this Contract is a reasonable time, taking into consideration the average climatic range and usual industrial conditions prevailing in this locality.

3.5.2.5 TIME LIMITS: Any and all time limits stated in the Contract Documents shall be strictly adhered to and are of the essence of the Contract.

3.5.3 LIQUIDATED DAMAGES: The Owner will sustain financial loss if the Work is not complete within the Contract time. If the Contractor shall neglect, fail, or refuse to substantially complete each phase of the Work within the Contract time, or any proper extension thereof granted by the Owner, then the Contractor and the Contractor's Surety shall be liable and do hereby agree, as a part consideration for the awarding of this Contract, to pay the Owner $1,000.00 (One Thousand Dollars) per day for each and every consecutive calendar day thereafter that the Work remains incomplete, not as a penalty, but as liquidated damages for such breach of Contract. The said amount is fixed and agreed upon by and between the Owner and the Contractor because of the impracticability and extreme difficulty of fixing and ascertaining the actual damages that the Owner would sustain in such event, and said amounts are agreed to be the amount of damages which the Owner would sustain.

3.5.3.1 If written final acceptance by the Architect/Engineer, in accordance with 4.7, has not been completed by the 30th calendar day after the Contract Completion Date as stated on the proposal form, including any authorized time extensions, the Contractor shall reimburse the Owner for additional Architect's/Engineer's and Owner's personnel costs at a rate of One Hundred Fifty Dollars ($150.00) per hour, per person, including travel time for any time in which the Contractor fails to complete the punch list corrections. This hourly rate is fixed and agreed upon by and between the Owner and the Contractor, and is in no way related to liquidated damages. If the Contractor fails to complete the punch list items within 30 days, the Owner may without further notice procure services by separate Contract to complete the Work and apply the cost of the separate Contract and costs of procuring the separate Contract against the retainages held in this Contract. In addition, additional liquidated damages of Two-Hundred and Fifty Dollars ($250.00) per day shall be assessed to the Contractor for each and every day in which the Contractor has failed to complete all punch list corrections beyond the 30 calendar days after the date of contract Substantial Completion as determined by the Architect/Engineer.

3.5.4 DELAYS AND EXTENSIONS OF TIME

3.5.4.1 Time is of the essence in completing the Work. Therefore, if the Contractor fails to complete the Work within the time herein specified, as adjusted by Change Orders, then, in accordance with 3.5.3 above, the Contractor agrees to pay, liquidated damages for the delay. Nothing in the above clause shall be interpreted as limiting in any way the Owner's right to proceed against the Contractor for additional damages or losses. The Owner reserves the right to deduct said liquidated damages from any amount due the Contractor under this Contract or, at its option, to collect such liquidated damages directly.
from the Contractor or its surety. Liquidated damages are for delay only and are in addition to any other rights available to the Owner by Contract or law. If the Contractor provides timely notice of excusable delays (approved by the Owner and Architect/Engineer), the Contractor shall be entitled to a Change Order adjusting the scheduled Contract completion date by the number of days that the entire project has been delayed.

3.5.4.2 A workday is defined as Monday through Friday, 7:00 a.m. to 9:00 p.m., excluding legal holidays. The Contractor shall notify the Architect/Engineer and the Owner's on site representative by 12 noon on Wednesday when the Contractor plans to work on Saturday, Sunday, holidays, or other non-work days outside of the established work day hours.

3.5.4.3 EXCUSABLE DELAY: Acts of God; acts of the Public Enemy; acts of the Government (in either its sovereign or contractual capacity); fires; floods; or strikes, provided that the Contractor shall, within five (5) days of the onset of any such delay, notify the Architect/Engineer in writing of the causes of delay for each day of occurrence to the critical path, and the facts relating thereto shall be considered excusable delays. Failure to provide such notice shall preclude the Contractor from claiming that delays to the critical path resulted from the acts of God; acts of the Public Enemy; acts of the Government (either in its sovereign capacity or contractual capacity); fires; floods; strikes; or unusually severe weather.

3.5.4.4 Contractor agrees that Dates under this Contract will not be extended due to normal inclement weather. In the judgment of the Architect/Engineer and Owner, for a time extension to be granted for abnormal inclement weather: (1) such weather must have an adverse effect upon the progress of the Contractor's Work which is of a critical nature; and (2) the adverse effect must not be due to any fault or negligence of the Contractor and could not have been avoided by the Contractor through proper planning, coordination, and implementation of adequate weather protection necessary to allow the Work to be continued without adverse effect upon labor production. Contractor agrees that the fact that abnormal inclement weather may occur, does not, of itself, justify any time extension hereunder.

3.5.4.5 The Contractor agrees that it shall anticipate the potential loss of the number of workdays listed in the General Conditions section 3.6.3.3.9 for each month due to weather and shall plan and schedule the Work accordingly. The Contractor acknowledges and warrants that in making its bid and Construction Schedule for the Work, it gave due care and consideration to this expected number of work days of inclement weather for the locale of the Project and allowed therefore the impact of inclement weather on subsequent Work. During the time of performance, should the expected number of work days of inclement weather for the locale of the Project be less than originally anticipated by the Contractor and Owner, at the time of contracting, those days not so affected by inclement weather shall be considered float time.

3.5.4.6 Weather shall be considered "unusually severe" only if a weather condition (or any combination of weather conditions) prevents the Contractor from working a number of workdays during a calendar month, which number exceeds the number of workdays listed in the General Conditions section 3.6.3.3.9 for that calendar month. The Contractor's schedule shall be adjusted pursuant to 3.6 "Scheduling Requirements" by adding the number of excess work days lost because of the weather condition (or conditions) to the duration of the activities actually affected by the weather condition (or conditions).

3.5.4.7 No weather delays to Work in the building shall be considered eligible for a time extension once the building has been sufficiently closed in as determined by the
Architect/Engineer.

3.5.4.8 Weather conditions will be as reported by the General Contractor’s Superintendent and confirmed by the Owner’s construction inspector in the Daily Report. Temperature and rainfall will be recorded from the reading of the thermometer and rain gauge supplied by the Owner and maintained at the Contractor’s construction trailer.

3.5.4.9 SHORTAGE OF MATERIAL AND EQUIPMENT: Delays due to shortages in material, shortages in equipment, or shortages in manpower not caused by strikes will not be considered excusable delay. The Contractor, by accepting this Contract, warrants that it has the necessary material, equipment, and personnel to achieve its scheduled completion.

3.5.4.10 ADDITIONAL ARCHITECTURAL OR ENGINEERING EXPENSES: Contractor shall be responsible to the Owner for any additional Architect’s/Engineer’s expenses incurred because of the Contractor’s delay or other breaches of its obligation under the Contract Documents.

3.5.5 EXTENSION OF TIME: Any request for extension of time must be supported by corresponding revisions in the CPM Schedule. Requests for extensions of time will receive consideration only for delays in the critical path. Requests for extensions of time will receive consideration only upon submittal of detailed written documentation sufficient to show that the delay has affected the overall project schedule.

3.5.6 REQUIRED DATA: Data including the Contractor’s daily report(s) supporting any claim for extension of time shall be submitted for each individual occurrence for which an extension of time is requested. Requests for extensions for time that combine more than one occurrence will not receive consideration. Complete backup data supporting claims for time extension shall be submitted to the Architect for review within 21 days after the last day of the occurrence of the claimed delay; otherwise the claim will not receive consideration. Claims for weather delays shall be provided with 10(Ten) days of the following month for the preceding month the weather delay is requested for. Failure to submit and provide data supporting the weather delay shall be cause for denying approval of such request.

3.6 SCHEDULING REQUIREMENTS

3.6.1 GENERAL SCHEDULING REQUIREMENTS

3.6.1.1 Summary Requirements

3.6.1.1.1 Contractor shall prepare and submit to the Architect/Engineer and Owner for review and acceptance a Detail Construction Schedule within 30 days following the earlier of the receipt of the Notice to Proceed or the execution of the Contract with the Owner. Refer to Section 3.6.3. Without a schedule conforming to contract documents, payment will be withheld and work will be halted and the Contractor will be judged in delay at any point in the construction process. No extension in contract time will be made for this Contractor induced delay." Work will be halted in the absence of this submission. Until submittal, the Contractor will be judged in delay. No extension in the contract time will be made for this Contractor induced delay.

3.6.1.2 The Architect/Engineer will review, reject, or accept the Contractor’s detailed Construction Schedule. When the detailed Construction Schedule meets the requirements contained in the Contract Documents and accurately represents how the project will be built, the schedule will become the Baseline schedule for the project.
3.6.1.3 The Contractor will record progress and update the detailed Construction Schedule each month, and maintain the Construction Schedule until the final completion of the Contract is met.

3.6.1.2 Execution of the Work

3.6.1.2.1 The Work shall be executed at such a rate as will assure meeting the specified Substantial Completion dates within the time/dates provided in the specifications. By execution of the Contract, the Contractor represents it has analyzed the Work, the materials, and methods involved, the systems of the building, availability of qualified labor, restrictions of the site, constraints imposed, Workload and capacity to perform the Work, and agrees that the specified times are reasonable considering the existing conditions prevailing in the locality of the Work, including weather conditions, and other factors, with reasonable allowance for variations from average or ideal conditions.

3.6.1.2.2 The Substantial Completion dates provided are considered essential to the satisfactory performance of this Contract and to the coordination of all Work on the project. The Owner reserves the right to require the Contractor to prosecute the Work in accordance with the specified Substantial Completion dates.

3.6.1.2.3 The Contractor is responsible to provide the operations, manpower, resources, materials, and all items and Work necessary to complete the Work and meet the Substantial Completion and Final Completion dates provided. The Contractor understands and agrees that: the Substantial Completion, Final Completion, actual start and completion dates, rate of progress, and coordination are essential conditions of this project.

3.6.1.2.4 It is understood and agreed that TIME IS OF THE ESSENCE and the Contractor agrees to follow and adhere to the schedule with due diligence so as to execute the Work within the Substantial Completion and Final Completion dates and time frames stipulated in the Contract Documents. The Contractor shall take all necessary steps, including overtime, double shifts, weekends, and holiday Work to complete this Work and meet the Substantial Completion and Final Completion dates stipulated in the Contract Documents.

3.6.2 PRE-CONSTRUCTION CONFERENCE

3.6.2.1 The Owner’s representative will schedule and conduct a pre-construction conference. The Contractor shall be prepared to review and discuss the schedule and sequence of operations. Refer to Section 3.1.4.

3.6.2.2 Procedures will be reviewed for the following:

3.6.2.2.1 Development of the detailed Construction Schedule by the Contractor;

3.6.2.2.2 Periodic updating of scheduled activities and method of determining schedule percent complete;

3.6.2.2.3 Procedures for making modifications to the schedule;

3.6.2.2.4 Procedures for assessing schedule impacts, schedule delays, and time extensions;

3.6.2.2.5 Development of recovery schedules;

3.6.2.2.6 Data exchange and communications.

3.6.3 TECHNICAL REQUIREMENTS
3.6.3.1 The Contractor will consider the following guidelines in the development of the Detail Construction Schedule:

3.6.3.2 Scheduling System

3.6.3.2.1 The Work under this Contract will be planned, scheduled, executed, and reported using a bar chart construction schedule.

3.6.3.2.2 The construction schedule shall be prepared using Microsoft Project or a similar software.

3.6.3.3 Schedule Requirements:

3.6.3.3.1 All Substantial Completion and Final Completion dates must be adhered to and shall be clearly identified on the schedule.

3.6.3.3.2 The schedule shall clearly identify the activities illustrating accomplishment of the time(s) for completion of the activities leading to the Substantial Completion and Final Completion dates as set forth in the Contract Documents. If the schedule indicates earlier completion time(s) than that set forth in the Contract Documents, the difference between the Schedule and the Contract Document dates shall be considered part of the total float available. This float is a resource available to both the Owner and the Contractor and may not be used as a basis of claim by the Contractor for additional compensation for actual project completion after the early completion schedule date but before the Substantial Completion or Final completion dates.

3.6.3.3.3 In developing the schedule, the Contractor shall be responsible for assuring that the Subcontractor’s Work at all tiers, as well as the Contractor’s own Work, and the Owner furnished materials, deliveries, and Work are included in the schedule.

3.6.3.3.4 The schedule as developed shall show the sequence and interdependence of activities required for complete performance of the Work. The Contractor shall be responsible for assuring all Work sequences are logical and the schedule shows a coordinated plan of the Work.

3.6.3.3.5 Failure by the Contractor to include any element of Work required for performance of the Contract or failure to properly sequence the Work shall not excuse the Contractor from completing all Work within the Contract Time.

3.6.3.3.6 The level of detail of the Contractor’s Schedule shall be a function of the complexity of the Work involved. The total number of activities shall be subject to approval by the Architect/Engineer and the Owner. No construction activity shall have a duration longer than 20 workdays, without prior acceptance of the Architect/Engineer or Owner. Non-construction activities (such as procurement, fabrication, etc.) may have durations in excess of 20 workdays without prior acceptance of the Architect/Engineer or the Owner.

3.6.3.3.7 The schedule should include, but not be limited to, the following activities as they apply to the project:

3.6.3.3.7.1 Construction tasks (maximum 20 workdays in duration).

3.6.3.3.7.2 For all major materials and equipment:

3.6.3.3.7.2.1 Shop drawing preparation and submittal process;

3.6.3.3.7.2.2 Shop drawing review and acceptance process;
3.6.3.3.7.2.3 Order, fabrication, and delivery;
3.6.3.3.7.3 Submittals of record drawings and maintenance manuals;
3.6.3.3.7.4 Cleanup and punch list preparation;
3.6.3.3.7.5 Punch list corrections;
3.6.3.3.7.6 Coordination of activities required to ensure timely support and/or inspections;
3.6.3.3.7.7 Pre-final, final inspections, and Substantial Completion;
3.6.3.3.7.8 Punch-out and Final Completion;
3.6.3.3.7.9 Specified interim completion milestones;
3.6.3.3.7.10 Owner move-in;
3.6.3.3.7.11 Occupancy/Use.

3.6.3.3.8 Custom calendars should be developed by the Contractor to identify the differing holiday, weather, workweek, and other work calendars on which specific work activities will be performed. Each activity should be assigned to the calendar corresponding with its work activity, weather, or season.

3.6.3.3.9 Normal weather conditions shall be considered and included in the planning and scheduling of all Work influenced by high or low ambient temperatures and/or precipitation to ensure completion of all Work within the Contract Time. The Contractor shall anticipate the potential loss of the number of workdays listed below for each calendar month due to weather and shall schedule the work accordingly. The Contractor shall not be entitled to weather delays on Saturday, Sunday, or legal holidays when Work was not scheduled in advance to occur.

<table>
<thead>
<tr>
<th>Month</th>
<th>January</th>
<th>February</th>
<th>March</th>
<th>April</th>
<th>May</th>
<th>June</th>
<th>July</th>
<th>August</th>
<th>September</th>
<th>October</th>
<th>November</th>
<th>December</th>
</tr>
</thead>
<tbody>
<tr>
<td>Days</td>
<td>8</td>
<td>8</td>
<td>8</td>
<td>6</td>
<td>4</td>
<td>4</td>
<td>8</td>
<td>8</td>
<td>8</td>
<td>8</td>
<td>4</td>
<td>8</td>
</tr>
</tbody>
</table>

3.6.3.3.10 Time extensions for weather delays during a given month will be allowed only for actual work days in excess of those numbers listed above and only when those excess days of delay affect the current critical path(s) leading to the specified Substantial Completion or Contract Completion dates.

3.6.3.3.11 Schedule activities shall meet the following criteria:

3.6.3.3.11.1 Activity descriptions shall be clear and concise. All activities must be tied into the schedule by logical relationships. Each activity shall be assigned a unique Activity ID number that shall not be changed once assigned. Use “skip numbering” of activities to allow insertion of additional activities for Contract modifications and logic changes.

3.6.3.3.11.2 Clearly explain abbreviations used in the schedules in legend of symbols, either separate or attached.
3.6.3.3.11.3 Except for Contract Award, Notice-to-Proceed with Off-site Work, Notice-to-Proceed with On-site Construction, and required interim and final completion milestones, activities shall not be constrained by any means other than logic ties to predecessor and successor activities. Relationships with start or finish lags may be used provided the lags are less than ten (10) days and can be logically explained.

3.6.3.3.11.4 Proposed durations assigned to each activity shall be the Contractor’s best estimate of time required to complete the activity considering the scope and resources planned for the activity.

3.6.3.3.11.5 Each activity shall be associated with a set of codes to be used for sorting, selecting, organizing, and providing additional information about the activity. Each activity should have activity codes and values identifying the following:

a. Responsibility (Subcontractor/Trade);
b. Phase (if applicable);
c. Area (e.g. Site, Building Area, and/or Floor);
d. Location (e.g. classroom, corridor, lobby, kitchen, etc.);
e. Division (01 through 48).

3.6.3.3.12 Include key milestones during the construction of each phase/area. Some suggestions are:

- Per base bid and alternate bid conditions.

3.6.4 BASELINE SCHEDULE

3.6.4.1 Preparation, Submittal, and Review Timing

3.6.4.1.1 Within 30 calendar days following the earlier of either the Notice-To-Proceed or the execution of the Contract with the Owner, the Contractor shall submit to the Architect/Engineer the Detailed Construction Schedule.

3.6.4.1.2 The Contractor shall submit the following:

- An electronic copy of the Detailed Construction Schedule (on a CD), or by electronic download, of the Contractor’s Schedule to the Architect/Engineer or Owner (as specified at the pre-construction conference).

- In addition, the Contractor shall submit two (2) sets of schedule reports and graphics as detailed in the REPORTS section.

3.6.4.1.3 The Construction Schedule shall be reviewed in the following manner:

- Within 14 calendar days after receipt by the Owner of the Detailed Construction Schedule, the Owner shall notify the Contractor of any concerns the Owner may have in regard to the Detailed Construction Schedule.

- If the Owner questions any of the elements in the Contractor’s Proposed Construction Schedule, the Contractor shall, within seven (7) calendar days after receipt of the Owner’s request, provide a satisfactory revision to, or adequate justification for, these elements to the satisfaction of the Owner.
• In the event the Contractor fails to define any element of Work, activity or logic, and the Owner’s review does not detect this omission or error, such omission or error, when discovered shall be corrected by the Contractor with the next monthly Schedule Update (discussed herein) and shall not affect the Contract Time.

3.6.4.2 Acceptance of Contractor’s Construction Schedule:

3.6.4.2.1 Upon the acceptance of the changes to the Construction Schedule by the Architect/Engineer and the Owner, the Contractor will be notified of such acceptance and this Detailed Construction Schedule shall become the Baseline Schedule for the project.

3.6.4.2.2 Acceptance by the Owner of the Contractor’s Construction Schedule does not relieve the Contractor of any responsibility whatsoever for the accuracy or feasibility of the detailed Construction Schedule, or of the Contractor’s ability to meet the Substantial Completion and Contract completion dates, nor does such acceptance acknowledge or admit the reasonableness of the activities, logic, and durations of the Contractor’s detailed Construction Schedule.

3.6.5 REPORTS

3.6.5.1 Upon acceptance of the Detailed Construction Schedule, as well as for each Monthly Schedule Update, the Contractor shall submit to the Architect/Engineer four (4) complete sets of the following graphics, report, and narrative and an electronic copy of the schedule (on CD).

3.6.5.2 GRAPHICS

3.6.5.2.1 Baseline Submittal - A detailed time-scaled bar chart schedule with the critical path highlighted and the critical logic shown.

3.6.5.2.2 Monthly Updates - A detailed time-scaled bar chart schedule with the current critical path highlighted, the data date, and progress indicated.

3.6.5.3 NARRATIVE SCHEDULE REPORTS

3.6.5.3.1 For the initial schedule, provide a written narrative explaining the Contractor’s plan for meeting the interim and Final Completion dates. Identify and explain assumptions, sequencing, and restraints such as manpower, material and equipment for major work categories.

3.6.5.3.2 Identify activities that may be expedited by use of overtime or double shifts, including work on Saturdays, Sundays, and holidays.

3.6.5.3.3 Describe calendars used and provide a listing of holidays, weather days, and other non-work periods.

3.6.5.3.4 Define abbreviations used.

3.6.5.3.5 For monthly progress updates, provide a narrative that describes problem areas, current and anticipated, delaying factors and their impact, and an explanation of corrective actions taken or proposed.

3.6.5.3.6 Description of the actual Work accomplished during the reporting period.

3.6.5.3.7 Payment shall be withheld until such narrative report(s) is reviewed and approved."
3.6.6 SCHEDULE UPDATING

3.6.6.1 Monthly Scheduled Meetings - At each construction progress meeting, the progress achieved by the Contractor since the previous meeting will be assessed. The Contractor shall submit a progress schedule listing the activities completed and in progress since the prior meeting and the activities scheduled for the succeeding month.

3.6.6.2 Schedule Updates - On a monthly basis, the Contractor shall meet with the Architect/Engineer, Owner, and others for the purpose of updating the Schedule. Jointly they will make an assessment of the schedule progress during or after a walk through at the job site. Information to be recorded and provided by the Contractor consists of activity actual start dates, actual finish dates, and activity percent complete or remaining duration.

3.6.6.2.1 Once this information has been recorded, the schedule shall be computerized and updated by the Contractor.

3.6.7 SCHEDULE MODIFICATIONS

3.6.7.1 If, as a result of the monthly Schedule Update, it appears the Construction Schedule no longer represents the actual prosecution and progress of the Work, the Owner will require the Contractor to submit a revision to the Construction Schedule at no additional cost to the Owner. Such revisions to the Schedule shall not alter any of the Substantial Completion dates.

3.6.7.2 The Contractor may also request revisions to the Construction Schedule in the event the Contractor’s planning of the Work is revised. If revisions to the Construction Schedule are contemplated, the Contractor shall notify the Owner in writing at least 14 calendar days prior to the next Scheduled Update meeting. The Contractor shall submit fragments of the proposed changes along with a written narrative of the proposed changes. Such revisions to the Schedule shall not alter any of the Substantial Completion dates. If accepted by the Owner, these fragments will be incorporated into the detailed Construction Schedule.

3.6.7.2.1 Work will be halted in the absence of this submission. Until submitted, the Contractor will be judged in delay. No extension in the contract time will be made for this Contractor induced delay.

3.6.7.2.2 Work will be halted in the absence of this submission. Until submitted, the Contractor will be judged in delay. No extension in the contract time will be made for this Contractor induced delay.

3.6.8 SCHEDULE RECOVERY PLAN

3.6.8.1 A Schedule Recovery Plan for regaining the time that the Project is behind schedule shall be submitted within five (5) working days of any schedule update that indicates that any Substantial Completion date will be more that 14 calendar days late.

3.6.8.2 The Schedule Recovery Plan shall indicate in both narrative form and in a detailed time-scaled bar chart schedule with logic the following information:

3.6.8.2.1 Amount of time the activity is late;

3.6.8.2.2 Reason for the lateness;
Proposed method for recovering the time and achieving all required project Substantial Completion deadlines, including manpower loading, if applicable.

CAUSES FOR EXTENSIONS OF TIME

The Substantial Completion and Contract Completion dates will be adjusted only for causes specified in the Contract. In the event the Contractor requests an extension of time, the Contractor shall furnish justification and supporting evidence as required by this Section and the General Conditions. The Owner will, after receipt of such justification and supporting evidence, make findings of fact and advise the Contractor in writing thereof. If the Owner determines that the Contractor is entitled to an extension of time, the Owner’s determination of the time extension owed shall be based upon the approved schedule or update. Actual delays in activities, which do not affect the scheduled Substantial Completion, Final Completion, or Contract Completion dates, shall not serve as the basis for a change in the Substantial Completion, Final Completion, or Contract Completion time.

FLOAT TIME

Float is not for the exclusive use or benefit of either the Owner or the Contractor. Contract time extensions will be granted only to the extent that equitable time adjustments to the activity or activities affected by the impact or delay exceeds the total float along the path of activities at the time of the delay.

SUSPENSION OF WORK

OWNER'S RIGHT OF SUSPENSION: The Owner may, at its sole option by notice in writing to the Contractor, suspend at any time the performance of all or any portion of the Work to be performed under the Contract. Upon such notice of suspension of the Work, the Contractor shall permit the Owner to designate the amount and type of material, labor, and equipment to remain on the Project. During the period of suspension, the Contractor shall use its best efforts to minimize costs associated with suspension. Work halted for the contractor's failure to submit required documentation shall not be considered under this Article.

DUTY OF CONTRACTOR UPON SUSPENSION: Upon receipt of such notice, the Contractor shall, unless the notice required otherwise:

Immediately discontinue Work on the date and to the extent specified in the notice;

Place no further orders or subcontracts for material, services, or facilities with respect to suspended Work other than to the extent required in the notice;

Promptly make every reasonable effort to obtain suspension upon terms satisfactory to the Owner of all orders, subcontracts, and rental agreements to the extent that they relate to performance of Work suspended; and

Unless otherwise specifically stated in the notice, continue to protect, and maintain the Project, including those portions of the Work, which have been suspended.

Work halted for the contractor's failure to submit required documentation shall not be considered under this Article.

ADJUSTMENT TO CONTRACT: If the performance of all or any part of the Work is, for a period exceeding 30 days in duration, suspended pursuant to a written notice of suspension as provided in 3.7.1, an adjustment shall be made for any increase in the
direct cost of performance of this Contract (excluding profit) necessarily caused by such written notice of suspension, and the Contract modified in writing accordingly. Contractor shall not be entitled to any adjustment for home office expenses or overhead, including, but not limited to, salaries of office staff, accounting expenses, equipment costs and utility services or other similar home office expenses as the result of any suspension. Work halted for the contractor's failure to submit required documentation shall not be considered under this Article.

3.7.4 WAIVER OF CLAIM: No claim under this clause shall be allowed unless the claim, in an amount stated, is asserted in writing within 20 days after the termination of such suspension, but not later than the date of final payment under the Contract.

3.8 TERMINATION OF RIGHT TO PROCEED

3.8.1 RIGHT TO TERMINATE: If any or all Work to be performed under the Contract shall be abandoned by the Contractor; or if the Contract or any part thereof shall be assigned in violation of 3.3; or if any Work is sublet by the Contractor without the required approval of the Owner; or, if the Contractor shall become insolvent or unable to meet its payroll or other current obligations, or shall be adjudicated as bankrupt, have an involuntary Petition in Bankruptcy filed against it, make an assignment for benefit of creditors, file a petition for an arrangement, composition of compromise with its creditors under the bankruptcy laws or any State laws, or shall have a trustee or other officer appointed to take charge of its assets; or if at any time it should appear to the Architect/Engineer that the Schedule of Work is not being maintained or that the Contractor is violating any of the conditions or provisions of the Contract, or if at any time the Architect/Engineer determines that the Contractor is refusing or failing to perform properly the Work or the Contractor is performing the Work under the Contract in bad faith or not in accordance with the terms thereof, and if the Contractor fails to remedy such default within five (5) calendar days after written notice of default, the Owner may, without notice to the Contractor's sureties, terminate the Contractor's right to proceed with all or any portion of such Work as to which default has occurred.

Thereupon the Owner shall have the right to complete such Work, by whatever method the Owner may deem expedient, including employing another Contractor or Contractors under such form of Contract as the Owner may deem advisable, or the Owner may itself provide all labor or materials and perform any part of such Work that has been terminated, and the Contractor agrees that the Owner shall have the right to take possession of and to use any or all of the materials, tools, goods, supplies, and property of any and every kind furnished by the Contractor for such Work. The expense of completing such Work, together with a reasonable charge for administering any contract for such completion, shall be charged to the Contractor, and such expense shall be deducted by the Owner out of such monies as may be due or may at any time thereafter become due to the Contractor. In case such expense exceeds the sum which would have otherwise been payable under the Contract, the Contractor and its sureties shall be liable for and shall, upon notice from the Owner, promptly pay to the Owner the amount of such excess. The Owner shall not be required to obtain proposals for completing such Work, but may make such expenditures as in the Owner's sole judgment will best accomplish such completion.

3.8.2 DUTY OF CONTRACTOR UPON TERMINATION: Upon receipt of any such written notice of termination of right to proceed, the Contractor shall, at its expense, for that Work affected by any such termination:

3.8.2.1 Assist the Architect/Engineer in making an inventory of all materials and equipment in storage at the site, en route to the site, in storage or manufactured away from the site, and on order from suppliers;
3.8.2.2 Assign to the Owner, subcontracts, supply contracts, and equipment rental agreements all as designated by the Architect/Engineer; and

3.8.2.3 Remove from the site all construction materials and equipment listed in said inventory other than such construction materials and equipment which are designated in writing by the Architect/Engineer to be used by the Owner in completing such work.

3.8.3 Contractor shall include a clause permitting assignment in all subcontracts, supply contracts, and equipment rental agreements in the event of termination of this Contract.

3.9 TERMINATION FOR CONVENIENCE

3.9.1 RIGHT TO TERMINATE: The Owner may, at its option, terminate the Contract in whole or in part at any time by written notice thereof to the Contractor, whether or not the Contractor is in default. Upon any such termination, the Contractor agrees to waive any claims for damages, including loss of anticipated profits, on account thereof, but as the sole right and remedy of the Contractor and the Owner, the Owner shall pay the Contractor in accordance with 3.9.3 below provided, however, that the provisions of the Contract, which by their very nature survive acceptance of the Work under the Contract, shall remain in full force and effect after such termination.

3.9.2 OBLIGATION OF CONTRACTOR: Upon receipt of any such notice, the Contractor shall, unless the notice directs otherwise:

3.9.2.1 Immediately discontinue the Work on the date and to the extent specified in the notice;

3.9.2.2 Place no further orders or subcontracts for materials, services, or facilities, except as may be necessary or required for completion of such portion of the Work under the Contract that is not terminated;

3.9.2.3 Promptly make every reasonable effort to obtain cancellation upon terms satisfactory to the Owner of all orders and subcontracts to the extent they relate to the performance of Work terminated;

3.9.2.4 Assist the Owner as specifically requested, in writing, in the maintenance, protection, and disposition of property acquired by the Owner under the Contract;

3.9.2.5 Transfer to the Owner title to Work completed for which payment is made to the Contractor.

3.9.3 RIGHT TO PAYMENT: Upon any such termination, the Owner will pay to the Contractor an amount determined in accordance with the following (without duplication of any item):

3.9.3.1 All amounts due and not previously paid to the Contractor for Work completed in accordance with the Contract prior to such notice, and for Work thereafter completed as specified in such notice;

3.9.3.2 The reasonable cost of settling and paying claims arising out of the termination of the Work under subcontracts or orders as provided in 3.9.2.3 above provided, however, no amount claimed under any subcontract or order in excess of 10% of the original subcontract or order price shall be charged to the Owner;

3.9.3.3 The reasonable costs incurred pursuant to 3.9.2.4. above;

3.9.3.4 Any other reasonable costs incidental to such termination of Work;
The foregoing amounts shall include a reasonable sum, under all of the circumstances, as profit for the Work performed by the Contractor.

SURVIVAL OF CONTRACT TERMS: Upon such termination, the obligations of this Contract shall continue as to Work already performed and as to bona fide obligations assumed by the Contractor prior to the date of termination. The provisions of this Contract, which by their nature survive final acceptance of the Work hereunder, shall remain in full force and effect after such termination to the extent provided in such provisions.

CHANGES AND EXTRA WORK

RIGHT TO ORDER CHANGES: The Owner may, at any time, without invalidating the Contract and without notice to the Contractor's sureties, make any changes or additions, which are within the general scope of the Contract, and may request the Contractor to perform extra Work. Any such change or request, when such request is accepted by the Contractor, will be authorized in writing by the Architect/Engineer, provided that in the event of an emergency, which the Architect/Engineer determines endangers life or property, any Work required by reason of such an emergency shall be performed in accordance with oral orders from the Architect/Engineer, which orders will be confirmed in writing as soon as practicable. Any such authorization, whether written or oral, may be accompanied by drawings and data as are necessary to show the extent of such change, addition, or extra Work. No change orders involving any site work with unit prices will be paid unless the Contractor receives and retains tickets each day from each truck as it goes in or out (dumping or hauling) from the site. The Contractor will produce the tickets when requested to do so by the Architect or Owner for purposes of verifying in the field quantity measurements taken by the Owner's soils testing agency. The superintendent, subcontractor foreman, Owner's inspector, and soils testing agent shall sign in agreement the length x width x depth of undercuts on site day of work for payment to be made. The superintendent and Owner's testing agent shall agree to the volumes to remove prior to removal and the Owner's testing agent shall include in his reports an ongoing tabulation of cuts with dates, location, and volumes noted.

EQUITABLE ADJUSTMENTS: If any such change, addition, or extra Work causes an increase or decrease in the Contractor's cost of performance of Work, the Contract price shall be adjusted accordingly. If any such change, addition, or extra Work causes an increase in the time required for performance of Work under the Contract, the scheduled Contract completion date will be modified accordingly by a Change Order in accordance with 3.6 to accommodate such Work.

CONTRACT COST PROPOSAL: Unless otherwise required, the Contractor shall, within ten (10) days following receipt of such written authorization, submit in writing to the Architect/Engineer a proposal for accomplishing such change, addition, or extra Work. The proposal shall set forth any increase or decrease in cost to the Owner, and a comparison to such cost had such change, addition or extra Work not been authorized. The proposal shall state the basis of compensation for all Work in connection with any such change, addition, or extra Work. The proposal shall include any time extension required to perform the work associated with the changes.

MAXIMUM ADJUSTMENT FOR OVERHEAD AND PROFIT: If the Contract Price is adjusted in accordance with this section, the maximum adjustment for overhead and profit (regardless of the extent of the adjustment to the Contract Time, if any) shall be as follows:

For the Contractor, for any Work performed by its own forces, 12% of actual field cost;
3.10.4.2 For each Subcontractor involved, for any Work performed by its own forces, 12% of the actual field cost;

3.10.4.3 For each Sub-subcontractor involved, for any Work performed by its own forces, 12% of the actual field cost;

3.10.4.4 For the Contractor, for Work performed by each Subcontractor, 5% of the sum of Subcontractor's actual field cost plus Sub-subcontractor costs plus the Subcontractor's allowance for overhead and profit as defined above.

3.10.4.5 "Actual field cost" shall include the cost to the Contractor of all Workmen, such as foreman, timekeepers, mechanics, and laborers; and materials, supplies, and teams for the time actually employed or used on such Work; plus actual transportation charges necessarily incurred, together with all power, water, and similar operating expenses; also all necessary incidental expenses incurred directly on account of such Work, including Social Security Old Age Benefits and other payroll taxes; and a ratable proportion of premiums on Performance and Payment Bonds and Maintenance Bonds, Public Liability and Property Damage and Workmen's Compensation, and all other insurance as may be required by any law or ordinance, or directed by the Owner, or by them agreed to. The Architect/Engineer may direct the form in which accounts of the "actual field cost" shall be kept and the records of these accounts shall be made available to the Architect/Engineer.

3.10.4.6 "Cost of machinery and equipment" shall be charged separately from "actual field cost," shall not be subject to markup for overhead or profit, and shall be based on actual rentals, unless the machinery or equipment is owned by the Contractor. Machinery and equipment owned by the Contractor shall be charged according to the latest edition of the Associated General Contractors (AGC) Contractors Equipment Manual. The Contractor shall be responsible for providing the information necessary to compute AGC equipment rates. Equipment supplied by separate divisions of the Contractor's organization shall be considered rental equipment.

3.10.4.7 QUANTITY VERIFICATION: No change orders involving unit prices will be paid unless the Contractor receives acknowledgement and verification from Owner's Representative of the daily quantities used and identified on the Contractor's daily reports.

3.10.4.8 The allowance for "overhead and profit" to be paid the Contractor shall cover and compensate him for his profit, overhead, general superintendence and field office expense, general and administrative home office expense, and all other elements of cost and expense not included within the "actual field cost" or "cost of machinery and equipment" as herein defined.

3.10.4.9 Changes in the Work resulting in additions to and deductions from the Contract Sum not covered by unit price shall be determined by the actual cost of the Work, plus a fixed overhead and profit.

3.10.5 CONSTRUCTION CHANGE DIRECTIVES

3.10.5.1 A Construction Change Directive is a written order prepared by the Architect/Engineer and signed by the Owner and Architect/Engineer, directing a change in the Work and stating a proposed basis for adjustment, if any, in the Contract Sum, Contract Time, or both. The Owner may by Construction Change Directive, without invaliding 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.
3.10.5.2 A Construction Change Directive shall be used in the absence of total agreement on the
terms of a Change Order.

3.10.5.3 If the Construction Change Directive provides for an adjustment to the Contract Sum, the
adjustments shall be based on one (1) of the following methods:

3.10.5.3.1 Mutual acceptance of a lump sum properly itemized and supported by sufficient
substantiating data to permit evaluation;

3.10.5.3.2 Unit prices stated in the Contract Documents or subsequently agreed upon;

3.10.5.3.3 the actual cost of the Work plus an affixed overhead and profit;

3.10.5.3.4 as provided in 3.10.5.6.

3.10.5.4 Upon receipt of a Construction Change Directive, the Contractor shall promptly proceed
with the change in the Work involved and advise the Architect/Engineer 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.

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

3.10.5.6 If the Contractor does not respond promptly or disagrees with the method for adjustm-
ent in the Contract Sum, the method and the adjustment shall be determined by the
Architect/Engineer 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, the fixed allowance for overhead and profit. In such case, and also under
3.10.5.3.3, the Contractor shall keep and present, in such form as the Architect/Engineer
may prescribe, an itemized accounting together with appropriate supporting data.

3.10.5.7 Pending final determination of cost to the Owner, amounts not in dispute may be included
in the Applications for Payment. The amount of credit to be allowed by the Contractor to
the Owner for a deletion or change, which results in a net decrease in the Contract Sum
shall be actual net cost as confirmed by the Architect/Engineer. 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.

3.10.5.8 If the Owner and Contractor do not agree with the adjustment in the Contract Time or the
method for determining it, the adjustment or the method shall be referred to the
Architect/Engineer for determination.

3.10.5.9 When the Owner and Contractor agree with the determination made by the
Architect/Engineer concerning the adjustments in the Contract Sum and Contract Time,
or otherwise reach agreement upon the adjustments, such agreement shall be effective
immediately and shall be recorded by the preparation and execution of an appropriate
Change Order.

3.11 DIFFERING SITE CONDITIONS

3.11.1 NOTICE, EQUITABLE ADJUSTMENT: The Contractor shall, within five (5) days of
discovery and before such conditions are disturbed, notify the Architect/Engineer in
writing of: (1) subsurface or latent physical conditions at the site differing materially from those indicated in the Contract Documents, or (2) unknown physical conditions at the site, of an unusual nature, differing materially from those ordinarily encountered and generally recognized as inherent in Work of the character provided for in this Contract. The Architect/Engineer shall promptly investigate the conditions and report to the Owner. If, after evaluation by the Architect/Engineer, the Owner finds that such conditions do materially so differ as to cause an increase or decrease in the Contractor's cost of, or the time required for, performance of any part of the Work under this Contract, an equitable adjustment shall be made and the Contract modified in writing accordingly.

3.11.2 WAIVER OF CLAIM: Failure to notify the Architect/Engineer within the time set forth in 3.11.1 above and before condition is determined of such differing site conditions shall operate as a complete waiver of the Contractor's right to claim an equitable adjustment.

3.11.3 EFFECT OF FINAL PAYMENT: No claim by the Contractor for an adjustment of the Contract price shall be allowed if asserted after application for payment is made for said Work and payment made. Acceptance of final payment by the Contractor serves as a waiver for all claims made or not reviewed at the time of application for final payment under this Contract.

3.12 DISPUTES AND CLAIMS

3.12.1 NOTICE OF CLAIMS: No claim for damages (or adjustment to the Contract Price) by the Contractor against the Owner shall be allowed unless the Contractor provides written notice of the claim in accordance with this Section within 20 days after the claim arises. Such notice shall include a qualification or projection of all direct costs being claimed and a reasonable estimate of indirect costs being claimed.

3.12.2 DISPUTES: Except as otherwise provided in this Contract, any dispute concerning a question of fact arising under this Contract which cannot be disposed of by agreement shall be decided by the Architect/Engineer subject to the written approval of the Owner. The decision by the Architect/Engineer and approval by the Owner shall be reduced to writing and a copy thereof mailed or otherwise furnished to the Contractor. The decision by the Architect/Engineer, as approved by the Owner, shall be final and conclusive.

3.12.3 OBLIGATION TO CONTINUE WORK: Unless otherwise agreed to in writing, the Contractor shall carry on the Work and maintain its progress during the pendency of any dispute, and the Owner shall continue to make payments to the Contract in accordance with the Contract Documents.

3.12.4 DUTY TO PROVIDE CERTIFIED STATEMENT: The Owner may require the Contractor to submit a written certification that any claim made by the Contractor arising out of the execution, performance, or breach of this Contract is not the result of, or affected by, any collusion with another person engaged in the same line of business or commerce or any act of fraud.

3.13 DAILY REPORTS: The Contractor shall maintain daily reports numbered "consecutively. Refer to "Division One Submittals" Section, Paragraph 1.6 for Daily Report requirements. The Daily Reports are to continue through the punch list until the Work is completed in its entirety. Progress payments may be withheld until such daily reports are received.

ARTICLE 4 - MISCELLANEOUS PROVISIONS

4.1 APPLICABLE LAW: This contract shall be deemed to be a Virginia Contract and shall be governed as to all matters whether of validity, interpretations, obligations, performance,
or otherwise exclusively by the laws of the Commonwealth of Virginia, and all questions arising with respect thereto shall be determined in accordance with such laws. Regardless of where actually delivered and accepted, this contract shall be deemed to have been delivered and accepted by the parties in the Commonwealth of Virginia.

4.2 COMPLIANCE WITH ALL LAWS: Contractor shall comply with all federal, state, and local statues, ordinances, and regulations now in effect or hereafter adopted, in the performance of scope Work set forth herein. Contractor represents that it possesses all necessary licenses and permits required to conduct its business and will acquire any additional licenses and permits necessary for performance of this contract prior to the initiation of work. Contractor further expressly represents that it is a corporation in good standing in the Commonwealth of Virginia and will remain in good standing throughout the term of contract. Contractor shall at all times observe all health and safety measures and precautions necessary for the sanitary and safe performance of the contract work.

4.3 PROTECTION OF PERSONS AND PROPERTY
4.3.1 SAFETY PRECAUTIONS

4.3.1.1 The Contractor shall, at its sole cost, protect and guard the Work and shall be responsible for planning, initiating, maintaining, supervising, and enforcing all measures, procedures, precautions, and programs for the greatest safety and protection of the Work, for any and all persons, and for any and all property. The safety of the Contractor's personnel shall be the Contractor's responsibility.

4.3.1.2 By way of illustration only and not by way of limitation, the Contractor shall, as applicable to its division of Work and at its sole cost:

4.3.1.2.1 Guard, secure, and protect the Work, all equipment, and all materials, whether incorporated into the Work or in storage on or off the site, against damages from any cause whatsoever.

4.3.1.2.2 Place and maintain barricades, lights, warning signs, and any and all other protective devices necessary for the prevention of injuries and damages and for the protection of the Work, all persons, and property.

4.3.1.2.3 Comply with all applicable laws, ordinances, rules, regulations, orders of any public authority, and codes relative to protection and safety of the Work, persons, and property.

4.3.1.2.4 Protect, prevent, and guard against injuries, damages, losses, or delays due to or contributed to by weather.

4.3.1.2.5 Provide the means, procedures, and equipment in sufficient quantity and capacity to keep all areas free and clear at all times from moisture and water from any source whatsoever; lawfully dispose of water in such a manner as to cause no damage or injury to any portion of the Work or to other property of the Owner or to adjoining properties.

4.3.1.2.6 Provide construction ladders, ramps, walkways, and stairs in accordance with applicable safety regulations.

4.3.1.2.7 Assure that all persons on the construction site wear hard hats at all times.

4.3.1.2.8 Contractor shall arrange deliveries of materials not to interfere with bus traffic. The bus schedule and school operating hours are as noted in the Summary of Work. 
4.3.1.3 By way of further illustration only and not by way of limitation, the Contractor shall, at its sole cost:

4.3.1.3.1 Take extreme precautions against the risk of fire.

4.3.1.3.2 Permit no fires to be built in or about any part of the construction site.

4.3.1.3.3 Use only heating devices operating on electricity or fuel oil and bearing the appropriate Underwriters Laboratory label; continuously supervise the use of such devices; and prohibit the use of stoves, salamanders, tar pots, or any other liquid petroleum, gas, gasoline, coal, or wood-burning devices.

4.3.1.3.4 Complete cleaning of the site shall occur on a daily basis. Failure by the Contractor to maintain a clean site will delay the Architect's approval of the Contractor's next application for payment until such time that the site is adequately clear to the Owner and Architect's/Engineer's satisfaction.

4.3.1.3.5 Take extreme precautions in performing any cutting or welding operations.

4.3.1.3.6 Place tanks for gas, welding, or cutting work at such distance from the Work as is necessary for safety and securely fasten and maintain them in an upright position. Such tanks shall be stored away from any combustible material and free from exposure to the rays of the sun and high temperatures.

4.3.1.3.7 Prohibit the storage and preparation of paint, varnish, gasoline, volatile substances, or other matter having low flash points on the job site.

4.3.1.3.8 Prohibit the use of asbestos, lead or hazardous containing materials. If any product or material specified by the Architect/Engineer or utilized by any Subcontractor is suspected of containing asbestos, it shall be removed from the job site immediately and both the Owner and Architect/Engineer shall be notified.

4.3.1.3.9 The Owner, Architect/Engineer, or their agents, employees or representatives are not responsible for the means, methods, techniques, sequences, or procedures utilized by the Contractor, or for safety precautions and programs in connection with the Work. The Contractor shall be solely responsible for initiating, maintaining, and supervising all safety precautions and programs in connection with the Work. This requirement applies continuously throughout the Contract performance, until Final Payment is made, and is not limited to regular working hours.

4.3.1.4 By way of further illustration only and not by way of limitations:

4.3.1.4.1 The Contractor shall provide and maintain adequate protection for all adjacent properties, whether or not utilized by the Contractor, which may be affected by the Work contemplated by the Contract Documents. If property adjacent to the construction site is required by the Contractor or any of its Subcontractors for storage of materials or for any other temporary use during the building operations, it shall be the Contractor's responsibility to obtain permission from any adjacent property owner for use of said property.

4.3.1.4.2 All public ways within or adjacent to the work site shall be maintained by the Contractor in such condition that they may be used freely and safely by the public.

4.3.2 EMERGENCIES: In the event of any emergency affecting the safety of persons or property, the Contractor shall act promptly to prevent damage, injury, or loss.
4.3.3 ACCIDENT REPORTS: The Contractor shall provide a written report to the Owner through the Architect/Engineer of any and all accidents whatsoever arising out of or in connection with the performance of the Work, whether on or adjacent to the site, which causes death or personal injury or property damage. The report shall be furnished within one (1) day of the occurrence.

4.3.4 RESTORATION OF PROPERTY: The Contractor shall restore all property which may be disturbed in the execution of the Work to its former condition and to the satisfaction of any property Owners or any governmental authority affected thereby.

4.3.5 WORKING CONDITIONS: The Contractor shall not require any laborer or mechanic to work in surroundings or under working conditions which are unsanitary, hazardous, or dangerous to his/her health and safety as determined under construction safety and health standards promulgated by the U.S. Secretary of Labor.

4.4 INSURANCE

4.4.1 CONTRACTOR'S LIABILITY INSURANCE

4.4.1.1 The Contractor shall purchase and maintain from a company or companies licensed to do business in the Commonwealth of Virginia such insurance as will protect him from claims set forth below which may arise out of or result from the Contractor's operations under the Contract, whether such operations be by himself or by any Subcontractor or by anyone directly or indirectly employed by any of them, or by anyone for whose acts any of them may be liable:

4.4.1.1.1 Claims under workers' or workmen's compensation, disability benefit, and other similar employee benefit acts;

4.4.1.1.2 Claims for damages because of bodily injury, occupational sickness or disease, or death of his employees;

4.4.1.1.3 Claims for damages because of bodily injury, sickness or disease, or death of any person other than his employees;

4.4.1.1.4 Claims for damages insured by usual personal injury liability coverage which are sustained: (1) by any person as a result of an offense directly or indirectly related to the employment of such person by the Contractor; or (2) by any other person directly related to the employment of such person by the Contractor; or (3) by any other person;

4.4.1.1.5 Claims for damages, other than to the Work itself, because of injury to or destruction of tangible property, including loss of use therefrom;

4.4.1.1.6 Claims for damages because of bodily injury or death of any person or property damage arising out of the Ownership, maintenance, or use of any motor vehicle; and

4.4.1.1.7 Liability insurance shall include all major divisions of coverage and be on a comprehensive basis including:


b. Independent Contractors Protective.

c. Products and Completed Operations.

d. Contractual - including specified provision for the Contractor's obligations.
e. Owned, non-owned, and hired motor vehicles.

f. Broad form coverage for property damage.

g. The Contractor's general liability shall include Comprehensive Form, Underground Explosion and Collapse Hazard, Body and/or Personal Injury.

4.4.1.2 The insurance required by 4.4.1.1 shall be written for not less than any limits of liability specified in the Contract Documents, or required by law, whichever is greater. The Contractor shall furnish insurance with the following minimum limits:

4.4.1.2.1 Worker’s Compensation

a. State and Federal: Statutory

b. Employer’s Liability: $500,000

4.4.1.2.2 Comprehensive General Liability (Including Premises-Operations; Independent Contractor’s Protective; Products and Completed Operations; Broad Form Property Damage):

a. Bodily Injury: $500,000 combined single limit.

b. Property Damage: $500,000 each occurrence.

c. Products and completed operations insurance shall be maintained for a minimum period of one (1) year after final payment. Contractor shall continue to provide evidence of such coverage to Owner on an annual basis during the aforementioned period.

d. Property Damage Liability Insurance shall include coverage for the following hazards: X (Explosion), C (Collapse), U (Underground).

e. Contractual Liability (Hold Harmless Coverage).

f. Personal Injury, with Employment Exclusion deleted.

4.4.1.2.3 Comprehensive Automobile Liability (owned, non-owned, hired):

a. Bodily Injury: $500,000 combined single limit.

b. Property Damage: $1,000,000 each occurrence.

4.4.1.2.4 Excess Liability Umbrella: $1,000,000.

4.4.1.2.5 Independent Contractors shall maintain the same limits as indicated above.

4.4.1.2.6 The Contractor shall provide builder's risk coverage on the full insurable value of the Work.

4.4.1.3 Certificates of all insurance required of the Contractor and/or any actual policies, if requested by the Owner instead of, or in addition to, certificates, shall be filed with the Owner for his review within ten (10) days after the Contractor receives the announcement of decision to Award. Certificates of insurance required of all Subcontractors and all Sub-
subcontractors shall be filed with the Contractor prior to the commencement of the Work. The certificate shall include the Owner and Architect as "additional insured's."

4.4.1.4 Cherapeake Public Schools shall be listed on the Certificates of Insurance as an additional named insured party with respect to the project. Each insurance policy, or certificate, shall specifically state, "Coverage is provided as set forth in 4.4.1.1 through 4.4.1.2.6 of the General Conditions of the Contract for Construction". Policies or Certificates not so stating will not be accepted. Cherapeake Public Schools shall receive from the Underwriter a letter stating that each insurance policy has been amended to name Cherapeake Public Schools as co-insured in each policy. Insurance coverage shall remain in force for one (1) year following Substantial Completion and acceptance.

4.4.1.5 Safety in, on, or about the site is the sole and exclusive responsibility of the Contractor. The Contractor's employees and sequencing of construction are also the sole and exclusive responsibilities of the Contractor. Contractor is required to indemnify, defend, and hold the Owner and Architect/Engineer harmless from any claim or liability for injury or loss arising from Owner's or Architect's/Engineer's alleged failure to exercise site safety responsibilities. The Contractor's general liability insurance policy shall be primary protection for the Owner and Architect/Engineer.

"4.4.1.5.1 Architect's site responsibilities are limited solely to the activities of Architect and Architect's employees on site. These responsibilities shall not be inferred by any party to mean that Architect has responsibility for site safety. Safety in, on, or about the site is the sole and exclusive responsibility of the Contractor alone. The Contractor's methods of work performance, superintendence of the Contractor's employees, and sequencing of construction are also the sole and exclusive responsibilities of the Contractor alone.

Owner warrants that:

1) The Contractor's responsibilities will be made clear in Owner's agreement with the Contractor;
2) Owner's agreement with the Contractor shall require the Contractor to indemnify, defend, and hold Owner and Architect harmless from any claim or liability for injury or loss arising from Owner's or Architect's alleged failure to exercise site safety responsibility; and
3) Owner's agreement with the Contractor shall require the Contractor to make Owner and Architect additional insureds under the Contractor's general liability insurance policy, which insurance protection shall be primary protection for Owner and Architect."

4.4.1.6 The Contractor shall furnish and maintain, during the life of this Contract, Builder's Risk Insurance, with Fire, Extended Coverage, Vandalism and Malicious Mischief Protection. Such insurance shall be written in the names of the Owner, and Contractors and Subcontractors as their interest may appear. Such insurance shall be to the full insurable value of the total construction covered under the general, mechanical, and electrical Contracts, including items of labor and materials connected therewith, materials in place, protective fences, temporary structures, the cost of which is included in the cost of the Work. Such insurance policy or policies shall not cover any tools owned by mechanics, any tools, equipment, scaffolding, staging, towers, and forms owned or rented by the Contractors, the capital value of which is not included in the cost of the Work, or any structure erected for housing the workmen. The insurance company or companies shall have no right to subrogate against the Owner, the Contractors, and Subcontractors, or other parties employed on the premises, for any Work of any nature whatsoever. The Contractor should separately furnish and maintain insurance covering loss or damage from all insurable causes to any tool owned or rented by the Contractor, his agents, Subcontractors, material men, or their employees.
4.4.1.7 Certificates of Insurance acceptable to the Owner shall be approved by the Architect/Engineer and then filed with the Owner prior to commencement of the Work. These Certificates shall contain a provision that coverages afforded under the policies will not be canceled until at least 30 days prior written notice has been given to the Owner. Certificates shall be A.I.A. Document G705. Furnish to the Owner copies of any endorsements that are subsequently issued amending coverage limits. The Certificate shall indicate the project name.

4.4.1.8 The Asbestos Contractor or Subcontractor, as the case may be, shall provide occurrence-based liability insurance with asbestos coverage in an amount not less than $1,000,000 and shall name the following as additional insureds: The School Board of the City of Chesapeake, its officers, its employees and its agents; the Architect/Engineer (if not the Asbestos Project Designer); and the Contractor (where the Asbestos work is being performed by the Asbestos Subcontractor).

4.4.2 OWNER'S LIABILITY INSURANCE

4.4.2.1 The Owner shall be responsible for purchasing and maintaining his own liability insurance and, at his option, may purchase and maintain such insurance as will protect him against claims, which may arise from operations under the Contract.

4.5 RELIEF FROM MAINTENANCE AND RESPONSIBILITY: Upon the written request of the Contractor to the Owner, through the Architect/Engineer, the Owner may, by written notice, relieve the Contractor of the duty of maintaining and protecting certain significant portions of the Work, which have been completed in all respects in accordance with the requirements of the Contract, and thereafter, except with the Contractor's consent, the Contractor will not be required to do further Work hereon. In addition, such action by the Owner will relieve the Contractor of responsibility for injury or damage to said completed portions of the Work resulting from use by public traffic or from the action of the elements or from any other cause, but not from injury or damage resulting from the Contractor's own operations nor from its negligence.

4.6 CONTRACTOR'S RESPONSIBILITY FOR THE WORK AND MATERIALS: Until the acceptance of the Work, the Contractor shall have the charge and care of the Work and of the materials to be used therein, including materials for which it has received payment as provided in 5.4 "Progress Payments," and materials which have been furnished by the Owner and shall bear the risk of injury, loss, or damage to any part thereof by the action of the elements or from any other cause, whether arising from the execution or from the non-execution of the Work, except as provided in 4.4. The Contractor shall rebuild, repair, or restore all injuries, losses, or damages to any portion of the Work and materials occasioned by any cause before its completion and acceptance and shall bear the expense thereof, except for such injuries, losses, or damages as are directly and proximately caused by acts of God, of the Public Enemy, or governmental authorities. Where necessary, the Contractor shall, at its expense, provide suitable drainage and erect such temporary structures as are necessary to protect the Work and materials from damage. The suspension of the Work from any cause whatever shall not relieve the Contractor of its responsibility for the Work and materials, which have been partially paid for by the Owner or which have been furnished by the Owner. Such storage by the Contractor shall be on behalf of the Owner and the Owner shall at all times be entitled to the possession of such materials. The Contractor shall promptly return the same to the site of the Work when requested. The Contractor shall not dispose of any of the materials so stored except on written authorization from the Architect/Engineer.

4.7 SUBSTANTIAL COMPLETION AND PUNCH LIST: When the Work is substantially complete as defined by the Contract, the Contractor shall so notify the Architect/Engineer.
in writing. Said notice shall be accompanied by an itemized Final Punch List as set forth in 4.7.3 listing all Work which is incomplete. Unless agreed otherwise by the Architect/Engineer, this list of Work shall refer specifically to individual items and may not be general or collective in nature. Upon receipt of this notice along with the Final Punch List, the Architect/Engineer will schedule an inspection. The failure to include any items on such Final Punch List does not alter the responsibility of the Contractor to complete all Work in accordance with the Contract Documents; however, defects, which occur or are observed after the completion of the Final Punch List shall be corrected as set forth. If the Architect/Engineer and the Owner determine that any items on the Final Punch List must be completed prior to the Work or designated portion thereof being accepted as substantially complete, the Contractor will be promptly notified. The Contractor shall complete said Work, without delay, notifying the Architect/Engineer in writing when completed. Refer also to 5.4.8 for Substantial Completion and Semi-Final Payment.

4.7.1 When the Architect/Engineer determines, based on information available to him, that the Work or designated portion thereof is substantially complete, he will then prepare a Certificate of Substantial Completion which shall establish the date of Substantial Completion, state the responsibilities of the Owner and the Contractor for security, maintenance, heat, utilities, damage to the Work, and insurance. The Certificate of Substantial Completion shall be submitted to the Owner and the Contractor for their written acceptance of the responsibilities assigned to them in such Certificate.

4.7.2 Upon Substantial Completion of the Work and upon application by the Contractor and certification by the Architect/Engineer, the Owner shall make payment, if any for such Work or portion thereof as provided in the Contract Documents. The Contractor’s Application shall be accompanied by the Final Punch List, which shall be revised as of the date of the Application to indicate all Work, which remains incomplete. This revised Final Punch List shall have an accurate dollar value assigned to each item of Work. If any items on the Final Punch List referenced in 4.7.1 are omitted from the revised Final Punch List accompanying the Application and the Owner or Architect/Engineer are not assured that these omitted items have been satisfactorily completed, they shall add such items to the list accompanying the Application and assign dollar values to each item to cover the cost of the Work involved. The Architect/Engineer and Owner shall also adjust the dollar values assigned by the Contractor if, in their reasonable opinion, the Contractor’s assignment is insufficient to cover the cost of the Work. The total of all final dollar value assignments will be deducted from the Contractor’s Application prior to payment by the Owner. This deduction shall be in addition to any percentage of retainage provided for elsewhere in the Contract Documents. After the issuance of the Certificate of Substantial Completion, no payment will become due until all required as-built drawings, maintenance manuals, bonds, guarantees, warranties, certificates and the like have been submitted and accepted by the Owner. No subsequent payment will be made until the Final Payment, unless authorized by the Owner. If, in the sole opinion of the Owner, the Contractor is diligently pursuing the remaining Work as itemized on the revised Final Punch List, and the Contractor is also correcting with dispatch, defects occurring after the preparation of the Final Punch List, then he may, at his option, authorize payment prior to Final Payment.

4.7.3 FINAL PUNCH LIST: Except for items specifically exempted by the Owner, the Final Punch List shall be corrected within 30 days of the date of Substantial Completion. For each day beyond 30 days of the date of Substantial Completion that the Final Punch List remains uncorrected, the Contractor shall pay to the Owner a sum of Two-Hundred and Fifty Dollars ($250.00) per day as liquidated damages. Contractor must coordinate such Work with the Owner.

4.8 ACCEPTANCE OF THE WORK: The Contractor shall request of the Architect/Engineer, in writing, a final inspection when the Work has been completed in all respects in
according with the Contract Documents. Upon receipt of the Contractor's written request, the Architect/Engineer will perform a final inspection and determine that the Work has been completed as specified. If the Work has not been completed, the Architect/Engineer will inform the Contractor in writing of the remaining Work to be completed. If the Work has been completed, the Architect/Engineer will formally accept the Work. Immediately upon and after such final written acceptance by the Architect/Engineer, the Contractor will be relieved of the duty of maintaining and protecting the Work as a whole, and it will not be required to perform any further Work thereon except as provided in 4.9 "Warranty of Construction"; and the Contractor shall be relieved of his responsibility for injury to persons or property or damage to the Work which occurs after the Final Acceptance by the Owner, except that the Contractor shall not be relieved of its responsibility for injury to persons or property arising from the Contractor's duties and obligations under 4.12, "Hold Harmless."

4.8.1 Under no circumstances shall any portion of the Work be construed as substantially complete (whether the Owner has assumed beneficial occupancy or not) until the Contractor has thoroughly and accurately conducted their own inspection, prepared their own itemized and detailed "Pre-Final Punch List," and conscientiously completed and corrected all items thereon, with the exception of any items which, in the Architect's opinion, may be delayed for just and reasonable cause.

4.8.2 If, upon receipt of the written notice from the Contractor that any portion of the work is substantially complete, as set forth in Subparagraph 1.20, 4.5.1, and 4.7, the Architect determines that the Contractor has not conscientiously complied with the above, then the inspection by the Owner and the Architect, as set forth in Subparagraph 5.4.6, may be delayed until the Architect determines that the Contractor has complied with the above requirements.

4.8.2.1 When the Work, or a designated portion thereof is substantially complete as defined in Subparagraph 5.4.8, the Contractor shall so notify the Architect in writing. Said notice shall be accompanied by the itemized Pre-Final Punch List as described in Subparagraph 5.4.8 listing all work which is incomplete. Unless agreed otherwise by the Architect, this list of work shall refer specifically to individual items and may not be general or collective in nature. Upon receipt of this notice along with the Pre-Final Punch List the Architect will schedule an inspection, which shall be held jointly with the Owner, the Contractor and the Architect at which time any additional items observed shall be added to the list. This list shall constitute the "Final Punch List." The failure to include any items on the Final Punch List does not alter the responsibility of the Contractor to complete all Work in accordance with the Contract Documents; however defects which occur or are observed after the completion of the Final Punch List shall be corrected and shall not be added to the Final Punch List. If the Architect and the Owner determine that any items on the Final Punch List must be completed prior to the Work or designated portion thereof being accepted as substantially complete, the Contractor will promptly be notified. The Contractor shall complete said work, without delay, notifying the Architect in writing when completion has been accomplished. When the Architect determines, based on information available to him, that the Work or designated portion thereof is substantially complete, he will then prepare a Certificate of Substantial Completion which shall establish the date of Substantial Completion, shall state the responsibilities of the Owner and the Contractor for security, maintenance heat, utilities, damage to the Work, and insurance, and shall fix the time within which the Contractor shall complete the items listed therein. Warranties required by the Contract Documents shall commence on the Date of Substantial Completion of the Work or designated portion thereof, except as otherwise provided in the Certificate of Substantial Completion. The Certificate of Substantial Completion shall be submitted to the Owner and the Contractor for their written acceptance of the responsibilities assigned to them in such Certificate.
Upon Substantial Completion of the Work or designated portion thereof and upon application by the Contractor and certification by the Architect, the Owner shall make payment, reflecting adjustment in retainage, if any, for such Work or portion thereof, as provided in the Contract Documents. The Contractor's Application shall be accompanied by the Final Punch List, which shall be revised as of the date of the Application to indicate all work which remains incomplete. This revised Final Punch List shall have an accurate dollar value assigned to each item of work. If any items on the Final Punch List are omitted from the revised Final Punch List accompanying the Application, and the Owner or the Architect are not assured that these omitted items have been satisfactorily completed, they shall add such items to the list accompanying the Application and assign dollar values to each item to cover the cost of the work involved. The Architect and Owner shall also adjust the dollar values assigned by the Contractor if, in their reasonable opinion, the Contractor's assignments will be deducted from the Contractor's Application prior to payment by the Owner. This deduction shall be in addition to any percentage of retainage provided for elsewhere in the Contract Documents. After the issuance of Substantial Completion, no payment will become due until all required as-built drawings, maintenance manuals, bonds, guarantees, warranties, certificates of final inspections, fire marshal inspection, mechanical inspection, etc., and the like have been submitted and accepted by the Owner. No subsequent payment will be made until the Final Payment, unless authorized by the Owner. If, in the opinion of the Owner and Architect, the Contractor is diligently pursuing the remaining Work as itemized on the revised Final Punch List, and the Contractor is also correcting with dispatch, defects occurring after the preparation of the Final Punch List, then the Owner may, at their option, authorize payment prior to Final Payment.

WARRANTY OF CONSTRUCTION: For a period of one (1) year from the date of Substantial Completion as determined and established by the Architect/Engineer and the Owner, the Contractor shall warrant that Work performed under this Contract conforms to the Contract Documents and is free of any defect of equipment, material, or workmanship performed by the Contractor or any of its Subcontractors or suppliers. Under this warranty, the Contractor shall remedy, at its own expense, any such failure to conform or any such defect. This and all other warranties shall include both material and labor.

The Contractor shall, prior to final payment, deliver to the Owner in writing a complete and unconditional notarized guarantee on all Work performed under this Contract. The Guarantee shall ensure the prompt repair, replacement, or correction of any defective item or condition, which might exist or develop. In addition, the Contractor shall deliver to the Owner any bonds, guarantees or warranties issued by the manufacturers on items of equipment furnished under this Contract. Where guarantees or warranties are written in any division of Specifications for a period of more than one (1) year, such longer terms shall apply.

The Contractor shall adequately respond to all warranty Work within 24 hours of notification or the Owner reserves the right to have the Work repaired by others and backcharged to the Contractor. The Contractor shall adequately respond to emergency situations, immediately upon notification.

PERMITS AND LICENSES: Unless otherwise provided in the Contract Documents, the Contractor shall secure the building permit and other permits and governmental fees, licenses and inspections necessary for proper execution and completion of the Work which are customarily secured after execution of the contract, and which are legally required when bids are received or negotiations concluded. When project is phased, obtain separate permit for each phase. The Contractor shall pay for building permit, plumbing permit, electrical permit, and all other permits and government fees and
licenses. The Owner will pay water, sewer, and Hampton Roads Sanitation Fees. Architect/Engineer to modify standard list of permits, as applicable.

4.11 ANTI-KICKBACK PROVISION: The Contractor is prohibited from inducing, by any means, any person employed under this Contract to give up any part of the compensation to which he/she is otherwise entitled.

4.12 HOLD HARMLESS: The Contractor agrees to defend, save, and hold the Owner, the Architect/Engineer, their agents and assigns, harmless from and against all suits, claims, and demands based upon any alleged damage to property or any alleged injury to persons (including death) which may occur or be alleged to have occurred by or on account of any negligent act or omission on the part of the said Contractor, its Subcontractors, or any of their servants, employees, or agents. Further, the Contractor shall defend all suits or claims for infringement of any patent rights and shall save and hold the Owner, his agents and assigns, harmless from and against any demand for payment for the use of any patented material, process, device, or article that may enter into the Work covered by this Contract. The Contractor also shall defend, indemnify and hold harmless Owner and Owner’s agents, Architect/Engineers, environmental consultants and their employees from any and all claims or liability for injury or loss that allegedly arises from the Contractor’s performance of the Work, but not including the sole negligence of the Owner or Owner’s agents, Architect/Engineers, environmental consultants, or their employees. The Contractor shall require all subcontracts to conform with this provision before they start any Work. The Contractor shall ensure that this provision is in conformity with the insurance provisions of this Contract.

4.13 NOTICE OF CLAIM OR ACTION FILED: The Contractor shall give the Owner immediate written notice of any suit or action filed or prompt written notice of any claim made against the Contractor arising out of the performance of this Contract. The Contractor shall furnish immediately to the Architect/Engineer copies of all pertinent papers received by the Contractor. If the amount of the liability claimed exceeds the amount of applicable insurance coverage, the Contractor shall authorize representatives of the Owner to collaborate with counsel for the insurance carrier, if any, in settling or defending such claim.

4.14 CONTRACT HEADINGS: The headings of the articles and sections of this Contract are inserted for reference purposes only and are not restrictive as to content.

4.15 SEVERABILITY: If any clause or provision of this Contract is declared to be invalid by any tribunal, then and in that event, it is the intention of the parties hereto that the remainder of this Contract shall not be affected thereby. It is also the intention of the parties to this Contract that, in lieu of each clause or provision of this Contract that is illegal, invalid, or unenforceable, there be added as a part of this Contract a clause or provision as similar in terms to such illegal, invalid or unenforceable clause or provision as may be possible and be legal, valid, and enforceable.

4.16 ATTORNEY, CONSULTANT AND EXPERT FEES: In the event of litigation arising out of the execution, performance, or breach of this Contract, the Contractor shall reimburse the Owner for reasonable attorney, consultant, and expert fees and costs should the Owner prevail. In the event the Contractor makes any claim that includes separate items and the Owner prevails relative to any separate item, the Contractor shall reimburse Owner for his reasonable attorney, consultant, or agent fees and costs related to the separate items Contractor did not prevail upon.

4.17 EMPLOYMENT DISCRIMINATION PROHIBITED

4.17.1 During the performance of this Contract, the Contractor agrees as follows:
4.17.1.1 The Contractor will not discriminate against any employee or applicant for employment because of race, religion, color, sex or national origin. The Contractor agrees to post in conspicuous places, available to employees and applicants for employment, notices setting forth the provisions of this non-discrimination clause.

4.17.1.2 The Contractor, in all solicitations or advertisements for employees placed by or on behalf of the Contractor, will state that such Contractor is an equal opportunity employer.

4.17.1.3 Notices, advertisements, and solicitations placed in accordance with federal law, rule, or regulation shall be deemed sufficient for the purpose of meeting the requirements of this Section.

4.17.1.4 The Contractor and any and all Subcontractors shall certify that no employee (i) has been convicted of a felony of any offense involving the sexual molestation or physical or sexual abuse or rape of a child; and (ii) has been convicted of a crime of moral turpitude.

4.17.2 The Contractor will include the provisions of the foregoing Paragraphs 4.17.1.1, 4.17.1.2, 4.17.1.3 and 4.17.1.4 (for any dollar amount), in every subcontract or purchase order of over $10,000, so that the provisions will be binding upon each Subcontractor or vendor.

4.18 ASBESTOS AND LEAD CERTIFICATION: At the completion of the Work, the Contractor must submit a written certification that no materials or equipment incorporated into the project contain: (a) asbestos; (b) Lead or any other hazardous or prohibited material, including, but not limited to paint, solder, and welding material or pipes. Lead sheet used in conjunction with roof flashings for VTR (Vent-through-Roof) and roof drains shall be an exception to the lead-free statement.

4.19 BONDS: The Contractor shall provide separate performance and material payment bonds, each in the amount of the full Contract Price.

4.20 ALLOWANCES: The Contractor shall include in the Contract Sum the 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 against which the Contractor makes reasonable objection.

Unless otherwise provided in the Contract Documents:

1. Materials and equipment or labor under an allowance shall be selected promptly by the Owner to avoid delay in the Work.

2. Allowances shall cover the cost including taxes and trade discounts to the Contractor of materials and equipment delivered at the site and all labor required for installation to complete the Work.

3. A specified allowance shall cover the cost of a separate Contract by the Owner.

4. 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 and not in the allowances.

5. 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; and (2) changes in Contractor's costs.
4.20.1 Allowances and requirements are specified in individual sections of these specifications.

4.21 AUDITS: The Owner shall have the right to audit all books and records (in whatever form they may be kept, whether written, electronic or other) relating or pertaining to this contract or agreement (including any and all documents and other materials, in whatever form they may be kept, which support or underlie those books and records), kept by or under the control of the Contractor, including, but not limited to, those kept by the Contractor, its employees, agents, assigns, successors, and Subcontractors. The Contractor shall maintain such books and records, together with such supporting or underlying documents and materials, for the duration of this contract or agreement and for at least three (3) years following the completion of this Contract or agreement, including any and all renewals thereof. The books and records, together with the supporting and underlying documents and materials shall be made available, upon request, to the Owner, through its employees, agents, representatives, Contractors or other designees, during normal business hours at the Contractor’s office or place of business in Virginia. In the event that no such location is available, then the books and records, together with the supporting or underlying documents and records, shall be made available for audit at a time and location in Chesapeake, Virginia, which is convenient for the Owner.

This paragraph shall not be construed to limit, revoke, or abridge any other rights, powers, or obligations relating to audit which the Owner may have the State, City, or Federal statute, ordinance, regulation, or agreement, whether those rights, powers, or obligations are expressed or implied.

4.22 ADDITIONAL PROFESSIONAL SERVICES

4.22.1 If the Architect or Consulting Engineers are required to visit any building site or provide Additional Professional Services due to the Contractor’s or Subcontractor’s mistakes, faulty workmanship or materials, the Contractor shall pay the Owner $150.00 per hour per person for the Services.

4.23 DEMONSTRATION NOTIFICATIONS

4.23.1 The Architect/Engineer (as required by discipline), Owner, and a General Contractor’s Representative shall be present at all demonstrations of all equipment and systems, i.e., HVAC, fire alarm, etc. The Owner and Architect/Engineer shall be contacted one (1) week prior to these demonstrations.

4.24 SHOP DRAWING DELIVERY ACCOUNT

4.24.1 Overnight Delivery: General Contractor shall provide the Architect with an overnight delivery account number for the Architect’s use in distribution of drawings, specifications, addenda, bulletins, shop drawings, correspondence, etc.

ARTICLE 5 - PAYMENT

5.1 CONTRACT: The Contract Sum is stated in the Contract and is the total amount payable by the Owner to the Contractor for the performance of the Work under the Contract Documents.

5.2 UNIT PRICE CONTRACT: The Contract Sum for Unit Price Contracts will be the sum of the products of the estimated quantities shown on the bid form multiplied by the unit prices bid. In the event of a discrepancy between the unit prices bid and extensions, the unit price shall govern.
5.2.1 **MEASUREMENT OF QUANTITIES:** Measurement of quantities for payment on unit price items shall be in accordance with the Measurement and Payment Sections of the appropriate technical Specification covering that item of Work.

5.3 **SCHEDULE OF VALUES:** Before filing application for its first payment, the Contractor, shall submit to the Architect/Engineer a Schedule of Values (cost breakdown) for approval by the Architect/Engineer and the Owner. The Schedule of Values shall provide a complete, itemized allocation of the various portions of the Work, aggregating the total Contract Sum. The Contractor shall, on its application for payment, provide breakout prices for labor and material for each line item as applicable for the progress of the work.

5.3.1 **PURPOSE:** The approved Schedule of Values shall be used to determine the total cost of the sections and divisions of the Work.

5.3.2 **TIMELINESS:** The Schedule of Values must be submitted within ten (10) days after receipt of the Notice to Proceed unless otherwise directed by the Owner.

5.3.3 **COST ITEMIZATIONS:** Cost itemizations shall be broken down into:

5.3.3.1 **EQUIPMENT:** cost, including taxes, paid and built into the Work.

5.3.3.2 **MATERIAL:** cost including taxes paid and built into the Work.

5.3.3.3 **LABOR OR OTHER COSTS

5.3.3.4 **COSTS OF SUBCONTRACT WORK** shall be incorporated into the Schedule of Values similarly broken down.

5.3.4 The Contractor shall allow for the payment of all county, state, and federal taxes with the exception of the Federal Excise Tax. Certificates of exemption covering Federal Excise Tax will be furnished by the Owner on written request. The Contractor shall furnish the Owner with separate documentary proof of payment of State Sales and Use Tax and the County Sales and Use Tax if applicable in order that the Owner may obtain a refund. These separate documents shall be certified by the Contractor and shall list each of his Subcontractors and suppliers by name and the amount of Sales and Use Taxes paid to and by each of them and the total amount of Sales and Use Taxes paid. The proof shall be submitted each month with the Contractor’s Application for Payment.

5.4 **PROGRESS PAYMENTS:** On or about the last day of the month, the Contractor shall submit a formal typewritten, certified (and notarized) Application for Payment on forms provided by the Owner and supported by such data required by the Owner to substantiate the Contractor’s rights to payment for current Work performed, in accordance with Contract Documents. Within seven (7) days after receipt of the formal typewritten Application, the Architect/Engineer will either:

5.4.1 Issue its Certificate for Payment and recommendation for payment to the Owner, or

5.4.2 Notify the Owner and the Contractor in writing of the reasons for withholding approval of payment as provided under 5.7.1.

5.4.3 **TIME OF PAYMENT:** Formal written Applications, which have been approved, will be paid within 45 days of receipt by the Owner.

5.4.4 **MINIMUM PAYMENTS:** No Application for Payment except the final application shall be made for a sum less than Five Hundred Dollars ($500.00).
5.4.5 CORRECTION OF PAYMENTS: The Applications, except the final Application, and the payments thereunder shall be subject to correction in any Application rendered following the discovery of any error.

5.4.6 RETENTION: An amount equivalent to five percent (5%) of each such payment application and also of any other sums due the Contractor from the Owner shall be deducted therefrom and withheld until the Work required by the Contract has been performed. The amount retained shall be withheld until final acceptance of the Work, with the exception that if the Architect/Engineer finds that satisfactory progress is being made in all phases of the Contract, he may, upon request by the Contractor after the time of Substantial Completion, authorize payment from the withheld percentage. Before such payment is made, the Architect/Engineer shall determine that satisfactory and substantial reasons exist for the payment and the Contractor shall provide the Owner with written approval from any surety furnishing bonds for the Contract Work. Any amount withheld pursuant to this provision shall be paid to the Contractor as part of the final payment, providing there are no claims or liens relating to this Contract.

5.4.7 EQUIPMENT AND MATERIALS ON HAND AND NOT PLACED: Payment may be made to the extent of the delivered cost of equipment and materials to be incorporated in the Work, when delivered on the project or stored in acceptable storage places approved by the Owner. Payment for such equipment and materials will not relieve the Contractor of responsibility for loss or damage of the stored equipment and materials. The delivered cost shall be evidenced by proper invoices. Equipment shall not be purchased so far in advance that the warranty period is affected. Materials not physically stored on the site will not be considered on hand and will not qualify for payment.

5.4.7.1 MATERIALS STORED OFF SITE: No payment will be made for materials stored off site. Material purchased specifically for the Project, but stored off the site, may be considered for payment provided all of the following is accomplished prior to any submission of request for payment for such material through inclusion on the regular monthly payment request.

1. The Contractor must notify the Owner IN WRITING, at least 21 days prior to the submission of the payment request, that specific items will be stored off site.
2. Such notification shall itemize the quantity of such materials; shall document with detailed invoices the cost of said materials and shall indicate the identification markings used on the materials. Such markings shall clearly reference the materials to this Project. The specific location of the materials shall be indicated.
3. The Contractor shall indicate, in writing, in the notification that he agrees that loss of materials stored off the site shall not relieve him of the obligation to furnish these types and quantities of materials for the Project and on a schedule to meet the time completion requirements of the Contract Documents at no additional cost to the Owner.
4. The Contractor agrees and certifies, in writing, in the notification that the storage location is safe and is suitable for the type of material stored.
5. The notification shall indicate that the Surety on the Performance Bond and the Payment Bond has been notified of the request for payment of materials stored off the site and has specifically approved such payment. A copy of the Surety’s written approval of Contractor’s request shall be included with the notification.
6. The notification shall indicate and certify that adequate all risk insurance has been obtained by the Contractor on the materials. Such insurance shall be in the names of the Owner and the Contractor.
7. All of the materials are stored at a single location not further than a 60 mile, one way, drive from the Project site.
8. Chesapeake Public Schools is to be the sole certificate holder on the certificate of insurance for stored material.

5.4.8 SUBSTANTIAL COMPLETION AND SEMI-FINAL PAYMENT: In accordance with 3.5.2.1 and 4.7, when the Contractor determines that the Work, or a designated portion thereof acceptable to the Owner is substantially complete and that all systems have been commissioned, the Contractor shall notify the Architect/Engineer and the Owner by letter that the project is complete and ready for inspection. When the Architect/Engineer is satisfied that the Work, or designated portion thereof is indeed ready for inspection, he will prepare a punch list of items to be completed or corrected and then an inspection shall be held jointly with representatives of the Owner, the Architect/Engineer, and the Contractor to discuss and determine the time required to complete the items on the list. The failure to include items on such list does not alter the responsibility of the Contractor to complete all Work in accordance with the Contract Documents. During the inspection, additional items discovered, but not listed, shall be added to the list. Defects which occur after the inspection shall be termed as warranty items and shall be treated as such. All items of emergency nature (i.e., roof leaks) shall be repaired immediately during the warranty period.

A Certificate of Substantial Completion and semi-final payment shall not be issued if the punch list items require over 30 calendar days to complete. In the event the Work is not completed after 30 calendar days following the date of Substantial Completion, the Owner may begin using retention funds to complete the Work. The Owner reserves the right to deduct all costs relative to such Work from any amount due the Contractor under this Contract.

5.5 FINAL PAYMENT: Not more than 45 days after completion and formal acceptance of all Work, required hereunder, in accordance with 4.7. Final payment of the amount due the Contractor under this Contract will be made upon the presentation of a properly executed and duly certified voucher therefor, and, in addition, if requested, a release of all claims against the Owner arising under and by virtue of this Contract other than such claims, if any, in stated amounts as may be specifically excepted by the Contractor from the operation of the release. At Project completion and prior to final payment, the Architect/Engineer will be supplied with one (1) set of “As-Built Contract Drawings and Documents” by the Contractor. The final payment will not be made until after the submittal is made to the Architect/Engineer and approved by the Architect/Engineer.

5.5.1 The Final Application shall be accompanied by the following items, in addition to those called for elsewhere in the Contract Documents:

5.5.1.1 Letter from the Contractor indicating items on the Final Punch List have been completed, corrected, and accepted by the Architect/Engineer;

5.5.1.2 Consent of the Surety Company;

5.5.1.3 General Release from Contractor;

5.5.1.4 Affidavit of the Contractor that all Subcontractors, equipment and material suppliers have been paid in full;

5.5.2 Written certification from the Contractor to the Architect/Engineer and Owner that no asbestos containing materials or products were included in the project.
5.5.3 Written certification from the Contractor to the Architect/Engineer and Owner that only 95-5 solder was used on the potable water supply piping installation.

5.6 PROPERTY RIGHTS IN MATERIALS AND EQUIPMENT: The Contractor warrants and guarantees that title to all Work, materials, and equipment for which payment is requested, whether incorporated in the Project or not, will pass to the Owner upon the receipt of such payment by the Contractor, free and clear of all liens, claims, security interests, or encumbrances; and that no Work, materials, or equipment covered by an Application for Payment will have been acquired by the Contractor, or by any other person performing the Work at the site or furnishing materials and equipment subject to an agreement under which an interest therein or an encumbrance thereon is retained by the seller or otherwise imposed by the Contractor or such other person.

5.7 PAYMENTS WITHHELD

5.7.1 AUTHORITY AND GROUNDS FOR WITHHOLDING: The Architect/Engineer may decline to approve an Application for Payment and may withhold the Certificate for Payment in whole or in part, to the extent necessary and reasonable to protect the Owner. The Owner may also decline to approve any Application for Payment, for any reason listed below in paragraphs 5.7.1.1 through 5.7.1.12. Similarly, because of subsequently discovered evidence or subsequent inspections, the Architect/Engineer may nullify the whole or any part of any Certificates for Payment previously issued to such extent as may be necessary, in its opinion, to protect the Owner from loss because of:

5.7.1.1 Defective Work not remedied;
5.7.1.2 Third-party claims filed or reasonable evidence indicating probability of filing of such claims;
5.7.1.3 Failure of the Contractor to make payments properly to Subcontractors or for labor, materials, or equipment;
5.7.1.4 Reasonable doubt that the Work can be completed for the unpaid balance of the price;
5.7.1.5 Damage to Work of another Contractor;
5.7.1.6 Unauthorized deviations or breaches from the Contract Documents;
5.7.1.7 Reasonable indication that the Work will not be completed within the Contract Time;
5.7.1.8 Unsatisfactory prosecution of the Work by the Contractor;
5.7.1.9 Unsatisfactory cleanup;
5.7.1.10 Failure by the Contractor to furnish Contract submittals, including but not limited to, schedules, and certified payrolls, or required permits and notices.
5.7.1.11 As-Built drawings to be approved by the Architect/Engineer and accepted by the Owner monthly.
5.7.1.12 Failure to comply with the requirements of any section of the Contract Specifications or Drawings.
5.7.2 RELEASE OF FAILURE to provide and maintain monthly record documents including WITHHELD PAYMENTS: When the grounds enumerated in 5.7.1 are removed, payment shall be made for amounts withheld therefor.

5.8 PAYMENT TO SUBCONTRACTORS

5.8.1 The Contractor shall make payment to his Subcontractors in accordance with the Code of Virginia § 2.2-4354.

5.8.2 The Contractor shall pay within seven (7) days, each Subcontractor, upon receipt of payment from the Owner, out of the amount paid to the Contractor on account of such Subcontractor’s work, the amount to which said Subcontractor is entitled, reflecting the percentage of actually retained, if any, from payments to the Contractor on account of such Contractor’s work.

5.8.3 If payment is not made within seven (7) days, the Contractor must, in writing, notify the Subcontractor of his intention to withhold all or a part of the Subcontractor’s payment and the reason for non-payment.

5.8.4 The Contractor and his Subcontractors and their lower-tier Subcontractors must provide the Owner with their social security numbers. Proprietorships, partnerships, and corporations must provide federal employer identification numbers.

5.8.5 The Contractor shall pay interest to the Subcontractor on all amounts owed by the Contractor that remain unpaid after seven (7) days following receipt by the Contractor of payment from the Owner for work performed by the Subcontractor under the contract except for amounts withheld as allowed under the Code of Virginia § 2.2-4354. Unless otherwise provided under the terms of the Contract, interest shall accrue at the rate of one percent (1%) per month.

