SECURITY VESTIBULE PROJECT

for
GRASSFIELD, GREAT BRIDGE, HICKORY, & OSCAR SMITH HIGH SCHOOLS

Chesapeake Public Schools

Bid 38-1920

Project Manual

March 10, 2020
HBA Project 18061.07
SECURITY VESTIBULE PROJECT

GRASSFIELD, GREAT BRIDGE, HICKORY, & OSCAR SMITH HIGH SCHOOLS

CHESAPEAKE PUBLIC SCHOOLS
Chesapeake, Virginia

Bid 38-1920

HBA Project 18061.07

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

ELECTRICAL ENGINEER
HICKMAN AMBROSE
825 Greenbriar Circle - #A
Chesapeake, VA 23320
757-420-3595
SECURITY VESTIBULE PROJECT - 18061.07 APN
GRASSFIELD, GREAT BRIDGE, HICKORY, and OSCAR SMITH HIGH SCHOOLS - CHESAPEAKE PUBLIC SCHOOLS
BID 38-1920

SECTION 000030

PROJECT DIRECTORY

Owner: Name: Chesapeake Public Schools
Address: 312 Cedar Road
         Chesapeake, VA  23322
POC: Robert Smalley
Phone: (757) 547-0013
Fax: (757) 547-0142
Email: Robert.Smalley@cpschools.com

Architect: Name: HBA Architecture & Interior Design, Inc.
Address: One Columbus Ctr., Suite 1000, Virginia Beach,
         Virginia, 23462-6797
POC: Jack Hasten, Jr., AIA
Phone: (757)490-9048
Fax: (757) 490-7081
Email: jackh@hbaonline.com

Engineer: Name: 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

END OF SECTION 000030
**SECTION 000050**

**TABLE OF CONTENTS**

<table>
<thead>
<tr>
<th>DIVISION 00</th>
<th>BIDDING DOCUMENTS</th>
</tr>
</thead>
<tbody>
<tr>
<td>Section</td>
<td></td>
</tr>
<tr>
<td>000030</td>
<td>Project Directory</td>
</tr>
<tr>
<td>000050</td>
<td>Table of Contents</td>
</tr>
<tr>
<td>002000</td>
<td>Advertisement/Invitation to Bid</td>
</tr>
<tr>
<td>002100</td>
<td>Instructions to Bidders</td>
</tr>
<tr>
<td>003100</td>
<td>Bid Form</td>
</tr>
<tr>
<td>003100a</td>
<td>Pre-Bid Question Form</td>
</tr>
<tr>
<td></td>
<td>Appendix A – Certificate of Compliance - Code of Virginia § 22.1-296.1</td>
</tr>
<tr>
<td></td>
<td>Appendix B - Certificate of Compliance with Immigration Laws &amp; Regulations - Code of Virginia § 40.1-11.1</td>
</tr>
<tr>
<td>003110</td>
<td>Vendor’s Authorization to Transact Business in the Commonwealth</td>
</tr>
<tr>
<td>004100</td>
<td>Anti-Collusion and Non-Discrimination Affidavit</td>
</tr>
<tr>
<td>005000</td>
<td>Sample Agreement Between Owner and Contractor</td>
</tr>
<tr>
<td>006000</td>
<td>Sample of Performance Bond</td>
</tr>
<tr>
<td>007000</td>
<td>General Conditions</td>
</tr>
<tr>
<td>007000</td>
<td>Supplementary Conditions</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>DIVISION 1</th>
<th>GENERAL REQUIREMENTS</th>
</tr>
</thead>
<tbody>
<tr>
<td>010950</td>
<td>Definitions and Standards</td>
</tr>
<tr>
<td>011000</td>
<td>Summary of Work</td>
</tr>
<tr>
<td>012113</td>
<td>Allowances</td>
</tr>
<tr>
<td>012600</td>
<td>Contract Modification Procedures</td>
</tr>
<tr>
<td>012900</td>
<td>Payment Procedures</td>
</tr>
<tr>
<td>013300</td>
<td>Submittals</td>
</tr>
<tr>
<td>015000</td>
<td>Temporary Facilities</td>
</tr>
<tr>
<td>017300</td>
<td>Execution Requirements</td>
</tr>
<tr>
<td>017320</td>
<td>Selective Demolition</td>
</tr>
<tr>
<td>017700</td>
<td>Closeout Procedures</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>DIVISION 2</th>
<th>SITE WORK (NOT USED)</th>
</tr>
</thead>
</table>

<table>
<thead>
<tr>
<th>DIVISION 3</th>
<th>CONCRETE</th>
</tr>
</thead>
<tbody>
<tr>
<td>034500</td>
<td>Precast Architectural Concrete</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>DIVISION 4</th>
<th>MASONRY</th>
</tr>
</thead>
<tbody>
<tr>
<td>042000</td>
<td>Unit Masonry</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>DIVISION 5</th>
<th>METALS (NOT USED)</th>
</tr>
</thead>
</table>

<table>
<thead>
<tr>
<th>DIVISION 6</th>
<th>WOOD &amp; PLASTICS</th>
</tr>
</thead>
<tbody>
<tr>
<td>061000</td>
<td>Rough Carpentry</td>
</tr>
<tr>
<td>064116</td>
<td>Plastic-Laminate-Faced Architectural Cabinets</td>
</tr>
<tr>
<td>DIVISION</td>
<td>DESCRIPTION</td>
</tr>
<tr>
<td>-----------</td>
<td>--------------------------------------------------</td>
</tr>
<tr>
<td>07</td>
<td>THERMAL AND MOISTURE PROTECTION</td>
</tr>
<tr>
<td>07113</td>
<td>Bituminous Damproofing</td>
</tr>
<tr>
<td>079005</td>
<td>Joint Sealers</td>
</tr>
<tr>
<td>08</td>
<td>DOORS AND WINDOWS</td>
</tr>
<tr>
<td>08113</td>
<td>Hollow Metal Doors and Frames</td>
</tr>
<tr>
<td>081416</td>
<td>Flush Wood Doors</td>
</tr>
<tr>
<td>084313</td>
<td>Aluminum-Framed Storefronts</td>
</tr>
<tr>
<td>087100a</td>
<td>Door Hardware-Grassfield</td>
</tr>
<tr>
<td>087100b</td>
<td>Door Hardware-Great Bridge</td>
</tr>
<tr>
<td>087100c</td>
<td>Door Hardware-Hickory</td>
</tr>
<tr>
<td>087100d</td>
<td>Door Hardware-Oscar Smith</td>
</tr>
<tr>
<td>088000</td>
<td>Glazing</td>
</tr>
<tr>
<td>09</td>
<td>FINISHES</td>
</tr>
<tr>
<td>092116</td>
<td>Gypsum Board Assemblies</td>
</tr>
<tr>
<td>096500</td>
<td>Resilient Flooring</td>
</tr>
<tr>
<td>096813</td>
<td>Carpet Tile</td>
</tr>
<tr>
<td>099000</td>
<td>Painting</td>
</tr>
<tr>
<td>10</td>
<td>SPECIALTIES</td>
</tr>
<tr>
<td>11</td>
<td>EQUIPMENT</td>
</tr>
<tr>
<td>12</td>
<td>FURNISHINGS</td>
</tr>
<tr>
<td>13</td>
<td>SPECIAL CONSTRUCTION</td>
</tr>
<tr>
<td>14</td>
<td>CONVEYING SYSTEMS</td>
</tr>
<tr>
<td>21</td>
<td>FIRE SUPPRESSION</td>
</tr>
<tr>
<td>22</td>
<td>PLUMBING</td>
</tr>
<tr>
<td>23</td>
<td>HEATING, VENTILATING, &amp; AIR CONDITIONING (HVAC)</td>
</tr>
<tr>
<td>230100</td>
<td>Mechanical General Provisions</td>
</tr>
<tr>
<td>230500</td>
<td>Materials and Methods</td>
</tr>
<tr>
<td>230593</td>
<td>Starting, Testing, Adjusting and Balancing</td>
</tr>
<tr>
<td>230713</td>
<td>Duct Insulation</td>
</tr>
<tr>
<td>230716</td>
<td>Piping and Equipment Insulation</td>
</tr>
<tr>
<td>230900</td>
<td>Controls and Instrumentations</td>
</tr>
<tr>
<td>232300</td>
<td>Refrigerant Piping System</td>
</tr>
<tr>
<td>233113</td>
<td>Sheet Metal Ductwork</td>
</tr>
</tbody>
</table>
## Table of Contents

**Division 25** Integrated Automation (Not Used)

**Division 26** Electrical
- 260010 Electrical General Provisions
- 260050 Materials and Methods
- 260513 Wire and Cable
- 260533 Conduit and Fittings
- 260534 Outlet Boxes
- 262726 Wiring Devices