5.8.6 The Contractor shall, by an appropriate agreement with each Subcontractor, require each Subcontractor to make payments and interest requirements with respect to each lower-tier Subcontractor.

5.8.7 The Contractor’s obligation to pay an interest charge to a Subcontractor pursuant to the payment clause in this section shall not be construed to be an obligation of the Owner. A contract modification shall not be made for the purpose of providing reimbursement for the interest charge. A cost reimbursement claim shall not include any amount for reimbursement for the interest charge.

5.9 ADDITIONAL PROFESSIONAL SERVICES

5.9.1 If the Architect and/or Consulting Engineers are required to provide services including but not limited to visiting the site, review of shop drawings 75 days beyond Notice to Proceed, revising or generating additional contract documentation, etc., resulting from the General Contractor’s and/or Subcontractor’s mistakes, delay, schedule noncompliance, faulty workmanship or materials, the General Contractor shall pay the Architect, its employees and/or Consulting Engineers $150.00 per hour for their services. Written Notice shall be given to the Contractor prior to performing these services. Written acknowledgement of this work shall be forwarded to the Owner and Architect. Payment shall be made by the General Contractor via check within 30 days of receipt of the Architect's invoice.
PART 1 - GENERAL

1.1 GENERAL CONDITIONS
   A. Drawings and general provisions of Contract, including General Conditions and other Division 0 and Division 1 specification sections, apply to this section.

1.2 DEFINITIONS
   A. General Explanation: A substantial amount of specification language constitutes definitions for terms found in other Contract Documents, including drawings which must be recognized as diagrammatic in nature and not completely descriptive of requirements indicated thereon. Certain terms used in Contract Documents are defined generally in this article. Definitions and explanations of this section are not necessarily either complete or exclusive, but are general for the Work to the extent not stated more explicitly in another provision of Contract Documents.

   B. General Requirements: Drawings and general provisions and the requirements of Division 0 and Division 1 sections apply to the entire work of the Contract.

   C. Indicated: The term "Indicated" is a cross-reference to details, notes, or schedules on drawings, to other paragraphs or schedules in the specifications, and to similar means of recording requirements in the Contract Documents. Where terms such as "shown," "noted," "scheduled," and "specified" are used in lieu of "indicated," it is for the purpose of helping the reader locate and cross-reference. No limitation of location is intended except as specifically noted.

   D. Directed, Requested, etc.: Where not otherwise explained, terms such as "directed," "requested," "authorized," "selected," "approved," "required," "accepted," and "permitted" mean "directed by Architect/Engineer," "requested by Architect/Engineer," etc. However, no such implied means will be interpreted to extend Architect's/Engineer's responsibility into Contractor's area of construction supervision.

   E. Approve: Where used in conjunction with Architect's/Engineer's response to submittals, requests, applications, inquiries, reports, and claims by Contractor, the meaning of the term "approved" will be held to limitations of Architect's/Engineer's responsibilities and duties as specified in General Conditions. In no case will "approval" by Architect/Engineer be interpreted as a release of Contractor from their responsibilities to fulfill requirements of the Contract Documents.

   F. Project Site: The space available to the Contractor for performance of the Work, either exclusively or in conjunction with others performing other Work as part of the project. The extent of project site is shown on drawings as construction limits, and may or may not be identical with description of land upon which project is to be built.

   G. Provide: Except as otherwise defined in greater detail, the term "provide" means furnish and install, complete and ready for intended use, as applicable in each instance.

   H. Furnish: Except as otherwise defined in greater detail, the term "furnish" is used to mean supply and deliver to project site, ready for unpacking, assembly, installation, etc., as applicable in each instance. "Furnish" shall mean to be furnished by the Contractor unless specifically stated to be furnished by the Owner.

   I. Install: Except as otherwise defined in greater detail, the term "install" is used to describe operations at project site including unloading, unpacking, assembly, erection, placing,
ANCHORING, APPLYING, WORKING TO DIMENSION, FINISHING, CURING, PROTECTING, CLEANING, AND SIMILAR OPERATIONS, AS APPLICABLE IN EACH INSTANCE. UNLESS SPECIFICALLY STATED OTHERWISE, MATERIAL AND EQUIPMENT TO BE INSTALLED BY THE CONTRACTOR SHALL BE FURNISHED BY THE CONTRACTOR.

J. Installer: The entity, person, or firm engaged by the Contractor or its Subcontractor or Subcontractor for performance of a particular unit of Work at project site, including installation, erection, application, and similar required operations. Installers shall be expert in the operations they are engaged to perform.

K. Testing Laboratory: An independent entity engaged to perform specific inspections or tests of the Work, either at project site or elsewhere; and to report, and when required, to interpret results of those inspections or tests.

L. Including: Except as otherwise defined in greater detail, the term “including” means “including but not limited to.”

1.3 FORMAT AND SPECIFICATION EXPLANATIONS

A. Specification Production: None of these explanations will be interpreted to modify substance of requirements. Portions of these specifications have been produced by the Architect’s/Engineer’s standard methods of editing master specifications, and may contain minor deviations from traditional writing formats. Such deviations are a normal result of this production technique, and no other meaning will be implied or permitted.

B. Format Explanation: The format of principal portions of these specifications can be described as follows; although other portions may not fully comply and no particular significance will be attached to such compliance or non-compliance.

C. Sections and Divisions: For convenience, basic unit of specification text is a “section,” each unit of which is named and numbered. These are organized into related families of sections, and various families of sections are organized into “divisions,” which are recognized as the present industry-consensus on uniform organization and sequencing of specifications. The section title is not intended to limit meaning or content of section, nor to be fully descriptive of requirements specified therein, nor to be an integral part of text.

1. Each section of specifications has been subdivided into three (3) or less "parts" for uniformity and convenience. Part 1 – General; Part 2 – Products; and Part 3 - Execution. These do not limit the meaning of and are not an integral part of text which specifies requirements.

D. Underscoring: Used strictly to assist reader of specification text in scanning text for key words in content. No emphasis on or relative importance of text is intended where underscoring is used.

E. Imperative Language: Used generally in specifications. Except as otherwise indicated, requirements expressed imperatively are to be performed by Contractor. For clarity of reading at certain locations, contrasting subjective language is used to describe responsibilities which must be fulfilled indirectly by Contractor, or when so noted, by others.

F. Section Numbering: Used to facilitate cross-references in the Contract Documents. Sections are placed in the Project Manual in numeric sequence; however, numbering sequence is not complete, and listing of sections at beginning of Project Manual must be consulted to determine numbers and name of specification sections in the Contract Documents.

G. Page Numbering: Numbered independently for each section; recorded in the Table of Contents in the Project Manual. Section number is shown with page number at bottom of each page, to
H. Project Identification: Project name and number are recorded at top of each page of specifications to minimize possible misuse of specifications, or confusion with other project specifications.

I. Specification Content: Because of methods by which this project specification has been produced, certain general characteristics of content, and conventions in use of language are explained as follows:

J. Minimum Quality/Quantity: In every instance, quality level or quantity shown or specified is intended as a minimum for the Work to be performed or provided. Except as otherwise specifically indicated, actual work may either comply exactly with that minimum (within specified tolerances), or may exceed that minimum with reasonable limits. In complying with requirements, indicated numeric values are either minimums or maximums as noted or as appropriate for context of requirements. Refer instances of uncertainty to Architect/Engineer for decision before proceeding.

K. Specialists, Assignments: In certain instances, specification text requires (or at least implies) that specific work be assigned to specialists or expert entities, who must be engaged for performance of those units of work. These must be recognized as special requirements over which Contractor has no choice or option. These assignments must not be confused with (and are not intended to interfere with) normal application of regulations, union jurisdictions, and similar conventions. One (1) purpose of such assignments is to establish which party or entity involved in a specific unit of work is recognized as "expert" for indicated construction processes or operations. Nevertheless, final responsibility for fulfillment of the entire set of requirements remains with the Contractor.

L. Trades: Except as otherwise indicated, the use of titles such as "carpentry" in specification text, implies neither that the Work must be performed by an accredited or unionized tradesperson of corresponding generic name (such as "carpenter"), nor that specified requirements apply exclusively to work by a tradesperson of that corresponding generic name.

M. Abbreviations: The language of specifications and other Contract Documents is of the abbreviated type in certain instances, and implies works and meanings which will be appropriately interpreted. Actual work abbreviations of a self-explanatory nature have been included in texts. Specific abbreviations have been established, principally for lengthy technical terminology and primarily in conjunction with coordination of specification requirements with notations on drawings and in schedules. These are frequently defined in section at first instance of use. Trade association names and titles of general standards are frequently abbreviated. Singular words will be interpreted as plural and plural words will be interpreted as singular where applicable and where full context of the Contract Documents so indicates.

1.4 DRAWING SYMBOLS

General: Except as otherwise indicated, graphic symbols used on drawings are those symbols recognized in the construction industry for purposes indicated. Refer instances of uncertainty to Architect/Engineer for clarification before proceeding.

1.5 INDUSTRY STANDARDS

A. General Applicability of Standards: Applicable standards of the construction industry have same force and effect (and are made a part of Contract Documents by reference) as if copied directly into the Contract Documents, or as if published copies were bound herewith. No provisions of any referenced standard specification, manual, code, or instrumentation shall be effective to change the duties and responsibilities of the Owner, Contractor, or
Architect/Engineer or employees from those set forth in the Contract Documents, nor shall it be effective to assign to Owner, Architect/Engineer, or any of the Architect/Engineer's consultants, agents, or employees, any duty or authority to supervise or direct the furnishing or performance of the work or any duty or authority to undertake responsibility inconsistent with the provisions of the Contract.

B. Standards referenced directly in the Contract Documents or by governing regulations have precedence over non-referenced standards, which are recognized in industry for applicability to the Work.

C. Non-referenced standards recognized in the construction industry are hereby defined, except as otherwise limited in the Contract Documents, to have direct applicability to the work, and will be so enforced for performance of the Work.

D. Publications Dates: Except as otherwise indicated, where compliance with an industry standard is required, comply with standard in effect as of the date of Contract Documents.

E. Copies of Standards: Provide where needed for proper performance of the work; obtain directly from publication sources.

PART 2 - PRODUCTS (not applicable)

PART 3 - EXECUTION (not applicable)

END OF SECTION 010950
SECTION 011000

SUMMARY OF WORK

PART 1 - GENERAL

1.1 SCOPE OF WORK

It is the intent of these contract documents to cover providing all labor, materials, equipment, and services necessary for and reasonably incidental to the completion of:

CEDAR ROAD ELEMENTARY SCHOOL ADDITION

As prepared by: HBA Architecture & Interior Design, Inc.
One Columbus Ctr., Suite 1000
Virginia Beach, VA 23462-6797

Serving as Architect/Engineer under the contract documents.

1.2 WORK COVERED BY CONTRACT DOCUMENTS

The project includes the renovation and additions to the Cafeteria including: structural modifications, interior finishes, exterior masonry walls, windows, doors, light fixtures replacement with associated electrical modifications and mechanical system ductwork modifications.

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

1.3 USE OF PREMISES

A. General: Contractor shall have limited use of premises for construction operations as indicated on Drawings by the Contract limits.

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

1. Owner Occupancy: Allow for Owner occupancy of Project site and use by the public.

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

3. Schedule deliveries to minimize space and time requirements for storage of materials and equipment on-site.

4. Use of Existing Building/site: Repair damage caused by construction operations. Protect building and its occupants during construction period.

5. Ruts, in grass areas, created by construction equipment, are to be corrected in the following manner.

   a. If grass is still present in the rut, pry up the grass with a digging fork. If ruts are shallow, lift the turf so it's 1 to 2 inches above the surrounding grade. Give it time to see if it settles evenly with surrounding turf. If the rut settles unevenly, then correct by cutting sod and adding additional soil, as stated below.

   b. For ruts deeper than 4 inches, use an edger and slice the grass in the center of the rut and cut sod loose. Lift the sod and fold it up and back so it's resting on surrounding lawn. Loosen soil in the rut, adding more as needed to bring it 1 to 2 inches above the surrounding grade. Flip the turf back into place, water, and wait for it to settle. Take care not to scalp this higher section of lawn when you mow. One (1) month after, roll any high spots that remain so that lawn is flush and smooth.
c. If there is no grass present in the rut, loosen soil before adding more soil and seeding. Stick a digging fork into soil beside the rut at a 45-degree angle so the fork's tines are beneath the rut. Gently lever soil up by pushing down on the handle. Fill the rut with your soil mix, sow grass seed, and water.

6. Ruts, in planting areas, created by construction equipment, are to be corrected in the following manner.

a. If the rut is less than 2-inches deep, pry up the bed with a digging fork, lifting and loosening the dirt and mulch so it’s 1 to 2 inches above the surrounding grade. Give it time to see if it settles evenly with surrounding turf. If the rut settles unevenly, then correct by adding additional soil and mulching.

7. For ruts deeper than 4 inches, loosen soil before adding more soil. Stick a digging fork into soil beside the rut at a 45-degree angle so the fork's tines are beneath the rut. Gently lever soil up by pushing down on the handle. Fill the rut with your soil mix, mulch, and water.

8. Soil mix

a. To fill in lawn ruts and holes, blend planting soil with sand and/or compost. Usually blending equal parts of each material forms a mix that allows grass to root effectively through the mix into existing soil. Check with your local extension agent or garden center for specific soil recommendations for your area.

1.4 OWNER'S OCCUPANCY REQUIREMENTS

A. Owner Occupancy: Owner will occupy the premises during the entire construction period. Cooperate with Owner during construction operations to minimize conflicts and facilitate Owner usage. Perform the Work so as not to interfere with Owner's operations. Maintain existing exits, unless otherwise indicated.

B. Provide not less than 72 hours' notice to Owner of activities that will affect Owner's operations.

C. Once the authorized purchase order has been established, work may take place from 7AM-10PM, Monday thru Friday, until September 7, 2020.

D. If the work is not completed prior to September 8, 2020, work shall be scheduled before or after the following school hours: 7:35-2:04 pm. Work on the building interior may take place from 2:30PM-10PM, Monday thru Friday.

1.5 WORK RESTRICTIONS

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

B. No access into the building will be provided unless the Contractor agrees to compensate the school for the custodian's services on Saturdays and Sundays.

C. Existing Utility Interruptions: Do not interrupt utilities serving facilities occupied by Owner or others unless permitted under the following conditions and then only after arranging to provide temporary utility services according to requirements indicated.
1.6 MANUFACTURER’S DIRECTIONS

A. Apply, install, connect and erect manufactured items or materials according to the recommendations of the manufacturer when such recommendations are not in conflict with the Contract Documents.

1.7 “OR EQUAL” CLAUSE

A. Whenever a material or article required is specified or shown in the Plans using the name of the proprietary product or of a particular manufacturer or vendor, any material or article which will perform adequately the duties imposed by the general design will be considered equal and satisfactory providing the material or articles so proposed is of equal substance and function in the Architect's/Engineer’s opinion. It shall not be purchased or installed without written approval of the Architect/Engineer.

B. When more than one (1) material or product is specified by name, the Contractor may select any of the name brands for the use specified.

C. Any substitutions or changes in materials or methods shall be approved by the Owner's Representative before being used in this Work.

1.8 CONFLICTS BETWEEN SPECIFICATIONS AND DRAWINGS

A. Should any conflict be found in the Contract Documents, the Architect/Engineer shall interpret or construe the Contract Documents so as to secure the most substantial and complete performance of the Work, within the constraints of the order of precedence established by the General Conditions.

1.9 GOVERNING REGULATIONS/AUTHORITIES

A. General: The procedure followed by Architect/Engineer has been to contact governing authorities where necessary, to obtain information needed for the purpose of preparing Contract Documents, recognizing that such information may or may not be of significance in relation to the Contractor’s responsibilities for performing the Work. Contact governing authorities directly for necessary information and decisions having a bearing on performance of the Work.

1.10 SUBMITTALS

A. Permits, License 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.

1.11 COORDINATION AND MEETINGS

A. General: Prepare and distribute to each entity performing Work at the project site a written memorandum of instructions on required coordination activities, including required notices, reports, and attendance at meetings. Prepare similar memorandum for separate Contractors where interfacing of Work is required. Architect/Engineer will prepare minutes of meetings where Architect's/Engineer’s presence is required.

B. Preconstruction Conference:
1. Schedule a preconstruction conference before starting construction, at a time convenient to the Owner and the Architect/Engineer, within two (2) weeks prior to the start of the construction. Hold the conference at the Project site.

2. Attendees: Authorized representatives of the Owner, Architect/Engineer, the Contractor and his superintendent, major material suppliers, Mechanical Subcontractor, Electrical Subcontractor and Building Officials(s) having jurisdiction. All Participants at the conference shall be familiar with the Project and authorized to conclude matters relating to the Work.

3. Agenda: Discuss items of significance that could affect progress, including the following:
   a. Tentative construction schedule
   b. Critical work sequencing
   c. Designation of responsible personnel
   d. Procedures for processing field decisions and Change Orders
   e. Procedures for processing Applications for Payment
   f. Distribution of Contract Documents
   g. Submittal of Shop Drawings, Product Data, and Samples
   h. Preparation of record documents
   i. Preparation and maintenance of “As-Built” record drawings
   j. Use of the premises
   k. Parking availability
   l. Storage areas
   m. Equipment deliveries and priorities
   n. Safety procedures
   o. First Aid
   p. Security
   q. Housekeeping
   r. Working hours
   s. Smoking policy
   t. Emergency contact personnel and phone numbers
   u. Sexual offender policy. Refer to Division 1 General Requirements

C. Progress meetings

1. Conduct progress meetings twice a month, at the Project Site, at the Architect’s/Engineer’s Discretion with a date coordinated with the preparation of payment request. Request representatives (at each meeting) of every entity currently involved in coordination or planning. Contractor shall conduct progress meeting. Minutes will be prepared by the Architect/Engineer and distributed to everyone in attendance and to others affected by decisions or actions resulting from each meeting, including the Owner. Progress meetings and other construction meetings involving the Contractor, the Architect/Engineer and Owner may be audio recorded at the Owner’s option without further notice.

2. Agenda: Review and correct or approve minutes of the previous progress meeting. Review other items of significance that could affect progress. Include topics for discussion as appropriate to the status of the Project.
   a. Contractor’s Construction Schedule: Refer to requirements of General Conditions.
   b. Review the present and future needs of each entity present, including the following:
      1) Interface requirements.
      2) Time.
      3) Sequences/phasing plan(s).
      4) Status of submittals.
      5) Deliveries.
      6) Access.
7) Hours of work.
8) Hazards and risks.
9) Housekeeping.
10) Quality and work standards.

c. Request for Information.
d. Change Orders.
e. Review “As Built” record drawings for monthly preparation and maintenance. Architect/Engineer to approve monthly prior to approval of request for payment. Documentation must be acceptable to the Owner or its authorized representative.
f. Documentation of information for payment request.

D. Schedule Updating: Revise the construction schedule after the progress meeting where revisions to the schedule have been made or recognized. Issue the revised schedule with every pay request submitted.

1.12 COMPLIANCE WITH CODES AND REGULATIONS

A. Contractor shall comply with all recognized codes and regulations governing construction, safety precautions, and other requirements. In case of conflict, the Virginia Uniform Statewide Building Code and Virginia Fire Safety Regulations shall govern. Comply with all OSHA and Accessibility and ADA requirements.

1.13 COMPLIANCE WITH INDUSTRY STANDARDS

A. Where compliance with two (2) or more industry standards or sets of requirements is specified, and overlapping of those different standards or requirements establishes different or conflicting minimums or levels of quality, the most stringent requirement shall be provided. The most stringent shall be interpreted or construed as being that to secure the most substantial and complete performance of the work as determined by the Architect/Engineer.

PART 2 - PRODUCTS (Not applicable)

PART 3 - EXECUTION (Not applicable)

END OF SECTION 011000
SECTION 012600

CONTRACT MODIFICATION PROCEDURES

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

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

1.3 MINOR CHANGES IN THE WORK

A. Architect/Engineer will issue supplemental instructions authorizing Minor Changes in the Work, not involving adjustment to the Contract Sum or the Contract Time, on AIA Document G710, "Architect's Supplemental Instructions."

1.4 PROPOSAL REQUESTS

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

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

2. Within 14 days after receipt of Proposal Request, submit a quotation estimating cost adjustments to the Contract Sum and the Contract Time necessary to execute the change.

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

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

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

   d. Include an updated Contractor's Construction Schedule that indicates the effect of the change, including, but not limited to, changes in activity duration, start and finish times, and activity relationship. Use available total float before requesting an extension of the Contract Time.
B. Contractor-Initiated Proposals: If latent or unforeseen conditions require modifications to the Contract, Contractor may propose changes by submitting a request for a change to the Architect/Engineer.

1. Include a statement outlining reasons for the change and the effect of the change on the Work. Provide a complete description of the proposed change. Indicate the effect of the proposed change on the Contract Sum and the Contract Time.
2. Include a list of quantities of products required or eliminated and unit costs, with total amount of purchases and credits to be made. If requested, furnish survey data to substantiate quantities.
3. Indicate applicable taxes, delivery charges, equipment rental, and amounts of trade discounts.
4. Include costs of labor and supervision directly attributable to the change.
5. Include an updated Contractor's Construction Schedule that indicates the effect of the change, including, but not limited to, changes in activity duration, start and finish times, and activity relationship. Use available total float before requesting an extension of the Contract Time.
6. Comply with requirements in Division 01 Section "Product Requirements" if the proposed change requires substitution of one (1) product or system for product or system specified.


1.5 CHANGE ORDER PROCEDURES


1.6 CONSTRUCTION CHANGE DIRECTIVE


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

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

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

PART 2 - PRODUCTS (Not applicable)

PART 3 - EXECUTION (Not applicable)

END OF SECTION 012600
SECTION 012900

PAYMENT PROCEDURES

PART 1 - GENERAL

I.1 RELATED DOCUMENTS

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

I.2 SUMMARY

A. This Section specifies administrative and procedural requirements governing the Contractor's Applications for Payment.

I.3 SCHEDULE OF VALUES

A. Contractor must coordinate preparation of the Schedule of Values with preparation of the Contractor's Construction Schedule.

B. Each Subcontractor shall coordinate preparation of this Schedule of Values for its part of the Work with preparation of the General Contractors' Construction Schedule and Schedule of Values.

C. Correlate line items in the Schedule of Values with other required administrative schedules and forms, including:
   1. Contractor's construction schedule.
   2. Application for Payment form.
   3. List of Subcontractors.

D. Submit the Schedule of Values to the Architect/Engineer at the earliest feasible date, but in no case later than seven (7) days before the date scheduled for submittal of the initial Application for Payment.

E. Format and Content: The project Schedule of Values shall include, but is not limited to, the following line items. The schedule shall be separated each school. However, the General Conditions can be defined by the project, and not by each individual school. Provide separate lines for labor and material values for items with an asterisk before them:

1. Division 1
   a. General Conditions.
   b. Superintendent.
   c. Bond.
   d. Insurances.
   e. Utilities/Equipment and Temporary Facilities.
   f. Each technical specification section.
   g. Base Bid.
   h. Each Additive Alternate Bid.
   i. The Base Bid, and each selected Additive Alternate Bid shall equal the total contract sum.

* Provide separate line for materials and labor
F. Identification: Include the following Project identification on the Schedule of Values:
   1. Project name and location
   2. Name of the Architect/Engineer
   3. Project number
   4. Contractor's name and address
   5. Date of submittal

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

H. Schedule Updating: Update and resubmit the Schedule of Values when Change Orders or Construction Change Directives result in a change in the Contract Sum.

I.4 Application for Payment

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

B. The initial Application for Payment, the Application for Payment at time of Substantial Completion, and the final Application for Payment involve additional requirements.

C. Payment Application Times: Each Application for Payment shall be submitted by the first day of each month. The period of construction Work covered by each Application for Payment is the period from the first to the last day of each month for the duration of the construction period.

D. Payment Application Forms: Use AIA Document G 702 and Continuation Sheets G 703 as the form for Application for Payment.

E. Application Preparation: Complete every entry on the form, including notarization and execution by person authorized to sign legal documents on behalf of the Owner. Incomplete applications will be returned without action.

F. Entries shall match data on the Schedule of Values and Contractor's Construction Schedule. Use updated schedules if revisions have been made.

G. Include amounts of processed Change Orders and Construction Change Directives issued prior to the last day of the construction period covered by the application.

H. Transmittal: Submit four (4) executed copies of each Application for Payment to the Architect/Engineer by means ensuring receipt within 24 hours; one (1) copy shall be complete, including waivers of lien and similar attachments.
   a. Transmit each copy with a transmittal form listing attachment, and recording appropriate information related to the application in a manner acceptable to the Architect/Engineer.

I. Waiver Delays: Submit each Application for Payment with the Contractor's waiver of mechanics lien for the period of construction covered by the application.

J. Submit final Application for Payment with or proceeded by final waivers from every entity involved with performance of Work covered by the application who could lawfully be entitled to a lien.

K. Waiver Forms: Submit waivers of lien on forms, and executed in a manner, acceptable to Owner.

L. Initial Application for Payment: Administrative actions and submittals that must precede submittal of the first Application for Payment include the following:
   1. List of Subcontractors.
   2. List of principal suppliers and fabricators.
   3. Schedule of Values.
   4. Contractor's Construction Schedule (preliminary if not final).
   5. Copies of building permits

M. Application for Payment at Substantial Completion: Following issuance of the Certificate of
Substantial Completion, submit an Application for Payment. This application shall reflect any Certificates of Partial Substantial Completion issued previously for Owner occupancy of designated portions of the Work.

1. Administrative actions and submittals that shall **precede** this application include:
   
   a. Occupancy permits and similar approvals.
   b. Final cleaning.
   c. Application for reduction of retainage, and consent of surety.
   d. Advice on shifting insurance coverage.
   e. List of incomplete Work recognized as exceptions to Architect/Engineer’s Certificate of Substantial Completion.
   f. All warranties and guarantees.

N. Final Payment Application: Administrative actions and submittals which must precede or coincide with submittal of the final payment Application for Payment include the following:

1. Completion of Project closeout requirements.
2. Completion of items specified for completion after Substantial Completion.
3. Assurance that unsettled claims will be settled.
4. Assurance that Work not complete and accepted will be completed without undue delay.
5. Transmittal of required Project construction records to Owner.
6. Proof that taxes, fees, and similar obligations have been paid.
7. Removal of temporary facilities and services.
8. Removal of surplus materials, rubbish, and similar elements.

PART 2 - PRODUCTS (Not applicable)

PART 3 - EXECUTION (Not applicable)

END OF SECTION 012900
SECTION 013300

SUBMITTALS

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

A. This Section specifies administrative and procedural requirements for submittals required for performance of the Work, including:

1. Submittal Schedule
2. Contractor’s Construction Schedule
3. Shop Drawings
4. Product Data
5. Samples
6. Schedule of Values
7. Architects Action.

1.3 Administrative Submittals: Refer to other Division-1 Sections and other Contract Documents for requirements for administrative submittals.

1.4 SUBMITTAL SCHEDULE

A. The Contractor shall prepare a complete schedule of submittals. Submit the schedule within ten (10) days of the date required for establishment of the Contractor’s construction schedule.

1. Coordinate submittal schedule with the list of subcontracts, schedule of values, and the list of products as well as the Contractor’s construction schedule.

2. Prepare the schedule in Specification Division order using the schedule shown at the end of this section as a template. Provide the following information for each submittal:

   a. Submittal reference number for each item.
   b. Review Status.
   c. Name of Subcontractor.
   d. Description of the part of the Work covered.

3. Scheduled date for resubmittal.

1.5 SUBMITTAL PROCEDURES

A. Coordination: Coordinate preparation and processing of submittals with performance of construction activities. Transmit each submittal sufficiently in advance of performance of related construction activities to avoid delay.
B. The Architect/Engineer reserves the right to withhold action on a submittal requiring coordination with other submittals until related submittals are received.

C. Submittal Processing: Allow sufficient review time so that installation will not be delayed as a result of the time required to process submittals, including time for resubmittals.

D. Provide submittals in PDF Format and transmit digital data through the Architect’s NEWFORMA project communications platform.

E. All submittals shall be submitted within ten (10) days of the notice to proceed. Completed reviews will be returned to the contractor within five (5) days of receipt of the submittals. If possible, review will be done more quickly. Allow additional time if processing must be delayed to permit coordination with subsequent submittals. The Architect/Engineer will promptly advise the Contractor when a submittal being processed must be delayed for coordination. No extension of Contract Time will be authorized because of failure to transmit submittals to the Architect/Engineer sufficiently in advance of the Work to permit processing.

F. Submittal Preparation: Place a permanent label, title block, or cover sheet on each submittal for identification. Indicate the name of the entity that prepared each submittal.

   1. Provide a space approximately 4” x 5” on the label, title block, or cover sheet on Submittal to record the Architect's/Engineer’s review and approval markings and the action taken. Include the following information on the label, title block, or cover sheet, for processing and recording action taken:

      a. Project name and date
      b. Name and address of Contractor and Supplier
      c. Number and title of appropriate Specification Section
      d. Drawing number and detail references, as appropriate

G. Submittal Transmittal: Package each submittal appropriately for transmittal and handling. Transmit each submittal from Contractor to Architect/Engineer using a transmittal form. Submittals received from sources other than the Contractor will be returned without action.

   1. On the transmittal, record relevant information and requests for data including submittal number and description (Note: Description should include whether it is product data or a shop drawing and what material it relates to, i.e. paint, roofing, sheet metal, etc.). On the form, or separate sheet, record deviations from Contract Document requirements, including minor variations and limitations. Include Contractor's certification that information complies with Contract Document requirements. If submittal comes without this certification, it will be returned without review.

H. Transmittal Form: Use AIA Document G810 or equal.

1.6 CONTRACTOR'S CONSTRUCTION SCHEDULE

A. Submission at time of Bid: Prepare a simple horizontal bar-chart type Contractor's construction schedule. Submit before the preconstruction conference.

   1. Provide a separate time bar for each significant construction activity. Provide continuous vertical line to identify the first working day of each week.
   2. Prepare the schedule on a sheet, of sufficient width to show data for the entire construction period.
   3. Show each activity in proper sequence, and highlight critical path items.
   4. Plan for completion in advance of the date established for Substantial Completion. Indicate
Substantial Completion on the schedule to allow time for the Architect's/Engineer's procedures necessary for certification of Substantial Completion.

B. Schedule Updating: Revise the schedule after the progress meeting or at times where revisions have been recognized or made. Issue the updated schedule concurrently with report of each meeting or when submitting a Request for Payment.

I.7 SHOP DRAWINGS

A. Submit newly prepared information, drawn to accurate scale. Highlight, encircle, or otherwise indicate deviations from the Contract Documents. Do not reproduce Contract Documents or copy standard information as the basis of Shop Drawings. Standard information prepared without specific reference to the Project is not considered Shop Drawings.

B. Shop Drawings include fabrication and installation drawings, schedules, and similar drawings. Include the following information:
   1. Dimensions
   2. Identification of products and materials included
   3. Compliance with specified standards
   4. Notation of coordination requirements
   5. Notation of dimensions established by field measurement

C. Submittals: Submit one electronic copy of Shop Drawings through the Architect’s NEWFORMA project communications platform for the Architect’s review. The Architect will return one electronic copy marked with action taken and corrections or modifications required. Submit concurrent copy to the Owner as required by the General Conditions.

D. See Section 017700, "Closeout Procedures" for additional information on Record Document requirements.

E. Do not use Shop Drawings for construction unless they have been reviewed and approved by the Architect/Engineer. All submittals shall be processed electronically.

I.8 PRODUCT DATA

A. Collect Product Data into a single submittal for each element of construction or system. Product Data includes printed information such as manufacturer's installation instructions, catalog cuts, standard color charts, etc. Where Product Data must be specially prepared because standard printed data is not suitable for use, submit as "Shop Drawings".

B. Mark each copy to show applicable choices and options. Where printed Product Data includes information on several products, some of which are not required, mark copies to indicate the applicable information. Include the following information:
   1. Submittal number
   2. Specification division
   3. Manufacturer's printed recommendations
   4. Compliance with recognized trade association standards
   5. Compliance with recognized testing agency standards
   6. Application of testing agency labels and seals
   7. Notation of dimensions verified by field measurement

C. Do not submit Product Data until compliance with requirements of the contract Documents has been confirmed. Stamp and sign data after reviewing it for compliance to indicate that such a review has been made and that the data does indeed comply with the specified requirements.

D. Submittals: Submit one electronic copy of Product Data through the Architect’s NEWFORMA project communications platform for the Architect's review. The Architect will return one electronic
copy marked with action taken and corrections or modifications required. Submit concurrent copy to the Owner as required by the General Conditions.

E. Distribution: Furnish copies of approved submittal to installers, Subcontractors, suppliers, manufacturers, fabricators, and others required for performance of construction activities. Show distribution on transmittal forms. Do not proceed with installation until an applicable copy of Product Data is in the installer's possession. Do not permit use of unmarked copies of Product Data in connection with construction.

1.9 SAMPLES

A. Electronic copies of color and finish samples will not be reviewed by the Architect. Deliver 4 sets of samples to the Architect. Concurrent with delivery of samples to the Architect, submit a transmittal with photographs of the samples and submit in PDF format through the Architect's NEWFORMA project communications platform. The Architect will return one sample to the Contractor marked with action taken and corrections or modifications required. Submit concurrent copy to the Owner as required by the General Conditions.

B. Submit full-size, fully fabricated Samples cured and finished as specified and physically identical with the material or product proposed. Samples include partial sections of manufactured or fabricated components, cuts or containers of materials, color range sets, and swatches showing color, texture, and pattern. Mount, display, or package Samples in the manner specified to facilitate review of qualities indicated. Prepare Samples to match the Architect's/Engineer's Sample. Include the following:

1. Generic description of the Sample
2. Product name or name of manufacturer
3. Compliance with recognized standards

C. Submit Samples for review of kind, color, pattern, and texture, for a final check of these characteristics with other elements, and for a comparison of these characteristics between the final submittal and the actual component as delivered and installed. Refer to other Specification Sections for requirements for Samples that illustrate workmanship, fabrication techniques, details of assembly, connections, operation, and similar construction characteristics.

D. Submittals: Except for Samples illustrating assembly details, workmanship, fabrication techniques, connections, submit four (4) sets; one (1) will be retained marked with the action taken. Maintain at least one (1) set of Samples, as returned, at the Project site, for quality comparisons throughout the course of construction.

E. Distribution of Samples: Prepare and distribute additional sets to Subcontractors, manufacturers, fabricators, suppliers, installers, and others as required for performance of the Work. Show distribution on transmittal forms.

1.10 SCHEDULE OF VALUES

A. Submit a schedule of values along with other product submittals consisting of a tabular breakdown of individual elements of the work in sufficient detail to be able to pay for individual items and see where the costs are. Include the project name and address, Contractor's name and address, Contract Purchase Order number, etc. and show the breakdown of what percentage of the total job cost is in each line item. This breakdown will be used for Applications for Payment. Include administrative items such as bond and supervision, insurance, etc. as applicable.

B. Application for payment must be based upon the approved schedule of values and submitted on AIA Application for Payment Forms G702 and G703, only. State of Virginia forms will not be accepted.

1.11 ARCHITECT'S ACTION

A. Except for submittals for record, information or similar purposes, where action and return is required
or requested, the Architect/Engineer will review each submittal, mark to indicate action taken, and return promptly. Compliance with specified characteristics is the Contractor's responsibility.

B. Action Stamp: The Architect/Engineer will stamp each submittal with a uniform, self-explanatory action stamp. The stamp will be appropriately marked, as follows, to indicate the action taken:

1. Final Unrestricted Release: Where submittals are marked "NO EXCEPTION TAKEN," that part of the Work covered by the submittal may proceed provided it complies with requirements of the Contract Documents; final acceptance will depend upon that compliance.

2. Final-But-Restricted Release: When submittals are marked "MAKE CORRECTIONS NOTED," that part of the Work covered by the submittal may proceed provided it complies with notations or corrections on the submittal and requirements of the Contract Documents; final acceptance will depend on that compliance.

3. Final-But-Restricted Release Requiring Resubmission: When submittals are marked "AMEND & RESUBMIT," that part of the Work covered by the submittal may proceed provided it complies with notations or corrections on the submittal and requirements of the Contract Documents; final acceptance will depend on that compliance. Revise or prepare new submittal in accordance with the notations; resubmit without delay.

4. Returned for Resubmittal: When submittal is marked "REJECTED," do not proceed with that part of the Work covered by the submittal, including purchasing, fabrication, delivery, or other activity. Revise or prepare a new submittal in accordance with the notations; resubmit without delay. Repeat if necessary to obtain a different action mark.
   a. Do not permit submittals marked "REJECTED" to be used at the Project site, or elsewhere where Work is in progress.

5. Other Action: Where a submittal is primarily for information or record purposes, special processing or other activity, the submittal will be returned, marked "RECEIPT ACKNOWLEDGED.

PART 2 - PRODUCTS (Not applicable)

PART 3 - EXECUTION (Not applicable)

END OF SECTION 013300
1.1 RELATED DOCUMENTS
A. Drawings and general provisions of Contract, including General Conditions and other Division-1 Specification Sections, apply to this Section.

1.2 SUMMARY
A. This Section specifies administrative and procedural requirements for Quality Control Services.
B. Certain structural components of the Project will be subject to the requirements for Special Inspections. Special inspections will be applicable to the following Materials and Activities:
   1. Structural Steel
   2. Earthwork
   3. Concrete

   The minimum scope for Special Inspections is outlined in the Schedule of Special Inspections at the end of this Section. Additional inspections and testing may be performed at the discretion of the Special Inspector.

C. Quality control services include inspections and tests and related actions including reports, performed by the Special Inspector or independent agencies, governing authorities, and the Contractor. They do not include Contract enforcement activities performed by the Architect.

D. The OWNER WILL procure and bear all costs of the Special Inspector or Special Inspectors, except as otherwise noted. The Special Inspector will be the manager of the special inspection process. He or she checks the certification of all other inspecting agents required by special inspection and coordinates their activities. The Special Inspector carries the exclusive responsibility for assuring that the inspections indicated are performed.

E. Special Inspector, inspection and testing services are required to verify compliance with requirements specified or indicated. These services in no way relieve the Contractor of responsibility to furnish materials and construction in full compliance with Contract Document requirements.

F. Requirements of this Section relate to customized fabrication and installation procedures, not production of standard products.
   1. Specific quality control requirements for individual construction activities are specified in the Sections that specify those activities. Those requirements, including inspections and tests, cover production of standard products as well as customized fabrication and installation procedures.

G. Inspections, test and related actions specified are not intended to limit the Contractor's quality control procedures that facilitate compliance with Contract Document requirements.

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

1.3 RESPONSIBILITIES
A. Contractor Responsibilities: The Contractor shall provide inspections, tests and similar quality control services, specified in individual Specification Sections and required by governing authorities, except where they are specifically indicated to be the Owner’s responsibility, or are provided by another identified entity; these services include those
specified to be performed by the Special Inspector or by an independent agency. Costs for these services shall be included in the Contract Sum.

1. The OWNER WILL engage and pay for the services of the Special Inspector or an independent agency, as specified, to perform inspections and tests.

2. Retesting: The Contractor is responsible for retesting where results of required inspections, tests or similar services prove unsatisfactory and do not indicate compliance with Contract Document requirements, regardless of whether the original test was the Contractor's responsibility.
   a. Cost of retesting construction revised or replaced by the Contractor is the Contractor's responsibility, where required tests were performed on original construction.
   b. Associated Services: The Contractor shall cooperate with agencies performing required inspections, tests and similar services and provide reasonable auxiliary services as requested. Notify the agency sufficiently in advance of operations to allow for completion of quality tests and for the assignment of personnel. Auxiliary services required include but are not limited to:
      c. Providing access to the Work and furnishing labor and facilities necessary to facilitate inspections and tests at the Project or other sources of material.
      d. Taking adequate quantities of representative samples of materials that require testing or assisting the agency in taking samples.
      e. Provide and maintain for the sole use of the Special Inspector or Special Inspectors adequate facilities for safe storage and proper curing of test specimens on the Project site.
      f. Providing the Special Inspector with a preliminary design mix proposed for use for materials mixes that require control by the Special Inspector.
      g. Security and protection of samples and test equipment at the Project site.
      h. The Contractor shall designate a representative (the superintendent or an assistant to the superintendent) who shall be the direct point-of-contact with the Special Inspector during each phase of the work. Discrepancies noted during the progress of the work will be reported to the Contractor's representative for corrective action. Communications given by the Special Inspector to the Contractor's representative shall be as binding as if given to the Contractor.

B. Owner Responsibilities: The OWNER WILL provide inspections, tests and similar quality control services specified to be performed by the Special Inspector or independent agencies and not by the Contractor, except where they are specifically indicated as the Contractor's responsibility or are provided by another identified entity. Costs for these services are not included in the Contract Sum.

1. The OWNER WILL employ and pay for the services of a Special Inspector or an independent agency, testing laboratory or other qualified firm to perform services which are the Owner's responsibility.
   a. Duties of the Special Inspector:
      1) The Special Inspector will keep records of all inspections and tests, which will be furnished to the Building Official, the Architect, and the Structural Engineer of Record. All discrepancies will be brought to the immediate attention of the Contractor for correction. If discrepancies are not corrected, the discrepancies will be brought to the attention of the Building Official and the Structural Engineer of Record.
      2) A final report documenting completion of all required special inspections and corrections of any discrepancies noted will be submitted to the Architect.
1) The Special Inspector shall not perform any duties of the Contractor.

c. Duties of the Testing Agency: The independent testing agency engaged to perform inspections, sampling and testing of materials and construction specified in individual Specification Sections shall cooperate with the Architect and Contractor in performance of its duties, and shall provide qualified personnel to perform required inspections and tests.

1) The agency shall notify the Architect and Contractor promptly of irregularities or deficiencies observed in the Work during performance of its services.

2) The agency is not authorized to release, revoke, alter or enlarge requirements of the Contract Documents, or approve or accept any portion of the Work.

3) The agency shall not perform any duties of the Contractor.

C. Coordination: The Contractor and each agency engaged to perform inspections, tests and similar services shall coordinate the sequence of activities to accommodate required services with a minimum of delay. In addition, the Contractor and each agency shall coordinate activities to avoid the necessity of removing and replacing construction to accommodate inspections and tests.

1. The Contractor is responsible for scheduling times for inspections, tests, taking samples and similar activities.

1.4 SUBMITTALS

A. The Special Inspector or the independent testing agency shall submit a certified written report of each inspection, test or similar service, to the Architect and the Owner, in duplicate, unless the Contractor is responsible for the service. If the Contractor is responsible for the service, submit a certified written report of each inspection, test or similar service through the Contractor, in duplicate.

1. Submit additional copies of each written report directly to the governing authority, when the authority so directs.

2. Report Data: Written reports of each inspection, test or similar service shall include, but not be limited to:
   a. Date of issue.
   b. Project title and number.
   c. Name, address and telephone number of testing agency.
   d. Dates and locations of samples and tests or inspections.
   e. Names of individuals making the inspection or test.
   f. Designation of the Work and test method.
   g. Identification of product and Specification Section.
   h. Complete inspection or test data.
   i. Test results and an interpretation of test results.
   j. Ambient conditions at the time of sample-taking and testing.
   k. Comments or professional opinion as to whether inspected or tested Work complies with Contract Document requirements.
   l. Name and signature of laboratory inspector.
   m. Recommendations on retesting.

1.5 QUALITY ASSURANCE

A. Qualification for Special Inspector: The Special Inspector shall be a Registered Professional Engineer, licensed in the Commonwealth of Virginia, experienced in performing special inspections and shall be approved by the Architect.
B. Qualification for Testing Agencies: Inspection and testing service agencies, including independent testing laboratories, shall comply with "Recommended Requirements for Independent Laboratory Qualification" by the American Council of Independent Laboratories, and shall specialize in the types of inspections and tests to be performed.
   1. Each independent inspection and testing agency engaged on the Project shall be authorized by authorities having jurisdiction to operate in the State in which the Project is located.
   2. Each Independent Inspection and Testing Agency engaged on the Project shall demonstrate that it has the experience and capability to conduct the required field and laboratory testing without delaying the progress of the work.

PART 2 – PRODUCTS (NOT APPLICABLE)

PART 3 – EXECUTION

3.1 REPAIR AND PROTECTION
   A. General: Upon completion of inspection, testing, sample-taking and similar services the Contractor shall, repair damaged construction and restore substrates and finishes to eliminate deficiencies, including deficiencies in visual qualities of exposed finishes. Comply with Contract Document requirements for "Cutting and Patching."
   B. The Contractor shall protect construction exposed by or for quality control service activities, and protect repaired construction.
   C. Repair and protection is the Contractor’s responsibility, regardless of the assignment of responsibility for inspection, testing or similar services.

END OF SECTION 01 45 23
Appendix A

HAMPTON ROADS AREA STATEMENT OF SPECIAL INSPECTIONS

<table>
<thead>
<tr>
<th>PROJECT</th>
<th>PERMIT APPLICANT</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cedar Road Elementary School</td>
<td></td>
</tr>
<tr>
<td>Dining Area</td>
<td></td>
</tr>
<tr>
<td>Chesapeake, VA</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>PRIMARY RDP OF RECORD</th>
<th>STRUCTURAL ENGINEER OF RECORD</th>
</tr>
</thead>
<tbody>
<tr>
<td>HBA Architecture &amp; Interior Design</td>
<td>SPEIGHT MARSHALL &amp; FRANCIS, PC</td>
</tr>
<tr>
<td>One Columbus Street, Suite 1000</td>
<td>1228 Perimeter Parkway, Suite 201</td>
</tr>
<tr>
<td>Virginia Beach, VA 23462</td>
<td>Virginia Beach VA 23454</td>
</tr>
</tbody>
</table>

This Statement of Special Inspections is submitted as a condition for permit issuance in accordance with the International Building Code (IBC) as stated in the Virginia Uniform Statewide Building Code (USBC). It includes a Schedule of Special Inspections applicable to this project as well as the name of the Special Inspector, and the identity of other testing laboratories or agencies intended to be retained for conducting these inspections or tests.

The Special Inspector shall keep records of all inspections, and shall furnish inspection reports to the Building Official, appropriate Registered Design Professional(s) (RDP(s)), Owner and Contractor. All discrepancies shall be brought to the immediate attention of the Contractor for correction. If the discrepancies are not corrected, the discrepancies shall be brought to the attention of the Building Official and appropriate RDP(s). Interim reports shall be submitted to the Building Official, Owner, Contractor, and the appropriate RDP(s) according to the Hampton Roads Regional Special Inspection Guidelines and Procedures.

Jobsite safety is solely the responsibility of the contractor. Materials and activities to be inspected are not to include the contractor’s equipment and methods used to erect or install the materials listed. All fees/costs related to the performance of Special Inspections shall be the responsibility of the Owner. Additionally, the undersigned (RDP or SER) are only acknowledging that the items enumerated on the Schedule of Special Inspections are consistent with the required design elements, the applicable sections of the Uniform Statewide Building Code, and their area of expertise.

REVIEW, AUTHORIZATION & ACCEPTANCE

| Permit Applicant (General Contractor): |
| Signature / date:                       |
| Printed Name:                           |

| Owner’s Authorization (If other than Applicant): |
| Signature / date:                           |
| Printed Name:                                |

| Primary RDP of Record: (Review and Acceptance of Schedule) |
| Signature / date:                  |
| Printed Name: Michael Ross, AIA     |

| SER of Record: (Review and Acceptance of Schedule) |
| Signature / date: 3/18/2020                  |
| Printed Name: Daniel W. Speight, P.E.       |

| Building Official’s Acceptance: |
| Signature / date:               |
| Printed Name:                   |

(Revision date 9/4/18)
# SCHEDULE OF SPECIAL INSPECTIONS

<table>
<thead>
<tr>
<th>MATERIAL/ACTIVITY</th>
<th>TYPE OF INSPECTION</th>
<th>APPLICABLE TO THIS PROJECT</th>
<th>EXTENT/REFERENCE</th>
<th>AGENT</th>
<th>COMPLETED</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>GENERAL</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Pre-construction conference</td>
<td>Meeting with parties listed in Section 6 of the HRRSIGP to discuss Special Inspection procedures</td>
<td>Y</td>
<td>Scheduled by SI with the Contractor prior to commencement of work; VCC 113.4</td>
<td>1 &amp; 2</td>
<td></td>
</tr>
<tr>
<td><strong>EARTHWORK</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Site preparation (structure)</td>
<td>Field testing and inspection</td>
<td>P</td>
<td>Field review, VCC 1705.6</td>
<td>2</td>
<td></td>
</tr>
<tr>
<td>Fill material (structure)</td>
<td>Review submittals, field testing and inspection</td>
<td>P</td>
<td>Field review, VCC 1705.6</td>
<td>2</td>
<td></td>
</tr>
<tr>
<td>Fill compaction (structure)</td>
<td>In-place density tests, lift thickness</td>
<td>C</td>
<td>Field review, VCC 1705.6</td>
<td>2</td>
<td></td>
</tr>
<tr>
<td>Excavation</td>
<td>Field inspection and verification of proper depth</td>
<td>P</td>
<td>Field review, VCC 1705.6</td>
<td>2</td>
<td></td>
</tr>
<tr>
<td>Foundation sub-grade (structure)</td>
<td>Field inspection of foundation subgrade prior to placement of concrete</td>
<td>P</td>
<td>Field review, VCC 1705.6</td>
<td>2</td>
<td></td>
</tr>
<tr>
<td><strong>DEEP FOUNDATION ELEMENTS</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Materials</td>
<td>Review product, sizes, and lengths</td>
<td>N</td>
<td>Submittal &amp; Field Review; VCC 1705.7, 1705.8, 1705.9</td>
<td>NA</td>
<td></td>
</tr>
<tr>
<td>Test piles</td>
<td>Monitor driving of test piles</td>
<td>N</td>
<td>Field Review; VCC 1705.8, 1704.9 or 1704.10</td>
<td>NA</td>
<td></td>
</tr>
<tr>
<td>Installation</td>
<td>Monitor drilling, placement, plumbness, driving of piles, including recording blows per foot, cut off and tip elevation</td>
<td>N</td>
<td>Field Review; VCC 1705.2, 1705.3, 1705.7</td>
<td>NA</td>
<td></td>
</tr>
<tr>
<td>Load test</td>
<td>Monitor pile load test</td>
<td>N</td>
<td>Field Review; VCC 1705.8, 1704.9 or 1704.10</td>
<td>NA</td>
<td></td>
</tr>
<tr>
<td><strong>CONCRETE</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Materials</td>
<td>Review product supplied versus certificates of compliance and mix design</td>
<td>P</td>
<td>Submittal &amp; Field Review; ACI 318: Ch. 19, 26.4.3, 26.4.4; VCC 1705.3, 1903.2, 1908.2, 1903.4</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>Installation of reinforcing steel, including prestress tendons and anchor bolts as well as welding</td>
<td>Field inspection of placement</td>
<td>C</td>
<td>Submittal &amp; Field Review; ACI 318: Ch. 20, 25.2, 25.3, 26.5.1-26.5.3; AWS D1.4; VCC 1705.3, 1901.3, 1908.4</td>
<td>1</td>
<td></td>
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<tr>
<td>Formwork installation</td>
<td>Field inspection</td>
<td>P</td>
<td>Field Review; ACI 318; VCC 1705.3</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>Concreting operations &amp; placement</td>
<td>Field inspection of placement/sampling</td>
<td>C</td>
<td>Field Review; ACI 318: 26.5.2, 26.12.3; ASTM C 172, C 31; VCC 1705.3, 1908.6, 1908.7, 1908.8, 1908.10</td>
<td>2</td>
<td></td>
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<tr>
<td>Concrete curing</td>
<td>Field inspection of curing process</td>
<td>P</td>
<td>Field Review, ACI 318: 26.5.3, 26.5.4; VCC 1705.3, 1908.9</td>
<td>1 &amp; 2</td>
<td></td>
</tr>
<tr>
<td>Concrete strength</td>
<td>Evaluation of concrete strength</td>
<td>P</td>
<td>Laboratory Testing; ACI 318: 26.12; VCC 1705.3</td>
<td>1 &amp; 2</td>
<td></td>
</tr>
<tr>
<td>Application of forces for prestressed concrete</td>
<td>Field inspection</td>
<td>N</td>
<td>Field Review; ACI 318: 26.10.2(c); VCC 1705.3</td>
<td>NA</td>
<td></td>
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</tbody>
</table>

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<table>
<thead>
<tr>
<th>MATERIAL/ACTIVITY</th>
<th>TYPE OF INSPECTION</th>
<th>APPLICABLE TO THIS PROJECT</th>
</tr>
</thead>
<tbody>
<tr>
<td>Grouting of prestress tendons</td>
<td>Field inspection</td>
<td>N Field Review; ACI 318: 19.4.1, 20.6.4, 26.13.3.2(b); VCC 1705.3</td>
</tr>
<tr>
<td>PRECAST CONCRETE</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Verify fabrication/quality control procedures</td>
<td>In-plant inspection of fabrication/quality control procedures**</td>
<td>N Submittal or Field Review; VCC 1705.3</td>
</tr>
<tr>
<td>Erection and Installation</td>
<td>Review submittals and as-built assemblies; Field inspection of in-place precast</td>
<td>N Submittal &amp; Field Review; ACI 318; VCC Table 1705.3</td>
</tr>
<tr>
<td>MASONRY (Level B)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Materials</td>
<td>Review of products supplied versus certificate of compliance and material submitted</td>
<td>P Submittal &amp; Field Review; ACI 530/ASCE 5; ACI 530.1/ASCE 6; VCC 1705.4, 1709</td>
</tr>
<tr>
<td>Strength</td>
<td>Testing/review of strength</td>
<td>P Submittal &amp; Field Reports; ACI 530/ASCE 5; ACI 530.1/ASCE 6; VCC 1705.4, 2105</td>
</tr>
<tr>
<td>Mortar and grout</td>
<td>Inspection of proportioning, mixing. Placement of mortar only.</td>
<td>P Field Review; VCC 1705.4; ACI 530/ASCE 5; ACI 530.1/ASCE 6</td>
</tr>
<tr>
<td>Grout placement, including prestressing grout</td>
<td>Verification to ensure compliance</td>
<td>C Field Review; VCC 1705.4; ACI 530/ASCE 5; ACI 530.1/ASCE 6</td>
</tr>
<tr>
<td>Grout Space</td>
<td>Verification to ensure compliance</td>
<td>P Field Review; VCC 1705.4; ACI 530/ASCE 5; ACI 530.1/ASCE 6; TMS 602</td>
</tr>
<tr>
<td>Mortar, grout and prism specimens</td>
<td>Observe Preparation</td>
<td>P Field Review; VCC 1705.4; ACI 530.1; ASCE 6</td>
</tr>
<tr>
<td>Reinforcement, prestressing, tendons, and connections</td>
<td>Inspect condition, size, location and spacing</td>
<td>C Field Review; VCC 1705.4; ACI 530/ASCE 5; ACI 530.1/ASCE 6</td>
</tr>
<tr>
<td>Welding of reinforcing bars</td>
<td>Inspection and testing of welds</td>
<td>N Field Review; VCC 1705.4; ACI 530/ASCE 5; ACI 530.1/ASCE 6</td>
</tr>
<tr>
<td>Prestressing force</td>
<td>Verify application and measurement</td>
<td>N Field Review; VCC 1705.4; ACI 530/ASCE 5; ACI 530.1/ASCE 6</td>
</tr>
<tr>
<td>Protection</td>
<td>Inspect procedures for protection during cold and hot weather</td>
<td>P Field Review; VCC 1705.4; ACI 530/ASCE 5; ACI 530.1/ASCE 6</td>
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<tr>
<td>Anchorage</td>
<td>Inspection of anchorages</td>
<td>C Field Review; VCC 1705.4; ACI 530/ASCE 5; ACI 530.1/ASCE 6</td>
</tr>
<tr>
<td>Masonry installation</td>
<td>Inspection of placement of masonry and joints</td>
<td>P Field Review; VCC 1705.4; ACI 530/ASCE 5; ACI 530.1/ASCE 6</td>
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<tr>
<td>STRUCTURAL STEEL</td>
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</tr>
<tr>
<td>Verify fabrication/quality control procedures</td>
<td>In-plant inspection of fabrication/quality control procedures** or submit Certificate of Compliance</td>
<td>Y Submittal or Field Review; VCC 1704.2.5, 1704.2.5.1, 1705.2</td>
</tr>
<tr>
<td>Bolts, nuts, and washers-materials</td>
<td>Material identification markings Review of Certificate of Compliance</td>
<td>P Submittal &amp; Field Review; VCC 1705.2.1, 1706; ASTM; AISC 360, Section A3.3</td>
</tr>
<tr>
<td>Bolts, nuts, and washers-installation</td>
<td>Inspection of in-place high-strength bolts, snug-tight joints, pre-tensioned and bearing type, and slip critical connections</td>
<td>P Submittal &amp; Field Review; VCC 1705.2.1, 2204.2; AISC 360 Section M2.5</td>
</tr>
</tbody>
</table>

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<table>
<thead>
<tr>
<th>MATERIAL/ACTIVITY</th>
<th>TYPE OF INSPECTION</th>
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<th>EXTENT/REFERENCE</th>
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<th>COMPLETED</th>
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<tbody>
<tr>
<td>Structural steel-materials</td>
<td>Material identification markings and review of Certificate of Compliance</td>
<td>Y</td>
<td>Submittal &amp; Field Review; VCC 1705.2.1, 1706; ASTM A6, A568; AISC 360 Section A3.1</td>
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<tr>
<td>Structural steel details - installation</td>
<td>Inspection of member locations, structural details for bracing, connections, stiffening</td>
<td>P</td>
<td>Submittal &amp; Field Review; VCC 1705.2.1, 1705.2.2, AISC 360</td>
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<tr>
<td>Open-web steel joists and joist girders – installation</td>
<td>Inspection of end connections and bridging</td>
<td>N</td>
<td>Submittal &amp; Field Review; VCC 1705.2.3</td>
<td>NA</td>
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<tr>
<td>Weld filler materials and welder certification</td>
<td>Review of identification markings, certificate of compliance, and welder certification</td>
<td>Y</td>
<td>Submittal &amp; Field Review; ASTM; AISC 360 A3.5</td>
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<tr>
<td>Welds</td>
<td>Inspection and testing of welds</td>
<td>C</td>
<td>Field Review; VCC 1705.2, 2204.1; AWS D1.1, D1.3</td>
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<tr>
<td>Cold-formed metal deck - materials</td>
<td>Review of identification marking manufacturer’s certified test results</td>
<td>N</td>
<td>Submittal &amp; Field Review; VCC 1705.2.2; ASTM</td>
<td>NA</td>
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<tr>
<td>Cold-formed metal deck - installation</td>
<td>Review laps and welds</td>
<td>N</td>
<td>Submittal &amp; Field Review; IBC 1705.2.2, AWS D1.3</td>
<td>NA</td>
<td></td>
</tr>
<tr>
<td>Cold-formed light frame construction - welds</td>
<td>Review welding operation</td>
<td>N</td>
<td>Field Review; VCC 1705.11, 1705.11.2, 1705.11.3</td>
<td>NA</td>
<td></td>
</tr>
<tr>
<td>Cold form light frame construction wind resistance - screws</td>
<td>Review screw attachment bolting, anchoring hold downs, bracing, diaphragms, struts</td>
<td>N</td>
<td>Field Review; VCC 1705.11, 1705.11.2, 1705.11.3</td>
<td>NA</td>
<td></td>
</tr>
<tr>
<td>Cold-formed steel trusses spanning 60’ or greater</td>
<td>Inspection of temporary and permanent restraints/bracing</td>
<td>N</td>
<td>Submittal &amp; Field Review; VCC 1705.2.4</td>
<td>NA</td>
<td></td>
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<tr>
<td>WOOD</td>
<td>Verify fabrication/quality control procedures</td>
<td>In-plant inspection of fabrication/quality control procedures** or submit Certificate of Compliance</td>
<td>N</td>
<td>Submittal or Field Review; VCC 1704.2.5, 1704.2.5.1, 1705.5</td>
<td>NA</td>
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<tr>
<td>Metal plate connected wood /metal trusses spanning 60’ or more</td>
<td>Review approved submittal and installation of restraint/bracing</td>
<td>N</td>
<td>Submittal &amp; Field Review; VCC 1704.2.5, 1704.2.5.1, 1705.5, 1705.5.2</td>
<td>NA</td>
<td></td>
</tr>
<tr>
<td>Joist Hangers-Materials/Installation</td>
<td>Review manufacturer’s material and test standards</td>
<td>N</td>
<td>Field Review; ASTM D 1761</td>
<td>NA</td>
<td></td>
</tr>
<tr>
<td>High-Load Diaphragms-Installation</td>
<td>Review submittal and as-built assemblies; Inspection of sheathing, framing size, nail and staple diameter and length, number of fastener lines, and fastener spacing</td>
<td>N</td>
<td>Submittal &amp; Field Review; VCC 1705.5, 1705.5.1</td>
<td>NA</td>
<td></td>
</tr>
<tr>
<td>Wood Shear Walls - installation</td>
<td>Review nailing, bolting, anchoring, fastening, diaphragms, struts, braces, and hold downs when fasteners are ≤ 4” on-center</td>
<td>N</td>
<td>Field Review; VCC 1705.11.1</td>
<td>NA</td>
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<tr>
<td>MAIN WIND FORCE RESISTING SYSTEM</td>
<td>Wind requirements</td>
<td>Review of the system components and installation for wood construction, cold-formed steel light frame construction, components, and cladding</td>
<td>N</td>
<td>Submittal &amp; Field Review; VCC 1609.1.2, 1704.6.2, 1705.11, 1709</td>
<td>NA</td>
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<tr>
<td>SEISMIC FORCE RESISTING SYSTEM</td>
<td>Seismic requirements</td>
<td>Review of the designated seismic systems and seismic force resistance systems.</td>
<td>N</td>
<td>Submittal &amp; Field Review; VCC 1613, 1704.6.1, 1705.12, 1705.13; ASCE 7</td>
<td>NA</td>
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(Revision Date 9/4/18)
<table>
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<tr>
<th>MATERIAL/ACTIVITY</th>
<th>TYPE OF INSPECTION</th>
<th>APPLICABLE TO THIS PROJECT</th>
<th>Y/N/P/C</th>
<th>EXTENT/REFERENCE</th>
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<tr>
<td><strong>SMOKE CONTROL</strong></td>
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<tr>
<td>Special inspection of smoke control systems</td>
<td>Leakage testing and recording of device location, pressure difference testing, flow measurement and detection, and control verification</td>
<td>N</td>
<td>Field Review; VCC 1705.18, 1705.18.1, 1705.18.2</td>
<td>NA</td>
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<tr>
<td><strong>SPRAYED FIRE RESISTIVE MATERIAL, FIRE RESISTANT PENETRATIONS; JOINTS, MASTIC AND INTERMESCENT FIRE RESISTANT COATING</strong></td>
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<tr>
<td>Structural member surface conditions</td>
<td>Field review of surface conditions prior to application</td>
<td>N</td>
<td>AWCI 12-B; VCC 1705.14, 1705.14.1, 1705.14.2</td>
<td>NA</td>
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<td>Mastic &amp; Intumescent Fire Resistant Coating</td>
<td>Field review of application operations and thickness</td>
<td>N</td>
<td>AWCI 12-B; VCC 1705.15</td>
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<td><strong>EXTERIOR INSULATION AND FINISH SYSTEMS</strong></td>
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<tr>
<td>Application</td>
<td>Field review of application/installation</td>
<td>N</td>
<td>ASTM E2570, VCC 1705.16</td>
<td>NA</td>
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<td><strong>SPECIAL CASES</strong></td>
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<tr>
<td>Retaining Walls</td>
<td>Field review of installation of pre-manufactured structural components</td>
<td>N</td>
<td>Field Review; VCC 113.4, 1705.1.1</td>
<td>NA</td>
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<td>Sprinkler system hangers/supports</td>
<td>Field review of placement and anchorage</td>
<td>N</td>
<td>Field Review; VCC 903.3.1.1, 1705.1.1; NFPA 13: 9.2</td>
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<td>Alternative Materials &amp; Systems</td>
<td>As requested by Building Official, review system &amp; installation</td>
<td>N</td>
<td>VCC 113.4, 1705.1.1</td>
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**INPECTION AGENTS**

<table>
<thead>
<tr>
<th>FIRM</th>
<th>ADDRESS</th>
<th>TELEPHONE</th>
</tr>
</thead>
<tbody>
<tr>
<td>Speight, Marshall &amp; Francis, P.C.</td>
<td>1228 Perimeter Parkway, Suite 201, VA Beach, VA 23454</td>
<td>(757) 427-1020</td>
</tr>
</tbody>
</table>

Note: * The Qualifications of the Special Inspector and Testing Laboratories are subject to the Approval of the Building Official.
** Inspection of quality control procedures required only if fabricator is not regularly inspected by an independent inspection agency.
*** For construction projects in seismic regions, the Schedule of Special Inspections shall be expanded to include Architectural, Mechanical, and Electric components, as well as Storage Racks and Isolation Systems. Items in VCC Section 1705.12

(Revision Date 9/4/18)
PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

A. This Section specifies requirements for temporary services and facilities, including utilities, construction and support facilities, security, and protection.

B. Temporary construction and support facilities required include, but are not limited to:

1. Storage facilities for construction materials.
2. Sanitary facilities, including drinking water.
3. Waste disposal services.
4. Dust barrier separating the cafeteria from the construction area.

C. Power and water are available at the facility at no cost to the Contractor. However, the Contractor shall make all necessary connections and distribution to serve the project. The Contractor shall remove distribution and connection at the conclusion of the work.

D. Security and protection facilities required include, but are not limited to:

1. Temporary fire protection.
2. Barricades, warning signs, and lights.
3. Environmental protection.
4. Exhibit Protection.

1.3 QUALITY ASSURANCE

A. Regulations: Comply with industry standards and applicable laws and regulations of authorities having jurisdiction, including but not limited to;

1. Building Code requirements.
2. Health and safety regulations.
3. Police, Fire Department, and Rescue Squad rules.
4. Environmental protection regulations.


1.4 GUIDELINES

A. Refer to “Guidelines for Bid Conditions for Temporary Job Utilities and Services”, prepared jointly by AGC and ASC, for industry recommendations.

1.5 PROJECT CONDITIONS

A. Conditions of Use: Keep temporary services and facilities clean and neat in appearance. Operate in a safe and efficient manner. Take necessary fire prevention measures. Do not overload facilities or permit them to interfere with progress. Do not allow hazardous, dangerous, or unsanitary conditions,
or public nuisances to develop or persist on the site.

PART 2 - PRODUCTS

2.1 MATERIALS

A. General: Provide new materials. If acceptable to the Architect/Engineer, the Contractor may use undamaged, previously used materials in serviceable condition. Provide materials suitable for the use intended.

B. Drinking Water Facilities: Provide containerized tap-dispenser bottled-water type drinking water units, including paper cup supply.

C. Temporary Toilet Units: Provide self-contained single-occupant toilet units of the chemical, aerated recirculation, or combustion type, properly vented and fully enclosed with a glass fiber reinforced polyester shell or similar nonabsorbent material, and supply unit(s) with toilet tissue.

D. First Aid Supplies: Comply with governing regulations.

E. Fire Extinguishers: Provide hand-carried, portable, UL-rated, class "ABC" dry chemical extinguishers, or a combination of extinguishers of NFPA recommended classes for the exposures. Comply with NFPA 10 and 241 for classification, extinguishing agent, and size required by location and class of fire exposure.

F. Dust and separation barrier between the cafeteria from the construction area: the barrier must be in place prior to initiating the work and shall remain in place to separate the school from the construction area. The contractor shall provide a partition that will prevent dust from entering adjacent areas. The barrier shall also prevent students from being able to enter the construction area. Provide a submittal for review by CPS and the architect prior to installation.

2.2 EQUIPMENT

A. General: Provide new equipment. If acceptable to the Architect/Engineer, the Contractor may use undamaged, previously used equipment in serviceable condition. Provide equipment suitable for use intended.

PART 3 - EXECUTION

3.1 INSTALLATION

A. Use qualified personnel for installation of temporary facilities. Locate facilities where they will serve the Project adequately and result in minimum interference with performance of the Work. Relocate and modify facilities as required.

B. Provide each facility ready for use when needed to avoid delay. Maintain and modify as required. Do not remove until facilities are no longer needed.

C. Locate storage trailers, sanitary facilities, and other temporary support facilities for easy access, and where approved by the Owner.

D. Sanitary facilities include temporary toilets, wash facilities, and drinking water fixtures. Comply with regulations and health codes for the type, number, location, operation, and maintenance of fixtures and facilities. Install where facilities will best serve the Project's needs.

E. Provide toilet tissue, paper towels, paper cups, and similar disposable materials for each facility. Provide covered waste containers for used material.
F. Toilets: Install self-contained toilet units in a location approved by the Owner. Shield toilets to ensure privacy. Use of pit-type privies will not be permitted. Have toilets regularly serviced to keep them clean and in good condition.

G. Collection and Disposal of Waste and Demolition Debris: Collect waste from construction areas and elsewhere daily and remove construction debris from the site weekly or as soon as containers are nearly full. Comply with requirements of NFPA 241 for removal of combustible waste material and debris. Enforce requirements strictly. Do not hold materials more than seven (7) days during normal weather or three (3) days when the temperature is expected to rise above 80 deg F (27 deg C). Handle hazardous, dangerous, or unsanitary waste by containerizing properly. Dispose of material in a lawful manner.

3.2 SECURITY AND PROTECTION FACILITIES INSTALLATION


B. Barricades: Provide temporary barricades to keep people or vehicles from away from accessing work areas.

C. Security: Where materials and equipment must be stored, and are of value or attractive for theft, provide a secure lockup.

D. Environmental Protection: Provide protection, operate temporary facilities, and conduct construction in ways and by methods that comply with environmental regulations, and minimize the possibility that air, waterways and subsoil might be contaminated or polluted, or that other undesirable effects might result. Avoid use of tools and equipment that would produce harmful noise. Restrict use of noise making tools and equipment to hours that will minimize complaints from persons or firms near the site.

3.3 OPERATION, TERMINATION AND REMOVAL

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

B. Maintenance: Maintain facilities in good operating condition until removal.

C. Termination and Removal: Unless the Architect/Engineer requests that it be maintained longer, remove each temporary facility at Substantial Completion.

END OF SECTION 01500
SECTION 017300
EXECUTION REQUIREMENTS

PART 1 - GENERAL

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

1.2 SUMMARY
   A. Section includes general administrative and procedural requirements governing execution of the Work including, but not limited to, the following:
      1. Installation of the Work.
      2. Cutting and patching.
      3. Starting and adjusting.
      4. Protection of installed construction.

1.3 DEFINITIONS
   A. Cutting: Removal of in-place construction necessary to permit installation or performance of other work.
   B. Patching: Fitting and repair work required to restore construction to original conditions after installation of other work.

1.4 QUALITY ASSURANCE
   A. Cutting and Patching: Comply with requirements for and limitations on cutting and patching of construction elements.
      1. Visual Elements: Do not cut and patch construction in a manner that results in visual evidence of cutting and patching. Do not cut and patch exposed construction in a manner that would, in Architect's/Engineer's opinion, reduce the sites aesthetic qualities. Remove and replace construction that has been cut and patched in a visually unsatisfactory manner.
   B. Cutting and Patching Conference: Before proceeding, meet at Project site with parties involved in cutting and patching, including mechanical and electrical trades. Review areas of potential interference and conflict. Coordinate procedures and resolve potential conflicts before proceeding.
   C. Manufacturer's Installation Instructions: Obtain and maintain on-site manufacturer's written recommendations and instructions for installation of products and equipment.

PART 2 - PRODUCTS

2.1 MATERIALS
   A. General: Comply with requirements specified in other Sections.
B. In-Place Materials: Use materials for patching identical to in-place materials. For exposed surfaces, use materials that visually match in-place adjacent surfaces to the fullest extent possible.

1. If identical materials are unavailable or cannot be used, use materials that, when installed, will provide a match acceptable to Architect/Engineer for the visual and functional performance of in-place materials.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Existing Conditions: The existence and location of underground and other utilities and construction indicated as existing are not guaranteed.

B. Examination and Acceptance of Conditions: Before proceeding with each component of the Work, examine substrates, areas, and conditions, with Installer or Applicator present where indicated, for compliance with requirements for installation tolerances and other conditions affecting performance. Record observations.

1. Examine roughing-in for mechanical and electrical systems to verify actual locations of connections before equipment and fixture installation.
2. Examine walls, floors, and roofs for suitable conditions where products and systems are to be installed.
3. Verify compatibility with and suitability of substrates, including compatibility with existing finishes or primers.

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

3.2 PREPARATION

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

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

C. Review of Contract Documents and Field Conditions: Immediately on discovery of the need for clarification of the Contract Documents caused by differing field conditions outside the control of Contractor, submit a request for information to Engineer according to requirements in the Contract.

3.3 INSTALLATION

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

1. Make vertical work plumb and make horizontal work level.
2. Where space is limited, install components to maximize space available for maintenance and ease of removal for replacement.
3. Conceal pipes, ducts, and wiring in finished areas unless otherwise indicated.
4. Maintain minimum headroom clearance of 96 inches (2440 mm) in occupied spaces and 90 inches (2300 mm) in unoccupied spaces u.o.n.

B. Comply with manufacturer’s written instructions and recommendations for installing products in applications indicated.

C. Install products at the time and under conditions that will ensure the best possible results. Maintain conditions required for product performance until Substantial Completion.

D. Conduct construction operations so no part of the Work is subjected to damaging operations or loading in excess of that expected during normal conditions of occupancy.

E. Sequence the Work and allow adequate clearances to accommodate movement of construction items on site and placement in permanent locations.

F. Tools and Equipment: Do not use tools or equipment that produce harmful noise levels.

G. Templates: Obtain and distribute to the parties involved templates for work specified to be factory prepared and field installed. Check Shop Drawings of other work to confirm that adequate provisions are made for locating and installing products to comply with indicated requirements.

H. Attachment: Provide blocking and attachment plates and anchors and fasteners of adequate size and number to securely anchor each component in place, accurately located and aligned with other portions of the Work. Where size and type of attachments are not indicated, verify size and type required for load conditions.

1. Mounting Heights: Where mounting heights are not indicated, mount components at heights directed by Architect/Engineer.
2. Allow for building movement, including thermal expansion and contraction.
3. Coordinate installation of anchorages. Furnish setting drawings, templates, and directions for installing anchorages, including sleeves, concrete inserts, anchor bolts, and items with integral anchors, that are to be embedded in concrete or masonry. Deliver such items to Project site in time for installation.

I. Joints: Make joints of uniform width. Where joint locations in exposed work are not indicated, arrange joints for the best visual effect. Fit exposed connections together to form hairline joints.

J. Hazardous Materials: Use products, cleaners, and installation materials that are not considered hazardous.

3.4 CUTTING AND PATCHING

A. Cutting and Patching, General: Employ skilled workers to perform cutting and patching. Proceed with cutting and patching at the earliest feasible time, and complete without delay.

1. Cut in-place construction to provide for installation of other components or performance of other construction, and subsequently patch as required to restore surfaces to their original condition.

B. Existing Warranties: Remove, replace, patch, and repair materials and surfaces cut or damaged during installation or cutting and patching operations, by methods and with materials so as not to void existing warranties.
C. Temporary Support: Provide temporary support of work to be cut.

D. Protection: Protect in-place construction during cutting and patching to prevent damage. Provide protection from adverse weather conditions for portions of Project that might be exposed during cutting and patching operations.

E. Adjacent Occupied Areas: Where interference with use of adjoining areas or interruption of free passage to adjoining areas is unavoidable, coordinate cutting and patching according to project requirements.

F. Existing Utility Services and Mechanical/Electrical Systems: Where existing services/systems are required to be removed, relocated, or abandoned, bypass such services/systems before cutting to prevent interruption to occupied areas.

G. Cutting: Cut in-place construction by sawing, drilling, breaking, chipping, grinding, and similar operations, including excavation, using methods least likely to damage elements retained or adjoining construction. If possible, review proposed procedures with original Installer; comply with original Installer’s written recommendations.

1. In general, use hand or small power tools designed for sawing and grinding, not hammering and chopping. Cut holes and slots neatly to minimum size required, and with minimum disturbance of adjacent surfaces. Temporarily cover openings when not in use.

2. Finished Surfaces: Cut or drill from the exposed or finished side into concealed surfaces.

3. Concrete and Masonry: Cut using a cutting machine, such as an abrasive saw or a diamond-core drill.

4. Excavating and Backfilling: Comply with requirements in applicable Sections where required by cutting and patching operations.

5. Mechanical and Electrical Services: Cut off pipe or conduit in walls or partitions to be removed. Cap, valve, or plug and seal remaining portion of pipe or conduit to prevent entrance of moisture or other foreign matter after cutting.

6. Proceed with patching after construction operations requiring cutting are complete.

H. Patching: Patch construction by filling, repairing, refinishing, closing up, and similar operations following performance of other work. Patch with durable seams that are as invisible as practicable. Provide materials and comply with installation requirements specified in other Sections, where applicable.

1. Inspection: Where feasible, test and inspect patched areas after completion to demonstrate physical integrity of installation.

2. Exposed Finishes: Restore exposed finishes of patched areas and extend finish restoration into retained adjoining construction in a manner that will minimize evidence of patching and refinishing.

   a. Clean piping, conduit, and similar features before applying paint or other finishing materials.

   b. Restore damaged pipe covering to its original condition.

3. Floors and Walls: Where walls or partitions that are removed extend one (1) finished area into another, patch and repair floor and wall surfaces in the new space. Provide an even surface of uniform finish, color, texture, and appearance. Remove in-place floor and wall coverings and replace with new materials, if necessary, to achieve uniform color and appearance.
a. Where patching occurs in a painted surface, prepare substrate and apply primer and intermediate paint coats appropriate for substrate over the patch, and apply final paint coat over entire unbroken surface containing the patch. Provide additional coats until patch blends with adjacent surfaces.

4. Ceilings: Patch, repair, or rehang in-place ceilings as necessary to provide an even-plane surface of uniform appearance.

5. Exterior Building Enclosure: Patch components in a manner that restores enclosure to a weathertight condition and ensures thermal and moisture integrity of building enclosure.

I. Cleaning: Clean areas and spaces where cutting and patching are performed. Remove paint, mortar, oils, putty, and similar materials from adjacent finished surfaces.

3.5 PROTECTION OF INSTALLED CONSTRUCTION

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

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

END OF SECTION 017300
PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

A. Section Includes:
   1. Demolition and removal of selected portions of building or structure.
   2. Salvage of existing items to be reused or recycled.

B. Related Requirements:
   1. Section 017300 “Execution Requirements” for cutting and patching procedures.

1.3 DEFINITIONS

A. Remove: Detach items from existing construction and dispose of them off-site unless indicated to be salvaged or reinstalled.

B. Remove and Salvage: Detach items from existing construction, in a manner to prevent damage, and store.

C. Remove and Reinstall: Detach items from existing construction, in a manner to prevent damage, prepare for reuse, and reinstall where indicated.

D. Existing to Remain: Leave existing items that are not to be removed and that are not otherwise indicated to be salvaged or reinstalled.

1.4 MATERIALS OWNERSHIP

A. Unless otherwise indicated, demolition waste becomes property of Contractor.

B. Historic items, relics, antiques, and similar objects including, but not limited to, cornerstones and their contents, commemorative plaques and tablets, and other items of interest or value to Owner that may be uncovered during demolition remain the property of Owner.

1. Carefully salvage in a manner to prevent damage and promptly return to Owner.

1.5 FIELD CONDITIONS

A. Owner will occupy portions of building immediately adjacent to selective demolition area. Conduct selective demolition so Owner’s operations will not be disrupted.

B. Notify Architect/Engineer of discrepancies between existing conditions and Drawings before proceeding with selective demolition.
C. Hazardous Materials: It is not expected that hazardous materials will be encountered in 
   the Work.
   
   1. If suspected hazardous materials are encountered, do not disturb; immediately 
      notify Architect/Engineer and Owner.

D. Storage or sale of removed items or materials on-site is not permitted.

E. Utility Service: Maintain existing utilities indicated to remain in service and protect them 
   against damage during selective demolition operations.
   
   1. Maintain fire-protection facilities in service during selective demolition operations.

1.6 WARRANTY

A. Existing Warranties: Remove, replace, patch, and repair materials and surfaces cut or 
   damaged during selective demolition, by methods and with materials and using approved 
   Contractors so as not to void existing warranties. Notify warrantor before proceeding.

B. Notify warrantor on completion of selective demolition, and obtain documentation 
   verifying that existing system has been inspected and warranty remains in effect. Submit 
   documentation at Project closeout.

PART 2 - PRODUCTS

2.1 PERFORMANCE REQUIREMENTS

A. Regulatory Requirements: Comply with governing EPA notification regulations before 
   beginning selective demolition. Comply with hauling and disposal regulations of 
   authorities having jurisdiction.

B. Standards: Comply with ASSE A10.6 and NFPA 241.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Verify that utilities have been disconnected and capped before starting selective 
   demolition operations.

B. Review Project Record Documents of existing construction or other existing condition and 
   hazardous material information provided by Owner. Owner does not guarantee that 
   existing conditions are same as those indicated in Project Record Documents.

3.2 UTILITY SERVICES AND MECHANICAL/ELECTRICAL SYSTEMS

A. Existing Services/Systems to Remain: Maintain services/systems indicated to remain and 
   protect them against damage.

B. Existing Services/Systems to Be Removed, Relocated, or Abandoned: Locate, identify, 
   disconnect, and seal or cap off mechanical/electrical systems serving areas to be 
   selectively demolished.
   
   1. Owner will arrange to shut off indicated services/systems when requested by 
      Contractor.
2. As indicated on the contract documents, the Contractor is required to remove and reinstall devices that are on the existing fascia elements of the building. The Contractor shall be responsible for removal, storage, reinstallation, and for verification that the devices are operating in the same condition as they were prior to removal.

3. If services/systems are required to be removed, relocated, or abandoned, provide temporary services/systems that bypass area of selective demolition and that maintain continuity of services/systems to other parts of building.

3.3 PROTECTION

A. Temporary Protection: Provide temporary barricades and other protection required to prevent injury to people and damage to adjacent buildings and facilities to remain.

1. Provide protection to ensure safe passage of people around selective demolition area and to and from occupied portions of building.
2. Provide temporary weather protection, during interval between selective demolition of existing construction on exterior surfaces and new construction, to prevent water leakage and damage to structure and interior areas.
3. Protect walls, ceilings, floors, and other existing finish work that are to remain or that are exposed during selective demolition operations.
4. Cover and protect furniture, furnishings, and equipment that have not been removed.

B. Temporary Shoring: Design, provide, and maintain shoring, bracing, and structural supports as required to preserve stability and prevent movement, settlement, or collapse of construction and finishes to remain, and to prevent unexpected or uncontrolled movement or collapse of construction being demolished.

1. Strengthen or add new supports when required during progress of selective demolition.

C. Remove temporary barricades and protections where hazards no longer exist.

3.4 SELECTIVE DEMOLITION, GENERAL

A. General: Demolish and remove existing construction only to the extent required by new construction and as indicated. Use methods required to complete the Work within limitations of governing regulations and as follows:

1. Proceed with selective demolition systematically, from higher to lower level. Complete selective demolition operations above each floor or tier before disturbing supporting members on the next lower level.
2. Neatly cut openings and holes plumb, square, and true to dimensions required. Use cutting methods least likely to damage construction to remain or adjoining construction. Use hand tools or small power tools designed for sawing or grinding, not hammering and chopping. Temporarily cover openings to remain.
3. Cut or drill from the exposed or finished side into concealed surfaces to avoid marring existing finished surfaces.
4. Do not use cutting torches until work area is cleared of flammable materials. At concealed spaces, such as duct and pipe interiors, verify condition and contents of hidden space before starting flame-cutting operations. Maintain portable fire-suppression devices during flame-cutting operations.
5. Maintain adequate ventilation when using cutting torches.
6. Remove decayed, vermin-infested, or otherwise dangerous or unsuitable materials and promptly dispose of off-site.
7. Remove structural framing members and lower to ground by method suitable to avoid free fall and to prevent ground impact or dust generation.
8. Locate selective demolition equipment and remove debris and materials so as not to impose excessive loads on supporting walls, floors, or framing.

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

C. Removed and Reinstalled Items:

1. Clean and repair items to functional condition adequate for intended reuse.
2. Pack or crate items after cleaning and repairing. Identify contents of containers.
3. Protect items from damage during transport and storage.
4. Reinstall items in locations indicated. Comply with installation requirements for new materials and equipment. Provide connections, supports, and miscellaneous materials necessary to make item functional for use indicated.

D. Existing Items to Remain: Protect construction indicated to remain against damage and soiling during selective demolition. Items may be removed to a suitable, protected storage location during selective demolition and cleaned and reinstalled in their original locations after selective demolition operations are complete.

3.5 SELECTIVE DEMOLITION PROCEDURES FOR SPECIFIC MATERIALS

A. Concrete: Demolish in sections. Cut concrete full depth at junctures with construction to remain and at regular intervals using power-driven saw, and then remove concrete between saw cuts.

B. Masonry: Demolish in small sections. Cut masonry at junctures with construction to remain, using power-driven saw, and then remove masonry between saw cuts.

C. Concrete Slabs-on-Grade: Saw-cut perimeter of area to be demolished, and then break up and remove.

3.6 DISPOSAL OF DEMOLISHED MATERIALS

A. Remove demolition waste materials from Project site and dispose of them in an EPA-approved construction and demolition waste landfill acceptable to authorities having jurisdiction.

1. Do not allow demolished materials to accumulate on-site.
2. Remove and transport debris in a manner that will prevent spillage on adjacent surfaces and areas.
3. Remove debris from elevated portions of building by chute, hoist, or other device that will convey debris to grade level in a controlled descent.