**Division 27** Communication
- 275123 Data Cabling System Cabling

**Division 28** Electronic Safety and Security
- 281000 Access Control System

**Division 29-30** (Not Used)

**Division 31** Earthwork (Not Used)

**Division 32** Exterior Improvements (Not Used)

**Division 33** Utilities (Not Used)

**Divisions 34-48** (Not Used)

END OF 000050
SECURITY VESTIBULE PROJECT - 18061.07 APN
GRASSFIELD, GREAT BRIDGE, HICKORY, and OSCAR SMITH HIGH SCHOOLS -
CHESAPEAKE PUBLIC SCHOOLS
BID 38-1920

SECTION 002000

ADVERTISEMENT/INVITATION TO BID

BID NUMBER: 38-1920

BID TITLE: SECURITY VESTIBULE PROJECT -
GRASSFIELD, GREAT BRIDGE, HICKORY, and OSCAR SMITH HIGH SCHOOLS

Grassfield High School address: 2007 Grizzly Trail, Chesapeake, VA 23323
Great Bridge High School address: 301 Hanbury Rd. W. Chesapeake, VA 23322
Hickory High School address: 1996 Hawk Blvd., Chesapeake, Virginia 23322
Oscar Smith High School address: 1994 Tiger Dr., Chesapeake, VA 23320

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

BID DESCRIPTION: The project includes the renovation of the main entrance vestibules at all four (4) schools that provides for new doors, frames, glazing, and security system infrastructure and electrical scope of work.

BID TIME AND PLACE: Sealed bids in duplicate will be received by Michele Zimbro, Buyer, Purchasing Department, Chesapeake Public Schools until 2:00 PM., local prevailing time on April 3, 2020, at the School Administration Building, Purchasing Department, 312 Cedar Road, Chesapeake, Virginia 23322. ABSOLUTELY NO BIDS WILL BE ACCEPTED AFTER THE ABOVE LISTED HOUR. Bids will be publicly opened and read aloud at 2:05 PM in the School Administration Building. 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: Documents will be available on the Chesapeake Public Schools Purchasing and DemandStar websites on March 10, 2020. One (1) set of Documents will also be
available for review at the Purchasing Office of Chesapeake Public Schools, School Administration Building, 312 Cedar Road, Chesapeake, Virginia, 23322.

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 10:00 a.m. on March 18, 2020 at the project site, Grassfield High School, 2007 Grizzly Trail, Chesapeake, VA 23323. A follow-up project site visit to the remaining schools will follow immediately afterward with the order of the site visits to be determined at that time. Any person/vendor visiting a Chesapeake Public Schools facility during school hours must coordinate the visit through the Main Office.

By order of
Chesapeake Public Schools

End of Section 002000
SECTION 002100

INSTRUCTIONS TO BIDDERS

Table of Articles

1. DEFINITIONS
2. BIDDER'S REPRESENTATION
3. BIDDING DOCUMENTS
4. BIDDING PROCEDURES
5. CONSIDERATION OF BID
6. FUNDING OUT CLAUSE
7. POST-BID INFORMATION
8. PERFORMANCE BOND AND LABOR AND MATERIAL PAYMENT BOND
9. FORM OF AGREEMENT BETWEEN OWNER AND CONTRACTOR
10. NEGOTIATION WITH LOWEST RESPONSIVE AND RESPONSIBLE BIDDER
11. DEBARMENT AND PROHIBITED CONTRACTS

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.

1.11 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 One (1) set of Documents will also be available for review at the Purchasing Office of Chesapeake Public Schools, School Administration Building, 312 Cedar Road, Chesapeake, Virginia, 23322.
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 008600, 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.
SECURITY VESTIBULE PROJECT - 18061.07 APN
GRASSFIELD, GREAT BRIDGE, HICKORY, and OSCAR SMITH HIGH SCHOOLS -
CHESAPEAKE PUBLIC SCHOOLS
BID 38-1920

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 All copies of the Bid, the bid security, and any other documents required to be submitted 
with the Bid shall be enclosed in a sealed opaque envelope. The envelope shall be 
addressed to the party receiving the Bids and shall be identified with the Bid number, 
date and time of Bid Opening as indicated in the advertisement to bid, Project name, the 
Bidder's name and address. An envelope template is provided at the end of this Section.

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.
SECURITY VESTIBULE PROJECT - 18061.07 APN
GRASSFIELD, GREAT BRIDGE, HICKORY, and OSCAR SMITH HIGH SCHOOLS - CHESAPEAKE PUBLIC SCHOOLS
BID 38-1920

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. 5.3.4.2.3. 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 submitals.”

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 Division’s option, permit the Division to terminate this Contract at any time and render it null and void, without any further liability on the part of the Division 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 Division, within the meaning of any limitations or indebtedness of the Division 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 Division 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 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.

11.1.2.3 Failure to collect and/or remit taxes may result in prohibition from contracting with the Division 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 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 divisions 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.**
Please complete the following “Return Envelope Template”, affix to the outside envelope of your bid response, and return to Chesapeake Public Schools. Failure to do so may affect the proper and timely receipt of your bid response.

| BIDDER’S NAME: | __________________________ |
| CONTRACTOR’S REGISTRATION CLASS | ___________ AND NO ________ |

**BID #**
**38-1920**

**BID NAME:** SECURITY VESTIBULE PROJECT
GRASSFIELD, GREAT BRIDGE, HICKORY, & OSCAR SMITH HIGH SCHOOLS

**OPENING:** FRIDAY, APRIL 3, 2020 @ 2:05 P.M.

MICHELE ZIMBRO, BUYER
CHESAPEAKE PUBLIC SCHOOLS
SCHOOL ADMINISTRATION BUILDING
PURCHASING DEPARTMENT
312 CEDAR ROAD
CHESAPEAKE, VIRGINIA 23322

END OF SECTION 002100
SECURITY VESTIBULE PROJECT - 18061.07 APN
GRASSFIELD, GREAT BRIDGE, HICKORY, and OSCAR SMITH HIGH SCHOOLS
CHESAPEAKE PUBLIC SCHOOLS
BID 38-1920

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: Michele Zimbro, Buyer
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: SECURITY VESTIBULE PROJECT- GRASSFIELD, GREAT BRIDGE, HICKORY, and OSCAR SMITH HIGH SCHOOLS, CHESAPEAKE VIRGINIA
CHESAPEAKE PUBLIC SCHOOLS BID NUMBER: 38-1920
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 1-GRASSFIELD HIGH SCHOOL**
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)

**BASE BID 2-GREAT BRIDGE HIGH SCHOOL**
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)

**BASE BID 3-HICKORY HIGH SCHOOL**
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)

**BASE BID 4-OSCAR SMITH HIGH SCHOOL**
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)

**GRAND TOTAL: BASE BID 1 + BASE BID 2 + BASE BID 3 + BASE BID 4**
The price for the entire Work, which shall comprise of the total price for Base Bids #1, #2, #3, and #4 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.
SECURITY VESTIBULE PROJECT - 18061.07 APN
GRASSFIELD, GREAT BRIDGE, HICKORY, and OSCAR SMITH HIGH SCHOOLS
CHESAPEAKE PUBLIC SCHOOLS
BID 38-1920

ALLOWANCES

Provide the following allowances in the Base Bid for each school as noted below. The allowances provide for all labor and materials required associated with the Division 281000 specification section scope of work. Refer to section 012113 for additional information.

Allowance No. 1: Great Bridge High School: $4,565/materials and $7,281/labor.

Allowance No. 2: Hickory High School: $4,840/materials and $7,906/labor.

Allowance No. 3: Oscar Smith High School: $2,764/materials and $6,313/labor.

Allowance No. 4: Grassfield High School: $3,974/materials and $7,500/labor.

Acknowledgment receipt of Addendum #1 ___ #2 ___ #3 ___ #4 ___ #5 ___
(initial above for each addendum received)

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-COLLUSION 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 by August 7, 2020.

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 Bid 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.

Very truly yours,

____________________________________________________________________________
Company

____________________________________________________________________________
Address

____________________________________________________________________________
City/State/Zip Code

Registered Virginia Contractor No. ___________________________________________

Signed: _________________________________________________________________

END OF SECTION 003100
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: __________________________

Security Vestibule Project – GRASSFIELD, GREAT BRIDGE, HICKORY, and OSCAR SMITH HIGH SCHOOLS

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. Michele Zimbro, Michele.Zimbro@cpschools.com, 312 Cedar Rd., Chesapeake, VA, 23322

Copies of the question shall be sent to: jackh@hbaonline.com.
SECURITY VESTIBULE PROJECT -
GRASSFIELD, GREAT BRIDGE, HICKORY, and OSCAR SMITH HIGH SCHOOLS
CHESAPEAKE PUBLIC SCHOOLS
BID 38-1920

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

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*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 Title

**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 12 months for the duration of the contract / agreement period.** Should there be a change to the certification 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 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

*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.*
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
SECURITY VESTIBULE PROJECT -
GRASSFIELD, GREAT BRIDGE, HICKORY, and OSCAR SMITH HIGH SCHOOLS
CHESAPEAKE PUBLIC SCHOOLS
BID 38-1920

(_____) __________________________ (_____) __________________________
Business Telephone #          Business Fax #
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:

___________________________________________________________________________
___________________________________________________________________________

________________________________________________________
SECTION 004100

ANTI-COLLUSION AND NON-DISCRIMINATION AFFIDAVIT

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: __________________________

38-1920 ANTI-COLLUSION AND NON-DISCRIMINATION AFFIDAVIT 004100 - 1
SECURITY VESTIBULE PROJECT
GRASSFIELD, GREAT BRIDGE, HICKORY, and OSCAR SMITH HIGH SCHOOLS
CHESAPEAKE PUBLIC SCHOOLS
BID 38-1920

BIDDER'S SIGNATURE NOTARIZATION:

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

____________________________________
(Title)

____________________________________

My commission expires _____________

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)
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: SECURITY VESTIBULE PROJECT
GRASSFIELD, GREAT BRIDGE, HICKORY, and OSCAR SMITH HIGH SCHOOLS
CHESAPEAKE, VIRGINIA
BID: # 38-1920

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 renovation of the main entrance vestibules at all four (4) schools that provides for new doors, frames, glazing, and security system and electrical scope of work.

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

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

GRASSFIELD HIGH SCHOOL

$ ______________________

(written) (numbers)

GREAT BRIDGE HIGH SCHOOL

$ ______________________

(written) (numbers)

HICKORY HIGH SCHOOL

$ ______________________

(written) (numbers)

OSCAR SMITH HIGH SCHOOL

$ ______________________

(written) (numbers)

Grand Total

$ ______________________

(written) (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 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.

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:

Documents: Dated:

38-1920 SAMPLE AGREEMENT BETWEEN OWNER AND CONTRACTOR 005000 - 3
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
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, and authorized to transact business within the Commonwealth of Virginia, as 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 Contract 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.
SECTION 007000
GENERAL CONDITIONS

TABLE OF CONTENTS
ARTICLE 1: DEFINITIONS
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.

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.

2.1.3  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/Engineer will review and approve or take other appropriate action upon the Contractor's Submittals such as Shop Drawings, Product Data, and Samples, but only for conformance with the design concept of the Work and with the information given in the Contract Documents. The Architect’s/Engineer's approval 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 marked on all shop drawings, product data, and samples.

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’s/Engineer’s approval 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’s/Engineer’s approval 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 approved 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.

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.
SECURITY VESTIBULE PROJECT -
GRASSFIELD, GREAT BRIDGE, HICKORY, and OSCAR SMITH HIGH SCHOOLS
CHESAPEAKE PUBLIC SCHOOLS
BID 38-1920

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 hereinabove 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 proves to be unsatisfactory to the Contractor and ceases to be in its employ. The Superintendent shall represent the Contractor. All communications given to the Superintendent shall be binding as if given to the Contractor. The Contractor’s Superintendent, or a designated alternate, shall be present on the job at all times when Work is being performed by the Contractor’s personnel or Subcontractor’s personnel. Such designated alternate shall be identified in initial submissions. The Contractor’s Superintendent shall remain on site until the Work is completed in its entirety, including punch list items.

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: **August 7, 2020**

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: __**August 31, 2020**__

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.

3.6 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.

3.6.1.1.2 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.

3.6.1.1.3 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.

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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:
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.

3.6.6 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.

3.6.8 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;
3.6.8.2.3 Proposed method for recovering the time and achieving all required project Substantial Completion deadlines, including manpower loading, if applicable.

3.6.9 CAUSES FOR EXTENSIONS OF TIME

3.6.9.1 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.

3.6.10 FLOAT TIME

3.6.10.1 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.

3.7 SUSPENSION OF WORK
3.7.1 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.

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

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

3.7.2.2 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;

3.7.2.3 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

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

3.7.3 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.

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;

3.9.3.5 The foregoing amounts shall include a reasonable sum, under all of the circumstances, as profit for the Work performed by the Contractor.

3.9.4 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.
3.10  CHANGES AND EXTRA WORK

3.10.1  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.

3.10.2  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.

3.10.3  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.

3.10.4  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:

3.10.4.1  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 adjustment
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.

4.3.1.3 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 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;
4.4.1.2 Claims for damages because of bodily injury, occupational sickness or disease, or death of his employees;

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

4.4.1.4 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;

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

4.4.1.6 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

4.4.1.7 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.

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.

4.4.1.4 Chesapeake 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. Chesapeake Public Schools shall receive from the Underwriter a letter stating that each insurance policy has been amended to name Chesapeake 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.
4.4.1.6 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.
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.

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.

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.

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 accordance 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."

4.9 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.

4.9.1 Not used.

4.9.2 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.

4.9.3 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.

4.10 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.

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.

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.

5.4.7.1 MATERIALS STORED OFF SITE: No payment will be made for materials stored off site.

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
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.

END OF SECTION 007000
1. **SUPPLEMENT:**

1.1 The following Supplements modify, change, delete from or add to the General Conditions. Where any of the General Conditions are modified or deleted by the supplements, the unaltered provisions shall remain in effect.

**ARTICLE 1: DEFINITIONS:**

1.12 CONTRACT DRAWINGS: Add the following at the end of the paragraph:

"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."

**ARTICLE 2: CONTROL OF WORK:**

2.1.2 CONTRACT ADMINISTRATION:

2.1.2.1 Add the following paragraph:

"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."

2.5.4 Delete this paragraph and add the following:

"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 Add the following to the end of this paragraph:

"All submissions shall be made within 90 days of the Notice to Proceed."

2.5.8 Change all references to the phrase "Architect’s approval" to "Architect’s review" within this paragraph.

2.5.10 Change the phrase "...approved by the Architect/Engineer" to "…reviewed by the Architect/Engineer."

**2.8 TESTS AND INSPECTION:**

2.8.1 Add to end of last sentence the following:

"…unless otherwise and specifically indicated in the Contract Documents."

**3.5 TIME:**

3.5.1 Add the following sub paragraphs:

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."

40-1920 SUPPLEMENTARY CONDITIONS 007100 - 1
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 Add the following sentences to the end of the paragraph as follows:
"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."

3.6.5.4 NARRATIVE SCHEDULE REPORTS:
Add the following subparagraph:
"3.6.5.4.8 Payment shall be withheld until such narrative report(s) is reviewed and approved."

3.6.7 SCHEDULE MODIFICATIONS
3.6.7.2 Add the following subparagraph:
"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."

3.7 SUSPENSION OF WORK
3.7.1 Add this sentence at the end of the paragraph:
"3.7.1 Work halted for the contractor's failure to submit required documentation shall not be considered under this Article."

3.7.2 Add the following subparagraph 3.7.2.5
"3.7.2.5 Work halted for the contractor's failure to submit required documentation shall not be considered under this Article."

3.7.3 Add this sentence at the end of the paragraph:
"3.7.3 Work halted for the contractor's failure to submit required documentation shall not be considered under this Article."

3.7.4 Add this sentence at the end of the paragraph:
"3.7.4 Work halted for the contractor's failure to submit required documentation shall not be considered under this Article."
3.10 CHANGES AND EXTRA WORK:

3.10.1 Add the following at the end of the paragraph:

"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 undercutts 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."

3.10.3 CONTRACT COST PROPOSAL: Add the following sentence to the end of this paragraph:

"The proposal shall include any time extension required to perform the work associated with the changes."

ARTICLE 4: MISCELLANEOUS PROVISIONS:

4.3 PROTECTION OF PERSONS AND PROPERTY

4.3 Add the following subparagraph:

"4.3.1 Safety Precautions: Add the following sentence to Subparagraph 4.3.1:

"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."

4.4 INSURANCE

4.4.1 CONTRACTOR'S LIABILITY INSURANCE:

4.4.1.7 Add the following Subparagraph:

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

4.4.1.5 Add the following Subparagraph:

"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."

38-1920 SUPPLEMENTARY CONDITIONS 007100 - 3
4.4.1.3 Add the following after the last sentence:
"The certificate shall include the Owner and Architect as "additional insured's."

4.8 ACCEPTANCE OF WORK:
"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.

4.8.3 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."

4.21 Escrow Amounts
Delete this paragraph and subparagraph 4.21.1 and 4.21.2 in their entirety.

4.23 Add new paragraphs as follows:
"4.23 ADDITIONAL PROFESSIONAL SERVICES
4.23.1 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.