B. Burning: Do not burn demolished materials.
3.7 CLEANING

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

END OF SECTION 017320
PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

A. This Section specified administrative and procedural requirements for project closeout, including:

1. Establishment of Substantial Completion
2. Final Acceptance
3. Inspection procedures
4. Project record document submittal
5. Submittal of warranties
6. Final cleaning and Repairs

B. Closeout requirements for specific construction activities are included in the appropriate Sections in Divisions-1 through 28.

1.3 SUBSTANTIAL COMPLETION

A. General: It is the Contractor's responsibility to initiate procedures for obtaining a Certificate of Substantial Completion. The date of Substantial Completion must be before the expiration of the Contract Time, or liquidated damages will be assessed. At Substantial Completion, all work must be complete with the exception of punch list items. The term "Substantial Completion" is defined in the general conditions section 007000.

B. Preliminary Procedures: Before requesting inspection for determining date of Substantial Completion, complete the following. List items below that are incomplete in request.

1. Prepare a list of items to be completed and corrected (punch list), the value of items on the list, and reasons why the Work is not complete. Failure to provide a complete punchlist will be grounds for the Architect/Engineer not to conduct Substantial Completion inspection and will prevent the issuance of a Certificate of Substantial Completion.
2. Advise Owner of pending insurance changeover requirements.
3. Submit specific warranties, workmanship bonds, maintenance service agreements, final certifications, and similar documents.
4. Obtain and submit releases permitting Owner unrestricted use of the Work and access to services and utilities. Include occupancy permits, operating certificates, and similar releases.
5. Prepare and submit Project Record Documents, operation and maintenance manuals, Final Completion construction photographs, damage or settlement surveys, property surveys, and similar final record information.
6. Complete final cleaning requirements, including touchup painting.
7. Touch up and otherwise repair and restore marred exposed finishes to eliminate visual defects.
8. Repair all damaged sidewalks, curbs, or dives resulting from Contractor's activities.
9. Repair all ruts in grass and planting areas resulting from Contractor's activities.

C. Inspection: Submit a written request for inspection for Substantial Completion. Upon receipt of request, Architect/Engineer will either proceed with inspection or notify Contractor of unfulfilled requirements. Architect/Engineer will prepare the Certificate of Substantial Completion after
inspection or will notify Contractor of items, either on Contractor's list or additional items identified by Architect/Engineer, that must be completed or corrected before certificate will be issued. Work that is incomplete shall not be included on the punchlist for Substantial Completion and shall be completed prior to initiating Substantial Completion procedures.

1. Reinspection: Request reinspection when the Work identified in previous inspections as incomplete is completed or corrected.
2. Results of completed inspection will form the basis of requirements for Final Completion.
3. If more than two (2) inspections are needed for the issuing of the Certificate of Substantial Completion, an amount of One Hundred Fifty Dollars ($150.00) will be deducted from the amount owed the Contractor for each subsequent inspection required of the Architect/Engineer to verify that the Contractor's work is completed.

D. In the Application for Payment that coincides with, or first follows, the date Substantial Completion is claimed, show 100 percent (100%) completion for the portion of the Work claimed as Substantially Complete. If not already provided, include supporting documentation for completion as indicated in these Contract Documents and a statement showing an accounting of changes to the Contract Sum.

E. Submit specific warranties and guarantees, final certifications, and similar documents.

F. Advise Owner of pending insurance changeover requirements.

G. Obtain and submit releases enabling the Owner unrestricted use of the Work and access to services and utilities. Include occupancy permits, operating certificates, and similar releases.

H. Submit record drawings and similar final record information.

I. Complete final clean up requirements, including the restoration of any damage to the building or site, which occurred during the course of construction.

1.4 FINAL ACCEPTANCE

A. Preliminary Procedures: Before requesting final inspection for certification of final acceptance and final payment, complete the following. List exceptions in the request.

B. Submit the final payment request with releases and supporting documentation not previously submitted and accepted. Include certificates of insurance for products and completed operations where required.

C. Submit an updated final statement, accounting for final additional changes to the Contract Sum.

D. Submit a certified copy of the Architect's/Engineer’s final inspection list of items to be completed or corrected, stating that each item has been completed or otherwise resolved for acceptance and the list has been endorsed and dated by the Architect/Engineer.

E. Submit consent of surety to final payment.

F. Submit a final liquidated damages settlement statement, if applicable.

G. Reinspection Procedures: The Architect/Engineer will reinspect the Work upon receipt of notice that the Work, including inspection list items from earlier inspections, has been completed, except items whose completion has been delayed because of circumstances acceptable to the Architect/Engineer. Upon completion of reinspection, the Architect/Engineer will prepare a certificate of final acceptance, or advise the Contractor of Work that is incomplete or of obligations that have not been fulfilled but are required for final acceptance. If necessary, reinspection will be repeated. If more than two (2) inspections are needed following the issuing of the Certificate of
Substantial Completion, an amount of One Hundred Fifty Dollars ($150.00) will be deducted from the amount owed the Contractor for each subsequent inspection required of the Architect/Engineer to verify that the Contractor's work is completed.

1.5 RECORD DOCUMENT SUBMITTALS

A. Record Drawings: The Contractor shall maintain a clean, undamaged set of blue or black line white-prints of contract Drawings and Shop Drawings during construction activities. Mark the set to show the actual installation where the installation varies substantially from the Work as originally shown. Mark whichever drawing is most capable of showing conditions fully and accurately. Where Shop Drawings are used, record a cross-reference at the corresponding location on the Contract Drawings. It is the Contractor's responsibility to maintain this record and the records indicated below. Failure to keep record of the information required herein will result in additional charges to the Contractor at Final Completion, as required to establish this information from other sources.

1. Make record drawings to show locations and quantities of any material changes.
2. Mark record sets with red erasable pencil.
3. Mark new information that is important to the Owner, but was not shown on Contract Drawings or Shop Drawings, such as conditions uncovered during the course of the work.
4. Upon completion of the Work, submit Record Drawings to the Architect/Engineer for the Owner's record.
5. Content: Types of items requiring marking include, but are not limited to, the following:
   a. Dimensional changes to Drawings.
   b. Revisions to details shown on Drawings.
   c. Changes made by Change Order.
   d. Changes made following Architect's/Engineer's written orders.
   e. Details not on the original Contract Drawings.
   f. Field records for variable and concealed conditions.
   g. Measured areas of deck replacement and deck painting.
   h. Location of wood replacement.
   i. Record information on the Work that is shown only schematically.

B. Record Specifications: Maintain one (1) complete copy of the Project Manual, including addenda, and one (1) copy of other written construction documents such as Field Orders, Change orders and Modifications issued in printed form during construction. Mark these documents to show substantial variations in actual Work performed in comparison with the text of the Specifications and modifications. Give particular attention to substitutions, selection of options and similar information on elements that are concealed or cannot otherwise be readily discerned later by direct observation. Note related record drawing information and Product Data. Upon completion of the Work, submit record Specifications to the Architect/Engineer for the Owner's record.

C. Record Product Data: Maintain one (1) copy of each Product Data submittal. Mark these documents to show significant variations in actual Work performed in comparison with information submitted. Include variations in products delivered to the site, and from the manufacturer's installation instructions and recommendations. Give particular attention to concealed products and portions of the Work, which cannot otherwise be readily discerned later by direct observation. Note related Change Orders and mark-up of record drawings and Specifications. Upon completion of mark-up, submit complete Set of record Data to the Architect/Engineer for the Owner's records.

D. Miscellaneous Record Submittals: Refer to other Specification Sections for requirements of miscellaneous record keeping and submittals in connection with actual performance of the Work.
Immediately prior to the date or dates of Substantial Completion, complete miscellaneous records including such documents as daily reports, and place in good order, properly identified and bound or filed, ready for continued use and reference. Submit to the Architect/Engineer for the Owner's records.

E. Maintenance Information: Submit information to the Owner from the manufacturer of products requiring maintenance. Bind information into 3 ring binders along with warranties, etc.

1.6 SUBMITTAL OF WARRANTIES

A. Submit manufacturer’s warranties, with the date of Substantial Completion, referenced on all warranty data.

PART 2 - PRODUCTS (Not applicable)

PART 3 - EXECUTION

3.1 FINAL CLEANING AND REPAIRS

A. General: General cleaning during construction is required by the General Conditions and included in Section "Temporary Facilities".

B. Cleaning: Complete the following cleaning operations before requesting inspection for Certification of Substantial Completion:

1. Clean the site, including landscape development areas, of rubbish, litter and other foreign substances caused by construction operations. Sweep paved areas broom clean; remove stains, spills and other foreign deposits. Rake grounds that are neither paved nor planted, to a smooth even-textured surface.

2. Clean all exposed building components, whether existing or new, of any stains or spills that occurred during construction.

C. Repairs: Repair any damage to the property caused by construction operations to condition prior to start of construction in accordance with requirements of these specifications. Fill any holes or ruts created during construction and reestablish grass in these and any other areas where grass has been damaged during the course of the work, as described in Section 011000, Summary of Work.

D. Removal of Protection: Remove temporary protection and facilities installed for protection of the Work during construction.

E. Compliance: Comply with regulations of authorities having jurisdiction and safety standards for cleaning. Do not burn waste materials. Do not bury debris or excess materials on the Owner's property. Do not discharge volatile, harmful or dangerous materials into drainage systems. Remove waste materials from the site and dispose of in a lawful manner.

END OF SECTION 017700
SECTION 02 41 20
SELECTIVE BUILDING DEMOLITION

PART 1 - GENERAL

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

1.02 SECTION INCLUDES
   A. This Section includes, but is not limited to, demolition and removal of selected portions of the existing building, mechanical and electrical systems as indicated, and patching and repairs.

1.03 RELATED SECTIONS
   A. Related sections include, but are not limited to, the following:
      1. Division 23 Sections - Heating, Ventilating, and Air Conditioning (HVAC)
      2. Division 26 Sections - Electrical

1.04 REFERENCE STANDARDS
   A. Reference standards include, but are not limited to, the following:
      1. ANSI A10.6 – Safety Requirements for Demolition Operations; 2006

1.05 DEFINITIONS
   A. Remove: Detach items from existing construction and legally dispose of them off-site, unless indicated to be removed and salvaged or removed and reinstalled.
   B. Remove and Salvage: Carefully detach from existing construction, in a manner to prevent damage, and deliver to Owner.
   C. Remove and Reinstall: Remove items indicated; clean, service, and otherwise prepare them for reuse; store and protect against damage. Reinstall items in the same locations or in locations indicated.
   D. Existing to Remain: Existing items of construction that are not to be removed and that are not otherwise indicated to be removed, removed and salvaged, or removed and reinstalled.

1.06 MATERIALS OWNERSHIP
   A. Unless otherwise indicated, demolition waste becomes property of Contractor, and shall be removed from the site promptly.

1.07 SUBMITTALS
   A. See Section 01 33 00 Submittals, for submittal procedures.
   B. Schedule of Selective Demolition Activities: Indicate the following:
      1. Sequence of selective demolition and removal work, with starting and ending dates for each activity. Ensure Owner's on-site operations are uninterrupted.
      2. Interruption of utility services. Indicate how long utility services will be interrupted.
      3. Coordination for shutoff, capping, and continuation of utility services.
      4. Use of elevator and stairs.
      5. Coordination of Owner's continuing occupancy of portions of existing building and of Owner's partial occupancy of completed Work.
      6. Means of protection for items to remain and items in path of waste removal from building.
   C. Pre-Construction Digital Image Documentation: Prior to commencing any work, submit digital image documentation of existing conditions to the Owner. Provide digital photographs or digital
video in DVD format, sufficiently detailed, of existing conditions of adjoining construction and site improvements including finish surfaces that might be misconstrued as damage caused by demolition and renovation operations. Exterior documentation shall include, but not be limited to, existing walls, windows, doors, walks, pavements, and landscaping. Interior documentation shall include, but not be limited to, existing floors, ceilings, walls and partitions, equipment and furnishings.

1.08 QUALITY ASSURANCE

A. Demolition Firm Qualifications: An experienced firm that has specialized in demolition work similar in material and extent to that indicated for this Project.

B. Regulatory Requirements: Comply with governing EPA notification regulations before beginning selective demolition. Comply with hauling and disposal regulations of authorities having jurisdiction.

C. Standards: Comply with ANSI A10.6 and NFPA 241.

1.09 PROJECT CONDITIONS

A. Owner will occupy portions of building immediately adjacent to selective demolition areas. Conduct selective demolition so Owner's operations will not be disrupted. Provide not less than 48 hours' notice to Owner of activities that will affect Owner's operations.

B. Conditions existing at time of inspection for bidding purpose will be maintained by Owner as far as practical.

C. Notify Architect of discrepancies between existing conditions and Drawings before proceeding with selective demolition.

D. Hazardous Materials: Hazardous materials are present in construction to be selectively demolished. A report on the presence of hazardous materials is contained in these specifications for review and use. Examine report to become aware of locations where hazardous materials are present.
   1. Hazardous material remediation is specified elsewhere in the Contract Documents.
   2. Do not disturb hazardous materials or items suspected of containing hazardous materials except under procedures specified elsewhere in the Contract Documents.

E. Storage or sale of removed items or materials on-site is not permitted.

F. Utility Service: Maintain existing utilities indicated to remain in service and protect them against damage during selective demolition operations. Maintain fire-protection facilities in service during selective demolition operations.

PART 2 - PRODUCTS

2.01 REPAIR MATERIALS

A. Use repair materials identical to existing materials. Where identical materials are unavailable or cannot be used for exposed surfaces, use materials that visually match existing adjacent surfaces to the fullest extent possible. Use materials whose installed performance equals or surpasses that of existing materials.

PART 3 - EXECUTION

3.01 EXAMINATION

A. Verify that utilities have been disconnected and capped before starting selective demolition operations.

B. Survey existing conditions and correlate with requirements indicated to determine extent of selective demolition required.
C. When unanticipated mechanical, electrical, or structural elements that conflict with intended function or design are encountered, investigate and measure the nature and extent of conflict. Promptly submit a written report to Architect.

D. Survey of Existing Conditions: Record existing conditions by use of preconstruction digital image documentation as specified hereinbefore.

3.02 UTILITY SERVICES AND MECHANICAL/ELECTRICAL SYSTEMS

A. Existing Services/Systems: Maintain services/systems indicated to remain and protect them against damage during selective demolition operations.

3.03 PREPARATION

A. Site Access and Temporary Controls: Conduct selective demolition and debris-removal operations to ensure minimum interference with roads, streets, walks, walkways, and other adjacent occupied and used facilities. Comply with requirements for access and protection specified in Division 01 Section “Construction Facilities and Temporary Controls.”

B. Temporary Facilities: Provide temporary barricades and other protection required to prevent injury to people and damage to adjacent buildings and facilities to remain.
   1. Provide protection to ensure safe passage of people around selective demolition area and to and from occupied portions of building.
   2. Provide temporary weather protection, during interval between selective demolition of existing construction on exterior surfaces and new construction, to prevent water leakage and damage to structure and interior areas.
   3. Protect walls, ceilings, floors, and other existing finish work that are to remain or that are exposed during selective demolition operations.
   4. Cover and protect furniture, furnishings, and equipment that have not been removed.
   5. Comply with requirements for temporary enclosures, dust control, heating, and cooling specified in Division 01 Section “Temporary Facilities.”

C. Temporary Shoring: Provide and maintain shoring, bracing, and structural supports as required to preserve stability and prevent movement, settlement, or collapse of construction and finishes to remain, and to prevent unexpected or uncontrolled movement or collapse of construction being demolished. Strengthen or add new supports when required during progress of selective demolition.

3.04 SELECTIVE DEMOLITION

A. General: Demolish and remove existing construction only to the extent required by new construction and as indicated. Use methods required to complete the Work within limitations of governing regulations and as follows:
   1. Do not use cutting saws or drills that will cause dust and/or fume contamination to the interior environment. Use “dustless” cutting saws equal to Arbor Tech with HEPA filtration systems.
   2. Neatly cut openings and holes plumb, square, and true to dimensions required. Use cutting methods least likely to damage construction to remain or adjoining construction. Use hand tools or small power tools designed for sawing or grinding, not hammering and chopping, to minimize disturbance of adjacent surfaces. Temporarily cover openings to remain.
   3. Cut or drill from the exposed or finished side into concealed surfaces to avoid marring existing finished surfaces.
   4. Do not use cutting torches without specific written permission from the Owner.
   5. Remove decayed, vermin-infested, or otherwise dangerous or unsuitable materials and promptly dispose of off-site.
   6. Locate selective demolition equipment and remove debris and materials so as not to impose excessive loads on supporting walls, floors, or framing.
   7. Dispose of demolished items and materials promptly.
8. Perform demolition in a manner that maximizes salvage and recycling of materials.
   a. Comply with requirements of Section 01 74 19 - Waste Management, as required for LEED Certification
   b. Dismantle existing construction and separate materials.
   c. Set aside reusable, recyclable, and salvageable materials; store and deliver to collection point or point of reuse.

B. Removed and Salvaged Items: Clean salvaged items. Pack or crate items after cleaning; identify contents of containers. Store items in a secure area until delivery to Owner.

C. Removed and Reinstalled Items: Clean and repair items to functional condition adequate for intended reuse. Protect items from damage during storage. Reinstall items in locations indicated. Comply with installation requirements for new materials and equipment. Provide connections, supports, and miscellaneous materials necessary to make item functional for use indicated.

D. Existing Items to Remain: Protect construction indicated to remain against damage and soiling during selective demolition. When permitted by Architect, items may be removed to a suitable, protected storage location during selective demolition, and cleaned and reinstalled in their original locations after selective demolition operations are complete.

E. Concrete: Demolish in small sections. Using power-driven saw, cut concrete to a depth of at least 3/4 inch (19 mm) at junctures with construction to remain. Dislodge concrete from reinforcement at perimeter of areas being demolished, cut reinforcement, and then remove remainder of concrete. Neatly trim openings to dimensions indicated.

F. Concrete Slabs-on-Grade: Saw-cut perimeter of area to be demolished, then break up and remove.

G. Masonry: Demolish in small sections. Cut masonry at junctures with construction to remain, using power-driven saw, then remove masonry between saw cuts.


3.05 DISPOSAL OF DEMOLISHED MATERIALS

A. General: Except for items or materials indicated to be reused, salvaged, reinstalled, or otherwise indicated to remain Owner's property, remove demolished materials from project site and legally dispose of them. Do not allow demolished materials to accumulate on-site. Remove and transport debris in a manner that will prevent spillage on adjacent surfaces and areas.

B. Remove from site all materials not to be reused on site; comply with requirements of Section 01 74 19 - Construction Waste Management and Disposal.

C. Transport demolished materials off Owner's property and legally dispose of them.

D. Burning: Do not burn demolished materials.

3.06 CLEANING

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

END OF SECTION 02 41 19
SECTION 033000  
CAST-IN-PLACE CONCRETE

PART 1 - GENERAL

1.1 SUMMARY
A. Section Includes:
   1. Cast-in-place concrete, including concrete materials, mixture design, placement procedures, and finishes.

B. Related Requirements:
   1. Section 031000 "Concrete Forming and Accessories" for form-facing materials, form liners, insulating concrete forms, and waterstops.
   2. Section 032000 “Concrete Reinforcing” for steel reinforcing bars and welded-wire reinforcement.
   3. Section 312000 "Earth Moving" for drainage fill under slabs-on-ground.

1.2 DEFINITIONS
A. Cementitious Materials: Portland cement alone or in combination with one or more of the following: blended hydraulic cement, fly ash, slag cement, and other pozzolans materials subject to compliance with requirements.

B. Water/Cement Ratio (w/cm): The ratio by weight of water to cementitious materials.

1.3 PREINSTALLATION MEETINGS
A. Preinstallation Conference: Conduct conference at Project site.

1.4 ACTION SUBMITTALS
A. Product Data: For each of the following.
   1. Portland cement.
   2. Fly ash.
   3. Slag cement.
   5. Aggregates.
   6. Admixtures:
      a. Include limitations of use, including restrictions on cementitious materials, supplementary cementitious materials, air entrainment, aggregates, temperature at time of concrete placement, relative humidity at time of concrete placement, curing conditions, and use of other admixtures.
   7. Vapor retarders.
   8. Liquid floor treatments.
   10. Joint fillers.

B. Design mixtures in "Design Mixtures" Paragraph below are usually considered to be an action submittal.
C. Design Mixtures: For each concrete mixture, include the following:
   1. Mixture identification.
   2. Minimum 28-day compressive strength.
   3. Durability exposure class.
   4. Maximum w/cm.
   5. Calculated equilibrium unit weight, for lightweight concrete.
   7. Air content.
   8. Nominal maximum aggregate size.
   9. Indicate amounts of mixing water to be withheld for later addition at Project site if permitted.
   10. Intended placement method.
   11. Submit alternate design mixtures when characteristics of materials, Project conditions, weather, test results, or other circumstances warrant adjustments.

D. Shop Drawings:
   1. Construction Joint Layout: Indicate proposed construction joints required to construct the structure.
      a. Location of construction joints is subject to approval of the Architect.

E. Concrete Schedule: For each location of each Class of concrete indicated in "Concrete Mixtures" Article, including the following:
   1. Concrete Class designation.
   2. Location within Project.
   3. Exposure Class designation.
   4. Formed Surface Finish designation and final finish.
   5. Final finish for floors.
   6. Curing process.
   7. Floor treatment if any.

1.5 INFORMATIONAL SUBMITTALS

A. Material Certificates: For each of the following, signed by manufacturers:
   1. Cementitious materials.
   2. Admixtures.
   3. Curing compounds.
   4. Vapor retarders.
   5. Joint-filler strips.

B. Material Test Reports: For the following, from a qualified testing agency:
   1. Portland cement.
   2. Fly ash.
   3. Slag cement.
5. Aggregates.
6. Admixtures:
   C. Research Reports: For concrete admixtures in accordance with ICC's Acceptance Criteria AC198.
   D. Preconstruction Test Reports: For each mix design.
   E. Field quality-control reports.
   F. Minutes of preinstallation conference.

1.6 QUALITY ASSURANCE
A. Ready-Mixed Concrete Manufacturer Qualifications: A firm experienced in manufacturing ready-mixed concrete products and that complies with ASTM C94/C94M requirements for production facilities and equipment.
   1. Manufacturer certified in accordance with NRMCA's "Certification of Ready Mixed Concrete Production Facilities."

1.7 DELIVERY, STORAGE, AND HANDLING
A. Comply with ASTM C94/C94M and ACI 301 (ACI 301M).

1.8 FIELD CONDITIONS
A. Cold-Weather Placement: Comply with ACI 301 (ACI 301M) and ACI 306.1.
B. Hot-Weather Placement: Comply with ACI 301 (ACI 301M) and ACI 305.1 (ACI 305.1M).

PART 2 - PRODUCTS
2.1 CONCRETE, GENERAL
A. ACI Publications: Comply with ACI 301 (ACI 301M) unless modified by requirements in the Contract Documents.

2.2 CONCRETE MATERIALS
A. Cementitious Materials:
   2. Fly Ash: ASTM C618, Class C or F.
   3. Slag Cement: ASTM C989/C989M, Grade 100 or 120.
B. Normal-Weight Aggregates: ASTM C33/C33M, coarse aggregate or better, graded. Provide aggregates from a single source.
   1. Maximum Coarse-Aggregate Size: 3/4 inch (19 mm) nominal.
   2. Fine Aggregate: Free of materials with deleterious reactivity to alkali in cement.
C. Air-Entraining Admixture: ASTM C260/C260M.
D. Chemical Admixtures: Certified by manufacturer to be compatible with other admixtures that do not contribute water-soluble chloride ions exceeding those permitted in hardened concrete. Do not use calcium chloride or admixtures containing calcium chloride.
   1. Water-Reducing Admixture: ASTM C494/C494M, Type A.
2. Retarding Admixture: ASTM C494/C494M, Type B.
3. Water-Reducing and Retarding Admixture: ASTM C494/C494M, Type D.
4. High-Range, Water-Reducing Admixture: ASTM C494/C494M, Type F.
5. High-Range, Water-Reducing and Retarding Admixture: ASTM C494/C494M, Type G.
6. Plasticizing and Retarding Admixture: ASTM C1017/C1017M, Type II.

E. Water and Water Used to Make Ice: ASTM C94/C94M, potable.

2.3 VAPOR RETARDERS
A. Sheet Vapor Retarder, Class A: ASTM E1745, Class A; not less than 10 mils (0.25 mm) thick. Include manufacturer's recommended adhesive or pressure-sensitive tape.

2.4 CURING MATERIALS
A. Absorptive Cover: AASHTO M182, Class 2, burlap cloth made from jute or kenaf, weighing approximately 9 oz./sq. yd. (305 g/sq. m) when dry.
   1. Color:
      a. Ambient Temperature Below 50 deg F (10 deg C): Black.
      b. Ambient Temperature between 50 deg F (10 deg C) and 85 deg F (29 deg C): Any color.
      c. Ambient Temperature Above 85 deg F (29 deg C): White.
C. Curing Paper: Eight-feet- (2438-mm-) wide paper, consisting of two layers of fibered kraft paper laminated with double coating of asphalt.
D. Water: Potable or complying with ASTM C1602/C1602M.
E. Clear, Waterborne, Membrane-Forming, Dissipating Curing Compound: ASTM C309, Type 1, Class B.

2.5 RELATED MATERIALS

2.6 CONCRETE MIXTURES, GENERAL
A. Prepare design mixtures for each type and strength of concrete, proportioned on the basis of laboratory trial mixture or field test data, or both, in accordance with ACI 301 (ACI 301M).
   1. Use a qualified testing agency for preparing and reporting proposed mixture designs, based on laboratory trial mixtures.
B. Cementitious Materials: Limit percentage, by weight, of cementitious materials other than portland cement in concrete as follows:
   1. Fly Ash or Other Pozzolans: 25 percent by mass.
   2. Slag Cement: 50 percent by mass.
   3. Total of Fly Ash or Other Pozzolans, Slag Cement: 50 percent by mass, with fly ash or pozzolans not exceeding 25 percent by mass.
   4. Total of Fly Ash or Other Pozzolans: 35 percent by mass with fly ash or pozzolans not exceeding 25 percent by mass.
C. Admixtures: Use admixtures in accordance with manufacturer's written instructions.
1. Use water-reducing admixture in concrete, as required, for placement and workability.

2. Use water-reducing and -retarding admixture when required by high temperatures, low humidity, or other adverse placement conditions.

3. Use water-reducing admixture in pumped concrete with a w/cm below 0.50.

2.7 CONCRETE MIXTURES

A. Normal-weight concrete used for footings:

1. Minimum Compressive Strength: As indicated on drawings at 28 days.
2. Maximum w/cm: 0.50.
3. Slump Limit: 8 inches (200 mm), plus or minus 1 inch (25 mm) for concrete with verified slump of 3 inches (75 mm) plus or minus 1 inch (25 mm) before adding high-range water-reducing admixture or plasticizing admixture at Project site.
4. Air Content:
   a. 6 percent, plus or minus 1.5 percent at point of delivery for concrete containing 3/4-inch (19-mm) nominal maximum aggregate size.

B. Normal-weight concrete used for interior slabs-on-ground:

1. Minimum Compressive Strength: As indicated on drawings at 28 days.
2. Maximum w/cm: 0.45.
3. Slump Limit: 8 inches (200 mm), plus or minus 1 inch (25 mm) for concrete with verified slump of 3 inches (75 mm) plus or minus 1 inch (25 mm) before adding high-range water-reducing admixture or plasticizing admixture.
4. Air Content:
   a. Do not use an air-entraining admixture or allow total air content to exceed 3 percent for concrete used in trowel-finished floors.

2.8 CONCRETE MIXING

A. Ready-Mixed Concrete: Measure, batch, mix, and deliver concrete in accordance with ASTM C94/C94M, and furnish batch ticket information.

B. Project-Site Mixing: Measure, batch, and mix concrete materials and concrete in accordance with ASTM C94/C94M. Mix concrete materials in appropriate drum-type batch machine mixer.

1. For mixer capacity of 1 cu. yd. (0.76 cu. m) or smaller, continue mixing at least 1-1/2 minutes, but not more than five minutes after ingredients are in mixer, before any part of batch is released.
2. For mixer capacity larger than 1 cu. yd. (0.76 cu. m), increase mixing time by 15 seconds for each additional 1 cu. yd. (0.76 cu. m).
3. Provide batch ticket for each batch discharged and used in the Work, indicating Project identification name and number, date, mixture type, mixture time, quantity, and amount of water added. Record approximate location of final deposit in structure.
PART 3 - EXECUTION

3.1 INSTALLATION OF EMBEDDED ITEMS

A. Place and secure anchorage devices and other embedded items required for adjoining Work that is attached to or supported by cast-in-place concrete.
   1. Use setting drawings, templates, diagrams, instructions, and directions furnished with items to be embedded.
   2. Install anchor rods, accurately located, to elevations required and complying with tolerances in Section 7.5 of ANSI/AISC 303.
   3. Install reglets to receive waterproofing and to receive through-wall flashings in outer face of concrete frame at exterior walls, where flashing is shown at lintels, shelf angles, and other conditions.

3.2 INSTALLATION OF VAPOR RETARDER

A. Sheet Vapor Retarders: Place, protect, and repair sheet vapor retarder in accordance with ASTM E1643 and manufacturer's written instructions.
   1. Install vapor retarder with longest dimension parallel with direction of concrete pour.
   2. Face laps away from exposed direction of concrete pour.
   3. Lap vapor retarder over footings and grade beams not less than 6 inches (150 mm), sealing vapor retarder to concrete.
   4. Lap joints 6 inches (150 mm) and seal with manufacturer's recommended tape.
   5. Terminate vapor retarder at the top of floor slabs, grade beams, and pile caps, sealing entire perimeter to floor slabs, grade beams, foundation walls, or pile caps.
   6. Seal penetrations in accordance with vapor retarder manufacturer's instructions.
   7. Protect vapor retarder during placement of reinforcement and concrete.
      a. Repair damaged areas by patching with vapor retarder material, overlapping damaged area by 6 inches (150 mm) on all sides, and sealing to vapor retarder.

3.3 JOINTS

A. Construct joints true to line, with faces perpendicular to surface plane of concrete.
B. Construction Joints: Coordinate with floor slab pattern and concrete placement sequence.
   1. Install so strength and appearance of concrete are not impaired, at locations indicated on Drawings or as approved by Architect.
C. Control Joints in Slabs-on-Ground: Form weakened-plane control joints, sectioning concrete into areas as indicated. Construct control joints for a depth equal to as indicated on drawings and as follows:
   1. Grooved Joints: Form control joints after initial floating by grooving and finishing each edge of joint to a radius of 1/8 inch (3.2 mm). Repeat grooving of control joints after applying surface finishes. Eliminate groover tool marks on concrete surfaces.
   2. Sawed Joints: Form control joints with power saws equipped with shatterproof abrasive or diamond-rimmed blades. Cut 1/8-inch- (3.2-mm-) wide joints into concrete when cutting action does not tear, abrade, or otherwise damage surface and before concrete develops random cracks.
D. Isolation Joints in Slabs-on-Ground: After removing formwork, install joint-filler strips at slab junctions with vertical surfaces, such as column pedestals, foundation walls, grade beams, and other locations, as indicated.
1. Extend joint-filler strips full width and depth of joint, terminating flush with finished concrete surface unless otherwise indicated on Drawings.

2. Terminate full-width joint-filler strips not less than 1/2 inch (13 mm) or more than 1 inch (25 mm) below finished concrete surface, where joint sealants, specified in Section 079200 "Joint Sealants," are indicated.

3. Install joint-filler strips in lengths as long as practicable. Where more than one length is required, lace or clip sections together.

3.4 CONCRETE PLACEMENT

A. Before placing concrete, verify that installation of formwork, reinforcement, embedded items, and vapor retarder is complete and that required inspections are completed.

   1. Immediately prior to concrete placement, inspect vapor retarder for damage and deficient installation, and repair defective areas.

   2. Provide continuous inspection of vapor retarder during concrete placement and make necessary repairs to damaged areas as Work progresses.

B. Notify Architect and testing and inspection agencies 24 hours prior to commencement of concrete placement.

C. Do not add water to concrete during delivery, at Project site, or during placement unless approved by Architect in writing, but not to exceed the amount indicated on the concrete delivery ticket.

   1. Do not add water to concrete after adding high-range water-reducing admixtures to mixture.

D. Before test sampling and placing concrete, water may be added at Project site, subject to limitations of ACI 301 (ACI 301M), but not to exceed the amount indicated on the concrete delivery ticket.

   1. Do not add water to concrete after adding high-range water-reducing admixtures to mixture.

E. Deposit concrete continuously in one layer or in horizontal layers of such thickness that no new concrete is placed on concrete that has hardened enough to cause seams or planes of weakness.

   1. If a section cannot be placed continuously, provide construction joints as indicated.

   2. Deposit concrete to avoid segregation.

   3. Deposit concrete in horizontal layers of depth not to exceed formwork design pressures and in a manner to avoid inclined construction joints.

   4. Consolidate placed concrete with mechanical vibrating equipment in accordance with ACI 301 (ACI 301M).

      a. Do not use vibrators to transport concrete inside forms.

      b. Insert and withdraw vibrators vertically at uniformly spaced locations to rapidly penetrate placed layer and at least 6 inches (150 mm) into preceding layer.

      c. Do not insert vibrators into lower layers of concrete that have begun to lose plasticity.

      d. At each insertion, limit duration of vibration to time necessary to consolidate concrete, and complete embedment of reinforcement and other embedded items without causing mixture constituents to segregate.

F. Deposit and consolidate concrete for floors and slabs in a continuous operation, within limits of construction joints, until placement of a panel or section is complete.

   1. Do not place concrete floors and slabs in a checkerboard sequence.
2. Consolidate concrete during placement operations, so concrete is thoroughly worked around reinforcement and other embedded items and into corners.


4. Screed slab surfaces with a straightedge and strike off to correct elevations.

5. Level concrete, cut high areas, and fill low areas.

6. Slope surfaces uniformly to drains where required.

7. Begin initial floating using bull floats or darbies to form a uniform and open-textured surface plane, before excess bleedwater appears on the surface.

8. Do not further disturb slab surfaces before starting finishing operations.

3.5 FINISHING FLOORS AND SLABS

A. Comply with ACI 302.1R recommendations for screeding, restraightening, and finishing operations for concrete surfaces. Do not wet concrete surfaces.

B. Scratch Finish:
   1. While still plastic, texture concrete surface that has been screeded and bull-floated or darbied.
   2. Use stiff brushes, brooms, or rakes to produce a profile depth of 1/4 inch (6 mm) in one direction.
   3. Apply scratch finish to surfaces to receive concrete floor toppings.

C. Float Finish:
   1. When bleedwater sheen has disappeared and concrete surface has stiffened sufficiently to permit operation of specific float apparatus, consolidate concrete surface with power-driven floats or by hand floating if area is small or inaccessible to power-driven floats.
   2. Repeat float passes and restraightening until surface is left with a uniform, smooth, granular texture and complies with ACI 117 (ACI A117M) tolerances for conventional concrete.
   3. Apply float finish to surfaces [to receive trowel finish] [and] [to be covered with fluid-applied or sheet waterproofing, built-up or membrane roofing, or sand-bed terrazzo] <Insert locations>.

D. Trowel Finish:
   1. After applying float finish, apply first troweling and consolidate concrete by hand or power-driven trowel.
   2. Continue troweling passes and restraighten until surface is free of trowel marks and uniform in texture and appearance.
   3. Grind smooth any surface defects that would telegraph through applied coatings or floor coverings.
   4. Do not add water to concrete surface.
   5. Do not apply hard-troweled finish to concrete, which has a total air content greater than 3 percent.
   6. Apply a trowel finish to surfaces exposed to view or to be covered with resilient flooring, carpet, ceramic or quarry tile set over a cleavage membrane, paint, or another thin-film-finish coating system.
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7. Finish and measure surface, so gap at any point between concrete surface and an unlevelled, freestanding, 10-ft.- (3.05-m-) long straightedge resting on two high spots and placed anywhere on the surface does not exceed 1/4 inch (6 mm).

E. Trowel and Fine-Broom Finish: Apply a first trowel finish to surfaces where ceramic or quarry tile is to be installed by either thickset or thinset method. While concrete is still plastic, slightly scarify surface with a fine broom perpendicular to main traffic route.

1. Coordinate required final finish with Architect before application.
2. Comply with flatness and levelness tolerances for trowel-finished floor surfaces.

F. Broom Finish: Apply a broom finish to exterior concrete platforms, steps, ramps, and locations indicated on Drawings.

1. Immediately after float finishing, slightly roughen trafficked surface by brooming with fiber-bristle broom perpendicular to main traffic route.
2. Coordinate required final finish with Architect before application.

3.6 INSTALLATION OF MISCELLANEOUS CONCRETE ITEMS

A. Filling In:

1. Fill in holes and openings left in concrete structures after Work of other trades is in place unless otherwise indicated.
2. Mix, place, and cure concrete, as specified, to blend with in-place construction.
3. Provide other miscellaneous concrete filling indicated or required to complete the Work.

3.7 CONCRETE CURING

A. Protect freshly placed concrete from premature drying and excessive cold or hot temperatures.

1. Comply with ACI 301 (ACI 301M) and ACI 306.1 for cold weather protection during curing.
2. Comply with ACI 301 (ACI 301M) and ACI 305.1 (ACI 305.1M) for hot-weather protection during curing.
3. Maintain moisture loss no more than 0.2 lb/sq. ft. x h (1 kg/sq. m x h), calculated in accordance with ACI 305.1, before and during finishing operations.

B. Curing Unformed Surfaces: Comply with ACI 308.1 (ACI 308.1M) as follows:

1. Begin curing immediately after finishing concrete.
2. Interior Concrete Floors:
   a. Floors to Receive Floor Coverings Specified in Other Sections: Contractor has option of the following:
      1) Absorptive Cover: As soon as concrete has sufficient set to permit application without marring concrete surface, install prewetted absorptive cover over entire area of floor.
         a) Lap edges and ends of absorptive cover not less than 12-inches (300-mm).
         b) Maintain absorptive cover water saturated, and in place, for duration of curing period, but not less than seven days.
      2) Moisture-Retaining-Cover Curing: Cover concrete surfaces with moisture-retaining cover for curing concrete, placed in widest practicable width, with sides and ends lapped at least 12 inches (300 mm), and sealed by waterproof tape or adhesive.
a) Immediately repair any holes or tears during curing period, using cover material and waterproof tape.

b) Cure for not less than seven days.

3) Ponding or Continuous Sprinkling of Water: Maintain concrete surfaces continuously wet for not less than seven days, utilizing one, or a combination of, the following:
   a) Water.
   b) Continuous water-fog spray.

3.8 TOLERANCES
   A. Conform to ACI 117 (ACI 117M).

3.9 APPLICATION OF LIQUID FLOOR TREATMENTS
   A. Penetrating Liquid Floor Treatment: Prepare, apply, and finish penetrating liquid floor treatment in accordance with manufacturer's written instructions.
      1. Remove curing compounds, sealers, oil, dirt, laitance, and other contaminants and complete surface repairs.
      2. Do not apply to concrete that is less than [three] [seven] [14] [28] days' old.
      3. Apply liquid until surface is saturated, scrubbing into surface until a gel forms; rewet; and repeat brooming or scrubbing.
      4. Rinse with water; remove excess material until surface is dry.
      5. Apply a second coat in a similar manner if surface is rough or porous.
   B. Sealing Coat: Uniformly apply a continuous sealing coat of curing and sealing compound to hardened concrete by power spray or roller in accordance with manufacturer's written instructions.

3.10 FIELD QUALITY CONTROL
   A. Special Inspections: Owner will engage a special inspector to perform field tests and inspections and prepare testing and inspection reports.
   B. Testing Agency: Owner will engage a qualified testing and inspecting agency to perform tests and inspections and to submit reports.
      1. Testing agency shall be responsible for providing curing container for composite samples on Site and verifying that field-cured composite samples are cured in accordance with ASTM C31/C31M.
      2. Testing agency shall immediately report to Architect, Contractor, and concrete manufacturer any failure of Work to comply with Contract Documents.
      3. Testing agency shall report results of tests and inspections, in writing, to Owner, Architect, Contractor, and concrete manufacturer within 48 hours of inspections and tests.
         a. Test reports shall include reporting requirements of ASTM C31/C31M, ASTM C39/C39M, and ACI 301, including the following as applicable to each test and inspection:
            1) Project name.
            2) Name of testing agency.
            3) Names and certification numbers of field and laboratory technicians performing inspections and testing.
4) Name of concrete manufacturer.
5) Date and time of inspection, sampling, and field testing.
6) Date and time of concrete placement.
7) Location in Work of concrete represented by samples.
8) Date and time sample was obtained.
9) Truck and batch ticket numbers.
10) Design compressive strength at 28 days.
11) Concrete mixture designation, proportions, and materials.
12) Field test results.
13) Information on storage and curing of samples before testing, including curing method and maximum and minimum temperatures during initial curing period.
14) Type of fracture and compressive break strengths at seven days and 28 days.

C. Batch Tickets: For each load delivered, submit three copies of batch delivery ticket to testing agency, indicating quantity, mix identification, admixtures, design strength, aggregate size, design air content, design slump at time of batching, and amount of water that can be added at Project site.

D. Inspections:
1. Headed bolts and studs.
2. Verification of use of required design mixture.
3. Concrete placement, including conveying and depositing.
4. Curing procedures and maintenance of curing temperature.
5. Verification of concrete strength before removal of shores and forms from beams and slabs.

E. Concrete Tests: Testing of composite samples of fresh concrete obtained in accordance with ASTM C 172/C 172M shall be performed in accordance with the following requirements:
1. Testing Frequency: Obtain one composite sample for each day's pour of each concrete mixture exceeding 5 cu. yd. (4 cu. m), but less than 25 cu. yd. (19 cu. m), plus one set for each additional 50 cu. yd. (38 cu. m) or fraction thereof.
   a. When frequency of testing provides fewer than five compressive-strength tests for each concrete mixture, testing shall be conducted from at least five randomly selected batches or from each batch if fewer than five are used.
2. Slump: ASTM C143/C143M:
   a. One test at point of placement for each composite sample, but not less than one test for each day's pour of each concrete mixture.
   b. Perform additional tests when concrete consistency appears to change.
3. Slump Flow: ASTM C1611/C1611M:
   a. One test at point of placement for each composite sample, but not less than one test for each day's pour of each concrete mixture.
   b. Perform additional tests when concrete consistency appears to change.
   a. One test for each composite sample, but not less than one test for each day's pour of each concrete mixture.

5. Concrete Temperature: ASTM C1064/C1064M:
   a. One test hourly when air temperature is 40 deg F (4.4 deg C) and below or 80 deg F (27 deg C) and above, and one test for each composite sample.

   a. One test for each composite sample, but not less than one test for each day's pour of each concrete mixture.

7. Compression Test Specimens: ASTM C31/C31M:
   a. Cast and laboratory cure two sets of three 6-inch (150 mm) by 12-inch (300 mm) or 4-inch (100 mm) by 8-inch (200 mm) cylinder specimens for each composite sample.
   b. Cast, initial cure, and field cure two sets of two standard cylinder specimens for each composite sample.

   a. Test one set of two laboratory-cured specimens at seven days and one set of two specimens at 28 days.
   b. Test one set of two field-cured specimens at seven days and one set of two specimens at 28 days.
   c. A compressive-strength test shall be the average compressive strength from a set of two specimens obtained from same composite sample and tested at age indicated.

9. When strength of field-cured cylinders is less than 85 percent of companion laboratory-cured cylinders, Contractor shall evaluate operations and provide corrective procedures for protecting and curing in-place concrete.

10. Strength of each concrete mixture will be satisfactory if every average of any three consecutive compressive-strength tests equals or exceeds specified compressive strength, and no compressive-strength test value falls below specified compressive strength by more than 500 psi (3.4 MPa) if specified compressive strength is 5000 psi (34.5 MPa), or no compressive strength test value is less than 10 percent of specified compressive strength if specified compressive strength is greater than 5000 psi (34.5 MPa).

11. Nondestructive Testing: Impact hammer, sonoscope, or other nondestructive device may be permitted by Architect but will not be used as sole basis for approval or rejection of concrete.

12. Additional Tests:
   a. Testing and inspecting agency shall make additional tests of concrete when test results indicate that slump, air entrainment, compressive strengths, or other requirements have not been met, as directed by Architect.
   b. Testing and inspecting agency may conduct tests to determine adequacy of concrete by cored cylinders complying with ASTM C42/C42M or by other methods as directed by Architect.
      1) Acceptance criteria for concrete strength shall be in accordance with ACI 301 (ACI 301M), section 1.6.6.3.
13. Additional testing and inspecting, at Contractor’s expense, will be performed to determine compliance of replaced or additional work with specified requirements.

14. Correct deficiencies in the Work that test reports and inspections indicate do not comply with the Contract Documents.

3.11 PROTECTION

A. Protect concrete surfaces as follows:

1. Protect from petroleum stains.
2. Diaper hydraulic equipment used over concrete surfaces.
4. Prohibit use of pipe-cutting machinery over concrete surfaces.
5. Prohibit placement of steel items on concrete surfaces.
6. Prohibit use of acids or acidic detergents over concrete surfaces.
7. Protect liquid floor treatment from damage and wear during the remainder of construction period. Use protective methods and materials, including temporary covering, recommended in writing by liquid floor treatments installer.
8. Protect concrete surfaces scheduled to receive surface hardener or polished concrete finish using Floor Slab Protective Covering.

END OF SECTION
SECTION 04 20 00
UNIT MASONRY

PART 1   GENERAL

1.01   SECTION INCLUDES
A.   Section includes, but is not limited to, the following:
    Concrete Masonry Units
    Brick Unit Masonry
    Mortar and Grout
    Reinforcement and Anchorage
    Flashings
    Accessories
B.   Installation of loose steel lintels and shelf angles furnished Under Section 05 50 00 - Metal Fabrications.
C.   Coordination of the work of this Section with that of other related sections.

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

1.03   RELATED SECTIONS
A.   Related sections include, but are not limited to, the following:
    Section 03 30 00 - Cast-In-Place Concrete
    Section 05 12 00 - Structural Steel Framing
    Section 05 40 00 - Cold-Formed Metal Framing
    Section 05 50 00 - Metal Fabrications, for loose steel lintels and fabricated steel items
    Section 07 21 19 - Foamed-In-Place Insulation
    Section 07 90 05 - Joint Sealers, for backing rod and sealant at control, expansion joints, and joints between masonry and dissimilar materials.

1.04   REFERENCE STANDARDS
A.   Reference standards include, but are not limited to, the following:
    ACI 530/ASCE 5/TMS 402 - Building Code Requirements for Masonry Structures; American Concrete Institute International; 2008
    ACI 530.1/ASCE 6/TMS 602 - Specification for Masonry Structures; American Concrete Institute International; 2008
    ACI SP-66 - Detailing Manual; American Concrete Institute International; 2004
    ASTM A 36/A 36M - Standard Specification for Carbon Structural Steel; 2008
    ASTM A 82/A 82M - Standard Specification for Steel Wire, Plain, for Concrete Reinforcement; 2007
    ASTM A 153/A 153M - Standard Specification for Zinc Coating (Hot-Dip) on Iron and Steel Hardware; 2009
    ASTM A 307 - Standard Specification for Carbon Steel Bolts and Studs, 60 000 PSI Tensile Strength; 2010
    ASTM A 615/A 615M - Standard Specification for Deformed and Plain Billet-Steel Bars for Concrete Reinforcement; 2009b
ASTM A 1008/A 1008M - Standard Specification for Steel, Sheet, Cold-Rolled, Carbon, Structural, High-Strength Low-Alloy, High-Strength Low-Alloy with Improved Formability, Solution Hardened, and Bake Hardenable; 2010
ASTM B 117 - Standard Practice for Operating Salt Spray (Fog) Apparatus; 2009
ASTM B 370 - Standard Specification for Copper Sheet and Strip for Building Construction; 2009
ASTM C 55 - Standard Specification for Concrete Brick; 2009
ASTM C 73 – Standard Specification for Calcium Silicate Brick (Sand-Lime Brick); 2010
ASTM C 90 - Standard Specification for Loadbearing Concrete Masonry Units; 2009
ASTM C 91 - Standard Specification for Masonry Cement; 2005
ASTM C 140 - Standard Test Methods of Sampling and Testing Concrete Masonry Units and Related Units; 2010
ASTM C 144 - Standard Specification for Aggregate for Masonry Mortar; 2004
ASTM C 216 - Standard Specification for Facing Brick (Solid Masonry Units Made From Clay or Shale); 2007a
ASTM C 270 - Standard Specification for Mortar for Unit Masonry; 2008a
ASTM C 331 - Standard Specification for Lightweight Aggregate for Concrete Masonry Units; 2005
ASTM C 476 - Standard Specification for Grout for Masonry; 2009
ASTM C 780 - Standard Test Method for Preconstruction and Construction Evaluation of Mortars for Plain and Reinforced Unit Masonry; 2009
ASTM C 954 - 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; 2010
ASTM C 1314 - Standard Test Method for Compressive Strength of Masonry Prisms; 2010
ASTM D 2000 - Standard Classification System for Rubber Products in Automotive Applications; 2008
ASTM F 594 - Standard Specification for Stainless Steel Nuts; 2009

1.05 ADMINISTRATIVE REQUIREMENTS

A. Preinstallation Meeting: Convene a preinstallation meeting one week before starting work of this section; conduit conference in compliance with requirements of Section 011000 Summary of Work and require attendance by all relevant installers, including the mason’s foreman assigned to this project.

1.06 DEFINITIONS

A. CMU(s): Concrete masonry unit(s).
B. Reinforced Masonry: Masonry containing reinforcing steel in grouted cells.

1.07 SUBMITTALS

A. See Section 01 33 00 - Submittals, for submittal procedures.
B. Product Data: Provide data for each product indicated including, but not limited to, masonry units, mortar, grout, reinforcement and anchors, flashing materials, dampproofing, reinforcing steel positioners and masonry accessories. Include size variation data verifying that actual range of brick unit sizes falls within ASTM C 216 dimensional tolerances for the specified type where modular dimensioning is indicated.
C. Shop Drawings
   1. Reinforcing Steel: Details of fabrication, bending and placement of unit masonry reinforcing steel; comply with ACI SP-66.
   2. Fabricated Flashing: Details expansion joint water stops and other special applications.
D. Samples
   1. Samples for Initial Selection: Where required for the Architect's initial selection, submit for the following:
      a. Face brick
      b. Pigmented mortars
   2. Samples for Verification: For each type and color of the following:
      a. Face brick, in the form of straps of five or more bricks, illustrating each type indicated
      b. Pigmented mortar: label samples to indicate type and amount of pigmentation used
      c. Masonry veneer anchors and fasteners
      d. Accessories embedded in masonry
E. Mason's Certification: Certify that mason and his personnel comply with qualification requirements of this Section; certificates shall be current and signed by the mason. Include a listing of projects successfully completed by the mason during the past 5 years and within 100 miles of the project site.
F. Material Certificates: For each type and size of the following:
1. Masonry units
   a. Include data on material properties and material test reports substantiating compliance with requirements.
   b. For brick units, include size-variation data verifying that actual range of sizes falls within ASTM C 216 dimensional tolerances for the brick type specified.
   c. For concrete masonry units, include data and calculations establishing average net-area compressive strength of units.
   d. For concrete masonry units, provide data verifying compliance with ASTM C 331 for lightweight aggregate.
2. Cementitious Materials: Include brand, type, name of manufacturer, and weight slips at time of delivery.
3. Pre-Blended, Dry Mortar Mixes: Include description of type and proportions of ingredients.
4. Grout Mixes: Include description of type and proportions of ingredients.
5. Reinforcing bars: Include each material and grade.
6. Joint reinforcement: Include each type and size.
7. Anchors, ties, and metal accessories: Include each type and size.

G. Material Test Reports: From a qualified independent testing agency employed and paid by the Contractor indicating and interpreting test results relative to compliance of the following to specified requirements:
1. Unit Masonry Prism Test: For each type of construction required, according to ASTM C 1314.
2. Clay Masonry Unit Test: For each type of unit required, according to ASTM C 67 for compressive strength, initial rate of absorption, and efflorescence. For surface-coated units, include durability of surface appearance after 50 cycles of freezing and thawing.
3. Manufactured Stone Units: For each type of unit required, according to ASTM C 140 for compressive strength and water absorption.
4. Concrete Masonry Unit Tests: For each type of unit required, according to ASTM C 140 for compressive strength.
5. Concrete Masonry Unit Tests: Provide test reports from the Producer of the CMU for this Project indicating the results of the testing criteria as prescribed by ASTM C 151 and ASTM C 641 on a weekly basis during the production of the CMU for this Project. Throughout the production of the CMU for this Project, the Producer of the CMU will also engage an independent certified testing laboratory, at the Producer's expense, to perform the same tests at least once during every six (6) month period, and furnish the test results to the Architect.
6. Mortar Test (Property Specification): For each mix required, according to ASTM C 780 for compressive strength.
7. Grout Test (Compressive Strength): For each mix required, according to ASTM C 1019.

H. Mix Designs: For each type of mortar and grout. Include description of type and proportions of ingredients.
1. Include test reports, according to the test methods listed, for the following properties of each mortar mix required:
   - Compressive Strength: ASTM C 109/C 109M
   - Water Retention: ASTM C 1506
   - Air Content: ASTM C 91
2. Include test reports, according to ASTM C 1019, for compressive strength of each grout mix required.
I. Manufacturer's Cleaning Instructions: Submit masonry unit manufacturers' written cleaning instructions and recommendations for each type of masonry unit indicated. If a cleaning solution is allowed by manufacturers of masonry and precast architectural concrete units, include cleaning solution manufacturer's product data and instruction for its use, and written approval for intended use by solution manufacturer, and manufacturers of masonry and precast architectural concrete units being cleaned.

1.08 QUALITY ASSURANCE

A. Single-Source Responsibility for Masonry Products
   1. Masonry Units: Obtain exposed masonry units of a uniform texture and color, or a uniform blend within the ranges accepted for these characteristics, from a single manufacturer for each different product required for each continuous surface or visually related surfaces.
   2. Mortar Materials: Obtain mortar ingredients of a uniform quality, including color for exposed masonry, from a single manufacturer for each cementitious component and from a single source or producer for each aggregate.
   3. Other Masonry Products: Obtain each type of product from a single manufacturer.


C. Net-Area Compress Strength: For each type of construction required, provide concrete unit masonry that develops 2,500 psi (F'm), unless otherwise indicated, net-area compressive strength at 28 days determined by testing masonry prisms according to ASTM C 1314.

D. Fire Performance Characteristics: Where fire-resistance ratings are indicated, provide materials and construction identical to those of assemblies whose fire resistance has been determined in accordance with ASTM E 119 by a testing and inspecting agency, by equivalent masonry thickness, or by other means, as acceptable to authorities having jurisdiction.

E. Aggregate for Concrete Masonry Units:
   1. If bottom ash is used as aggregate in the CMU, the "Source" for the bottom ash shall be a power station that has a minimum of ten (10) years of continuous experience as a supplier of quality material as verified by independent certified laboratory testing and no defects in the marketplace. Acceptable sources of bottom ash are:
      a. Chesterfield Power Station, Chesterfield County, VA
      b. Mount Storm Power Station, Mt. Storm, WV.

F. Defective Units: Referenced masonry unit standards may allow a certain percentage of units to contain chips, cracks, or other defects exceeding limits stated in the standard. Do not use units where such defects will be exposed in the completed Work.

G. Mason's Qualifications: The mason shall have not less than twenty (20) years documented experience in the work of this Section with experienced and qualified personnel that shall carry out the work required, and who has provided work similar to that required for this project including, but not limited to, load-bearing masonry construction, fire-resistance rated masonry construction, masonry soffits, and installation of precast architectural concrete units in masonry. Mason's field supervisory personnel shall have not less than ten (10) years documented experience.

1.09 MOCKUPS

A. Prior to installation of any unit masonry, and no later than 45 calendar days after Notice to Proceed, erect mockups on site in locations indicated, or if not indicated, as directed by the
Architect. Notify the Architect one week in advance of the date and time when mockups shall be erected, and when ready for review.

B. Build mockups to further verify selections made under sample submittals and to demonstrate aesthetic effects and set quality standards for materials and execution. Construct mockups in compliance with the requirements of this Section utilizing materials, techniques and masons that will be used for the actual work.
   1. Mockup panels shall be L-shaped or otherwise configured to represent all of the wall elements including, but not limited to, face brick colors and textures indicated, accent bands, offsets, arises, and projections.
   2. Provide two (2) mockup panels.

C. Build mockups for typical exterior wall of the size necessary to demonstrate the acceptable level of workmanship for masonry construction represented on the project. The minimum size of a straight panel or a leg of an L-shaped panel shall be approximately 72 inches long by 48 inches high by full thickness, including face and backup wythes and accessories.
   1. Include a sealant-filled movement joint at least 16 inches long in each mock-up.
   2. Include through-wall flashing installed for a 24-inch length in corner of exterior wall mock-up approximately 16 inches down from top of mock-up, with a 12-inch length of flashing left exposed to view (omit masonry above half of flashing).
   3. Include joint and/or penetration treatment, cavity insulation, joint reinforcement, veneer anchors, flashing, expansion joint water stops, dampproofing, cavity drainage material, and weep holes in exterior masonry-veneer wall mockup.

D. Clean one-half of exposed faces of mockups utilizing cleaning method specified and in accordance with manufacturers' written cleaning instructions and recommendations.

E. Protect accepted mockups from the elements with weather-resistant membrane.

F. Acceptance of mockups is for color, texture, and blending of masonry units; relationship of mortar and sealant colors to masonry unit colors; tooling of joints; and aesthetic qualities of workmanship.
   1. Acceptance of mockups is also for other material and construction qualities specifically approved by Architect in writing.
   2. Acceptance of mockups does not constitute approval of deviations from the Contract Documents contained in mockups unless such deviations are specifically approved by Architect in writing.

G. Retain and maintain accepted mockups during construction in undisturbed condition as standards for judging the unit masonry work. When directed by the Architect, demolish mock-ups complete and remove for the project site.

1.10 DELIVERY, STORAGE, AND HANDLING

A. Deliver, handle, and store masonry units by means that will prevent mechanical damage, staining, and contamination by other materials.

B. Lift skids with proper and sufficiently long slings or forks with protection to prevent damage to units. Protect edges and corners.

C. Store masonry units on elevated platforms (not less than 4 inches high) in a dry location. If units are not stored in an enclosed location, cover tops and sides of stacks with waterproof sheeting, securely tied. If units become wet, do not install until they are in an air-dried condition.

D. Store cementitious materials on elevated platforms (not less than 4 inches high), under cover, and in a dry location. Do not use cementitious materials that have become damp.
E. Store aggregates where grading and other required characteristics can be maintained and contamination can be avoided.

F. Deliver pre-blended, dry mortar mix in moisture-resistant containers designed for use with dispensing silos. Store pre-blended, dry mortar mix in delivery containers on elevated platforms (not less than 4 inches high), under cover, and in a dry location or in covered weatherproof dispensing silos.

G. Store masonry accessories, including metal items, to prevent corrosion and accumulation of dirt and oil.

1.11 PROJECT CONDITIONS

A. Protection of Masonry: During construction, cover tops of walls, projections, and sills with waterproof sheeting at end of each day's work. Cover partially completed masonry when construction is not in progress.
   1. Extend cover a minimum of 24 inches down both sides of walls and hold cover securely in place.
   2. 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 un-constructed wythe and hold cover in place.

B. Do not apply uniform floor or roof loads for at least 12 hours and concentrated loads for at least three days after building masonry walls or columns.

C. Stain Prevention: Prevent grout, mortar, and soil from staining the face of masonry to be left exposed or painted. Immediately remove grout, mortar, and soil that come in contact with such masonry. Remove as the work progresses; do not use trowels to remove flesh mortar for face of masonry, utilize brush
   1. Protect base of walls from rain-splashed mud and from mortar splatter by spreading coverings on ground and over wall surface.
   2. Protect sills, ledges, and projections from mortar droppings.
   3. Protect surfaces of window and door frames, as well as similar products with painted and integral finishes, from mortar droppings.
   4. Turn scaffold boards near the wall on edge at the end of each day to prevent rain from splashing mortar and dirt onto completed masonry.
   5. Dry brush surfaces to remove mortar droppings as the work progresses; avoid any motion that will result in rubbing or pressing mortar into the face of masonry. Tool joints when “thumbprint” hard; after tooling, brush excess mortar and dust from surfaces utilizing a dry, medium-soft bristle brush. Clean surfaces as soon as possible after laying.

D. Environmental Requirements
   1. Cold-Weather Requirements: Do not use frozen materials, or materials mixed or coated with ice or frost. Do not build on frozen subgrade, substrates or setting beds. Remove and replace unit masonry damaged by frost or freezing conditions. Comply with cold-weather requirements of ACI 530.1/ASCE 6/TMS 602 or the local Code, whichever is more stringent; and the the following:
      a. Cold-Weather Construction: When the ambient temperature is within the limits indicated, use the following procedures:
         (1) 40 to 32 Degrees F: Heat mixing water or sand to produce mortar temperatures between 80 and 120 degrees F.
         (2) 32 to 25 Degrees F: Heat mixing water and sand to produce mortar temperatures between 80 and 120 degrees F. Heat grout materials to produce grout temperatures between 40 and 120 degrees F. Maintain mortar and grout above freezing until used in masonry.
(3) 25 to 20 Degrees F: Heat mixing water and sand to produce mortar temperatures between 80 and 120 degrees F. Heat grout materials to produce grout temperatures between 40 and 120 degrees F. Maintain mortar and grout above freezing until used in masonry. Heat masonry units to 40 degrees F if grouting. Use heat on both sides of walls under construction.

(4) 20 Degrees F and Below: Heat mixing water and sand to produce mortar temperatures between 80 and 120 degrees F. Heat grout materials to produce grout temperatures between 40 and 120 degrees F. Maintain mortar and grout above freezing until used in masonry. Heat masonry units to 40 degrees F. Provide enclosures and use heat on both sides of walls under construction to maintain temperatures above 32 degrees F within the enclosures.

b. Cold-Weather Protection: When the mean daily temperature is within the limits indicated, provide the following protection:

(1) 40 to 25 Degrees F: Cover masonry with a weather-resistant membrane for 48 hours after construction.

(2) 25 to 20 Degrees F: Cover masonry with insulating blankets or provide enclosure and heat for 48 hours after construction to prevent freezing. Install wind breaks when wind velocity exceeds 15 mph.

(3) 20 Degrees F and Below: Provide enclosure and heat to maintain temperatures above 32 degrees F within the enclosure for 48 hours after construction.

c. Cold-Weather Cleaning: Use liquid cleaning methods only when air temperature is 40 degrees F (4 deg C) and above and will remain so until masonry has dried out, but not less than 7 days after completion of cleaning.

2. Hot-Weather Requirements: Comply with hot-weather requirements of ACI 530.1/ASCE 6/TMS 602 or the local Code, whichever is more stringent. Protect unit masonry work when temperature and humidity conditions produce excessive evaporation of water from mortar and grout. Provide artificial shade and wind breaks and use cooled materials as required. Do not apply mortar to substrates with temperatures of 100 degrees F and above.

PART 2 PRODUCTS

2.01 CONCRETE MASONRY UNITS

A. General

1. Regional Materials: CMUs shall be manufactured within 500 miles of project site from aggregates that have been extracted, harvested, or recovered, as well as manufactured, within 500 miles of project site.

2. Exposed Faces

a. Provide manufacturer's standard color and texture, unless otherwise indicated. Exposed faces shall be comparatively smooth, of uniform texture, and free of surface defects including, but not limited to, voids, spalls, cracks, and chipped or broken edges.

b. Do not use aggregates made from pumice, scoria, tufa or tuff where concrete masonry will be exposed to view or painted in the completed construction.

3. Fire-Resistance Ratings: Where fire-resistance rated construction is indicated, provide concrete masonry units classified by UL, or another testing and inspection agency acceptable to the authorities having jurisdiction, for the hourly-rated design assembly indicated.
4. Shapes: Provide shapes indicated and as follows, with exposed surfaces matching exposed faces of adjacent units.
   a. Provide special shapes for lintels, corners, 135-degree corners, jambs, sashes, movement joints, headers, bonding, and other special conditions.
   b. Provide one-inch radius bullnose units for exposed outside corners unless otherwise indicated.

B. Concrete Masonry Units: 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.
   2. Load-Bearing Units: ASTM C 90, provide hollow units, except where solid units are indicated or required.
      a. Density Classification: Lightweight (105 lbs/cu ft maximum average oven-dry density) with aggregate strictly complying with ASTM C 331, unless otherwise indicated.
      b. Unit Compressive Strength: 2,800 psi minimum average net area unit compressive strength, unless otherwise indicated.
      c. Lightweight Aggregates: Lightweight aggregate used shall strictly comply with ASTM C 331, ASTM C 151, and ASTM C 641.
      d. Moisture Content and Linear Shrinkage Limitations: Limit moisture absorption content to 35 percent maximum with linear shrinkage limited to 0.065 percent.
      e. Dry shrinkage of aggregate shall not exceed 0.10 percent at 100 days.
      f. Fly ash that meets ASTM C 618 may be used as a cement replacement, but shall NOT be used as an aggregate.
      g. Provide concrete masonry units containing thirty percent (30%) pre-consumer recycled content by weight. All recycled aggregate content shall comply with ASTM C 331 for lightweight aggregates. Aggregates not in compliance will not be permitted.
      h. Regional Materials: Provide CMU that have been manufactured within 500 miles of the Project Site from materials and products that have been extracted, harvested or recovered, as well as manufactured, within 500 miles of the Project site.

C. Concrete Building Bricks: ASTM C 55; provide cored units, except where solid units are indicated or required.
   1. Grade and Unit Compressive Strength: Grade N, 3,500 psi minimum average net area unit compressive strength, unless otherwise indicated.
   2. Weight Classification: Lightweight (105 lbs/cu ft maximum average oven-dry weight) with aggregate strictly complying with ASTM C 331, unless otherwise indicated. Dry shrinkage of aggregate shall not exceed 0.10 percent at 100 days.
   3. Water Absorption: 15 lb/cu ft (Grade N, Lightweight) maximum.

D. Concrete Unit Masonry Lintels: Built-in-place unit masonry lintels made from bond beam CMUs with reinforcing bars placed as indicated and filled with grout. Temporarily support built-in-place lintels until cured.

2.02 BRICK UNITS
A. General
   1. Recycled Content: Postconsumer recycled content plus one-half of preconsumer recycled content not less than 20 percent.
2. Exposed Faces: Provide the manufacturer's colors and textures indicated. Exposed faces shall be of uniform texture, and free of surface defects including, but not limited to, voids, spalls, cracks, and chipped or broken edges.

3. Shapes: Provide shapes indicated and as follows, with exposed surfaces matching color and texture of exposed faces of adjacent units:
   a. For ends of sills, caps, opening heads, and for similar applications that would otherwise expose unfinished brick surfaces, provide units without cores or frogs and with exposed surfaces finished.
   b. Provide special shapes for applications requiring brick of size, form, color, and texture on exposed surfaces that cannot be produced by sawing.
   c. Provide special shapes for applications where shapes produced by sawing would result in sawed surfaces being exposed to view.
   d. See Drawings for brick shapes

4. Initial Rate of Absorption (IRA): Less than 30 g/30 sq in per minute when tested in accordance with ASTM C 67.

5. Efflorescence: Provide brick that has been tested according to ASTM C 67 and is rated "not effloresced."

B. Face Brick: ASTM C 216, Type FBS, Grade SW.

2.03 MORTAR AND GROUT MATERIALS

A. Regional Materials: Aggregate for mortar and grout shall be extracted, harvested, or recovered, as well as manufactured, within 500 miles of project site.

B. Masonry Cement: ASTM C 91, Type S, except where Type M mortar is indicated on the Structural Drawings. For colored mortar(s), provide packaged formulation(s) as required to match the Architect's sample (WR 2073). Utilize colored masonry cement of formulation required to produce the indicated, or selected, color; pigments shall not exceed five (5) percent of masonry cement by weight for mineral oxides, nor one (1) percent for carbon black. Subject to compliance with the requirements of this Section, provide one the following:
   Essroc Italcementi Group; Flamingo-Brixment: www.essroc.com
   Lehigh Cement Company; Lehigh Masonry Cement: www.lehighcement.com
   North America Inc; Magnolia or Lafarge Masonry Cement: www.lafargenorthamerica.com

C. Portland Cement: ASTM C 150, Type I or II, except Type III may be used for cold-weather construction; not more than 0.60 percent alkali. Provide natural color or white cement as required to produce mortar color indicated.

D. Hydrated Lime: ASTM C 207, Type S.

E. Mortar Aggregate: ASTM C 144; for mortars exposed to view, use washed aggregate consisting of natural sand or crushed stone.
   1. White-Mortar Aggregates: Natural white sand or crushed white stone.
   2. Colored-Mortar Aggregates: Natural sand or crushed stone of color necessary to produce required mortar color.
   3. For joints less than 1/4 inch thick, use aggregate graded with 100 percent passing the No. 16 sieve.

F. Grout Aggregate: ASTM C 404.
G. Water: Clean and potable.

2.04 REINFORCEMENT AND ANCHORAGE

A. Reinforcing Steel: ASTM A 615/A 615M Grade 60 (420) deformed billet bars; uncoated.

B. Reinforcing Steel Positioners: Wire units designed to fit into mortar bed joints spanning masonry unit cells and hold reinforcing bars in center of cells. Units are formed from 0.148-inch (9-gauge) steel wire, ASTM A 153/A 153M hot-dip galvanized after fabrication. Provide units designed for number of bars indicated. Subject to compliance with the requirements of this Section, provide reinforcing steel positioners as manufactured by one of the following:
   Hohmann & Barnard Inc: www.h-b.com
   Dur-O-Wal: www.dur-o-wal.com
   Wire-Bond: www.wirebond.com

C. Joint Reinforcement: ASTM A 951/A 951M ladder type joint reinforcement unless otherwise indicated, lengths of not less than 10 feet, with cross rods spaced not more than 16 inches on centers; provide prefabricated corner and tee units.
   1. Manufacturers: Subject to compliance with the requirements of this Section, provide joint reinforcement as manufactured by one of the following:
      Hohmann & Barnard Inc: www.h-b.com
      Dur-O-Wal: www.dur-o-wal.com
      Wire-Bond: www.wirebond.com
   2. 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; 0.1875 inch side rods with 0.1483 inch cross rods; width as required to provide not more than 3/4 inch and not less than 1/2 inch of mortar coverage on each exposure.
   3. Multiple Wythe Joint Reinforcement: Ladder type; ASTM A 82/A 82M steel wire, hot dip galvanized after fabrication to ASTM A 153/153M, Class B; 0.1875 inch side rods with 0.1483 inch cross rods; width as required to provide not more than 3/4 inch and not less than 1/2 inch of mortar coverage on each exposure. Provide one side rod for each face shell of hollow masonry units more than 4 inches in nominal width plus one side rod at each wythe of masonry 4 inches or less in nominal width.

D. Ties and Anchors
   1. Materials: Provide ties and anchors made from materials that comply with the following unless otherwise indicated:
      c. Steel Plates, Shapes, and Bars: ASTM A 36/A 36M.
   2. Strap Anchors: Bent steel shapes configured as required for specific situations, 1-1/4 in width, 0.105 in thick, lengths as required to provide not more than 3/4 inch and not less than 1/2 inch of mortar coverage from masonry face, corrugated for embedment in masonry joint, hot dip galvanized to ASTM A 153/A 153M, Class B.
   3. Flexible Anchors: 2-piece anchors that permit differential movement between masonry and building frame, sized to provide not more than 3/4 inch and not less than 1/2 inch of mortar coverage from masonry face.
      a. Concrete frame: Dovetail anchors of bent steel strap, nominal 1 inch width x 0.024 in thick, with trapezoidal wire ties 0.1875 inch thick, hot dip galvanized to ASTM A 153/A 153M, Class B, and removable foam slot filler.
      b. Steel Frame: Anchor plate for welding to frame, rib-stiffened, not less than 0.104-inch thick by 0.75 inch wide by 6 inches long, allowing 4 inches of vertical...
adjustment. Provide 0.1875 inch diameter wire ties, hot dip galvanized to ASTM A 153/A 153M, Class B, trapezoidal in shaped at column flanges, and 12 inches long with 4 inch high trapezoidal top section at column webs.

4. Wire Ties: Formed steel wire, 0.1875 inch thick, hot dip galvanized to ASTM A 153/A 153M, Class B, sized to provide not more than 3/4 inch and not less than 1/2 inch of mortar coverage from masonry face.
   a. Where units are laid with cells vertical, provide rectangular-shaped ties, not less than 4 inches wide, with closed ends.
   b. Where wythes are of differing materials, provide 2-piece pintle and eye ties allowing up to 1-1/4 inch adjustment.

5. Masonry Veneer Anchors: Two-piece anchors that permit differential movement between masonry veneer and structural backup, capable of withstanding a 100 lb-ft load in both tension and compression without deforming or developing play in excess of 0.05 inches, hot dip galvanized to ASTM A 153/A 153M, Class B.
   a. Product: Subject to compliance with the requirements of this Section, provide one of the following veneer anchors:
      Hohmann & Barnard Inc; MWT:  www.h-b.com
      Dur-O-Wal; DA960:  www.dur-o-wal.com
      Wire-Bond; 1900:  www.wirebond.com
   b. Anchor Section Plate (L-Shape): Rib-stiffened L-shape plate, not less than 0.075 inch thick with horizontal leg sized to accommodate insulation thickness indicated; designed for screw attachment to CMU substrate and to studs through sheathing by two (2) fasteners.
   c. Pintle Wire Ties: Rectangular shape ties, not less than 0.1875 inch diameter, sized to provide not more than 3/4 inch and not less than 1/2 inch of mortar coverage from masonry face.
   d. Vertical adjustment: Not less than 1-1/4 inches.

6. Dowels: 1/4-inch diameter x 1-inch long unless otherwise indicated, smooth, hot-dipped galvanized steel dowels; provide at manufacturer stone units where indicated.

7. Mesh Wall Ties: ASTM A 153/A 153M, Class B, hot-dipped galvanized 1/2-inch square by 16-gauge wire mesh, sized to provide not more than 3/4 inch and not less than 1/2 inch of mortar coverage from masonry face, complying with ASTM A 82 and ASTMA 740. Subject to compliance with the requirements of this Section, provide one of the following veneer anchors:
   a. Hohmann & Barnard Inc; MWT:  www.h-b.com
   b. Dur-O-Wal; DA960:  www.dur-o-wal.com
   c. Wire-Bond; 1900:  www.wirebond.com

8. Miscellaneous Anchors
   a. Anchor Bolts: Steel bolts complying with ASTM A 307, Grade A, with ASTM A 563/A 563M hex nuts and, where indicated, flat washers; hot-dip galvanized to comply with ASTM A 153/A 153M, Class C; of diameters and lengths indicated and in the following configurations:
      (1) Headed bolts
      (2) Non-headed bolts, bent in manner indicated
   b. Post-Installed Anchors: Torque-controlled expansion anchors, chemical anchors and masonry/concrete screw anchors complying with the following:
      (1) Interior Locations: Carbon-steel components zinc plated to comply with ASTM B 633 or ASTM F 1941/F 1941M, Class Fe/Zn 5 (5 microns) for Class SC 1 service conditions (mild) unless otherwise indicated.
(2) Exterior Locations and Where Stainless Steel is Indicated: Group 1, Alloy 304, or Group 2, Alloy 316, ASTM F 593 stainless-steel bolts and ASTM F 594 nuts.

2.05 CONCEALED AND THRU-WALL FLASHINGS

A. General: Use only where flashing is fully concealed in masonry, not exposed to the exterior, unless otherwise indicated.

B. Metal Flashing: Provide metal flashing complying with SMACNA's "Architectural Sheet Metal Manual" and the following:
   2. Water Stops, Expansion Joint: Fabricate to shapes indicated in continuous sections 96 inches long minimum, but not exceeding 144 inches. Provide lap sections not less than 4 inches in direction of water flow; solder laps below grade.

C. Flexible Flashing
   1. Thru-Wall Flashing, Non-Asphaltic Copper Core: ASTM B 370, 060 Temper, copper core, 5 oz/sq ft, with non-asphaltic adhesive glass fabric laminated to each copper face. Subject to compliance with requirements of this Section, provide one of the following products:
      a. York Manufacturing Inc; Multi-Flash 500 5-Ounce (Red): www.yorkmfg.com
      b. Advanced Building Products Inc; Copper Sealite 2000 Flashing: www.advancedflashing.com
      c. Sandell Manufacturing Company Inc; Copper Fabric NA Flashing: www.sandellmfg.com
   2. Self-Adhering Membrane Flashing, Rubberized-Asphalt: Composite flashing product consisting of a pliable, adhesive rubberized-asphalt compound, bonded to a high-density, cross-laminated polyethylene film to produce an overall thickness of not less than 0.030 inch. Subject to compliance with requirements of this Section, provide one of the following products:
      a. Hohmann & Barnard Inc; TeXtroflash Flashing: www.h-b.com
      c. Advanced Building Products Inc; Strip-N-Flash Flashing: www.advancedflashing.com
      d. Sandell Manufacturing Company Inc; Sando-Seal Flashing: www.sandellmfg.com (rubberized)

D. Adhesives, Primers, and Seam Tapes for Flashings: Flashing manufacturer's standard products or products recommended by flashing manufacturer for bonding flashing sheets to each other and to substrates.

2.06 ACCESSORIES

A. Nonmetallic Expansion Joint Fillers: Premolded filler strips complying with ASTM D 1056, Type 2 (closed-cell), Class A (synthetic, natural or reclaimed rubber or rubber-like material, alone or in combination), Grade 1 (2 to 5 psi compressive-deflection range), compressible up to 35 percent, and of width and thickness indicated; formulate from neoprene.

B. Preformed Control-Joint Gaskets: Made from styrene-butadiene-rubber compound complying with ASTM D 2000, Designation M2AA-805, or polyvinyl chloride (PVC) complying with ASTM D 2287, Type PVC-65406, and designed to fit standard sash block and to maintain lateral stability in masonry wall; size and configuration as indicated.
C. Bond-Breaker Strips: Asphalt-saturated, organic roofing felt complying with ASTM D 226, Type I (No. 15 asphalt felt).

D. Metal Termination Bars: Predrilled stainless-steel bars, approximately 1 by 1/8 inch thick; with anchors.

E. Mortar Collection System: HDPE strands woven into 90% open mesh; 1 inch thickness; Basis of Design: H&B Mortar Trap.

F. Weeps: Provide open head joints.

G. Brick Vents: cast aluminum brick vent, as manufactured by Greenheck with straight duct connector for extension through the exterior wall assembly into the inside face of the concrete masonry unit exterior wall, with baked enamel paint finish.

2.07 MORTAR AND GROUT MIXES

A. General
   1. Do not use admixtures, including pigments, air-entraining agents, accelerators, retarders, water-repellent agents, antifreeze compounds, or other admixtures, unless otherwise indicated.
   2. Do not use calcium chloride in mortar or grout.

B. Mortar for Unit Masonry: ASTM C 270, using the Proportion Specification. Provide the following types of mortar for applications indicated:
   1. Reinforced masonry, and masonry below grade, and in contact with earth: Type M
   2. Unreinforced masonry above grade: Type S

C. Grout: ASTM C 476, proportioned to obtain 28-day compressive strength indicated. Consistency shall be as 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. Examine conditions, with Installer present, for compliance with requirements for installation tolerances and other conditions affecting performance of the Work.

B. Verify the following:
   1. Field conditions are acceptable and are ready to receive masonry; and foundations are within tolerances specified and reinforcing dowels are properly placed.
   2. Related items provided under other sections are properly sized and located.
   3. Built-in items are in proper location, and ready for roughing into masonry work; and piping and conduit systems, and their connections are in place and properly located.

3.02 PREPARATION

A. Direct and coordinate placement of metal anchors supplied for installation under other sections.

B. Provide temporary centering, shoring and bracing during installation of masonry work. Maintain in place until building structure provides permanent bracing.

C. The Contractor shall coordinate sequencing and scheduling of the work of this Section with that of other trades including, but not limited to, precast architectural concrete, sheet
waterproofing, foamed-in-place insulation, interior finish system (IFS), sheet metal flashing and trim, and firestopping.

3.03 INSTALLATION, GENERAL

A. 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 to the fullest extent 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. Cut manufactured stone units in accordance with manufacturer’s instructions. 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. Mix units from several pallets or cubes as they are placed.

F. Wet brick made from clay or shale before laying only if initial rate of absorption exceeds 30 g/30 sq in per minute when tested per ASTM C 67. Wet brick and manufactured stone units in accordance with their manufacturers’ instructions; allow units to absorb water so they are damp but not wet at time of laying. Do not wet concrete masonry units.

3.04 LAYING MASONRY WALLS

A. Lay out walls in advance for accurate spacing of surface bond patterns with uniform joint thicknesses and for accurate location of openings, movement-type joints, returns, and offsets. Avoid using less-than-half-size units, particularly at corners, jambs, and, where possible, at other locations.

B. Unless otherwise indicated, lay exposed masonry in running bond; do not use units with less than nominal 4-inch horizontal face dimensions at corners or jambs.

C. Lay concealed masonry with all units in a wythe in running bond. Bond and interlock each course of each wythe at corners. Do not use units with less than nominal 4-inch horizontal face dimensions at corners or jambs.

D. Stop work by racking back units in each course from those in course below; do not tooth. When resuming work, clean masonry surfaces that are to receive mortar, remove loose masonry units and mortar, and wet brick if required before laying fresh masonry.

E. As construction progresses, build in items specified in this and other sections. Fill in solidly with masonry around built-in items.

F. Fill space between steel frames and masonry solidly with mortar unless otherwise indicated.

G. Where built-in items are to be embedded in cores of hollow masonry units, place a layer of metal lath, wire mesh, or plastic mesh in the joint below and rod mortar or grout into core.

H. Fill cores in hollow CMUs with grout 24 inches (3 CMU courses) under bearing plates, beams, lintels, posts, and similar items unless otherwise indicated.

I. Build non-load-bearing interior partitions full height of story to underside of solid floor or roof structure above unless otherwise indicated.

1. Install compressible filler in joint between top of partition and underside of structure above.

2. At fire-rated partitions, treat joint between top of partition and underside of structure above to comply with Section 07 84 00 - Firestopping.
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; except for minor variations required to maintain bond alignment, lay masonry with 3/8-inch joints unless otherwise indicated.
C. Concrete Masonry Units
   1. Coursing: One unit and one mortar joint to equal 8 inches.
   2. Bond: Running Bond
   3. Mortar Joints: Provide tooled concave joints unless otherwise noted. At exterior walls, this joint type shall be used for the interior face and exterior face of the CMU. This is a mandatory project requirement.
D. Brick Units
   1. Coursing: Three (3) units and three (3) mortar joints to equal 12 inches.
   2. Bond: Running Bond
   3. Mortar Joints: Concave

3.06 PLACING AND BONDING
A. Lay solid masonry units in full bed of mortar, with full head joints, uniformly jointed with other work.
B. Lay hollow masonry units with face shell bedding on head and bed joints.
   1. With face shells fully bedded in mortar and with head joints of depth equal to bed joints.
   2. With webs fully bedded in mortar in all courses of piers, columns and pilasters; and in grouted masonry, including starting course on footings.
   3. With entire units, including areas under cells, fully bedded in mortar at starting course on footings where cells are not grouted.
C. Buttering corners of joints or excessive furrowing of mortar joints is not permitted. Butter unit ends with sufficient mortar to fill head joints and shove into place. Do not deeply furrow bed joints or slush head joints.
D. Remove excess mortar and mortar smears as work progresses. Dry brush surfaces to remove mortar droppings as the work progresses; avoid any motion or technique that will result in rubbing or pressing mortar into the face of masonry. Tool joints when "thumbprint" hard; after tooling, brush excess mortar and dust from surfaces utilizing a dry, medium-soft bristle brush.
E. Interlock intersections and external corners.
F. Do not shift or tap masonry units after mortar has achieved initial set. Where adjustment must be made, remove mortar and replace.
G. Tool exposed joints slightly concave when thumbprint hard, using a 3/4-inch jointer unless otherwise indicated. Tool joints on both sides of CMU masonry unless otherwise indicated.
H. Cut mortar joints flush where wall tile is scheduled.
I. Architectural precast trim: rake mortar joints between architectural precast trim and dissimilar materials. Strike joints 3/8" deep and provide continuous sealant joint.
J. Interior concrete masonry unit wall construction: all outside corners shall have radiused CMU, except for locations directly adjacent to suspended acoustical tile ceilings, or, gypsum wallboard ceilings. At those locations provide for square edge concrete masonry unit where the CMU is directly adjacent to the ceiling.

3.07 CAVITY MORTAR CONTROL
A. Do not permit mortar or other materials to drop or accumulate into cavity air.

B. For cavity walls, build inner wythe ahead of outer wythe to accommodate accessories.

3.08 REINFORCEMENT AND ANCHORAGE

A. General

1. Provide continuous horizontal joint reinforcement as indicated. Install entire length of longitudinal side rods in mortar with a minimum cover of not more than 3/4 inch and not less than 1/2 inch of mortar coverage on each exposure.
   a. Interrupt joint reinforcement at control and expansion joints unless otherwise indicated.
   b. Provide continuity at corners and wall intersections by using prefabricated L-shaped and T-shaped units, respectively. Cut and bend reinforcing units as directed by manufacturer for continuity at returns, offsets, column fireproofing, pipe enclosures, and other special conditions.
   c. Unless otherwise indicated, install horizontal joint reinforcement 16 inches on center above grade, and 8 inches on center below grade.

2. Place masonry joint reinforcement in first and second horizontal joints above and below openings and extend minimum 16 inches each side of opening.

3. Lap joint reinforcement ends minimum 6 inches.

4. Reinforce joint corners and intersections with mesh anchors 16 inches on center unless otherwise indicated.

5. Secure anchors to structural framing and embed in masonry joints as masonry is laid. Unless otherwise indicated on drawings or closer spacing is indicated under specific wall type, space anchors at maximum of 32 inches horizontally and 16 inches vertically.
   a. Provide an open space not less than 1/2-inch-wide between masonry and structural steel or concrete unless otherwise indicated. Keep open space free of mortar and other rigid materials.
   b. Anchor masonry to structural members with flexible anchors embedded in masonry joints and attached to structure.