4.24 DEMONSTRATION NOTIFICATIONS
4.24.1 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.

4.25 SHOP DRAWING DELIVERY ACCOUNT
4.25.1 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:
5.3 SCHEDULE OF VALUES: Add the following sentence to Paragraph 5.3:
"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."

5.4.7 Materials On Hand and Not Placed: Add to paragraph, "Materials not physically stored on the site will not be considered on hand and will not qualify for payment".

Add the following Subparagraph:
"5.4.5.1 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.

Add the following paragraph:

5.10 ADDITIONAL PROFESSIONAL SERVICES

5.10.1 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 workpersonship 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.

END OF SECTION 007100
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/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 facilitate location of text in the Project Manual.

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
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
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:

SECURITY VESTIBULE PROJECT -
GRASSFIELD, GREAT BRIDGE, HICKORY, and OSCAR SMITH HIGH SCHOOLS

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 of the main entrance vestibules all four (4) schools that provides for new doors, frames, glazing, security system, and electrical scope of work.

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 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. Work shall be scheduled before or after the following school hours: Grassfield and Great Bridge High Schools (8:40-3:38 pm) and Hickory and Oscar Smith High Schools (8:45-3:43 pm.). After June 12, 2020, access from the referenced date to the Substantial Completion date is as noted in article 1.5 below.

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. On-Site Work Hours after June 12, 2020 is as follows: 7 AM-5 PM, Monday through Thursday.
C. No access into the building will be provided unless the Contractor agrees to compensate the school for the custodian’s services on Fridays, Saturdays, and Sundays.

D. 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 it 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 01 21 13

ALLOWANCES

PART 1 - GENERAL

1.01 RELATED DOCUMENTS

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

1.02 SUMMARY

A. This Section includes administrative and procedural requirements governing allowances.
   1. Selected materials and equipment are specified in the Contract Documents by allowances. In some cases, these allowances include installation. Allowances have been established in lieu of additional requirements and to defer selection of actual materials and equipment to a later date when additional information is available for evaluation. If necessary, additional requirements will be issued by Change Order.
   2. Types of allowances include the following:
      a. Lump-sum labor/material allowances.

B. Related Sections: The following Sections contain requirements that relate to this Section:
   1. Division 1 Section "Modification Procedures" specifies procedures for submitting and handling Change Orders.

1.03 SELECTION AND PURCHASE

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

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

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

1.04 SUBMITTALS

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

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

PART 2 - PRODUCTS

PART 3 - EXECUTION

3.01 EXAMINATION

A. Examine products covered by an allowance promptly upon delivery for damage or defects.

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

3.03 SCHEDULE OF ALLOWANCES

A. The allowances noted below are to be included in the Base Bid for each of the referenced schools below for the work associated with labor and materials for the work described in Division 281000. Please note the following:

B. Allowance No. 1: Great Bridge High School: $4,565/materials and $7,281/labor.
   1. The cost of this allowance shall be included in the projects Schedule of Values.

C. Allowance No. 2: Hickory High School: $4,840/materials and $7,906/labor.
   1. The cost of this allowance shall be included in the projects Schedule of Values.

D. Allowance No. 3: Oscar Smith High School: $2,764/materials and $6,313/labor.
   1. The cost of this allowance shall be included in the projects Schedule of Values.

E. Allowance No. 4: Grassfield High School: $3,974/materials and $7,500/labor.
   1. The cost of this allowance shall be included in the projects Schedule of Values.

F. The Bid shall include the cost of sales tax for materials (which are not included above) and all overhead and profit mark-ups.

END OF SECTION
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

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 governing the Contractor's Applications for Payment.

1.3 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.

APPLICATIONS FOR PAYMENT:

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

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

K. **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.

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

M. **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.

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

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

P. **Transmittal:** Submit five (5) executed copies of each Application for Payment to the Architect/Engineer by means ensuring receipt within 24 hours; two (2) copies shall be complete, including waivers of lien and similar attachments.

Q. Transmit each copy with a transmittal form listing attachments, and recording appropriate information related to the application in a manner acceptable to the Architect/Engineer.

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

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

U. **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

V. **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.

W. **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
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. **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. 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.

E. **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

F. **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.

G. **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.

1.7 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. Sheet size: Submit Shop Drawings on sheets at least 8-1/2” x 11” but no larger than 24” x 36”.

D. Submittal: Submit seven (7) copies of all shop drawings for review. For shop drawings submitted in format larger than 8-1/2x11, submit one (1) reproducible copy and three (3) prints. The Architect/Engineer will retain two (2) and will return the others marked with action taken and corrections or modifications required. (One [1] of these two [2] copies shall be marked up and maintained as a Record Document in the Architect’s/Engineer’s file. The remaining copy will be distributed to the Owner upon Project Closeout.) One (1) copy of the submittal is forwarded to the Owner with action taken and the remaining copies are forwarded to the Contractor. 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.

1.8 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 seven (7) copies of each required submittal; The Architect/Engineer will retain two (2) and will return the others marked with action taken and corrections or modifications required.

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. 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

B. 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.

C. 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.

D. Distribution of Samples: Prepare and distribute additional sets to Subcontractors, manufacturers, fabricators, suppliers, installers, and others as required for performance of the Work. Show
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. Reviewed: Where submittals are marked "Reviewed" 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. Comments Attached: When submittals are marked "Comments Attached," 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. If resubmittal is also required, promptly respond, in order to acknowledge that requested changes will be made.

3. Rejected: When submittal is marked "Rejected" and "Resubmit" 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. Do not permit submittals marked "Rejected" and "Resubmit" to be used at the Project site, or elsewhere where Work is in progress.

4. Confirm: Where a submittal is marked "Confirm" the comment indicates an "approved as noted" status and the Contractor must confirm to the Architect/Engineer in writing that they will comply with the "as noted" comments before proceeding with that part of the Work.

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

PART 2 - PRODUCTS (Not applicable)

PART 3 - EXECUTION (Not applicable)
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.

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

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.

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.
SECURITY VESTIBULE PROJECT -
GRASSFIELD, GREAT BRIDGE, HICKORY, and OSCAR SMITH HIGH SCHOOLS
CHESAPEAKE PUBLIC SCHOOLS
BID 38-1920

END OF SECTION 015000
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 site's 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 as indicated.

B. Comply with manufacturer's written instructions and recommendations for installing products in applications indicated.

C. Install products at the time and under conditions that will ensure the best possible results. Maintain conditions required for product performance until Substantial Completion.

D. Conduct construction operations so no part of the Work is subjected to damaging operations or loading in excess of that expected during normal conditions of occupancy.

E. 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 level 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
SECTION 017700
CLOSEOUT PROCEDURES

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 03 45 00

PRECAST ARCHITECTURAL CONCRETE

PART 1  GENERAL

1.01  SECTION INCLUDES

A. Precast architectural window sill/trim units produced by the wet-cast method.

B. Installation of precast architectural units shall be the work of Section 04 20 00 - Unit Masonry.

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: Unit masonry setting materials and installation of precast architectural concrete and trim items.
   Section 07 90 05 - Joint Sealers.

1.04  REFERENCE STANDARDS

A. Reference standards include, but are not limited to, the following:
   ACI 301 - Specifications for Structural Concrete for Buildings; American Concrete Institute International; 2005.
   ACI 318 - Building Code Requirements for Structural Concrete and Commentary; American Concrete Institute International; 2008.
   ASTM A 615/A 615M - Standard Specification for Deformed and Plain Billet-Steel Bars for Concrete Reinforcement; 2009b.
   ASTM A 767/A 767M - Standard Specification for Zinc-Coated (Galvanized) Steel Bars for Concrete Reinforcement; 2009.
1.05 DEFINITION

A. Wet-Cast Method: Manufactured from measurable slump concrete and consolidated into a mould.

1.06 SUBMITTALS

A. See Section 01 33 00 - Submittals, for submittal procedures.

B. Product Data: Manufacturer's information on accessory products including, but not limited to, pigments, admixtures, inserts, plates, etc.

C. Design Mixtures: For each precast concrete mixture; include compressive strength and water-absorption tests. Submit not less than fifteen (15) days prior to start of precast architectural concrete unit production; do not proceed with production until design mixtures and evaluation have been accepted by the Architect.

D. Shop Drawings: Detail fabrication and installation of architectural precast concrete units. Indicate details of reinforcement and anchorage, locations, plans, elevations, dimensions, shapes, and cross sections of each unit; include details at corners. Indicate joints, reveals, and extent and location of each surface finish.
   1. Indicate expansion, control and other "soft" type sealant joints, and "rigid" type grout or mortar joints.
   2. Indicate locations, tolerances, and details of anchorage devices to be embedded in or attached to structure or other construction.
   3. Include plans and elevations showing unit location and sequence of erection for special conditions.
   4. Indicate location of each architectural precast concrete unit by same identification mark placed on panel.
   5. Indicate relationship of architectural precast concrete units to adjacent materials.

E. Samples: Submit in sets of three (3) for each type of finish and color indicated on exposed surface of precast architectural concrete units, 6×4×1 inch minimum size, illustrating full range of surface finish, color and texture variations expected. When other faces of precast concrete unit are exposed, include samples illustrating workmanship, color, and texture of those faces.

F. Material Certificates: For the following items:
   Cementitious materials.
   Reinforcing materials.
   Admixtures.

G. Material Test Reports: For aggregates.

H. Fabricator's Certificate: Certification, current and signed by the fabricator, showing compliance with qualification requirements of this Section.
SECURITY VESTIBULE PROJECT - 18061.07 APN
GRASSFIELD, GREAT BRIDGE, HICKORY, and OSCAR SMITH HIGH SCHOOLS
CHESAPEAKE PUBLIC SCHOOLS
BID 38-1920

I. Installation Instructions: Submit fabricator's installation instructions and recommendations.
J. Maintenance Data: Indicate surface cleaning instructions.

1.07 QUALITY ASSURANCE

A. Fabricator Qualifications
   1. Firm having at least ten (10) years of documented experience in continuous production of wet-cast custom precast architectural concrete of the type required; and having facilities and capacity to furnish the quality and volume of precast architectural concrete required for this project.
   2. Plant shall be certified by the Architectural Precast Association (APA).

B. Design Standards: Comply with ACI 318 and design recommendations of PCI MNL-120 applicable to types of architectural precast concrete units indicated.

C. Quality-Control Standard: For manufacturing procedures and testing requirements, quality-control recommendations, and dimensional tolerances for types of units required, comply with PCI MNL-117 and PCI MNL-135, and APA standards.

D. Rejection of Precast Architectural Concrete: Units may be rejected for the following deficiencies:
   - Deviation from specified tolerances
   - Damage incurred during erection or construction
   - Ragged or irregular edges
   - Honeycombs/voids on finished surfaces
   - Excessive variation of color or finish from approved sample, or unit to unit
   - Form lines or irregular surfaces
   - Rust or tar stains on finished surfaces
   - Visible repairs or cracks
   - Surface crazing
   - Other defects as listed in PCI MNL 117

1.08 MOCK-UP

A. Furnish precast architectural concrete trim units as required for inclusion in unit masonry mockups indicated in Section 04 20 00 - Unit Masonry.

1.09 DELIVERY, STORAGE, AND HANDLING

A. Deliver architectural precast concrete units in such quantities and at such times to limit unloading units temporarily on the ground.

B. Handle and transport units in a position consistent with their shape and design in order to avoid excessive stresses which would cause cracking or damage. Lift and support precast units only from support points.

C. Blocking and Lateral Support during Transport and Storage: Use materials that are shock-absorbing, clean, non-staining, and non-harmful to exposed surfaces. Provide temporary lateral support to prevent bowing and warping.

D. Store units with adequate dunnage and bracing, and protect units to prevent staining, chipping, spalling, cracking, distortion, warping or other physical damage.
E. Place stored units so identification marks are clearly visible, and units can be inspected.

1.10 SEQUENCING

A. Furnish loose connection hardware and anchorage items to be embedded in or attached to other construction without delaying the Work. Provide locations, setting diagrams, templates, instructions, and directions, as required, for installation.

PART 2 PRODUCTS

2.01 MANUFACTURERS

A. Subject to compliance with the requirements of this Section, provide precast architectural concrete units by one of the following manufacturers:
   - Seaboard Concrete Products Company, Richmond VA: www.seaboardconcrete.com
   - Architectural Concrete Products, Daleville VA: www.archconcrete.com
   - Carolina Cast Stone Company, Greensboro NC: www.carolinacaststone.com
   - Arban and Carosi Inc, Woodbridge VA: www.arbancarosi.com

2.02 REINFORCEMENT

A. Recycled Content of Steel Products: Postconsumer recycled content plus one-half of preconsumer recycled content not less than 25 percent.

B. Reinforcing Steel: ASTM A 615/A 615M Grade 60 (420).
   1. Deformed billet-steel bars.
   2. Galvanized after fabrication in accordance with ASTM A 767/A 767M, Class I.

C. Steel Wire: ASTM A 82/A 82M cold-drawn steel wire, plain type, galvanized after fabrication.

D. Steel Welded Wire Reinforcement: ASTM A 185/A 185M, plain type, galvanized after fabrication.

E. Supports
   1. Suspend reinforcement from back of mould or use bolsters, chairs, spacers, and other devices for spacing, supporting, and fastening reinforcing bars and welded wire reinforcement in place according to PCI MNL 117.
   2. For exposed-to-view surfaces where legs of supports are in contact with forms, provide supports with legs that are plastic protected (CRSI Class 1) or stainless steel (CRSI Class 2) complying with CRSI Manual of Standard Practice.

2.03 CONCRETE MATERIALS

A. Portland Cement: ASTM C 150, Type I - Normal or Type III - High Early Strength.
   1. White, or as required by color and finish indicated.
   2. Use one brand, type and source of supply for the entire project, unless otherwise acceptable to the Architect.

B. Prohibited Filler Materials: Use of any fly ash, ground granulated blast furnace slag, silica fume, rice hull ash, or other waste material is strictly prohibited.
C. Fine and Coarse Normal-Weight Aggregates: Except as modified by PCI MNL 117, ASTM C33, with coarse aggregates complying with Class 5S. Stockpile fine and coarse aggregates for each type of exposed finish from a single source (pit or quarry) for project.

D. Color Additives: ASTM C979, pure, concentrated synthetic or natural mineral-oxide pigments or colored water-reducing admixtures, temperature stable, and non-fading.
   1. Color: To match Architect's sample when incorporated into specified mix design.
   2. Color and texture shall match existing window sills.

E. Water: Clean, potable; free from deleterious material that may affect color stability, setting, or strength of concrete and complying with chemical limits of PCI MNL 117.

F. Air Entrainment Admixture: ASTM C260, certified by manufacturer to be compatible with other required admixtures.

G. Chemical Admixtures: Certified by manufacturer to be compatible with other admixtures and to not contain calcium chloride, or more than 0.15 percent chloride ions or other salts by weight of admixture.
   1. Water-Reducing and Retarding Admixtures: ASTM C494/C494M, Type D.

2.04 MOULDS

A. Materials: Rigid, dimensionally stable, non-absorptive material, warp and buckle free, that will provide continuous and true precast concrete surfaces within fabrication tolerances indicated; non-reactive with concrete and suitable for producing required finishes.

B. Release Agent: Commercially produced liquid-release agent that will not bond with, stain or adversely affect precast concrete surfaces and will not impair subsequent surface or joint treatments of precast concrete.

2.05 ACCESSORIES

A. Precast Accessories: Provide clips, hangers, plastic or steel shims, and other accessories required to install architectural precast concrete units.

2.06 CONCRETE MIXTURES

A. General
   1. Prepare design mixtures for each type of precast concrete required.
   2. Design mixtures may be prepared by a qualified independent testing agency or by qualified precast plant personnel at architectural precast concrete fabricator's option.
   3. Limit water-soluble chloride ions to maximum percentage by weight of cement permitted by ACI 318 or PCI MNL 117 when tested according to ASTM C1218/C1218M.
   4. Use of any fly ash, ground granulated blast furnace slag, silica fume, rice hull ash, or other waste material is strictly prohibited.

B. Normal-Weight Concrete Mixtures: Proportion full-depth mixture by either laboratory trial batch or field test data methods according to ACI 211.1, with materials to be used on Project, to provide normal-weight concrete with the following properties:
   1. Compressive Strength (28 Days): 5,000 psi minimum.
   2. Maximum Water-Cementitious Materials Ratio: 0.45.
C. Water Absorption: 6 percent by weight or 14 percent by volume, tested according to PCI MNL 117.

D. Air-Entraining Admixture: Add air-entraining admixture in strict accord with manufacturer's prescribed rate to result in concrete at point of placement having an air content complying with PCI MNL 117.

E. Other Admixtures: When included in design mixtures, add other admixtures to concrete mixtures according to manufacturer's written instructions and as required to maintain quality control. Admixtures to increase cement dispersion, or to provide increased workability for low-slump concrete, may be used subject to the Architect’s acceptance.