B. Single Wythe Masonry

1. Install horizontal joint reinforcement 16 inches on center above grade, and 8 inches on center below grade.

2. Place masonry joint reinforcement in first and second horizontal joints above and below openings. Extend minimum 16 inches each side of opening.

3. Lap joint reinforcement ends minimum 6 inches.

C. Masonry Veneer

1. Install horizontal joint reinforcement 16 inches on center above grade, and 8 inches on center below grade. Do not bridge concrete masonry expansion joint cavities with horizontal joint reinforcement.

2. Place masonry joint reinforcement in first and second horizontal joints above and below openings. Extend minimum 16 inches each side of opening.

3. Lap joint reinforcement ends minimum 6 inches.

4. At multi-wythe concrete masonry back-up, provide horizontal joint reinforcement with one side rod for each each face shell of hollow masonry units more than 4 inches in nominal width plus one side rod for each wythe of masonry 4 inches or less in nominal width.
5. Secure veneer anchors to concrete, concrete masonry, and stud-framed back-up and embed into masonry veneer at maximum 16 inches on center vertically and 32 inches on center horizontally. Place additional anchors at perimeter of openings and ends of panels, so maximum spacing of anchors is 8 inches on center.

D. Cavity Wall Masonry
1. Install horizontal joint reinforcement 16 inches on center above grade, and 8 inches on center below grade. Do not bridge expansion joint cavities with horizontal joint reinforcement.
2. Place masonry joint reinforcement in first and second horizontal joints above and below openings. Extend minimum 16 inches each side of openings.
3. Lap joint reinforcement ends minimum 6 inches.

E. Multiple Wythe Unit Masonry
1. At multi-wythe concrete masonry, provide horizontal joint reinforcement with one side rod for each each face shell of hollow masonry units more than 4 inches in nominal width plus one side rod for each wythe of masonry 4 inches or less in nominal width.
2. Install horizontal joint reinforcement 16 inches on center above grade, and 8 inches on center below grade.
3. Place masonry joint reinforcement in first and second horizontal joints above and below openings. Extend minimum 16 inches each side of opening.
4. Lap joint reinforcement ends minimum 6 inches.
5. Use continuous horizontal joint reinforcement installed in horizontal mortar joints to bond wythes together.
6. At corners, provide interlocking masonry unit bond in each course unless otherwise indicated. In addition to masonry bond, provide continuity of horizontal joint reinforcement with prefabricated corner units.
7. Except where vertical expansion or control joints are indicated at intersecting or abutting walls, provide continuity of horizontal joint reinforcement with prefabricated tee units.

3.09 REINFORCED UNIT MASONRY
A. Temporary Formwork and Shores: Construct formwork and shores to support reinforced masonry elements during construction. The Contractor shall be responsible for the design and erection of all safeguards necessary to protect the construction.
1. Construct formwork to conform to shape, line, and dimensions shown. Make sufficiently tight to prevent leakage of mortar and grout. Brace, tie, and support forms to maintain position and shape during construction and curing of reinforced masonry.
2. Do not remove forms and shores until reinforced masonry members have obtained sufficient strength to allow members to carry their own weight and other temporary loads that may be placed on them during construction.

B. Placing Reinforcing: Clean, free of loose rust, mill scale, earth, ice or other materials which will reduce bond to mortar or grout. Do not use reinforcing bars with kinks or bends not indicated on Drawings or final shop drawings, or bars with reduced cross-section due to excessive rusting or other causes. Anchor reinforced masonry work to supporting structure as indicated.
1. Place in accordance with requirements of referenced masonry standards. Except where approved by the Architect, dowels and reinforcing shall not be bent or deformed in the field or after it has been embedded in concrete, grout or mortar.
2. Position reinforcing accurately with bar positioners at the spacing indicated. Support and secure vertical bars against displacement. Horizontal reinforcing may be placed as the masonry work progresses. Where vertical bars are indicated in close proximity, provide a clear distance between bars of not less than the nominal bar diameter or 1 inch (whichever is greater).

3. For columns, pier and pilasters, provide a clear distance between vertical bars as indicated, but not less than 1-1/2 times the nominal bar diameter or 1-1/2 inches whichever is greater. Provide lateral ties as indicated.

4. Splice reinforcing bars where indicated; do not splice at other points unless acceptable to the Architect. Provide lapped splices, unless otherwise indicated. In splicing vertical bars or attaching to dowels, lap ends, place in contact and wire tie. Provide not less than minimum lap indicated, or if not indicated, as required by governing code.

5. Embed horizontal joint reinforcement and metal ties in mortar joints as the work progresses, with a minimum mortar cover of not more than 3/4 inch and not less than 1/2 inch of mortar coverage on each exposure.

C. Placing Reinforced Unit Masonry
1. General: Lay concrete masonry units with full-face shell mortar beds. Fill vertical head joints (end joints between units) solidly with mortar from face of unit to a distance behind face equal to or less than the thickness of longitudinal face shells. Solidly bed cross-webs of starting courses in mortar. Maintain head and bed joint width as indicated, or if not indicated, provide 3/8-inch joints.
   a. Do not wet concrete masonry units.
   b. Where solid concrete masonry units are indicated, lay with full mortar head and bed joints.

2. Walls: Maintain vertical continuity of core or cell cavities, which are to be reinforced and grouted, to provide minimum clear dimensions indicated, and to provide minimum clearance and grout coverage for vertical reinforcing bars. Keep cavities free of mortar and other materials. Solidly bed webs in mortar where adjacent to reinforced cores or cells.
   a. Lay concrete masonry unit wall in pattern bond indicated unless otherwise specified or noted. Bond and interlock each course at corners and intersections. Use special-shaped units where indicated, and as required for corners, jambs, control joints, lintels, bond beams, and other special conditions.
   b. Where horizontal reinforced beams (bond beams) are indicated, use special units to allow for placement of continuous horizontal reinforcing bars. Place small mesh expanded metal lath or wire screening in mortar joints under bond beam courses over cores or cells of non-reinforced vertical cells, or provide units with solid bottoms.

3. Pilasters: Use concrete masonry units of the size, shape, and number of vertical core spaces indicated. If not indicated, use units that provide minimum clearances and grout coverage for number and size of vertical reinforcing.
   a. Provide pattern bond indicated, or if not indicated, alternate head joints in vertical alignment.
   b. Where bonded pilaster construction is indicated, lay wall and pilaster units together to maximum pour height specified.

D. Grouting: Use “fine grout” for filling spaces less than 4 inches in both horizontal directions; use “course grout” for filling spaces 4 inches or larger in both horizontal directions.
1. Preparation of Grout Spaces: Prior to grouting, inspect and clean grout spaces. Remove dust, dirt, mortar droppings, loose pieces of masonry, and other foreign materials from grout spaces. Clean reinforcing and adjust to proper position. Clean top surface of structural members supporting masonry to ensure bond. After final
cleaning and inspection, close cleanout holes and brace closures to resist grout pressures.

a. Do not place grout until entire height of masonry to be grouted has attained sufficient strength to resist displacement of masonry units and breaking of mortar bond. Install shores and bracing, if required, before starting grouting operations.

b. Place grout by pumping into grout spaces, unless alternate methods are acceptable to the Architect.

c. Limit grout pours to sections that can be completed in one working day with not more than one-hour interruption of pouring operation. Place grout in lifts that do not exceed maximum limit for the grouting technique used. Allow not less than 30 minutes, nor more than one hour between lifts of a given pour. Rod or vibrate each grout lift during pouring operation.

d. Place grout in lintels over openings in one continuous pour.

e. Where bond beam occurs more than one course below top of pour, fill bond beam course to within one inch of vertically reinforced cavities, during construction of masonry.

f. When more than one pour is required to complete a given section of masonry, extend reinforcing beyond masonry as required for splicing. Pour grout to within 1 1/2 inch of top course of first pour. After grouted masonry is cured, lay masonry units and place reinforcing for second pour section before grouting. Repeat sequence if more pours are required.

2. Grouting Technique: At the Contractor's option, and subject to the requirements specified below, use either low-lift or high-lift grouting technique.

a. Low-Lift Grouting

(1) Provide minimum clear dimension of 2 inches and clear area of 8 square inches in vertical cores to be grouted.

(2) Place vertical reinforcing prior to laying concrete masonry units. Extend above elevation of maximum pour height as required to allow for splicing. Support in position at vertical intervals not exceeding 192 bar diameters nor 10 feet.

(3) Lay concrete masonry units to maximum pour height. Do not exceed 4 feet height, or if bond beam occurs below 4 feet height, stop pour at course below bond beam.

(4) Pour grout using container with spout or by chute. Rod or vibrate grout during placing. Place grout continuously; do not interrupt pouring of grout for more than one hour. Terminate grout pores 1-1/2 inches below top course of pour.

b. High-Lift Grouting

(1) Do not use high-lift grouting technique for grouting of concrete masonry units unless minimum cavity dimensions are 3 inches and 10 square inches.

(2) Provide cleanout holes in first course at all vertical cells that are to be filled with grout. Use units with one face shell removed and provide temporary supports for units above, or use header units with concrete brick supports, or cut openings in one face shell.

(3) Construct masonry to full height of maximum grout pour specified prior to placing grout.

(4) Limit grout lifts to a maximum height of 5 feet and grout pour to a maximum height of 24 feet, for single-wythe hollow concrete masonry walls, unless otherwise indicated.

(5) Place vertical reinforcing before grouting. Place before or after laying masonry units, as required by job conditions. Tie vertical reinforcing to
dowels at base of masonry where indicated and thread concrete masonry units over or around reinforcing. Support vertical reinforcing at intervals not exceeding 192 bar diameters.

(6) Where individual bars are placed after laying masonry, place wire loops extending into cells as masonry is laid and loosen before mortar sets. After insertion of reinforcing bars, pull loops and bar to proper position and tie free ends.

(7) Place horizontal beam reinforcing as the masonry units are laid.

(8) Embed lateral tie reinforcing in mortar joints where indicated. Place as masonry units are laid, at the vertical spacing indicated.

(9) Where lateral ties are indicated in contact with vertical reinforcing bars, embed additional lateral tie reinforcing in mortar joints. Place as indicated, or if not indicated, provide as required to prevent grout blowout or rupture of concrete masonry unit face shells, but provide not less than No 2 bars or 8-gauge wire ties spaced 16 inches on centers for member with side dimensions exceeding 20 inches.

3. Bond Beams: Stop grout in vertical cells 1-1/2 inches below bond beam course. Place horizontal reinforcing in bond beams; lap at corners and intersections as indicated. Place grout in bond beam course before filling vertical cores above bond beam.

3.10 MASONRY FLASHINGS

A. Provide embedded and thru-wall flashing in masonry where indicated, and at shelf angles, lintels, ledges, other obstructions to downward flow of water in wall to divert its flow to the exterior.

B. Coordinate the work of this Section with that of Section 07 62 00 - Sheet Metal Flashing and Trim.

C. Install flashing as follows unless otherwise indicated:

1. Prepare masonry surfaces so they are smooth and free from projections that could puncture flashing. Where flashing is within mortar joint, place thru-wall flashing on sloping bed of mortar and cover with mortar. Before covering with mortar, seal penetrations in flashing with sealant, mastic or tape as recommended by flashing manufacturer.

2. Starting at not more than 1/2 inch back from exterior face of outer wythe, extend flashing through outer wythe, across wall cavity, turn up not less than 6 inches on and 1-1/2 inches into inner wythe. At stud-framed back-up turn up flashing not less than 6 inches on sheathing and secure with termination bar.

3. At shelf angles, lintels and ledges and other obstructions, extend flashing a minimum of 8 inches into masonry and turn up not less than 2 inches to form end dams at each end.

4. Provide termination bars where indicated or required to terminate flashing. At stud-framed back-up secure termination bars through sheathing to studs.

D. Provide weep holes in head joints in exterior wythes of first course of masonry immediately above embedded and thru-wall flashing. Use open head joints to form weep holes; space weep holes not more than 32 inches on center unless otherwise indicated.

3.11 LINTELS

A. Install loose steel lintels and shelf angles over openings and where indicated. Exterior steel lintels shall be hot-dip galvanized.

B. Provide formed-in-place masonry lintels where shown and where openings of more than 12 inches for brick-size units and 24 inches for block-size units are shown without structural steel or other supporting lintels.
C. Install formed-in-placed masonry lintels where indicated and over openings of more than 12 inches for brick-size units and 24 inches for block-size units are shown without structural steel or other supporting lintels.
   1. For CMU walls, use specially formed U-shaped lintel units with reinforcement bars sized and placed as indicated, and filled with course grout.
   2. Allow masonry lintels to attain specified strength before removing temporary supports.

D. Maintain minimum 8 inch bearing on each side of opening.

3.12 CONTROL AND EXPANSION JOINTS

A. Do not continue horizontal joint reinforcement through control and expansion joints.
B. Provide vertical and horizontal expansion, control, isolation and pressure-relieving joints in masonry where indicated and of the types specified or noted. Build in joints and related items as the masonry work progresses.
C. Provide continuous joint sealant in concrete masonry control joints prior to placing brick veneer; joint sealants are specified in Section 07 90 05 - Joint Sealers.

3.13 BUILT-IN WORK

A. As work progresses, install built-in metal door frames and fabricated metal frames, 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. Where items are to be embedded in cores of hollow masonry units, place a layer of metal lath, wire mesh, or plastic mesh in the joint below and rod mortar or grout into core.
D. Bed anchors of metal door frames in adjacent mortar joints. Fill frame voids solid with grout. Fill adjacent masonry cores with grout minimum 8 inches from frame openings.

3.14 TOLERANCES

A. Dimensions and Locations of Elements
   1. For dimensions in cross section or elevation do not vary by more than plus or minus 1/4 inch.
   2. For location of elements in plan do not vary from that indicated by more than plus or minus 1/8 inch in 10 feet and 1/4 inch in 20 feet or more.
   3. For location of elements in elevation do not vary from that indicated by more than plus or minus 1/4 inch in a story height or 1/2 inch total.
B. Lines and Levels
   1. For bed joints and top surfaces of bearing walls do not vary from level by more than 1/8 inch in 10 feet, or 1/4 inch maximum.
   2. For conspicuous horizontal lines, such as lintels, sills, parapets, and reveals, do not vary from level by more than 1/8 inch in 10 feet, or 1/4 inch maximum.
   3. For vertical lines and surfaces do not vary from plumb by more than 1/8 inch in 10 feet, or 1/4 inch maximum.
   4. For conspicuous vertical lines, such as external corners, door jambs, reveals, and expansion and control joints, do not vary from plumb by more than 1/8 inch in 10 feet, or 1/4 inch maximum.
   5. For lines and surfaces do not vary from straight by more than 1/8 inch in 10 feet, or 1/4 inch maximum.
   6. For vertical alignment of exposed head joints, do not vary from plumb by more than 1/8 inch in 10 feet, or 1/4 inch maximum.
7. For faces of adjacent exposed masonry units, do not vary from flush alignment by more than 1/16 inch except due to warpage of masonry units within tolerances specified for warpage of units.

C. Joints
   1. For bed joints, do not vary from thickness indicated by more than plus or minus 1/16 inch, with a maximum thickness limited to 1/2 inch.
   2. For exposed bed joints, do not vary from bed-joint thickness of adjacent courses by more than 1/16 inch.
   3. For exposed head joints, do not vary from thickness indicated by more than plus or minus 1/16 inch. Do not vary from adjacent bed-joint and head-joint thicknesses by more than 1/16 inch.

3.15 CUTTING AND FITTING
   A. Cut and fit for chases, pipes, conduit, and sleeves. Coordinate with other sections of work to provide correct size, shape, and location.
   B. Obtain Architect's approval prior to cutting or fitting masonry work not indicated or where appearance or strength of masonry work may be impaired.

3.16 FIELD QUALITY CONTROL
   A. An independent testing and inspection agency will perform field quality control tests, as specified in Section 01 45 23 - Testing and Inspection Services. Allow inspectors access to scaffolding and work areas, as needed to perform tests and inspections. Retesting of materials that fail to comply with specified requirements shall be done at Contractor's expense.
   B. Inspections: In accordance with the requirements of the local Code, special inspections will be Level 1 for Typical Building Areas, and Level 2 for Category II Hurricane Resistant Building Areas.
      1. Begin masonry construction only after inspectors have verified proportions of site-prepared mortar.
      2. Place grout only after inspectors have verified compliance of grout spaces and of grades, sizes, and locations of reinforcement.
      3. Place grout only after inspectors have verified proportions of site-prepared grout.
   C. Testing Frequency: One set of tests for each 5,000 sq ft of wall area or portion thereof unless otherwise indicated.
      1. Clay Masonry Unit Tests: Sample and test each variety of clay masonry in accordance with ASTM C 67 requirements, sampling 5 randomly chosen units for each 100,000 installed.
      2. Concrete Masonry Unit Tests: Sample and test each variety of concrete unit masonry in accordance with ASTM C 140 for conformance to requirements of this Section, and for compressive strength, absorption and moisture content.
      3. Mortar Tests: Sample and test each type of mortar and mix in accordance with ASTM C 780 for the following:
         - Aggregate to Cementitious Materials Ratio
         - Air Content
         - Compressive Strength
      4. Grout Tests: For each mix provided, sample and test according to ASTM C 1019 for compressive strength.
      5. Prism Test: For each type of construction provided, according to ASTM C 1314 at 7 days and at 28 days.
D. Evaluation of Quality Control Tests: In absence of other indications of noncompliance with requirements, masonry will be considered satisfactory if results from construction quality control tests comply with minimum requirements indicated.

E. In addition to the quality control test indicated above, the Special Inspector will on a random basis observe the Contractors execution of the masonry work including:
   1. Inspection of reinforcement for condition (free of mud, oil, rust, mill scale, etc.), size, type, clearances, splices, and other details of placement. This includes vertical and horizontal reinforcing, as well as joint reinforcing.
   2. Inspection of grout and mortar for general mixing operations and consistency.
   3. Inspection of general workmanship with regard to mortar placement, preparation of grout spaces, grout pour heights, and grout consolidation and re-consolidation.
   4. Inspection of hot and cold weather practices, and general protection of the work.

F. The amount of random inspection for general quality control will be based on the judgment of the Special Inspector as necessary to provide reasonable assurance that the Contractor's methods and practices are in general conformance with the requirements of ACI 530.1/ASCE 6/TMS 602 and the Contract Documents.

G. The Special Inspector's testing and inspection services shall in no way relieve the Contractor of the responsibility to furnish material and construction in full compliance with the Contract Documents.

3.17 REPAIRING AND POINTING

A. Remove and replace masonry units that are loose, chipped, broken, stained, or otherwise damaged or that do not match adjoining units. Install new units to match adjoining units; install in fresh mortar, and grout where required to match construction. Pointed utilizing mortar that match adjoining mortar to eliminate evidence of replacement.

B. Pointing: During the tooling of joints, enlarge voids and holes, except weep holes, and completely fill with mortar. Point up joints, including corners, openings, and adjacent construction, to provide a neat, uniform appearance. Prepare joints for sealant application, where indicated.

3.18 CLEANING

A. In-Progress Cleaning: Dry brush surfaces to remove mortar droppings, fins and smears as work progresses; avoid any motion or technique that will result in rubbing or pressing mortar into the face of masonry. Tool joints when "thumbprint" hard; after tooing, brush excess mortar and dust from surfaces utilizing a dry, medium-soft bristle brush. Clean surfaces as soon as possible after laying.

B. 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. After mortar is thoroughly set and cured, clean exposed masonry surfaces utilizing techniques and masonry cleansers expressly approved in writing by manufacturer of masonry units and mortars being cleaned; utilize bucket-and-brush cleaning method, pressure washing of masonry will not be allowed.
   3. Protect adjacent concrete, precast architectural concrete, stone and all non-masonry surfaces during cleaning by covering them with liquid strippable masking agent, polyethylene film, or waterproof masking tape.

3.19 PROTECTION

A. Without damaging completed work, provide protective boards at exposed external corners that are subject to damage by construction activities.
B. Provide protection and maintain conditions that ensure unit masonry is without damage and deterioration at time of project Substantial Completion.

END OF SECTION
SECTION 05 12 00

STRUCTURAL STEEL FRAMING

PART 1 - GENERAL

1.01 RELATED DOCUMENTS

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

1.02 SUMMARY

A. Section Includes:
   1. Structural steel.

B. Related Sections:
   1. Section 014000 "Quality Requirements" for independent testing agency procedures and administrative requirements.

1.03 DEFINITIONS

A. Structural Steel: Elements of structural-steel frame, as classified by AISC 303, "Code of Standard Practice for Steel Buildings and Bridges."

1.05 ACTION SUBMITTALS

A. Product Data: For each type of product indicated.

B. Shop Drawings: Show fabrication of structural-steel components.
   1. Include details of cuts, connections, splices, camber, holes, and other pertinent data.
   2. Include embedment drawings.
   3. Indicate welds by standard AWS symbols, distinguishing between shop and field welds, and show size, length, and type of each weld. Show backing bars that are to be removed and supplemental fillet welds where backing bars are to remain.
   4. Indicate type, size, and length of bolts, distinguishing between shop and field bolts. Identify pretensioned and slip-critical high-strength bolted connections.

C. Welding Procedure Specifications (WPSs) and Procedure Qualification Records (PQRs): Provide according to AWS D1.1/D1.1M, "Structural Welding Code - Steel," for each welded joint, including the following:
   1. Power source (constant current or constant voltage).
   2. Electrode manufacturer and trade name, for demand critical welds.

1.06 INFORMATIONAL SUBMITTALS

A. Welding certificates.

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

C. Mill test reports for structural steel, including chemical and physical properties.

D. Product Test Reports: For the following:
   1. Bolts, nuts, and washers including mechanical properties and chemical analysis.
   2. Shop primers.

E. Source quality-control reports.
1.07 QUALITY ASSURANCE

A. Welding Qualifications: Qualify procedures and personnel according to AWS D1.1/D1.1M, "Structural Welding Code - Steel."
   1. Welders and welding operators performing work on bottom-flange, demand-critical welds shall pass the supplemental welder qualification testing, as required by AWS D1.8. FCAW-S and FCAW-G shall be considered separate processes for welding personnel qualification.

B. Comply with applicable provisions of the following specifications and documents:
   1. AISC 303.
   2. AISC 341 and AISC 341s1.
   3. AISC 360.
   4. RCSC’s "Specification for Structural Joints Using ASTM A 325 or A 490 Bolts."

C. Preinstallation Conference: Conduct conference at Project site.

1.08 DELIVERY, STORAGE, AND HANDLING

A. Store materials to permit easy access for inspection and identification. Keep steel members off ground and spaced by using pallets, dunnage, or other supports and spacers. Protect steel members and packaged materials from corrosion and deterioration.
   1. Do not store materials on structure in a manner that might cause distortion, damage, or overload to members or supporting structures. Repair or replace damaged materials or structures as directed.

B. Store fasteners in a protected place in sealed containers with manufacturer’s labels intact.
   1. Fasteners may be repackaged provided Owner’s testing and inspecting agency observes repackaging and seals containers.
   2. Clean and relubricate bolts and nuts that become dry or rusty before use.
   3. Comply with manufacturers’ written recommendations for cleaning and lubricating ASTM F 1852 fasteners and for retesting fasteners after lubrication.

PART 2 - PRODUCTS

2.01 STRUCTURAL-STEEL MATERIALS

A. Recycled Content of Steel Products: Postconsumer recycled content plus one-half of preconsumer recycled content not less than 25 percent.

B. W-Shapes: ASTM A 992/A 992M

C. Plate and Bar: ASTM A 36/A 36M.

D. Cold-Formed Hollow Structural Sections: ASTM A 500, Grade B, structural tubing.

E. Welding Electrodes: Comply with AWS requirements.

2.02 PRIMER

A. Low-Emitting Materials: Paints and coatings shall comply with the testing and product requirements of the California Department of Health Services’ "Standard Practice for the Testing of Volatile Organic Emissions from Various Sources Using Small-Scale Environmental Chambers."

B. Primer: Fabricator’s standard lead- and chromate-free, nonasphaltic, rust-inhibiting primer complying with MPI#79 and compatible with topcoat.
2.05 FABRICATION
A. Structural Steel: Fabricate and assemble in shop to greatest extent possible. Fabricate according to AISC's "Code of Standard Practice for Steel Buildings and Bridges" and AISC 360.
B. Bolt Holes: Cut, drill, or punch standard bolt holes perpendicular to metal surfaces.
C. Finishing: Accurately finish ends of columns and other members transmitting bearing loads.
D. Cleaning: Clean and prepare steel surfaces that are to remain unpainted according to SSPC-SP 3, "Power Tool Cleaning."

2.06 SHOP CONNECTIONS
A. Weld Connections: Comply with AWS D1.1/D1.1M for tolerances, appearances, welding procedure specifications, weld quality, and methods used in correcting welding work.
   1. Assemble and weld built-up sections by methods that will maintain true alignment of axes without exceeding tolerances in AISC 303 for mill material.

2.07 SHOP PRIMING
A. Shop prime steel surfaces except the following:
   1. Surfaces to be field welded.
B. Surface Preparation: Clean surfaces to be painted. Remove loose rust and mill scale and spatter, slag, or flux deposits. Prepare surfaces according to the following specifications and standards:
   1. SSPC – SP3, "Power Tool Cleaning"
C. Priming: Immediately after surface preparation, apply primer according to manufacturer's written instructions and at rate recommended by SSPC to provide a minimum dry film thickness of 1.5 mils (0.038 mm). Use priming methods that result in full coverage of joints, corners, edges, and exposed surfaces.

2.08 SOURCE QUALITY CONTROL
A. Testing Agency: Owner will engage an independent testing and inspecting agency to perform shop tests and inspections and prepare test reports.
   1. Provide testing agency with access to places where structural-steel work is being fabricated or produced to perform tests and inspections.
B. Correct deficiencies in Work that test reports and inspections indicate does not comply with the Contract Documents.
C. Welded Connections: In addition to visual inspection, shop-welded connections will be tested and inspected according to AWS D1.1/D1.1M.

PART 3 - EXECUTION
3.01 EXAMINATION
A. Verify, with steel Erector present, elevations of concrete- and masonry-bearing surfaces and locations of anchor rods, bearing plates, and other embedments for compliance with requirements.
B. Proceed with installation only after unsatisfactory conditions have been corrected.

3.02 PREPARATION
A. Provide temporary shores, guys, braces, and other supports during erection to keep structural steel secure, plumb, and in alignment against temporary construction loads and loads equal in intensity to design loads. Remove temporary supports when permanent structural steel, connections, and bracing are in place unless otherwise indicated.
3.03 ERECTION

A. Set structural steel accurately in locations and to elevations indicated and according to AISC 303 and AISC 360.


C. Maintain erection tolerances of structural steel within AISC's "Code of Standard Practice for Steel Buildings and Bridges."

D. Align and adjust various members that form part of complete frame or structure before permanently fastening. Before assembly, clean bearing surfaces and other surfaces that will be in permanent contact with members. Perform necessary adjustments to compensate for discrepancies in elevations and alignment.

3.04 FIELD CONNECTIONS

A. Weld Connections: Comply with AWS D1.1/D1.1M for tolerances, appearances, welding procedure specifications, weld quality, and methods used in correcting welding work.

3.05 FIELD QUALITY CONTROL

A. Testing Agency: Owner will engage a qualified independent testing and inspecting agency to inspect field welds.

B. Welded Connections: Field welds will be visually inspected according to AWS D1.1/D1.1M.
   1. In addition to visual inspection, field welds will be tested and inspected according to AWS D1.1/D1.1M.

C. Correct deficiencies in Work that test reports and inspections indicate does not comply with the Contract Documents.

3.07 REPAIRS AND PROTECTION

A. Touchup Painting: Immediately after erection, clean exposed areas where primer is damaged or missing and paint with the same material as used for shop painting to comply with SSPC-PA 1 for touching up shop-painted surfaces.
   1. Clean and prepare surfaces by SSPC-SP 2 hand-tool cleaning or SSPC-SP 3 power-tool cleaning.

B. Galvanizing Repairs: Prepare and repair damaged galvanized coatings on steel with galvanized repair paint according to ASTM A 780 and manufacturer's written instructions.

END OF SECTION
SECTION 05 40 00
COLD-FORMED METAL FRAMING

PART 1 - GENERAL

1.1 SUMMARY

A. This Section includes the following:
   1. Interior non-load-bearing wall framing (at sliding wood door walls).

B. Work under this Section is subject to special inspections as described in Chapter 17 of the International Building Code.

1.2 PERFORMANCE REQUIREMENTS

A. Structural Performance: Provide cold-formed metal framing capable of withstanding design loads within limits and under conditions indicated.
   1. Design Loads: As indicated.
   2. Deflection Limits: Design framing systems to withstand design loads without deflection.

1.3 SUBMITTALS

A. Product Data: For each type of product and accessory indicated.

B. Shop Drawings: Show layout, spacings, sizes, thicknesses, and types of cold-formed metal framing; fabrication; and fastening and anchorage details, including mechanical fasteners. Shop Drawings shall be signed and sealed by an Engineer registered in the Commonwealth of Virginia.
   1. For cold-formed metal framing indicated to comply with design loads, include structural analysis data signed and sealed by the qualified professional engineer responsible for their preparation.

C. Welding certificates.

D. Qualification data.

E. Product test reports.

F. Research/evaluation reports.

1.4 QUALITY ASSURANCE

A. Product Tests: Mill certificates or data from a qualified independent testing agency indicating steel sheet complies with requirements.
B. Welding: Qualify procedures and personnel according to AWS D1.3, "Structural Welding Code-Sheet Steel."

C. Fire-Test-Response Characteristics: Where indicated, provide cold-formed metal framing identical to that of assemblies tested for fire resistance per ASTM E 119 by a testing and inspecting agency acceptable to authorities having jurisdiction.

D. AISI Specifications and Standards: Comply with AISI's "North American Specification for the Design of Cold-Formed Steel Structural Members" and its "Standard for Cold-Formed Steel Framing - General Provisions."

1. Comply with AISI's "Standard for Cold-Formed Steel Framing - Truss Design."
2. Comply with AISI's "Standard for Cold-Formed Steel Framing - Header Design."

E. Comply with AISI's "Standard for Cold-Formed Steel Framing - Prescriptive Method for One and Two Family Dwellings."

PART 2 - PRODUCTS

2.1 MATERIALS

A. Steel Sheet: ASTM A 1003/A 1003M, Structural Grade, Type H, metallic coated, of grade and coating weight as follows:

1. Grade: As required by structural performance.
2. Coating: G60 (Z180), A60 (ZF180), AZ50 (AZ150), or GF30 (ZGF90).

2.2 INTERIOR NON-LOAD-BEARING WALL FRAMING

A. Steel Studs: Manufacturer's standard C-shaped steel studs, of web depths indicated, punched, with stiffened flanges, and as follows:

1. Minimum Base-Metal Thickness: As required by design.

B. Steel Track: Manufacturer's standard U-shaped steel track, of web depths indicated, unpunched, with unstiffened flanges, and same minimum base-metal thickness as steel studs.

C. Vertical Deflection Clips: Manufacturer's standard bypass or head clips, capable of accommodating upward and downward vertical displacement of primary structure through positive mechanical attachment to stud web.

D. Single Deflection Track: Manufacturer's single, deep-leg, U-shaped steel track; unpunched, with unstiffened flanges, of web depth to contain studs while allowing free vertical movement, with flanges designed to support horizontal and lateral loads.

E. Double Deflection Tracks: Manufacturer's double, deep-leg, U-shaped steel tracks, consisting of nested inner and outer tracks; unpunched, with unstiffened flanges.
2.3 FRAMING ACCESSORIES

A. Fabricate steel-framing accessories from steel sheet, ASTM A 1003/A 1003M, Structural Grade, Type H, metallic coated, of same grade and coating weight used for framing members, unless otherwise indicated.

B. Steel Shapes and Clips: ASTM A 36/A 36M, zinc coated by hot-dip process according to ASTM A 123/A 123M.

C. Expansion Anchors: Fabricated from corrosion-resistant materials, with capability to sustain, without failure, a load equal to 5 times design load, as determined by testing per ASTM E 488 conducted by a qualified independent testing agency.

D. Power-Actuated Anchors: Fastener system of type suitable for application indicated, fabricated from corrosion-resistant materials, with capability to sustain, without failure, a load equal to 10 times design load, as determined by testing per ASTM E 1190 conducted by a qualified independent testing agency.

E. Mechanical Fasteners: ASTM C 1513, corrosion-resistant-coated, self-drilling, self-tapping steel drill screws.
   1. Head Type: Low-profile head beneath sheathing, manufacturer's standard elsewhere.

2.4 MISCELLANEOUS MATERIALS

A. Galvanizing Repair Paint: ASTM A 780.

B. Cement Grout: Portland cement, ASTM C 150, Type I; and clean, natural sand, ASTM C 404. Mix at ratio of 1 part cement to 2-1/2 parts sand, by volume, with minimum water required for placement and hydration.

C. Shims: Load bearing, high-density multimonomer plastic, nonleaching.

D. Sealer Gaskets: Closed-cell neoprene foam, 1/4 inch (6.4 mm) thick, selected from manufacturer's standard widths to match width of bottom track or rim track members.

PART 3 - EXECUTION

3.1 PREPARATION

A. Install load bearing shims or grout between the underside of wall bottom track or rim track and the top of foundation wall or slab at stud or joist locations to ensure a uniform bearing surface on supporting concrete or masonry construction.

B. Install sealer gaskets to isolate the underside of wall bottom track or rim track and the top of foundation wall or slab at stud or joist locations.
3.2 INSTALLATION, GENERAL

A. Install cold-formed metal framing according to AISI's "Standard for Cold-Formed Steel Framing - General Provisions" and to manufacturer's written instructions unless more stringent requirements are indicated.

B. Install cold-formed metal framing and accessories plumb, square, and true to line, and with connections securely fastened.

C. Install framing members in one-piece lengths.

D. Install temporary bracing and supports to secure framing and support loads comparable in intensity to those for which structure was designed. Maintain braces and supports in place, undisturbed, until entire integrated supporting structure has been completed and permanent connections to framing are secured.

E. Do not bridge building expansion and control joints with cold-formed metal framing. Independently frame both sides of joints.

F. Install insulation, specified in Division 7 Section "Building Insulation," in built-up exterior framing members, such as headers, sills, boxed joists, and multiple studs at openings, that are inaccessible on completion of framing work.

G. Fasten hole reinforcing plate over web penetrations that exceed size of manufacturer's standard punched openings.

H. Erection Tolerances: Install cold-formed metal framing level, plumb, and true to line to a maximum allowable tolerance variation of 1/8 inch in 10 feet (1:960) and as follows:

1. 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.

3.3 INTERIOR NON-LOAD-BEARING WALL INSTALLATION

A. Install continuous tracks sized to match studs. Align tracks accurately and securely anchor to supporting structure as indicated.

B. Fasten both flanges of studs to top and bottom track, unless otherwise indicated. Space studs as follows:

1. Stud Spacing: As indicated and as required to comply with performance requirements.

C. Set studs plumb, except as needed for diagonal bracing or required for nonplumb walls or warped surfaces and similar requirements.

D. Isolate non-load-bearing steel framing from building structure to prevent transfer of vertical loads while providing lateral support.

1. Install single deflection tracks and anchor to building structure.
2. Install double deflection tracks and anchor outer track to building structure.
3. Connect vertical deflection clips to bypassing or infill studs and anchor to primary building structure.

E. Install horizontal bridging in wall studs, spaced in rows indicated on Shop Drawings but not more than 48 inches (1220 mm) apart. Fasten at each stud intersection.
1. Top Bridging for Single Deflection Track: Install row of horizontal bridging within 18 inches (450 mm) of single deflection track. Install a combination of flat, taut, steel sheet straps of width and thickness indicated and stud or stud-track solid blocking of width and thickness matching studs. Fasten flat straps to stud flanges and secure solid blocking to stud webs or flanges.

2. Bridging: Proprietary bridging bars installed according to manufacturer's written instructions.

F. Install miscellaneous framing and connections, including stud kickers, web stiffeners, clip angles, continuous angles, anchors, fasteners, and stud girts, to provide a complete and stable curtain-wall-framing system.

3.4 FIELD QUALITY CONTROL

A. Testing: Owner will engage a qualified independent testing and inspecting agency to perform field tests and inspections and prepare test reports.

B. Field and shop welds will be subject to testing and inspecting.

C. Testing agency will report test results promptly and in writing to Contractor and Architect.

D. Remove and replace work where test results indicate that it does not comply with specified requirements.

E. Additional testing and inspecting, at Contractor's expense, will be performed to determine compliance of replaced or additional work with specified requirements.

3.5 REPAIRS AND PROTECTION

A. Galvanizing Repairs: Prepare and repair damaged galvanized coatings on fabricated and installed cold-formed 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 ensures that the cold-formed metal framing is without damage or deterioration at time of Substantial Completion.

END OF SECTION 05 40 00
SECTION 05 50 00
METAL FABRICATIONS

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Shop fabricated steel fabrications including, but not limited to, the following:
   Steel framing and supports for, but not limited to, the following:
   Mechanical and electrical equipment
   Applications where framing and supports are not specified in other Sections
   Miscellaneous steel trim including steel edgings
   Loose bearing and leveling plates for applications where they are not specified in other Sections

B. Products furnished, but not installed, under this Section including, but not limited to, the following:
   Loose steel lintels
   Anchor bolts, steel pipe sleeves, slotted-channel inserts, and wedge-type inserts indicated
   to be cast into concrete or built into unit masonry
   Steel weld plates and angles for casting into concrete for applications where they are not specified in other Sections

1.02 RELATED DOCUMENTS

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

1.03 RELATED SECTIONS

A. Related sections include, but are not limited to, the following:
   Section 03 30 00 - Cast-in-Place Concrete
   Section 04 20 00 - Unit Masonry
   Section 05 12 00 - Structural Steel Framing
   Section 09 90 00 - Painting

1.04 REFERENCE STANDARDS

A. Reference standards include, but are not limited to, the following:
   ANSI/NAAMM MBG 531 - Metal Bar Grating Manual; National Association of Architectural Metal Manufacturers; 2009
   ASME B18.2.1 - Square and Hex Bolts and Screws, Inch Series; 1996
   ASME B18.6.3 - Machine Screws and Machine Screw Nuts; 2003
   ASME B18.21.1 - Washers: Helical Spring-Lock, Tooth Lock, and Plain Washers (Inch Series); 2009
   ASME B18.22.1 - Plain Washers; 1965
   ASTM A 36/A 36M - Standard Specification for Carbon Structural Steel; 2008
   ASTM A 240/A 240M - Standard Specification for Chromium and Chromium-Nickel Stainless Steel Plate, Sheet, and Strip for Pressure Vessels and for General Applications; 2010b
   ASTM A 312/A 312M - Standard Specification for Seamless, Welded, and Heavily Cold Worked Austenitic Stainless Steel Pipes; 2009
   ASTM A 325 - Standard Specification for Structural Bolts, Steel, Heat Treated, 120/105 ksi Minimum Tensile Strength; 2009a
ASTM A 500/A 500M - Standard Specification for Cold-Formed Welded and Seamless Carbon Steel Structural Tubing in Rounds and Shapes; 2010
ASTM A 554 - Standard Specification for Welded Stainless Steel Mechanical Tubing; 2010
ASTM A 563 - Standard Specification for Carbons and Alloy Steel Nuts; 2007a
ASTM A 653/A 653M - Standard Specification for Steel Sheet, Zinc-Coated (Galvanized) or Zinc-Iron Alloy-Coated (Galvannealed) by the Hot-Dip Process; 2009a
ASTM A 666 - Standard Specification for Annealed or Cold-Worked Austenitic Stainless Steel Sheet, Strip, Plate, and Flat Bar; 2010
ASTM A 780/A 780M - Standard Practice for Repair of Damaged and Uncoated Areas of Hot-Dip Galvanized Coatings; 2009
ASTM A 1011/A 1011M - Standard Specification for Steel, Sheet and Strip, Hot-Rolled, Carbon, Structural, High-Strength Low-Alloy and High-Strength Low-Alloy with Improved Formability, and Ultra-High Strength; 2009b
ASTM C 1107/C 1107M - Standard Specification for Packaged Dry, Hydraulic-Cement Grout (Nonshrink); 2008
ASTM F 436 - Standard Specification for Hardened Steel Washers; 2010
ASTM F 1554 - Standard Specification for Anchor Bolts, Steel, 36, 55, and 105-ksi Yield Strength; 2007a
AWS A2.4 - Standard Symbols for Welding, Brazing, and Nondestructive Examination; American Welding Society; 2007
AWS D1.1/D1.1M - Structural Welding Code - Steel; 2010
AWS D1.3/D1.3M - Structural Welding Code - Sheet Steel; 2008
AWS D1.6/D1.6M - Structural Welding Code - Stainless Steel, 2007
NAAMM/NOMMA 500 - Metal Finishes Manual for Architectural and Metal Products; National Association of Architectural Metal Manufacturers; 2006
NOMMA JFG - Joint Finishes Guidelines; National Ornamental and Miscellaneous Metals Association; 1994
SSPC-PA 1 - Shop, Field, and Maintenance Painting of Steel; Society for Protective Coatings; 2000 (Ed. 2004)
SSPC-Paint 15 - Steel Joist Shop Primer; Society for Protective Coatings; 1999 (Ed. 2004)
SSPC-SP 2 - Hand Tool Cleaning; Society for Protective Coatings; 1982 (Ed. 2004)
SSPC-SP 3 - Power Tool Cleaning; Society for Protective Coatings; 1982 (Ed. 2004)
SSPC-SP 6/NACE No. 3 - Commercial Blast Cleaning; Society for Protective Coatings; 2007

1.05 PERFORMANCE REQUIREMENTS

A. Thermal Movements: Allow for thermal movements from 120 degrees F ambient and 180 degrees F surface temperature changes acting on exterior metal fabrications by preventing buckling, opening of joints, overstressing of components, failure of connections, and other detrimental effects.

1.06 SUBMITTALS

A. See Section 01 33 00 - Submittals, for submittal procedures.

B. Product Data: Submit manufacturer's product data for the following:
   - Paint products
   - Grout
C. Shop Drawings: Indicate profiles, sizes, dimensions, connection attachments, reinforcing, anchorage, size and type of fasteners, and accessories. Include plans, drawings, elevations, and details where applicable. Indicate welded connections using standard AWS A2.4 welding symbols. Indicate net weld lengths.

D. Welders' Certificates: Submit certification for welders employed on the project, verifying AWS qualification within the previous 12 months.

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

1.07 QUALITY ASSURANCE
A. Welding Qualifications: Qualify procedures and personnel according to the following:
   - AWS D1.1/D1.1M - Structural Welding Code - Steel
   - AWS D1.3/D1.3M - Structural Welding Code - Sheet Steel
   - AWS D1.6/D1.6M - Structural Welding Code - Stainless Steel
B. Field Measurements: Verify actual floor to floor elevations, locations of walls and other construction contiguous with metal fabrications by field measurements before fabrication.
C. Coordination
   1. Coordinate selection of shop primers with topcoats to be applied over them. Comply with paint and coating manufacturers' written recommendations to ensure that shop primers and topcoats are compatible with one another.
   2. Coordinate installation of anchorages and steel weld plates and angles for casting into concrete. Furnish setting drawings, templates, and directions for installing anchorages, including sleeves, concrete inserts, anchor bolts, and items with integral anchors, that are to be embedded in concrete or masonry. Deliver such items to project site in time for installation.

1.08 DELIVERY, STORAGE, AND HANDLING
A. Store materials to permit easy access for inspection and identification. Keep materials off ground and spaced by using pallets, dunnage, or other supports and spacers. Protect members and packaged materials from corrosion and deterioration.
B. Store fasteners in a protected place in manufacturer's containers with labels intact. Clean and relubricate bolts and nuts that become dry or rusty before use.

PART 2 PRODUCTS
2.01 GENERAL
A. Metal Surfaces: Provide materials with smooth, flat surfaces unless otherwise indicated. For metal fabrications exposed to view in the completed Work, provide materials without seam marks, roller marks, rolled trade names, or blemishes.
B. Recycled Content of Steel Products: Postconsumer recycled content plus one-half of preconsumer recycled content not less than 25 percent.

2.02 MATERIALS
A. Steel
   1. Plates, Shapes and Bars: ASTM A 36/A 36M.
   2. Tubing: ASTM A 500, Grade B cold-formed structural tubing.
   3. Abrasive-Surface Floor Plate: Steel plate with abrasive granules rolled into surface or with abrasive material metallically bonded to steel.
   5. Pipe: ASTM A 53/A 53M, Grade B Schedule 40, black and hot-dip galvanized finish, as
indicated.

B. Stainless Steel
1. Tubing: ASTM A 554, Grade MT 304
2. Pipe: ASTM A 312/A 312M, Grade TP 304
3. Plate and Sheet: ASTM A 240/A 240M or ASTM A 666, Type 304

C. Fasteners
1. Steel Bolts, Nuts, and Washers: ASTM A 325, Type 1, hexagon-head bolts, with ASTM A 563, Grade C, hex nuts and ASTM F 436, Type 1, flat washers; galvanize to ASTM A 153/A 153M where connecting galvanized components.
2. Stainless-Steel Bolts and Nuts: Regular hexagon-head annealed stainless-steel bolts, ASTM F 593; with hex nuts, ASTM F 594; and, where indicated, flat washers; Alloy Group 1.
3. Anchor Bolts: ASTM F 1554, Grade 36 with ASTM A 563, Grade C, hex nuts and ASTM F 436, Type 1, flat washers; galvanize to ASTM A 153/A 153M where connecting galvanized components.
8. Post-Installed Anchors: Chemical anchors capable of sustaining, without failure, a load equal to six (6) times the load imposed when installed in unit masonry and four (4) times the load imposed when installed in concrete, as determined by testing according to ASTM E 488, conducted by a qualified independent testing agency. At interior locations, zinc plate carbon-steel components in compliance with ASTM B 633, Class Fe/Zn 5, unless otherwise indicated.

D. Paints and Coatings
1. Low-Emitting Materials: Paints and coatings shall comply with the testing and product requirements of the California Department of Health Services’ “Standard Practice for the Testing of Volatile Organic Emissions from Various Sources Using Small-Scale Environmental Chambers.”
3. Touch-Up Primer for Galvanized Surfaces: SSPC-Paint 20, Type I - Inorganic.

E. Miscellaneous Materials
1. Nonshrink, Nonmetallic Grout: ASTM C 1107/C 1107M, factory-packaged, nonstaining, noncorrosive, non-gaseous grout; provide grout specifically recommended by manufacturer for interior and exterior applications.
2. Concrete: Comply with requirements in Section 03 30 00 - Cast-in-Place Concrete for normal-weight, air-entrained, concrete with a minimum 28-day compressive strength of 3000 psi.

2.03 FABRICATION

A. Fit and shop assemble items to greatest extent possible and in largest practical sections. Disassemble units only as necessary for shipping and handling limitations. Use connections that maintain structural value of joined pieces. Clearly mark units for reassembly and coordinated installation.

B. Cut, drill, and punch metals cleanly and accurately. Remove burrs and ease edges to a radius of approximately 1/32 inch unless otherwise indicated. Remove sharp or rough areas on exposed surfaces.

C. Form bent-metal corners to smallest radius possible without causing grain separation or otherwise impairing work. Form exposed work with accurate angles and surfaces and straight edges.
D. Weld corners and seams continuously to comply with the following:
   1. Use materials and methods that minimize distortion and develop strength and corrosion resistance of base metals.
   2. Obtain fusion without undercut or overlap.
   3. Remove welding flux immediately.
   4. At exposed connections, finish exposed welds and surfaces smooth and blended so no roughness shows after finishing and contour of welded surface matches that of adjacent surface.

E. Form exposed connections with hairline joints, flush and smooth, using concealed fasteners or welds where possible. Where exposed fasteners are required, use Phillips flat-head (countersunk) fasteners unless otherwise indicated. Locate joints where least conspicuous.

F. Fabricate seams and other connections that will be exposed to weather in a manner to exclude water. Provide weep holes where water may accumulate.

G. Cut, reinforce, drill, and tap metal fabrications as indicated to receive finish hardware, screws, and similar items.

H. Provide for anchorage of type indicated; coordinate with supporting structure. Space anchoring devices to secure metal fabrications rigidly in place and to support indicated loads.

I. Fabrication Tolerances: Fabricate to the following tolerances:
   - Squareness: 1/8-inch maximum difference in diagonal measurements.
   - Maximum Offset Between Faces: 1/16 inch.
   - Maximum Misalignment of Adjacent Members: 1/16 inch.
   - Maximum Bow: 1/8 inch in 48 inches.
   - Maximum Deviation From Plane: 1/16 inch in 48 inches.

2.04 MISCELLANEOUS FRAMING AND SUPPORTS

A. Provide steel framing and supports not specified in other Sections as needed to complete the Work.

B. Fabricate units from steel shapes, plates, and bars of welded construction unless otherwise indicated. Fabricate to sizes, shapes, and profiles indicated and as necessary to receive adjacent construction. Furnish inserts for units installed after concrete is placed.

C. Fabricate supports for operable partitions from continuous steel beams of sizes indicated with attached bearing plates, anchors, and braces as indicated. Drill or punch bottom flanges of beams to receive partition track hanger rods; locate holes where indicated on operable partition Shop Drawings.

D. Unless otherwise indicated hot-dip galvanize all miscellaneous framing and supports located in exterior walls, in exterior locations and where indicated. Prime paint miscellaneous framing and supports at other locations.

2.05 MISCELLANEOUS STEEL TRIM

A. Unless otherwise indicated, fabricate units from steel shapes, plates, and bars of profiles shown with continuously welded joints and smooth exposed edges; miter corners and use concealed field splices where possible.

B. Provide cutouts, fittings, and anchorages as needed to coordinate assembly and installation with other work, and with integrally welded steel strap anchors for embedding in concrete or masonry construction.

C. Hot-dip galvanized miscellaneous steel trim located in exterior walls, in exterior locations, where exposed to the exterior, and where indicated. Prime paint miscellaneous framing and supports at other locations.

2.06 LOOSE BEARING AND LEVELING PLATES
A. For applications where they are not specified in other Sections, provide loose bearing and leveling plates for steel items bearing on masonry or concrete construction. Drill plates to receive anchor bolts and for grouting. Provide with galvanized finish.

2.07 LOOSE STEEL LINTELS

A. Fabricate loose steel lintels from steel angles and shapes of size indicated for openings and recesses in masonry walls and partitions at locations indicated. Fabricate in single lengths for each opening unless otherwise indicated. Weld adjoining members together to form a single unit where indicated. Size loose lintels to provide bearing length at each side of openings equal to 1/12 of clear span, but not less than 8 inches unless otherwise indicated. Provide with galvanized finish.

2.08 STEEL WELD PLATES AND ANGLES

A. For applications where they are not specified in other Sections, provide steel weld plates and angles for items supported from concrete and masonry construction as needed to complete the Work. Provide each unit with no fewer than two integrally welded steel strap anchors for embedding in concrete or masonry.

2.09 FINISHES

A. General
   1. Comply with NAAMM/NOMMA 500 for recommendations for applying and designating finishes.
   2. Finish metal fabrications after assembly.
   3. Finish exposed surfaces to remove tool and die marks and stretch lines, and to blend into surrounding surface.

B. Steel and Iron Finishes
   1. Prime Painting
      a. Shop prime iron and steel items except those with galvanized finishes, and unless those to be embedded in concrete or masonry, or to receive sprayed-on fireproofing, unless otherwise indicated.
      b. Prepare surfaces to be primed in accordance with SSPC-SP 2 or SSPC-SP 3, and SSPC-SP 6/NACE No. 3 for exterior items.
      c. Clean surfaces of rust, scale, grease, and foreign matter prior to finishing.
      d. Apply shop primer to comply with SSPC-PA 1 for shop painting. Stripe paint corners, crevices, bolts, welds, and sharp edges.
   2. Galvanizing: Hot-dip galvanize items as indicated to comply with ASTM A 153/A 153M for steel and iron hardware and with ASTM A 123/A 123M for other steel and iron products. Do not quench or apply post galvanizing treatments that might interfere with paint adhesion.

C. Stainless Steel Finishes
   1. General
      a. Remove tool and die marks and stretch lines, or blend into finish.
      b. For directionally textured finishes, grind and polish surfaces to produce uniform, directionally textured, polished finish indicated, free of cross scratches. Run grain with long dimension of each piece.
      c. When polishing is completed, passivate and rinse surfaces. Remove embedded foreign matter and leave surfaces chemically clean.
   2. Directional Satin Finish: No. 4.

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 setting templates to the appropriate entities for steel items required to be cast into concrete or embedded in masonry.

3.03 INSTALLATION - GENERAL

A. Cutting, Fitting, and Placement: Perform cutting, drilling, and fitting required for installing metal fabrications. Set metal fabrications accurately in location, alignment, and elevation; with edges and surfaces level, plumb, true, and free of rack; and measured from established lines and levels.
   1. Fit exposed connections accurately together to form hairline joints. Weld connections that are not to be left as exposed joints but cannot be shop welded because of shipping size limitations. Do not weld, cut, or abrade surfaces of exterior units that have been hot-dip galvanized after fabrication and are for bolted or screwed field connections.
   2. Provide for erection loads, and for sufficient temporary bracing to maintain true alignment until completion of erection and installation of permanent attachments.
   3. Obtain Architect's approval prior to site cutting or making adjustments not scheduled.

B. Field Welding: Comply with the following requirements:
   1. Use materials and methods that minimize distortion and develop strength and corrosion resistance of base metals.
   2. Obtain fusion without undercut or overlap.
   3. Remove welding flux immediately.
   4. At exposed connections, finish exposed welds and surfaces smooth and blended so no roughness shows after finishing and contour of welded surface matches that of adjacent surface.

C. Fastening to In-Place Construction: Provide anchorage devices and fasteners where metal fabrications are required to be fastened to in-place construction. Provide threaded fasteners for use with concrete and masonry inserts, toggle bolts, and other connectors. Provide temporary bracing or anchors in formwork for items that are to be built into concrete, masonry, or similar construction.

D. Corrosion Protection: Coat concealed surfaces that will come into contact with grout, concrete, masonry, wood, or dissimilar metals with a heavy coat of bituminous paint, and with 2 coats of clear lacquer for extruded aluminum.

E. Tolerances
   1. Maximum Variation From Plumb: 1/4 inch per story, non-cumulative.

3.04 MISCELLANEOUS FRAMING AND SUPPORTS

A. Install framing and supports to comply with requirements of items being supported, including manufacturers' written instructions and requirements indicated on Shop Drawings.
B. Anchor supports for operable partitions securely to and rigidly brace from building structure.

3.05 BEARING AND LEVELING PLATES

B. Set bearing and leveling plates on wedges, shims, or leveling nuts. After bearing members have been positioned and plumbed, tighten anchor bolts. Do not remove wedges or shims but, if protruding, cut off flush with edge of bearing plate before packing with grout.
   1. Use nonshrink grout, nonmetallic, in concealed locations where not exposed to moisture; use nonshrink, nonmetallic grout in exposed locations and where exposed to moisture.
unless otherwise indicated.

2. Pack grout solidly between bearing surfaces and plates to ensure that no voids remain.

3.06 ADJUSTING AND CLEANING

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

B. Galvanized Surfaces: Clean field welds, bolted connections, and abraded areas and repair galvanizing to comply with ASTM A 780.

END OF SECTION
SECTION 06 10 00

ROUGH CARPENTRY

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Section includes, but is not limited to, the following:
   - Rough opening framing for doors, windows, and roof openings.
   - Preservative treated wood materials.
   - Fire retardant treated wood materials.
   - Communications and electrical room mounting boards.
   - Concealed wood blocking, nailers, and supports.
   - Miscellaneous wood framing, nailers, furring, and grounds.

1.02 RELATED DOCUMENTS

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

1.03 RELATED SECTIONS

A. Reference sections include, but are not limited to, the following:
   - Section 04 20 00 - Unit Masonry: Setting anchors in masonry.
   - Section 05 50 00 - Metal Fabrications: Miscellaneous steel connectors and support angles
   - Section 09 21 16 - Gypsum Board Assemblies.

1.04 REFERENCE STANDARDS

A. Reference standards include, but are not limited to, the following:
   - ASME B18.2.1 - Square, Hex, Heavy Hex, and Askew Head Bolts and Hex, Heavy Hex, Hex Flange, Lobed Head, and Lag Screws (Inch Series); 2010.
   - ASME B18.6.1 - Wood Screws (Inch Series); 1981.
   - ASTM A 653/A 653M - Standard Specification for Steel Sheet, Zinc-Coated (Galvanized) or Zinc-Iron Alloy-Coated (Galvannealed) by the Hot-Dip Process; 2009a.
   - ASTM D 3201 - Standard Test Method for Hygroscopic Properties of Fire-Retardant Wood and Wood-Based Products; 2008ae1
   - ASTM F 593 - Standard Specification for Stainless Steel Bolts, Hex Cap Screws, and
1.05 DEFINITIONS

A. Exposed Framing: Framing not concealed by other construction.

B. Dimension Lumber: Lumber of 2 inches nominal or greater but less than 5 inches nominal in least dimension.

C. Timber: Lumber of 5 inches nominal or greater in least dimension.

D. Lumber grading agencies and the abbreviations used to reference them include, but are not limited to, the following:

   - ALSC: American Lumber Standards Committee Inc.
   - FSC: Forest Stewardship Council.

1.06 SUBMITTALS

A. See Section 01 33 00 - Submittals, for submittal procedures.

B. Product Data: Submit for each type of process and factory-fabricated product.

   1. Include data for wood-preservative treatment from chemical treatment manufacturer and certification by treating plant that treated materials comply with requirements. Indicate type of preservative used and net amount of preservative retained.

   2. Include data for fire-retardant treatment from chemical treatment manufacturer and certification by treating plant that treated materials comply with requirements. Include physical properties of treated materials based on testing by a qualified independent testing agency acceptable to the authorities having jurisdiction.

C. Material Certificates: For dimension lumber specified to comply with minimum allowable unit stresses. Indicate species and grade selected for each use and design values approved by the ALSC Board of Review.

D. Research/Evaluation Reports: Submit for the following, from ICC-ES:

   - Wood-preservative-treated wood.
   - Fire-retardant-treated wood.
   - Power-driven fasteners.
Powder-actuated fasteners.
Expansion anchors.

1.07 QUALITY ASSURANCE
A. Testing Agency Qualifications: For testing agency providing classification marking for fire-retardant treated material, an inspection agency acceptable to authorities having jurisdiction that periodically performs inspections to verify that the material bearing the classification marking is representative of the material tested.
B. VOC Limitations: Composite-wood products, adhesives, cements and other liquid-type materials shall comply with testing and product requirements of the California Department of Health Services’ “Standard Practice for the Testing of Volatile Organic Emissions from Various Sources Using Small-Scale Environmental Chambers.”

1.08 DELIVERY, STORAGE, AND HANDLING
A. General: Stack lumber, above grade and flat with spacers beneath and between each bundle to provide air circulation, and prevent deformation. Cover wood products with waterproof coverings securely anchored to protect against moisture and weather. Provide for air circulation around stacks and under coverings.
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 DOC 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 ALSC’s Board of Review and who is certified by the ALSC Board of Review to provide grading service for the species and grade specified.
      a. Factory mark each piece of lumber with grade stamp of grading agency.
      b. For exposed lumber indicated to receive a stained or natural finish, mark grade stamp on end or back of each piece or omit grade stamp and provide certificates of grade compliance issued by grading agency.
   4. Lumber of other species or grades is acceptable provided structural and appearance characteristics are equivalent to or better than products specified.
   5. Where nominal sizes are indicated, provide actual sizes required by DOC PS 20 for moisture content specified. Where actual sizes are indicated, they are minimum dressed sizes for dry lumber. Provide dressed lumber, S4S, unless otherwise indicated.
B. Certified Wood Materials: Materials shall be produced from wood obtained from forests certified by an FSC-accredited certification body to comply with FSC STD-01-001.
C. Maximum Moisture Content of Lumber: MC19, unless otherwise indicated.

2.02 DIMENSION LUMBER FOR CONCEALED APPLICATIONS
A. Grading Agency: Southern Pine Inspection Bureau, Inc. (SPIB).
B. Sizes: Nominal sizes as indicated on drawings, S4S.
C. Moisture Content: S-dry or MC19.
D. Miscellaneous Framing, Blocking, Nailers, Grounds, and Furring:
   1. Lumber: S4S, Construction, or No 2 and Better.
2. Boards: Standard, or No 3 and Better.

2.03 CONSTRUCTION PANELS

A. Communications and Electrical Room Mounting Boards: DOC PS 1, Exposure 1, C-D Plugged plywood, fire-retardant treated; unless otherwise indicated, 3/4 inch minimum thickness.

2.04 ACCESSORIES

A. Fasteners and Anchors: Provide fasteners that comply with requirements specified for material and manufacture.
   1. Metal and Finish: Unfinished steel, except as following:
      a. Hot-dipped galvanized steel per ASTM A 153/A 153M for exposed to weather, in ground contact, and high relative humidity locations.
      b. Stainless steel, silicon bronze or copper, or ASTM A 153/A 153M hot-dipped galvanized steel at fire-retardant and preservative treated lumber and plywood.
   4. Drywall Screws: Bugle head, hardened steel, power driven type, length three times thickness of sheathing.
   7. Bolts: Steel bolts complying with ASTM A 307, Grade A; with ASTM A 563/A 563M hex nuts and, where indicated, flat washers.
   8. Expansion Anchors: Anchor bolt and sleeve assembly of stainless steel with bolts and nuts complying with ASTM F 593 and ASTM F 594, Alloy Group 1 or 2, with capability to sustain, without failure, a load equal to six times the load imposed when installed in unit masonry assemblies and equal to four times the load imposed when installed in concrete as determined by testing per ASTM E 488 conducted by a qualified independent testing and inspecting agency.

2.05 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
      a. Treated lumber shall be tested according ASTM D 5664 and design value adjustment factors shall be calculated according to ASTM D 6841.
      b. Use treatment that does not promote corrosion of metal fasteners.
      c. Mark each piece of wood with producer’s stamp indicating compliance with specified requirements. For exposed lumber indicated to receive a stained or natural finish mark end or back of each piece; or if acceptable to the authorities having jurisdiction, omit marking and provide certificates of treatment compliance issued by testing agency acceptable to the authorities having jurisdiction.
   2. Preservative-Treated Wood
      a. Preservative chemicals shall be acceptable to authorities having jurisdiction and shall contain no arsenic or chromium.
      b. For exposed items indicated to receive a stained or natural finish, use chemical formulations that do not require incising, contain colorants, bleed through, or otherwise adversely affect finishes.
      c. Provide lumber and plywood marked or stamped by an ALSC-accredited testing agency, certifying level and type of treatment in accordance with AWPA standards. For exposed lumber indicated to receive a stained or natural finish mark end or back of each piece; or if acceptable to the authorities having jurisdiction, omit marking and provide certificates of treatment compliance issued by testing agency acceptable to the authorities having jurisdiction.
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 E 84, with no evidence of significant combustion when test is extended for an additional 20 minutes, and with the flame front not extending more than 10.5 feet beyond the centerline of the burners at any time during the test both before and after accelerated weathering test performed in accordance with ASTM D 2898.
   a. Kiln dry wood after treatment to a maximum moisture content of 19 percent for lumber and 15 percent for plywood.
   b. Treat all exterior rough carpentry items unless otherwise indicated.
   c. Do not use exterior 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 index of 25 or less when tested in accordance with ASTM E 84, with no evidence of significant combustion when test is extended for an additional 20 minutes, and with the flame front not extending more than 10.5 feet beyond the centerline of the burners at any time during the test. Treated materials shall have a moisture content of 28 percent or less when tested according to ASTM D 3201 at 92 percent relative humidity.
   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 are to be fire retardant treated unless otherwise indicated.
   c. Do not use interior treated wood in applications exposed to weather or where the wood may become wet.

C. Preservative Treatment:
1. 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.
   a. Kiln dry lumber after treatment to maximum moisture content of 19 percent. Do not use material that is warped or that does not comply with requirements for untreated material.
   b. Treat lumber in contact with roofing, flashing, or waterproofing.
   c. Treat lumber in contact with masonry or concrete.
   d. Treat lumber in other locations as indicated.
2. 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.
   a. Preservative for Field Application to Cut Surfaces: As recommended by manufacturer of factory treatment chemicals for brush-application in the field.

PART 3 EXECUTION

3.01 PREPARATION
A. Coordinate installation of rough carpentry members specified in other sections.

3.02 INSTALLATION - GENERAL
A. Set rough carpentry to required levels and lines, with members plumb, true to line, cut, and fitted. Fit rough carpentry to other construction; scribe and cope as needed for accurate fit. Locate furring, nailers, blocking, grounds, and similar supports to comply with requirements for support of facing materials and attaching other construction including, but not limited to, fixtures, specialty items, equipment and trim.
B. Sort and select lumber so that natural characteristics will not interfere with installation or with fastening other materials to lumber. Do not use materials with defects that interfere with function of member or pieces that are too small to use with minimum number of joints or optimum joint arrangement. Do not splice members between supports unless otherwise
C. Comply with AFPA Wood Frame Construction Manual, unless otherwise indicated.

D. Securely attach rough carpentry work to substrate by anchoring and fastening as indicated, complying with ICC-ES ESR 1539, and Table 2304.9.1 “Fastening Schedule” of the local Code.

1. Select fasteners of size that will not fully penetrate members where opposite side will be exposed to view or will receive finish materials. Make tight connections between members. Install fasteners without splitting wood. Drive nails snug but do not countersink nail heads unless otherwise indicated.

2. For exposed work, arrange fasteners in straight rows parallel with edges of members, with fasteners evenly spaced, and with adjacent rows staggered.

E. Select material sizes to minimize waste.

F. Reuse scrap to the greatest extent possible; clearly separate scrap for use on site as accessory components, including: shims, bracing, and blocking.

G. 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 framed assemblies that have concealed spaces, provide solid wood fireblocking as required by applicable local code, to close concealed draft openings between floors and between top story and roof/attic space; other material acceptable to code authorities may be used in lieu of solid wood blocking.

C. In metal stud walls, provide continuous blocking around door and window openings for anchorage of frames, securely attached to stud framing.

D. 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.

E. Where ceiling-mounting is indicated, provide blocking and supplementary supports above ceiling, unless other method of support is explicitly indicated.

3.04 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. Coordinate size and location requirements with equipment and utilities requiring mounting boards.

2. Install adjacent boards without gaps.

3.05 SITE APPLIED WOOD TREATMENT

A. Apply preservative treatment compatible with factory applied treatment at site-sawn cuts, complying with manufacturer’s instructions and AWPA M4.

B. Allow preservative to dry prior to erecting members.

3.06 PROTECTION

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

A. Waste Disposal:
   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
PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

A. Section Includes:
   1. Interior trim, including non-fire-rated interior door frames.

B. Related Requirements:
   1. Section 061000 "Rough Carpentry" for furring, blocking, and other carpentry work not exposed to view.
   2. Section 099000 "Painting" for priming and backpriming of interior finish carpentry.

1.3 DEFINITIONS

A. MDF: Medium-density fiberboard.

B. MDO: Plywood with a medium-density overlay on the face.

C. PVC: Polyvinyl chloride.

1.4 ACTION SUBMITTALS

A. Product Data: For each type of process and factory-fabricated product. Indicate component materials, dimensions, profiles, textures, and colors and include construction and application details.
   1. Include data for wood-preservative treatment from chemical-treatment manufacturer and certification by treating plant that treated materials comply with requirements. Indicate type of preservative used and net amount of preservative retained. Include chemical-treatment manufacturer’s written instructions for finishing treated material.
   2. For products receiving a waterborne treatment, include statement that moisture content of treated materials was reduced before shipment to Project site to levels specified.

B. Samples: For each exposed product and for each color and texture specified.
CEDAR ROAD ELEMENTARY SCHOOL ADDITION
APN 18061_11
CHESAPEAKE PUBLIC SCHOOLS
BID 48-1920

1.5 DELIVERY, STORAGE, AND HANDLING

A. Stack lumber, plywood, and other panels flat with spacers between each bundle to provide air circulation.

1. Protect materials from weather by covering with waterproof sheeting, securely anchored.
2. Provide for air circulation around stacks and under coverings.

B. Deliver interior finish carpentry materials only when environmental conditions comply with requirements specified for installation areas. If interior finish carpentry materials must be stored in other than installation areas, store only where environmental conditions comply with requirements specified for installation areas.

1.6 FIELD CONDITIONS

A. Environmental Limitations: Do not deliver or install interior finish carpentry materials until building is enclosed and weatherproof, wet-work in space is completed and nominally dry, and HVAC system is operating and maintaining temperature and relative humidity at occupancy levels during the remainder of the construction period.

B. Do not install finish carpentry materials that are wet, moisture damaged, or mold damaged.

1. Indications that materials are wet or moisture damaged include, but are not limited to, discoloration, sagging, or irregular shape.
2. Indications that materials are mold damaged include, but are not limited to, fuzzy or splotchy surface contamination and discoloration.

PART 2 - PRODUCTS

2.1 MATERIALS, GENERAL

A. Lumber: DOC PS 20 and applicable rules of grading agencies indicated. If no grading agency is indicated, comply with applicable rules of any rules-writing agency certified by the American Lumber Standard Committee's (ALSC) Board of Review. Grade lumber by an agency certified by the ALSC's Board of Review to inspect and grade lumber under the rules indicated.

1. Factory mark each piece of lumber with grade stamp of grading agency.
2. For exposed lumber, mark grade stamp on end or back of each piece.

B. Softwood Plywood: DOC PS 1.

C. Hardboard: ANSI A135.4.

2.2 WOOD-PRESERVATIVE-TREATED MATERIALS

A. Preservative Treatment by Pressure Process: AWPA U1; Use Category UC1.

1. Kiln dry lumber and plywood after treatment to a maximum moisture content of 19 and 18 percent, respectively.
2. Preservative Chemicals: Acceptable to authorities having jurisdiction and containing no arsenic or chromium.
3. For exposed items indicated to receive transparent finish, do not use chemical formulations that contain colorants or that bleed through or otherwise adversely affect finishes.

4. Do not use material that is warped or does not comply with requirements for untreated material.

5. Mark lumber with treatment-quality mark of an inspection agency approved by the ALSC’s Board of Review.
   a. For exposed lumber indicated to receive a stained or natural finish, mark end or back of each piece.

6. Mark plywood with appropriate classification marking of an inspection agency acceptable to authorities having jurisdiction.
   a. For exposed plywood indicated to receive a stained or natural finish, mark back of each piece.

7. Application: Where indicated on Drawings.

2.3 INTERIOR TRIM

A. Lumber Trim for Opaque Finish (Painted Finish):

1. Species and Grade:
   a. Douglas fir-larch or Douglas fir south; NLGA, WCLIB, or WWPA Superior or C & Btr finish.

2. Maximum Moisture Content for Softwoods: 15 percent with at least 85 percent of shipment at 12 percent or less.

   a. Maximum Moisture Content: 9 percent.

2.4 MISCELLANEOUS MATERIALS

A. Fasteners for Interior Finish Carpentry: Nails, screws, and other anchoring devices of type, size, material, and finish required for application indicated to provide secure attachment, concealed where possible.

2.5 FABRICATION

A. Back out or kerf backs of the following members, except those with ends exposed in finished work:
   1. Interior standing and running trim, except shoe and crown molds.
   2. Wood-board paneling.

B. Ease edges of lumber less than 1 inch (25 mm) in nominal thickness to 1/16-inch (1.5-mm) radius and edges of lumber 1 inch (25 mm) or more in nominal thickness to 1/8-inch (3-mm) radius.
3.1 EXAMINATION
   A. Examine substrates, with Installer present, for compliance with requirements for installation tolerances and other conditions affecting performance of the Work.
   B. Examine finish carpentry materials before installation. Reject materials that are wet, moisture damaged, and mold damaged.
   C. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 PREPARATION
   A. Clean substrates of projections and substances detrimental to application.
   B. Before installing interior finish carpentry, condition materials to average prevailing humidity in installation areas for a minimum of 24 hours unless longer conditioning is recommended by manufacturer.

3.3 INSTALLATION, GENERAL
   A. Do not use materials that are unsound; warped; improperly treated or finished; inadequately seasoned; too small to fabricate with proper jointing arrangements; or with defective surfaces, sizes, or patterns.
   B. Install interior finish carpentry level, plumb, true, and aligned with adjacent materials.
      1. Use concealed shims where necessary for alignment.
      2. Scribe and cut interior finish carpentry to fit adjoining work. Refinish and seal cuts as recommended by manufacturer.
      3. Where face fastening is unavoidable, countersink fasteners, fill surface flush, and sand unless otherwise indicated.
      4. Install to tolerance of 1/8 inch in 96 inches (3 mm in 2438 mm) for level and plumb. Install adjoining interior finish carpentry with 1/32-inch (0.8-mm) maximum offset for flush installation and 1/16-inch (1.5-mm) maximum offset for reveal installation.
      5. Coordinate interior finish carpentry with materials and systems in or adjacent to it. Provide cutouts for mechanical and electrical items that penetrate interior finish carpentry.

3.4 ADJUSTING
   A. Replace interior finish carpentry that is damaged or does not comply with requirements.
      1. Interior finish carpentry may be repaired or refinished if work complies with requirements and shows no evidence of repair or refinishing.
   B. Adjust joinery for uniform appearance.
3.5 CLEANING

A. Clean interior finish carpentry on exposed and semiexposed surfaces.

B. Restore damaged or soiled areas and touch up factory-applied finishes if any.

3.6 PROTECTION

A. Protect installed products from damage from weather and other causes during construction.

B. Remove and replace finish carpentry materials that are wet, moisture damaged, and mold damaged.

1. Indications that materials are wet or moisture damaged include, but are not limited to, discoloration, sagging, or irregular shape.

2. Indications that materials are mold damaged include, but are not limited to, fuzzy or splotchy surface contamination and discoloration.

END OF SECTION 06 20 23
SECTION 07 01 51
SELECTIVE REMOVAL AND REPAIRS TO EXISTING ROOFING SYSTEM

PART 1 - GENERAL

1.01 RELATED DOCUMENTS
   A. Drawings and general provisions of Contract, including General and Supplementary Conditions and other Division 01 Specification sections, apply to work of this section.

1.02 SECTION INCLUDES
   A. The work in this section is related to temporary shoring that will impact the existing roof system and flashings.
   B. Section includes, but is not limited to, selective removal and repairs to existing roofing system as indicated:
      - Existing Roofing System ............Built-up Roofing
      - Warranty Term ........................Verify with Owner
      - Installation Completed ..............Verify with Owner
      - Installing Contractor .................Verify with Owner

1.03 RELATED SECTIONS
   A. Related sections include, but are not limited to, the following:
      - Section 06 10 00 Rough Carpentry

1.04 REFERENCE STANDARDS
   A. Reference standards include, but are not limited to, the following:
      - ASTM D 1079 – Standard Terminology Relating to Roofing and Waterproofing; 2010

1.05 DEFINITIONS
   A. Roof Assembly: An assembly designed to provide weather protection and resistance to design loads, consisting of the roof deck, substrate boards (where serving as a Code-required thermal barrier separating foam insulation from steel decking, or a part of fire-resistance rated roof assembly), insulation, recover boards and roof covering.
   B. Roofing System: Roofing system shall include roofing membrane, membrane and metal flashing items, roof drain sumps and flashing, recover board, rigid board insulation, and substrate board (where serving as Code-required thermal barrier separating foam insulation from steel decking, or part of roof-ceiling fire resistance rated assembly).
   C. Roofing Terminology: See ASTM D 1079 and glossary of NRCA ML104 for definition of terms related to roofing work in this Section.

1.06 SUBMITTALS
   A. See Section 01 33 00 – Submittals, for submittal procedures.
   B. Product Data: Submit manufacturer’s technical data for each type of product indicated including, but not limited to the following:
      - Roof Membranes and flashings
      - Insulation
      - Roof adhesives, primers, cements, bitumens
      - Fasteners of each type, including fasteners design for FMG IA-90 uplift
      - Cover and Substrate Boards
Accessories

C. Installer Certificates

D. Manufacturer’s installation instructions

1.07 QUALITY ASSURANCE

A. The Installer shall have at least five (5) years of experience in providing and installing membrane roofing systems of the type indicated, and shall submit evidence of same and have all the necessary resources to perform the work. The Installer shall be pre-qualified prior to the bidding by the roofing system manufacturer and shall be required to submit evidence of such prequalification as follows:

1. A current certified letter of approval from the roofing system manufacturer which states that the Installer is approved to install the indicated roofing system(s) including all components.

2. A current notarized letter from the Installer or roofing system manufacturer stating that the Installer is experienced in the installation of the indicated roofing system and a list of successfully completed projects of the indicated system within one hundred (100) miles of the project site and dating back for a period of five (5) years.

B. Provide all primary roofing system materials from a single source roofing manufacturer who has been successfully producing the specified types of primary products for not less than fifteen (15) years and are acceptable for the deck and surfacing to which they are to be applied. Primary products include, but are not limited to: ply membranes, flashing plies, stripping-in-plies, adhesive, primers, cements, fasteners, walkways membranes, roof drain flashings.

C. Provide only secondary products which are acceptable to and warrantable by the manufacturer of the primary roofing products. Secondary products include, but are not limited to: insulation, lead flashings, expansion joints, metal sill flashing, sealant-backer rod, and metal gravel stops.

D. All products shall be acceptable to the existing roofing system manufacturer and includable under the existing roof system manufacturer's warranty.

1.08 WARRANTIES

A. Upon substantial completion of the project and Owner acceptance and prior to final payment, the Installer shall issue the Owner a written, signed, warranty against defective workmanship and materials for the ROOF REPAIRS and all related work. This labor and materials warranty shall be for a period of TWO (2) years.

B. Non-Conflicting Warranties: The issuance of an installer’s warranty shall in no way affect the existing Roofing System Manufacturer’s Warranty.

PART 2 - PRODUCTS

2.01 MATERIALS

A. Provide Roofing System Repairs with materials and products equivalent to those of the existing roofing systems and acceptable to the existing roofing system manufacturer.

PART 3 - EXECUTION

3.01 SURFACE INSPECTION AND PREPARATION

A. Before commencing work, the Contractor, the Installer, roofing system manufacturer’s field representative and Owner’s field inspector shall meet at the site and inspect the existing conditions, discuss the schedule and proposed work plan. If defective conditions are encountered or if disagreement occurs over the schedule or work plan, it shall be noted in writing to the Owner and no work shall begin until such is corrected or resolved.
3.02 ENVIRONMENTAL CONDITIONS
   A. Proceed with roofing work only when existing and forecasted weather conditions to include temperature permit work to be performed in accordance with the manufacturers written instructions and warranty requirements.
   B. Do not perform demolition or install new roofing in rain, fog, mists, or snow or when the temperature is below 40o F.

3.03 PROTECTION OF ROOF DURING WORK
   A. At all times the Contractor and Installer shall take the precautions necessary to protect the interior of the building from any water penetration.
   B. During demolition and new work, the Installer shall have, on site, heavy duty waterproof tarpaulins in sufficient quantity to cover work surfaces in the event of a sudden change in weather conditions, and a means to secure same.
   C. Do not remove any more roof drains, expansion joints, flashings, mechanical equipment, roof membrane or insulation than can be reinstalled and or waterproofed (dried-in) in the same day.
   D. Protect all adjoining surfaces against “any” damage that could result from roofing demolition or installation of roofing materials and related components.
   E. Seal all exposed edges at the end of each day’s work.

3.04 STORAGE OF MATERIALS
   A. The roof area will not be used to store materials other than what is scheduled to be installed the same day. Such daily stored materials will be dispersed so as not to create areas of concentrated loading.

3.05 BLOCKING REQUIREMENTS
   A. Treated wood blocking will be installed around openings, projections, at expansion joints and where indicated on the drawings and details. It shall be in multiple layers, staggered joints, the thickness of the insulation and be mechanically fastened with 1/2 inch round stainless steel bolts with washer and hex nuts. Countersink.

3.06 EXISTING ROOFING SYSTEM REMOVAL
   A. Remove existing roofing and associated components down to existing roof deck; and only to the extent required for the Work indicated, and required to affect connections with new flashing and roofing repairs.
   B. Cut existing roofing and associated components along straight lines and remove without damage to existing roof deck.
   C. Remove gravel/ballast surfacing from existing roofing plies, at least 18 inches back from cut; remove without damaging plies.
   D. Sequence work to minimize building exposure between existing roofing system removal and installation of roofing repair materials.

3.07 ROOFING SYSTEM REPAIRS
   A. Install all roofing system repair materials in accordance with roofing system manufacturer’s instruction and in a manner acceptable for inclusion in and coverage by existing roofing system manufacturer’s warranty.

END OF SECTION 07 01 51
SECTION 07 11 13
BITUMINOUS DAMPPROOFING

PART 1 GENERAL

1.01 SECTION INCLUDES

Bituminous dampproofing, asbestos-free, cold-applied, emulsified-asphalt, at locations where the CMU, near windows for example, does not have a cavity wall for the application of foamed-in-place insulation.

Refer to article 3.03 for additional locations requiring dampproofing.

1.02 RELATED DOCUMENTS

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

1.03 RELATED SECTIONS

A. Related sections include, but are not limited to, the following:
   - Section 03 30 00 – Cast-In-Place Concrete
   - Section 04 20 00 – Unit Masonry

1.04 REFERENCE STANADARDS

A. Reference standard include, but are not limited to, the following:
   - ASTM D 1668 - NRCA ML104 - Roofing and Waterproofing Manual; National Roofing Contractors Association; Fifth Edition, with interim updates

1.05 SUBMITTALS

A. General: See Section 01 33 00 - Submittals, for submittal procedures.

B. Product Data: Provide properties of primer, bitumen, and mastics. Include recommended method of application, recommended primer, number of coats, coverage or thickness, and recommended protection course.

1.06 QUALITY ASSURANCE

A. General: Perform work in accordance with NRCA ML 104.

B. Installer Qualifications: Company specializing in performing the work of this section with minimum 5 years experience.

C. Single-Source Responsibility: Obtain primary dampproofing materials and primers from one source and by a single manufacturer. Provide secondary materials only as recommended by manufacturer of primary materials.

1.07 ENVIRONMENTAL REQUIREMENTS

A. Maintain ambient temperatures above 40 degrees F for 24 hours before and during application until dampproofing has cured.

PART 2 PRODUCTS

2.01 COLD-APPLIED, EMULSIFIED-ASPHALT DAMPPROOFING

A. Acceptable Manufacturers: Subject to compliance with requirements, provide bituminous dampproofing by one of the following manufacturers:
   - Karnak Corporation: www.karnakcorp.com
Mar-Flex Systems Inc: www.mar-flex.com  
Sonneborn Products, BASF Construction Chemicals LLC: www.buildingsystems.basf.com  
W R Meadows Inc: www.wrmeadows.com

B. Dampproofing: Cold-applied type, asbestos-free, fibred emulsified asphalt dampproofing conforming to ASTM D 1227, Type II, Class 1, manufactured of refined asphalt, emulsifiers and selected clay, fibred with mineral fibers, for application by fibered brush or spray.

C. Low-Emitting Materials: Dampproofing shall comply with the testing and product requirements of the California Department of Health Services’ “Standard Practice for the Testing of Volatile Organic Emissions from Various Sources Using Small-Scale Environmental Chambers.”

2.02 AUXILIARY MATERIALS

A. General: Furnish auxiliary materials recommended in writing by dampproofing manufacturer for intended use and compatible with bituminous dampproofing.

B. Emulsified-Asphalt Primer: ASTM D 1227, Type III, Class 1, except diluted with water as recommended in writing by manufacturer. Primer shall comply with the testing and product requirements of the California Department of Health Services’ “Standard Practice for the Testing of Volatile Organic Emissions from Various Sources Using Small-Scale Environmental Chambers.”

C. Asphalt-Coated Glass Fabric: ASTM D 1668, Type I.

D. Patching Compound: Asbestos-free fibered mastic of type recommended in writing by dampproofing manufacturer.

PART 3 EXECUTION

3.01 EXAMINATION

A. Examine substrates, areas, and conditions with Applicator present, for compliance with requirements for surface smoothness, surface moisture, and other conditions affecting performance of bituminous dampproofing work. Proceed with application only after substrate construction and penetrating work have been completed and unsatisfactory conditions have been corrected.

3.02 PREPARATION

A. Mask or otherwise protect adjoining exposed surfaces from being stained, spotted, or coated with dampproofing. Prevent dampproofing materials from entering and clogging weep holes, drains, conductors, piping and conduits. Make provisions to prevent spillage and migration onto other surfaces of work.

B. Clean substrates of projections and substances detrimental to the dampproofing work; fill voids, seal joints, and remove bond breakers if any, as recommended in writing by prime material manufacturer. Clean and prepare surfaces to receive dampproofing in accordance with manufacturer’s instructions. Do not apply dampproofing to surfaces unacceptable to manufacturer.

1. Masonry surfaces shall be free of oil, grease, dirt, laitance, loose material, frost, debris and other contaminants and free of extraneous mortar and chipped or broken masonry.

2. Concrete surfaces shall be properly cured, free of form release agents, oil, grease, dirt, laitance, loose material, frost, debris and other contaminants with form ties cut flush with surfaces and sharp protrusions and form match lines removed. Holes, voids, spalled areas and cracks shall be repaired, and rough surfaces shall be parged.

3. Metal surfaces shall be dry and free of rust, scale, loose paint, oil, grease, dirt, frost, debris, and other contaminants.

C. Apply patching compound to seal penetrations, and patch and fill tie holes, minor honeycombs, reveals, small cracks and other imperfections; cover with asphalt-coated glass fabric. Apply
bond breakers where required or as recommended by dampproofing manufacturer, with particular attention at construction joints.

D. Install separate flashings and corner protection stripping, as recommended by dampproofing manufacturer and where indicated to precede application of dampproofing. Comply with details shown and with manufacturer's recommendations. Pay particular attention to requirements at building expansion and control joints.

E. Dampproofing shall not be installed until after all masonry control and expansion joints have been cleaned, backer rod and sealant installed, and sealant has cured.