2.07 FABRICATION

A. General

1. Fabricate in conformance with PCI MNL-117 and PCI MNL-135, and APA standards, producing units true to dimension and line, having clean and accurate arris (arrises), and without warps, cracks, breaks, spalls, stains or otherwise defective.
   a. All returns, reveals, lug and ribs shall be cast integrally with basic unit.
   b. All corners shall be made with the face profile returned the depth of the section; miter corners shall not be allowed.
   c. Provide slots, holes and openings to receive, clamps, dowels, waterstops, flashings and other similar work as indicated. Do not drill, or cut openings or prestressing strand without Architect's approval.
   d. Provide cast-in plates, inserts and other anchorage for attachment of loose hardware as required.

2. Fabricate units by the wet-cast process; use of the dry-tamp process will not be allowed.

3. Mark each unit to correlate with shop/setting drawings; marks shall not occur on finished surfaces.

B. Reinforcement: Comply with ACI 301 and the recommendations in PCI MNL 117 for fabricating, placing, and supporting reinforcement. Reinforce units to resist handling, transportation, and erection stresses.

1. Clean reinforcement of loose rust and mill scale, earth, and other materials that reduce or destroy the bond with concrete.

2. Accurately position, support, and secure reinforcement against displacement during concrete-placement and consolidation operations. Completely conceal support devices to prevent exposure on finished surfaces.

3. Place reinforcement to maintain at least 3/4-inch minimum coverage. Arrange, space, and securely tie bars and bar supports to hold reinforcement in position while placing concrete. Direct wire tie ends away from finished, exposed concrete surfaces.

4. Place reinforcing steel and prestressing strand to maintain at least 3/4-inch minimum concrete cover. Increase cover requirements for reinforcing steel to 1-1/2 inches when units are exposed to corrosive environment or severe exposure conditions. Arrange, space, and securely tie bars and bar supports to hold reinforcement in position while placing concrete. Direct wire tie ends away from finished, exposed concrete surfaces.

5. Install welded wire fabric in lengths as long as practicable. Lap adjoining pieces at least one full mesh spacing and wire tie laps, where required by design. Offset laps of adjoining
widths to prevent continuous laps in either direction.

C. Fabrication of Moulds
   1. Use rigid moulds, constructed to maintain precast unit uniform in shape, size, and finish. Accurately construct, mortar tight, of sufficient strength to withstand pressures due to concrete-placement operations and temperature changes and for prestressing and detensioning operations. Coat contact surfaces of moulds with release agent before reinforcement is placed. Avoid contamination of reinforcement and prestressing tendons by release agent.
   2. Maintain moulds to provide completed architectural precast concrete units of shapes, lines, and dimensions indicated, within fabrication tolerances specified.
      a. Form joints are not permitted on faces exposed to view in the finished work.

D. Concrete
   1. Comply with requirements ACI 304R, ASTM C 94/C 94M, PCI MNL 117 and requirements in this Section for measuring, mixing, transporting, and placing concrete. After concrete batching, no additional water may be added.
      a. Place concrete in a continuous operation to prevent seams or planes of weakness from forming in precast concrete units.
      b. Thoroughly consolidate placed concrete by internal and external vibration without dislocating or damaging reinforcement and built-in items, and minimize pour lines, honeycombing, or entrapped air on surfaces. Use equipment and procedures complying with PCI MNL 117.
      c. Comply with PCI MNL 117 for hot- and cold-weather concrete placement.
   2. Identify pickup points of architectural precast concrete units and orientation in structure with permanent markings, complying with markings indicated on Shop Drawings. Imprint or permanently mark casting date on each architectural precast concrete unit on a surface that will not show in finished structure.
   3. Cure units to develop concrete quality, and to minimize appearance blemishes such as non-uniformity, staining, or surface cracking.
      a. Cure in accordance with the requirements of PCI MNL 117, by moisture retention without heat or by accelerated heat curing using low-pressure live steam or radiant heat and moisture. Cure units until compressive strength is high enough to ensure that stripping does not have an effect on performance or appearance of final product.
      b. Cure units until compressive strength is high enough to ensure that stripping does not have an effect on performance or appearance of final product.
   4. Discard and replace architectural precast concrete units that do not comply with requirements, including structural, manufacturing tolerance, and appearance, unless repairs meet requirements in PCI MNL 117 and Architect's approval. Limitations as to amount of patching which may be permitted will be subject the Architect's acceptance.

2.08 FABRICATION TOLERANCES

A. Fabricate architectural precast concrete units straight and true to size and shape with exposed edges and corners precise and true so each finished panel complies with PCI MNL 117 product tolerances as well as position tolerances for cast-in items.

B. Fabricate architectural precast concrete units straight and true to size and shape with exposed edges and corners precise and true so each finished panel complies with PCI MNL-117 and PCI
MNL-135 product tolerances as well as position tolerances for cast-in items, except as specifically amended below.

1. Product Tolerances
   a. Overall Height and Width of Units, Measured at the Face Exposed to View: As follows:
      i. 10 feet or under, plus or minus 1/8 in.
      ii. 10 to 20 feet, plus 1/8 inch, minus 3/16 inch.
   b. Variation from Square or Designated Skew (Difference in Length of the Two Diagonal Measurements): Plus or minus 1/8 inch in 10 feet or 1/4 inch total, whichever is greater.
   c. Total Thickness: Plus or minus 1/8 in.
   d. Tipping and Flushness of Anchors, Plates and Inserts: Plus or minus 1/8 inch.
   e. Bowing: Plus or minus length/360, maximum 1 inch.
   f. Length and Width of Block-outs and Openings within One Unit: Plus or minus 1/4 inch.
   g. Local Smoothness: 1/8 inch per 10 feet.
   h. Warping: 1/16 inch per 12 inches of distance from nearest adjacent corner.
   i. Dimensions of Architectural Features: Plus or minus 1/8 inch.

2. Position Tolerances: For cast-in items measured from datum line location, as indicated on Shop Drawings.
   a. Weld Plates: Plus or minus 1 inch.
   b. Inserts: Plus or minus 1/2 inch.
   c. Reinforcing Steel and Welded Wire Fabric: Plus or minus 1/4 inch where position has structural implications or affects concrete cover; otherwise, plus or minus 1/2 inch.

2.09 FINISHES

   A. Faces shall be free of joint marks, grain, sand streaks, pockets, honeycomb and other obvious defects. Corners, including false joints shall be uniform, straight, and sharp. After units have cured, finish exposed-face surfaces of precast architectural concrete units to match approved sample panels and as follows:
      1. Honed Finish: Use continuous mechanical abrasion with fine grit, followed by filling and rubbing procedures, and of uniform color and texture.

   B. Finish exposed top and bottom surfaces of architectural precast concrete units by smooth, steel-towel finish.

   C. Finish unexposed surfaces of architectural precast concrete units by float finish.

PART 3 EXECUTION

3.01 INSTALLATION

   A. Furnish precast architectural concrete units for installation as the work of Section 04 20 00 - Unit Masonry.

END OF SECTION 03 45 00
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 Section 03 45 00 - Precast Architectural Concrete and loose steel lintels.

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 45 00 - Precast Architectural Concrete
   Section 07 90 05 - Joint Sealers, for backing rod and sealant at control, expansion joints, and joints between architectural precast 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
1.05 ADMINISTRATIVE REQUIREMENTS
   A. Preinstallation Meeting: Convene a preinstallation meeting one week before starting work of this section.

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. Fabricated Flashing: Details expansion joint water stops and other special applications. Samples
      2. Samples for Initial Selection: Where required for the Architect's initial selection, submit for the following:
         a. Face brick
         b. Pigmented mortars
      3. 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

ASTM D 2000 - Standard Classification System for Rubber Products in Automotive Applications; 2008
ASTM F 594 - Standard Specification for Stainless Steel Nuts; 2009
D. 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.

E. 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.

F. 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.
G. 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.

H. 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 Compressive 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 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 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.

1.10 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 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. 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 shall NOT be used.
   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. 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.
   2. 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.
3. Initial Rate of Absorption (IRA): Less than 30 g/30 sq in per minute when tested in accordance with ASTM C 67.
4. Efflorescence: Provide brick that has been tested according to ASTM C 67 and is rated "not effloresced."

B. Re-use existing brick associated with the demolition of the existing wall

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
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/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. Provide one side rod for each face shell of hollow masonry units more than 4 inch es 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; HB-200: www.h-b.com
      Dur-O-Wal; DA213: www.dur-o-wal.com
      Wire-Bond; RJ711 (2401): 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 × 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 ASTM A 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.advancedflashings.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.advancedflashings.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.

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
   2. Bond: match existing.

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. Set precast architectural concrete units in full bed of mortar with full vertical joints. Fill dowel, anchor, and similar holes.
E. 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.

F. Interlock intersections and external corners.

G. Do not shift or tap masonry units after mortar has achieved initial set. Where adjustment must be made, remove mortar and replace.