3.03 APPLICATION

A. Comply with manufacturer’s written instructions for dampproofing application, cure time between coats, and drying time before backfilling unless more stringent requirements are indicated.
   1. Apply dampproofing to provide continuous plane of protection.
   2. Apply additional coats if recommended in writing by manufacturer or to achieve a smooth surface and uninterrupted coverage.

B. Primer: Prime surfaces in accordance with manufacturer's instructions. Rate of application shall not be less than 1/2-gal/100-sq ft.

C. Dampproofing: Materials shall have a smooth and uniform consistency at time of application. Apply by fibered-brush or spray, at a rate of not less than 2-gal/100-sq ft, producing a smooth, uniform, impervious dry film of not less than 60-mil without voids or defects; dull or porous areas shall be recoated.
   1. Apply dampproofing to the following surfaces:
      a. Exterior, below-grade surfaces of exterior concrete or masonry walls in contact with earth or other backfill and where space is enclosed on opposite side.
      b. Where indicated on the Drawings.
   2. Apply vertical dampproofing down walls from finished-grade line to top of footing and extend over top of footing.
   3. Seal around piping, conduit, and other projections through dampproofing watertight with mastic.

D. Reinforcement: At changes in plane, or where otherwise shown as "reinforced", install lapped course of glass fabric in dampproofing compound before it thickens.

3.05 PROTECTION AND CLEANING

A. Protect exterior, below-grade dampproofing membrane from damage until backfilling is completed.

B. Clean spillage and soiling from adjacent construction using cleaning agents and procedures recommended in writing by manufacturer of affected construction.

END OF SECTION
PART 1 GENERAL

1.01 SECTION INCLUDES

A. Board insulation at perimeter foundation wall and underside of floor slabs.
B. Batt insulation in exterior walls.
C. Batt insulation for filling perimeter window and door shim spaces and door shim spaces and crevices in exterior walls and soffits.
D. Fire safing Insulation.

1.02 RELATED DOCUMENTS

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

1.03 RELATED SECTIONS

A. Related sections include, but are not limited to, the following:
   Section 06 10 00 - Rough Carpentry.
   Section 07 26 16 - Below Grade Vapor Barrier

1.04 REFERENCE STANDARDS

A. Reference standards include, but are not limited to, the following:
   ASTM C 612 - Standard Specification for Mineral Fiber Block and Board Thermal Insulation; 2009
   ASTM E 136 - Standard Test Method for Behavior of Materials in a Vertical Tube Furnace At 750 Degrees C; 2009b

1.05 SUBMITTALS

A. See Section 01 33 00 - Submittals, for submittal procedures.
B. Product Data: Submit data for each type of insulation specified including, but not limited to, product characteristics, performance criteria, and product limitations.
C. Manufacturer’s Certificate: Certify that products meet specified requirements.

1.06 ENVIRONMENTAL REQUIREMENTS

A. Do not install insulation and/or adhesives when temperature or weather conditions are detrimental to successful installation. Batt and fire safing insulation products which have become wet shall not be used.

1.07 QUALITY ASSURANCE
A. Single-Source Responsibility for Insulation Products: Obtain each type of building insulation from a single source with resources to provide products complying with requirements indicated without delaying the Work.

B. Fire-Test-Response Characteristics: Provide insulation and related materials with the fire-test-response characteristics indicated on Drawings or specified elsewhere in this Section as determined by testing identical products per test method indicated below by UL or another testing and inspecting agency acceptable to authorities having jurisdiction. Identify materials with appropriate markings of applicable testing and inspecting agency.

- Surface-Burning Characteristics: ASTM E 84
- Fire-Resistance Ratings: ASTM E 119
- Combustion Characteristics: ASTM E 136

1.08 DELIVERY, STORAGE, AND HANDLING

A. Protect insulation materials from physical damage and from deterioration by moisture, soiling, and other sources. Store inside and in a dry location. Comply with manufacturer's written instructions for handling, storing, and protecting during installation.

B. Protect plastic insulation as follows:
   1. Do not expose to sunlight, except to extent necessary for period of installation and concealment.
   2. Protect against ignition at all times. Do not deliver plastic insulating materials to project site before installation time.
   3. Complete installation and concealment of plastic materials as rapidly as possible in each area of construction.

1.09 SEQUENCING

A. Sequence work to ensure fireproofing and firestop materials are in place before beginning work of this Section.

PART 2 PRODUCTS

2.01 APPLICATIONS

A. Insulation Under Concrete Slabs: Extruded polystyrene board; 10.6 minimum aged R-value at 75 (± 2) degrees F for 2.25-inch total thickness.

B. Insulation at Perimeter of Foundation: Extruded polystyrene board; 15 minimum aged R-value at 75 (± 2) degrees F for 3-inch total thickness.

2.02 FOAM BOARD INSULATION MATERIALS

A. Extruded Polystyrene Board Insulation: ASTM C 578, Type IV; Extruded polystyrene board with either natural skin or cut cell surfaces; with the following characteristics:
   1. Flame Spread Index: 75 or less, when tested in accordance with ASTM E 84.
   2. Smoke Developed Index: 450 or less, when tested in accordance with ASTM E 84.
   3. Thermal Resistance (R Value): As indicated hereinbefore.
   5. Board Density: 1.6 lb/cu ft.
   6. Water Absorption, maximum: 0.3 percent, volume.
   7. Manufacturers: Subject to compliance with the specified requirements, provide board insulation product from one of the following manufacturers:

2.03 BATT INSULATION MATERIALS
A. Glass Fiber Batt Insulation: Flexible preformed batt or blanket, complying with ASTM C 665; friction fit.
   1. Flame Spread Index: 25 or less, when tested in accordance with ASTM E 84.
   2. Smoke Developed Index: 450 or less, when tested in accordance with ASTM E 84.
   3. Combustibility: Non-combustible, when tested in accordance with ASTM E 136, except for facing, if any.
   5. Thermal Resistance (R Value): As indicated hereinafter.
   7. Manufacturers: Subject to compliance with the specified requirements, provide batt insulation product from one of the following manufacturers:

2.04 FIRE SAFING INSULATION MATERIALS

A. Slag-Wool/-Rock-Wool-Fiber Board Insulation: Unfaced, thermal insulation combining slag-wool or rock-wool fibers with thermosetting resin binders complying with with ASTM C 612 and passing ASTM E 136 for combustion characteristics. Flame-spread and smoke-developed indices shall be 5 and 0 or less, respectively.
   1. Manufacturers: Subject to compliance with the specified requirements, provide safing insulation product from one of the following manufacturers:
      - John Manville: www.jm.com
      - Industrial Insulation Group LLC: www.iig-llc.com

B. Safing Clips: Galvanized steel safing clips approved by manufacturer of safing insulation for holding safing insulation in place

2.05 ACCESSORIES

A. Tape: Bright aluminum self-adhering type, mesh reinforced, 2 inch wide.

B. Insulation Fasteners: Impaling clip of galvanized steel with washer retainer and clips, to be adhered to surface to receive insulation, length to suit insulation thickness and substrate, capable of securely and rigidly fastening insulation in place.

C. Adhesive: Low-VOC 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. Batt and fire safing insulation products which have become wet shall not be used.

B. Verify substrate surfaces are flat, free of honeycomb, fins, irregularities, or materials or substances that may impede adhesive bond.

3.02 INSTALLATION, GENERAL

A. Comply with insulation manufacturer's written instructions applicable to products and applications indicated.

B. Install insulation that is undamaged, dry, and un-soiled and that has not been left exposed to ice, rain, or snow at any time.

C. Extend insulation to envelop entire area to be insulated. Cut and fit tightly around obstructions and fill voids with insulation. Remove projections that interfere with placement.
D. Provide sizes to fit applications indicated and selected from manufacturer's standard thicknesses, widths, and lengths. Apply single layer of insulation units to produce thickness indicated unless multiple layers are otherwise shown or required to make up total thickness.

3.03 BOARD INSTALLATION AT FOUNDATION PERIMETER

A. Adhere a 6 inch wide strip of polyethylene sheet over construction, control, and expansion joints with double beads of adhesive each side of joint. Extend sheet full height of joint.

B. Apply adhesive to back of boards in accordance with manufacturer's instructions.

C. Install boards vertically in running bond pattern on foundation perimeter in multiple layers to achieve total insulation thickness required, offset joints between insulation board layers. Boards shall extend full height of foundation wall from top of footing to underside of slab-on-grade above.
   1. Place boards to maximize adhesive contact.
   2. Butt edges and ends tightly to adjacent boards and to protrusions.

D. Cut and fit insulation tightly to protrusions or interruptions to the insulation plane.

E. Prevent insulation from being displaced or damaged while placing below grade vapor barrier, placing base for slab is being placed and compacted, and placing slab.

3.04 BATT INSTALLATION

A. Install insulation in accordance with manufacturer's instructions.

B. Install in exterior wall and exterior soffit spaces without gaps or voids. Do not compress insulation.

C. Trim insulation neatly to fit spaces. Insulate miscellaneous gaps and voids.

D. Fit insulation tightly in cavities and tightly to exterior side of mechanical and electrical services within the plane of the insulation. If more than one length is required to fill the cavities, provide lengths that will produce a snug fit between ends; tap joints between lengths. Maintain 3-inch clearance of insulation around recessed lighting fixtures not rated for or protected from contact with insulation.

E. Install with factory applied vapor retarder membrane facing warm side of building spaces.

F. Where required for support, retain insulation batts in place with spindle fasteners at 12 inches on center.

G. Tape seal tears or cuts in vapor retarder.

H. Install insulation in miscellaneous voids and cavity spaces where required to prevent gaps in insulation, and to fill perimeter window and door shim spaces and crevices in exterior walls and soffits.

3.05 FIRE SAFING INSULATION

A. Install safing insulation in accordance with manufacturer's instructions completely filling voids between adjacent assemblies, providing safing clips as required to support insulation. Cut safing insulation wider than gap, 25-percent larger, to be filled to ensure compression fit.

3.07 PROTECTION

A. Do not permit installed insulation to be damaged prior to its concealment; protect insulation from damage due to harmful weather exposures, physical abuse, and other causes. Provide temporary coverings or enclosures where insulation is subject to abuse and cannot be concealed and protected by permanent construction immediately after installation.

END OF SECTION
SECTION 07 21 19
FOAMED-IN-PLACE INSULATION

PART 1 GENERAL

1.01 SECTION INCLUDES

Foamed-in-place polyurethane insulation

1.02 RELATED DOCUMENTS

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

1.03 RELATED SECTIONS

A. Related sections include, but are not limited to, the following:

   Section 04 20 00 - Unit Masonry

1.04 REFERENCE STANDARDS

A. Reference standards include, but are not limited to, the following:

   AATCC Test Method 127 - Water Resistance: Hydrostatic Pressure Test; 2008
   ASTM C 297/C 297M - Standard Test Method for Flatwise Tensile Strength of Sandwich Constructions; 2004
   ASTM D 1621 - Standard Test Method for Compressive Properties of Rigid Cellular Plastics; 2010
   ASTM D 6226 - Standard Test Method for Open Cell Content of Rigid Cellular Plastics; 2010
   ASTM E 283 - Standard Test Method for Determining Rate of Air Leakage Through Exterior Windows, Curtain Walls, and Doors Under Specified Pressure Differences Across the Specimen; 2004

1.05 ADMINISTRATIVE REQUIREMENTS

A. Preinstallation Meeting: Convene one week prior to commencing work of this Section.

1.06 SUBMITTALS

A. See Section 01 33 00 - Submittals, for submittal procedures.
B. Product Data: Provide manufacturer’s technical product description, insulation and physical properties, and preparation requirements, including primers, foam repair kit, mineral wool and moisture detection paper (MDP) strips.

C. Manufacturer’s Installation Instructions: Indicate procedures and recommendation, preparation of substrates, and perimeter conditions requiring special attention.

D. Manufacturer’s Certificates: Certify that products meet specified requirements.

1.07 QUALITY ASSURANCE

A. Manufacturer Qualifications: Company specializing in manufacturing products of the type specified in this section, with not less than ten (10) years of experience.

B. Applicator Qualifications: Company specializing in performing work of the type specified, with minimum five (5) years of documented experience and approved by the insulation manufacturer.

1.08 FIELD CONDITIONS

A. Substrates: Proceed with spray polyurethane foam application only after substrate construction, penetration work, and related welding and other hot work has been completed. Verify that mortar has cured sufficiently for installation of insulation, and that substrates are dry by checking surface for moisture with moisture detection paper (MDP) strips.

B. Weather Limitations: Do not install spray polyurethane foam during precipitation or when precipitation is imminent, or when the ambient temperature and/or humidity are outside the ranges prescribed by the insulation manufacturer. Insulation shall not be installation at ambient temperatures less than 50 degrees F, nor when temperature is within 5 degrees F of dew point.

C. Coordination: The Contractor shall coordinate scheduling and sequencing of foamed-in-place insulation installation with the work of other trades; ensure that the work of other trades is in place and ready for installation of insulation.

PART 2 PRODUCTS

2.01 MANUFACTURERS

A. Foamed-In-Place Insulation: Subject to compliance with the specified requirements, provide foamed-in-place insulation from one of the following:

   BASF Polyurethane Foam Enterprises LLC: www.basf-pfe.us.
   Icynene: www.icynene.com/en-us

2.02 MATERIALS

A. Low-Emitting Materials: Foamed-in-place insulation and primers used inside the weatherproofing system shall comply with the testing and product requirements of the California Department of Health Services’ "Standard Practice for the Testing of Volatile Organic Emissions from Various Sources Using Small-Scale Environmental Chambers."

B. Foamed-In-Place Insulation: Medium-density, rigid, non-corrosive, formaldehyde free, closed cell polyurethane foam complying with ASTM C 1029, Type II; foamed on-site, using blowing agent of water, hydrochlorofluorocarbons (HCFCs) or non-ozone-depleting gases, and complying with the following:

   1. Physical Properties:
      a. Core Density: 1.9 to 2.2 lbs/cu ft when tested in accordance with ASTM D 1622.
b. Thermal Resistance (R-value): 7.0 (deg F hr sq ft)/Btu minimum when tested at 1-inch thickness in accordance with ASTM C 518 after aging for 180 days at 75 degrees F.
   (1) Total R-value = 14 (2” of insulation).

c. Water Vapor Transmission: 1.0 perm maximum at 2-inch test thickness when tested in accordance with ASTM E96/E 96M.

d. Compressive Strength: 25 psi minimum when tested in accordance with ASTM D 1621.

e. Water Absorption: 1 percent by volume, maximum, when tested in accordance with ASTM D 2842.

f. Air Permeance: 0.004 cfm/sq ft, maximum, when tested at intended thickness in accordance with ASTM E 2178 at 1.5 psf.

g. Closed Cell Content: Greater than 90 percent when tested in accordance with ASTM D 6226.

h. Surface Burning Characteristics: Flame Spread/Smoke Developed Index of 25/450 maximum when tested in accordance with ASTM E 84.

i. Air Leakage: No air leakage at 6.24 psf when tested in accordance with ASTM E 283.

j. Tensile Bond Strength: When tested in accordance with ASTM D 1623 for the following substrates, not less than:
   - Masonry: 45 psi.
   - Gypsum Sheathing: 15 psi.

2. Hydrostatic Pressure Resistance: No failure at 184.9 cm head pressure when tested in accordance with AATCC Test Method 127.

3. Products: Subject to compliance with the specified requirements, provide one of the following:
   - PolyMaster Inc: Incylthane 2000
   - BASF Polyurethane Foam Enterprises LLC: WallTite
   - North Carolina Foam Industries (NCFI): InsulBloc

C. Accessories
1. Primer: As required by insulation manufacturer, and complies with VOC limits of Section 01 61 16.
2. Foam Repair Kits: Foam repair kits acceptable to the insulation manufacturer.
3. Mineral Wool: 4 lb/cu ft density safing mineral wool with flame-spread and smoke-developed indices of 5 and 0 or less, respectively, acceptable to the insulation manufacturer.

PART 3 EXECUTION

3.01 EXAMINATION

A. Verify work within construction spaces or crevices is complete prior to insulation application including, but not limited to, veneer anchors, horizontal joint reinforcing, flashing, framing for metal wall panels, and piping, conduits and other wall penetrations.

B. Verify that surfaces are clean, dry, and free of matter that may inhibit insulation adhesion.

3.02 PREPARATION

A. Mask and protect adjacent surfaces and materials from over spray or dusting.
B. Fill voids and gaps between adjacent materials and at tops of walls with mineral wool; ensure insulation is separated from interior exposure.

C. Clean surfaces to receive insulation; remove dirt, debris, foreign matter and other deleterious substances that may inhibit insulation adhesion.

D. Test substrates with MDP strips to affirm that substrates are dry.

E. Apply primer in accordance with manufacturer's instructions.

3.03 APPLICATION

A. Apply insulation by spray method in accordance with manufacturer's instructions to a uniform monolithic density without voids. Apply insulation to full thickness in any given area the same day; layered application of insulation is not acceptable.

B. Apply insulation to achieve the following minimum thermal resistances (R-values) at the following substrates unless otherwise indicated:
   1. Concrete Unit Masonry Wall System Backups: R-14-with 2.0 inch average thickness.

C. Ensure work within construction spaces such as, but not limited to, veneer anchors, horizontal joint reinforcing, flashing and framing for metal wall panels are not dislodged and/or damaged by application of insulation.

D. Patch damaged areas using foam repair kits and in accordance with insulation manufacturer's instructions and recommendations.

E. Where applied to voids and gaps assure space for expansion to avoid pressure on adjacent materials that may bind operable parts.

F. Trim excess away for applied trim or remove as required for continuous sealant bead.

3.04 PROTECTION

A. Remove over spray and masking from adjacent surfaces, utilizing care to avoid damage to the surfaces. Replace or repair damaged surfaces in accordance with adjacent surface manufacturer's instruction and as directed by the Architect.

B. Do not permit subsequent construction work to disturb applied insulation.

END OF SECTION
PART 1 GENERAL

1.01 SECTION INCLUDES

Below grade vapor barriers, seam tape and mastic for installation under concrete slabs.

1.02 RELATED DOCUMENTS

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

1.03 RELATED SECTIONS

A. Related sections include, but are not limited to, the following:
   - Section 03 30 00 - Cast-In-Place Concrete
   - Section 04 20 00 - Unit Masonry
   - Section 07 21 00 - Thermal Insulation
   - Division 31 sections - Earthwork

1.04 REFERENCE STANDARDS

A. Reference standards include, but are not limited to, the following:
   - ASTM E 154 - Standard Test Method for Water Vapor Retarders Used in Contact with Earth Under Concrete Slabs, on Walls, or as Ground Cover; 1999 (R2005)
   - ASTM E 1643 - Standard Practice for Installation of Water Vapor Retarders Used in Contact with Earth or Granular Fill Under Concrete Slabs; 1998 (R2005)
   - ASTM E 1745 - Standard Specification for Plastic Water Vapor Retarders Used in Contact with Soil or Granular Fill under Concrete Slabs; 2009
   - ASTM F 1249 - Standard Test Method for Water Vapor Transmission Rate Through Plastic Film and Sheeting Using a Modulated Infrared Sensor; 2005

1.05 SUBMITTALS

A. See Section 01 33 00 - Submittals, for submittal procedures.

B. Product Data: Submit data including, but not limited to, product characteristics, performance criteria, and product limitations.

C. Manufacturer's Instructions: Installation instructions and recommendations for product placement, seaming, sealing of penetrations, and repair of vapor barriers.

D. Manufacturer's Certificate: Certify that products of this section meet specified requirements.

1.06 ENVIRONMENTAL REQUIREMENTS

A. Do not install below grade vapor barrier products when temperature or weather conditions are detrimental to successful installation.

1.07 QUALITY ASSURANCE

A. Single-Source Responsibly: Obtain below grade vapor barrier products from a single source with resources to provide products complying with requirements indicated without delaying the
Work.

1.08 DELIVERY, STORAGE, AND HANDLING

A. Deliver below grade vapor barrier products to project site in manufacturer's standard packaging and containers.

B. Store vapor barrier products in accordance with manufacturer's instructions under cover and elevated above grade.

1.09 SEQUENCING

A. Sequence the work of this Section with the work of Sections 03 30 00, 04 20 00 and 07 21 00, and Division 31 to ensure that foundation perimeter board insulation is in place; and base for slabs have been placed, compacted and approved, and prepared to receive below grade vapor barriers.

PART 2 PRODUCTS

2.01 MANUFACTURERS

A. Subject to compliance with the specified requirements, provide below grade vapor barrier products from one of the following manufacturers:

2.02 BELOW GRADE VAPOR BARRIERS

A. ASTM E 1745, Class A, 15-mil minimum thickness flexible, non-bituminous, preformed sheet vapor barriers having the following properties:
   1. Perm Rating: 0.3 perms maximum. At test temperature of 73.4 degrees F and test humidity of 50 (± 2) percent, maximum 0.3 gr/(h·ft2·in·Hg) when tested in accordance with ASTM E 154 Section 7 based on ASTM E 96 test methods, or with ASTM F 1249.
   2. Strength: 45.0 lbf/in minimum when tested in accordance with E 154, Section 13, using apparatus described by ASTM D 882.
   3. Puncture Resistance: 2,200 g minimum when tested in accordance with ASTM D 1709, Method B.
   4. Flame Spread: 25 maximum when tested in accordance with ASTM E 154, Section 16.

B. Products: Subject to compliance with the specified requirements, provide one of the following below grade vapor barrier products:
   1. Stego: Stego Wrap 15-Mil Class A.
   2. W R Grace: Florprufe 120.

2.03 ACCESSORIES

A. Pressure-Sensitive Tape: Seaming tape as recommended by the sheet vapor barrier manufacturer.

B. Adhesive: Low-VOC vapor-proof mastic as recommended by the sheet vapor barrier manufacturer.
PART 3 EXECUTION

3.01 EXAMINATION

A. Verify that foundation perimeter board insulation is in place; and base for slabs have been placed, compacted, brought to grade, approved, and prepared to receive below grade vapor barriers.

3.02 INSTALLATION

A. Place, protect, and repair below grade vapor barrier in accordance with ASTM E 1643 and manufacturer's written instructions.

B. Unroll vapor barrier and place sheets in position with longest dimension parallel with direction of concrete placement. Utilize the greatest widths and lengths practicable to eliminate joints wherever possible.

C. Lap vapor barrier over top of footings and seal to foundation walls.

D. Lap joints 6 inches minimum and seal with manufacturer's recommended tape. Seal all penetrations, including piping and conduits, per manufacturer's instructions.

E. Remove torn, punctured or damaged vapor barrier and replace with new prior to placing concrete. Minor tears and punctures may be repaired by cutting patches of vapor barrier material, sized to overlap damaged area 6 inches minimum on all sides, and taping securely in place.

F. Coordinate the work with that of Section 03 30 00 and ensure that concrete placement shall not damage vapor barrier.

3.03 PROTECTION

A. Protect installed vapor barrier from displacement and damage from subsequent construction operations.

END OF SECTION
SECTION 07 84 00
FIRESTOPPING

PART 1 GENERAL

1.01 SECTION INCLUDES
Joints in or between fire-resistance rated assemblies and other non-rated assemblies
Penetrations in fire-resistance-rated assemblies, including walls and horizontal assemblies,
and empty openings and openings containing penetrating items

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

1.03 RELATED SECTIONS
A. Related sections include, but are not limited to, the following:
   Section 21 01 00 – Fire Protection, for fire suppression sprinkler system piping
   penetrations
   Division 22 Sections – Plumbing, for plumbing system piping penetrations
   Division 23 Sections – Heating, Ventilating, and Air Conditioning (HVAC), for HVAC
   system piping and ductwork penetrations
   Division 26, 27, and 28 Sections, for cabling and conduit penetrations

1.04 REFERENCE STANDARDS
A. Reference standards include, but are not limited to, the following:
   ASTM E 84 – Standard Test Method for Surface Burning Characteristics of Building
   Materials; 2010b
   ASTM E 814 – Standard Test Method for Fire Tests of Through-Penetration Fire Stops;
   2006
   ASTM E 2174 – Standard Practice for On-Site Inspection of Installed Fire Stops; 2010a
   ASTM E 2393 – Standard Practice for On-Site Inspection of Installed Fire Resitive
   Joint Systems and Perimeter Fire Barriers; 2010a
   FMG 4991 – Approval Standard for Approval of Firestop Contractors; FM Global
   Group; 2001
   UL 1479 – Standard for Tests of Through-Penetration Firestops; 2003

1.05 SUBMITTALS
A. See Section 01 33 00 -Submittals, for submittal procedures.
B. Product Data: Submit manufacturer’s product data for each type of product required.
C. Product Schedule: For each type of fire-resistive joint and penetration firestopping; include
   location and UL design designation or that of a qualified testing and inspection agency
   acceptable to the authorities having jurisdiction.
   1. Submit documentation, including illustrations, from a qualified testing and inspecting
      agency that is applicable to each fire-resistive joint or penetration firestopping
      condition; include relationships to adjoining construction, and type of penetrating items.
   2. Where project conditions require modification to a qualified testing and inspecting
      agency’s illustration for a particular fire-resistive joint or penetration firestopping, submit
      illustration, with modifications marked, approved by firestopping manufacturer’s fire-
      protection engineer as an engineering judgment or equivalent fire-resistance-rated
      assembly.
D. Qualification Data: For qualified Installer.

E. Installer Certificates: From Installer indicating fire-resistant joint and penetration firestopping have been installed in compliance with requirements and manufacturer's written recommendations.

1.06 QUALITY ASSURANCE

A. Source Limitations: For each kind of fire-resistant joint, penetration firestopping and construction condition indicated, obtain fire-resistant joint and penetration firestopping products through one source from a single manufacturer.

B. Manufacturer Qualifications: Company specializing in manufacturing the products specified in this Section with minimum ten (10) years experience.

C. Installer Qualifications: Company specializing in performing the work of this Section, having a minimum of five (5) years documented experience installing work of the type required for and able to show satisfactory completion of at least three (3) projects of comparable size to this project, and meets one of the following requirements:

1. A firm that has been approved by FM Global according to FMG 4991
2. A firm that has been evaluated by UL and found to comply with its "Qualified Firestop Contractor Program Requirements."
3. A firm that is acceptable to the authorities having jurisdiction, experienced in installing fire-resistant joints and penetration firestopping similar in material, design, and extent to that indicated, and whose work has resulted in construction with a record of successful performance. Qualifications include having the necessary experience, staff, and training to install manufacturer's products in accordance with specified requirements. Manufacturer's willingness to sell its fire-resistant joint and penetration firestopping products to the Contractor or to an Installer engaged by the Contractor does not in itself confer qualification on buyer.

D. Fire-Test-Response Characteristics: Fire-resistant joints and penetration firestopping shall comply with the following requirements:

1. Fire-resistant joint tests and penetration firestopping tests are performed by a qualified testing agency acceptable to authorities having jurisdiction.
2. Fire-resistant joint systems and penetration firestopping are identical to those tested per testing standard referenced in "Fire-Resistant Joints" and "Penetration Firestopping" Articles hereinafter. Provide rated systems complying with the following requirements:
   a. Fire-resistant joint and penetration firestopping products bear classification marking of qualified testing and inspecting agency.
   b. Fire-resistant joints correspond to those indicated by reference to, and classification markings on penetration firestopping correspond to designations listed by the following directories:
      UL Fire Resistance Directory
      Intertek ETL SEMKO Directory of Listed Building Products

1.07 MOCKUPS

A. Install one fire-resistant joint design and one penetration firestopping design representative of each type required for this project, using materials and methods specified in this Section. Acceptable mockups shall be of fire rating designs required on this project.

B. Where a joint design or a firestopping design may be used at different wall, partition and floor construction, provide mockups of each different combination.

C. Retain acceptable mock-ups during construction as standard by which all fire-resistant joints and penetration firestopping will be judged in the completed work.
Acceptable mockups may remain as part of the completed work.

1.08 PROJECT CONDITIONS

A. Do not install fire-resistive joints and penetration firestopping when ambient or substrate temperatures are outside limits permitted by their manufacturers or when substrates are wet due to rain, frost, condensation, or other causes.

B. Install and cure fire-resistive joints and penetration firestopping in accordance with their manufacturer's written instructions using natural means of ventilation or, where this is inadequate, forced-air circulation.

1.09 COORDINATION

A. Coordinate construction of joints, and construction of openings and penetration items to ensure that fire-resistive joints and penetration firestopping are installed according to specified requirements.

B. Coordinate sizing of joints to accommodate fire-resistive joints, and sizing of sleeves, openings, core-drilled holes, or cut openings to accommodate penetration firestopping.

C. Notify Owner's testing agency at least seven (7) days in advance of fire-resistive joint and penetration firestopping installations; confirm dates and times on day preceding each series of installations.

PART 2 PRODUCTS

2.01 MANUFACTURERS

A. Subject to compliance with requirements of this Section, provide products by one of the following manufacturers:

   - Grace Construction Products:  www.na.graceconstruction.com
   - Nelson Fire Stop Products:  www.nelsonfirestop.com
   - RectorSeal Corporation:  www.rectorseal.com
   - Specified Technologies Inc:  www.stifirestop.com
   - 3M Fire Protection Products:  www.3m.com/us
   - Tremco Inc; Tremco Fire Protection Systems Group:  www.tremcosealants.com

2.02 FIRE-RESISTIVE JOINTS

A. Provide fire-resistive joint systems that are produced and installed to resist spread of fire according to requirements indicated, resist passage of smoke and other gases, and maintain original fire-resistance rating of assemblies in or between which fire-resistive joint systems are installed. Fire-resistive joint systems shall accommodate building movements without impairing their ability to resist the passage of fire and hot gases.

B. Joints In or Between Fire-Resistance Rated Construction: Provide fire-resistive joint systems with ratings determined per ASTM E 1966 or UL 2079:

   1. Joints include those installed in or between fire-resistance-rated walls, floor or floor/ceiling assemblies, and roofs or roof/ceiling assemblies.
   2. Fire-resistance rating shall be equal to or exceeding the fire-resistance rating of construction they will join.

C. Exposed Fire-Resistive Joints: Provide products with flame-spread and smoke-developed indexes of less than 25 and 450, respectively, as determined in accordance with ASTM E 84.

D. Low-Emitting Materials: Fire-resistive joint sealants and sealant primers shall comply with the testing and product requirements of the California Department of Health Services "Standard Practice for the Testing of Volatile Organic Emissions from Various Sources Using Small-Scale Environmental Chambers."
E. Accessories: Provide components of fire-resistive joints, including primers and forming materials, that are needed to install fill materials and to maintain ratings required. Use only components specified by fire-resistive joint system manufacturer and approved by the qualified testing agency for systems indicated.

2.03 PENETRATION FIRESTOPPING

A. Provide penetration firestopping that are produced and installed to resist spread of fire according to requirements indicated, resist passage of smoke and other gases, and maintain original fire-resistance rating of construction penetrated. Penetration firestopping shall be compatible with one another, with the substrates forming openings, and with penetrating items if any.

B. Penetrations in Fire-Resistance Rated Walls and Horizontal Assemblies: Provide penetration firestopping with ratings determined per ASTM E 814 or UL 1479, based on testing at a positive pressure differential of 0.01-inch wg.
   1. Fire-resistance-rated walls include fire walls and fire-barrier walls. F-rating shall be not less than the fire-resistance rating of constructions penetrated.
   2. Horizontal assemblies include floors or floor/ceiling assemblies.
      a. F-Rating: At least 1 hour, but not less than the fire-resistance rating of constructions penetrated.
      b. T-Rating: At least 1 hour, but not less than the fire-resistance rating of constructions penetrated except for floor penetrations within the cavity of a wall.

C. Exposed Penetration Firestopping: Provide products with flame-spread and smoke-developed indexes of less than 25 and 450, respectively, as determined per ASTM E 84.

D. Low-Emitting Materials: Penetration firestopping sealants and sealant primers shall comply with the testing and product requirements of the California Department of Health Services' "Standard Practice for the Testing of Volatile Organic Emissions from Various Sources Using Small-Scale Environmental Chambers."

E. Fill Materials
   1. Cast-in-Place Firestopping Devices: Factory-assembled devices for use in cast-in-place concrete floors and consisting of an outer metallic sleeve lined with an intumescent strip, a radial extended flange attached to one end of the sleeve for fastening to concrete formwork, and a neoprene gasket.
   2. Latex Sealants: Single-component latex formulations that do not re-emulsify after cure during exposure to moisture.
   3. Firestop Devices: Factory-assembled collars formed from galvanized steel and lined with intumescent material sized to fit specific diameter of penetrant.
   5. Intumescent Putties: Non-hardening dielectric, water-resistant putties containing no solvents, inorganic fibers, or silicone compounds.
   7. Mortars: Prepackaged dry mixes consisting of a blend of inorganic binders, hydraulic cement, fillers, and lightweight aggregate formulated for mixing with water at Project site to form a non-shrinking, homogeneous mortar.
   8. Pillows/Bags: Reusable heat-expanding pillows/bags consisting of glass-fiber cloth cases filled with a combination of mineral-fiber, water-insoluble expansion agents, and fire-retardant additives. Where exposed, cover openings with steel-reinforcing wire mesh to protect pillows/bags from being easily removed.
   9. Silicone Foams: Multicomponent, silicone-based liquid elastomers that, when mixed, expand and cure in place to produce a flexible, non-shrinking foam.

F. Accessories: Provide components for each penetration firestopping assembly that are needed to install fill materials and to maintain ratings required. Use only those components specified by penetration firestopping manufacturer and approved by qualified testing and inspecting agency for firestopping indicated. Accessories include, but are not limited to, the following:

1. Permanent forming/damming/backing materials, including the following:
   - Slag-wool-fiber or rock-wool-fiber insulation
   - Sealants used in combination with other forming/damming/backing materials to prevent leakage of fill materials in liquid state
   - Fire-rated form board
   - Fillers for sealants
2. Temporary forming materials
3. Substrate primers
4. Collars
5. Steel sleeves

G. Mixing: For those products requiring mixing before application, comply with penetration firestopping manufacturer's written instructions for accurate proportioning of materials, water (if required), type of mixing equipment, selection of mixer speeds, mixing containers, mixing time, and other items or procedures needed to produce products of uniform quality with optimum performance characteristics for application indicated.

PART 3 EXECUTION

3.01 EXAMINATION AND PREPARATION

A. Examine substrates and conditions, with Installer present, for compliance with requirements for joint and opening configurations, penetrating items, substrates, and other conditions affecting performance of work. Proceed with installation only after unsatisfactory conditions have been corrected.

B. Clean out joints and openings immediately before installing fire-resistant joint systems and penetration firestopping to comply with manufacturer's written instructions and with the following requirements:

1. Remove from surfaces of joint and opening substrates, and from penetrating items foreign materials that could interfere with adhesion of fill materials and penetration firestopping.
2. Clean joint and opening substrates, and penetrating items to produce clean, sound surfaces capable of developing optimum bond with fire-resistant joints and penetration firestopping. Remove loose particles remaining from cleaning operation.
3. Remove laitance and form-release agents from concrete.

C. Prime substrates where recommended in writing by manufacturer using that manufacturer's recommended products and methods. Confine primers to areas of bond; do not allow spillage and migration onto exposed surfaces.

D. Use masking tape to prevent fire-resistant joint fill materials and penetration firestopping from contacting adjoining surfaces that will remain exposed on completion of the Work and that would otherwise be permanently stained or damaged by such contact or by cleaning methods used to remove stains. Remove tape as soon as possible without disturbing fire-resistant joint system's or penetration firestopping's seals with substrates.
3.02 INSTALLATION

A. Install fire-resistive joint systems and penetration firestopping to comply with manufacturer's written installation instructions and published drawings for products and applications indicated.

B. Install forming materials and other accessories of types required to support fill materials during their application and in the position needed to produce cross-sectional shapes and depths required to achieve fire ratings indicated. After installing fill materials and allowing them to fully cure, remove combustible forming materials and other accessories not indicated as permanent components of fire-resistive joint system or firestopping.

C. Install fill materials for fire-resistive joint systems and firestopping by proven techniques to produce the following results:
   1. Fill voids and cavities formed by joints, openings, forming materials, accessories, and penetrating items as required to achieve fire-resistance ratings indicated.
   2. Apply materials so they contact and adhere to substrates formed by joints, openings and penetrating items.
   3. For fill materials that will remain exposed after completing the work, finish to produce smooth, uniform surfaces that are flush with adjoining finishes.

3.03 IDENTIFICATION

A. Identify fire-resistive joint systems and penetration firestopping with preprinted metal or plastic labels. Attach labels permanently to surfaces adjacent to and within 6 inches of joint or firestopping edge so labels will be visible to anyone seeking to remove or penetrate joint system, or to remove penetrating items or firestopping. Use mechanical fasteners or self-adhering-type labels with adhesives capable of permanently bonding labels to surfaces on which labels are placed. Include the following information on labels:
   3. Contractor's name, address, and phone number.
   4. Designation of applicable testing agency.
   5. Date of installation.
   6. Manufacturer's name.
   7. Installer's name.

3.04 FIELD QUALITY CONTROL

A. Owner will engage a qualified testing agency to perform tests and inspections in accordance with ASTM E 2174 and ASTM E 2393.

B. Where deficiencies are found, or fire-resistive joint systems or penetration firestopping are damaged or removed because of testing, repair or replace fire-resistive joint systems and penetration firestopping to comply with requirements.

C. Proceed with enclosing fire-resistive joint systems and penetration firestopping with other construction only after inspection reports are issued and installations comply with requirements.

3.05 CLEANING AND PROTECTION

A. Clean off excess fill materials adjacent to openings as the work progresses by methods and with cleaning materials that are approved in writing by fire-resistive joint system and penetration firestopping manufacturers and that do not damage materials in which openings occur.
B. Provide final protection and maintain conditions during and after installation that ensure that fire-resistive joint systems and penetration firestopping are without damage or deterioration at time of Substantial Completion. If, despite such protection, damage or deterioration occurs, immediately cut out and remove damaged or deteriorated fire-resistive joint systems and penetration firestopping and install new materials to produce systems complying with specified requirements.

END OF SECTION
PART 1 GENERAL

1.01 SECTION INCLUDES

A. Extent of joint sealer application is indicated on drawings and schedules includes the following:

B. Exterior joints in vertical surfaces and non-traffic horizontal surfaces including, but not limited to, the following:
   - Control and expansion joints in unit masonry
   - Perimeter joints between unit masonry and frames of doors, windows, louvers and other exterior openings
   - Control and expansion joints in ceiling and other overhead surfaces
   - Joints between dissimilar materials
   - Other exterior vertical surfaces and non-traffic horizontal joints as indicated

C. Exterior joints in horizontal traffic surfaces, but not limited to, the following:
   - Expansion joints in concrete sidewalks and paving
   - Other exterior horizontal traffic joints as indicated

D. Interior joints in vertical surfaces and horizontal non-traffic surfaces including, but not limited to, the following:
   - Control and expansion joints on exposed interior surfaces of exterior walls
   - Perimeter joints of exterior openings where indicated
   - Vertical control joints on exposed surfaces of interior unit masonry and concrete walls and partitions
   - Perimeter joints between interior wall surfaces and frames of interior doors, windows, and elevator entrances
   - Interior joints between dissimilar materials
   - Other interior vertical surface and horizontal non-traffic joints as indicated

1.02 RELATED DOCUMENTS

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

1.03 RELATED SECTIONS

A. Related sections include, but are not limited to, the following:
   - Section 04 20 00 – Unit Masonry, for masonry joint fillers and gaskets
   - Section 07 62 10 – Flashing and Sheet Metal, for sealing joints related to flashing and sheet metal
   - Section 07 84 00 – Firestopping, for firestopping sealants
   - Section 07 95 13 – Expansion Control, for building expansion joints
   - Section 08 80 00 – Glazing, for glazing sealants and accessories
   - Section 09 21 16 – Gypsum Board Assemblies, for sealing perimeter joints and penetrations
   - Section 09 51 10 – Acoustical Panel Ceilings, for sealing edge perimeter moldings

1.04 REFERENCE STANDARDS

A. Reference standards include, but are not limited to, the following:
   - ASTM C 834 – Standard Specification for Latex Sealants; 2010
   - ASTM C 919 – Standard Practice for Use of Sealants in Acoustical Applications; 2008

1.05 SUBMITTALS
A. See Section 01 33 00 – Submittals, for submittal procedures.
B. Product Data: Provide data for each joint sealant product indicated; include sealant manufacturer’s instructions for substrate preparation and sealant application.
C. Samples
   1. For Initial Selection: For each type of joint sealer required and for the Architect’s selection, provide manufacturer’s color charts consisting of strips of cured sealants showing the full range of colors available for each product exposed to view.
   2. For Verification: For each type and color of joint sealer required, provide samples with joint sealants in 1/2-inch wide joints formed between two 6-inch long strips of material matching the appearance of exposed surfaces adjacent to joint sealants.
D. Qualification Data: For qualified Applicator.
E. Manufacturer’s Certificates: For each kind of joint sealant and accessory, attesting that manufacturer’s products comply with specification requirements and are suitable for the uses indicated.
F. Qualification data complying with requirements specified in "Quality Assurance" article. Include list of completed projects with project name, addresses, names of Architects and Owners, plus other information specified.

1.06 QUALITY ASSURANCE
A. Source Limitations: Obtain each kind of joint sealant from single source from single manufacturer.
B. Manufacturer Qualifications: Company specializing in manufacturing the products specified in this Section with minimum 10 (ten) years experience.
C. Applicator Qualifications: Company specializing in performing the work of this section with minimum five (5) years experience. Engage an Applicator who has successfully completed within the last five (5) years at least 3 joint sealer applications similar in type and size to that of this Project. The Installer shall assume full responsibility for the replacement of any work or materials which becomes stained as the result of the use of his priming, sealing, caulking, bond breaker or back-up materials.

1.07 MOCKUPS
A. Prior to beginning the application of joint sealers, for further verification of colors selected and to represent completed work in qualities of appearance, materials, install sealants in mockups of assemblies specified in other sections that are indicated to receive joint sealers specified in this Section.
   1. Use materials and installation methods specified in this Section.
   2. Retain mock-ups during construction as standard for judging completed construction.

1.08 PROJECT CONDITIONS
A. Do not proceed with installation of joint sealants under the following conditions:
1. When ambient and substrate temperature conditions are outside limits permitted by the sealant manufacturer or below 40 deg F (4.4 deg C).
2. When relative humidity conditions are outside the limits permitted by the sealant manufacturer.
3. When joint substrates are wet.
4. Where joint widths are less than those allowed by joint-sealant manufacturer for applications indicated.
5. Where contaminants capable of interfering with adhesion have not yet been removed from joint substrates.

B. Maintain temperature and humidity recommended by the sealant manufacturer during and after installation.

1.09 WARRANTY

A. Special Project Warranty: Submit a written warranty executed by the Installer and Contractor, warranting all exterior sealant joints, to be wind- and dust-proof for a period of 10 years after date of final acceptance of the Work; and agreeing to make any repairs necessary during the warranty period at no additional expense to the Owner.

1.10 DELIVERY, STORAGE, AND HANDLING

A. Deliver all materials in original, unopened containers and/or wrappings bearing all manufacturers' seals, product name and designation, color, expiration period for use, pot life, curing time, and mixing instructions for multi-component materials. Store primers and sealants in cool dry location with ambient temperature range of 60 to 80 degrees F.

B. Store and handle materials in compliance with manufacturers' instructions and recommendations to prevent their deterioration or damage due to moisture, high or low temperatures, contaminants, or other causes.

PART 2 PRODUCTS

2.01 MATERIALS

A. Compatibility: Provide joint sealants, backings, and other related materials that are compatible with one another and with joint substrates under conditions of service and application, as demonstrated by joint-sealant manufacturer, based on testing and field experience.

B. Low-Emitting Interior Sealants: Sealants and sealant primers used inside the weatherproofing system shall comply with the testing and product requirements of the California Department of Health Services' "Standard Practice for the Testing of Volatile Organic Emissions from Various Sources Using Small-Scale Environmental Chambers."

C. Liquid-Applied Joint Sealants: Comply with ASTM C 920 and other requirements indicated for each liquid-applied joint sealant specified, including those referencing ASTM C 920 classifications for type, grade, class, and uses related to exposure and joint substrates.

D. Stain-Test-Response Characteristics: Where sealants are specified to be nonstaining to porous substrates, provide products that have undergone testing according to ASTM C 1248 and have not stained porous joint substrates indicated for project.

E. Colors of Exposed Joint Sealants: Provide colors indicated or, if not indicated, as selected by Architect from manufacturer's full range of colors.

2.02 MANUFACTURERS

A. Subject to compliance with requirements of this Section, provide products by one of the following manufacturers:

   Tremco Inc: www.tremcosealants.com
   Pecora Corporation: www.pecora.com
2.03 URETHANE JOINT SEALANTS
   A. Multicomponent, Nonsag, Nontraffic-Grade Polyurethane Sealant: ASTM C 920, Type M, Grade NS, Class 25, for Use NT. Subject to compliance with the requirements of this Section provide one of the following products:
      - Tremco; Dymeric 240 FC
      - Pecora; Dynatrol II
      - BASF; Sonalastic NP 2
      - Bostik; Chem-Calk 500
   B. Multicomponent, Traffic-Grade, Polyurethane Joint Sealant: ASTM C 920, Type M, Grade NS, Class 25, for Use T. Subject to compliance with the requirements of this Section provide one of the following products:
      - Tremco; Dymeric 240 FC
      - Pecora; Dynatred
      - BASF; Sonalastic NP 2
      - Bostik; Chem-Calk 505

2.04 LATEX JOINT SEALANTS
   A. Acrylic-Emulsion Sealant: Acrylic latex or siliconized acrylic latex, ASTM C 834, Type OP, Grade NF, mildew resistant. Subject to compliance with the requirements of this Section provide one of the following products:
      - Tremco; Tremflex 834
      - Pecora; AC-20+
      - BASF; Sonolac

2.05 ACOUSTICAL JOINT SEALANTS
   A. Nonsag, paintable, nonstaining latex sealant complying with ASTM C 834. Product effectively reduces airborne sound transmission through perimeter joints and openings in building construction as demonstrated by testing representative assemblies according to ASTM E 90. Subject to compliance with the requirements of this Section provide one of the following products:
      - Tremco; Tremco Acoustical Sealant
      - Pecora; AIS-919
      - USG Corporation; SHEETROCK Acoustical Sealant

2.06 JOINT SEALANT BACKING
   A. General: Provide sealant backings of material that are non-staining; are compatible with joint substrates, sealants, primers and other joint fillers; and are approved for applications indicated by sealant manufacturer based on field experience and laboratory testing.
   B. Cylindrical Sealant Backings: ASTM C 1330, Type C (closed-cell material with a surface skin), and of size and density to control sealant depth and otherwise contribute to producing optimum sealant performance.
   C. Bond-Breaker Tape: Polyethylene tape or other plastic tape recommended by sealant manufacturer for preventing sealant from adhering to rigid, inflexible joint-filler materials or joint surfaces at back of joint. Provide self-adhesive tape where applicable.

2.07 MISCELLANEOUS MATERIALS
A. Primer: Material recommended by joint-sealant manufacturer where required for adhesion of sealant to joint substrates indicated, as determined from preconstruction joint-sealant-substrate tests and field tests.

B. Cleaners for Nonporous Surfaces: Chemical cleaners acceptable to manufacturers of sealants and sealant backing materials, free of oily residues or other substances capable of staining or harming joint substrates and adjacent nonporous surfaces in any way, and formulated to promote optimum adhesion of sealants to joint substrates.

C. Masking Tape: Nonstaining, nonabsorbent material compatible with joint sealants and surfaces adjacent to joints.

PART 3 EXECUTION

3.01 EXAMINATION

A. Examine joints indicated to receive joint sealants, with Installer present, for compliance with requirements for joint configuration, installation tolerances, and other conditions affecting joint-sealant performance. Proceed with installation only after unsatisfactory conditions have been corrected.

3.02 PREPARATION

A. Surface Cleaning of Joints: Clean out joints immediately before installing joint sealants to comply with joint-sealant manufacturer's written instructions and the following requirements:

1. Remove all foreign material from joint substrates that could interfere with adhesion of joint sealant, including dust, paints (except for permanent, protective coatings tested and approved for sealant adhesion and compatibility by sealant manufacturer), old joint sealants, oil, grease, waterproofing, water repellents, water, surface dirt, and frost.

2. Clean porous joint substrate surfaces by brushing, grinding, mechanical abrading, or a combination of these methods to produce a clean, sound substrate capable of developing optimum bond with joint sealants. Remove loose particles remaining after cleaning operations above by vacuuming or blowing out joints with oil-free compressed air. Porous joint substrates include the following:
   - Concrete
   - Masonry
   - Unglazed surfaces of ceramic tile

3. Remove laitance and form-release agents from concrete.

4. Clean nonporous joint substrate surfaces with chemical cleaners or other means that do not stain, harm substrates, or leave residues capable of interfering with adhesion of joint sealants. Nonporous joint substrates include the following:
   - Metal
   - Glass
   - Glazed surfaces of ceramic tile

B. Joint Priming: Prime joint substrates where recommended by joint-sealant manufacturer or as indicated by preconstruction joint-sealant-substrate tests or prior experience. Apply primer to comply with joint-sealant manufacturer's written instructions. Confine primers to areas of joint-sealant bond; do not allow spillage or migration onto adjoining surfaces.

C. Masking Tape: Use masking tape where required to prevent contact of sealant or primer with adjoining surfaces that otherwise would be permanently stained or damaged by such contact or by cleaning methods required to remove sealant smears. Remove tape immediately after tooling without disturbing joint seal.

3.03 INSTALLATION OF JOINT SEALANTS

A. General

1. Comply with joint-sealant manufacturer's written installation instructions for products and applications indicated, unless more stringent requirements apply.
2. Comply with recommendations in ASTM C 1193 for use of joint sealants as applicable to materials, applications, and conditions indicated.
3. Install sealants using proven techniques that comply with the following and at the same time backings are installed:
   a. Place sealants so they directly contact and fully wet joint substrates.
   b. Completely fill recesses in each joint configuration.
   c. Produce uniform, cross-sectional shapes and depths relative to joint widths that allow optimum sealant movement capability.

B. Joint Sealant Backing: Install sealant backings of kind indicated to support sealants during application and at position required to produce cross-sectional shapes and depths of installed sealants relative to joint widths that allow optimum sealant movement capability.
   1. Do not leave gaps between ends of sealant backings.
   2. Do not stretch, twist, puncture, or tear sealant backings.
   3. Remove absorbent sealant backings that have become wet before sealant application and replace them with dry materials.

C. Bond-Breaker Tapes: Install bond-breaker tape behind sealants where sealant backings are not used between sealants and backs of joints.

D. Tooling of Nonsag Sealants: Immediately after sealant application and before skinning or curing begins, tool sealants according to requirements specified in subparagraphs below to form smooth, uniform beads of configuration indicated; to eliminate air pockets; and to ensure contact and adhesion of sealant with sides of joint.
   1. Remove excess sealant from surfaces adjacent to joints.
   2. Use tooling agents that are approved in writing by sealant manufacturer and that do not discolor sealants or adjacent surfaces.
   3. Provide concave joint profile per Figure 8A “Concave” in ASTM C 1193, unless otherwise indicated.

E. Acoustical Sealant Installation: At sound-rated assemblies and elsewhere as indicated, seal construction at perimeters, behind control joints, and at openings and penetrations with a continuous bead of acoustical sealant. Install acoustical sealant at both faces of partitions at perimeters and through penetrations. Comply with ASTM C 919 and with manufacturer's written recommendations.

3.04 CLEANING
A. Clean off excess sealant or sealant smears adjacent to joints as the Work progresses by methods and with cleaning materials approved in writing by manufacturers of joint sealants and of products in which joints occur.

3.05 PROTECTION
A. Protect joint sealants during and after curing period from contact with contaminating substances and from damage resulting from construction operations or other causes so sealants are without deterioration or damage at time of Substantial Completion. If, despite such protection, damage or deterioration occurs, cut out and remove damaged or deteriorated joint sealants immediately so installations with repaired areas are indistinguishable from original work.

3.06 SCHEDULE
A. Multicomponent, Nonsag, Nontraffic-Grade, Polyurethane Joint Sealant: Vertical and horizontal nontraffic bearing joints including the following:
   1. Control and expansion joints in unit masonry, concrete and tile
   2. Joints between precast architectural concrete units, between metal and masonry or concrete, and between masonry and concrete
3. Perimeter joints between materials listed above and frames of exterior doors, windows louveres and other exterior openings

4. Control and expansion joints in ceiling and other overhead surfaces

5. Other exterior and interior joints in vertical and horizontal nontraffic bearing surfaces as indicated

B. Multicomponent, Traffic-Grade, Polyurethane Joint Sealant: Horizontal-surface, traffic-bearing joints including the following:
   1. Exterior and interior control and expansion joints in horizontal traffic surfaces of concrete and tile
   2. Other exterior and interior joints in horizontal traffic surfaces as indicated

C. Acrylic-Emulsion Sealant: Interior vertical and horizontal nontraffic bearing joints including the following:
   1. Control joints in plaster and gypsum wallboard assemblies
   2. Perimeter joints between wall surfaces and frames of doors, windows, borrowed lites and other wall openings
   3. Other interior joints in vertical and horizontal nontraffic bearing surfaces as indicated

D. Acoustical Sealant: Interior vertical and horizontal nontraffic bearing acoustical joints including the following:
   1. Through penetrations of sound-rated walls and partitions
   2. Perimeter joints between sound-rated walls and partitions, and other assemblies
   3. Other vertical and horizontal nontraffic bearing acoustical joints as indicated.

END OF SECTION
SECTION 08 11 13
HOLLOW METAL DOORS AND FRAMES

PART 1 GENERAL

1.01 SECTION INCLUDES
Non-fire-rated steel doors and frames
Steel frames for wood
Fire-rated steel doors and frames
Thermally insulated steel doors
Accessories, including glazing and louvers

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

1.03 RELATED SECTIONS
A. Related sections include, but are not limited to, the following:
   - Section 04 20 00 - Unit Masonry, for building frame anchors into and grouting hollow metal frames
   - Section 07 90 05 - Joint Sealers, for backing rod and sealant at perimeter joints.
   - Section 08 14 16 - Flush Wood Doors, for solid-core wood doors installed in hollow metal frames
   - Section 08 71 00 - Door Hardware
   - Section 08 80 00 – Glazing, for glass for doors lites
   - Section 09 21 16 - Gypsum Board Assemblies
   - Section 09 90 00 - Painting and Coating, for field painting
   - Division 26 Sections - Electrical
   - Division 28 Sections - Electronic Safety and Security

1.04 REFERENCE STANDARDS
A. Reference standards include, but are not limited to, the following:
   - ANSI/DHI A115 Series - Specifications for Steel Door and Frame Preparation for Hardware; current editions
   - ANSI/SDI A250.4 - Test Procedure and Acceptance Criteria for Physical Endurance of Steel Doors and Hardware Reinforcing; 2001
   - ANSI/SDI A250.6 - Recommended Practice for Hardware Reinforcing on Standard Steel Doors and Frames; 2003 (R2009)
   - ANSI A250.8 - SDI-100 Recommended Specifications for Standard Steel Doors and Frames; 2003 (R2008)
   - ANSI A250.10 - Test Procedure and Acceptance Criteria for Prime Painted Steel Surfaces for Steel Doors and Frames; 1998 (R2004)
   - ANSI A250.11 - Recommended Erection Instructions for Steel Frames; 2001
   - ASTM A 153/A 153M - Standard Specification for Zinc Coating (Hot-Dip) on Iron and Steel Hardware; 2009
   - ASTM A 653/A 653M - Standard Specification for Steel Sheet, Zinc-Coated (Galvanized) or Zinc-Iron Alloy-Coated (Galvannealed) by the Hot-Dip Process; 2009a
   - ASTM A 780/A 780M - Standard Practice for Repair of Damaged and Uncoated Areas of Hot-Dip Galvanized Coatings; 2009
   - BHMA A156.115 - Hardware Preparation in Steel Doors and Steel Frames; 2006
NAAMM HMMA 840 - Guide Specifications for Installation and Storage of Hollow Metal Doors and Frames; National Association of Architectural Metal Manufacturers; 2007
NAAMM/NOMMA AMP 500 - Metal Finishes Manual for Architectural and Metal Products; 2006
NFPA 80 - Standard for Fire Doors and Other Opening Protective; 2010
NFPA 105 - Standard for Smoke Door Assemblies and Other Opening Protective; 2010
NFPA 252 - Standard Methods of Fire Tests of Door Assemblies; National Fire Protection Association; 2008
SDI 112 - Zinc-Coated (Galvanized/Galvannealed) Steel Doors and Frames; Steel Door Institute; 2008
SSPC-PA 1 - Shop, Field, and Maintenance Painting of Steel; The Society for Protective Coatings; 2000 (E2004)
SSPC-Paint 20 - Zinc-Rich Primers (Type I, Inorganic, and Type II, Organic); The Society for Protective Coatings; 2002 (E2004)
UL 10C - Standard for Positive Pressure Fire Tests of Door Assemblies; Current Edition, Including All Revisions
UL 1784 - Standard for Air Leakage Tests of Door Assemblies; Current Edition, Including All Revisions

1.05 SUBMITTALS

A. See Section 01 33 00 - Submittals, for submittal procedures.
B. Product Data: Submit data for each type of door and frame indicated including, but not limited to, materials and details of design and construction, core materials, fire-resistance and sound ratings, dimensions and profiles, hardware locations and preparation, reinforcement types and locations, anchorage types and fastening methods, and finishes.
C. Shop Drawings: Submit dimensioned drawing and details showing fabrication and installation of steel doors and frames including, but not limited to, the following:
   - Details and elevations of each door design and frame type; include door edge details, dimensioned frame profiles and material thicknesses
   - Locations of reinforcement and preparation for hardware
   - Details of each different wall opening condition
   - Details of anchorage, joints, field splices and connections
   - Details of moldings, removable stops, glazing, louvers and accessories
   - Details of conduit and preparation for power, signal and control systems
   - Identifying location of different finishes, if any
D. Door Schedule: Submit schedule of doors and frames using same reference numbers for details and openings as those on the drawings and coordinated with the final door hardware schedule. Include coordination of glass and glazing, power, signal and control systems.
E. Manufacturer's Certificate: Certification that products meet specified requirements.

1.06 QUALITY ASSURANCE

A. General: Provide doors and frames complying with ANSI A250.8 and the requirements of this Section.
B. Single-Source Responsibility: Obtain hollow metal work from a single source with resources to provide products complying with requirements indicated without delaying the Work.
C. Manufacturer Qualifications: Company specializing in manufacturing the products specified in this Section with minimum 10 years documented experience.
D. Fire-Resistance Rated Assemblies: Provide assemblies complying with NFPA 80 and listed and labeled by a qualified testing agency acceptable to authorities having jurisdiction for fire-protection ratings indicated or scheduled, based on testing at positive pressure according to NFPA 252 or UL 10C.
   1. Fire-Resistance Ratings: Ratings shall be obtained without the use of astragals.
2. Smoke- and Draft-Control Assemblies: Provide an assembly with gaskets listed and labeled for smoke and draft control by a qualified testing agency acceptable to authorities having jurisdiction, based on testing according to UL 1784 and installed in compliance with NFPA 105.

E. Field measure all reused existing openings and existing hollow metal frames for proper height and width (no less than at top, middle and bottom between jambs). Verify hardware rough-ins sizes and configurations.

1.07 DELIVERY, STORAGE, AND HANDLING

A. Deliver hollow metal work palletized, packaged, or crated to provide protection during transit and project site storage; do not use non-vented plastic. Provide additional protection to prevent damage to factory-finished units, if any.

B. Deliver welded frames with two removable spreader bars across bottom of frames, tack welded to jambs and mullions.

C. Inspect doors and frames on delivery for damage. Minor damages may be repaired provided refinished items match new work and are acceptable to Architect; otherwise, remove and replace damaged items as directed.

D. Store hollow-metal work in accordance with NAAMM HMMA 840, vertically under cover, at project site with head up.

1. Place on minimum 4-inch high wood blocking. Provide minimum 1/4-inch space between each stacked door to promote air circulation.

2. To prevent corrosion of products and damage to factory-finished items, do not use non-vented plastic or canvas shelters. Protect products with resilient packaging; avoid humidity build-up under coverings; prevent corrosion.

PART 2 PRODUCTS

2.01 MANUFACTURERS

A. Steel Doors and Frames: Subject to compliance with the specified requirements, provide steel doors and frames from one of the following manufacturers:
Assa Abloy Ceco or Curries: www.assaabloydss.com
Amweld International: www.amweld.com
Windsor Republic Doors: www.republicdoor.com
Steelcraft: www.steelcraft.com

2.02 DOORS AND FRAMES

A. Requirements for All Doors and Frames:
2. Door Top and Bottom Closures: Flush with top and bottom of faces and edges.
3. Door Edge Profile: Beveled on both edges.
5. Glazed Lights: Non-removable stops on non-secure side; sizes and configurations as indicated on drawings.
6. Hardware Preparation: In accordance with BHMA A156.115, with reinforcement welded in place, in addition to other requirements specified in door grade standard.
8. Finish: Factory primed, for field finishing.

B. Combined Requirements: If a particular door and frame unit is indicated to comply with more than one type of requirement and/or standard, 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. Unless otherwise indicated or scheduled, provide 1-3/4 inches thick ANSI A250.8 Level 3 Extra Heavy-Duty, Model 2 Seamless edge construction doors with Level A physical performance when tested in accordance with ANSI/SDI A250.4, and smooth textured 0.053-inch (16-gauge) minimum thickness, prior to galvanizing, cold-rolled steel sheet faces.

B. Fire-Resistance Rated Doors: Provide where indicated or scheduled.

C. Interior Smoke and Draft Control Doors (as indicated or scheduled): Same construction as fire-rated doors with indicated fire rating, plus:
   1. Gasketing: No added gasketing or seals allowed.
   2. Label: UL “S” label.

D. Exterior Door Thermal Performance: Provide exterior doors with thermal resistance (R-value) of not less than 10 when tested in accordance with ASTM C 1363.

2.04 STEEL FRAMES

A. Unless otherwise indicated or scheduled, provide frames ANSI A250.8 Level 3 Extra Heavy-Duty frames with smooth textured 0.067-inch (14-gauge) minimum thickness, prior to galvanizing, cold-rolled steel sheet.
   1. Fire-Resistance Rated Frames: Provide fire-resistance labeled frames where fire-resistance rated doors are indicated or scheduled.
   2. Plaster/Mortar Guard Boxes: Provide 0.0179-inch minimum thickness galvanized steel plaster/mortar guard boxes at back of hardware cutouts and silencer holes where mortar or other materials may obstruct hardware installation and/or operation, and to close off interior of openings.
   3. Construction: Fabricate frames of full-profile continuous welded construction with mitered corners, except frames to be fitted into existing masonry or concrete openings may be fabricated with knocked-down mitered and coped corners for field assembly and face welding ground smooth.
   4. Provide pathways for electronic hardware cabling where required. Coordinate with hardware and security requirements.

2.05 ACCESSORY MATERIALS

A. Glazing: As specified in Section 08 80 00, factory installed.

B. Grout for Frames: As specified in Section 04 20 00 for frames installed in masonry, and Section 09 21 16 for spot grouting of frames installed in gypsum board assemblies.

C. Silencers: Resilient rubber, fitted into drilled hole; 3 on strike side of single door, 3 on each strike side of center mullion of pairs, and 2 on head of pairs without center mullions. Provide at all frames except at fire-resistance rated, sound and smoke gaskets, and weatherstripped doors.

D. Temporary Frame Spreaders: Provide for all frames.

E. Supports: Fabricated from not less than 0.0516-inch thick galvanized steel. At masonry construction, provide corrugated T-shaped strap masonry wall anchors; wire-type masonry wall anchors shall not be accepted.

F. Inserts, Bolts, and Fasteners: Manufacturer’s standard units. Where items are to be built into exterior walls, provide hot-dip galvanize complying with ASTM A 153/A 153M, Class C or D as applicable. Unless otherwise indicated, exposed fasteners shall have countersunk flat or oval heads.

2.06 FRAME ANCHORS

A. Jamb Anchors
   1. Masonry Type: T-shaped strap anchors to suit frame size, not less than 0.0516 inches
thick, with corrugated or perforated straps not less than 2 inches wide by 10 inches long.

2. Stud-Wall Type: Designed to engage stud, welded to back of frames; not less than 0.042 inches thick.

3. Expansion Type for In-Place Concrete or Masonry: Minimum 3/8-inch diameter bolts with expansion shields or inserts. Provide pipe spacer from frame to wall, with throat reinforcement plate, welded to frame at each anchor location. Bolts shall be countersunk flat-head type for field finishing smooth with filler.

4. Quantities and Spacing
   a. Masonry Type: Locate anchors not more than 16 inches from top and bottom of frame. Space anchors not more than 32 inches on center, to match coursing, and as follows:
      1) 2 anchors per jamb up to 60 inches high.
      2) 3 anchors per jamb from 60 to 90 inches high.
      3) 4 anchors per jamb from 90 to 120 inches high.
      4) 4 anchors per jamb plus one additional anchor per jamb for each 24 inches or fraction thereof above 120 inches high.

   b. Stud-Wall Type: Locate anchors not more than 18 inches from top and bottom of frame. Space anchors not more than 32 inches on center and as follows:
      1) 3 anchors per jamb up to 60 inches high.
      2) 4 anchors per jamb from 60 to 90 inches high.
      3) 5 anchors per jamb from 90 to 120 inches high.
      4) 5 anchors per jamb plus one additional anchor per jamb for each 24 inches or fraction thereof above 120 inches high.

   c. Expansion Type: Locate anchors not more than 6 inches from top and bottom of frame. Space anchors not more than 26 inches on center.

B. Floor Anchors: Formed from same material as frames, minimum thickness of 0.0516-inch, welded to bottom of jambs with at least 4 spot welds per anchor, and as follows:
   1. Monolithic Concrete Slabs: Clip-type anchors, welded to frame, with two holes to receive fasteners.

C. Head Anchors: 2 anchors per head for frames more than 42 inches wide and mounted in metal-stud partitions.

2.07 FABRICATION

A. General: Comply with requirements of ANSI A250.8; fabricate door and frame units rigid, neat in appearance, and free from defects, warps and buckles.
   1. Fabricate hollow-metal work to be rigid and free of defects, warp, or buckle. Accurately form metal to required sizes and profiles, with minimum radius for metal thickness. Where practical, fit and assemble units in manufacturer’s plant. To ensure proper assembly at project site, clearly identify work that cannot be permanently factory assembled before shipment to ensure proper assembly at the project site.
   2. Fabricate concealed stiffeners, reinforcement, edge channels and moldings from either cold- or hot-rolled steel sheet.
   3. Where frames are fabricated in sections due to shipping or handling limitations, provide alignment plates or angles at each joint, fabricated of same thickness metal as frames.
   4. Provide weep-hole openings in bottoms of exterior doors to permit moisture to escape. Seal joints in top edges of doors against water penetration.

B. Hardware Preparation: Factory prepare hollow-metal work to receive mortised and concealed hardware in accordance with final door hardware schedule, templates provide by hardware supplier; include cutouts, reinforcement, mortising, drilling, and tapping.
   1. Reinforce doors and frames to receive non-templated, mortised, closers, and surface-mounted door hardware.
   2. Comply with applicable requirements in ANSI/SDI A250.6 and BHMA A156.115 for preparation of hollow-metal work for hardware.

C. Stops and Moldings: Provide stops and moldings around glazed lites and louver, unless
otherwise indicated. Form corners of stops and moldings with hairline joints.

1. Single Glazed Lites: Provide fixed stops and moldings welded on secure side of hollow-metal work.
2. Multiple Glazed Lites: Provide fixed and removable stops and moldings so that each glazed lite is capable of being removed independently.
3. Provide fixed frame moldings on secure side of interior doors and frames.
4. Coordinate rabbet width between fixed and removable stops with glazing and installation types indicated.

2.08 FINISHES

A. General: Comply with SSPC-PA 1 for steel sheet finishes and with recommendations of NAAMM/NOMMA AMP 500 for application and designation of finishes.

B. Primer: Rust-inhibiting, complying with ANSI A250.10, lead and chromate free, air-dried, door manufacturer's standard primer compatible with substrate and field-applied finish paint systems indicated, and providing a sound foundation for field-applied topcoats despite prolonged exposure. Apply primer to hollow metal work after fabrication.

C. Galvanized Repair Paint: High zinc dust content paint for regalvanizing welds in steel, with a dry-film containing not less than 94-percent zinc dust by weight, complying with SSPC-Paint 20 Type II.

D. Galvanized Steel Sheet Finish
   1. Surface Preparation: Clean surfaces with non-petroleum-based solvent to produce surfaces free of dirt, oil, grease and other contaminants. After cleaning, apply a conversion coating of type suited to the coating applied over it. Clean welds, mechanical connections and abraded areas, and apply galvanizing repair paint specified hereinafter in accordance with ASTM A 780/A 780M.
   2. Factory-Prime Finish for Field-Painting: Apply primer immediately after cleaning and pretreatment producing a smooth coat of even consistency having a uniform dry-film thickness of not less than 0.7 mils.

E. Bituminous Coating: Low VOC, asbestos-free, asphalt emulsion or other high-build, water-resistant, resilient coating.

PART 3 EXECUTION

3.01 EXAMINATION

A. Examine and verify substrates, areas and conditions before starting work for compliance with requirements.

B. Verify that opening sizes and tolerances are acceptable. Examine roughing-in for embedded and built-in anchors to verify actual locations before frame installation.

C. Proceed with installation only after unsatisfactory conditions have been corrected.

3.02 PREPARATION

A. Coat inside of frames to be installed in masonry or to be grouted with bituminous coating, prior to installation; provide 1/16-inch minimum coating thickness. Any misplaced coating shall be removed from exposed to view surfaces immediately.

B. Remove welded-in shipping spreaders installed at factory. Restore exposed finish by grinding, filling, and dressing, as required to make repaired area smooth, flush, and invisible on exposed faces; coat repaired areas with galvanized repair paint, smoothly and evenly applied.

C. Prior to installation with installation spreaders in place, adjust and securely brace frames in their intended locations for squareness, alignment, twist and plumbness to the following tolerances:
   1. Squareness: ± 1/16-inch, measured at door rabbet on a line 90 degrees from jamb perpendicular to frame head.
   2. Alignment: ± 1/16-inch, measured at jambs on a horizontal line parallel to plane of wall or
partition.
3. Twist: ± 1/16-inch, measured at opposite face corners of jambs on parallel lines and perpendicular to plane of wall.
4. Plumbness: ± 1/16-inch, measured at jambs on a perpendicular line from head of door.
D. Drill and tap doors and frames to receive non-templated, mortised, and surface-mounted door hardware.

3.03 PREPARATION OF EXISTING HOLLOW METAL FRAMES
A. Remove any rust from existing door frames schedule to be reused, and prime with galvanizing primer prior to field painting as work of Section 099000.

3.04 INSTALLATION
A. Install hollow-metal work plumb, rigid, properly aligned, and securely fastened in place in accordance with the requirements of the specified door grade standard and NAAMM HMMA 840. In addition, install fire-resistance rated units in accordance with NFPA 80 and NFPA 105. Brace units securely until permanent anchors are sets; remove temporary braces only after wall construction is complete, leaving surfaces smooth and undamaged.
B. Where frames are fabricated in sections because of shipping or handling limitations, field splice at approved locations by welding face joint continuously; grind, fill, dress, and make splice smooth, flush, and invisible on exposed faces; coat areas with galvanized repair paint, smoothly and evenly applied.
C. Coordinate frame anchor placement with wall construction. Provide floor anchors for each jamb and mullion that extends to floor, and secure with post-installed expansion anchors or power-actuated fasteners.
D. At in-place concrete or masonry construction, secure frames in place with post-installed expansion anchors. Countersink anchors, and fill and make smooth, flush, and invisible on exposed faces.
E. Grout frames in masonry construction, using hand trowel methods; brace frames so that pressure of grout before setting will not deform frames. Spot-grout anchors at gypsum board assemblies.
F. Clean grout and other bonding material off hollow metal work immediately after installation.
G. Fit hollow-metal doors accurately in frames, within the following clearances:
   1. Non-Fire-Resistance Rated Steel Doors (ANSI 250.8 clearances, unless otherwise indicated)
      c. At Bottom of Door: 1/2-inch (± 1/32-inch) above top of decorative floor covering and 1/4-inch (± 1/32-inch) above top of thresholds.
      d. Between Door Face and Stop: 1/16-inch (± 1/32-inch).
   2. Fire-Rated Doors: Install doors with clearances according to NFPA 80.
   3. Smoke-Control Doors: Install doors and gaskets according to NFPA 105.
H. Provide continuous joint sealant in perimeter joints with adjacent construction; joint sealants are specified in Section 07 90 05 - Joint Sealers.
I. Coordinate installation of hardware.
J. Coordinate installation of glazing.
K. Coordinate the work with that of other trades including, but not limited to, hardware, glazing, and electrical connections to electrical hardware items, and power, signal and control systems.

3.05 ADJUSTING
A. Adjust for smooth and balanced door movement.
B. Touch-up damaged factory primed finishes in preparation for field painting.
C. Provide tolerance adjustments to hollow metal doors and frames eleven (11) months after Substantial Completion. Repair or replace hollow metal door and frames that bind or cannot be adjusted to required tolerances.

END OF SECTION
SECTION 08 32 10
CUSTOM WOOD FRAME WITH ACRYLIC PANEL DOORS

EDIT SPEC TO ADD MODEL # SSPA5

PART 1 – GENERAL

1.1 SUMMARY
A. Section Includes:
   1. Manually operated telescoping sliding walls.
B. Related Sections
   1. Division 06 Sections for wood framing and supports, and all blocking at head and jambs as required
   2. Division 09 Sections for wall and ceiling framing at head and jambs
   3. Division 05 section for cold-formed metal framing.

1.2 COORDINATION
A. Coordinate with any supporting materials including but not limited to existing structure, framing, ceilings, other supports and finishes which interface with the RAYDOOR system.

1.3 PREINSTALLATION MEETING
A. Pre-installation Conference: Conduct conference at Project Site. Contractor shall be familiar with the system and confirm all door openings and mounting conditions prior to ordering material.

1.4 QUALITY ASSURANCE
A. Manufacturer’s Qualifications – Engaged in manufacturing of doors of similar type to those specified with 14 years successful experience
B. Installer’s Qualifications
   1. Installer shall have a minimum of 2 years of experience installing systems.
   2. Installer shall have a minimum of 4 years of similar experience installing interior doors or sliding partitions.

1.5 SUBMITTALS
A. Product Data: Submit manufacturer’s product data including description of materials, components, hardware, and finishes.
CEDAR ROAD ELEMENTARY SCHOOL ADDITION
CHESAPEAKE PUBLIC SCHOOLS
BID 48-1920

B. Shop Drawings: Indicate location, size, elevation, details of construction, and factory preparation requirements for each door type on vendor supplied shop drawings.

1.6 WARRANTY
A. Factory Finished Door Warranty: Provide manufacturer's standard 1-year warranty.

PART 2 – PRODUCTS

2.1 MANUFACTURERS
A. Product:
   1. Raydoor Sliding Walls and Doors, [www.raydoor.com](http://www.raydoor.com) : SSPA5
   2. Substitutions allowed

2.1 PERFORMANCE REQUIREMENTS
A. PETG Resin Materials
   1. Non embossed material minimum ¼" thick
   2. Meets or exceeds requirements of ASTM D 2843 Smoke Density
   3. Meets or exceeds requirements of ASTM D 635 Flame Spread

2.2 OPERATION
A. Sliding Wall: series of doors that are mechanically linked to one another, to be manually operated and top supported. Pulling lead door across opening to bring following doors in succession. When fully extended, door stiles should overlap.

2.3 PANEL CONSTRUCTION
A. All panels to be constructed of MDF substrate frame with central glazing layer of acrylic or PETG. Panels are fully adhered and pneumatically pressed for permanent bond. Panels to show no mechanical fasteners or molding of any kind.

B. Panel to be 1-3/4" thick and made from laminating 3 structural layers together in a high pressure process. The 2 outer layers are made from ¾” thick veneer, the central core layer to be made of a 1/4" thick machine-able, semi structural layer of acrylic. The core layer and the outer frame layers are to be constructed such that the nominal width will be no more than +/-1/16". Assembly should be such that if translucent materials have been selected for the core layer, they are to permit light to emanate from the edge of the door.

C. Pre-fit and pre-machine doors at factory.
1. Installer to obtain accurate field measurements and verify dimensions before manufacturer proceeds with machining in factory. Panels may not be undercut in the field.

2. Manufacturer to machine doors for hardware requiring cutting of doors. For low-profile option, top of panels to receive two mortises.

3. Comply with accepted hardware schedules, door frame shop drawings and with hardware templates to ensure proper fit of doors and hardware.

2.4 SLIDING HARDWARE

A. Each panel to receive two nylon wheeled carriers, anodized aluminum self-cleaning track, and carrier to door connections that allow for height adjustment without removing panels. Also to have at least one doorstop to limit travel that is placed within track and can be set with one screw. Also, 1 pair of plastic end caps for each row of track.

B. Telescoping hardware system, linking all panels to one another, maintaining spacing between the faces of the panels and allowing user to extend system by pulling just leading door panel. Hardware will allow user to stack panels flush using only the lead door. Guiding mechanism to maintain precise 3” stile overlap for all doors in the system, ensuring uniform appearance in both open and closed positions. Guiding system components machined from steel and pre-drilled with countersunk holes for mounting screws. Components to be surface mounted to the bottom and/face of each panel in the appropriate sequence as determined by final operating configuration (see project drawings).

2.5 PANEL FINISHES

A. Panel finish: Finish shall be:

   1. Wood Veneer on face, sides and back of MDF board, hand sanded, clear coated with pre-catalyzed satin lacquer or stained and then clear-coated or painted. Frames are butt-joined.

B. Glazing finish:

   1. 1/4” acrylic (recyclable post-consumer use).

2.6 SYSTEM CONFIGURATIONS

A. OPTIONAL SYSTEM CONFIGURATION

   1. Sliding Wall, 5 panel (SSPA5)

2.7 HARDWARE

A. Track Hardware

   1. Floor track in mill-finish aluminum, 13/16”w x 13/16”d
CEDAR ROAD ELEMENTARY SCHOOL ADDITION
CHESAPEAKE PUBLIC SCHOOLS
BID 48-1920

Lock and Pull Hardware

1. Flush bolt, 10"h x 3/4"w x 9/16"d with 13/32" diameter bolt and 1-1/2" throw, satin finish. Provide one at each panel.

5. Flush pull, round, 60mm x 10mm in stain stainless steel

6. Privacy lock, medium duty, or euro-cylinder key/thumb turn with 40mm backset. In satin finished steel and aluminum. Cylinder shall be compatible with the Owner’s existing keying system.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Prior to ordering confirm all opening sizes. Coordinate final door sizes with manufacturer based upon confirmed openings.

B. Before installation, verify that frames are proper size and type for door and are installed as required for proper installation of doors.

C. Notification: Notify General Contractor of unsatisfactory conditions in writing with copy to Architect.

D. Acceptance: Beginning of work means acceptance of existing conditions by installer.

3.2 PREPARATION

A. Conditioning: Condition doors to average humidity in installation area prior to hanging. Keep doors in packaging until ready to install.

3.3 DELIVERY, STORAGE AND HANDLING

A. General: Material shall be stored in a clean dry location in original packaging until ready for installation. Once installed doors shall be protected in place until occupancy.

B. Delivery: Do not deliver doors to building until it is entirely enclosed, drywall, plaster and concrete work is completed and dry, humidity in the building is below 60% and temperature is between 45° and 90° Fahrenheit.

C. Storage: Stack doors vertically at an angle of 10 degrees (or less) to the wall, on a level floor surface in a dry, well ventilated area. Keep doors in packaging while allowing air circulation. Do not stack or lean other objects against doors.

D. Handling: Do not drag doors across one another. Do not drop or rest doors on corners or edges. Doors should be carried sideways and upright (not flat like a tabletop)

E. Protection: Do not subject doors to abnormal heat (above 90°F or below 45°F, dryness, humidity (above 60% or below 20% humidity), or drastic changes in these conditions. Allow sufficient time for doors to acclimate before installation. Keep doors in original packaging until ready to be installed.
3.4 INSTALLATION

A. General: Install doors in accordance with manufacturer's recommendations.
   1. Installation: By skilled finish carpenters or factory authorized installers.
   2. Installer: Thoroughly familiar with the requirements of the manufacturer's door warranty as currently in effect and assure compliance with all provisions.

B. Hanging:
   1. Fit for hardware as scheduled.
   2. Hang doors to be free of binding with hardware functioning properly. No greasing of hardware necessary.

3.5 ADJUSTING, CLEANING AND PROTECTION

A. Adjustment: At completion of job, adjust doors and hardware as required and leave in proper operating condition (operating smoothly, easily and quietly throughout operational range).

B. Clean partition surfaces upon completing installation to remove dust and other foreign materials according to manufacturer's written instructions

C. Protection: Advise General Contractor of proper procedures required to protect installed wood doors from damages or deterioration until acceptance of entire project

END OF SECTION 083210
SECTION 085113
ALUMINUM WINDOWS

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 aluminum windows for exterior locations.
B. Related Requirements:
   1. 088000- “Glazing” for glazing installed in aluminum windows.

1.3 PREINSTALLATION MEETINGS
A. Preinstallation Conference: Conduct conference at Project site.
   1. Review and finalize construction schedule and verify availability of materials, Installer’s personnel, equipment, and facilities needed to make progress and avoid delays.
   2. Review and discuss the finishing of aluminum windows that is required to be coordinated with the finishing of other aluminum work for color and finish matching.
   3. Review, discuss, and coordinate the interrelationship of aluminum windows with other exterior wall components. Include provisions for anchoring, flashing, weeping, sealing perimeters, and protecting finishes.
   4. Review and discuss the sequence of work required to construct a watertight and weathertight exterior building envelope.
   5. Inspect and discuss the condition of substrate and other preparatory work performed by other trades.

1.4 ACTION SUBMITTALS
A. Product Data: For each type of product.
   1. Include construction details, material descriptions, glazing and fabrication methods, dimensions of individual components and profiles, hardware, and finishes for aluminum windows.

B. Shop Drawings: For aluminum windows.
   1. Include plans, elevations, sections, hardware, accessories, insect screens, operational clearances, and details of installation, including anchor, flashing, and sealant installation.

C. Samples:
1. For each exposed product and for each color specified, 2 by 4 inches (50 by 100 mm) in size.
2. Exposed Hardware: Full-size units.

D. Product Schedule: For aluminum windows. Use same designations indicated on Drawings.

1.5 INFORMATIONAL SUBMITTALS

A. Qualification Data: For manufacturer and Installer.
B. Product Test Reports: For each type of aluminum window, for tests performed by a qualified testing agency.
C. Sample Warranties: For manufacturer's warranties.

1.6 QUALITY ASSURANCE

A. Manufacturer Qualifications: A manufacturer capable of fabricating aluminum windows that meet or exceed performance requirements indicated and of documenting this performance by test reports and calculations.
B. Installer Qualifications: An installer acceptable to aluminum window manufacturer for installation of units required for this Project.

1.7 WARRANTY

A. Manufacturer's Warranty: Manufacturer agrees to repair or replace aluminum windows that fail in materials or workmanship within specified warranty period.

1. Failures include, but are not limited to, the following:
   a. Failure to meet performance requirements.
   b. Structural failures including excessive deflection, water leakage, condensation, and air infiltration.
   c. Faulty operation of movable sash and hardware.
   d. Deterioration of materials and finishes beyond normal weathering.
   e. Failure of insulating glass.

2. Warranty Period:
   a. Window: 10 years from date of Substantial Completion.
   b. Glazing Units: 10 years from date of Substantial Completion.
   c. Aluminum Finish: 10 years from date of Substantial Completion.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

A. Source Limitations: Obtain aluminum windows from single source from single manufacturer.
2.2 WINDOW PERFORMANCE REQUIREMENTS

A. Product Standard: Comply with AAMA/WDMA/CSA 101/I.S.2/A440 for definitions and minimum standards of performance, materials, components, accessories, and fabrication unless more stringent requirements are indicated.

B. Performance Class and Grade: AAMA/WDMA/CSA 101/I.S.2/A440 as follows:
   1. Minimum Performance Class: AW.
   2. Minimum Performance Grade: 45.

C. Air Infiltration: With test specimen window sash and ventilators closed and locked, test unit in accordance with ASTM E 283 at a static air pressure of 6.24 psf. Air infiltration shall not exceed 0.10 cfm per square foot.

D. Water Resistance: With test specimen window sash and ventilators closed and locked, test unit in accordance with ASTM E 331 with a minimum static pressure difference of 10 psf. with no uncontrolled water leakage.

E. Uniform Load Structural Test: With test specimen window sash and ventilators closed and locked, test unit in accordance with ASTM E330 at a static pressure difference of 1.5 times the specified design load. During the course of testing, no member shall deflect more than L/175 of the span.

F. Thermal Transmittance: NFRC 100 maximum whole-window U-factor of 0.38 Btu/sq. ft x h x deg F for fixed and 0.45 Btu/sq. ft x h x deg F for operable.

G. Solar Heat-Gain Coefficient (SHGC): NFRC 200 maximum whole-window SHGC of 0.40.

H. Thermal Movements: Provide aluminum windows, including anchorage, that allow for thermal movements resulting from the following maximum change (range) in ambient and surface temperatures by preventing buckling, opening of joints, overstressing of components, failure of joint sealants, failure of connections, and other detrimental effects. Base engineering calculation on surface temperatures of materials due to both solar heat gain and nighttime-sky heat loss.
   1. Temperature Change: 120 deg F ambient and 180 deg F material surface temperature change.

2.3 ALUMINUM WINDOWS

A. Products: subject compliance with requirements of this Section the Basis of Design product is 1150 Series 2" Heavy Commercial Thermally Improved Window as manufactured Winco Manufacturing Co.

B. Acceptable Manufacturers: Subject to compliance with the requirements of this Section acceptable manufacturers include:
   1. Winco Manufacturing Co.
   2. EFCO Corporation.
   3. Oldcastle Building Envelope.

C. Types: Provide the following types in locations indicated on Drawings:
   1. Fixed and projected in hopper.
   1. Thermally Improved Construction: Fabricate frames, sashes, and muntins with an integral, concealed, low-conductance thermal barrier located between exterior materials and window members exposed on interior side in a manner that eliminates direct metal-to-metal contact.

E. Insulating-Glass Units: Refer to Section 088000 Glazing for requirements.

F. Glazing System: Manufacturer's standard factory-glazing system that produces weathertight seal.

G. Hardware, General: Provide manufacturer's standard hardware fabricated from aluminum, stainless steel, carbon steel complying with AAMA 907, or other corrosion-resistant material compatible with adjacent materials; designed to smoothly operate, tightly close, and securely lock windows, and sized to accommodate sash weight and dimensions.
   1. Exposed Hardware Color and Finish: As selected by Architect from manufacturer's full range.

H. Projected Window Hardware:
   1. Hinges: Manufacturer standard operating arms consisting of 4 bar stainless steel arms, not less than two per sash.
   2. Lock: Manufacturer standard lever handle and cam-action lock with keeper manufactured from a white bronze alloy with a US25D brushed finish.
   3. Limit Devices: Manufacturer standard limit devices designed to restrict sash opening.
      a. Limit clear opening to 4 inches (100 mm) for ventilation; with custodial key release.

I. Weather Stripping: Provide full-perimeter weather stripping for each operable sash unless otherwise indicated.

J. Fasteners: Noncorrosive and compatible with window members, trim, hardware, anchors, and other components.
   1. Exposed Fasteners: Do not use exposed fasteners to greatest extent possible. For application of hardware, use fasteners that match finish hardware being fastened.

2.4 ACCESSORIES

A. Subsills: Thermally broken, extruded-aluminum subsills in configurations indicated on Drawings.

B. Column Covers: Extruded-aluminum profiles in sizes and configurations indicated on Drawings.

C. Interior Trim: Extruded-aluminum profiles in sizes and configurations indicated on Drawings.

D. Panning Trim: Extruded-aluminum profiles in sizes and configurations indicated on Drawings.

E. Receptor System: Two-piece, snap-together, thermally broken, extruded-aluminum receptor system that anchors windows in place.
2.5 INSECT SCREENS

A. General: Fabricate insect screens to integrate with window frame. Provide screen for each operable exterior sash. Screen wickets are not permitted.

1. Type and Location: Full, outside for projected in, hopper sashes.

B. Aluminum Frames: Manufacturer's standard aluminum alloy complying with SMA 1004 or SMA 1201. Fabricate frames with mitered or coped joints or corner extrusions, concealed fasteners, and removable PVC spline/anchor concealing edge of frame.

1. Tubular Framing Sections and Cross Braces: Roll formed from aluminum sheet.

C. Glass-Fiber Mesh Fabric: 18-by-14 (1.1-by-1.4-mm) or 18-by-16 (1.0-by-1.1-mm) mesh of PVC-coated, glass-fiber threads; woven and fused to form a fabric mesh resistant to corrosion, shrinkage, stretch, impact damage, and weather deterioration. Comply with ASTM D3656/D3656M.

1. Mesh Color: Manufacturer's standard.

2.6 FABRICATION

A. Fabricate aluminum windows in sizes indicated. Include a complete system for assembling components and anchoring windows.

B. Glaze aluminum windows in the factory.

C. Weather strip each operable sash to provide weathertight installation.

D. Weep Holes: Provide weep holes and internal passages to conduct infiltrating water to exterior.

E. Complete fabrication, assembly, finishing, hardware application, and other work in the factory to greatest extent possible. Disassemble components only as necessary for shipment and installation.

2.7 GENERAL FINISH REQUIREMENTS

A. Comply with NAAMM's "Metal Finishes Manual" for recommendations for applying and designating finishes.

B. Protect mechanical finishes on exposed surfaces from damage by applying a strippable, temporary protective covering before shipping.

C. Appearance of Finished Work: Noticeable variations in same piece are not acceptable. Variations in appearance of adjoining components are acceptable if they are within the range of approved Samples and are assembled or installed to minimize contrast.

2.8 ALUMINUM FINISHES

A. Finish designations prefixed by AA comply with the system established by the Aluminum Association for designating aluminum finishes.
PART 3 - EXECUTION

3.1 EXAMINATION

A. Examine openings, substrates, structural support, anchorage, and conditions, with Installer present, for compliance with requirements for installation tolerances and other conditions affecting performance of the Work.

B. Verify rough opening dimensions, levelness of sill plate, and operational clearances.

C. Examine wall flashings, vapor retarders, water and weather barriers, and other built-in components to ensure weathertight window installation.

D. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 INSTALLATION

A. Comply with manufacturer’s written instructions for installing windows, hardware, accessories, and other components. For installation procedures and requirements not addressed in manufacturer’s written instructions, comply with installation requirements in ASTM E2112.

B. Install windows level, plumb, square, true to line, without distortion or impeding thermal movement, anchored securely in place to structural support, and in proper relation to wall flashing and other adjacent construction to produce weathertight construction.

C. Install windows and components to drain condensation, water penetrating joints, and moisture migrating within windows to the exterior.

D. Separate aluminum and other corroding surfaces from sources of corrosion or electrolytic action at points of contact with other materials.

3.3 ADJUSTING, CLEANING, AND PROTECTION

A. Adjust operating sashes and hardware for a tight fit at contact points and weather stripping for smooth operation and weathertight closure.

B. Clean exposed surfaces immediately after installing windows. Avoid damaging protective coatings and finishes. Remove excess sealants, glazing materials, dirt, and other substances.

1. Keep protective films and coverings in place until final cleaning.

C. Remove and replace glass that has been broken, chipped, cracked, abraded, or damaged during construction period.

D. Protect window surfaces from contact with contaminating substances resulting from construction operations. If contaminating substances do contact window surfaces, remove contaminants immediately according to manufacturer’s written instructions.
END OF SECTION 085113
SECTION 087100
DOOR HARDWARE

PART 1 - GENERAL

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

1.2 SUMMARY
A. This Section includes the following:
   1. Commercial door hardware for the following:
      a. Swinging doors.
      b. Sliding doors.

B. Related Sections include the following:
   1. Division 8 Section “Steel Doors and Frames” for astragals provided as part of a fire-rated labeled assembly and for door silencers provided as part of the frame.
   2. Division 26 Sections for connections to electrical power system and for low-voltage wiring work.

C. Products furnished, but not installed, under this Section include the following. Coordinating, purchasing, delivering, and scheduling remain requirements of this Section.

1.3 SUBMITTALS
A. Product Data: Include installation details, material descriptions, dimensions of individual components and profiles, and finishes.

B. Shop Drawings: Details of electrified door hardware, indicating the following:
   1. Operation Narrative: Describe the operation of doors controlled by electrified door hardware.

C. Door Hardware Schedule: Prepared by or under the supervision of supplier, detailing fabrication and assembly of door hardware, as well as procedures and diagrams. Coordinate the final Door Hardware Schedule with doors, frames, and related work to ensure proper size, thickness, hand, function, and finish of door hardware.
   1. Format: Comply with scheduling sequence and vertical format in DHI’s “Sequence and Format for the Hardware Schedule.”
   2. Organization: Organize the Door Hardware Schedule into door hardware sets indicating complete designations of every item required for each door or opening.
      a. Organize door hardware sets in same order as in the Door Hardware Schedule at the end of Part 3.
   3. Content: Include the following information:
      a. Type, style, function, size, label, hand, and finish of each door hardware item.
      b. Manufacturer of each item.
      c. Fastenings and other pertinent information.
      d. Location of each door hardware set, cross-referenced to Drawings, both on floor plans and in door and frame schedule.
      e. Explanation of abbreviations, symbols, and codes contained in schedule.
      f. Mounting locations for door hardware.
      g. Door and frame sizes and materials.
4. Submittal Sequence: Submit the final Door Hardware Schedule at earliest possible date, particularly where approval of the Door Hardware Schedule must precede fabrication of other work that is critical in the Project construction schedule. Include Product Data, Samples, Shop Drawings of other work affected by door hardware, and other information essential to the coordinated review of the Door Hardware Schedule.

D. Keying Schedule: Prepared by or under the supervision of the lock manufacturer, detailing Owner's final keying instructions for locks. Include schematic keying diagram and index each key set to unique door designations.

E. Product Test Reports: Based on evaluation of comprehensive tests performed by manufacturer and witnessed by a qualified testing agency, indicating current products meet requirements.

F. Maintenance Data: For each type of door hardware to include in maintenance manuals specified in Division 1.

G. Warranties: Special warranties specified in this Section.

1.4 QUALITY ASSURANCE

A. Installer Qualifications: An experienced installer who has completed door hardware similar in material, design, and extent to that indicated for this Project and whose work has resulted in construction with a record of successful in-service performance.

1. Engineering Responsibility: Preparation of data for electrified door hardware, including Shop Drawings, based on testing and engineering analysis of manufacturer's standard units in assemblies similar to those indicated for this Project.

B. Supplier Qualifications: Door hardware supplier with local warehousing facilities and who is or employs a qualified Architectural Hardware Consultant, available during course of the Work to consult with Contractor, Architect, and Owner about door hardware and keying.

1. Scheduling Responsibility: Preparation of door hardware and keying schedules.

C. Architectural Hardware Consultant Qualifications: A person who is currently certified by the Door and Hardware Institute as an Architectural Hardware Consultant and who is experienced in providing consulting services for door hardware installations that are comparable in material, design, and extent to that indicated for this Project.

1. Electrified Door Hardware Consultant Qualifications: A qualified Architectural Hardware Consultant who is experienced in providing consulting services for electrified door hardware installations.

D. Source Limitations: Obtain each type and variety of door hardware from a single manufacturer, unless otherwise indicated.

1. Provide electrified door hardware from same manufacturer as mechanical door hardware, unless otherwise indicated. Manufacturers that perform electrical modifications and that are listed by a testing and inspecting agency acceptable to authorities having jurisdiction are acceptable.

E. Regulatory Requirements: Comply with provisions of the following:

1. Where indicated to comply with accessibility requirements, comply with Americans with Disabilities Act (ADA), ANSI A117.1, as follows:

   a. Handles, Pulls, Latches, Locks, and other Operating Devices: Shape easy to grasp with one hand and not requiring tight grasping, tight pinching, or twisting of wrist.

   b. Door Closers: Comply with the following opening-force requirements:

       1) Interior Hinged Doors: Maximum 5 lbf applied perpendicular to door.

       2) Fire Doors: Minimum opening force per authorities having jurisdiction.

   c. Thresholds: Not more than 1/2 inch high, beveled with maximum slope of 1:2.
2. NFPA 101: Comply with the following for means of egress doors:
   a. Latches, Locks, and Exit Devices: Not more than 15 lbf to release the latch. Locks shall not require the use of a key, tool, or special knowledge for operation.
   b. Door Closers: Not more than 30 lbf to set door in motion and not more than 15 lbf to open door to minimum required width.
   c. Thresholds: Not more than 1/2 inch high.

F. Fire-Rated Door Assemblies: Provide door hardware for assemblies complying with NFPA 80 that are listed and labeled by a testing and inspecting agency acceptable to authorities having jurisdiction, for fire ratings indicated, based on testing according to NFPA 252.
   1. Test Pressure: After 5 minutes into the test, neutral pressure level in furnace shall be established at 40 inches or less above the sill. (Positive pressure testing per IBC 2000).

G. Electrified Door Hardware: Listed and labeled as defined in NFPA 70, Article 100, by a testing agency acceptable to authorities having jurisdiction, and marked for intended use.

H. Keying Conference: Conduct conference at Project site to comply with requirements in Division 1 Section “Project Management and Coordination.” Incorporate keying conference decisions into final keying schedule after reviewing door hardware keying system including, but not limited to, the following:
   1. Function of building, flow of traffic, purpose of each area, degree of security required, and plans for future expansion.
   2. Address for delivery of keys.

1.5 DELIVERY, STORAGE, AND HANDLING
   A. Inventory door hardware on receipt and provide secure lock-up for door hardware delivered to Project site.
   B. Tag each item or package separately with identification related to the final Door Hardware Schedule, and include basic installation instructions with each item or package.
   C. Deliver keys to Owner by registered mail or overnight package service.
   D. Aluminum door hardware is to be delivered to the general contractor for inventory.

1.6 COORDINATION
   A. Templates: Obtain and distribute to the parties involved templates for doors, frames, and other work specified to be factory prepared for installing door hardware. Check Shop Drawings of other work to confirm that adequate provisions are made for locating and installing door hardware to comply with indicated requirements.

1.7 WARRANTY
   A. General Warranty: Special warranties specified in this Article shall not deprive Owner of other rights Owner may have under other provisions of the Contract Documents and shall be in addition to, and run concurrent with, other warranties made by Contractor under requirements of the Contract Documents.
   B. Warranty Period: One year from date of Substantial Completion, unless otherwise indicated.
      a. Exit Devices: Five years from date of Substantial Completion.
      b. Manual Closers: 25 years from date of Substantial Completion.

1.8 MAINTENANCE SERVICE
   A. Maintenance Tools and Instructions: Furnish a complete set of specialized tools and maintenance instructions as needed for Owner's continued adjustment, maintenance, and removal and replacement of door hardware.
B. Maintenance Service: Beginning at Substantial Completion, provide six months’ full maintenance by skilled employees of door hardware Installer. Include quarterly preventive maintenance, repair or replacement of worn or defective components, lubrication, cleaning, and adjusting as required for proper door hardware operation. Provide parts and supplies as used in the manufacture and installation of original products.

PART 2 - PRODUCTS

2.1 SCHEDULED DOOR HARDWARE

A. General: Provide door hardware for each door to comply with requirements in this Section, door hardware sets indicated in door and frame schedule, and the Door Hardware Schedule at the end of Part 3.
   1. Door Hardware Sets: Provide quantity, item, size, finish or color indicated, and products equivalent in function and comparable in quality to named products.

B. Designations: Requirements for design, grade, function, finish, size, and other distinctive qualities of each type of door hardware are indicated in the Door Hardware Schedule at the end of Part 3. Products are identified by using door hardware designations, as follows:
   1. Named Manufacturer's Products: Product designation and manufacturer are listed for each door hardware type required for the purpose of establishing minimum requirements. Manufacturers' names are abbreviated in the Door Hardware Schedule.

2.2 HINGES AND PIVOTS

A. Available Manufacturers: Subject to compliance with requirements, manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following:
   1. Hinges:
      a. Hager Companies (HAG).
      c. Stanley Commercial Hardware; Div. of The Stanley Works (STH).
   2. Continuous Geared Hinges: (with serviceable panels at electric hinges) – Not used
      a. McKinney Products Company; Div. of ESSEX Industries, Inc. (MCK)/Pemko
      b. *Pemko.

B. Quantity: As scheduled.

C. Size: Provide sizes scheduled.

D. Hinge Base Metal: Unless otherwise indicated, provide the following:
   1. Exterior Hinges: Brass, with stainless-steel pin body and brass protruding heads.
   2. Interior Hinges: Steel, with steel pin.
   3. Hinges for Fire-Rated Assemblies: Steel, with steel pin.

E. Hinge Options: Comply with the following where indicated in the Door Hardware Schedule or on Drawings:
   1. Non-removable Pins: Provide set screw in hinge barrel that, when tightened into a groove in hinge pin, prevents removal of pin while door is closed; for the following applications:
      a. Out-swinging exterior doors.
   2. Corners: Square.

F. Continuous-Geared Hinges: Overall width of 4 inches; fabricated to full height of door and frame. Fabricate hinges to template screw locations. Prep for power transfers as required.

G. Electrified Functions for Hinges: Comply with the following:
1. Power Transfer: Concealed PTFE-jacketed wires, secured at each leaf and continuous through hinge knuckle.

H. Fasteners: Comply with the following:
2. Wood Screws: For wood doors and frames.
3. Threaded-to-the-Head Wood Screws: For fire-rated wood doors.
4. Screws: Phillips flat-head screws; Finish screw heads to match surface of hinges.

2.3 LOCKS AND LATHCES

A. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
1. Sargent Locks – No substitutions
2. *Sliding Door Locks – Accurate Hardware

B. Bored Locks: BHMA Grade 1; Series 4000.

C. Mortise Locks: Stamped steel case with steel or brass parts; BHMA Grade 1, unless Grade 2 is indicated; Series 1000.

D. Auxiliary Locks: BHMA Grade 1, unless Grade 2 is indicated.

E. Certified Products: Provide door hardware listed in the following BHMA directories:

F. Lock Trim: Comply with the following:
1. Lever: Cast
2. Escutcheon (Rose): Cast
3. Lockset Designs: Provide the lockset design designated in schedule or, if sets are provided by another manufacturer, provide designs that match those designated.

G. Lock Functions: Function numbers and descriptions indicated in the Door Hardware Schedule comply with the following:

H. Lock Throw: Comply with testing requirements for length of bolts to comply with labeled fire door requirements, and as follows:

I. Backset: 2-3/4 inches, unless otherwise indicated.

2.4 EXIT DEVICES

A. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
1. Sargent – No Substitutions

B. Certified Products: Exit devices listed in BHMA’s “Directory of Certified Exit Devices.”

C. Panic Exit Devices: Listed and labeled by a testing and inspecting agency acceptable to authorities having jurisdiction, for panic protection, based on testing according to UL 305.

D. Fire Exit Devices: Complying with NFPA 80 that are listed and labeled by a testing and inspecting agency acceptable to authorities having jurisdiction, for fire and panic protection, based on testing according to UL 305 and NFPA 252.

E. Outside Trim: Lever with cylinder material and finish to match locksets.
1. Match design for locksets and latchsets, unless otherwise indicated.
2.5 KEYING SYSTEM
   A. Provide Sargent cylinders at all locations – no substitutions.
   B. Locks shall be keyed in sets or sub-sets as scheduled to comply with Owner’s instructions.

2.6 KEY REQUIREMENTS
   A. Upon receipt of approved Hardware Schedule, arrange an interview with the contractor and owner’s representative to obtain and determine necessary keying information.
      1. Metals: Construct lock cylinder parts from brass, bronze, stainless steel or nickel silver.
      2. Cylinders shall be the same product of single manufacturer and identified on the core face.
      3. All locksets, exit devices, and padlocks shall accept same.
      4. Furnished with a construction core master keying system for interim use during construction.
   B. Stamp each key with change number and stamp set symbol; and stamp each master key with set symbol, as applicable.
      1. Provide change keys in individual envelopes for each cylinder delivered.
      2. Envelopes shall be marked with respective door identification numbers.
      3. The inscription “Do Not Duplicate” shall be stamped on all change keys.
      4. Provide visual key control – BHMA key symbol on cylinders and keys.
   C. Keys shall be supplied as follows:
      1. Construction Keys: Five (5) each
      2. Masterkeys (each Masterkey set): Five (5) per each master
      3. Change Keys per Lock: Five (5) per cylinder
   D. Send all master keys and key blanks by registered mail, directly from the manufacturer, to the Owner’s Representative.

2.7 ACCESSORIES FOR PAIRS OF DOORS
   A. Available Manufacturers: Subject to compliance with requirements, manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following:
      1. Removable Mullions: Provide aluminum finish at all aluminum frames.
         a. Sargent Manufacturing Company; Div. of ESSEX Industries, Inc. (SGT).

2.8 CLOSERS
   A. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
      1. Surface-Mounted Closers:
         a. Sargent 351 – No Substitutions
   B. Surface Closers: BHMA Grade 1
   C. Certified Products: Provide door closers listed in BHMA’s “Directory of Certified Door Closers.”
   D. Size of Units: Comply with manufacturer’s written recommendations for size of door closers depending on size of door, exposure to weather, and anticipated frequency of use. Provide factory-sized closers, adjustable to meet field conditions and requirements for opening force.

2.9 PROTECTIVE TRIM UNITS
   A. Available Manufacturers: Subject to compliance with requirements, manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following:
1. Metal Protective Trim Units:
   a. Hager Companies (HAG).

B. Fasteners: Provide manufacturer's standard exposed fasteners for door trim units consisting of either machine or self-tapping screws.

C. Furnish protection plates sized 2 inches less than door width on push side and 1 inch less than door width on pull side, by height specified in Door Hardware Schedule.

2.10 STOPS AND HOLDERS

A. Available Manufacturers: Subject to compliance with requirements, manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following:
   1. Hager Companies (HAG).
   2. Ives: H. B. Ives (IVS).

B. Stops and Bumpers: BHMA Grade 1.

C. Combination Overhead Stops and Holders: BHMA Grade 1, unless Grade 2 is indicated.
   1. ABH (AB).
   2. Glynn Johnson; an Ingersoll-Rand Company (GJ).

D. Electromagnetic Door Holders: *Specified in Division 26.

E. Floor Stops: For doors, unless wall or other type stops are scheduled or indicated. Do not mount floor stops where they will impede traffic.
   1. Where floor or wall stops are not appropriate, provide overhead holders.

2.11 DOOR GASKETING

A. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
   1. Door Gasketing:
      a. National Guard Products, Inc. (NGP).
      c. Reese Enterprises, Inc. (RE).
   2. Door Bottoms:
      a. National Guard Products, Inc. (NGP).
      c. Reese Enterprises, Inc. (RE).

B. General: Provide continuous weather-strip gasketing on exterior doors where indicated or scheduled. Provide noncorrosive fasteners for exterior applications and elsewhere as indicated.
   1. Perimeter Gasketing: Apply to head and jamb, forming seal between door and frame.
   2. Meeting Stile Gasketing: Fasten to meeting stiles, forming seal when doors are closed.
   3. Door Bottoms: Apply to door bottom, forming seal with threshold when door is closed.

2.12 THRESHOLDS

A. Available Manufacturers: Subject to compliance with requirements, manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following:
1. National Guard Products, Inc. (NGP).

2.13 MISCELLANEOUS DOOR HARDWARE

A. Available Manufacturers: Subject to compliance with requirements, manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following:
   1. Hager Companies (HAG).
   2. Ives: H. B. Ives (IVS).

B. Boxed Power Supplies: Modular unit in NEMA ICS 6, Type 4 enclosure; filtered and regulated; voltage rating and type matching requirements of door hardware served; and listed and labeled for use with fire alarm systems, where applicable.

C. Auxiliary Hardware: BHMA Grade 1, unless otherwise indicated.
   1. Sargent Manufacturing Co; Div. of ASSA Abloy Co. (SGT).

2.14 FABRICATION

A. Manufacturer's Nameplate: Do not provide manufacturers' products that have manufacturer's name or trade name displayed in a visible location (omit removable nameplates) except in conjunction with required fire-rated labels and as otherwise approved by Architect.
   1. Manufacturer's identification will be permitted on rim of lock cylinders only.

B. Base Metals: Produce door hardware units of base metal, fabricated by forming method indicated, using manufacturer's standard metal alloy, composition, temper, and hardness. Furnish metals of a quality equal to or greater than that of specified door hardware units and BHMA A156.18 for finishes. Do not furnish manufacturer's standard materials or forming methods if different from specified standard.

C. Fasteners: Provide door hardware manufactured to comply with published templates generally prepared for machine, wood, and sheet metal screws. Provide screws according to commercially recognized industry standards for application intended. Provide Phillips flat-head screws with finished heads to match surface of door hardware, unless otherwise indicated.
   1. Concealed Fasteners: For door hardware units that are exposed when door is closed, except for units already specified with concealed fasteners. Do not use through bolts for installation where bolt head or nut on opposite face is exposed unless it is the only means of securely attaching the door hardware. Where through bolts are used on hollow door and frame construction, provide sleeves for each through bolt.

2. Steel Machine or Wood Screws: For the following fire-rated applications:
   a. Mortise hinges to doors.
   b. Strike plates to frames.
   c. Closers to doors and frames.

3. Steel Through Bolts: For the following fire-rated applications, unless door blocking is provided:
   a. Surface hinges to doors.
   b. Closers to doors and frames.
   c. Surface-mounted exit devices.

4. Spacers or Sex Bolts: For through bolting of hollow metal doors.

5. Fasteners for Wood Doors: Comply with requirements of DHI WDHS.2, “Recommended Fasteners for Wood Doors.”
2.15 FINISHES
A. Standard: Comply with BHMA A156.18.
B. Protect mechanical finishes on exposed surfaces from damage by applying a strippable, temporary protective covering before shipping.
C. Appearance of Finished Work: Variations in appearance of abutting or adjacent pieces are acceptable if they are within one-half of the range of approved Samples. Noticeable variations in the same piece are not acceptable. Variations in appearance of other components are acceptable if within the range of approved Samples and assembled or installed to minimize contrast.
D. BHMA Designations: Comply with base material and finish requirements indicated by the following:
   1. BHMA 626: Satin chromium plated over nickel, over brass or bronze base metal.
   2. BHMA 628: Satin aluminum, clear anodized, over aluminum base metal.
   3. BHMA 630: Satin stainless steel, over stainless-steel base metal.
   4. BHMA 652: Satin chromium plated over nickel, over steel base metal.

PART 3 - EXECUTION
3.1 EXAMINATION
A. Examine doors and frames, with Installer present, for compliance with requirements for installation tolerances, labeled fire door assembly construction, wall and floor construction, and other conditions affecting performance.
B. Examine roughing-in for electrical power systems to verify actual locations of wiring connections before electrified door hardware installation.
C. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 PREPARATION
A. Steel Doors and Frames: Comply with DHI A115 series.
   1. Surface-Applied Door Hardware: Drill and tap doors and frames according to SDI 107.
B. Wood Doors: Comply with DHI A115-W series.

3.3 INSTALLATION
A. Mounting Heights: Mount door hardware units at heights indicated in following applicable publications, unless specifically indicated or required to comply with governing regulations:
   1. Follow mandatory mounting heights for elementary school in the State of Virginia.
   2. DHI WDHS.3, Locations for Wood Doors.”
B. Install each door hardware item to comply with manufacturer's written instructions. Where cutting and fitting are required to install door hardware onto or into surfaces that are later to be painted or finished in another way, coordinate removal, storage, and reinstallation of surface protective trim units with finishing work specified in Division 9 Sections. Do not install surface-mounted items until finishes have been completed on substrates involved.
   1. Set units level, plumb, and true to line and location. Adjust and reinforce attachment substrates as necessary for proper installation and operation.
   2. Drill and countersink units that are not factory prepared for anchorage fasteners. Space fasteners and anchors according to industry standards.
C. Boxed Power Supplies: Locate power supplies as indicated or, if not indicated, above accessible ceilings. Verify location with Architect.
   1. Configuration: Provide the least number of power supplies required to adequately serve doors with electrified door hardware.

D. Thresholds: Set thresholds for exterior doors in full bed of sealant complying with requirements specified in Division 7 Section “Joint Sealants.”

3.4 ADJUSTING
A. Initial Adjustment: Adjust and check each operating item of door hardware and each door to ensure proper operation or function of every unit. Replace units that cannot be adjusted to operate as intended. Adjust door control devices to compensate for final operation of heating and ventilating equipment and to comply with referenced accessibility requirements.
   1. Electric Strikes: Adjust horizontal and vertical alignment of keeper to properly engage lock bolt.
   2. Door Closers: Adjust sweep period so that, from an open position of 70 degrees, the door will take at least 3 seconds to move to a point 3 inches from the latch, measured to the leading edge of the door.

B. Six-Month Adjustment: Approximately six months after date of Substantial Completion, Installer shall perform the following:
   1. Examine and readjust each item of door hardware as necessary to ensure function of doors, and door hardware, and electrified door hardware.
   2. Consult with and instruct Owner’s personnel on recommended maintenance procedures.
   3. Replace door hardware items that have deteriorated or failed due to faulty design, materials, or installation of door hardware units.

3.5 CLEANING AND PROTECTION
A. Clean adjacent surfaces soiled by door hardware installation.
B. Clean operating items as necessary to restore proper function and finish.
C. Provide final protection and maintain conditions that ensure door hardware is without damage or deterioration at time of Substantial Completion.

3.6 DOOR HARDWARE SCHEDULE

**SET 1**

<table>
<thead>
<tr>
<th>Item Description</th>
<th>Quantity</th>
<th>Specification</th>
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<tbody>
<tr>
<td>Continuous Hinge</td>
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<td>CFM HD1 AL</td>
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<tr>
<td>Keyed Mullion</td>
<td>1</td>
<td>L980 PC</td>
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<tr>
<td>Cylinder Kit</td>
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<td>64-980C1 980C1 626</td>
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<tr>
<td>Exits</td>
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<td>64-16-8804 ETJ 630</td>
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<tr>
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<td>Door Closers</td>
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<td>Kick Plates</td>
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<tr>
<td>Threshold</td>
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<tr>
<td>Door Bottoms</td>
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<td>Weatherstrip</td>
<td>1 Set</td>
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<tr>
<td>Astragals</td>
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<td>18041CNB</td>
</tr>
</tbody>
</table>

**DOORS: 343, 347**

**SET 2**
1 EACH CORE 6300 626. Coordinate with lock provided in Spec Section 083210.

DOORS: 344, 346

END OF SECTION
SECTION 08 80 00

GLAZING

PART 1 - GENERAL

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

1.02 SUMMARY
A. This Section includes glass for the following products, including those specified in other Sections where glazing requirements are specified by reference to this Section:
   1. Section 08 11 13 – Hollow Metal Doors
B. This Sections includes decorative film (indicated as Opaque Film on drawings) applied to glass where indicated on drawings.

1.03 DEFINITIONS
A. Manufacturer is used in this Section to refer to a firm that produces primary glass or fabricated glass as defined in the referenced glazing standard.
B. Deterioration of Insulating Glass: Failure of the hermetic seal under normal use due to causes other than glass breakage and improper practices for maintaining, and cleaning insulating glass. Evidence of failure is the obstruction of vision by dust, moisture, or film on the interior surfaces of glass. Improper practices for maintaining and cleaning glass do not comply with the manufacturer's directions.

1.04 SYSTEM PERFORMANCE REQUIREMENTS
A. General: Provide glazing systems that are produced, fabricated, and installed to withstand normal thermal movement, wind loading, and impact loading (where applicable), without failure including loss or glass breakage attributable to the following: defective manufacture, fabrication, and installation; failure of sealants or gaskets to remain watertight and airtight; deterioration of glazing materials; and other defects in construction.
B. Glass Design: Glass thicknesses indicated are for detailing only. Confirm glass thicknesses by analyzing Project loads and in-service conditions. Provide glass lites for the various size openings in the thicknesses and strengths (annealed or heat-treated) to meet or exceed the following criteria:
   1. Normal thermal movement results from the following maximum change (range) in ambient and surface temperatures acting on glass-framing members and glazing components. Base engineering calculation on materials' actual surface temperatures due to both solar heat gain and nighttime sky heat loss.
      a. Temperature Change (Range): 120 degrees F (67 degrees C), ambient; 180 degrees F (100 degrees C), material surfaces.

1.05 SUBMITTALS
A. General: Submit the following according to Conditions of Contract and Division 1 Specification Sections.
B. Product data for each glass product and glazing material indicated.
C. Product data for shading film.
D. Samples for verification purposes of 12-inch-square samples of each type of glass indicated except for clear monolithic glass products, and 12-inch-long samples of each color required (except black) for each type of sealant or gasket exposed to view. Install sealant or gasket
sample between two strips of material representative in color of the adjoining framing system.

E. Product certificates signed by glazing materials manufacturers certifying that their products comply with specified requirements.
   1. Separate certifications are not required for glazing materials bearing manufacturer's permanent labels designating type and thickness of glass, provided labels represent a quality control program of a recognized certification agency or independent testing agency acceptable to authorities having jurisdiction.
   2. Compatibility and adhesion test reports from sealant manufacturer indicating that glazing materials were tested for compatibility and adhesion with glazing sealants. Include sealant manufacturer's interpretation of test results relative to sealant performance and recommendations for primers and substrate preparation needed for adhesion.
   3. Compatibility test report from manufacturer of insulating glass edge sealant indicating that glass edge sealants were tested for compatibility with other glazing materials including sealants, glazing tape, gaskets, setting blocks, and edge blocks.
   4. Product test reports for each type of glazing sealant and gasket indicated, evidencing compliance with requirements specified.
   5. Maintenance data for glass and other glazing materials to include in Operating and Maintenance Manual specified in Division 1.

1.06 QUALITY ASSURANCE

A. Glazing Publications: Comply with published recommendations of glass product manufacturers and organizations below, except where more stringent requirements are indicated. Refer to these publications for glazing terms not otherwise defined in this Section or in referenced standards.
   1. FGMA Publications: "FGMA Glazing Manual."
   2. SIGMA Publications: TM-3000 "Vertical Glazing Guidelines."
   4. Subject to compliance with requirements, provide safety glass permanently marked with certification label of Safety Glazing Certification Council (SGCC) or other certification agency acceptable to authorities having jurisdiction.
   5. Fire-Resistive Glazing Products for Door Assemblies: Products identical to those tested per ASTM E 152, labeled and listed by UL or another testing and inspecting agency acceptable to authorities having jurisdiction.
   6. Fire-Resistive Glazing Products for Window Assemblies: Products identical to those tested per ASTM E 163, labeled and listed by UL or another testing and inspecting agency acceptable to authorities having jurisdiction.
   7. Insulating Glass Certification Program: Provide insulating glass units permanently marked either on spacers or at least one component lite of units with appropriate certification label of inspecting and testing agency.
   8. Glazier Qualifications: Engage an experienced glazier who has completed glazing similar in material, design, and extent to that indicated for Project with a record of successful in-service performance.
  11. Preconstruction Compatibility and Adhesion Testing: Submit to sealant manufacturers, samples of each glass, gasket, glazing accessory, and glass-framing member that will contact or affect glazing sealants for compatibility and adhesion testing as indicated below:
  12. Use test methods standard with sealant manufacturer to determine if priming and other specific preparation techniques are required for rapid, optimum glazing sealants adhesion to glass and glazing channel substrates.
  13. Testing is not required when glazing sealant manufacturer can submit required preparation data that is acceptable to Architect and is based on previous testing of current sealant products for adhesion to and compatibility with submitted glazing materials.
1.07 DELIVERY, STORAGE, AND HANDLING

A. Protect glass and glazing materials during delivery, storage and handling to comply with manufacturer's directions and as required to prevent edge damage to glass and damage to glass and glazing materials from effects of moisture including condensation, of temperature changes, of direct exposure to sun, and from other causes.

1.08 PROJECT CONDITIONS

A. Environmental Conditions: Do not proceed with glazing when ambient and substrate temperature conditions are outside the limits permitted by glazing materials manufacturer or when glazing channel substrates are wet from rain, frost, condensation, or other causes.

1. Install liquid sealants at ambient and substrate temperatures above 40 degrees F (4.4 degrees C).

1.09 WARRANTY

A. General: Warranties specified in this Article shall not deprive the Owner of other rights the Owner may have under other provisions of the Contract Documents and will be in addition to and run concurrent with other warranties made by the Contractor under requirements of the Contract Documents.

B. Manufacturer's Warranty on Insulating Glass: Submit written warranty signed by manufacturer of insulating glass agreeing to furnish replacements for insulating glass units that deteriorate as defined in "Definitions" article, free-on-board point of manufacture, freight allowed Project site, within specified warranty period indicated below. Warranty covers only deterioration due to normal conditions of use and not to handling, installing, protecting, and maintaining practices contrary to glass manufacturer's published instructions.

1. Warranty Period: Manufacturer's standard but not less than 10 years after date of Substantial Completion.

PART 2 - PRODUCTS

2.01 PRIMARY FLOAT GLASS PRODUCTS

A. Float Glass: ASTM C 1036, Type I (transparent glass, flat), Class as indicated below, and Quality q3 (glazing select).

1. Class 1 (clear) unless otherwise indicated.
2. Class 2 (tinted, heat absorbing, and light reducing) at exterior lite of insulating units.
3. Refer to requirements for sealed insulating glass units for performance characteristics of assembled units composed of coated units, relative to visible light transmittance, U-values, shading coefficient, and visible reflectance.

2.02 HEAT-TREATED FLOAT GLASS PRODUCTS

A. Fabrication Process: By vertical (tong-held) or horizontal (roller-hearth) process, at manufacturer's option, except provide horizontal process where indicated as tongless or free of tong marks.

B. Uncoated, Clear and Tinted, Heat-Treated Float Glass: ASTM C 1048, Condition A (uncoated surfaces), Type I (transparent glass, flat), Quality q3 (glazing select), kind as indicated below.

1. Kind HS (heat strengthened) unless otherwise indicated.
2. Kind FT (fully tempered) where indicated.
3. Available Manufacturers: Subject to compliance with requirements, manufacturers offering heat-treated glass products that may be incorporated in the Work include, but are not limited to, the following companies.
   AFG Industries, Inc.
   Cardinal IG.
   Saint-Gobain.
   Falconer Glass Industries.
2.03 INSULATING GLASS PRODUCTS

A. Sealed Insulating Glass Units: Preassembled units consisting of organically sealed lites of glass separated by dehydrated air spaces complying with ASTM E 774 and with other requirements indicated, including those in Insulating Glass Product Data Sheet at the end of this Section.
   1. For properties of individual glass lites making up units, refer to requirements specified elsewhere in this Section applicable to types, classes, kinds, and conditions of glass products comprising lites of insulating glass units.
   2. Provide heat-treated, float glass of kind indicated or, if not otherwise indicated, Kind HS (heat strengthened) where recommended by manufacturer to comply with system performance requirements specified and Kind FT (fully tempered) where safety glass is designated or required.
   3. Performance characteristics designated for coated insulating glass are nominal values based on manufacturer's published test data for units with lites 6.0 mm (0.23 inch) thick and nominal 1/2-inch dehydrated space between lites, unless otherwise indicated.
   4. U-values are expressed as Btu/hour x sq. ft. x degrees F.

2.04 ELASTOMERIC GLAZING SEALANTS

A. General: Provide products of type indicated, complying with the following requirements:
   1. Compatibility: Select glazing sealants and tapes of proven compatibility with other materials they will contact, including glass products, seals of insulating glass units, and glazing channel substrates, under conditions of installation and service, as demonstrated by testing and field experience.
   2. Suitability: Comply with sealant and glass manufacturer's recommendations for selecting glazing sealants and tapes that are suitable for applications indicated and conditions existing at time of installation.
   3. Colors: Provide color of exposed joint sealants as selected by the Architect from manufacturer's full range of standard colors for products of type indicated.

B. Elastomeric Glazing Sealant Standard: Provide manufacturer's standard chemically curing, elastomeric sealants of base polymer indicated that comply with ASTM C 920 requirements indicated on each Elastomeric Glazing Sealant Product Data Sheet at the end of this Section, including those referencing ASTM classifications for Type, Grade, Class and Uses.
   1. Additional Movement Capability: Where additional movement capability is specified in Elastomeric Glazing Sealant Product Data Sheet, provide products, when tested for adhesion and cohesion under maximum cyclic movement per ASTM C 719, with the capability to withstand the specified percentage change in the joint width existing at time of installation and remain in compliance with other requirements of ASTM C 920 for uses indicated.

C. Products: Subject to compliance with requirements, provide one of the following:
   One-Part Non-Acid Curing Medium-Modulus Silicone Glazing Sealant:
   "Dow Corning 795"; Dow Corning Corp.
   "Silpruf"; General Electric Corp.
   "Gesil"; General Electric Corp.
   "Spectrum 2"; Tremco, Inc.
2.05 GLAZING TAPES

A. Back-Bedding Mastic Glazing Tape: Preformed, butyl-based elastomeric tape with a solids content of 100 percent, nonstaining and nonmigrating in contact with nonporous surfaces, with or without spacer rod as recommended by tape and glass manufacturers for application indicated, packaged on rolls with a release paper backing, and complying with AAMA 800 for products indicated below:
1. AAMA 804.1.
2. Expanded Cellular Glazing Tape: Closed-cell, polyvinyl chloride foam tape, factory coated with adhesive on both surfaces, packaged on rolls with release liner protecting adhesive, and complying with AAMA 800 for product 810.5.
3. Available Products: Subject to compliance with requirements, glazing tape that may be incorporated in the Work include, but is not limited to, the following:
   a. Back-Bedding Mastic Glazing Tape Without Spacer Rod:
      PTI 303 Glazing Tape (shimless), Protective Treatments, Inc.
      S-M 5700 Poly-Glaze Tape Sealant, Schnee-Morehead, Inc.
      Tremco 440 Tape, Tremco Inc.
   b. Back-Bedding Mastic Glazing Tape With Spacer Rod:
      PTI 303 Glazing Tape (with shim), Protective Treatments, Inc.
      Pre-shimmed Tremco 440 Tape, Tremco, Inc.

2.06 GLAZING GASKETS

A. Dense Compression Gaskets: Molded or extruded gaskets of material indicated below, complying with standards referenced with name of elastomer indicated below, and of profile and hardness required to maintain watertight seal:
2. EPDM, ASTM C 864.
3. Thermoplastic polyolefin rubber, ASTM C 1115.
5. Soft Compression Gaskets: Extruded or molded closed-cell, integral-skinned gaskets of material indicated below, complying with ASTM C 509, Type II, black, and of profile and hardness required to maintain watertight seal:
6. Any material indicated above.
7. Available Manufacturers: Subject to compliance with requirements, manufacturers offering products that may be incorporated in the work include, but are not limited to, the following companies:
   Advanced Elastomer Systems, L.P.
   Schnee-Morehead, Inc.
   Tremco, Inc.

2.7 MISCELLANEOUS GLAZING MATERIALS

A. General: Provide products of material, size, and shape complying with referenced glazing standard, requirements of manufacturers of glass and other glazing materials involved for glazing application indicated, and with a proven record of compatibility with surfaces contacted in installation.

B. Cleaners, Primers and Sealers: Type recommended by sealant or gasket manufacturer.

C. Setting Blocks: Elastomeric material with a Shore A durometer hardness of 85 plus or minus 5.

D. Spacers: Elastomeric blocks or continuous extrusions with a Shore A durometer hardness required by glass manufacturer to maintain glass lites in place for installation indicated.

E. Edge Blocks: Elastomeric material of hardness needed to limit glass lateral movement (sidewalking).

2.8 DECORATIVE FILM

A. Basis of Design Product: The design for decorative films is based on LLumar® Decorative Frost
Films manufactured by an Eastman Chemical Company business: CPFilms Inc., 575 Maryville Centre Drive, St. Louis, Missouri 63141; Telephone: 800-255-8627; Email address: commercialalerts@eastman.com; Web Site: www.llumar.com.

1. Selection of film to be made by Architect from manufacturer’s full range of films.

B. Decorative Film Accessories:

1. General: Provide accessories either manufactured by or acceptable to Decorative film manufacturer for application indicated, and with a proven record of compatibility with surfaces contacted in installation.

2. Pressure Sensitive Adhesive: This adhesive is activated by pressure and water. It is characterized by its permanently tacky nature and its installation ease.


2.8 FABRICATION OF GLASS AND OTHER GLAZING PRODUCTS

A. Fabricate glass and other glazing products in sizes required to glaze openings indicated for Project, with edge and face clearances, edge and surface conditions, and bite complying with recommendations of product manufacturer and referenced glazing standard as required to comply with system performance requirements.

PART 3 - EXECUTION

3.01 EXAMINATION

A. Examine glass framing, with glazier present, for compliance with the following:

1. Manufacturing and installation tolerances, including those for size, squareness, offsets at corners.

2. Presence and functioning of weep system.

3. Minimum required face or edge clearances.

4. Effective sealing between joints of glass-framing members.

5. Do not proceed with glazing until unsatisfactory conditions have been corrected.

3.02 PREPARATION

A. Clean glazing channels and other framing members receiving glass immediately before glazing. Remove coatings that are not firmly bonded to substrates.

3.03 DECORATIVE FILM

A. Comply with manufacturer’s written instructions for surface preparation and installation.

B. Do not remove release liner from film until just before each piece of film is cut and ready for installation.

C. Custom cut to the glass with neat, square corners and edges to within 1/16-inch of the window frame.

D. Remove all air bubbles, blisters, and other defects.

E. Remove excess mounting solution at finished seams, perimeter edges, and adjacent surfaces.

F. Use cleaning methods recommended by film manufacturer.

G. Replace films that cannot be cleaned.

3.04 GLAZING, GENERAL

A. Comply with combined recommendations of manufacturers of glass, sealants, gaskets, and other glazing materials, except where more stringent requirements are indicated, including
those in referenced glazing publications.

B. Protect glass from edge damage during handling and installation as follows:
   1. Use a rolling block in rotating glass units to prevent damage to glass corners. Do not impact glass with metal framing. Use suction cups to shift glass units within openings; do not raise or drift glass with a pry bar. Rotate glass lites with flares or bevels on bottom horizontal edges so edges are located at top of opening, unless otherwise indicated by manufacturer's label.
   2. Remove damaged glass from Project site and legally dispose of off site. Damaged glass is glass with edge damage or other imperfections that, when installed, weaken glass and impair performance and appearance.
   3. Apply primers to joint surfaces where required for adhesion of sealants, as determined by preconstruction sealant-substrate testing.
   4. Install elastomeric setting blocks in sill rabbets, sized and located to comply with referenced glazing standard, unless otherwise required by glass manufacturer. Set blocks in thin course of compatible sealant suitable for heel bead.
   5. Do not exceed edge pressures stipulated by glass manufacturers for installing glass lites.
   6. Provide spacers for glass sizes larger than 50 united inches (length plus height) as follows:
   7. Locate spacers inside, outside, and directly opposite each other. Install correct size and spacing to preserve required face clearances, except where gaskets and glazing tapes are used that have demonstrated ability to maintain required face clearances and comply with system performance requirements.
   8. Provide 1/8-inch minimum bite of spacers on glass and use thickness equal to sealant width. With glazing tape, use thickness slightly less than final compressed thickness of tape.
   9. Provide edge blocking to comply with requirements of referenced glazing publications, unless otherwise required by glass manufacturer.
  10. Set glass lites in each series with uniform pattern, draw, bow, and similar characteristics.

3.05 TAPE GLAZING

A. Position tapes on fixed stops so that when compressed by glass their exposed edges are flush with or protrude slightly above sightline of stops.
B. Install tapes continuously but not in one continuous length. Do not stretch tapes to make them fit opening.
C. Where framing joints are vertical, cover these joints by applying tapes to heads and sills first and then to jambs. Where framing joints are horizontal, cover these joints by applying tapes to jambs and then to heads and sills.
D. Place joints in tapes at corners of opening with adjoining lengths butted together, not lapped. Seal joints in tapes with compatible sealant approved by tape manufacturer.
E. Do not remove release paper from tape until just before each lite is installed.
F. Center glass lites in openings on setting blocks and press firmly against tape by inserting dense compression gaskets formed and installed to lock in place against faces of removable stops. Start gasket applications at corners and work toward centers of openings.

3.06 GASKET GLAZING (DRY)

A. Fabricate compression gaskets in lengths recommended by gasket manufacturer to fit openings exactly, with stretch allowance during installation.
B. Secure compression gaskets in place with joints located at corners to compress gaskets producing a weathertight seal without developing bending stresses in glass. Seal gasket joints with sealant recommended by gasket manufacturer.
C. Install gaskets so they protrude past face of glazing stops.
3.07 SEALANT GLAZING (WET)

A. Install continuous spacers between glass lites and glazing stops to maintain glass face clearances and to prevent sealant from extruding into glass channel weep systems until sealants cure. Secure spacers in place and in position to control depth of installed sealant relative to edge clearance for optimum sealant performance.

B. Force sealants into glazing channels to eliminate voids and to ensure complete wetting or bond of sealant to glass and channel surfaces.

C. Tool exposed surfaces of sealants to provide a substantial wash away from glass. Install pressurized gaskets to protrude slightly out of channel to eliminate dirt and moisture pockets.

3.08 PROTECTION AND CLEANING

A. Protect exterior glass from breakage immediately after installation by attaching crossed streamers to framing held away from glass. Do not apply markers to glass surface. Remove nonpermanent labels, and clean surfaces.

B. Protect glass from contact with contaminating substances resulting from construction operations including weld splatter. If, despite such protection, contaminating substances do come into contact with glass, remove them immediately as recommended by glass manufacturer.

C. Examine glass surfaces adjacent to or below exterior concrete and other masonry surfaces at frequent intervals during construction, but not less than once a month, for build-up of dirt, scum, alkali deposits, or stains, and remove as recommended by glass manufacturer.

D. Remove and replace glass that is broken, chipped, cracked, abraded, or damaged in any way, including natural causes, accidents and vandalism, during construction period.

3.09 INSULATING GLASS PRODUCT DATA SHEET

A. Insulating Glass Units:

1. Basis of Design: PPG Solarban 70XL (2)
   a. Air Space Width: Nominal 1/2 inch measured perpendicularly from surfaces of glass lites at unit's edge.
   b. Interspace Content: Air.
   c. Sealing System: Dual seal, primary and secondary sealants as standard with manufacturer.
   d. Spacer Specifications: Manufacturer's standard metal.
      1) Desiccant: Either molecular sieve or silica gel or blend of both.
      2) Corner Construction: Manufacturer's standard corner construction.
      3) Color of Spacer: Black.
   e. Inner Lite: Type 1 float glass, 1/4-inch thick, clear, (heat strengthened or tempered as indicated or required).
   f. Outdoor Lite: Type 1 float glass, 1/4-inch thick, clear or tinted as indicated in Insulating Glass Unit Designations, (heat strengthened or tempered as indicated or required) with Low E coating on interior surface (2nd surface).

3.10 ELASTOMERIC GLAZING SEALANT PRODUCT DATA SHEET

A. Base Polymer: Neutral-curing silicone.

B. Type: S (single component).

C. Grade: NS (nonsag).

D. Class: 25.
E. Additional Movement Capability: 50 percent movement in extension and 50 percent in compression for a total of 100 percent movement.

F. Uses Related to Exposure: NT (nontraffic).

G. Uses Related to Glazing Substrates: G, A, and, as applicable to glazing substrates indicated, O.

H. Use O Glazing Substrates: Coated glass, color anodized aluminum, aluminum coated with a high-performance coating, galvanized steel, wood, elastomeric glazing gaskets and glazing accessories.

END OF SECTION 08 80 00
SECTION 09 21 16

GYPSUM BOARD ASSEMBLIES

PART 1 GENERAL

1.01 SECTION INCLUDES

Metal stud wall framing, non-load bearing, for interior gypsum board assemblies
Metal channel ceiling framing, suspension systems for interior gypsum ceilings and soffits
Gypsum wallboard
Joint treatment and accessories

1.02 RELATED DOCUMENTS

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

1.03 RELATED SECTIONS

A. Related sections include, but are not limited to, the following:
   Section 06 10 00 - Rough Carpentry: Wood blocking product and execution requirements.
   Section 07 21 00 - Thermal Insulation.
   Section 07 84 00 - Firestopping: Top-of-wall assemblies at fire rated walls.
   Section 08 11 13 - Hollow Metal Doors and Frames.

1.04 REFERENCE STANDARDS

A. Reference standards include, but are not limited to, the following:
   ANSI A108.11 - American National Standard for Interior Installation of Cementitious Backer
   Units; 1999 (R2005).
   ANSI A118.9 - American National Standard Specifications for Test Methods and
   Specifications for Cementitious Backer Units; 1999 (R2005).
   ASTM A 653/A 653M - Standard Specification for Steel Sheet, Zinc-Coated (Galvanized) or
   Zinc-Iron Alloy-Coated (Galvannealed) by the Hot-Dip Process; 2009a.
   ASTM A 641/A 641M - Standard Specification for Zinc-Coated (Galvanized) Carbon Steel
   Wire; 2009a.
   ASTM C 11 - Standard Terminology Relating to Gypsum and Related Building Materials
   and Systems; 2010a.
   ASTM C 475/C 475M - Standard Specification for Joint Compound and Joint Tape for
   Finishing Gypsum Board; 2002 (Reapproved 2007).
   Frame Construction and Manufactured Housing; 2006.
   ASTM C 754 - Standard Specification for Installation of Steel Framing Members to Receive
   Screw-Attached Gypsum Panel Products; 2009a.
   ASTM C 840 - Standard Specification for Application and Finishing of Gypsum Board;
   2008.
   ASTM C 954 - 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; 2007.
   ASTM C 1002 - Standard Specification for Steel Self-Piercing Tapping Screws for the
   Application of Gypsum Panel Products or Metal Plaster Bases to Wood Studs or Steel
   ASTM C 1047 - Standard Specification for Accessories for Gypsum Wallboard and
   Gypsum Veneer Base; 2009.
as Sheathing; 2008.
ASTM C 1513 - Standard Specification for Steel Tapping Screws for Cold-Formed Steel Framing Connections; 2010.
ASTM D 3274 - Standard Test Method for Evaluating Degree of Surface Disfigurement of Paint Films by Fungal or Algal Growth, or Soil and Dirt Accumulation; 2009e1.
ASTM E 413 - Classification for Rating Sound Insulation; 2004.
GA-214 - Recommended Levels of Gypsum Board Finish; Gypsum Association; 2010.
GA-226 - Application of Gypsum Board to Form Curved Surfaces; Gypsum Association; 2008.
GA-600 - Fire Resistance Design Manual; Gypsum Association; 2009.

1.05 DEFINITIONS
A. Refer to ASTM C 11 for definitions of terms related to gypsum and related building materials and systems not defined in this Section or in other reference standards.

1.06 SUBMITTALS
A. See Section 01 33 00 - Submittals, for submittal procedures.
B. Product Data: Provide data for each type of product including, but not limited to, metal framing, gypsum board, cementitious panels, acoustical insulation, acoustical sealants, trim accessories, and joint finishing tapes and compounds.
C. Installer's Certificates: Showing compliance with qualification requirements of this Section.

1.07 MOCKUPS
A. On actual gypsum board assemblies, prepare mockups, not less than 100 sq ft in surface area, to demonstrate aesthetic effects and set quality standards for materials and execution.
1. Install mockups for the following:
   a. Wall surfaces indicated to receive non-textured finishes.
   b. Ceiling surfaces indicated to receive non-textured finishes.
2. Simulate finished lighting conditions for review of mockups.

1.08 QUALITY ASSURANCE
A. Installer Qualifications: Company specializing in performing gypsum board application and finishing, with minimum ten (10) years of experience.

1.09 DELIVERY, STORAGE AND HANDLING
A. Store materials inside under cover and keep them dry and protected against weather,
condensation, direct sunlight, construction traffic, and other potential causes of damage. Stack panels flat and supported on risers on a flat platform to prevent sagging.

1.10 FIELD CONDITIONS

A. Environmental Limitations: Comply with ASTM C 840 requirements or gypsum board manufacturer's written recommendations, whichever are more stringent.

B. Do not install paper-faced gypsum panels until installation areas are enclosed and conditioned.

C. Do not install panels that are wet, those that are moisture damaged, and those that are mold damaged.
   1. Indications that panels are wet or moisture damaged include, but are not limited to, discoloration, sagging, or irregular shape.
   2. Indications that panels are mold damaged include, but are not limited to, fuzzy or splotchy surface contamination and discoloration.

PART 2 PRODUCTS

2.01 GYPSUM BOARD ASSEMBLIES

A. Provide completed assemblies complying with ASTM C 840 and GA-216.

B. STC-Rated Assemblies: For STC-rated assemblies, provide materials and construction identical to those tested in assembly indicated according to ASTM E 90 and classified according to ASTM E 413 by an independent testing agency.

C. Fire-Resistance-Rated Assemblies: For fire-resistance-rated assemblies, provide materials and construction identical to those tested in assembly indicated according to ASTM E 119 by an independent testing agency acceptable to the authorities having jurisdiction.

D. Recycled Content of Gypsum Panel Products: Postconsumer recycled content plus one-half of preconsumer recycled content not less than ten (10) percent.

E. Regional Materials: Gypsum Panel products shall be manufactured within 500 miles of project site from materials that have been extracted, harvested, or recovered, as well as manufactured, within 500 miles of project site.

F. Recycled Content of Steel Products: Postconsumer recycled content plus one-half of preconsumer recycled content not less than 25 percent.

G. Low-Emitting Materials: For ceiling and wall assemblies, provide materials and construction identical to those tested in assembly and complying with the testing and product requirements of the California Department of Health Services’ "Standard Practice for the Testing of Volatile Organic Emissions from Various Sources Using Small-Scale Environmental Chambers."

H. Panel Products Size: Provide maximum lengths and widths available that will minimize joints in each area and that correspond with support system indicated.

2.02 METAL FRAMING MATERIALS

A. Manufacturers - Metal Framing, Connectors, and Accessories
   1. Subject to compliance with specified requirements provided framing products manufactured by one of the following:
      MarinoWare: www.marinoware.com.

B. Non-Loadbearing Framing System Components: ASTM C 645; ASTM A 653/A 653M G40
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.

1. Studs and Runners: 0.033 inch (20 gauge) minimum uncoated-metal thickness unless otherwise indicated.
   a. Studs: "C" shaped with flat or formed webs, depth as indicated; provide pre-punched of installation of electrical, plumbing and bridging.
   b. Tracks (Runners): U-shaped, sized to match studs.
   c. Deep-Leg Deflection Tracks: Top runner with 2-1/2 inch deep flanges in thickness not less than indicated for studs, installed with studs friction fit into top runner and with continuous bridging located within 12 inches of the top of studs to provide lateral bracing.

2. Cold-Rolled Furring and Carrying Channels: U-shaped, minimum depth of 1-1/2 inches, 0.053 inch (16 gauge) minimum uncoated-metal thickness, with minimum 1/2 inch wide flanges.

3. Furring Channels: Hat-shaped sections, minimum depth of 7/8 inch, 0.033 inch (20 gauge) minimum base metal thickness.

4. Cold-Rolled Channel Bridging and Clip Angles: 0.053 inch (16 gauge) minimum uncoated-metal thickness, 3/4 inch minimum depth U-shaped channels with minimum 1/2 inch wide flanges and 1-1/2 by 1-1/2 inch clip angles of length to suite framing braced.

5. Flat Strap and Backing Plate: Steel sheet for blocking and bracing, length and width as required for fixture attachment, 0.033 inch (20 gauge) minimum base metal thickness.

6. Refer to details on drawings for other framing components including but not limited to steel joists, runners and plates. Provide sizes and gages as indicated in details.

C. Cold-Formed Metal Studs for non-loadbearing Applications of Gypsum Board: As specified in Section 05 40 00.

D. Miscellaneous Framing Materials

1. Z-Clips: ASTM A 653/A 653M G40 galvanized sheet steel, 0.033 inch (20 gauge) minimum uncoated-metal thickness unless otherwise indicated, 1-1/2 inches deep unless otherwise indicated with 1-1/4 wide flanges.


3. Ceiling Hangers: Type and size as specified in ASTM C 754 for spacing required.

4. Wire Hangers: ASTM A 641/A 641M, Class 1 zinc coating, soft temper; select wire diameter such that its stress at three (3) times hanger design load will be less that yield stress of wire, but provide not less than 0.106 inch diameter (12 gauge) wire.

5. Tie Wire: ASTM A 641/A 641M, Class 1 zinc coating, soft temper; size wire minimum 0.062 inch diameter (16 gauge) wire.

6. Shims: Load bearing, high-density multimonomer plastic, and non-leaching; or of cold-formed steel of same grade and coating as framing members supported by shims. At fire-resistance rated assemblies provide cold-formed steel shims.

7. Isolation Strip at Exterior Walls: Adhesive-backed, closed-cell vinyl foam strips that allow fastener penetration without foam displacement, 1/8 inch thick, in width to suit steel stud size.

E. Partition Head To Structure Connections: Provide track fastened to structure with flanges not less than 2-1/2 inches wide, or of sufficient width to accommodate deflection of not less than one-inch, for friction fit of studs cut short and braced with continuous bridging both sides.

2.03 BOARD MATERIALS

A. Manufacturers

1. Subject to compliance with the requirements of this Section, provide products by one of the following:

B. Gypsum Wallboard: ASTM C 1396/C 1396M; sizes to minimize joints in place, ends square cut. Provide with moisture and mold resistant core and paper surfaces, scoring 10 when tested and evaluated in accordance with ASTM D 3273 and ASTM D 3274 respectively.

1. Fire-Resistant Rated Gypsum Wallboard: Type X, UL or Warnock Hersey (Intertek) listed as acceptable to the authorities having jurisdiction.
   a. Application: Use for vertical surfaces not exposed to view, and vertical surfaces exposed to view and 8'-0” or more above walking surfaces.
   b. Thickness: 5/8 inch.
   c. Long Edges: Tapered.

2. Fire-Resistant Rated Abuse-Resistant Gypsum Board: Tested to Level 2 surface abrasion resistance, Level 2 surface indentation resistance, and Level 1 soft-body impact resistance in accordance with ASTM C 1629/C 1629M.
   a. Application: Use for vertical surfaces exposed to view and 8'-0” or less above walking surfaces.
   b. Core: Type X.
   c. Thickness: 5/8 inch.
   d. Long Edges: Tapered.

2.04 ACCESSORIES

A. Acoustic Insulation (Sound Attenuation Batts): ASTM C 665, Type I, preformed glass fiber, friction fit type, unfaced, with maximum 10/10 flame spread/smoke developed index when tested in accordance with ASTM E 84. Provide in thicknesses indicated or required to obtain assembly STC-ratings indicated.

1. Fire-Resistance-Rated Assemblies: Comply with mineral-fiber requirements of assembly.

2. Recycled Content of Batts: Postconsumer recycled content plus one-half of preconsumer recycled content not less than 10 percent.

B. Acoustical Sealant: Nonsag, paintable, nonstaining latex sealant complying with ASTM C 834. Product effectively reduces airborne sound transmission through perimeter joints and openings in building construction as demonstrated by testing representative assemblies according to ASTM E 90.

1. Acoustical joint sealant shall comply with the testing and product requirements of the California Department of Health Services’ “Standard Practice for the Testing of Volatile Organic Emissions from Various Sources Using Small-Scale Environmental Chambers.”

2. Products
   a. Subject to compliance with specified requirements, provide one of the following:

C. Trim Accessories

1. Interior: ASTM C 1047, galvanized steel or rolled zinc, unless otherwise indicated.
   a. Shapes: As detailed or required for finished appearance, and as follows (reference Figure 1, ASTM C 1047):
      1) Corner Beads: Provide at external (outside) corners 10 feet above walking surface.
      2) LC-Beads: With both face and back flange, face flange designed to receive joint compound; provide where gypsum panels are abutted to other construction and back flange can be attached to framing or supporting substrate. Use LC-Beads for edge trim unless otherwise indicated.
      3) L-Beads: With face flange only, face flange designed to receive joint compound; provide where edge trim can only be installed after gypsum panels are installed.
4) U-Beads: Use will not be allowed.

5) Control Joints, One-Piece: Formed with V-shaped slot and flanges designed to receive joint compound; slot shall have cover strip designed for removal following finishing of gypsum panels.

b. Special Shapes: In addition to conventional cornerbead and control joints, provide the following where indicated:

1) Corner Trim, Heavy-Duty: Provide at external (outside) corners within 8'-0" of a walking surface; ASTM B 208/B 208M extruded aluminum heavy-duty corner trim, 6063 T5 alloy and temper, with chemical conversion coat mill finish. Provide with 3/8 inch wide exposed corner faces, and 7/8 inch minimum width "mud-in" tapered flanges; punch flanges for screw-attachment to substrate.

(a) Subject to compliance with specified requirements, provide one of the following:

- Fry Reglet DMCT-375
- Pittcon SO-HSN-90
- Gordon 901-SC-375

E. Joint Materials: ASTM C 475 and as recommended by gypsum board manufacturer for project conditions, and as follows:

1. Tape: Provide the following types; tapes shall not support growth of mold and mildew:
   a. Interior Gypsum Board: 2 inch wide, creased paper tape for joints and corners.
   b. Glass-Mat Gypsum Sheathing Board: 10×10 glass mesh tape.
   c. Tile-Backing Panels: As recommended by panel manufacturer.

2. Joint Compounds: Compounds shall not support growth of mold and mildew, and shall comply with the testing and product requirements of the California Department of Health Services’ "Standard Practice for the Testing of Volatile Organic Emissions from Various Sources Using Small-Scale Environmental Chambers."

   a. Interior Gypsum Board: For each coat use formulation that is compatible with other compounds applied on previous or for successive coats.

      1) Prefilling: At open joints and damaged surface areas, use setting-type taping compound.
      2) Embedding and First Coat: For embedding tape and first coat on joints, fasteners, and trim flanges, use setting-type taping.
      3) Fill Coat: For second coat, use drying-type, all-purpose compound.
      4) Finish Coat: For third coat, use drying-type, all-purpose compound.

   b. Glass-Mat Gypsum Sheathing Board: As recommended by sheathing board manufacturer.

   c. Tile Backing Panels

      1) Cementitious Backer Units: As recommended by backer unit manufacturer.
      2) Water-Resistant Gypsum Backing Board: Use setting-type taping compound and setting-type, sandable topping compound.

F. Steel Drill Screws

1. For Attachment to Steel Members Less Than 0.03 inch In Thickness, to Wood Members, and to Gypsum Board: ASTM C 1002; self-piercing tapping type; cadmium-plated for exterior locations.

2. For Attachment to Steel Members From 0.033 to 0.112 inch in Thickness: ASTM C 954; steel drill screws for application of gypsum board to loadbearing steel studs.

3. For Fastening Cementitious Backer Units: Screws of type and size recommended by panel manufacturer.

G. Laminating Adhesive: Adhesive or joint compound recommended for directly adhering gypsum panels to continuous substrate.

1. Laminating adhesive shall comply with the testing and product requirements of the California Department of Health Services’ "Standard Practice for the Testing of Volatile Organic Emissions from Various Sources Using Small-Scale Environmental Chambers."
H. Spot Grout: ASTM C 475 setting-type joint compound that does not support growth of mold and mildew, and complies the testing and product requirements of the California Department of Health Services' "Standard Practice for the Testing of Volatile Organic Emissions from Various Sources Using Small-Scale Environmental Chambers."

PART 3 EXECUTION

3.01 EXAMINATION

A. Verify that project conditions are appropriate for work of this section to commence.

B. Examine areas and substrates, with Installer present, and including welded hollow-metal frames and framing, cast-in anchors, and structural framing, for compliance with requirements and other conditions affecting performance of the Work. Proceed with installation only after unsatisfactory conditions have been corrected.

C. Examine panel products before installation. Reject panels that are wet, moisture damaged, and mold damaged.

3.02 PREPARATION

A. Suspended Assemblies: Coordinate installation of suspension systems with installation of overhead structure to ensure that inserts and other provisions for anchorages to building structure have been installed to receive hangers at spacing required to support the Work and that hangers will develop their full strength. Furnish inserts and other devices to other trades for installation in advance of time needed for coordination and construction.

3.03 FRAMING INSTALLATION

A. General: Install in accordance with ASTM C 754, in compliance with framing installation requirements of ASTM C 840, and manufacturer's instructions.
   1. Install supplementary framing, and blocking to support fixtures, equipment services, heavy trim, grab bars, toilet accessories, furnishings, or similar construction.
   2. Install bracing at terminations in assemblies.
   3. Isolate framing from building structure at locations indicated to prevent transfer of loading imposed by structural movement, comply with details indicated; locations include, but are not limited to the following:
      a. Where building structure abuts ceiling perimeters or penetrates ceilings.
      b. Where partition framing and wall furring abut structure except at floor. Provide slip- or cushioned-type joints as indicated to attain lateral support and avoid axial loading.
   4. Where studs are installed directly against exterior masonry walls or dissimilar metals at exterior walls, install isolation strip between studs and exterior wall.
   5. Do not bridge building control and expansion joints with non-load-bearing steel framing members. Frame both sides of joints independently.

B. Partition Assemblies: Install framing components according to sizes and spacings indicated, but not greater than 16 inches on center. Install so flanges within framing assembly point in same direction.
   1. General: Install tracks (runners) at floors and overhead supports. Extend framing full height to structural supports or substrates above suspended ceilings except where partitions are indicated to terminate at suspended ceilings. Continue framing around ducts penetrating partitions above ceiling.
   2. Partitions Terminating at Structure: Attach deep-leg deflection track to structure, maintain 1/2 inch clearance between top of studs and structure, friction-fit studs into track and brace with continuous bridging located within 12 inches of the top of studs to provide lateral bracing.
3. Door Openings: Comply with details indicated and with GA-219 recommendations. Screw vertical studs at jamb to jamb anchor clips on door frames; install runner track section (for cripple studs) at head and secure to jamb studs.
   a. Install minimum two (2) studs at each jamb unless otherwise indicated.
   b. Install cripple studs at head adjacent to each jamb stud, with a minimum 1/2-inch clearance from jamb stud to allow for installation of control joint in finished assembly where they occur.
4. Other Framed Openings: Frame openings other than door openings the same as required for door openings unless otherwise indicated. Install framing below sills of openings to match framing required above opening heads.
5. Fire-Resistance-Rated Partitions and Sound-Rated Partitions: Install framing to comply with fire-resistance-rated and sound-rated assemblies indicated and support closures and to make partitions continuous from floor to underside of solid structure. Install framing around structural and other members extending below floor/roof slabs as required to support gypsum board closures required for partition continuity from floor to underside of solid structure above.
6. Curved Partitions: Bend track to uniform curve and locate straight lengths so they are tangent to arcs. Begin and end each arc with a stud, and space intermediate studs equally along arcs. On straight lengths of no fewer than two studs at ends of arcs, place studs 6 inches on center.
7. Installation Tolerance: Install each framing member so fastening surfaces vary not more than 1/8 inch from the plane formed by faces of adjacent framing.

C. Suspended Ceilings and Soffits
1. Install suspension system components according to spacings indicated, but not greater than spacings required by ASTM C 754 for assembly types.
   Hangers: 48 inches on center.
   Carrying Channels (Main Runners): 48 inches on center.
   Furring Channels (Furring Members): 16 inches on center.
2. Isolate suspension systems from building structure where they abut or are penetrated by building structure to prevent transfer of loading imposed by structural movement.
3. Suspend hangers from building structure 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 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 locations of hangers required to support standard suspension system members, install supplemental suspension members and hangers in the form of trapezes or equivalent devices. Size supplemental suspension members and hangers to support ceiling loads within maximum deflection limit of L/360.
   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 hangers to deteriorate or otherwise fail due to age, corrosion or elevated temperatures.
   d. Secure flat, angle,channel and rood 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 and hanger, and in a manner that will not cause hangers to deteriorate or otherwise fail due to age, corrosion or elevated temperatures.
   e. Do not attach hangers to steel roof deck; attach hangers to structural members or supplemental framing.
   f. Do not connect or suspend steel framing from ducts, pipes, or conduit.
4. Install suspension systems that are level to within 1/8 inch in 10 feet measured lengthwise.
on each member that will receive finishes and transversely between parallel members that will receive finishes.

3.04 ACOUSTIC ACCESSORIES INSTALLATION

A. Acoustic Insulation: Place tightly within spaces, around cut openings, behind and around electrical and mechanical items within partitions, and tight to items passing through partitions.

B. Acoustic Sealant: Install in accordance with manufacturer's instructions.
   1. Seal construction at perimeters, behind control joints, and at openings and penetrations with a continuous bead of acoustical sealant. Install acoustical sealant at both faces of partitions at perimeters and through penetrations.
   2. Comply with ASTM C 919 and with manufacturer's written recommendations for locating edge trim and closing off sound-flanking paths around or through assemblies, including sealing partitions above acoustical ceilings.

3.05 BOARD INSTALLATION

A. General: Comply with ASTM C 840, GA-216, and manufacturer's instructions. Install to minimize butt end joints, especially in highly visible locations.
   1. Install panels with face side out. Butt panels together for a light contact at edges and ends with not more than 1/16 inch of open space between panels. Do not force into place.
   2. Locate edge and end joints over supports, except in ceiling applications where intermediate supports or gypsum board back-blocking is provided behind end joints. Do not place tapered edges against cut edges or ends. Stagger vertical joints on opposite sides of partitions. Do not make joints other than control joints at corners of framed openings.
   3. Install wall/partition panels to minimize the number of abutting end joints and to avoid them entirely. Stagger abutting end joints of adjacent panels not less than one framing member in alternate courses of boards.
   4. Install ceiling panels across framing to minimize the number of abutting end joints and to avoid abutting end joints in central area of each ceiling. Stagger abutting end joints of adjacent panels not less than one framing member.
   5. Form control and expansion joints at locations indicated and as detailed, and with space between edges of adjoining gypsum panels and between support framing behind panels.
   6. Cover both faces of support framing with gypsum panels in concealed spaces (above ceilings, etc.), except in chases braced internally.
      a. Fit gypsum panels around ducts, pipes, and conduits.
      b. Where partitions intersect structural members projecting below underside of floor/roof slabs and decks, cut gypsum panels to fit profile formed by structural members; allow 1/4- to 3/8-inch wide joints to install sealant.
   7. Isolate perimeter of gypsum board applied to non-load-bearing partitions at structural abutments, except floors. Provide 1/4- to 1/2-inch wide spaces at these locations and trim edges with edge trim where edges of panels are exposed. Seal joints between edges and abutting structural surfaces with acoustical sealant.
   8. Attach panels so leading edge or end of each panel is attached to open (unsupported) edges of steel framing flanges first. Attach panels to framing at openings and cutouts.
   9. Fastener spacing shall be in accordance with referenced application and finishing standards and manufacturer's instructions.
  10. Spot grout hollow metal door frame anchors; apply spot grout to each jamb anchor clip and immediately insert gypsum panels into frames.

B. Fire-Rated Construction: Install gypsum board in strict compliance with requirements of assembly indicated.

C. Interior Gypsum Board
   1. Single-Layer Application
      a. On ceilings, apply gypsum panels before wall/partition board application to greatest
extent possible and at right angles to framing unless otherwise indicated.

b. On partitions/walls, apply gypsum panels vertically (parallel to framing) unless otherwise indicated or required by fire-resistance-rated assembly, and minimize end joints. Stagger abutting end joints not less than one framing member in alternate courses of panels.

c. Fastening Methods: Apply gypsum panels to supports with steel drill screws.

2. Multilayer Application

a. On ceilings, apply gypsum board indicated for base layers before applying base layers on walls/partitions; apply face layers in same sequence. Apply base layers at right angles to framing members and offset face-layer joints one framing member, 16 inches minimum, from parallel base-layer joints, unless otherwise indicated or required by fire-resistance-rated assembly.

b. On partitions/walls, apply gypsum board indicated for base layers and face layers vertically (parallel to framing) with joints of base layers located over stud or furring member and face-layer joints offset at least one stud or furring member with base-layer joints, unless otherwise indicated or required by fire-resistance-rated assembly. Stagger joints on opposite sides of partitions.

c. Fastening Methods: Fasten base layers and face layers separately to supports with screws.

3. Curved Surfaces: Apply gypsum board to curved substrates in accordance with GA-226.

E. Moisture Protection: Treat cut edges and holes in moisture resistant gypsum board and exterior gypsum soffit board with sealant.

3.06 INSTALLATION OF TRIM AND ACCESSORIES

A. General: For trim and accessories with back flanges, secure to framing with same fasteners used to fasten panel products; otherwise fasten trim and accessories in accordance with manufacturer's instructions for type, length and spacing of fasteners.

B. Control Joints: Install control joints consistent with lines of building spaces, and where not indicated according to ASTM C 840 and in specific locations approved by Architect for visual effect.

1. Provide horizontal Control Joint continuous at 8'-0" AFF when Gypsum Board Partition exceeds 8'-0" in height

C. Corner Beads: Except where heavy-duty corner trim is indicated, install corner beads at external (outside) corners, using longest practical lengths.

D. Edge Trim: Install edge trim at locations where gypsum board abuts dissimilar materials, where panel edges would otherwise be exposed or semi-exposed.

E. Special Shape Trim: Corner Trim, Heavy-Duty: Provide at external (outside) corners within 8'-0" of a walking surface

3.07 JOINT TREATMENT

A. General: Treat gypsum board joints, interior angles, edge trim, control joints, penetrations, fastener heads, surface defects, and elsewhere as required to prepare gypsum board surfaces for decoration. Promptly remove residual joint compound from adjacent surfaces.

1. Prefill open joints and damaged surface areas.

2. Apply joint tape over gypsum board joints, except for trim products specifically indicated as not intended to receive tape.

3. In accordance with sheathing manufacturer's instructions, apply joint tape and chemical hardening type joint compound over joints in glass-mat-faced gypsum sheathing soffit indicated to receive exterior finish system.

4. Fill and finish joints and corners of cementitious backing board as recommended by
5. Tape, fill, and sand exposed joints, edges, and corners to produce smooth surface ready to receive finishes. Feather coats of joint compound so that camber is maximum 1/32 inch.

B. Gypsum Board Finish Levels: Finish panels to levels indicated below and according to ASTM C 840 and GA-214:
1. Level 1: Provide for ceiling plenum areas and concealed areas where there are no requirements for fire-resistance rated and/or sound rated assemblies.
   a. All joints and interior angles shall be tape set in joint compound.
   b. Surfaces shall be free of excess joint compound; tool marks and ridges are acceptable.
2. Level 2: Panels that are substrate for tile, and ceiling plenum areas and concealed areas where there are requirements for fire-resistance rated and/or sound rated assemblies.
   a. All joints and interior angles shall have tape embedded in joint compound and wiped with a joint knife leaving a thin coating of joint compound over all joints and interior angles.
   b. Fastener heads, trim and accessories shall be covered with a coat of joint compound; tool marks and ridges are acceptable.
   c. Joint compound applied over the body of the tape at the time of tape embedment shall be considered a separate coat of joint compound and shall satisfy the conditions of this level.
3. Level 4: At panel surfaces that will be exposed to view unless otherwise indicated.
   a. All joints and interior angles shall have tape embedded in joint compound and shall be immediately wiped with a joint knife leaving a thin coating of joint compound over all joints and interior angles.
   b. Two (2) separate coats of joint compound shall be applied over all flat joints and one separate coat applied over interior angles.
   c. Fastener heads, trim and accessories shall be covered with three (3) separate coat of joint compound.
   d. All joint compound shall be smooth and free of tool marks and ridges.

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 PROTECTION
A. Protect adjacent surfaces from drywall compound and promptly remove from floors and other non-drywall surfaces. Repair surfaces stained, marred, or otherwise damaged during drywall application.
B. Protect installed products from damage from weather, condensation, direct sunlight, construction, and other causes during remainder of the construction period.
C. Remove and replace panels that are wet, moisture damaged, and mold damaged.
   1. Indications that panels are wet or moisture damaged include, but are not limited to, discoloration, sagging, or irregular shape.
   2. Indications that panels are mold damaged include, but are not limited to, fuzzy or splotchy surface contamination and discoloration.
D. Provide final protection and maintain conditions, in a manner acceptable to Installer, that ensure gypsum board assemblies remain without damage or deterioration at time of Substantial Completion.

END OF SECTION
SECTION 09 51 10
ACOUSTICAL PANEL CEILINGS

PART 1 GENERAL

1.01 SECTION INCLUDES
Acoustical panel ceilings (APC) installed in exposed suspension systems.

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

1.03 RELATED SECTIONS
A. Related sections include, but are not limited to, the following:
   Section 09 21 16 - Gypsum Board Assemblies
   Division 23 Sections - Heating, Ventilating, & Air Conditioning (HVAC)
   Section 26 50 00 - Interior Building Lighting

1.04 REFERENCE STANDARDS
A. Reference standards include, but are not limited to, the following:
   ASTM A 641/A 641M - Standard Specification for Zinc-Coated (Galvanized) Carbon Steel Wire; 2009a
   ASTM A 653/A 653M - Standard Specification for Steel Sheet, Zinc-Coated (Galvanized) or Zinc-Iron Alloy-Coated (Galvanized) by the Hot-Dip Process; 2010
   ASTM C 636/C 636 - Standard Practice for Installation of Metal Ceiling Suspension Systems for Acoustical Tile and Lay-In Panels; 2008
   ASTM C 834 - Standard Specification for Latex Sealants; 2010
   ASTM D 3274 - Standard Test Method for Evaluating Degree of Surface Disfigurement of Paint Films by Fungal or Algal Growth, or Soil and Dirt Accumulation; 2009e1
   ASTM E 1264 - Standard Classification for Acoustical Ceiling Products; 2008e1
   ASTM G 21 - Standard Practice for Determining Resistance of Synthetic Polymeric Materials to Fungi; 2009
1.05 SUBMITTALS
   A. General: See Section 01 33 00 – Submittals, for submittal procedures.
   B. Product Data: Submit product data for each type of product specified.
   C. Samples for Verification: Submit samples of each type of exposed finish required, prepared on
      samples of size indicated below and of same thickness and material indicated for final unit of
      Work. Where finishes involve normal color and texture variations, include sample sets showing
      full range of variations expected.
      1. 6-inch-square samples of each acoustical panel type, pattern, and color.
      2. Set of 12-inch-long samples of exposed suspension system members, including moldings,
         for each color and system type required.
   D. Qualification Data: Data for firms and persons specified in “Quality Assurance” article to
      demonstrate their capabilities and experience.
   E. Certificates: Submit certificates from manufacturers of acoustical ceiling units and suspension
      systems attesting that their products comply with the specification requirements.

1.06 MAINTENANCE MATERIALS
   A. Furnish and delivery to the Owner extra materials that match products installed and that are
      packaged with protective covering for storage and identified with labels describing contents.
      1. Acoustical Ceiling Panels: Full-size panels equal to 2-percent of quantity installed for each
         type of acoustical ceiling panel provided.
      2. Suspension-System Components: Quantity of each exposed component equal to
         2-percent of quantity installed for each type of suspension system provided.

1.07 QUALITY ASSURANCE
   A. Installer Qualifications: Engage an experienced Installer who has successfully completed
      acoustical ceilings similar in material, design, and extent to those indicated for Project.
   C. Source Limitations
      1. Ceiling Units: Obtain each type of acoustical ceiling panel from a single source from a
         single manufacturer.
      2. Suspension System: Obtain each type of suspension system from a single source from a
         single manufacturer.
   D. Coordination of Work: Coordinate layout and installation of acoustical ceiling units and
      suspension system components with other construction that penetrates ceilings or is supported
      by them including, but not limited to, acoustic room components, fire protection system
      components and devices, HVAC equipment and devices, light fixtures, communication systems
      devices, electronic safety and security systems devices, and partition system (if any).
1.08 DELIVERY, STORAGE, AND HANDLING

A. Deliver acoustical panels, suspension-system components, and accessories to Project site in original, unopened packages and store them in a fully enclosed, conditioned space where they will be protected against damage from moisture, humidity, temperature extremes, direct sunlight, surface contamination, and other causes.

B. Before installing acoustical panels, permit them to reach room temperature and a stabilized moisture content.

C. Handle acoustical panels carefully to avoid chipping edges or damaging units in any way.

1.09 FIELD CONDITIONS

A. Environmental Limitations: Do not install interior acoustical ceilings until space is enclosed and weatherproof, wet-work in space is completed and nominally dry, work above ceilings is complete, and ambient temperature and humidity are maintained at the levels indicated for project when occupies for its intended use at final occupancy. Operate ventilation system for not less than 48 hours before beginning acoustical panel ceiling installation.

PART 2 PRODUCTS

2.01 PERFORMANCE REQUIREMENTS

A. Surface-Burning Characteristics: Comply with ASTM E 84; testing by a qualified testing agency. Identify products with appropriate markings of applicable testing agency.

1. Flame-Spread Index: Comply with ASTM E 1264 for Class A materials.

2. Smoke-Developed Index: 50.

B. Acoustical Ceiling Panel Standard: Provide manufacturers’ standard panels of configuration indicated that comply with ASTM E 1264 classifications as designated by reference to types, patterns, acoustical ratings, and light reflectances unless otherwise indicated.

C. Mounting Method for Measuring NRC: Type E-400; plenum mounting in which face of test specimen is 15-3/4 inches away from test surface according to ASTM E 795.

D. Acoustical Panel Patterns: Match pattern and appearance characteristics indicated for each product type.

2.02 ACOUSTICAL CEILING PANELS (APC)

A. General

1. Low-Emitting Materials: Acoustical panel ceilings shall comply with the testing and product requirements of the California Department of Health Services’ “Standard Practice for the Testing of Volatile Organic Emissions from Various Sources Using Small-Scale Environmental Chambers.”

2. Recycled Content: Postconsumer recycled content plus one-half of preconsumer recycled content not less than percentage indicated for each type of acoustical ceiling panel.

3. Urea Formaldehyde: No urea formaldehyde shall have been added to any ingredient or during manufacturing process for an acoustical panel.

4. Broad Spectrum Antimicrobial Fungicide and Bactericide Treatment: Provide acoustical panels treated with manufacturer’s standard antimicrobial formulation that inhibits fungus, mold, mildew, and gram-positive and gram-negative bacteria and showing no mold, mildew, or bacterial growth when tested according to ASTM D 3273 and evaluated according to ASTM D 3274 or ASTM G 21.
B. Acoustical Panels, (APC-Type-1)
   1. Basis of Design: Design for APC Type-1 panels is based on the following product:
      Armstrong; School Zone Fine Fissured, series 1810.
   2. Panel Characteristics: Provide panels complying with the following:
      Color/Facing ........................................ White
      Light Reflectance (LR) Coefficient........ Not less than 0.82
      Ceiling Attenuation Class (CAC) ....... Not less than 40
      Edge/Joint Detail......................... Square edge
      Thickness................................. 3/4-inch
      Modular Size..............................24×24 inches
      Recycled content ...................... Not less than 56-percent
      NRC..............................................0.70

2.03 METAL SUSPENSION SYSTEMS
   A. General
      1. Metal Suspension-System Standard: Provide manufacturer's standard direct-hung metal
         suspension systems of types, structural classifications, and finishes indicated that comply
         with applicable requirements in ASTM C 635/C 635M.
      2. Recycled Content: Postconsumer recycled content plus one-half of preconsumer recycled
         content not less than 25 percent.
      3. High-Humidity Finish: Comply with ASTM C 635/C 635M requirements for "Coating
         Classification for Severe Environment Performance" for APC Type-2 locations.
      4. Attachment Devices: Size for 5 times the design load indicated in ASTM C 635/C 635M,
         Table 1, "Direct Hung," unless otherwise indicated. Comply with seismic design
         requirements.
         Select wire diameter so its stress at three times hanger design load (ASTM C 635/C 635M,
         Table 1, "Direct Hung") will be less than yield stress of wire, but provide not less than 12-
         gauge (0.106-inch) diameter wire.
      6. Edge Moldings and Trim: Types and profiles indicated or, if not indicated, manufacturer's
         standard moldings for edges and penetrations that fit type of edge detail and suspension
         system indicated; formed from sheet metal of same material, finish, and color as that used
         for exposed flanges of suspension system runners.
            a. Provide manufacturer's standard edge moldings that fit acoustical panel edge details
               and suspension systems indicated and that match width and configuration of exposed
               runners unless otherwise indicated.
            b. For circular penetrations of ceiling, provide edge moldings fabricated to diameter
               required to fit penetration exactly.
   B. Non-Fire-Resistance-Rated Direct-Hung Suspension Systems
      1. Manufacturers: Subject to compliance with requirements, provide products by one of the
         following:
            USG Interiors Inc, Subsidiary of USG Corporation: www.usg.com
            Chicago Metallic Corporation: www.chicago-metallic.com
            Armstrong World Industries Inc: www.armstrong.com
      2. Wide-Face Capped Double-Web Steel Suspension System: Main and cross runners roll
         formed from cold-rolled steel sheet; pre-painted, electrolytically zinc coated or ASTM A
         653/A 653M G30 hot-dip galvanized; with prefinished 15/16-inch wide metal caps on
flanges; and having the following characteristics:
- Structural Classification: Intermediate-duty system
- End Condition of Cross-Runners: Override (stepped) or butt-edge type as standard with manufacturer
- Face Design: Flat, flush
- Cap Material: Steel, cold-rolled sheet
- Cap Finish: Painted white
- Location: Provide at APC Types 1

2.04 AUXILIARY MATERIALS

A. Adapters and Subframes: Provide special light fixture and ceiling grille/diffuser frame adapters or subframes as required.