H. 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.

I. Cut mortar joints flush where wall tile is scheduled.

J. Architectural precast trim: rake mortar joints between architectural precast trim and dissimilar materials. Strike joints 3/8” deep and provide continuous sealant joint.

K. 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 removes 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 crosswebs 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. 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.

C. 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-place 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. 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 Contractor’s 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 tooling, 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 04 20 00
SECTION 061000 - ROUGH CARPENTRY

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. Wood blocking and nailers.
   2. Wood furring.
   3. Wood sleepers.

1.3 DEFINITIONS

A. Boards or Strips: Lumber of less than 2 inches nominal (38 mm actual) size in least dimension.

B. Dimension Lumber: Lumber of 2 inches nominal (38 mm actual) size or greater but less than 5 inches nominal (114 mm actual) size in least dimension.

C. Exposed Framing: Framing not concealed by other construction.

D. OSB: Oriented strand board.

E. Timber: Lumber of 5 inches nominal (114 mm actual) size or greater in least dimension.

1.4 ACTION SUBMITTALS

A. Product Data: For each type of process and factory-fabricated product. Indicate component materials and dimensions and include construction and application details.

   1. Include data for wood-preservative treatment from chemical treatment manufacturer and certification by treating plant that treated materials comply with requirements. Indicate type of preservative used and net amount of preservative retained.
   2. For products receiving a waterborne treatment, include statement that moisture content of treated materials was reduced to levels specified before shipment to Project site.
1.5 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.

PART 2 - PRODUCTS

2.1 WOOD PRODUCTS, GENERAL

A. Lumber: DOC PS 20 and applicable rules of grading agencies indicated. If no grading agency is indicated, comply with the applicable rules of any rules-writing agency certified by the ALSC Board of Review. Grade lumber by an agency certified by the ALSC Board of Review to inspect and grade lumber under the rules indicated.

2.2 MISCELLANEOUS LUMBER

A. General: Provide miscellaneous lumber indicated and lumber for support or attachment of other construction, including the following:

1. Blocking.
2. Nailers.
3. Furring.

B. Dimension Lumber Items: Construction or No. 2.

C. For blocking not used for attachment of other construction, Utility, Stud, or No. 3 grade lumber of any species may be used provided that it is cut and selected to eliminate defects that will interfere with its attachment and purpose.

D. For blocking and nailers used for attachment of other construction, select and cut lumber to eliminate knots and other defects that will interfere with attachment of other work.

E. For furring strips for installing plywood or hardboard paneling, select boards with no knots capable of producing bent-over nails and damage to paneling.

2.3 FASTENERS

A. General: Fasteners shall be of size and type indicated and shall comply with requirements specified in this article for material and manufacture.

B. Nails, Brads, and Staples: ASTM F 1667.
PART 3 - EXECUTION

3.1 INSTALLATION, GENERAL

A. Framing Standard: Comply with AF&PA's WCD 1, "Details for Conventional Wood Frame Construction," unless otherwise indicated.

B. Framing with Engineered Wood Products: Install engineered wood products to comply with manufacturer's written instructions.

C. Set rough carpentry to required levels and lines, with members plumb, true to line, cut, and fitted. Fit rough carpentry accurately to other construction.

D. Install shear wall panels to comply with manufacturer's written instructions.

E. Install metal framing anchors to comply with manufacturer's written instructions. Install fasteners through each fastener hole.

F. Install sill sealer gasket to form continuous seal between sill plates and foundation walls.

G. Do not splice structural members between supports unless otherwise indicated.

H. Provide blocking and framing as indicated and as required to support facing materials, fixtures, specialty items, and trim.

   1. Provide metal clips for fastening gypsum board or lath at corners and intersections where framing or blocking does not provide a surface for fastening edges of panels. Space clips not more than 16 inches (406 mm) o.c.

I. Sort and select lumber so that natural characteristics do 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.

3.2 WOOD BLOCKING, AND NAILER INSTALLATION

A. Install where indicated and where required for attaching other work. Form to shapes indicated and cut as required for true line and level of attached work. Coordinate locations with other work involved.

B. Attach items to substrates to support applied loading. Recess bolts and nuts flush with surfaces unless otherwise indicated.
C. Provide permanent grounds of dressed, pressure-preservative-treated, key-beveled lumber not less than 1-1/2 inches (38 mm) wide and of thickness required to bring face of ground to exact thickness of finish material. Remove temporary grounds when no longer required.

END OF SECTION 061000
SECTION 064116 - PLASTIC-LAMINATE-FACED ARCHITECTURAL CABINETS

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. Plastic-laminate-faced architectural cabinets and countertops.
2. Wood furring, blocking, shims, and hanging strips for installing plastic-laminate-faced architectural cabinets unless concealed within other construction before cabinet installation.

B. Related Requirements:

1. Section 061000 "Rough Carpentry" for wood furring, blocking, shims, and hanging strips required for installing cabinets and concealed within other construction before cabinet installation.

1.3 ACTION SUBMITTALS

A. Product Data: For each type of product.

B. Shop Drawings: Show location of each item, dimensioned plans and elevations, large-scale details, attachment devices, and other components.

1. Show details full size.
2. Show locations and sizes of furring, blocking, and hanging strips, including concealed blocking and reinforcement specified in other Sections.
3. Show locations and sizes of cutouts and holes for electrical switches and outlets and other items installed in architectural plastic-laminate cabinets.

C. Samples for Initial Selection:

1. Plastic laminates.
2. PVC edge material.
3. Thermoset decorative panels.

D. Samples for Verification:
1. Plastic laminates, 12 by 12 inches (300 by 300 mm), for each type, color, pattern, and surface finish, with one sample applied to core material.

2. Corner pieces as follows:
   a. Cabinet-front frame joints between stiles and rails, as well as exposed end pieces, 18 inches (450 mm) high by 18 inches (450 mm) wide by 6 inches (150 mm) deep.

3. Exposed cabinet hardware and accessories, one unit for each type.

1.4 INFORMATIONAL SUBMITTALS

A. Product Certificates: For the following:
   1. High-pressure decorative laminate.

B. Woodwork Quality Standard Compliance Certificates: AWI Quality Certification Program certificates.

1.5 QUALITY ASSURANCE

A. Fabricator Qualifications: Shop that employs skilled workers who custom fabricate products similar to those required for this Project and whose products have a record of successful in-service performance. Shop is a certified participant in AWI's Quality Certification Program.

B. Installer Qualifications: Certified participant in AWI's Quality Certification Program.

1.6 DELIVERY, STORAGE, AND HANDLING

A. Do not deliver cabinets until painting and similar operations that could damage woodwork have been completed in installation areas. If cabinets must be stored in other than installation areas, store only in areas where environmental conditions comply with requirements specified in "Field Conditions" Article.

1.7 FIELD CONDITIONS

A. Environmental Limitations: Do not deliver or install cabinets until building is enclosed, wet work is complete, and HVAC system is operating and maintaining temperature and relative humidity at occupancy levels during the remainder of the construction period.

B. Field Measurements: Where cabinets are indicated to fit to other construction, verify dimensions of other construction by field measurements before fabrication, and indicate measurements on Shop Drawings. Coordinate fabrication schedule with construction progress to avoid delaying the Work.
1. Locate concealed framing, blocking, and reinforcements that support cabinets by field measurements before being enclosed, and indicate measurements on Shop Drawings.

C. Established Dimensions: Where cabinets are indicated to fit to other construction, establish dimensions for areas where cabinets are to fit. Provide allowance for trimming at site, and coordinate construction to ensure that actual dimensions correspond to established dimensions.

1.8 COORDINATION

A. Coordinate sizes and locations of framing, blocking, furring, reinforcements, and other related units of Work specified in other Sections to ensure that cabinets can be supported and installed as indicated.

B. Hardware Coordination: coordinate Shop Drawings and fabrication with hardware requirements.

PART 2 - PRODUCTS

2.1 PLASTIC-LAMINATE-FACED ARCHITECTURAL CABINETS

A. Quality Standard: Comply with Section 1600 of AWI “Architectural Woodwork Quality Standards.” Band all drawers, doors and body fronts with a 3 mm PVC edge band, color as selected by the Architect. Provide units with integral toe kick.

B. Type of Cabinet Construction: Flush full overlay/laminate face.

C. Colors, Patterns, and Finishes of Laminates: As indicated, or as selected by the Architect.

D. Laminates and Edging: Provide as follows unless otherwise indicated:
   1. Open Interior   GP-28 decorative laminate
   2. Closed Interior  Melamine laminate
   3. Exposed Ends   GP-28 decorative laminate
   4. Wall Unit Bottom Exterior Decorative laminate
   5. Shelf Edges 3 mm PVC front
   6. Door and Drawer Edges,
   7. Cabinet Body Edges   3 mm PVC

2.2 TOPS FOR CABINETS AND OTHER LOCATIONS

A. Quality Standard: Comply with Section 400C of AWI “Architectural Woodwork Quality Standards.”

B. Type of Top: High pressure decorative laminate with 3 mm PVC edge banding.

C. Colors, Patterns, and Finishes: As indicated, or as selected by the Architect.
2.3 CABINET HARDWARE AND ACCESSORIES

A. General: Provide cabinet hardware and accessory materials associated with architectural cabinets except for items specified in Section 087100 "Door Hardware (Descriptive Specification)." Refer to schedule at the end of this section.