B. Acoustical Sealant: Manufacturer's standard sealant complying with ASTM C 834 and effective in reducing airborne sound transmission through perimeter joints and openings in building construction as demonstrated by testing representative assemblies according to ASTM E 90.
   1. Low Emittance Sealants: Acoustical sealant shall comply with the testing and product requirements of the California Department of Health Services' "Standard Practice for the Testing of Volatile Organic Emissions from Various Sources Using Small-Scale Environmental Chambers."
   2. Exposed and Concealed Joints: Nonsag, paintable, nonstaining latex sealant.

PART 3 EXECUTION

3.01 EXAMINATION

A. Examine substrates, areas, and conditions, including structural framing to which acoustical panel ceilings attach or abut, with Installer present, for compliance with requirements specified in this and other sections that affect ceiling installation and anchorage and with requirements for installation tolerances and other conditions affecting performance of acoustical panel ceilings. Proceed with installation only after unsatisfactory conditions have been corrected.

B. Examine acoustical panels before installation. Reject acoustical panels that are wet, moisture damaged, or mold damaged.

3.02 PREPARATION

A. Measure each ceiling area and establish layout of acoustical units to balance border widths at opposite edges of each ceiling. Avoid use of less-than-half-width units at borders, unless otherwise indicated, and comply with reflected ceiling plans.

B. Sequence installation of hangers to occur prior to application of cementitious spray fireproofing; coordinate with the work of Section 07 81 00 - Cementitious Spray Fireproofing.

3.03 INSTALLATION

A. Install acoustical panel ceilings to comply with ASTM C 636/C 636M and seismic design requirements indicated, according to manufacturer's written instructions and CISCA's "Ceiling Systems Handbook." Arrange acoustical units and orient directionally patterned units (if any) in a manner shown by reflected ceiling plans.

B. Suspend ceiling hangers from building structural members and as follows:
   1. Install hangers plumb and free from contact with insulation or other objects within ceiling plenum that are not part of supporting 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.

2. Where width of ducts and other construction within ceiling plenum produces hanger spacings that interfere with the location of hangers at spacings required to support standard suspension system members, install supplemental suspension members and hangers in form of trapezes or equivalent devices. Size supplemental suspension members and hangers to support ceiling loads within performance limits established by referenced standards.

3. Provide supplementary framing as required to maintain hanger spacing specified. Size supplementary framing members to support ceiling loads within performance limits established by referenced standards.

4. Secure supplementary framing members, by attaching to inserts, eye screws, or other devices that are secure and appropriate for structure to which supplementary framing are attached as well as for type of supplementary framing involved, and in a manner that will not cause them to deteriorate or fail due to age, corrosion, or elevated temperatures.

5. Secure wire hangers by looping and wire-tying, either directly to structures or to inserts, eye screws, or other devices 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. DO NOT support hangers from roof deck.

6. Install additional hangers at ends of each suspension member.

7. Install additional hangers to support cubical curtain tracks, lighting fixtures, grilles, and other penetrations through the ceiling. Support none of the above on main or cross tees when weight of the work results in dead load exceeding deflection capacity of suspension system. Location and number of additional hangers shall be coordinated with the work of other trades and in accordance with ceiling manufacturer's recommendations and instructions.

8. Wrap wire tightly minimum of 3 times horizontally, turning ends upwards.

9. Space hangers not more than 48 inches on center along each member supported directly from hangers, unless otherwise shown, and provide hangers not more than 8 inches from ends of each member.

C. Install edge moldings of type indicated at perimeter of acoustical ceiling area and where necessary to conceal edges of acoustical panels.

1. Apply continuous ribbon of acoustical sealant, concealed on back of vertical leg before installing moldings.

2. Screw-attach moldings to substrate at intervals not over 16 inches on center, and not more than 3 inches from ends, leveling with ceiling suspension system to tolerance of 1/8 inch in 12 feet. Miter corners accurately and connect securely.

3. Following installation of edge molding, apply a continuous bead of acoustical sealant along end of edge molding’s vertical flange at wall.

D. Install suspension-system runners so they are square and securely interlocked with one another. Remove and replace dented, bent, or kinked members.

E. Install acoustical panels in coordination with suspension system, with edges concealed by support of suspension members. Scribe and cut panels to fit accurately at borders and at penetrations.

3.04 CLEANING

A. Clean exposed surfaces of acoustical ceilings, including trim, edge moldings, and suspension members. Comply with manufacturer's instructions for cleaning and touch-up of minor finish damage. Remove and replace work that cannot be successfully cleaned and repaired to permanently eliminate evidence of damage.

B. The Contractor shall correct any defects which occur during the warranty period set forth in the
General and Supplementary Conditions, including the correction of noticeable warping, shrinking or sagging of acoustical ceiling panels, replacement of acoustical ceiling panels showing discoloration or cracking, peeling or scaling of finishes, and replacement of suspension system members showing rust, discoloration, cracking, peeling or scaling of finishes, without additional cost to the Owner.

END OF SECTION
SECTION 09 65 00

RESILIENT FLOORING

PART 1 - GENERAL

1.01 DESCRIPTION OF WORK

A. Section includes:
   1. Vinyl Composition Tile
   2. Rubber Wall Base

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.

1.03 QUALITY ASSURANCE

A. Manufacturer: Provide each type of resilient flooring and accessories as produced by a single manufacturer, including recommended primers, adhesives, sealants, and leveling compounds.

B. Installer's Qualifications: Engage Installer who is certified in writing by resilient flooring manufacturer as qualified for installation of sheet vinyl employing heat welded seams.

1.04 SUBMITTALS

A. General: Submit the following according to Conditions of Contract and Division 1 Specification Sections.

B. Product Data: Submit manufacturer's technical data for each type of resilient flooring and accessory.

C. Submit qualifications of independent testing agency for concrete slab testing.

D. Samples for Verification Purposes: Submit the following samples of each type, color, and pattern of resilient flooring required, showing full-range of color and pattern variations.
   a. Full size tile samples.
   b. 12' long samples of resilient flooring accessories.
   c. Other materials as requested.
   d. Maintenance Instructions: Submit manufacturer's recommended maintenance practices for each type of resilient flooring and accessory required.

E. Testing: Submit reports 72 hours prior to initiating the work. Tests shall be performed by an independent testing agency (engaged by the contractor).
   a. Moisture test reports: submit tests so that each test area does not exceed 200 sq. ft. (18.6 sq. m) and perform no fewer than three tests in each installation area and with test areas evenly spaced in installation areas.
   b. Anhydrous Calcium Chloride Test: ASTM F 1869. Proceed with installation only after substrates have maximum moisture-vapor-emission rates in accordance with the manufacturer's recommendations. Relative Humidity Test: Using in-situ probes, ASTM F2170. Proceed with installation only after substrates have a maximum in accordance with the manufacturer's recommendations.
   c. Alkalinity and Adhesion Testing: Perform tests recommended by floor tile manufacturer. Proceed with installation only after substrate alkalinity falls within range on pH scale recommended by manufacturer in writing.
1.05 PROJECT CONDITIONS

A. Maintain minimum temperature of 65 deg. F (18 deg. C) in spaces to receive resilient flooring for at least 48 hours prior to installation, during installation, and for not less than 48 hours after installation. Store resilient flooring materials in spaces where they will be installed for at least 48 hours before beginning installation. Subsequently, maintain minimum temperature of 55 deg. F (13 deg. C) in areas where work is completed.

B. Install resilient flooring and accessories after other finishing operations, including painting, have been completed. Do not install resilient flooring over concrete slabs until the latter have been cured and are sufficiently dry to achieve bond with adhesive as determined by resilient flooring manufacturer's recommended bond and moisture test.

PART 2 - PRODUCTS

2.01 ACCEPTABLE MANUFACTURERS

A. Manufacturer: Subject to compliance with requirements, provide products of one of the following:

1. Manufacturers of Vinyl Composition Tile:
   a. Azrock Industries, a Tarkett Company
   b. Armstrong World Industries, Inc.
   c. Mannington Mills

2. Manufacturers of Rubber Wall Base:
   a. Roppe Rubber Corp.
   b. Mannington Mills
   c. Johnsonite Rubber Co., Inc.

2.02 VINYL COMPOSITION TILE FLOORING

A. Vinyl Composition Tile: FS SS-T-312, Type IV; 12" x 12" unless otherwise indicated, and as follows:

1. Composition 1 - asbestos-free.
2. Gage: 1/8".
3. Colors: As selected by the Architect from manufacturer's full range of colors and patterns.
   a. Two colors/patterns of VCT will be selected by the Architect. One color/pattern for field and one color/pattern for accent. Accent layout to be provided by Architect.

B. Performance Criteria

1. Flexibility: ASTM F137 Passes
2. Dimensional Stability: ASTM F2199 Passes
3. Static Load: ASTM F970 Passes
4. Residual Indentation: ASTM F1914 Excellent
5. Flammability: ASTM E648 CRF≥0.45 wats/cm2 NFPA Class 1
6. Slip Resistance: ASTM D2047 Passes >0.5 ADA Compliant
7. Smoke Density: ASTM E662 Passes <450 DMC
8. Resistance to Light: ASTM F1515 Excellent
9. Chemical Resistance: ASTM F925 Excellent
10. Resistance to Heat: ASTM F1514 Excellent

C. Environmental Data:
11. Recycled Content: 27.5% Pre-consumer

2.05 ACCESSORIES
A. Rubber Wall Base: Provide rubber base complying with FS SS-W-40, Type I, with matching end stops and preformed or molded corner units, and as follows:
   1. Height: 4" unless otherwise indicated.
   2. Thickness: 1/8" gage.
   3. Length: Not less than 100-foot coils.
   5. Finish: Matte.
B. Resilient Edge Strips: 1/8" thick, homogeneous rubber composition, tapered or bullnose edge, color to match flooring, or as selected by Architect from standard colors available; not less than 1" wide.

2.06 INSTALLATION MATERIALS
A. Concrete Slab Primer: Non-staining type as recommended by flooring manufacturer
B. Trowelable Cementitious Leveling and Patching Compounds: Latex-modified, portland cement based formulation provided or approved by floor tile manufacturer for applications indicated.
C. Adhesives (Cements): Waterproof, stabilized type as recommended by flooring manufacturer to suit material and substrate conditions. Adhesives shall comply with the testing and product requirements of the California Department of Public Health's "Standard Method for the Testing and Evaluation of Volatile Organic Chemical Emissions from Indoor Sources Using Environmental Chambers." (Prop 65 compliant)

PART 3 - EXECUTION
3.01 INSPECTION
A. Require Installer to inspect subfloor surfaces to determine that they are satisfactory. A satisfactory subfloor surface is defined as one that is smooth and free from cracks, holes, ridges, coatings preventing adhesive bond, and other defects impairing performance or appearance.
B. Perform bond and moisture tests on concrete subfloors to determine if surfaces are sufficiently cured and dry as well as to ascertain presence of curing compounds.
C. Do not allow resilient flooring work to proceed until subfloor surfaces are satisfactory.

3.02 PREPARATION
A. Prepare subfloor surfaces as follows:
   a. Use leveling and patching compounds as recommended by resilient flooring manufacturer for filling small cracks, holes and depressions in subfloors.
   b. Remove existing coatings from subfloor surfaces that would prevent adhesive bond, including curing compounds incompatible with resilient flooring adhesives, paint, oils, waxes and sealers.
c. Broom clean or vacuum surfaces to be covered, and inspect subfloor.
d. Apply concrete slab primer, if recommended by flooring manufacturer, prior to application of adhesive. Apply in compliance with manufacturer's directions.

B. Alkalinity and Adhesion Testing: Perform tests recommended by floor tile manufacturer. Proceed with installation only after substrate alkalinity falls within range on pH scale recommended by manufacturer in writing.

C. Moisture Testing: Perform tests so that each test area does not exceed 200 sq. ft. (18.6 sq. m) and perform no fewer than three tests in each installation area and with test areas evenly spaced in installation areas.

D. Anhydrous Calcium Chloride Test: ASTM F 1869. Proceed with installation only after substrates have maximum moisture-vapor-emission rates in accordance with the manufacturer’s recommendations. Relative Humidity Test: Using in-situ probes, ASTM F2170. Proceed with installation only after substrates have a maximum in accordance with the manufacturer’s recommendations.

3.03 INSTALLATION

A. INSTALLATION, GENERAL
1. Install resilient flooring using method indicated in strict compliance with manufacturer's printed instructions. Extend resilient flooring into toe spaces, door reveals, and into closets and similar openings.
2. Scribe, cut, and fit resilient flooring to permanent fixtures, built-in furniture and cabinets, pipes, outlets and permanent columns, walls and partitions.
3. Maintain reference markers, holes, or openings that are in place or plainly marked for future cutting by repeating on finish flooring as marked on subfloor. Use chalk or other non-permanent marking device.
4. Install resilient flooring on covers for expansion joint covers and similar items occurring within finished floor areas. Maintain overall continuity of color and pattern with pieces of flooring installed on these covers. Tightly cement edges to perimeter of floor around covers and to covers.
5. Tightly cement resilient flooring to subbase without open cracks, voids, raising and puckering at joints, telegraphing of adhesive spreader marks, or other surface imperfections. Hand roll resilient flooring at perimeter of each covered area to assure adhesion.

3.04 INSTALLATION OF TILE FLOORS

A. Lay tile from center marks established with principal walls, discounting minor offsets, so that tile at opposite edges of room area of equal width. Adjust as necessary to avoid use of cut widths less than 1/2 tile at room perimeters. Lay tile square to room axis, unless otherwise shown.

B. Match tiles for color and pattern by using tile from cartons in same sequence as manufactured and packaged if so numbered. Cut tile neatly around all fixtures. Broken, cracked, chipped, or deformed tiles are not acceptable.
1. Lay tile in fashion as directed by the Architect.
2. Adhere tile flooring to substrates using full spread of adhesive applied in compliance with flooring manufacturer's directions.

3.05 INSTALLATION OF ACCESSORIES

A. Apply wall base to walls, columns, pilasters, casework and other permanent fixtures in rooms or areas where base is required. Install base in lengths as long as practicable, with preformed corner units, or fabricated from base materials with mitered or coped inside corners. Tightly bond base to substrate throughout length of each piece, with continuous contact at horizontal and vertical surfaces.
1. On masonry surfaces, or other similar irregular substrates, fill voids along top edge of resilient wall base with manufacturer's recommended adhesive filler material.
2. Place resilient edge strips tightly butted to flooring and secure with adhesive. Install edging strips at edges of flooring which would otherwise be exposed.

### 3.06 CLEANING AND PROTECTION

A. Perform following operations immediately upon completion of resilient flooring:
   1. Sweep or vacuum floor thoroughly.
   2. Do not wash floor until time period recommended by resilient flooring manufacturer has elapsed to allow resilient flooring to become well-sealed in adhesive.
   3. Damp-mop floor being careful to remove black marks and excessive soil.
   4. Remove any excess adhesive or other surface blemishes, using appropriate cleaner recommended by resilient flooring manufacturers.
   5. Protect flooring against damage during construction period to comply with resilient flooring manufacturer's directions.
   6. Protect resilient flooring against damage from rolling loads for initial period following installation by covering with plywood or hardboard. Use dollies to move stationary equipment or furnishings across floors.
   7. Cover resilient flooring with undyed, untreated building paper until inspection for substantial completion.

### 3.07 EXTRA STOCK

A. Deliver stock of maintenance materials to Owner. Furnish maintenance materials from same manufactured lot as materials installed and enclosed in protective packaging with appropriate identifying labels.
   1. Tile Flooring: Furnish not less than one box for each 25 boxes or fraction thereof, (or 2%, whichever is greater), for each type, color, pattern and size installed.
   2. Wall Base: Furnish not less than 2% for each type, color, pattern and size installed.

**END OF SECTION**
SECTION 09 84 33
SOUND-ABSORBING WALL UNITS AND PANELS

PART 1 - GENERAL

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

1.2 SUMMARY
A. Section includes shop-fabricated, acoustical panel units tested for acoustical performance, including the following:
   1. Fabric wrapped Sound-absorbing wall panels.

1.3 DEFINITIONS
A. NRC: Noise Reduction Coefficient.
B. SAA: Sound Absorption Average.

1.4 PREINSTALLATION MEETINGS
A. Preinstallation Conference: Conduct conference at Project site.

1.5 ACTION SUBMITTALS
A. Product Data: For each type of product.
   1. Include fabric facing, panel edge, core material, and mounting indicated.
B. Shop Drawings: For unit assembly and installation.
   1. Include plans, elevations, sections, and mounting devices and details.
   2. Include details at panel head, base, joints, and corners; and details at ceiling, floor base, and wall intersections. Indicate panel edge profile and core materials.
   3. Include details at cutouts and penetrations for other work.
   4. Include direction of fabric weave and pattern matching.
C. Samples for Initial Selection: For each type of fabric facing.
   1. Include Samples of hardware and accessories involving color or finish selection.
D. Samples for Verification: For the following products:
1. Fabric: Full-width by approximately 36-inch- (900-mm-)long Sample, but not smaller than required to show complete pattern repeat, from dye lot to be used for the Work, and with specified treatments applied. Mark top and face of fabric.
2. Panel Edge: 12-inch- (300-mm-) long Sample(s) showing each edge profile, corner, and finish.
3. Core Material: 12-inch- (300-mm-) square Sample at corner.
5. Assembled Panels: Approximately 36 by 36 inches (900 by 900 mm), including joints and mounting methods.

1.6 INFORMATIONAL SUBMITTALS

A. Coordination Drawings: Elevations and other details, drawn to scale, on which the following items are shown and coordinated with each other, using input from installers of the items involved:
   1. Electrical outlets, switches, and thermostats.
   2. Items penetrating or covered by units including the following:
      a. Lighting fixtures.
      b. Air outlets and inlets.
      c. Speakers.
      d. Alarms.
      e. Sprinklers.
      f. Access panels.
   3. Show operation of hinged and sliding components covered by or adjacent to units.

B. Product Certificates: For each type of unit.

C. Sample Warranty: For manufacturer’s special warranty.

1.7 CLOSEOUT SUBMITTALS

A. Maintenance Data: For each type of unit to include in maintenance manuals. Include fabric manufacturers’ written cleaning and stain-removal instructions.

1.8 QUALITY ASSURANCE

A. Mockups: Build mockups to verify selections made under Sample submittals, to demonstrate aesthetic effects, and to set quality standards for materials, fabrication, and installation.
   1. Build mockup of typical panel area 48 inches (1200 mm) wide by 16 inches (400 mm).
   2. Approval of mockups does not constitute approval of deviations from the Contract Documents contained in mockups unless Architect specifically approves such deviations in writing.
   3. Subject to compliance with requirements, approved mockups may become part of the completed Work if undisturbed at time of Substantial Completion.
1.9 DELIVERY, STORAGE, AND HANDLING

A. Comply with fabric and unit manufacturers’ written instructions for minimum and maximum temperature and humidity requirements for shipment, storage, and handling.

B. Deliver materials and units in unopened bundles and store in a temperature-controlled dry place with adequate air circulation.

1.10 FIELD CONDITIONS

A. Environmental Limitations: Do not install units until spaces are enclosed and weathertight, wetwork in spaces is complete and dry, work at and above ceilings is complete, and ambient temperature and humidity conditions are maintained at the levels indicated for Project when occupied for its intended use.

B. Lighting: Do not install units until a permanent level of lighting provided on surfaces to receive the units.

C. Air-Quality Limitations: Protect units from exposure to airborne odors, such as tobacco smoke, and install units under conditions free from odor contamination of ambient air.

D. Field Measurements: Verify unit locations and actual dimensions of openings and penetrations by field measurements before fabrication, and indicate them on Shop Drawings.

1.11 WARRANTY

A. Special Warranty: Manufacturer agrees to repair or replace units and components that fail in materials or workmanship within specified warranty period.

1. Failures include, but are not limited to the following:

   b. Fabric sagging, distorting, or releasing from panel edge.
   c. Warping of core.

2. Warranty Period: Two years from date of Substantial Completion.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

A. Source Limitations: Obtain wall units specified in this Section from a single source from single manufacturer.

2.2 PERFORMANCE REQUIREMENTS

A. Fire-Test-Response Characteristics: Units shall comply with "Surface-Burning Characteristics" or "Fire Growth Contribution" Subparagraph below, or both, as determined by testing identical products by UL or another testing and inspecting agency acceptable to authorities having jurisdiction:
1. Surface-Burning Characteristics: Comply with ASTM E 84 or UL 723; testing by a qualified testing agency. Identify products with appropriate markings of applicable testing agency.
   a. Flame-Spread Index: 25 or less.
   b. Smoke-Developed Index: 450 or less.

2. Fire Growth Contribution: Comply with acceptance criteria of local code and authorities having jurisdiction when tested according to NFPA 265 Method B Protocol or NFPA 286.

2.3 SOUND-ABSORBING WALL UNITS

A. Sound-Absorbing Wall Panel: Manufacturer's standard panel construction consisting of facing material stretched over front face of edge-framed core and bonded or attached to edges and back of frame.
   1. Panel Shape: Flat.
   2. Mounting: Edge mounted with splines secured to substrate.
      a. Finish Color at Exposed Edges: Match color of facing material.
   4. Core: Glass-fiber board.
      a. Core-Face Layer: in accordance with product basis of design.
   5. Edge Construction: Manufacturer's standard extruded-aluminum or zinc-coated, rolled-steel frame.
   6. Edge Profile: half bevel.
   7. Corner Detail in Elevation: Square with continuous edge profile indicated.
   10. Acoustical Performance: Sound absorption NRC not less than 0.80 according to ASTM C 423 for Type A mounting according to ASTM E 795.
   11. Nominal Overall Panel Thickness: 1 inch.
   13. Panel Height: 16 inches (400 mm).

2.4 MATERIALS

A. Products shall be Armstrong, Soundsoak, 85 series, Basis of Design.

B. Core Materials: Manufacturer's standard.
   1. Glass-Fiber Board: ASTM C 612; of type standard with manufacturer; nominal density of 6 to 7 lb/cu. ft. (96 to 112 kg/cu. m) unfaced, and dimensionally stable, molded rigid board; and with maximum flame-spread and smoke-developed indexes of 25 and 50, respectively.
   2. Impact-Resistant, Acoustically Transparent, Copolymer Sheet for Face Layer: 1/16- to 1/8-inch- (1.6- to 3.2-mm-) thick layer of perforated, noncombustible, copolymer sheet laminated to face of core.

D. Mounting Devices: Concealed on back of unit, recommended by manufacturer to support weight of unit, and as follows:
   1. Impaling Clips: Manufacturer’s standard.

2.5 FABRICATION

A. Standard Construction: Use manufacturer’s standard construction unless otherwise indicated; with facing material applied to face, edges, and back border of dimensionally stable core; and with rigid edges to reinforce panel perimeter against warpage and damage.

B. Edge Hardening: For glass-fiber board cores, chemically harden core edges and areas of core where mounting devices are attached.

C. Core-Face Layer: Evenly stretched over core face and edges and securely attached to core; free from puckers, ripples, wrinkles, or sags.

D. Facing Material: Apply fabric facing fully covering visible surfaces of unit; with material stretched straight, on the grain, tight, square, and free from puckers, ripples, wrinkles, sags, blisters, seams, adhesive, or other visible distortions or foreign matter.
   1. Square Corners: Tailor corners.
   2. Fabrics with Directional or Repeating Patterns or Directional Weave: Mark fabric top and attach fabric in same direction so pattern or weave matches in adjacent units.

E. Dimensional Tolerances of Finished Units: Plus or minus 1/16 inch (1.6 mm) in accordance with the manufacturer’s/Basis of Design.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Examine fabric, fabricated units, substrates, areas, and conditions for compliance with requirements, installation tolerances, and other conditions affecting unit performance.

B. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 INSTALLATION

A. Install units in locations indicated. Unless otherwise indicated, install units with vertical surfaces and edges plumb, top edges level and in alignment with other units, faces flush, and scribed to fit adjoining work accurately at borders and at penetrations.

B. Comply with manufacturer’s written instructions for installation of units using type of mounting devices indicated. Mount units securely to supporting substrate.

C. Align fabric pattern and grain with adjacent units.
3.3 INSTALLATION TOLERANCES

A. Variation from Plumb and Level: Plus or minus 1/16 inch (1.6 mm) in 48 inches (1200 mm), noncumulative.

3.4 CLEANING

A. Clip loose threads; remove pills and extraneous materials.

B. Clean panels on completion of installation to remove dust and other foreign materials according to manufacturer's written instructions.

END OF SECTION 09 84 33
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 this section.

1.02 SUMMARY

A. This Section includes surface preparation, painting, and finishing of exposed interior and exterior items and surfaces. Surface preparation, priming, and finish coats specified in this section are in addition to shop priming and surface treatment specified under other sections.

B. Paint exposed surfaces whether or not colors are designated, except where a surface or material is specifically indicated not to be painted or is to remain natural. Where an item or surface is not specifically mentioned, paint the same as similar adjacent materials or surfaces. If color or finish is not designated, the Architect will select from standard colors or finishes available. Painting includes field painting exposed bare and covered pipes and ducts (including color coding), hangers, exposed steel and iron work, and primed metal surfaces of mechanical and electrical equipment.

C. Painting is not required on prefinished items, finished metal surfaces, concealed surfaces, operating parts, and labels. Prefinished items not to be painted include the following factory-finished components:
   1. Acoustic materials.
   2. Architectural woodwork and casework.
   3. Finished mechanical and electrical equipment.
   4. Light fixtures.
   5. Distribution cabinets.

D. Concealed surfaces not to be painted include wall or ceiling surfaces in the following generally inaccessible areas:
   1. Furred areas.
   2. Pipe spaces.
   3. Duct shafts.
   4. Interstitial mechanical space above ceilings.

E. Finished metal surfaces not to be painted include:
   1. Anodized and factory finished aluminum.
   2. Stainless steel.
   3. Chromium plate.

F. Operating parts not to be painted include moving parts of operating equipment such as the following:
   1. Valve and damper operators.
   2. Linkages.
   4. Motor and fan shafts.

G. Labels: Do not paint over Underwriter's Laboratories, Factory Mutual or other code-required labels or equipment name, identification, performance rating, or nomenclature plates.

1.03 RELATED SECTIONS

A. The following sections contain requirements that relate to this Section:
   Division 5 Sections – Metals, for shop priming structural steel and other ferrous metals.
Section 08 11 13 – Hollow Metal Doors and Frames, for shop priming steel doors and frames
Division 21 Sections - Fire Suppression, for sprinkler systems painting and marking.
Division 22 Sections – Plumbing, for plumbing systems painting and marking.
Division 23 Sections - Heating, Ventilating, and Air Conditioning (HVAC), for HVAC systems painting and marking
Division 26 Sections – Electrical, for electrical systems painting and marking

1.04 DEFINITIONS
A. "Paint" includes coating systems materials, primers, emulsions, enamels, stains, sealers and fillers, and other applied materials whether used as prime, intermediate, or finish coats.

1.05 SUBMITTALS
A. Product Data: Manufacturer's technical information, label analysis, and application instructions for each material proposed for use. Submit Material Safety Data Sheets (MSDS) for each coating material proposed. List each material and cross-reference the specific coating and finish system and application. Identify each material by the manufacturer's catalog number and general classification.

B. Samples for selection purposes: Submit complete color selection samples for selection by the Architect.

C. Samples for verification purposes: Provide samples of each color and materials to be applied, with texture to simulate actual conditions, on representative samples of the actual substrate. Define each separate coat, including block fillers and primers. Use representative colors when preparing samples for review. Resubmit until required sheen, color, and texture are achieved.
   1. Provide a list of material and application for each coat of each sample. Label each sample as to location and application.
   2. Submit samples on the following substrates for the Architect's review of color and texture only:
      a. Stained or Natural Wood: Provide two 4 by 8 inch samples of natural and stained wood finish on actual wood surfaces for each type of hardwood.
      b. Ferrous Metal: Provide two 4 inch square samples of flat metal and two 8 inch long samples of solid metal for each color and finish.

1.06 QUALITY ASSURANCE
A. Painting and coating work shall be performed by highly skilled tradesmen thoroughly experienced with commercial work and the application of the paint and coating systems specified.

B. Single-Source Responsibility: Provide primers and undercoat paint produced by the same manufacturer as the finish coats. Use only thinners recommended by the manufacturer, and only within recommended limits; otherwise thinning materials shall not be allowed.

C. 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. Notify the Architect of problems anticipated using the materials specified.

D. Material Quality: Provide the manufacturer's best quality trade sale paint material of the various coating types specified. Paint material containers not displaying manufacturer's product identification will not be acceptable.

E. Pre-Application Conference: Prior to application of paint and coatings and associated work, meet at the project site, or mutually agreed location, with Applicator and other entities concerned with paint and coating performance, including the Architect and the Owner. Record discussions and agreements, and furnish copies to each participant. Provide at least 72 hours
advance notice to participants prior to convening pre-application conference.

F. Owner's Inspection: Prior to proceeding with or continuing with successive painting and coating operations, allow the Owner's on site representatives to inspect the surface in each area or room to be coated and each completed coat of the paint and coating systems specified. Inspection of surfaces and completed coats of the paint and coating systems specified shall not relieve the Contractor and Applicator of any requirements and responsibility specified.

1.07 PRE-INSTALLATION MEETING
A. Convene one week before starting work of this section.
B. Conduct conference at Project site to comply with requirements of Division 1 Section "Project Meetings."

1.08 DELIVERY, STORAGE, AND HANDLING
A. Deliver materials to the job site in the manufacturer's original, unopened packages and containers bearing manufacturer's name and label and the information listed below. Materials not bearing this information shall be promptly removed from the project site.
   1. Product name or title of material.
   2. Product description (generic classification or binder type).
   3. Manufacturer's stock number and date of manufacture.
   4. Contents by volume, for pigment and vehicle constituents.
   5. Thinning instructions.
   6. Application instructions.
   7. Color name and number.

B. Store materials not in use in tightly covered containers in a well ventilated area at a minimum ambient temperature of 45 deg F (7 deg C). Maintain containers used in storage in a clean condition, free of foreign materials and residue. Materials shall not be stored in buildings after the date of Substantial Completion. Protect from freezing and excessive heat. Keep storage area neat and orderly. Remove oily rags and waste daily. Take necessary measures to ensure that workers and work areas are protected from fire and health hazards resulting from handling, mixing, and application.

1.09 JOB CONDITIONS
A. Apply water-based paints only when the temperature of surfaces to be painted and surrounding air temperatures are between 50 deg F (10 deg C) and 90 deg F (32 deg C).
B. Apply solvent-thinned paints only when the temperature of surfaces to be painted and surrounding air temperatures are between 45 deg F (7 deg C) and 95 deg F (35 deg C).
C. Do not apply paint in snow, rain, fog, or mist, when the relative humidity exceeds 85 percent, at temperatures less than 5 deg F (3 deg C) above the dew point, or to damp or wet surfaces. 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 and drying periods.

PART 2 - PRODUCTS
2.01 MANUFACTURERS
A. Products by other manufacturers must, in the Architect's sole judgment, provide equal appearance, color, texture, pattern, and finish to the materials indicated on the schedule.
   2. ICI Paints (includes Devoe and Glidden).
   3. PPG Industries, Pittsburgh Paints (Pittsburgh).
   4. Pratt and Lambert (P & L).
PART 3 - EXECUTION

3.01 EXAMINATION

A. Examine substrates and conditions under which painting will be performed for compliance with requirements for application of paint. Plaster substrates shall be fully cured before application of paint. Do not begin paint application until unsatisfactory conditions have been corrected. Start of painting will be construed as the Applicator's acceptance of surfaces and conditions within a particular area.

3.02 PREPARATION

A. General Procedures: Remove hardware and hardware accessories, plates, machined surfaces, lighting fixtures, and similar items in place that are not to be painted, or provide surface-applied protection prior to surface preparation and painting. Remove these items if necessary for complete painting of the items and adjacent surfaces. Following completion of painting operations in each space or area, have items reinstalled by workers skilled in the trades involved. Clean surfaces before applying paint or surface treatments. Remove oil and grease prior to cleaning. Schedule cleaning and painting so that dust and other contaminants from the cleaning process will not fall on wet, newly painted surfaces.

B. Surface Preparation: Clean and prepare surfaces to be painted in accordance with the manufacturer's instructions for each particular substrate condition and as specified. Provide barrier coats over incompatible primers or remove and reprime. Notify Architect in writing of problems anticipated with using the specified finish-coat material with substrates primed by others.

C. Cementitious Materials: Prepare concrete, concrete masonry block, and cement plaster surfaces to be painted. Remove efflorescence, chalk, dust, dirt, grease, oils, and release agents. Roughen as required to remove glaze. If hardeners or sealers have been used to improve curing, use mechanical methods of surface preparation.
   1. Use abrasive blast-cleaning methods if recommended by the paint manufacturer.
   2. Determine alkalinity and moisture content of surfaces by performing appropriate tests. If surfaces are sufficiently alkaline to cause blistering and burning of finish paint, correct this condition before application. Do not paint surfaces where moisture content exceeds that permitted in manufacturer's printed directions.

D. Wood: Clean surfaces of dirt, oil, and other foreign substances with scrapers, mineral spirits, and sandpaper, as required. Sand surfaces exposed to view smooth and dust off.
   1. Prime, or seal wood to be painted immediately upon delivery. Prime edges, ends, faces, undersides, and backsides of wood.
   2. When transparent finish is required, backprime with spar varnish.
   3. Seal tops, bottoms, and cutouts of unprimed wood doors with a heavy coat of varnish or sealer immediately upon delivery.

E. Wood Doors: Before applying any finish, wood doors shall be thoroughly block-sanded or belt-sanded with 100 to 150 grit sandpaper to remove all scuffs, scratches, burnishes, raised grain, handling marks and effects of exposure to moisture. Sand both door faces in a horizontal position. Sanding in a vertical position and without a sanding block or belt-sander shall not be allowed.

F. Galvanized Surfaces: Clean galvanized surfaces with non-petroleum-based solvents so that the surface is free of oil and surface contaminants. Remove pretreatment from galvanized sheet metal fabricated from coil stock by mechanical methods.

3.03 MATERIALS PREPARATION: Carefully mix and prepare paint materials in accordance with manufacturer's directions.
A. Maintain containers used in mixing and application of paint in a clean condition, free of foreign materials and residue.

B. Stir material before application to produce a mixture of uniform density; stir as required during application. Do not stir surface film into material. Remove film and, if necessary, strain material before using.

C. Use only thinners approved by the paint manufacturer, and only within recommended limits.

D. Tinting: Tint each undercoat a lighter shade to facilitate identification of each coat where multiple coats of the same material are applied. Tint undercoats to match the color of the finish coat, but provide sufficient differences in shade of undercoats to distinguish each separate coat.

3.04 APPLICATION

A. Apply paint in accordance with manufacturer's directions. Use applicators and techniques best suited for substrate and type of material being applied. Spray application of paint and coatings shall not be allowed.

B. Application on Decorative MDF Panels in Auditorium: Sand surface after each coat of primer/sealer (2 coats) and after first finish coat, using flexible sanding medium such as steel wool. Clean surfaces thoroughly after sanding just prior to application of subsequent coat.

C. Do not paint over dirt, rust, scale, grease, moisture, scuffed surfaces, or conditions detrimental to formation of a durable paint film.
   1. Paint colors, surface treatments, and finishes are indicated on Drawing Sheet A-604, Finish Schedule.
   2. Provide finish coats that are compatible with primers used.
   3. The number of coats and film thickness required is the same regardless of the application method. Do not apply succeeding coats until the previous coat has cured as recommended by the manufacturer. Sand between applications where sanding is required to produce an even smooth surface in accordance with the manufacturer's directions.
   4. Apply additional coats when undercoats, stains, or other conditions show through final coat of paint until paint film is of uniform finish, color, and appearance. Give special attention to ensure that surfaces, including edges, corners, crevices, welds, and exposed fasteners, receive a dry film thickness equivalent to that of flat surfaces.
   5. The term "exposed surfaces" includes areas visible when permanent or built-in fixtures, convector covers, covers for finned tube radiation, grilles, and similar components are in place. Extend coatings in these areas as required to maintain the system integrity and provide desired protection.
   6. Paint surfaces behind movable equipment and furniture same as similar exposed surfaces. Paint surfaces behind permanently fixed equipment or furniture with prime coat only before final installation of equipment.
   7. Paint interior surfaces of ducts, where visible through registers or grilles, with a flat, non-specular black paint.
   8. Finish doors on tops, bottoms, and side edges same as faces.
   9. Sand lightly between each succeeding enamel or varnish coat.
   10. Omit primer on metal surfaces that have been shop-primed and touch up painted.

D. Scheduling Painting: Apply first coat to surfaces that have been cleaned, pretreated, or otherwise prepared for painting as soon as practicable after preparation and before subsequent surface deterioration. Allow sufficient time between successive coats to permit proper drying. Do not recoat until paint has dried to where it feels firm, and does not deform or feel sticky under moderate thumb pressure and where application of another coat of paint does not cause lifting or loss of adhesion of the undercoat.

E. Minimum Coating Thickness: Apply materials at not less than the manufacturer's recommended spreading rate. Provide a total dry film thickness of the entire system as recommended by the manufacturer.
F. Electrical items to be painted include but are not limited to:
   Conduit and fittings

G. Block Fillers: Apply block fillers to concrete masonry block at a rate to ensure complete
   coverage with pores filled. Where ceramic tile, precast terrazzo and other wall bases are
   schedule on masonry walls, hold block filler application 3 inches clear of finish floor elevation.

H. Prime Coats: Before application of finish coats, apply a prime coat of material as recommended
   by the manufacturer to material that is required to be painted or finished and has not been prime
   coated by others. Recoat primed and sealed surfaces where evidence of suction spots or
   unsealed areas in first coat appears, to assure a finish coat with no burn through or other
   defects due to insufficient sealing.

I. Pigmented (Opaque) Finishes: Completely cover to provide an opaque, smooth surface of
   uniform finish, color, appearance, and coverage. Cloudiness, spotting, holidays, laps, brush
   marks, runs, sags, ropiness, or other surface imperfections will not be acceptable.

J. Transparent (Clear) Finishes: Use multiple coats to produce a glass-smooth surface film of
   even luster. Provide a finish free of laps, cloudiness, color irregularity, runs, brush marks,
   orange peel, nail holes, or other surface imperfections. Provide satin finish for final coats.

K. Completed Work: Match approved samples for color, texture, and coverage. Remove, refinish,
   or repaint work not in compliance with specified requirements. All painting and coating work
   shall be completed prior to the date of Substantial Completion.

3.05 FIELD QUALITY CONTROL

A. The Owner reserves the right to invoke the following test procedure at any time and as often as
   the Owner deems necessary during the period when paint is being applied:
   1. The Owner will engage the services of an independent testing laboratory to sample the
      paint material being used. Samples of material delivered to the project will be taken,
      identified, sealed, and certified in the presence of the Contractor.

B. The testing laboratory will perform appropriate tests for the following characteristics as required
   by the Owner:
   1. Quantitative materials analysis.
   2. Abrasion resistance.
   3. Apparent reflectivity.
   4. Flexibility.
   5. Washability.
   6. Absorption.
   7. Accelerated weathering.
   8. Dry opacity.
   10. Recoating.
   11. Skinning.
   12. Color retention.
   13. Alkali and mildew resistance.

C. If test results show material being used does not comply with specified requirements, the
   Contractor may be directed to stop painting, remove noncomplying paint, pay for testing, repaint
   surfaces coated with rejected paint, and remove rejected paint from previously painted surfaces
   if, upon repainting with specified paint, the two coatings are noncompatible.

3.06 CLEANING

A. Cleanup: At the end of each work day, remove empty cans, rags, rubbish, and other discarded
   paint materials from the site.

B. Upon completion of painting, clean glass and paint-spattered surfaces. Remove spattered paint
   by washing and scraping, using care not to scratch or damage adjacent finished surfaces.
3.08 Protect work of other trades, whether to be painted or not, against damage by painting. Correct damage by cleaning, repairing or replacing, and repainting, as acceptable to Architect. Provide “wet paint” signs to protect newly painted finishes. Remove temporary protective wrappings provided by others for protection of their work after completion of painting operations. At completion of construction activities of other trades, touch up and restore damaged or defaced painted surfaces.

3.09 The Contractor shall correct any defects which occur during the warranty period set forth in the General and Supplementary Conditions, including the correction of discoloration, cracking, peeling, scaling and deterioration of the coating systems. Any defects shall be repaired, and the finish restored without additional cost to the Owner.

3.10 INTERIOR PAINT SCHEDULE

A. General: Provide the following paint systems for the various substrates, as indicated. Contractor shall assume that 25% of wall surfaces will be painted a different color. Contractor shall assume that gypsum wallboard ceiling surfaces and any exposed construction will be painted a different color than the adjacent wall surface.

B. Concrete Masonry Units: Provide the following finish systems over interior concrete and concrete masonry block units:
   1. Semigloss, Acrylic-Enamel Finish: 2 finish coats over a block filler.
      a. Block Filler: High-performance, latex-based, block filler applied at spreading rate recommended by the manufacturer to achieve a total dry film thickness of not less than 5.0 mils (0.13 mm). Recoil as necessary to provide a pinhole free surface.
         2) Fuller: 280-00 Interior/Exterior Latex Block Filler.
         4) Moore: Moorcraft Interior and Exterior Block Filler #173.
         5) PPG: 6-7 Speedhide Interior/Exterior Masonry Block Filler.
         6) P & L: Z 98 Pro-Hide Plus Latex Block Filler.
      b. First and Second Coats: Semigloss, acrylic-latex, interior enamel applied at spreading rate recommended by the manufacturer to achieve a total dry film thickness of not less than 2.6 mils (0.066 mm).
         1) S-W: B31-2600 Series Promar 200 Interior Latex Semi-Gloss-Zero VOC

C. Gypsum Board: Provide the following finish systems over interior gypsum board surfaces:
   1. Low-Luster, Acrylic-Enamel Finish: 2 finish coats over a primer. Provide unless otherwise indicated.
      a. Primer: Latex-based, interior primer applied at spreading rate recommended by the manufacturer to achieve a total dry film thickness of not less than 1.2 mils (0.031 mm).
         1) S-W: B28W02600 Promar 200 Interior Latex Primer-Low VOC
         2) Fuller: 220-20 Pro-Tech Interior Latex Wall Primer and Sealer.
         3) Glidden: 5111 Spred Ultra Latex Primer-Sealer.
         4) Moore: Regal First Coat Interior Latex Primer & Underbody #216.
         5) PPG: 17-10 Quick-Drying Interior Latex Primer-Sealer.
         6) P & L: Z/F 1004 Supreme "4" Interior Latex Wall Primer.
      b. First and Second Coats: Low-luster (eggshell or satin), acrylic-latex, interior enamel applied at spreading rate recommended by the manufacturer to achieve a total dry
film thickness of not less than 2.8 mils (0.071 mm).

1) S-W: B20-2600 Promar 200 Interior Latex Eggshell-Low VOC.
2) Fuller: 212-XX AA Enamel Acrylic Latex Eggshell Enamel.
3) Glidden: 4100 Series Spred Ultra Eggshell Latex Wall & Trim Paint.
4) Moore: Moore's Regal AquaVelvet #319.
5) PPG: 89 Line Manor Hall Eggshell Latex Wall and Trim Enamel.

D. Woodwork (Opaque Finish): Provide the following paint finish systems over new, interior wood surfaces:

1. Semigloss, Acrylic-Enamel Finish: 2 finish coats over a wood undercoater.
   a. Undercoat: Acrylic-latex based, interior wood undercoater, as recommended by the manufacturer for this substrate, applied at spreading rate recommended by the manufacturer to achieve a total dry film thickness of not less than 1.2 mils (0.031 mm).
      1) S-W: B28W02600 Promar 200 Interior Latex Primer-Low VOC
      2) Fuller: 220-07 Interior Alkyd Enamel Undercoat.
      4) Moore: Moore's Alkyd Enamel Underbody #217.
      5) PPG: 6-755 Speedhide Interior Water-Based Undercoater.
      6) P & L: Z/F 1001 Suprime "1" 100 Percent Acrylic Multi-Purpose Primer.

b. First and Second Coats: Semigloss, acrylic-latex, interior enamel applied at spreading rate recommended by the manufacturer to achieve a total dry film thickness of not less than 2.6 mils (0.066 mm).
   1) S-W: B31-2600 Series Promar 200 Interior Latex Semi-Gloss-Zero VOC.

E. Woodwork (Transparent Finish): Provide the following coating finish systems over new, interior wood surfaces:

1. Water-Based Varnish System
   c. Topcoat: Varnish, water based, clear, satin.
      1) PPG: Olympic Premium Interior Water Based Polyurethane Clear 42786
      2) Sherwin Williams Minwax Polycrylic Protective Finish Satin 3333
      3) Valspar Polyurethane Water-Borne Satin 8082

F. Zinc-Coated Metal: Provide the following finish systems over zinc-coated metal:

1. Semigloss, Acrylic-Enamel Finish: 2 finish coats over a primer.
   a. Primer: Galvanized metal primer applied at spreading rate recommended by the manufacturer to achieve a total dry film thickness of not less than 1.2 mils (0.031 mm).
      1) S-W: B66-310 Pro-Cryl Universal Primer.
      2) Fuller: 621-05 Blox-Rust Latex Metal Primer.
      3) Glidden: 5207 Gld-Guard Tank & Structural Primer, White.
      4) Moore: IronClad Galvanised Metal Latex Primer #155.
      6) P & L: Z/F 1033 Suprime "3" Interior/Exterior Latex Metal Primer.
   b. First and Second Coats: Semi-gloss, acrylic-latex, interior enamel applied at spreading rate recommended by the manufacturer to achieve a total dry film thickness of not less than 2.6 mils (0.066 mm).
1) S-W: B31-2600 Series Promar 200 Interior Latex Semi-Gloss-Zero VOC.

3.12 EXTRA STOCK
A. Deliver stock of maintenance materials to Owner. Furnish maintenance materials from same manufactured lot as materials applied and enclosed in protective packaging with appropriate identifying labels.
B. Furnish not less than one un-opened gallon for each paint and coating material, for each type and color applied, prior to start of painting.

3.13 PAINT COLOR SELECTIONS
A. All paint colors will be selected by the Architect.

END OF SECTION
SECTION 10 44 00

FIRE PROTECTION SPECIALTIES

PART 1 - GENERAL

1.01 SECTION INCLUDES

Fire extinguishers (multipurpose dry-chemical type)
Fire extinguisher cabinets

1.02 RELATED DOCUMENTS

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

1.03 RELATED SECTIONS

A. Related sections include, but are not limited to, the following:
Section 04 20 00 - Unit Masonry
Section 06 10 00 - Rough Carpentry
Section 09 21 16 - Gypsum Board Assemblies

1.04 REFERENCE STANDARDS

A. Reference standards include, but are not limited to, the following:
AAMA 611 - Voluntary Specification for Anodized Architectural Aluminum; 1998
ASTM A 1008/A 1008 - Standard Specification for Steel, Sheet, Cold-Rolled, Carbon, Structural, High-Strength Low-Alloy, High-Strength Low-Alloy with Improved Formability, Solution Hardened, and Bake Hardenable; 2011
ASTM C 1048 - Standard Specification for Heat-Treated Flat Glass—Kind HS, Kind FT Coated and Uncoated Glass; 2004
NFPA 10 - Standard for Portable Fire Extinguishers; National Fire Protection Association; 2007

1.05 SUBMITTALS

A. General: See Section 01 33 00 - Submittals, for submittal procedures.

B. Product Data: Submit manufacturer’s product data for each type of product specified. For fire extinguisher cabinets include rough-in dimensions, details showing mounting methods, relationships of box and trim to surrounding construction, door hardware, cabinet type and materials, trim style, door construction, panel style, and materials.

1.06 QUALITY ASSURANCE

A. Single-Source Responsibility: Obtain fire extinguishers and cabinets from one source from a single manufacturer.

B. UL-Listed Products: Provide UL-listed fire extinguishers, bearing UL "Listing Mark" for type, rating, and classification of extinguisher.

C. FM-Listed Products: Fire extinguishers approved by Factory Mutual Global for type, rating, and
classification of extinguisher and carry appropriate FM marking.

D. Fire-Rated, Extinguisher Cabinets: Where located in fire-resistant rated assemblies, provide listed and labeled fire extinguisher cabinets to comply with requirements in ASTM E 814 for fire-resistance rating of walls where they are installed.

E. Coordination:
   1. Coordinate size of fire extinguisher cabinets to ensure that type and capacity of fire extinguishers indicated are accommodated.
   2. Coordinate sizes and locations of fire extinguisher cabinets with wall depths.

PART 2 - PRODUCTS

2.01 MATERIALS

A. Cold-Rolled Steel Sheet: ASTM A 1008/A 1008M, Commercial Steel (CS), Type B.

B. Tempered Float Glass: ASTM C 1048, Kind FT, Condition A, Type I, Quality q3, 3 mm thick, Class 1 (clear).

2.02 MANUFACTURERS

A. Fire Extinguisher Cabinets
   Basis-of-Design Products: The design for fire extinguisher cabinets is based on the following products by:
   Larsen's Manufacturing Company: www.larsensmfg.com
   Semi-Recessed Cabinets AL2409-6R Full Panel Glass

B. Other Acceptable Manufacturers: Subject to compliance with the requirements of this Section:
   Fire End & Croker Corporation: www.croker.com
   Modern Metal Products: www.modern-metal.com
   Moon American: www.moon-amERICAN.com

C. Fire Extinguishers: Subject to compliance with requirements, provide products by one of the following:
   a. Larsen's Manufacturing Company: www.larsensmfg.com
   b. Fire End & Croker Corporation: www.croker.com
   c. Modern Metal Products: www.modern-metal.com
   d. Moon American: www.moon-amERICAN.com

2.04 FIRE EXTINGUISHERS AND CABINETS

A. Construction: Manufacturer's standard enameled steel box, not less than 18-gauge, with trim, frame, door and hardware to suit cabinet type, trim style and door style indicated. Weld all joints and grind smooth.
   a. Cabinet Type: Provide semi-recessed cabinets suitable for mounting conditions indicated. Provide fire-rated cabinets for mounting in fire-resistant rated assemblies.
   b. Trim Style: Fabricate trim in one piece with corners mitered, welded, and ground smooth.
   c. Exposed Trim: Sheet steel, one-piece combination trim and perimeter door frame overlapping surrounding wall surface with exposed trim face and wall return at outer edge (backbend); for semi-recessed cabinets, provide rolled-edge trim with 2-1/2-inch backbend depth.
d. Door Material and Construction: Manufacturer's standard flush hollow sheet steel door construction, 1/2-inch thick; coordinated with cabinet types and trim styles selected.

e. Door Style and Glazing: Manufacturer's standard fully-glazed panel with frame door style; 1/8-inch tempered, clear, float glass.

f. Door Hardware: Provide manufacturer's standard door-operating hardware of proper type for cabinet type, trim style, and door material and style indicated.
   2. Hinges: Continuous-type hinge, of same material as door and trim, permitting door to open 180 degrees.

g. Finishes
   1. Exterior and Interior of Cabinets: Manufacturer standard baked-enamel or powder coat finish, lead- and chromate-free, white.
   2. Protect mechanical finishes on exposed surfaces from damage by application of strippable, temporary protective covering prior to shipment.

B. Fire Extinguishers
   a. General: Provide fire extinguishers for each extinguisher cabinet indicated.
   b. Multipurpose Dry Chemical Type: 3A-40B:C UL-rated, 6-pound nominal capacity, in enameled steel container.

PART 3 - EXECUTION

3.01 EXAMINATION AND PREPARATION

A. Examine walls and partitions for suitable framing depth and blocking where recessed and semi-recessed fire extinguisher cabinets will be installed. Proceed with installation only after unsatisfactory conditions have been corrected.

B. Prepare recesses for recessed and semi-recessed fire extinguisher cabinets as required by type and size of cabinet and trim style.

3.02 INSTALLATION

A. Install fire extinguisher cabinets in locations and at mounting heights indicated, but not more than that required by NFPA 10 for weight of fire extinguisher installed. Secure mount cabinets in place, plumb, square, level, true to line and without twists or distortion.

B. Remove temporary protective coverings and strippable films, if any, as cabinets are installed unless otherwise indicated in manufacturer's written installation instructions.

C. Adjust fire protection cabinet doors to operate easily without binding. Verify that latching devices operate properly.

D. Clean interior and exterior surfaces as recommended by manufacturer. Install fire extinguishers in cabinets at time of Substantial Completion.

END OF SECTION 10 44 00
SECTION 122113 - HORIZONTAL LOUVER BLINDS

PART 1 - GENERAL

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

1.2 SUMMARY
   A. Section Includes:
      1. Horizontal louver blinds with aluminum slats to be provided at each exterior wall window location. The intent is to match the existing horizontal louver blinds that are in the dining room with respect to color, profile, and controls.
   B. Related Requirements:
      1. Section 061053 "Miscellaneous Rough Carpentry" for wood blocking and grounds for mounting horizontal louver blinds and accessories.

1.3 ACTION SUBMITTALS
   A. Product Data: For each type of product.
   B. Shop Drawings: For horizontal louver blinds, include fabrication and installation details.
   C. Samples: For each exposed product and for each color and texture specified, 12 inches (300 mm) long.
   D. Samples for Initial Selection: For each type and color of horizontal louver blind.
      1. Include Samples of accessories involving color selection.
   E. Product Schedule: For horizontal louver blinds. Use same designations indicated on Drawings.

1.4 CLOSEOUT SUBMITTALS
   A. Maintenance Data: For horizontal louver blinds to include in maintenance manuals.

1.5 QUALITY ASSURANCE
   A. Mockups: Build mockups to verify selections made under Sample submittals, to demonstrate aesthetic effects, and to set quality standards for fabrication and installation.
1. Approval of mockups does not constitute approval of deviations from the Contract Documents contained in mockups unless Architect specifically approves such deviations in writing.
2. Subject to compliance with requirements, approved mockups may become part of the completed Work if undisturbed at time of Substantial Completion.

1.6 DELIVERY, STORAGE, AND HANDLING
A. Deliver horizontal louver blinds in factory packages, marked with manufacturer, product name, and location of installation using same designations indicated on Drawings.

1.7 FIELD CONDITIONS
A. Environmental Limitations: Do not install horizontal louver blinds until construction and wet-work and finish work in spaces, including painting, is complete and dry and ambient temperature and humidity conditions are maintained at the levels indicated for Project when occupied for its intended use.
B. Field Measurements: Where horizontal louver blinds are indicated to fit to other construction, verify dimensions of other construction by field measurements before fabrication and indicate measurements on Shop Drawings. Allow clearances for operating hardware of operable glazed units through entire operating range. Notify Architect of installation conditions that vary from Drawings. Coordinate fabrication schedule with construction progress to avoid delaying the Work.

PART 2 - PRODUCTS

2.1 MANUFACTURERS
A. Source Limitations: Obtain horizontal louver blinds from single source from single manufacturer.

2.2 HORIZONTAL LOUVER BLINDS, ALUMINUM SLATS
A. Slats: Aluminum; alloy and temper recommended by producer for type of use and finish indicated; with crowned profile and radius corners.
   1. Width: 1 inch. Verify, to match existing.
   2. Thickness: Manufacturer’s standard.
   3. Spacing: Manufacturer’s standard.
B. Headrail: Formed steel or extruded aluminum; long edges returned or rolled. Headrails fully enclose operating mechanisms on three sides.
   1. Capacity: One per headrail unless otherwise indicated.
   2. Ends: Manufacturer’s standard.
   3. Manual Lift Mechanism:
      a. Lift-Cord Lock: Variable; stops lift cord at user-selected position within blind full operating range.
b. Operator: Extension of lift cord(s) through lift-cord lock mechanism to form cord pull.

   a. Tilt: Full.
   b. Over-Rotation Protection: Manufacturer's detachable operator or slip clutch to prevent over rotation of gear.


C. Bottom Rail: Formed-steel or extruded-aluminum tube that secures and protects ends of ladders and lift cords and has plastic- or metal-capped ends.
   1. Type: Manufacturer's standard.

D. Lift Cords: Manufacturer's standard braided cord.

E. Ladders: Evenly spaced across headrail at spacing that prevents long-term slat sag.

F. Valance: Manufacturer's standard.

G. Mounting Brackets: With spacers and shims required for blind placement and alignment indicated.
   1. Type: Wall/Overhead.
   2. Intermediate Support: Provide intermediate support brackets to produce support spacing recommended by blind manufacturer for weight and size of blind.

H. Hold-Down Brackets and Hooks or Pins: Manufacturer's standard.

I. Side Channels and Perimeter Light Gap Seals: Manufacturer's standard.

J. Colors, Textures, Patterns, and Gloss:
   1. Slats: As selected by Architect from manufacturer's full range.
   2. Components: Provide rails, cords, ladders, and materials exposed to view matching or coordinating with slat color unless otherwise indicated.

2.3 HORIZONTAL LOUVER BLIND FABRICATION

A. Product Safety Standard: Fabricate horizontal louver blinds to comply with WCMA A 100.1 including requirements for corded, flexible, looped devices; lead content of components; and warning labels.

B. Unit Sizes: Fabricate units in sizes to fill window and other openings as follows, measured at 74 deg F (23 deg C):
   1. Between (Inside) Jamb Installation: Width equal to jamb-to-jamb dimension of opening in which blind is installed less 1/4-inch (6 mm) per side or 1/2 inch (13 mm) total, plus or minus 1/8 inch (3.1 mm). Length equal to head-to-sill dimension of opening in which blind is installed less 1/4 inch (6 mm), plus or minus 1/8 inch (3.1 mm).
C. Concealed Components: Noncorrodible or corrosion-resistant-coated materials.

D. Mounting and Intermediate Brackets: Designed for removal and reinstallation of blind without damaging blind and adjacent surfaces, for supporting blind components, and for bracket positions and blind placement indicated.

E. Installation Fasteners: No fewer than two fasteners per bracket, fabricated from metal noncorrosive to brackets and adjoining construction; type designed for securing to supporting substrate; and supporting blinds and accessories under conditions of normal use.

F. Color-Coated Finish:
   1. Metal: For components exposed to view, apply manufacturer’s standard baked finish complying with manufacturer’s written instructions for surface preparation including pretreatment, application, baking, and minimum dry film thickness.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Examine substrates, areas, and conditions, with Installer present, for compliance with requirements for installation tolerances, operational clearances, and other conditions affecting performance of the Work.

B. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 INSTALLATION

A. Install horizontal louver blinds level and plumb, aligned and centered on openings, and aligned with adjacent units according to manufacturer’s written instructions.
   1. Locate so exterior slat edges are not closer than 2 inches from interior faces of glass and not closer than 1/2 inch from interior faces of glazing frames through full operating ranges of blinds.
   2. Install mounting and intermediate brackets to prevent deflection of headrails.
   3. Install with clearances that prevent interference with adjacent blinds, adjacent construction, and operating hardware of glazed openings, other window treatments, and similar building components and furnishings.

3.3 ADJUSTING

A. Adjust horizontal louver blinds to operate free of binding or malfunction through full operating ranges.
3.4 CLEANING AND PROTECTION

A. Clean horizontal louver blind surfaces after installation according to manufacturer's written instructions.

B. Provide final protection and maintain conditions in a manner acceptable to manufacturer and Installer that ensures that horizontal louver blinds are without damage or deterioration at time of Substantial Completion.

C. Replace damaged horizontal louver blinds that cannot be repaired in a manner approved by Architect before time of Substantial Completion.

3.5 DEMONSTRATION

A. Engage a factory-authorized service representative to train Owner's maintenance personnel to adjust, operate, and maintain systems.

END OF SECTION 122113
PART 1 - GENERAL

1.1 GENERAL CONDITIONS

A. Work under this Division shall be subject to the General and Special Conditions.

1.2 SCOPE

A. The work required for this Division includes labor, materials, equipment, services and supervision required to provide complete working Plumbing and Mechanical systems as shown on the drawings and specified in this specification.

1.3 APPLICABLE SPECIFICATIONS, CODES AND STANDARDS

A. Work shall comply with all applicable codes and ordinances. The latest effective publications of specifications, regulations, standards, codes, etc., as applicable, shall form a part of these specifications the same as if written fully herein and shall be followed as minimum requirements.

1. Air Moving and Conditioning Association (AMCA)
2. American National Standard Institute (ANSI)
3. Air Conditioning and Refrigeration Institute (ARI)
4. American Society of Heating, Refrigerating and Air Conditioning Engineers (ASHRAE)
5. American Society of Mechanical Engineers (ASME)
7. National Association of Fan Manufacturers (NAFM)
8. National Electric Code (NEC)
9. National Electrical Manufacturers Association (NEMA)
10. National Fire Protection Association (NFPA)
11. Occupational Safety and Health Administration (OSHA)
12. Sheet Metal and Air Conditioning Contractors National Association (SMACNA)
13. Uniform Federal Accessibility Standards (UFAS)
14. Underwriters Laboratories, Inc. (UL)
15. Virginia Fire Safety Regulation (VFSR)
16. Virginia Uniform Statewide Building Code (VUSBC)
17. Americans with Disabilities Act (ADA)
18. International Plumbing Code
19. International Mechanical Code

B. Contractor shall obtain and pay for permits and required inspections.

1.4 CONTRACT DOCUMENTS

A. The drawings and specifications are intended to cover all work enumerated under respective headings. The drawings are diagrammatical only. Due to the scale of the drawings, offsets, fittings, and accessories may not be indicated. Work indicated, but having details omitted shall be provided completely to perform function intended at no additional cost to the Owner.

B. This Contractor shall examine the architectural, structural, plumbing, mechanical and
Electrical drawings and specifications to avoid conflict with other trades. Minor variations in location of equipment shall be made upon written approval of the Architect at no additional cost to the Owner. No Contractor shall take advantage of conflict or error between the drawings and specifications or between general drawings and Plumbing, Mechanical and/or Electrical drawings but shall request a clarification of such from the Architect/Engineer should this condition exist. If there is insufficient time to issue an addendum for this clarification, the Contractor shall be required to assume the most expensive item in conflict.

C. Cooperate and coordinate the work of this Division with other trades.

1.5 ELECTRICAL WORK

A. All electrical power wiring required for equipment installed under Division 23 shall be provided under Division 26 with all necessary and approved wiring diagrams and guidance provided under Division 23.

B. Control wiring shall be in conduit, except low voltage wiring in concealed, accessible non-air plenum ceiling spaces may be run without conduits and adequately supported from the building’s structure with cable ties. Electrical and/or other plumbing or mechanical items shall not be used for cable support.

C. Low voltage control cable specifically listed for application in accessible ceiling air plenums may be utilized in lieu of wiring in conduit.

D. When substituted motors and/or equipment require electrical modifications to support said motors and/or equipment, the cost of the electrical modifications, associated work and coordination shall be included under the Division providing the substituted equipment.

1.6 PROTECTION OF EQUIPMENT AND MATERIALS

A. Responsibility for care and protection of mechanical equipment rests with the Contractor providing the equipment until it has been tested and accepted.

B. After delivery, before and after installation, the Contractor shall protect the equipment and materials against theft, injury, the environment and damages from all causes.

C. The Contractor shall be responsible for protecting equipment and ductwork outlets by temporarily plugging or capping pipe openings.

D. Temporary filters shall be provided bi-weekly for all equipment that is operated during construction. New filters shall be installed after all construction dirt has been removed from the building just prior to final acceptance of the building.

E. Equipment not designated for exterior installation shall not be delivered to the job site until a location protected from the environment is provided. Location must be approved by the Engineer prior to the delivery.

1.7 TESTING, CLEANING AND PAINTING

A. After the installation is complete and before final acceptance of the work, each system shall be cleaned and tested for proper operation.

B. Equipment, ductwork and filters shall be cleaned thoroughly in accordance with the best
practice or as specified herein.

1.9 OPERATING AND MAINTENANCE INSTRUCTIONS

A. Furnish complete diagrams and instructions for operation and maintenance of the systems and component parts, including the automatic control system. These shall be included within a three ring binder with the record drawings and delivered to the General Contractor for the Architect.

1.11 WARRANTY AND SERVICE

A. This Contractor shall service the installation for one year from date of substantial completion. This shall include emergency service, on all equipment. Maintain a log book on site for service entries (i.e. date, service performed, etc.).

1.12 RECORD DRAWINGS

A. Upon completion of the work, the Contractor shall submit corrected reproducible drawings and specifications indicating deviations made in the actual installation to the contract plans.

1.13 VISIT TO THE SITE

A. The Contractor shall visit the site of the work and familiarize himself with all conditions affecting his work. Submission of his proposal shall be construed as indicating such knowledge of existing conditions. No additional payment will be made on claims that arise from a lack of such knowledge of existing conditions.

1.14 COORDINATION

A. Before installing any of this work, the Contractor shall verify that it does not interfere with clearances for the erection of beams, columns, ceilings, walls and other structural, electrical or architectural members as shown on the Contract Drawings. If any work is so installed and it later develops that the design cannot be followed, the Contractor shall, at his own expense, make such changes in his work as the Architect may direct to permit the completion of the work in accordance with the drawings and specifications.

B. It shall be the duty of the Contractor to report any interferences between his work and that of any other Contractor to the Architect as soon as they are discovered. The Architect will determine which equipment shall be relocated regardless of which was first installed, and his decision shall be final.

1.15 CUTTING AND PATCHING

A. Where cutting, channeling, chasing, or drilling of floors, walls, partitions, ceilings, ductwork or equipment surfaces is necessary for the proper installation, support or anchorage of the piping, it shall be carefully done in accordance with the current edition of the Building Code. Any damage to the building, piping, ductwork or equipment shall be repaired by skilled mechanics of the trades involved at no additional cost to the Owner. This work shall be carefully laid out in advance. Cutting of masonry block shall be done with a masonry saw.

1.16 SCHEDULE OF VALUES

A. This Contractor shall furnish and the General Contractor shall include as a minimum the
following list of items. This shall form the basis for determining the completed work as part of the Application for Payment process.

1. Mechanical:

Demolition
Ductwork and Accessories (material)
Ductwork and Accessories (labor)
Ductwork Insulation (material)
Ductwork Insulation (labor)
Grilles and Registers (material)
Grilles and Registers (labor)
Temperature Control (material)
Temperature Control (labor)
Testing, Adjusting and Balancing

1.17 PROJECT CLOSEOUT

A. This Contractor shall furnish the following list of items in order to achieve final project acceptance. Final payment, including retainage, shall not be processed without the required documentation as follows:

1. Verification of completed punch list items.
2. Start-up reports.
3. Approved operations and maintenance manuals.
4. Verification of Owner training.
5. Warranty letters.
6. Approved Testing and Balancing reports.
7. Complete approval by Local Authority.
9. Record drawings.

PART 2 - PRODUCTS - Not Applicable

PART 3 - EXECUTION

3.1 After balancing and adjustment operations have been completed, Contractor shall conduct system check tests to prove to satisfaction of Architect that all systems are performing as specified.

3.2 The Architect shall be given 48 hours notice before tests are made. The Contractor shall furnish the Architect a certificate of approval from the Local Authority Having Jurisdiction.

3.3 At the time the tests are conducted, the following personnel shall be present:

A. Architect
B. Mechanical Engineer
C. Owner
D. Mechanical Contractor including:
   1. Sheetmetal sub-Contractor
   2. Electrical sub-Contractor
   3. Temperature Control sub-Contractor
E. Other trades as may be required to successfully conduct tests.

3.4 Equipment shall be tested in operation for a continuous period of not less than 48 hours.

3.5 Automatic control systems shall be adjusted and tested to assure satisfactory operation through every cycle of operation. Safety controls shall be tested to assure performance of their required function.
3.6 Defects in the work provided shall be corrected and the tests repeated at no additional cost to the Owner.

3.7 Labor, material and instruments required for check tests shall be provided by the Contractor at no additional cost to the Owner. Any cutting of ductwork or insulation required during test shall be repaired to the satisfaction of the Architect.

END OF SECTION 23 01 00
SECTION 23 05 00 - MATERIALS AND METHODS

PART 1 - GENERAL

1.1 GENERAL CONDITIONS

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

1.2 SCOPE

A. Materials and equipment furnished under these specifications shall be new and free of scratches or any other imperfections and shall be the current product of the Manufacturer for the intended service.

1.3 REFERENCES

A. Mechanical materials furnished under these specifications shall be new and listed, inspected and approved by the Underwriters' Laboratories (UL) and shall bear the UL label where labeling service is available. Where the UL labeling service is not available, the Contractor shall submit a statement from a nationally recognized, adequately equipped testing agency indicating that the items have been tested in accordance with required procedures and that the materials and equipment comply with all contract requirements. Materials and equipment shall also comply with the requirements of all applicable Codes.

1.4 SUBMITTALS

A. Submittals that do not contain the General Contractor's and Mechanical Contractor's stamps of approval shall be returned without review.

B. Where Drawings are required, they must be submitted along with product data. Separate submittals will not be reviewed.

C. Submittal data shall include (See individual Specification Sections for detail requirements), but not be limited to the following:

1.5 SUBSTITUTIONS

A. The name of a certain brand, make, Manufacturer or definite specification is to denote the quality standard of article desired, but does not restrict bidders to the specified brand, make, Manufacturer or specification named. Substitution of any other brand, make, or Manufacturer, which in the opinion of the Architect or Engineer, and approved by the Owner, is recognized the equal of that specified, shall be accepted, but only if submitted within the requirements of Division 1. If substitute equipment is allowed, the Contractor shall be responsible for its use and for its ability to fulfill all intended functions in the completed system with no additional or extra cost to the Owner.

B. When substituted equipment is dissimilar from that specified, the Contractor may be requested by the Engineer to submit layout drawings (drawn to scale) indicating the proposed method of installation. Modifications required to duct, piping, access, etc. shall be clearly indicated. All cost associated with such modification shall be the responsibility of the Contractor providing the substitute equipment.

C. When three or more Manufacturers are specified, there will be no substitution.
PART 2 - PRODUCTS - Not Applicable

PART 3 - EXECUTION

3.1 Materials and equipment shall be properly stored and protected at the project site until installation by the Contractor and acceptance by the Owner. Materials intended for indoor use must be stored inside or adequately protected from the weather.

3.2 Workmanship shall be of highest quality and shall conform to standard practice for trade involved.

3.3 Equipment and/or ducts shall not be supported from the roof deck, the ceiling or the support wires.

3.4 CLEANING

A. Remove all dirt trash and oil from the exterior and interior or all equipment and duct prior to installation.

3.5 REPAIR OF EXISTING WORK

A. Repair of existing work, demolition, and modification of existing plumbing and/or HVAC systems shall be performed as follows:
   1. Workmanship: Lay out work in advance. Exercise care when cutting, channeling, chasing, or drilling of floors, walls, partitions, ceilings, or other surfaces as necessary for proper installation, support, or anchorage of other work. Repair damage to buildings, piping, and equipment using skilled craftsmen of trades involved.
   2. Existing Concealed Piping to be Removed: Existing concealed piping to be removed shall be disconnected from its source. Cut piping flush with floor, underside of floor, and through walls; and seal openings.
   3. Maintain access and operation of existing installations and devices which are to remain active. Modify installation or provide access panel as required.
   4. Surfaces damaged by demolition and unfinished surfaces exposed by demolition shall be repaired and painted to match surrounding surfaces.

END OF SECTION 23 05 00
SECTION 23 05 93 - STARTING, TESTING, ADJUSTING AND BALANCING

PART 1 - GENERAL

1.1 WORK INCLUDED

A. The work under this Section shall include the adjustment of each air system to design quantities, the balance of all water systems, verification of the performance of equipment and automatic controls, electrical measurements, and all labor, materials, equipment and services required to perform the work specified in this Section.

B. Testing, adjusting and balancing shall be performed and conducted in strict accordance with the methods and requirements of the NEBB or AABC. The Contractor shall secure the services of an independent Testing and Balancing Contractor, certified by the NEBB or AABC, to perform the work outlined herein. The TAB Agency shall have been in the TAB business for a minimum of 5 years.

1.2 QUALITY ASSURANCE

A. Adhere to all standards, codes, rules and regulations listed in SECTION 23 01 00 - GENERAL PROVISIONS.

B. All test and balance procedures shall be in accordance with Standards published by the NEBB or the AABC.

1.3 SUBMITTALS

A. Submittals shall be in accordance with Section 23 05 00 - MATERIALS AND METHODS.

B. Four (4) copies of a complete testing and balancing report shall be submitted to the Engineer for evaluation and approval prior to final acceptance of the project.

C. The report shall list all test, adjust and balance work reported on NEBB approved forms. It shall also include a letter of certification listing all instruments and the last date of calibration of each. This report shall be submitted at least two (2) weeks prior to final inspection.

PART 2 - PRODUCTS

2.1 INSTRUMENTS

A. Provide all instruments required to properly perform the test and balance work. All instruments shall be of first quality and accurately calibrated at the time of use.

B. Whenever possible, the same instrument shall be used for the entire job to avoid possible errors in calibration. If more than one instrument of a similar type is used, check to verify the variation in instrument readings does not exceed plus or minus 5%.

2.2 ACCESSORY DEVICES
A. The Mechanical Contractor shall provide, as required by the TAB Contractor, all necessary dampers, and other appurtenances as required. He shall coordinate the location of these devices as construction progresses to avoid disturbing the finished systems.

PART 3 - EXECUTION

3.1 TAB work will be required to adhere to phasing requirements of the project. This will require repeated visits to the Site.

3.2 PREPARATION

A. Notify the Engineer in writing of the date and time of all tests a minimum of one (1) week prior to start of air and water systems tests.

B. Test, adjust and balance work shall not begin until the system installation is complete, the system is thoroughly cleaned prior to start-up, and the system is in full working order.

C. The Temperature Control/Energy Management Contractor shall provide a mechanic familiar with the building control systems for the purpose of making modifications and adjustments to the control system to complete the balancing work.

D. After completion of the installation of the air conditioning, heating, ventilating, and exhaust systems, and prior to acceptance by the Owner, all systems and appurtenances applicable to the above systems shall be adjusted and balanced to deliver the air and water quantities as specified and indicated on the Drawings.

3.5 AIR SYSTEMS TESTING

A. The test and balance agency shall perform the following for each system:
   1. Adjust fan RPM, tighten and align fan belts.
   2. Adjust volume dampers to obtain desired air flow.
   3. Adjust grilles, diffusers and registers to obtain desired air flow and air pattern.
   4. Adjust dampers to obtain desired outdoor air quantities.
   5. Operation of automatically operated dampers shall be verified.

B. Total system air values shall be determined by traversing supply, return and/or outside air intake ductwork. Where this methodology is not possible, a summation of values obtained at individual outlets and inlets is acceptable. Where the summation method is used, it shall be clearly noted for each instance in the final report.

C. A set of neatly marked plans identifying the location of all recorded data shall be submitted with the report.

3.6 REPORTING

A. The test and balance technicians shall record the following data for each system and include it in the report. All data shall be neatly typed.
   1. Location, Manufacturer, serial number, model number, size, design air flow and design static pressure of each air handling unit, exhaust fan, or air moving device.
2. Discharge and suction static pressure of each air handling unit, exhaust fan, or air moving device.
3. Supply air and mixed air temperature for each air handling unit.
4. Fan CFM and RPM.
5. Manufacturer, location, size, design and actual CFM air quantities, of each supply, return, or exhaust grille or diffuser.

3.7 FIELD QUALITY CONTROL

A. Air side balancing tolerance shall be +10% of design values unless otherwise noted.

B. Use duct mounted dampers for rough air balance. Trim with register or diffuser mounted dampers to avoid excessive room air noise.

C. Any work showing faults during the testing or any work not in accordance with the Contract Documents shall be corrected by the Mechanical Contractor at his own expense prior to preparation of the final report. Failure to correct faults shall result in the final report being rejected without review.

END OF SECTION 23 05 93
SECTION 23 07 13 - DUCT INSULATION

PART 1 - GENERAL

1.1 SCOPE

A. New supply, return and return air ductwork shall be insulated as specified herein unless otherwise indicated on the contract drawings.

PART 2 - PRODUCTS

2.1 Interior supply, and return air intake ductwork and plenums, including metal on the back of diffusers and registers shall be insulated with 2" thick, 1.0 PCF, fiberglass flexible blanket type or rigid board type insulation with fire retardant, reinforced foil-backed vapor barrier.

PART 3 - EXECUTION

3.1 Insulation shall be applied with 100 percent coverage of fire retardant adhesive.

3.2 Joints shall be sealed with minimum 3" wide strips same as vapor barrier jackets.

3.3 All transitions to and from flexible duct shall be sealed with 3" wide strips same as vapor barrier jackets.

3.4 Insulation and accessories shall be applied in accordance with the Manufacturer's recommendations unless indicated otherwise.

3.5 Insulation shall be applied on clean, dry surfaces after inspection. Run insulation continuous through wall, floor, roof and ceiling openings. Insulation on cold surfaces where vapor barrier jackets are used, shall be applied with a continuous unbroken vapor seal. Hangers, supports, anchors, etc., that are secured directly to cold surfaces must be adequately insulated and vapor sealed to prevent condensation.

END OF SECTION 23 07 13
SECTION 23 31 13 - SHEET METAL DUCTWORK

PART 1 - GENERAL

1.1 Provide complete systems of supply, and return ducts as shown on the drawings.

1.2 Duct sizes shown on drawings are clear inside dimensions. Where sizes must be varied from those indicated on the drawings, the full area of the duct shall be maintained.

PART 2 - PRODUCTS

2.1 Ductwork shall be galvanized steel sheets constructed and supported in accordance with the recommendations of the ASHRAE Guide and SMACNA Duct Construction Standards. All duct joints and seams shall be sealed with approved duct sealant.

2.2 Supply and/or return ducts where indicated on plans as internally lined shall be acoustically lined with 1” thick liner. Duct liner shall be permacote, liacoustic HP or equal.

2.3 Furnish and install volume dampers where indicated on the drawings. Dampers shall be constructed of not lighter than 18 gauge galvanized sheet metal and shall be equipped with blade bearings. Damper shafts shall be terminated in locking quadrants. Damper blades shall be bent and center grooved for rigidity. Damper in ducts larger than 220 sq. inch in cross-sectional area shall be opposed blade dampers. All dampers shall be provided with a minimum of 2” standoffs to clear insulation.

2.4 Flexible round ductwork shall be 1” thick flexible fiberglass duct with fire-resistant aluminum pigmented plastic vapor barrier, and continuous inner barrier film. Flexible duct runouts shall not exceed 5 feet in length. Runouts longer than 5 feet shall be rigid round duct (field insulated) with the last 5 feet being flexible ducting.

PART 3 - EXECUTION

3.1 Ductwork shall be true to the dimensions indicated on the drawings and shall be straight and smooth on the inside with joints neatly finished. Duct shall be supported in accordance with SMACNA duct construction standards. Ducts shall not be supported from the metal deck systems.

3.2 After the installation is complete and prior to insulation application, the Contractor shall clean inside and outside of duct system.

3.3 No ductwork shall be run above the Electrical equipment rooms.

END OF SECTION 23 31 13
1.1 GENERAL CONDITIONS

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

1.2 SCOPE

A. The work required for this Division includes [[demolition,]] labor, materials, equipment, appurtenances, coordination and services to provide a complete and fully operational electrical system as shown on the drawings and specified in the specifications, including special systems indicated.

B. The Contractor shall install the systems as specified herein and indicated on the drawings and shall furnish the labor, material, tools, scaffolds, erection equipment, services and other items of expense as necessary as a part of this Contract. This Contract further includes placing the systems into operation and properly testing, adjusting, and balancing the items of equipment as specified and as approved by the Architect/Engineer.

1.3 APPLICABLE SPECIFICATIONS, CODES AND STANDARDS

A. The latest effective publications of the following standards, codes, etc., as applicable form a part of these specifications the same as if written fully herein and shall be followed as minimum requirements. The Contractor shall be responsible for furnishing and installing higher grade materials and workmanship in excess of the minimum requirements where indicated on the drawings and in the specifications.

1. National Electrical Code (NEC)
2. Underwriters Laboratories (UL)
3. Institute of Electrical and Electronic Engineers (IEEE)
4. National Fire Protection Association (NFPA)
5. National Electrical Manufacturer's Associations (NEMA)
6. American National Standards Institute (ANSI)
8. Occupational Safety and Health Act (OSHA)
9. Certified Ballast Manufacturers Association (CBMA)
10. Insulated Cable Engineers Association (ICEA)
11. Americans with Disabilities Act (ADA)
13. Service Rules and Regulations of the local Utility Companies
14. State and Local Building Codes
15. Local Authority Having Jurisdiction (LAHJ)

B. The Contractor shall give the required notices, obtain the necessary permits, and pay the permit and inspection fees.

C. The Contractor shall provide the necessary information to assist the Owner in obtaining
permanent Electrical service from the Power Company. For additional information, see Section 260510 - Electrical Service.

D. The Contractor shall coordinate with the local Power, Cable Television, and Telephone companies and install the services as required.

E. The equipment, material, apparatus, and work shall conform to the requirements of the NEC. If the Contractor observes that the drawings and specifications are at variance therewith, he shall notify the Architect/Engineer in writing. If the Contractor performs such work contrary to the above referenced rules and regulations and without written acknowledgment or notice thereto, he shall correct this work and bear the cost arising therefrom.

1.4 SUPERVISOR

A. As required by the laws of the Commonwealth of Virginia, the Electrical Contractor shall always have a Supervisor on the job when electrical work is being installed. This shall include the work being accomplished by the contractors who are subcontractors to the prime Electrical Contractor.

B. The Supervisor shall be licensed by the Commonwealth of Virginia as a "Master" in the electrical construction trade.

1.5 DEFINITIONS

A. Where the word "Contractor" appears in this Division of the specifications, it shall apply to the Contractor performing the Electrical portion of the work, unless explicitly noted otherwise.

B. "Install" shall mean to place, fix in position, secure, anchor, etc., including necessary appurtenances and labor so the equipment or installation will function as specified and intended.

C. "Furnish" shall mean to purchase and supply equipment or components.

D. "Provide" shall mean "Furnish and Install".

E. "Or approved equal" shall mean equal in type, design, quality, etc., as determined by the Engineer.

1.6 CONTRACT DOCUMENTS

A. The Architectural, Structural, Mechanical, Electrical and Equipment drawings and specifications are hereby incorporated into and become a part of this Division. The Contractor shall examine all such drawings and specifications and become thoroughly familiar with provisions contained herein and the submission of this bid shall be constructed as indicating such knowledge.

B. The drawings and specifications are intended to cover the work enumerated under respective headings. The drawings are diagrammatical only. The exact locations of apparatus, fixtures, equipment and conduits shall be ascertained from the Architect. Minor variations in location of equipment shall be made upon written approval of the Architect at no additional cost to the Owner.

C. This Contractor shall examine the architectural, structural, plumbing, mechanical and electrical drawings and specifications to avoid conflict with other trades. Minor variations
in location of equipment shall be made upon written approval of the Architect at no additional cost to the Owner. No Contractor shall take advantage of conflict or error between the drawings and specifications or between general drawings and Plumbing, Mechanical and/or Electrical drawings but shall request a clarification of such from the Architect/Engineer should this condition exist. If there is insufficient time to issue an addendum for this clarification, the Contractor shall be required to assume the most expensive item in conflict.

D. Cooperate and coordinate the work of this Division with other trades.

E. The Electrical drawings and specifications are intended to supplement each other and any material called for by one shall be as binding as if specifically mentioned in both. Labor and/or materials neither shown nor specified but necessary for the complete installation and proper functioning of the systems shall be provided by the Contractor.

F. Equipment provided under this Division of the specifications shall be installed in accordance with the recommendations of the equipment or material manufacturer.

1.7 VISIT TO THE SITE

A. The Contractor shall visit the site of the work and familiarize himself with the conditions affecting his work, and submission of his proposal shall be construed as indicating such knowledge. No additional payment will be made on claims that arise from lack of such knowledge of existing conditions.

1.8 TEMPORARY LIGHTING AND POWER

A. Provide in accordance with NEC, NFPA and Section 260510 - ELECTRICAL SERVICE of this specification.

B. Provide temporary service and wiring as required to support construction of the project. Permanent wiring provided by this project shall not at anytime be used as temporary wiring, unless otherwise noted.

1.9 COORDINATION

A. Before installing any of this work, the Contractor shall verify that it does not interfere with clearances for the erection of finish beams, columns, pilasters, walls and other structural or architectural members as shown on the Architectural drawings. If any work is so installed and it later develops that the Architectural design cannot be followed, the Contractor shall, at his own expense, make such changes in his work as the Architect may direct to permit the completion of the Architectural work in accordance with the drawings and specifications.

B. It shall be the duty of the Contractor to report any interferences between his work and that of any other Division to the Architect as soon as they are discovered. The Architect will determine which equipment shall be relocated regardless of which was first installed, and his decision shall be final.

C. Installation of various conduit runs and equipment shall conform to conditions in the building and any changes shall be submitted in sketch form to the Architect for approval.

D. The Electrical Contractor shall obtain the electrical requirements for intended motors and/or equipment from the Mechanical/Plumbing Contractor(s), the Food Service Contractor, the Civil Contractor, and the General Contractor during the Submittal/Shop Drawing phase. Any electrical modifications required to support the intended
1.10 EQUIPMENT CONNECTIONS

A. Disconnect switches, starters, controllers, variable frequency drives and line voltage connections to fan switches and thermostats shall be provided under this Division, unless otherwise indicated. The control wiring regardless of voltage shall be provided under the Division providing the motor and/or equipment. Coordinate connection requirements with given trade prior to electrical equipment order and release. The Contractor shall be responsible for reviewing the drawings and coordinating with other trades and Divisions to determine the exact quantity, sizes and locations of the equipment. Provide adequately sized power wiring and conduit and make final connections to this equipment, whether indicated or not on the Electrical drawings, to allow proper functioning of the systems. Provide junction boxes with line voltage power source for control voltage wiring by other Divisions, as required.

B. Power wiring and power connections to the equipment shall be provided under Division 26 - ELECTRICAL unless otherwise indicated on the Electrical drawings.

C. When substituted motors and/or equipment require electrical modifications to support said motors and/or equipment, the cost of the electrical modifications, associated work and coordination shall be included under the Division providing the motor and/or equipment.

1.11 CUTTING AND PATCHING

A. The work shall be carefully laid out in advance, and where cutting, channeling, chasing, or drilling of floors, walls, partitions, ceiling, or other surfaces is necessary for the proper installation, support, or anchorage of the conduit, raceways, or other electrical work, this work shall be carefully done, and any damage to building, piping, or equipment shall be repaired by skilled mechanics of the trades involved, at no additional cost to the Owner. Cutting of masonry block shall be done with masonry saw.

1.12 EQUIPMENT MARKING AND PAINTING

A. Panelboards, safety switches, cabinets, etc. shall be provided with permanently attached (adhesives not acceptable), laminated black phenolic label with 3/8" engraved white letters to indicate equipment or circuit controlled. Safety Switches associated with HVAC, Plumbing or Kitchen Equipment shall indicate the circuit controlled.

B. The electrical apparatus such as switchgear, disconnect switches, panelboard enclosures, transformer housings, motor controllers, terminal cabinets, and light fixture housings, shall be post-fabrication factory painted.

C. Interior exposed, metal, conduit, etc., in finished spaces shall be painted with two coats of paint to match adjacent surfaces as directed by the Architect. Additional marking and painting shall be as indicated in the specific equipment specification sections.[[Interior exposed, metal, conduit, in unfinished spaces shall be painted as directed by the Architect.]]

1.13 DEFACEMENT OF EQUIPMENT

A. Equipment shall not be defaced with any form of personal advertisement, stickers, or nameplates.
CEDAR ROAD ELEMENTARY SCHOOL ADDITION
CHESAPEAKE PUBLIC SCHOOLS
BID 48-1920

B. Manufacturers rating plates and other acceptable identification as required by code for equipment is permitted, and this material shall be applied in usual and acceptable manner.

C. Protect the equipment provided against damage during construction to the satisfaction of the Architect/Engineer. If damage occurs to materials, refinish, repair, or replace the equipment or material as directed by the Architect/Engineer.

1.14 ACCESS DOORS

A. This Contractor shall furnish and the General Contractor shall install steel access doors where necessary and where required by the LAHJ, especially for electrical access, style necessary for surface in which placed, sized as indicated or required, with cylinder lock.

1.15 SHOP DRAWINGS

A. Submit complete shop drawings covering the equipment listed in Section 260050 for review. The Contractor shall check the shop drawings, and arrange the shop drawings for submittal as described.

260510 - Electrical Service (conductors)  Panel
260513 - Wire and Cable  262500 - Low Voltage Busway
260526 - Grounding  262713 - Meter Centers
260533 - Conduit and Fittings  262726 - Wiring Devices
260534 - Outlet Boxes  262813 - Fuses
260535 – Surface Non-Metallic Raceway  262816 - Disconnect Switches
260536 - Cable Tray System  262817 - Circuit Breakers and Fusible Switches
260543 - Underfloor Duct Systems  264113 - Lightning Protection System
260923 - Lighting Controls  264313 - Transient Voltage Surge Suppression
262213 - Dry-Type Transformers  265000 - Lighting Fixtures (all types)
262216 - Non-Linear Dry-Type Transformers  273000 - Telephone System
262218 - Main Switchboard  278000 - Specialty Sound System
262413 - Panelboards  283000 - Fire Alarm System
262423 - Loadcenters  - Dimming System
262438 - Main Distribution  - Emergency Generator

1.16 PROJECT INSPECTIONS

A. The Contractor shall notify the Engineer to perform project inspections to verify that the installed materials and workmanship conform to codes and the specifications. The inspections shall include, but not be limited to:

1. Inspection of conduits within or below slab prior to pouring of slab.
2. Electrical rough-in.
3. Above ceiling inspection prior to installation of final ceiling.

B. If any electrical material, device or workmanship does not meet the intent of these specifications, the Contractor shall remove the material and devices complete, and then reinstall the material or devices per these specifications, at no additional cost to the Owner. If any of the electrical material is damaged during this removal, the Contractor shall be required to provide new electrical devices or material.
C. If the final ceiling has been installed prior to the inspection, the Contractor shall provide access to above the ceiling as required. This work shall be performed by the Contractor at no additional cost to the Owner.

1.17 FINAL INSPECTION AND TESTS

A. Upon completion of the entire work, the Contractor shall perform such tests as required by the Architect. The Architect shall be given 48 hours’ notice before tests are made. The Contractor shall provide the manpower and equipment necessary to perform the tests required by the Architect. Upon completion of the tests and inspections, the Contractor shall furnish the Architect a certificate of approval from the LAHJ.

1.18 RECORD DRAWINGS

A. Keep accurate records of the deviations in work as indicated and as actually installed. Record drawings shall be kept at the project site and available for monthly review.

B. Upon completion of the work, the Contractor shall submit corrected reproducible drawings and specifications indicating deviations made in the actual installation to the contract plans.

C. When work is completed, make one complete record set of marked prints, certify the accuracy of each print by endorsement and signature thereon, and deliver same to the Architect/Engineer who will, after approval, deliver the set to the Owner. Record drawings will be revised as required by the Engineer until the Engineer accepts them as correct and accurately reflecting the project as constructed.

1.19 WARRANTY

A. This Contractor shall furnish written warranty, countersigned and guaranteed by the General Contractor, stating that the work executed under this Division of the specifications shall be free from defects of materials and workmanship for a period of 12 months from the date of final acceptance of building, except as otherwise noted in these specifications.

1.20 SCHEDULE OF VALUES

A. This Contractor shall furnish, and the General Contractor shall include as a minimum the following list of items. This shall form the basis for determining the completed work as part of the Application for Payment process.

- Demolition
- Voice/Data/Video System Engineering
- Voice/Data/Video System (material)
- Voice/Data/Video System (labor)
- Fire Alarm System (material)
- Fire Alarm System (labor)
- Conduit, Boxes and Fittings (material)
- Conduit, Boxes and Fittings (labor)
- Lighting Fixtures (material)
- Lighting Fixtures (labor)
- Panels, Starters, Safety Switches and Transformers (material)
- Panels, Starters, Safety Switches and Transformers (labor)
- Main Switchboard (material)
- Main Switchboard (labor)
1.21 TRAINING

A. Refer to each Section of the Specification for the required Training.

B. The Attached form shall be utilized to document the training and shall be included in the Maintenance and Operation Manuals.

PART 2 - PRODUCTS - NOT APPLICABLE

PART 3 - EXECUTION - NOT APPLICABLE

END OF SECTION 26 00 10
Owner Training Certification

Project:

Equipment:

Contractor Certification

The undersigned as the Contractor’s authorized training agent for the above noted equipment certifies that all required and applicable training has been provided to the Owner’s representative(s) per the project Contract.

Contractor Representative: ___________________________ Date: _______

Owner Certification

The undersigned as the Owner’s authorized agent certifies that all required and applicable training has been provided to the Owner’s satisfaction.

Owner Representative: _______________________________ Date: _______
PART 1 - GENERAL

1.1 GENERAL CONDITIONS

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

1.2 SCOPE

A. Install materials in a first class and workmanlike manner and specifically, run conduit concealed throughout building, except as indicated or approved by the Architect.

1.3 REFERENCES

A. Electrical materials furnished under these specifications shall be new and listed, inspected and approved by the Underwriters' Laboratories (UL) and shall bear the UL label where labeling service is available.

B. Where the UL labeling service is not available, the Contractor shall submit a statement from a nationally recognized, adequately equipped testing agency indicating that the items have been tested in accordance with required procedures and that the materials and equipment comply with all contract requirements. Materials and equipment shall also comply with the requirements of all applicable Codes.

1.4 SUBMITTALS

A. Contractor shall submit complete schedules of material and equipment proposed for installation to the Architect within 90 days after award of the contract, in quantities as indicated in Division 1. The schedules shall include catalogs, cuts, diagrams and such other descriptive data and/or samples as indicated in the SUBMITTALS paragraph of each Section in Division 26 - ELECTRICAL. Schedules of material which consist of facsimiles or copies of facsimiles shall be unacceptable. If after expiration of the 90 day period or any extension thereof as authorized by the Architect the Contractor fails to submit a schedule of acceptable material or equipment, the Engineer reserves the right to accept no substitutions, and the Contractor may be required to submit material and equipment as specified. In the event any items of material or equipment submitted within the 90 day period fail to comply with the specification requirements, such items will be rejected and approved items shall be submitted for the items rejected. If the resubmitted material or equipment fails to comply with the specification requirements, the Contractor shall then be required to submit material and equipment as specified without additional cost to the Owner.

B. Submittals which do not adhere to the following format shall be rejected without review. Submittals shall be bound by staples, or in book form. The first page of the submittal shall be a Title page, which shall indicate the Project name and Project address, the General Contractor's name, address, phone number and contact and the Electrical Contractor's name, address, phone number and contact. The second page of the submittal shall be a Table of Contents indicating the specification section number and name, and contain the General Contractor's and the Electrical Contractor's stamps of approval. Blank page dividers shall separate each section and shall be tagged with the corresponding specification section number as listed under the SHOP DRAWINGS paragraph, Section 26010 - GENERAL PROVISIONS. One of the submittals shall be hole-punched and placed in a 3-ring binder, which shall be retained by the Engineer. Partial submittals shall be allowed only when requested by the Contractor in writing and
approved by the Engineer. The copies shall be clear and readable. Approved copies of all shop drawings shall be kept on the job site at all times accessible to the Architect/Engineer.

C. Submittals that do not contain the General Contractor’s and Electrical Contractor’s stamps of approval shall be returned without review.

D. Where Drawings are required, they must be submitted along with product data. Separate submittals will not be reviewed.

E. Submittal data shall include (See individual Specification Sections for detail requirements), but not be limited to the following:

Fuses

Conduit and Fittings
- Rigid Steel Conduit and Fittings
- IMC Conduit and Fittings
- EMT Conduit and Fittings
- PVC Conduit and Fittings
- FMC Conduit and Fittings
- Liquid Tight FMC Conduit and Fittings
- Supports

Surface Non-metallic Raceway
- Raceway, covers, fittings and end caps
- Outlets

Underfloor Duct Systems
- Size and material data sheets
- Fittings, outlets and supports

Cable Tray System
- Cable tray accessories and fittings with load and deflection data

Wire and Cable
- Aluminum conversion chart (where applicable)

Wiring Devices
- Wiring devices
- Device plates/or covers

Outlet Boxes
- Outlet boxes and fitting
- Multi-service flush floor boxes, fittings and covers

Panelboards
- Catalog data (cabinet, covers circuit breakers)
- Drawing indicating detentions, location of main, branch and solid neutral and equipment ratings for voltage, amperage and short circuit. Series rating riser diagram and calculations as required.

Disconnect Switches
- Catalog data-Interior mounted switches
- Catalog data-Nema-3R or Nema-4 stainless steel switches
Main Distribution Panel
- Catalog data
- Drawing indicating detentions, location of main, branch and solid neutral and equipment ratings for voltage, amperage and short circuit. Series rating riser diagram and calculations as required.

Main Switchboard
- Catalog data
- Drawing indicating detentions, location of main, branch and solid neutral and equipment ratings for voltage, amperage and short circuit. Series rating riser diagram and calculations as required.
- Single line diagram

TVSS data

TVSS Devices
- Catalog data
- Category C3 independent clamp voltage test results
- UL 1449 clamp voltage documentation

Lightning Protection System
- Air terminal
- Base assembly
- Main conductor
- Ground rods

Meter Centers

Grounding
- Ground rod and clamp
- Ground wire

Dry Type Transformers
- Catalog data including dimensions, weight and sound level
- Accessories

Non-Linear Dry Type Transformers
- Catalog data including dimensions, weight and sound level
- Accessories

Low Voltage Busway

Loadcenters

Circuit Breakers and Fusible Switches

Low Voltage Automatic Transfer Switches

Lighting Fixtures
- Aiming charts (where applicable)
- Foot candle point grips (where applicable)

Lighting Controls
- Photocells
- Timeclocks
- Contactors
- Ultrasonic occupancy sensors
- Infrared occupancy sensors
- Interconnecting diagrams
- Light harvesting systems

Theatrical Dimming System
- Single line system diagram
- Dimmer rack
- Electronic modules
- Dimmer modules
- Automatic transfer system (switch & panel)
- Remote control stations
- Theater control console
- Auxiliary controls and devices
- Stage electrical rigging equipment
- Lighting instruments and accessories

Theatrical Lighting and Rigging System
- Lighting Fixtures lamps and distribution components
- Lighting control components
- Single line system diagram
- Rigging systems

Exit and Emergency Lighting System
- AC inverter system
- Battery charger

Packaged Engine Generator
- Product data
- Shop Drawings

Fire Alarm System
- Control panel/cabinet
- Peripheral devices
- Graphic Annunciator
- Duct mounted smoke detector
- Point to point CAD drawing
- Batteries with calculations
- Construction process narrative

Fire Control Communicator

Security Motion Sensor System

Wireless Clock System
- Product data as required
- Operating license

Closed Circuit Television Surveillance Systems
- Drawings of device locations

Wireless Bell and Tone Synchronization System
- Operator license

Nurse Call System
Television Distribution System
- Product data as required
- Device layout and location drawings
- Equipment rack layouts
- Cabinets and assembly
- Contractor qualification

Speakers, Intercom Paging and Clock System

Intercommunication System
- Product data as required
- Single line system diagram (each system)
- Device layout and location drawings
- Equipment rack layouts
- Cabinets and assemblies
- Contractor qualification

Data Distribution System
- Product data as required
- Single line system diagram (each system)
- Device layout and location drawings
- Equipment rack layouts
- Cabinets and assemblies
- Contractor qualification

Specialty Sound Systems
- Required product data
- Single line system diagram (each system)
- Contractor qualification
- Device layout and location drawings
- Cabinets and assemblies

Motor Control
- Magnetic motor controllers
- Manual starters

1.5 SUBSTITUTIONS

A. The name of a certain brand, make, Manufacturer or definite specification is to denote the quality standard of article desired, but does not restrict bidders to the specified brand, make, Manufacturer or specification named. Substitution of any other brand, make, or Manufacturer, which in the opinion of the Architect or Engineer, and approved by the Owner, is recognized as equal to that specified, shall be accepted, but only if submitted within the requirements of Division 1. The Contractor shall make available a sample of the substituted equipment within fourteen (14) calendar days when requested by the Engineer to determine if the equipment is equal to that specified. If substitute equipment is allowed, the Contractor shall be responsible for any building or utility modifications and for its ability to fulfill the intended functions in the completed system, with no additional cost to the Owner.

B. When substituted equipment is provided, the Contractor may be requested by the Engineer to submit electrical equipment room/space layout drawings (drawn to scale) indicating the proposed method of installation, including all required clearances. All cost associated with such modifications shall be the responsibility of the Contractor providing the substitute equipment.
C. When three or more Manufacturers are specified, there will be no substitution.

PART 2 - PRODUCTS

2.1 Replace or repair defective equipment and materials, or material damaged in the course of delivery, storage or installation.

PART 3 - EXECUTION

3.1 Material and equipment shall be properly stored and protected until installed by the Contractor and acceptance by the Owner. Materials intended for indoor use must be stored inside or adequately protected from the weather.

3.2 Switchboards, panelboards, transformers, and safety switches shall be manufactured by the same Manufacturer. Wiring devices shall be manufactured by the same Manufacturer.

3.3 SUPPORT AND MOUNTING

A. Provide all angle iron, channel iron, rods, supports or hangers required to install or mount switchboards, panelboards, transformers, safety switches, or any electrical equipment called for on the plans and in the specifications, or as necessary to mount any piece of electrical equipment, material or device.

B. Provide a minimum 4” thick housekeeping PAD under all floor/ground mounted equipment. Concrete housekeeping PAD larger than the physical dimension of the equipment concrete PAD shall be provided for switchboards, transformers, and emergency generator. Emergency generator concrete PAD is required to have a minimum of 6” thick concrete PAD (thickness shall be based on weight) and 12” extension beyond the equipment footprint.

3.4 Conduit, fixtures or any electrical devices shall not be supported from the steel roof deck, the ceiling, or the ceiling support wires.

3.5 CLEANING

A. Remove dirt, trash, and oil from raceways, boxes, fittings, cabinets, panelboards, and switchgear.

3.6 OPERATION AND MAINTENANCE MANUALS

A. Furnish to the Architect/Engineer a copy of maintenance manuals for the electrical equipment. After approval by the Architect/Engineer, provide copies as required by Division 1 or two copies, whichever is greater, bound in hardback, loose-leaf binders, properly identified and indexed, and turn these copies over to the Owner's representative.

B. Maintenance manuals shall include the necessary information to provide complete instructions of servicing and maintenance of the equipment installed. Manuals shall include, but are not limited to, light fixtures, electric switchgear, panelboards, transformers, starters and controllers, contactors, disconnect switches, and auxiliary systems equipment and devices. Provide a copy of each panelboard index in the maintenance manuals.

3.7 REPAIR OF EXISTING WORK

A. Repair of existing work, demolition, and modification of existing electrical systems shall be performed as follows:
1. Workmanship: Lay out work in advance. Exercise care when cutting, channeling, chasing, or drilling of floors, walls, partitions, ceilings, or other surfaces as necessary for proper installation, support, or anchorage of conduit, raceways, or other electrical work. Repair damage to buildings, piping, and equipment using skilled craftsmen of trades involved.

2. Existing Concealed Wiring to be Removed: Existing concealed wiring to be removed shall be disconnected from its source. Remove conductors; cut conduit flush with floor, underside of floor, and through walls; and seal openings.

3. Removal of Existing Electrical Distribution System: Removal of existing electrical distribution system equipment shall include equipment's associated wiring, including conductors, cables, exposed conduit, surface metal raceways, boxes, fittings, etc., back to equipment's source as indicated.

4. Maintain access and power supplied to existing electrical installations and devices which are to remain active. Modify installation or provide access panel as required.

5. Surfaces damaged by demolition and unfinished surfaces exposed by demolition shall be repaired and painted to match surrounding surfaces.

END OF SECTION 26 00 50
PART 1 - GENERAL

1.1 GENERAL CONDITIONS
   A. Drawings and general provisions of Contract, including General and Supplementary
      Conditions and Division 1 Specification sections, apply to this Section.

1.2 SCOPE
   A. Feeder and branch circuit wire and cable shall be intended for lighting and power circuits
      at 600 volts in residential, commercial and industrial buildings. The wire shall be
      operated at a minimum of 750°C in wet or dry locations and shall be listed by UL for use in
      accordance with Article 310 of the NEC.

1.3 REFERENCES
   A. Wire and cable shall conform to the following:

1.4 SUBMITTALS
   A. Contractor shall submit the following Shop Drawings and Submittals listed below for
      review by the Architect. Submittals shall indicate conformance with the hereinbefore
      listed References, or provide certification of meeting those requirements.
      1. Wire and cable

PART 2 - PRODUCTS

2.1 MANUFACTURERS
   A. Shop Drawings shall clearly indicate Manufacturer, catalog numbers, trade sizes and
      type of wire and cable which will be used on the project.

2.2 TYPE THW
   A. Conductors shall be solid or Class B stranded, annealed uncoated copper per UL 83.
   B. Each conductor shall be insulated with PVC complying with the physical and electrical
      requirements of UL 83. In addition, the PVC insulation shall comply with the optional Oil
      Resistant I listing of UL 83.
   C. The average thickness of insulation, for a given conductor size, shall be as specified in
      UL 83. The minimum thickness at any point shall not be less than 90% of the specified
      average thickness. The insulation shall be applied tightly to the conductor and shall be
      free-stripping.
2.3 TYPE THWN/THHN

A. Conductors shall be solid or Class B stranded, annealed uncoated copper per UL 83.

B. Each conductor shall be insulated with PVC and sheathed with nylon complying with requirements of UL 83. In addition, the PVC insulation shall comply with the optional Oil Resistant II rating of UL 83, and shall comply with UL requirements for 105 degrees Centigrade Appliance Wiring material.

C. The average thickness of PVC insulation, for a given conductor size, shall be as specified in UL 83. The minimum thickness at any point of the PVC insulation shall not be less than 90% of the specified average thickness. The minimum thickness at any point of the nylon sheath, shall be as specified in UL 83 for Types THWN or THHN. The insulation shall be applied tightly to the conductor and shall be free-stripping.

2.4 TYPE XHHW-2

A. Conductors shall be solid or Class B stranded, annealed uncoated copper per UL 44.

B. Each conductor shall be insulated with a crosslinked polyethylene complying with the physical and electrical requirements of UL 44.

C. The average thickness of insulation, for a given conductor size, shall be as specified in UL 44. The minimum thickness at any point shall not be less than 90% of the specified average thickness. The insulation shall be applied tightly to the conductor and shall be free-stripping.

2.5 TYPE USE-2

A. Conductors shall be solid or Class B stranded, annealed uncoated copper per UL 854 and UL 44.

B. Each conductor shall be insulated with a cross-linked polyethylene complying with the physical and electrical requirements of UL 854.

C. The average thickness of insulation, for a given conductor size, shall be as specified in UL 44. The minimum thickness at any point shall not be less than 90% of the specified average thickness. The insulation shall be applied tightly to the conductor and shall be free-stripping.

2.6 IDENTIFICATION

A. All insulated conductors shall be new and the outer covering shall be marked with the name and trademark of the Manufacturer, the voltage, insulation type, conductor size, and shall be tagged showing UL acceptance.

PART 3 - EXECUTION

3.1 Wire and cable shall be installed in conduit, unless otherwise indicated. Non-metallic (Type NM – “Romex”) is permitted to be installed without conduit and installed per NEC Article 336. Service entrance cable (Type SE) is permitted for panel (load centers) feeders and shall be installed per NEC Article 338.

3.2 Wires No. 10 and 12 shall be connected with coil spring insert "Wire-Nut" or "Wing-Nut" connectors manufactured by Ideal Industries or 3M Company. Wires No. 8 and larger shall be joined or terminated with 600 volt pressure type copper connectors.
3.3 Wire shall be color coded as follows, and each circuit conductor of the same color shall be connected to the same ungrounded feeder conductor throughout the installation. Phase tape shall not be permitted for wires No. 2 and smaller. Other conductors shall be of other colors.

<table>
<thead>
<tr>
<th></th>
<th>120/208 Volt System</th>
<th>277/480 Volt System</th>
</tr>
</thead>
<tbody>
<tr>
<td>Phase A</td>
<td>Black</td>
<td>Phase A</td>
</tr>
<tr>
<td>Phase B</td>
<td>Red</td>
<td>Phase B</td>
</tr>
<tr>
<td>Phase C</td>
<td>Blue</td>
<td>Phase C</td>
</tr>
<tr>
<td>Neutral</td>
<td>White</td>
<td>Neutral</td>
</tr>
<tr>
<td>Ground</td>
<td>Green</td>
<td>Ground</td>
</tr>
</tbody>
</table>

120/208 Volt System: Black, Red, Blue, White, Green
277/480 Volt System: Brown, Orange, Yellow, Grey, Green

3.4 Electrical designs are based on copper wire and cable. Aluminum wire and cable shall not be allowed.

END OF SECTION 26 05 13
PART 1 - GENERAL

1.1 GENERAL CONDITIONS
   A. Drawings and general provisions of Contract, including General and Supplementary
      Conditions and Division 1 Specifications section, apply to this Section.

1.2 SCOPE
   A. Conduit shall be run concealed within finished walls, ceilings, and floors unless otherwise
      shown on the drawings. Conduit may be exposed above joist in mechanical rooms and
      spaces with exposed construction as approved by the Architect. Conduit sizes shown
      are based on use of copper conductors with THHN/THWN insulation types, unless a
      specific type of insulation is called for on the drawings.
   B. Conduit shall be installed as a complete system, including fittings and hangers as
      specified herein or as required by the NEC, and shall be continuous from outlet to outlet
      and from fitting to fitting, and shall be mechanically and electrically connected to all
      boxes, fittings, wire ways, etc., and grounded in accordance with the NEC.

1.3 REFERENCES
   A. Conduit and fittings shall conform to the following:
      1. Rigid Steel - ANSI C80.1, UL 6
      2. Intermediate Metal Conduit (IMC) - ANSI C80.6, UL 1242
      3. Electrical Metallic Tubing (EMT) - ANSI C80.3, UL 797
      4. Flexible Metal Conduit - UL 1
      5. Liquid-Tight Flexible Metal Conduit - UL 360
      6. Plastic Conduit (PVC) - NEMA TC2, NEMA TC3, UL 651
      [7. Electrical Nonmetallic Tubing (ENT) - NEMA TC13]

1.4 SUBMITTALS
   A. Contractor shall submit the following Shop Drawings and Submittals listed below for
      review by the Architect. Submittals shall indicate conformance with the hereinbefore
      listed References, or provide certification of meeting those requirements.
      1. Conduit
      2. Fittings
      3. Supports

PART 2 - PRODUCTS

2.1 MANUFACTURERS
   A. Shop Drawings shall clearly indicate Manufacturer and catalog numbers of trade sizes
      and type of conduit, fittings and supports which will be used on the project.

2.2 CONDUIT
   A. Minimum size conduit shall be 1/2" with larger sizes as required by the NEC for number of
      wires contained therein.
B. Conduit and tubing shall be hot dipped galvanized or sheradized steel, except as hereinbefore specified.

C. Intermediate metal conduit shall be permitted in lieu of rigid where allowed in Article 345 of the NEC.

D. Flexible conduit shall be \(\frac{1}{2}\)" galvanized, single strip type, minimum 18 inches and a maximum 6 feet in length. In areas subject to moisture, or where called for on the drawings, flexible conduit shall have plastic covering in accordance with NEC, Article 351-A. Flexible conduit shall be used for connections to motors, dry type transformers and other equipment subject to vibration and for connections to recessed or semi-recessed fixtures.

E. Plastic conduit shall be PVC Type EPC-40-PVC.

F. Electrical nonmetallic tubing shall be permitted in lieu of EMT where allowed in Article 331 of the NEC.

2.3 FITTINGS

A. All conduits entering or leaving panelboards, cabinets, outlet boxes, pull boxes, or junction boxes shall have lock nuts and bushings, except provide insulated throat connectors on EMT sizes 1" and smaller. Rigid steel conduit shall have a lock nut installed both inside and outside of the enclosure entered. Bushings shall be installed on the ends of IMC and rigid steel conduit and EMT larger than 1". Insulating bushings shall be O.Z. Gedney Type "A" for rigid steel and IMC, and Type "B" for EMT. Conduit entering enclosures through concentric knockouts shall have grounding-type bushings with copper bond wire to enclosure.

B. Fittings for rigid steel and IMC shall be threaded. Where rigid steel or IMC changes to EMT above slab, fittings may be threadless type. EMT fittings shall be galvanized steel, concrete-tight, set screw type.

C. Cast metal fittings shall not be allowed for any type of conduit or cable system.

D. Provide O.Z. Gedney Type "AX" expansion fittings where conduits cross expansion joints.

E. Flexible conduit fittings shall be standard UL approved with ground connector. Watertight connectors shall be used with plastic covered conduit.

F. Provide O.Z. Gedney Type "M" cable supports as required by Article 300-19 of NEC.

PART 3 - EXECUTION

3.1 Conduits and tubing concealed in walls and above ceiling shall be electrical metallic tubing and/or electrical nonmetallic tubing, and conduits in the floor shall be rigid steel. Conduits within the slab shall be minimum 3/4" rigid steel with a minimum spacing of 2 inches between parallel runs; larger sizes shall be run below the slab. Conduits run below the first floor shall be adequately supported by approved hangers supported entirely from the building structural system if the building has a crawl space or if the building has a pile foundation.

3.2 Exposed conduits shall be run parallel or perpendicular to building walls and shall be supported as hereinafter specified and in accordance with NEC.

3.3 Conduits run outside of building perimeter shall be minimum 3/4 inch and buried a minimum of
24" below finished grade. Conduits run below slab on grade shall be minimum 3/4 inch and buried a minimum as specified in Table 300-5 of the NEC. Provide any extensions required to ensure conduits are protected below slab. These conduits shall be rigid non-metallic polyvinylchloride conduit, minimum Schedule 40, unless a specific type of conduit is specified or indicated on the drawings. Schedule 40 nonmetallic PVC conduit shall be changed to Schedule 80 nonmetallic PVC conduit when passing through the floor slab and remain Schedule 80 up to the first Electrical box. The first two masonry block courses shall be grouted where conduits pass through the slab. Fiber duct shall not be allowed.

3.4 Metallic conduits shall be securely fastened in place at intervals not greater than 10 feet and nonmetallic conduits shall be securely fastened at intervals not greater than 3 feet. All conduits shall be securely fastened in place within 3 feet of boxes, cabinets, and fittings, with approved pipe straps, wall brackets, conduit clamps, conduit hangers, threaded C-clamps, or ceiling trapeze. C-clamps or beam clamps shall have strap or rod-type retainers. Contractor shall coordinate loads and supports with the General Contractor in order to prevent damage or deformation to the supporting structure, but no loads shall be supported from metal roof decks, from lay-in ceiling grid or run tight against metal roof decks.

3.5 Fastenings shall be by wood screws or screw-type nails to wood, by toggle bolts on hollow masonry units, by expansion bolts on concrete or brick, and by machine screws, welded threaded studs, heat-treated or spring-steel-tension clamps on steel work. Nail-type nylon anchors or threaded studs driven in by powder charge and provided with lock washers and nuts may be used in lieu of expansion bolts or machine screws. Raceways or pipe straps shall not be welded to steel structures. In partitions of light steel construction, sheet-metal screws may be used. Conduit shall not be supported using any type of wire or nylon ties.

3.6 Metal conduits installed in earth shall be field painted with two coats bitumastic paint prior to installation in the ductbank, trench or earth.

3.7 Conduits passing through exterior concrete walls, floors or footings below grade shall be made watertight. Provide O.Z. Gedney Type "FSK" conduit entrance seals. Provide conduit sealing bushings O.Z. Gedney Type "CSB" or "CSBG" series as applicable and provide with cabinet adapter plate when required.

3.8 Conduits and cables passing through fire rated walls and/or floors shall be sealed by approved methods, or by installing O.Z. Gedney fire-seal Type "CFSI" or "CFSF" series as applicable to maintain UL classified fire rating.

3.9 480 volt feeder conduits entering pull boxes, panels, etc., shall have O.Z. Gedney Type "BL" grounding type bushings.

3.10 All empty conduits shall contain a plastic pullwire.

3.11 Conduits passing through roofs shall be sealed by approved methods of the Roof Manufacturer to maintain the integrity of the roof.

3.12 Cement for use with ENT shall be recommended by the manufacturer.

3.13 ENT systems shall be color coded as follows: BLUE for branch wiring, YELLOW for communications and RED for alarm system.

3.14 Conduits installed above grade in damp or wet locations shall be rigid galvanized steel.

END OF SECTION 26 05 33
PART 1 - GENERAL

1.1 GENERAL CONDITIONS
A. Drawings and general provisions of Contract, including General and Supplementary Conditions and Division 1 Specification sections, apply to this Section.

1.2 SCOPE
A. Fixture outlets, receptacles, switches, devices, etc., requiring outlet boxes shall have steel [and/or nonmetallic] outlet boxes as required, constructed as required by NEC and installed as indicated.

B. Special care shall be exercised in the location of the outlet and junction boxes in order that the hanging or recessing of light fixtures will not be obstructed by the piping or ductwork installed by other trades. To this end, the work shall be coordinated with representatives of the other trades involved and by reference to the Mechanical, Plumbing, Structural, and Architectural drawings.

1.3 REFERENCES
A. Outlet boxes shall conform to the following:

1. Metallic Boxes - NEMA OS1, UL 514A
2. Non-Metallic Boxes - NEMA OS2, UL514C
3. Multiservice Flush Floor Box

1.4 SUBMITTALS
A. Contractor shall submit the following Shop Drawings and Submittals listed below for review by the Architect. Submittals shall indicate conformance with the hereinbefore listed References, or provide certification of meeting those requirements.

1. Outlet boxes
2. Fittings

PART 2 - PRODUCTS

2.1 MANUFACTURERS
A. Shop Drawings shall clearly indicate Manufacturer, catalog numbers, trade sizes and type of outlet boxes which will be used on the project.

2.2 OUTLET BOXES
A. Outlet boxes shall be hot dipped galvanized steel type with standard knock-outs as required for conduit termination. Minimum size of outlet box shall be 4" square, 1-1/2" deep, and shall be increased in dimensions to accommodate conductors and devices as required by the NEC, and as indicated. Outlet boxes for exposed tile and block shall be provided with square cornered tile ring, size as required. Outlet boxes shall not be installed back-to-back in any wall and thru-the-wall boxes shall not be used.

B. Location of the outlets for lighting, devices, power, and equipment are shown on the drawings. Due to the small scale of the drawings, it is not possible to indicated the exact
location. The Contractor shall examine the Architectural, Structural, Plumbing and Mechanical drawings and finish conditions and arrange his work as may be required to meet such conditions.

C. The Contractor shall verify the exact swing of doors and locations of built-in cabinetry prior to installing outlets for switches and receptacles. The Contractor shall also coordinate outlets with change orders, addendums, and job site differences.

D. Shallow outlet boxes may be employed where construction prohibits use of 4" square, 1-1/2" deep box specified above.

E. Nonmetallic outlet boxes and fittings shall be designed for use with ENT. All fittings, boxes and accessories shall be from one Manufacturer.

F. Multiservice Flush Floor Box:
Concrete Tight Steel Box For Pours of 2-7/16" or greater

1. Box must have (2) 1/2" and (2) 3/4" knockouts per side and (1) 1/2" and (1) 3/4" knockouts per end.
2. Box must have (3) 1/2", (1) 3/4", and (1) 1-1/4" knockout located on the bottom.
3. Flange provided on ends of box for nailing box to form.
4. Box must be available with choice of brass or polycarbonate activation.
5. Capacity must be 82.5 cubic inches total or split into two compartments of 43.8 and 38.6 cubic inches.
6. Box partition to be removable.
7. Floorbox to be fully adjustable and UL listed.

G. Concrete Tight Steel Box For Pours of 3-9/16" or greater

1. Box must have (2) 1/2" and 3/4" concentric and (2) 1" and 1-1/4" concentric knockout per side and (1) 1" and 1-1/4" concentric knockout per end.
2. Box must be available with choice of brass or polycarbonate activation.
3. Capacity must be 86.3 cubic inches total or split into two compartments of 44.8 and 41.5 cubic inches.
4. Box partition to be removable.
5. Floorbox to be fully adjustable and UL listed.

PART 3 - EXECUTION

3.1 Check all door swings and built-in equipment and cabinetry prior to roughing-in boxes for switches and receptacles.

3.2 Mounting heights of outlets in tile or un-plastered masonry shall be varied plus or minus to the nearest block joint. Outlet boxes in the same space shall be installed at the same height above finished floor.

3.3 Contractor shall check location of all wall outlets to verify that the outlet will clear any wall fixtures, shelving, work tables, etc. that will be installed prior to roughing-in conduit. If discrepancies are noted, contact the Architect/Engineer before proceeding.

3.4 Outlet boxes occurring in finished outside walls, wet areas or areas designed for wash down such as kitchens and can wash areas, shall be cast and provided with gaskets between box and waterproof cover.

3.5 Ceiling and bracket outlets shall be boxes suitably supported by headers and 3/8" fixture stud for supporting fixtures as required. In areas of exposed steel beams, fixture shall be supported by
steel channel as required. Fixtures weighing over 20 pounds shall be supported independently of box.

3.6 Outlet boxes in finished areas shall be flush mounted with raised plaster rings suitable to accommodate device and hold it flush with finish wall line. Surface outlets requiring device plates shall be provided with raised covers serving both purposes. Blanked outlets and junction boxes shall be provided with flush blank covers.

3.7 Outlet boxes that are surface mounted on finished walls shall be of the cast type with hub sizes and number as required.

3.8 Junction and pull boxes shall be installed where indicated or necessary for installation of the electrical system. Junction or pull boxes not over 100 cubic inches in volume shall be standard outlet boxes. Junction boxes over 100 cubic inches in volume shall be constructed in accordance with the requirements of the NEC. Junction boxes shall have covers and be accessible after completion of the building. Where several feeders pass through a common pull box or junction box, the feeders shall be tagged to clearly indicate their electrical characteristics, circuit number, and panel designation. Paint same information on cover of the box.

END OF SECTION 26 05 34
PART 1 - GENERAL

1.1 GENERAL CONDITIONS

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

1.2 SCOPE

A. Provide wiring devices complete with required adapters, wall plates, screws and device rings.

1.3 REFERENCES

A. Wiring devices and device plates shall conform to the following:

1. AC Wall Switches - Fed. Spec. WS-896E, UL 20, NEMA WD-1
3. GFCI Receptacles - UL 943 Class A, UL 498, NEMA WD-1, NEMA WD-6
4. Isolated Ground Receptacles - UL 498, NEMA WD-1
5. Hospital Grade Receptacles - UL 498, UL 544, UL 943, NEMA WD-1
6. Device Plates - UL-514
7. Weatherproof Covers - UL Listed (UL File #E-18897, NEMA 3R, NEC 410-57(b)

1.4 SUBMITTALS

A. Contractor shall submit the following Shop Drawings and Submittals listed below for review by the Architect. Submittals shall indicate conformance with the hereinbefore listed References, or provide certification of meeting those requirements.

1. Wiring devices
2. Device plates
3. Weatherproof cover

PART 2 - PRODUCTS

2.1 MANUFACTURERS

A. Wiring devices provided on this project shall be by the same Manufacturer and shall be as manufactured by Bryant or equal.

2.2 INDUSTRIAL SPECIFICATION GRADE DEVICES

A. Ground fault interrupter receptacles shall be molded of impact-resistant thermoplastic material, 20 ampere, 125 volt, 2 pole, 3 wire, and with NEMA 5-20R configuration. Color shall be as selected by the Architect. The receptacles shall incorporate design to be sensitive to fault currents as low as 5 milliamperes from no-load to full-rated load, and a disconnect speed of 0.025 seconds (25 milliseconds). The receptacles shall be capable of withstanding voltage transients of 6000 volts in a ringwave configuration. Silver alloy contacts shall be required for maximum conductivity. Units shall be UL listed Hospital Grade receptacle construction where required. The device shall have dual slot terminal and installation screws and the capability of feed-through GFCI protection to other receptacles on the same circuit when connected in that configuration.
1. GFCI Receptacle
2. Hospital Grade GFCI Receptacle

B. Isolated ground grounding type receptacles shall be 20 ampere, 125 volt, 2 pole, 3 wire, and orange color with NEMA 5-20R configuration. The receptacles shall have a smooth face molded of high-impact thermoplastic nylon. The grounding system shall include an isolated ground circuit with insulated green color steel screw and brass grounding contact mounted in isolated ground shunt. The zinc-plated steel mounted strap with riveted self-grounding clip shall be insulated from the ground contact.

1. Isolated Ground Receptacles

C. Special devices shall be indicated on the drawings.

2.3 COMMERCIAL GRADE WIRING DEVICES

A. A.C. switches shall be single pole, double pole, three-way and/or four way as shown on the drawings, back and side wiring, 20 ampere, 120/277 volts. Color shall be selected by the Architect. Switches shall have one piece, copper alloy, rivetless contact arms and silver cadmium oxide contacts. Switch toggle shall be nylon, and have an insulation barrier between interior and yoke. Terminals shall be clamp-type, back and side wired with provision for two solid or stranded wires. One-piece yoke shall be heavy duty steel, zinc plated to resist corrosion, with an integral grounding clip and green grounding screw.

1. Single pole switch
2. Two pole switch
3. Three way switch
4. Four way switch

B. Duplex grounding type receptacles shall be nylon, 20 ampere, 125 volts, 2 pole, 3 wire, and with NEMA 5-20R configuration. **Color shall be selected by the Architect.** Receptacles shall have a wrap around, full face design, constructed of nylon to resist physical abuse and chemical attack. Yoke shall be heavy duty steel, wrapped around the device and locked in place, zinc plated to resist corrosion. Grounding system shall consist of high performance copper alloy, consisting of double wipe contacts, green terminal screw and grounding strap. Line contacts shall be one-piece, triple wipe, high performance copper alloy with clamp-type terminals, for side wiring, stranded or solid wire.

1. Duplex receptacles

C. Special devices shall be as indicated on the drawings.

2.4 DEVICE PLATES

A. Unless otherwise shown on the drawings or herein specified, all plates for wiring devices shall be 0.032" thick stainless steel, satin finish on unfinished walls and smooth nylon on finished walls, as manufactured to suit devices. Color shall be selected by the Architect. Screws shall be metal with countersunk heads, in a color to match the finish of the plate. One piece type device plates shall be provided for all outlets and fittings. Sectional type device plates shall not be allowed.

2.5 OUTDOOR RECEPTACLE COVER

A. Outdoor receptacle enclosure shall comply with NEC Article 406.8 and shall be clearly
marked “suitable for wet locations while in use”. There shall be a gasket between the enclosure and the mounting surface, and between the cover and base to assure proper seal. Outdoor enclosures shall be lockable where the receptacle is accessible to the public.

1. Outdoor receptacle enclosure
2. Rooftop receptacle enclosure

PART 3 - EXECUTION

3.1 Install wiring devices in accordance with the NEC. Device plates shall be installed with all four edges in continuous contact with finished wall surfaces without the use of mats or similar devices. Plaster fillings shall not be allowed. Plates shall be installed with an alignment tolerance of 1/16 inch.

3.2 Location of wiring devices shall be as indicated on drawings or as directed in field where specific requirements for location are required. Contractor shall verify location of special devices prior to roughing in.

3.3 Mounting heights of devices as shown on the drawings shall be from finished floor to the center of the outlet box or device, unless otherwise noted.

3.4 Receptacles occurring in outside walls, wet areas or areas designed for wash down such as kitchens and can wash areas shall be GFCI type.

3.5 Test each GFCI receptacle for proper polarity and proper operation in accordance with Manufacturer’s instructions.

3.6 Provide blank device plates for telephone, intercommunication, data and television outlets, unless otherwise indicated.

END OF SECTION 26 27 26
PART 1 - GENERAL

1.1 GENERAL CONDITIONS

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

1.2 SCOPE

A. Lighting fixtures shall be provided complete with lamps, mounting hardware, accessories, etc., and shall be approved before installation. Lamps shall meet the requirements of the Energy Policy Act of 1992.

1.3 REFERENCES

A. Lighting fixtures, ballasts and lamps shall conform to the following:

1. Incandescent Lighting Fixtures - UL 1571, NEMA LE 4
2. Fluorescent Lighting Fixtures - UL 1570, NEMA LE 4
3. Lampholders for Fluorescent Lamps - UL 542
4. Electronic Ballasts for Fluorescent Lamps - ANSI C82.11, ANSI C62.41, FCC Part 18 (Class A) for EMI and RFI, UL listed (Class P, Type 1, Outdoor)
5. Ballasts for Fluorescent Lamps - ANSI C82.1, UL 935
6. HID Lighting Fixtures - UL 1572, NEMA LE 4
7. Ballasts for HID Lamps - ANSI C82.4, UL 1029
8. Emergency Lighting & Power Equipment - UL 924
9. Fixtures in Hazardous Locations - UL 844

1.4 SUBMITTALS

A. Contractor shall submit the following Shop Drawings and Submittals listed below for review by the Architect. Submittals shall indicate conformance with the hereinbefore listed References, or provide certification of meeting those requirements.

1. Lighting Fixtures
2. Photometric reports based on I.E.S. testing procedures
3. Coefficient of Utilization Tables
4. Lamps
5. Ballasts and Warranty Information

PART 2 - PRODUCTS

2.1 MANUFACTURERS

A. Fixtures indicated shall be UL approved for the particular installation. Fixture types shown on the drawings are indicative of the general type desired and are not intended to restrict selection to fixtures of any particular manufacturer. Fixtures of similar designs and equivalent energy efficiency, light-distribution and brightness characteristics, and of equal finish and quality will be acceptable if approved.

B. Shop Drawings shall clearly indicate lighting fixture Manufacturer, catalog numbers, type and number of lamps, operating voltage, type of mounting and any required options as indicated on the drawings and in the schedules.
C. Lamps shall be as manufactured by General Electric, type as indicated on the schedules. Lamps manufactured by OSRAM-Sylvania or Phillips shall be considered equal.

[D. Electronic ballasts shall be Triad Octic type as manufactured by MagneTek. Ballasts manufactured by Advance, Motorola or Valmont shall be considered equal.]

[E. Electromagnetic ballasts shall be as manufactured by MagneTek Triad. Ballasts manufactured by Advance, Motorola or Valmont shall be considered equal.]

2.2 INCANDESCENT FIXTURES

A. Recessed incandescent fixtures shall have thermal protection in accordance with NEC.

2.3 FLUORESCENT FIXTURES

A. Fluorescent fixtures shall be constructed so as to limit the ballast case temperature to 90 degrees Celsius, when installed in an ambient temperature of 104 degrees Fahrenheit.

B. Fluorescent fixtures on the exterior of the building or in unheated spaces shall be provided with zero degree low temperature ballasts.

2.4 HID FIXTURES

A. Recessed HID fixtures shall be thermally protected and shall be so identified. Where fixtures, whether recessed or otherwise, are operated by remote ballasts, the ballasts shall also be thermally protected.

2.5 LAMPS

A. Incandescent lamps shall be for 125 volt operation, unless otherwise indicated. Incandescent reflector (R30, R40) and PAR (PAR30, PAR38) lamps shall not be allowed.

B. T12 fluorescent lamps shall be of the energy-saving, rapid start type with a color temperature of 35000 degrees Kelvin. Full wattage T12 (40W, 75W, 110W) fluorescent lamps shall not be allowed.

C. T8 fluorescent lamps shall be operational on either rapid start, instant start or cathode cutout types of ballasts rated for T8 lamps. T8 lamps shall have a color temperature of 3500 degrees Kelvin.

D. T5 fluorescent biax lamps shall be instant start type with a color temperature of 3500 degrees Kelvin.

E. T4 fluorescent lamps shall be double biax type with 4-pin base and shall be operational on electronic or dimming ballasts. T4 lamps shall have a color temperature of 3500 degrees Kelvin.

2.6 FLUORESCENT BALLASTS

A. Electromagnetic ballasts shall be CBM approved, energy-saving with a power factor above 90%. Lamp current crest factor shall be less than 1.7 and total harmonic distortion shall be less than 32%. Ballast shall be UL listed Class “P” with a Class “A” sound rating.

B. Electronic ballasts shall operate lamps at a frequency of 20 kHz or higher with no detectable flicker. Ballasts shall be instant start with a power factor above 95%, a ballast factor below 92%, and a ballast efficacy of 1.7, or less. Lamp current crest factor shall be
less than 1.6, and total harmonic distortion shall be less than 10%. Ballast circuit shall be parallel operation, such that if one lamp becomes inoperative in the fixture, it shall not affect operation of the remaining lamps.

[C. Electronic dimming ballasts shall operate lamps at a frequency of 20 kHz or higher with no detectable flicker. Ballasts shall have power factor above 98%, a lamp current crest factor of less than 1.5 and total harmonic distortion of less than 10%. Ballasts shall have Class “A” sound rating and provide continuous dimming from 100-10% light output. Control wiring and interface for the dimming ballast shall be per manufacturers requirements.]

2.7 HID BALLASTS

A. HID ballasts shall be of the core and coil type, with a constant wattage autotransformer circuit type. Where this circuit type is not available, circuit type shall be high reactance-high power factor. Where HID fixtures are located in interior spaces, ballasts shall be encapsulated.

[2.8 LED FIXTURES

A. LED fixtures shall carry a minimum five year warranty that covers LED’s, drivers, and complete assembly. Driver shall have a minimum of 50,000 hours of life expectancy. Fixtures shall have integrated thermal feedback loop for gradual current reduction in critical temperature on LED’s and driver.]

PART 3 - EXECUTION

3.1 Contractor shall refer to the Architectural reflected ceiling plan for exact locations of fixtures in the ceiling. The Contractor’s attention is also directed to coordination with sprinkler heads and mechanical equipment. Where recessed lighting fixtures are indicated, this Contractor shall be responsible for coordinating the type fixtures with the actual ceiling being installed. This shall include changes resulting from alternate bid items, change orders, etc.

3.2 Surface mounted fluorescent lighting fixtures shall be mounted independent of ceiling construction. Fluorescent lighting fixtures mounted in or on a plaster ceiling shall also be mounted independent of ceiling construction. When recessed fluorescent lighting fixtures occur in lay-in tile or concealed spline ceilings, the Electrical Contractor shall install a support hanger at each of the four corners of the fixture and fasten these hangers to the structure above the ceiling, so as to support fixtures independently of ceiling. Hanger wires shall be galvanized carbon steel wire, 12 gauge minimum. Fixtures shall not be supported from the steel roof deck, the ceiling, or the ceiling support wires.

3.3 No insulation shall be placed within three inches of recessed lighting fixtures, unless fixtures are listed as suitable for direct contact with insulation.

3.4 Contractor shall furnish written warranties and manufacturer’s wiring diagrams for the electronic ballasts, which shall carry a minimum three-year warranty, including labor allowance for the entire three year warranty period.

[3.5 A minimum of visual comfort probability (VCP) shall be furnished in accordance with IES LM-42 method in media centers and instructional spaces. The brightness ratio shall not exceed 3 to 1 in any area.]
PART 1 - GENERAL

1.1 SUMMARY
A. Section Includes:
1. Excavating and filling for rough grading the Site.
2. Preparing subgrades for slabs-on-grade.
3. Excavating and backfilling for buildings and structures.
4. Drainage course for concrete slabs-on-grade.

1.2 DEFINITIONS
A. Backfill: Soil material used to fill an excavation.
   1. Initial Backfill: Backfill placed beside and over pipe in a trench, including haunches to support sides of pipe.
   2. Final Backfill: Backfill placed over initial backfill to fill a trench.
B. Base Course: Aggregate layer placed between the subbase course and hot-mix asphalt paving.
C. Bedding Course: Aggregate layer placed over the excavated subgrade in a trench before laying pipe.
D. Borrow Soil: Satisfactory soil imported from off-site for use as fill or backfill.
E. Drainage Course: Aggregate layer supporting the slab-on-grade that also minimizes upward capillary flow of pore water.
F. Excavation: Removal of material encountered above subgrade elevations and to lines and dimensions indicated.
   1. Authorized Additional Excavation: Excavation below subgrade elevations or beyond indicated lines and dimensions as directed by Architect. Authorized additional excavation and replacement material will be paid for according to Contract provisions for changes in the Work.
   2. Unauthorized Excavation: Excavation below subgrade elevations or beyond indicated lines and dimensions without direction by Architect. Unauthorized excavation, as well as remedial work directed by Architect, shall be without additional compensation.
G. Fill: Soil materials used to raise existing grades.
H. Structures: Buildings, footings, foundations, retaining walls, slabs, tanks, curbs, mechanical and electrical appurtenances, or other man-made stationary features constructed above or below the ground surface.
I. Subbase Course: Aggregate layer placed between the subgrade and base course for hot-mix asphalt pavement, or aggregate layer placed between the subgrade and a cement concrete pavement or a cement concrete or hot-mix asphalt walk.
J. Subgrade: Uppermost surface of an excavation or the top surface of a fill or backfill immediately below subbase, drainage fill, drainage course, or topsoil materials.
K. Utilities: On-site underground pipes, conduits, ducts, and cables as well as underground services within buildings.
1.3 PREINSTALLATION MEETINGS
   A. Preinstallation Conference: Conduct pre-excavation conference at Project site.

1.4 INFORMATIONAL SUBMITTALS
   A. Material test reports.

1.5 FIELD CONDITIONS
   A. Utility Locator Service: Notify utility locator service for area where Project is located before beginning earth-moving operations.
   B. Do not commence earth-moving operations until plant-protection measures specified in Section 015639 "Temporary Tree and Plant Protection" are in place.

PART 2 - PRODUCTS

2.1 SOIL MATERIALS
   A. General: Provide borrow soil materials when sufficient satisfactory soil materials are not available from excavations.
   B. Satisfactory Soils: Soil Classification Groups GW, GP, GM, SW, SP, and SM according to ASTM D2487.
   C. Unsatisfactory Soils: Soil Classification Groups GC, SC, CL, ML, OL, CH, MH, OH, and PT according to ASTM D2487, or a combination of these groups.
      1. Unsatisfactory soils also include satisfactory soils not maintained within 2 percent of optimum moisture content at time of compaction.
   D. Subbase Material: Naturally or artificially graded mixture of natural or crushed gravel, crushed stone, and natural or crushed sand; ASTM D2940/D2940M; with at least 90 percent passing a 1-1/2-inch (37.5-mm) sieve and not more than 12 percent passing a No. 200 (0.075-mm) sieve.
   E. Base Course: Naturally or artificially graded mixture of natural or crushed gravel, crushed stone, and natural or crushed sand; ASTM D2940/D2940M; with at least 95 percent passing a 1-1/2-inch (37.5-mm) sieve and not more than 8 percent passing a No. 200 (0.075-mm) sieve.
   F. Engineered Fill: Naturally or artificially graded mixture of natural or crushed gravel, crushed stone, and natural or crushed sand; ASTM D2940/D2940M; with at least 90 percent passing a 1-1/2-inch (37.5-mm) sieve and not more than 12 percent passing a No. 200 (0.075-mm) sieve.
   G. Bedding Course: Naturally or artificially graded mixture of natural or crushed gravel, crushed stone, and natural or crushed sand; ASTM D2940/D2940M; except with 100 percent passing a 1-inch (25-mm) sieve and not more than 8 percent passing a No. 200 (0.075-mm) sieve.
   H. Drainage Course: Narrowly graded mixture of washed crushed stone, or crushed or uncrushed gravel; ASTM D448; coarse-aggregate grading Size 57; with 100 percent passing a 1-1/2-inch (37.5-mm) sieve and zero to 5 percent passing a No. 8 (2.36-mm) sieve.

2.2 ACCESSORIES
   A. Warning Tape: Acid- and alkali-resistant, polyethylene film warning tape manufactured for marking and identifying underground utilities, 6 inches (150 mm) wide and 4 mils (0.1 mm) thick, continuously inscribed with a description of the utility; colored to comply with local practice or requirements of authorities having jurisdiction.
   B. Detectable Warning Tape: Acid- and alkali-resistant, polyethylene film warning tape manufactured for marking and identifying underground utilities, a minimum of 6 inches (150 mm) wide and 4 mils (0.1 mm) thick, continuously inscribed with a description of the utility, with metallic core encased in a protective jacket for corrosion protection, detectable by metal detector when
tape is buried up to 30 inches (750 mm) deep; colored to comply with local practice or requirements of authorities having jurisdiction.

PART 3 - EXECUTION

3.1 PREPARATION

A. Protect structures, utilities, sidewalks, pavements, and other facilities from damage caused by settlement, lateral movement, undermining, washout, and other hazards created by earth-moving operations.

B. Protect and maintain erosion and sedimentation controls during earth-moving operations.

C. Protect subgrades and foundation soils from freezing temperatures and frost. Remove temporary protection before placing subsequent materials.

3.2 EXCAVATION, GENERAL

A. Unclassified Excavation: Excavate to subgrade elevations regardless of the character of surface and subsurface conditions encountered. Unclassified excavated materials may include rock, soil materials, and obstructions. No changes in the Contract Sum or the Contract Time will be authorized for rock excavation or removal of obstructions.

1. If excavated materials intended for fill and backfill include unsatisfactory soil materials and rock, replace with satisfactory soil materials.

3.3 EXCAVATION FOR STRUCTURES

A. Excavate to indicated elevations and dimensions within a tolerance of plus or minus 1 inch (25 mm). If applicable, extend excavations a sufficient distance from structures for placing and removing concrete formwork, for installing services and other construction, and for inspections.

1. Excavations for Footings and Foundations: Do not disturb bottom of excavation. Excavate by hand to final grade just before placing concrete reinforcement. Trim bottoms to required lines and grades to leave solid base to receive other work.

2. Pile Foundations: Stop excavations 6 to 12 inches (150 to 300 mm) above bottom of pile cap before piles are placed. After piles have been driven, remove loose and displaced material. Excavate to final grade, leaving solid base to receive concrete pile caps.

3. Excavation for Underground Tanks, Basins, and Mechanical or Electrical Utility Structures: Excavate to elevations and dimensions indicated within a tolerance of plus or minus 1 inch (25 mm). Do not disturb bottom of excavations intended as bearing surfaces.

B. Excavations at Edges of Tree- and Plant-Protection Zones:

1. Excavate by hand or with an air spade to indicated lines, cross sections, elevations, and subgrades. If excavating by hand, use narrow-tine spading forks to comb soil and expose roots. Do not break, tear, or chop exposed roots. Do not use mechanical equipment that rips, tears, or pulls roots.

2. Cut and protect roots according to requirements in Section 015639 "Temporary Tree and Plant Protection."

3.4 EXCAVATION FOR WALKS AND PAVEMENTS

A. Excavate surfaces under walks and pavements to indicated lines, cross sections, elevations, and subgrades.

3.5 EXCAVATION FOR UTILITY TRENCHES

A. Excavate trenches to indicated gradients, lines, depths, and elevations.
B. Excavate trenches to uniform widths to provide the following clearance on each side of pipe or conduit. Excavate trench walls vertically from trench bottom to 12 inches (300 mm) higher than top of pipe or conduit unless otherwise indicated.
   1. **Clearance:** 12 inches (300 mm) each side of pipe or conduit.

C. Trench Bottoms: Excavate and shape trench bottoms to provide uniform bearing and support of pipes and conduit. Shape subgrade to provide continuous support for bells, joints, and barrels of pipes and for joints, fittings, and bodies of conduits. Remove projecting stones and sharp objects along trench subgrade.
   1. Excavate trenches 6 inches (150 mm) deeper than elevation required in rock or other unyielding bearing material to allow for bedding course.

D. Trenches in Tree- and Plant-Protection Zones:
   1. Hand-excavate to indicated lines, cross sections, elevations, and subgrades. Use narrow-tine spading forks to comb soil and expose roots. Do not break, tear, or chop exposed roots. Do not use mechanical equipment that rips, tears, or pulls roots.
   2. Do not cut main lateral roots or taproots; cut only smaller roots that interfere with installation of utilities.
   3. Cut and protect roots according to requirements in Section 015639 "Temporary Tree and Plant Protection."

3.6 SUBGRADE INSPECTION
A. Proof-roll subgrade below the building slabs and pavements with a pneumatic-tired dump truck to identify soft pockets and areas of excess yielding. Do not proof-roll wet or saturated subgrades.
B. Reconstruct subgrades damaged by freezing temperatures, frost, rain, accumulated water, or construction activities, as directed by Architect, without additional compensation.

3.7 UNAUTHORIZED EXCAVATION
A. Fill unauthorized excavation under foundations or wall footings by extending bottom elevation of concrete foundation or footing to excavation bottom, without altering top elevation. Lean concrete fill, with 28-day compressive strength of 2500 psi (17.2 MPa), may be used when approved by Architect.
   1. Fill unauthorized excavations under other construction, pipe, or conduit as directed by Architect.

3.8 STORAGE OF SOIL MATERIALS
A. Stockpile borrow soil materials and excavated satisfactory soil materials without intermixing. Place, grade, and shape stockpiles to drain surface water. Cover to prevent windblown dust.
   1. Stockpile soil materials away from edge of excavations. Do not store within drip line of remaining trees.

3.9 UTILITY TRENCH BACKFILL
A. Place backfill on subgrades free of mud, frost, snow, or ice.
B. Place and compact bedding course on trench bottoms and where indicated. Shape bedding course to provide continuous support for bells, joints, and barrels of pipes and for joints, fittings, and bodies of conduits.
C. Trenches under Footings: Backfill trenches excavated under footings and within 18 inches (450 mm) of bottom of footings with satisfactory soil; fill with concrete to elevation of bottom of footings. Concrete is specified in Section 033000 "Cast-in-Place Concrete."
D. Initial Backfill: Place and compact initial backfill of subbase material, free of particles larger than 1 inch (25 mm) in any dimension, to a height of 12 inches (300 mm) over the pipe or conduit.
   1. Carefully compact initial backfill under pipe haunches and compact evenly up on both sides and along the full length of piping or conduit to avoid damage or displacement of piping or conduit. Coordinate backfilling with utilities testing.
E. Final Backfill: Place and compact final backfill of satisfactory soil to final subgrade elevation.
F. Warning Tape: Install warning tape directly above utilities, 12 inches (300 mm) below finished grade, except 6 inches (150 mm) below subgrade under pavements and slabs.

3.10 SOIL FILL
A. Plow, scarify, bench, or break up sloped surfaces steeper than 1 vertical to 4 horizontal so fill material will bond with existing material.
B. Place and compact fill material in layers to required elevations as follows:
   1. Under walks and pavements, use satisfactory soil material.
   2. Under building slabs, use engineered fill.
   3. Under footings and foundations, use engineered fill.

3.11 SOIL MOISTURE CONTROL
A. Uniformly moisten or aerate subgrade and each subsequent fill or backfill soil layer before compaction to within 2 percent of optimum moisture content.
   1. Do not place backfill or fill soil material on surfaces that are muddy, frozen, or contain frost or ice.
   2. Remove and replace, or scarify and air dry, otherwise satisfactory soil material that exceeds optimum moisture content by 2 percent and is too wet to compact to specified dry unit weight.

3.12 COMPACTION OF SOIL BACKFILLS AND FILLS
A. Place backfill and fill soil materials in layers not more than 8 inches (200 mm) in loose depth for material compacted by heavy compaction equipment and not more than 4 inches (100 mm) in loose depth for material compacted by hand-operated tampers.
B. Place backfill and fill soil materials evenly on all sides of structures to required elevations and uniformly along the full length of each structure.
C. Compact soil materials to not less than the following percentages of maximum dry unit weight according to ASTM D698:
   1. Under structures, building slabs, steps, and pavements, scarify and recompact top 12 inches (300 mm) of existing subgrade and each layer of backfill or fill soil material at 95 percent.
   2. Under walkways, scarify and recompact top 6 inches (150 mm) below subgrade and compact each layer of backfill or fill soil material at 92 percent.
   3. Under turf or unpaved areas, scarify and recompact top 6 inches (150 mm) below subgrade and compact each layer of backfill or fill soil material at 85 percent.
   4. For utility trenches, compact each layer of initial and final backfill soil material at 85 percent.

3.13 GRADING
A. General: Uniformly grade areas to a smooth surface, free of irregular surface changes. Comply with compaction requirements and grade to cross sections, lines, and elevations indicated.
B. Site Rough Grading: Slope grades to direct water away from buildings and to prevent ponding. Finish subgrades to elevations required to achieve indicated finish elevations, within the following subgrade tolerances:
   1. Unpaved Areas: Plus or minus 1 inch (25 mm).
   2. Walks: Plus or minus 1 inch (25 mm).
   3. Pavements: Plus or minus 1/2 inch (13 mm).

C. Grading inside Building Lines: Finish subgrade to a tolerance of 1/2 inch (13 mm) when tested with a 10-foot (3-m) straightedge.

3.14 SUBBASE AND BASE COURSES UNDER PAVEMENTS AND WALKS
A. Place subbase course on subgrades free of mud, frost, snow, or ice.
B. On prepared subgrade, place subbase course under pavements and walks as follows:
   1. Shape subbase course to required crown elevations and cross-slope grades.
   2. Place subbase course that exceeds 6 inches (150 mm) in compacted thickness in layers of equal thickness, with no compacted layer more than 6 inches (150 mm) thick or less than 3 inches (75 mm) thick.
   3. Compact subbase course at optimum moisture content to required grades, lines, cross sections, and thickness to not less than 95 percent of maximum dry unit weight according to ASTM D698.

3.15 DRAINAGE COURSE UNDER CONCRETE SLABS-ON-GRADE
A. Place drainage course on subgrades free of mud, frost, snow, or ice.
B. On prepared subgrade, place and compact drainage course under cast-in-place concrete slabs-on-grade as follows:
   1. Place drainage course that exceeds 6 inches (150 mm) in compacted thickness in layers of equal thickness, with no compacted layer more than 6 inches (150 mm) thick or less than 3 inches (75 mm) thick.
   2. Compact each layer of drainage course to required cross sections and thicknesses to not less than percent of maximum dry unit weight according to ASTM D698.

3.16 FIELD QUALITY CONTROL
A. Special Inspections: Owner will engage a qualified special inspector to perform inspections:
B. Testing Agency: Owner will engage a qualified geotechnical engineering testing agency to perform tests and inspections.
C. Allow testing agency to inspect and test subgrades and each fill or backfill layer. Proceed with subsequent earth moving only after test results for previously completed work comply with requirements.
D. Footing Subgrade: At footing subgrades, at least one test of each soil stratum will be performed to verify design bearing capacities. Subsequent verification and approval of other footing subgrades may be based on a visual comparison of subgrade with tested subgrade when approved by Architect.
E. When testing agency reports that subgrades, fills, or backfills have not achieved degree of compaction specified, scarify and moisten or aerate, or remove and replace soil materials to depth required; recompact and retest until specified compaction is obtained.
3.17 PROTECTION
   A. Protecting Graded Areas: Protect newly graded areas from traffic, freezing, and erosion. Keep free of trash and debris.
   B. Repair and reestablish grades to specified tolerances where completed or partially completed surfaces become eroded, rutted, settled, or where they lose compaction due to subsequent construction operations or weather conditions.
   C. Where settling occurs before Project correction period elapses, remove finished surfacing, backfill with additional soil material, compact, and reconstruct surfacing.
      1. Restore appearance, quality, and condition of finished surfacing to match adjacent work, and eliminate evidence of restoration to greatest extent possible.

3.18 DISPOSAL OF SURPLUS AND WASTE MATERIALS
   A. Remove surplus satisfactory soil and waste materials, including unsatisfactory soil, trash, and debris, and legally dispose of them off Owner's property.

END OF SECTION
PART 1 GENERAL

1.01 SECTION INCLUDES
Soil treatment for subterranean termite prevention including, but is not limited to, all areas that shall be covered by concrete slab-on-grade, under and immediately adjacent to the building, and material adjacent to the exterior side of walls.

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

1.03 RELATED SECTIONS
A. Related Sections: Related sections include, but are not limited to, the following:
   - Section 03 30 00 – Cast-In-Place Concrete
   - Section 04 20 00 – Unit Masonry
   - Section 31 20 00 – Earth Moving

1.04 REFERENCE STANDARDS
A. Reference Standards: Standards referenced by this Section include, but are not limited to, the following:
   - 7 USC Section 136 – Federal Insecticide, Fungicide, and Rodenticide Act; 1988, as amended

1.05 SAFETY REQUIREMENTS
A. Formulate, treat, and dispose of termiticides and their containers in accordance with label directions, federal, state and local laws, regulations and ordinances. Draw water for formulating only from sources fitted with a backflow preventer conforming to the requirement of the local Code. Overflows shall be prevented during filling operations. Secure pesticides and related materials under lock and key when unattended. Ensure that proper protective clothing and equipment are worn and used during all phases of termiticide application. Dispose of used termiticide containers on site shall not be allowed.

1.06 SUBMITTALS
A. General: See Section 01 33 00 – Submittals, for submittal procedures.
B. Product Data: Clearly identifying the termiticides that shall be provided, submit manufacturer’s product data and application instructions including, but not limited to, composition by percentage, dilution schedule and application rate for intended use.
C. Material Safety Data Sheets: Submit for all chemicals proposed.
D. Certifications: Submit certificates that soil treatment products comply with 7 USC Section 136, and local and state regulations; include EPA federal registration number and evidence of registration with state and local authorities having jurisdiction.
E. Applicator’s Qualifications and License: Submit treatment applicator’s qualifications and copy of his licenses.

1.07 QUALITY ASSURANCE
A. General: In addition to the requirements of this Section, comply with all local, state and federal pesticide regulations, and with manufacturer's instructions and recommendations for preparation of substrates and application. Applicator licensing, certification, and record keeping shall comply with the requirements of 7 USC Section 136 and with local and state regulations.
B. Applicator: Engage an applicator whose principal business is pest control, who has a minimum of 5 years documented experience, and who is licensed and certified in the state and locality where the work shall be performed. Termitecidic applicator shall be certified in the US Environmental Protection Agency (EPA) pesticide applicator category that includes structural pest control, and approved by treatment materials manufacturer.

C. Termitecides: Use only termitecides bearing an EPA federal registration number and that are approved for the intended use by the local authorities having jurisdiction.

1.08 CERTIFICATION AND RECORD DOCUMENTS

A. General: The Contractor shall ensure the following are included along with the soil treatment warranty in the record documents submittal required under Section 01 77 00 – Closeout Procedures.

B. Certification of Treatment: Upon final completion of soil treatment and as a condition for final acceptance, the Contractor shall furnish a written certificate stating manufacturer and brand names of chemicals used, that they were of at least the minimum required concentration, and their rate and method of application.

C. Treatment Record Documents: Accurately record moisture content of soil before treatment, date and rate of application, areas of application, diary of meter readings and corresponding soil coverage.

1.09 WARRANTIES

A. General: Include warranties in the Warranty Manual as required under Section 01 77 00 – Closeout Procedures. Warranties shall not deprive the Owner of other rights or remedies the Owner may have under other provisions of the Contract Documents, and is in addition to and runs concurrent with other warranties made by the Contractor under requirements of the Contract Documents, and, shall be in accord with prevailing State law.

B. Warranty: Provide a written 5-year warranty from date of Substantial Completion, executed by both the Applicator and the Contractor, certifying that applied soil poisoning treatment will prevent infestation of subterranean termites; and if subterranean termite activity is discovered during the warranty period, re-treat soil, and repair or replace damage caused by termite infestation at no additional cost to the Owner. The warranty shall be drawn in the Owner's favor, and shall be non-cancelable by all parties to the contract except the Owner. Correction during the warranty period shall include not less than –

   1. Retreatment of areas in which evidence of infestation is discovered
   2. Repairing, patching, removing, and reinstalling of building materials and soil materials when necessary to facilitate retreatment following infestation
   3. Restoration, repair or replacement of building materials (including permanent fixtures) that become damaged by subterranean termites.

C. Extended Warranty (Annual Renewal Option): An optional extended warranty shall be offered to the Owner that would be in effect after the end of the warranty period, and shall include not less than annual reinspection, retreatment of affected areas where active or previous infestation is discovered, and annual renewal fee and the number of years for which the renewal fee will remain fixed.

1.10 DELIVERY, STORAGE, AND HANDLING

A. Delivery: Deliver termitecide material to the site in the original unopened containers bearing legible labels indicating the EPA federal registration number and manufacturer's registered uses. All other materials, to be used on site for the purpose of termite control, shall be delivered in new or otherwise good condition as supplied by the manufacturer or formulator.

B. Inspection: Inspect termitecides upon arrival at the job site for conformity to requirements of this Section. Each label shall bear evidence of EPA federal registration, and evidence of registration with state and local authorities having jurisdiction. Other materials shall be
inspected for conformance with specified requirements. Remove all unacceptable materials from the project site.

C. Storage: Store materials in designated areas and in accordance with manufacturer's labels. Termiticides and related materials shall be kept under lock and key when unattended.

D. Handling: Observe manufacturer's warnings and precautions. Termiticides shall be handled in accordance with manufacturer's labels, preventing contamination by dirt, water, and organic material. Protect termiticides from sunlight as recommended by the manufacturer.

1.11 SITE CONDITIONS

A. Soil Moisture: Soils to be treated shall be tested immediately before application. Test soil moisture content to a minimum depth of 3 inches. Soil moisture shall be as recommended by the termiticide manufacturer; termiticide shall not be applied when soil moisture exceeds manufacturer's recommendations. Do not apply termiticide to frozen or excessively wet soils.

B. Runoff and Wind Drift: Do not apply termiticide during or immediately following heavy rains. Applications shall not be performed when conditions may cause runoff or create an environmental hazard. Applications shall not be performed when average wind speed exceeds 10 miles per hour. The termiticide shall not be allowed to enter water systems, aquifers, or endanger humans or animals.

C. Vapor Barriers and Waterproof Membranes: Termiticide shall be applied prior to placement of vapor barriers or waterproof membranes.

D. Placement of Concrete: For slab-on-grade structures, treat soils before concrete slabs are placed. Place concrete covering treated soils as soon as the termiticide has reached maximum penetration into the soil. Time for maximum penetration shall be as recommended by the manufacturer.

PART 2 PRODUCTS

2.01 TERMITICIDES

A. Provide only termiticides currently EPA registered and approved for intended use by the state and local authorities having jurisdiction. Select non-repellant termiticide for maximum effectiveness and duration after application. The selected termiticide shall be suitable for the soil and climatic conditions at the project site. Solution shall be approved and registered by the EPA, and state and local authorities having jurisdiction for use as a termiticide under conditions of use prevailing at the project site.

B. Use an emulsible concentrated termiticide for dilution with water, and specifically formulated to prevent termite infestations. Fuel oil will not be permitted as a diluent. Soil treatment solutions used shall not be injurious to lawn and plant material.

PART 3 EXECUTION

3.01 GENERAL

A. Soil treatment solutions shall be applied in strict accord with manufacturer's instructions, and EPA, local and state regulations. Post signs in areas of application to warn workers that soil termiticide treatment has been applied. Remove signs when areas are covered by other construction.

3.02 PREPARATION

A. General: Coordinate work related to clearing and grubbing, earthwork, grading, seeding, sodding, planting, and any other alterations to finished construction that might alter the condition of treated soils, shall be coordinated with the work of this Section. Do not apply soil treatment solution until all excavating, filling and grading operations are completed, except as otherwise required by construction operations, scheduling and sequencing.
B. Ground Preparation: Eliminated foreign matter that could decrease effectiveness of treatment on areas to be treated, and potential termite food sources by removing debris from clearing and grubbing and construction wood scraps including, but not limited to, ground stakes, form boards, and scrap lumber from the site, before termiticide application begins. Loosen, rake, and level soil to be treated, except previously compacted areas under slabs and foundations. Termiticide may be applied before placement of compacted fill under slabs, if recommended by termiticide manufacturer.

C. Equipment Calibration: Immediately prior to commencement of termiticide application, calibration equipment to ensure that equipment is operating within manufacturer’s specifications and will meet specified requirements. Prior to each day of use, equipment shall be inspected for leaks, clogging, wear, or damage. Any repairs are to be performed immediately.

3.03 MIXING
A. Formulate and mix termiticides from unopened containers with the manufacturer’s labels intact in the presence of Owner’s field representative. Formulating and mixing termiticides shall be in strict accord with termiticide manufacturer’s instructions. Utilize a closed system to prevent termiticides from coming into contact with the applicator or other persons. Draw water for formulating only from sources fitted with a backflow preventer conforming to the requirement of the local Code. Overflow shall be prevented during the filling operation.

3.04 APPLICATION
A. Application: For areas to be treated, establish complete and unbroken vertical and/or horizontal soil poison barriers between the soil and all portions of the intended structure which may allow termite access to wood and wood related products.
1. Treat all areas under slabs and attached slabs including, but not limited to, the following critical under slabs areas: entire inside perimeter of foundation walls, along both sides of interior walls and partitions, expansion and control joints, around piping, conduits and other slab penetrations, and around interior column footings.
2. Treat outside perimeter of building from grade to footing including, but not limited to, the following critical areas: expansion and control joints, and around piping, conduits and other penetrations.
3. Do not allow contamination of crawl spaces, plenums, and surfaces not intended to be treated; follow manufacturer's instructions to completely remove solution from surface should contamination occur.
B. Surface Application: Use surface application for establishing horizontal barriers. Surface applications shall be applied as a coarse spray and provide uniform distribution over the soil surface. Minimum termiticide penetration into the soil shall be as recommended by the termiticide manufacturer. Avoid surface flow by treating soils only when soil will retain treatment agent.
C. Rodding and Trenching: Use rodding and trenching for establishing vertical soil barriers for each foot of depth from grade to footing. Trenching shall be 6 to 8 inches in width and not less than 12 inches in depth, but not less than that recommended by the termiticide manufacturer. Punch holes in base of trenches to top of footings at not more than 12 inches on center and apply termiticide by rodding. Immediately after termiticide has reached maximum penetration as recommended by the manufacturer, backfilling of the trench shall commence. Backfilling shall be in 6-inch lifts. Mix termiticide with the soil as it is being replaced in trench.
D. Drying: Allow not less than 12 hours drying time after soil treatment application before beginning concrete placement or other construction activities.
E. Reapplication: Reapply soil treatment solution to areas disturbed by subsequent excavation, landscape grading, or other construction activities following application.

3.05 CLEAN UP, DISPOSAL, AND PROTECTION
A. General: Once application has been completed, proceed with clean up and protection of the site without delay.

B. Clean Up: The site shall be cleaned of all material associated with the treatment measures, according to label instructions, and as indicated. Excess and waste material shall be removed and disposed off site.

C. Disposal of Termiticide: Dispose of residual termiticides and containers in accordance with manufacturer’s label instructions, and all federal, state and local laws, regulations and ordinances.

D. Protection of Treated Area: Immediately after the application, protect treated area from other use by erecting barricades and providing signage to identify treated area as required.

END OF SECTION
SECTION 32 13 13
SITE CONCRETE

PART 1 - GENERAL

1.1 RELATED DOCUMENTS
   A. The provisions of the Contract Documents apply to the work of this Section.

1.2 DESCRIPTION OF WORK:
   A. Extent of Portland cement concrete paving is shown on drawings, including:
      1. Walkways

1.3 SUBMITTALS
   A. Provide certification that all materials meet VDOT standards for the class of concrete required.

PART 2 - PRODUCTS

2.1 MATERIALS
   A. Forms: Steel, wood, or other suitable material of size and strength to resist movement during
cement concrete placement and to retain horizontal and vertical alignment until removal. Use straight forms,
free of distortion and defects.
      1. Use flexible spring steel forms or laminated boards to form radius bends as required.
      2. Coat forms with a nonstaining form release agent that will not discolor or deface surface of
         concrete.
   B. Concrete Materials: Comply with requirements of applicable Division 3 sections for concrete
materials, admixtures, bonding materials, curing materials, and others as required.
   C. Expansion Joint Materials: Comply with requirements of applicable Division 7 sections for preformed
expansion joint fillers and sealers.
   D. Antispalling Compound: Combination of boiled linseed oil and mineral spirits, complying with
AASHTO M-233.
   E. Liquid-Membrane Forming and Sealing Curing Compound: Comply with VDOT Road and Bridge
Specifications.
2.2 CONCRETE MIX, DESIGN, AND TESTING
   A. Comply with requirements of applicable Division 3 sections for concrete mix design, sampling and testing, and quality control or VDOT Road and Bridge Specifications whichever is more stringent.
   B. Design mix to produce normal-weight concrete consisting of Portland cement, aggregate, water-reducing or high-range water-reducing admixture (superplasticizer), air-entraining admixture, and water to produce the following properties:
      1. Comply with the requirements of VDOT Std. Class A3 Concrete, unless otherwise indicated.

PART 3 - EXECUTION

3.1 SURFACE PREPARATION
   A. Remove loose material from compacted subbase surface immediately before placing concrete.
   B. Proof-roll prepared subbase surface to check for unstable areas and need for additional compaction. Do not begin paving work until such conditions have been corrected and are ready to receive paving,

3.2 FORM CONSTRUCTION
   A. Set forms to required grades and lines, braced and secured. Install forms to allow continuous progress of work and so that forms can remain in place at least 24 hours after concrete placement.
   B. Check completed formwork for grade and alignment to following tolerances:
      1. Top of forms not more than 1/8 inch in 10 feet.
      2. Vertical face on longitudinal axis, not more than 1/4 inches in 10 feet.
   C. Clean forms after each use and coat with form release agent as required to ensure separation from concrete without damage.

3.3 REINFORCEMENT
   A. Not used.

3.4 CONCRETE PLACEMENT
   A. General: Comply with requirements of applicable Division 3 sections for mixing and placing concrete or VDOT Road and Bridge Specifications whichever is more stringent.
   B. Do not place concrete until subbase and forms have been checked for line and grade. Moisten subbase if required to provide a uniform dampened condition at time concrete is placed. Do not place concrete around manholes or other structures until they are at required finish elevation and alignment.
   C. Place concrete by methods that prevent segregation of mix. Consolidate concrete along face of forms and adjacent to transverse joints with internal vibrator. Keep vibrator away from joint assemblies, reinforcement, or side forms. Use only square-faced shovels for hand spreading and consolidation. Consolidate with care to prevent dislocation of reinforcing, dowels, and joint devices.
   D. Deposit and spread concrete in a continuous operation between transverse joints as far as possible. If interrupted for more than 1/2 hour, place a construction joint.
E. Remove and replace portions of bottom layer of concrete that have been placed more than 15 minutes without being covered by top layer or use bonding agent if acceptable to Architect.

F. Curbs and Gutters: Automatic machine may be used for curb and gutter placement. If machine placement is to be used, submit revised mix design and laboratory test results that meet or exceed minimums indicated. Machine placement must produce curbs and gutters to required cross-section, lines, grades, finish, and jointing as indicated for formed concrete. If results are not acceptable, remove and replace with formed concrete meeting requirements.

3.5 JOINTS

A. General: Construct expansion, weakened-plane (contraction), and construction joints true to line with face perpendicular to surface of concrete. Construct transverse joints at right angles to the centerline, unless otherwise indicated.

B. Weakened-Plane (Contraction) Joints: Provide weakened-plane (contraction) joints, sectioning concrete into areas as shown on drawings. Construct weakened-plane joints for a depth equal to at least 1/4 concrete thickness, as follows:

1. Tooled Joints: Form weakened-plane joints in fresh concrete by grooving top portion with a recommended cutting tool and finishing edges with a jointer.

2. Sawed Joints: Form weakened-plane joints with powered saws equipped with shatterproof abrasive or diamond-rimmed blades. Cut joints into hardened concrete as soon as surface will not be torn, abraded, or otherwise damaged by cutting action.

3. Inserts: Use embedded strips of metal or sealed wood to form weakened-plane joints. Set strips into plastic concrete and carefully remove strips after concrete has hardened.

C. Construction Joints: Place construction joints at end of placements and at locations where placement operations are stopped for more than 1/2 hour, except where such placements terminate at expansion joints.

1. Construct joints as indicated or, if not indicated, use standard metal keyway-section forms.

D. Expansion Joints: Provide premolded joint filler for expansion joints abutting concrete curbs, catch basins, manholes, inlets, structures, walks, and other fixed objects, unless otherwise indicated.

E. Extend joint fillers full width and depth of joint, not less than 1/2 inch or more than 1 inch below finished surface where joint sealer is indicated. If no joint sealer, place top of joint filler flush with finished concrete surface.

F. Provide joint fillers in one-piece lengths for full width being placed wherever possible. Where more than one length is required, lace or clip joint filler sections together.

G. Protect top edge of joint filler during concrete placement with a metal cap or other temporary material. Remove protection after concrete has been placed on both sides of joint.

H. Fillers and Sealants: Comply with requirements of applicable Division 7 sections for preparation of joints, materials, installation, and performance.

3.6 CONCRETE FINISHING

A. After striking-off and consolidating concrete, smooth surface by screeding and floating. Use hand methods only where mechanical floating is not possible. Adjust floating to compact surface and produce uniform texture.

B. After floating, test surface for trueness with a 10-ft. straightedge. Distribute concrete as required to remove surface irregularities, and relfloat repaired areas to provide a continuous smooth finish.
C. Work edges of slabs, gutters, back top edge of curb, and formed joints with an edging tool, and round to 1/2-inch radius, unless otherwise indicated. Eliminate tool marks on concrete surface.

D. After completion of floating and when excess moisture or surface sheen has disappeared, complete troweling and finish surface as follows:
   1. Broom finish by drawing a fine-hair broom across concrete surface perpendicular to line of traffic. Repeat operation if required to provide a fine line texture acceptable to Architect.

E. Do not remove forms for 24 hours after concrete has been placed. After form removal, clean ends of joints and point-up any minor honeycombed areas. Remove and replace areas or sections with major defects, as directed by Architect.

3.7 CURING
   A. Protect and cure finished concrete paving in compliance with applicable requirements of Division 3 sections. Use membrane-forming curing and sealing compound or approved moist-curing methods.

3.8 REPAIRS AND PROTECTIONS
   A. Repair or replace cracked, broken or defective concrete curbs and curb and gutter, as directed by Architect.
   B. Replace cracked, broken or defective concrete sidewalks.
   C. Repair or replace cracked, broken or defective concrete pavement, as directed by Architect.
   D. Drill test cores where directed by Architect when necessary to determine magnitude of cracks or defective areas. Fill drilled core holes in satisfactory pavement areas with Portland cement concrete bonded to pavement with epoxy adhesive.
   E. Protect concrete from damage until acceptance of work. Exclude traffic from pavement for at least 14 days after placement. When construction traffic is permitted, maintain pavement as clean as possible by removing surface stains and spillage of materials as they occur.
   F. Sweep concrete pavement and wash free of stains, discolorations, dirt, and other foreign material just before final inspection.

END OF SECTION 32 13 13