B. Grommets (Basis of Design; Doug Mockett and Company, XG Series): 3 inch hole, 3-1/2 inch outside diameter, with cord slop cap; colors as selected by the Architect from manufacturer's full-range of colors.

2.4 MISCELLANEOUS MATERIALS

A. Furring, Blocking, Shims, and Hanging Strips: kiln dried to less than 15 percent moisture content.

B. Anchors: Select material, type, size, and finish required for each substrate for secure anchorage. Provide metal expansion sleeves or expansion bolts for post-installed anchors. Use nonferrous-metal or hot-dip galvanized anchors and inserts at inside face of exterior walls and at floors.

2.5 FABRICATION

A. Sand fire-retardant-treated wood lightly to remove raised grain on exposed surfaces before fabrication.

B. Fabricate cabinets to dimensions, profiles, and details indicated.

C. Complete fabrication, including assembly and hardware application, to maximum extent possible before shipment to Project site. Disassemble components only as necessary for shipment and installation. Where necessary for fitting at site, provide ample allowance for scribing, trimming, and fitting.

1. Notify Architect seven days in advance of the dates and times woodwork fabrication will be complete.

2. Trial fit assemblies at fabrication shop that cannot be shipped completely assembled. Install dowels, screws, bolted connectors, and other fastening devices that can be removed after trial fitting. Verify that various parts fit as intended and check measurements of assemblies against field measurements before disassembling for shipment.

D. Shop-cut openings to maximum extent possible to receive hardware, appliances, electrical work, and similar items. Locate openings accurately and use templates or roughing-in diagrams to produce accurately sized and shaped openings. Sand edges of cutouts to remove splinters and burrs.

E. Install glass to comply with applicable requirements in Section 088000 "Glazing" and in GANA's "Glazing Manual." For glass in wood frames, secure glass with removable stops.
PART 3 - EXECUTION

3.1 PREPARATION

A. Before installation, condition cabinets to average prevailing humidity conditions in installation areas.

B. Before installing cabinets, examine shop-fabricated work for completion and complete work as required.

3.2 INSTALLATION

A. Grade: Install cabinets to comply with same grade as item to be installed.

B. Assemble cabinets and complete fabrication at Project site to the extent that it was not completed in the shop.

C. Install cabinets level, plumb, true, and straight. Shim as required with concealed shims. Install level and plumb to a tolerance of 1/8 inch in 96 inches (3 mm in 2400 mm).

D. Scribe and cut cabinets to fit adjoining work, refinish cut surfaces, and repair damaged finish at cuts.

E. Anchor cabinets to anchors or blocking built in or directly attached to substrates. Secure with countersunk, concealed fasteners and blind nailing. Use fine finishing nails[ or finishing screws] for exposed fastening, countersunk and filled flush with woodwork.

1. Use filler matching finish of items being installed.

F. Cabinets: Install without distortion so doors and drawers fit openings properly and are accurately aligned. Adjust hardware to center doors and drawers in openings and to provide unencumbered operation. Complete installation of hardware and accessory items as indicated.

1. Install cabinets with no more than 1/8 inch in 96-inch (3 mm in 2400-mm) sag, bow, or other variation from a straight line.

3.3 ADJUSTING AND CLEANING

A. Repair damaged and defective cabinets, where possible, to eliminate functional and visual defects; where not possible to repair, replace woodwork. Adjust joinery for uniform appearance.

B. Clean, lubricate, and adjust hardware.

C. Clean cabinets on exposed and semiexposed surfaces.
### CABINET HARDWARE SCHEDULE

<table>
<thead>
<tr>
<th>Item</th>
<th>Description</th>
<th>BHMA No</th>
<th>Location</th>
<th>Manufacturer</th>
</tr>
</thead>
<tbody>
<tr>
<td>5-Knuckle Hinges</td>
<td>Heavy-duty institutional hinge, for overlay door, nickel plated steel</td>
<td>B01011</td>
<td>Cabinet Doors</td>
<td>Stanley Hardware 1588 Series, or approved equivalent</td>
</tr>
<tr>
<td>Shelf Clips</td>
<td>Zinc-plated steel</td>
<td>B04091</td>
<td>Casework</td>
<td>Knafe &amp; Vogt</td>
</tr>
<tr>
<td>Standards, Mortised</td>
<td>Zinc-plated steel</td>
<td>B04071</td>
<td>Adjustable shelves</td>
<td>Knafe &amp; Vogt</td>
</tr>
<tr>
<td>Drawer Slides</td>
<td>Bottom mount w/ wrap around or side mount; self-closing; ball bearing; 100 lb</td>
<td>B05051</td>
<td>Cabinet drawers</td>
<td>Knafe &amp; Vogt Grant Hardware Co Mepla Blum 430 E (std)</td>
</tr>
<tr>
<td>Drawer and Door Pulls</td>
<td>Satin anodized B02011 aluminum; U-pull 5/16” dia x 1-5/16” proj at 3-1/2”</td>
<td>B02011</td>
<td>Casework doors and drawers.</td>
<td>Ives Stanley Hardware</td>
</tr>
<tr>
<td>Surface Bolt</td>
<td>Surface mount; spring loaded w/ chain stop</td>
<td>L04131</td>
<td>Inactive door leaf</td>
<td>Stanley 1055</td>
</tr>
<tr>
<td>Door Bumper</td>
<td>Clear plastic, stick-on</td>
<td>N/A</td>
<td>Inside door leaf at</td>
<td>Blum Tp-1590 Mepla Hewi</td>
</tr>
<tr>
<td>Cabinet Door Locks</td>
<td>Pin tumbler, cam lock, key removable in all positions, cam permanently</td>
<td>E07281</td>
<td>Coat Racks</td>
<td>National Locks Stanley Hardware Knafe &amp; Vogt</td>
</tr>
<tr>
<td></td>
<td>attached, keyed alike, US14. Keys labeled as to which cabinet they are for.</td>
<td></td>
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</tr>
<tr>
<td></td>
<td>All cabinets in common room keyed alike; however, key each room differently,</td>
<td></td>
<td></td>
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<tr>
<td></td>
<td>and provide a master key to fit all like manufacturer cabinets.</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Coat Hooks</td>
<td>Heavy duty zinc pie-cast, satin, brass finish</td>
<td></td>
<td>Coat Racks</td>
<td>Stanley CD7084, or approved equivalent</td>
</tr>
</tbody>
</table>

END OF SECTION 064116
SECTION 07 11 13
BITUMINOUS DAMPPROOFING

PART 1 GENERAL

1.01 SECTION INCLUDES
Bituminous dampproofing, asbestos-free, cold-applied, emulsified-asphalt

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

1.04 REFERENCE STANDARDS
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, fibrated emulsified-asphalt dampproofing conforming to ASTM D 1227, Type II, Class 1, manufactured of refined asphalt, emulsifiers and selected clay, fibrated 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 hole, 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.

3.04 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 07 11 13
SECTION 07 90 05

JOINT SEALERS

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:
   - 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. 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
   - Tile control and expansion joints
   - 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

D. Interior joints in horizontal traffic surfaces including, but not limited to, the following:
   - Control and expansion joints in tile flooring

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 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. See Section 01 78 36 – Warranties, for additional warranty requirements.

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.tremco.com
   - Pecora Corporation: www.pecora.com
   - BASF Building Systems: www.buildingsystems.basf.com
   - Bostik, Inc: www.bostik-us.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; Sonafoam 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; Dynatrol
   - BASF; Sonafoam 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+
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, louvers 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.
SECTION 081113 - HOLLOW METAL DOORS AND FRAMES

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:

1. Standard and custom hollow metal doors and frames.
2. Steel sidelight, borrowed lite and transom frames.
3. Light frames and glazing installed in hollow metal doors.

B. Related Sections:

1. Division 08 Section "Glazing" for glass view panels in hollow metal doors.
2. Division 08 Section "Door Hardware".
3. Division 09 Sections "Interior Painting" for field painting hollow metal doors and frames.
4. Refer to electrical drawings and specifications for rough in requirements relating to hardware preparation.

C. Codes and References: Comply with the version year adopted by the Authority Having Jurisdiction.

1. ANSI/SDI A250.8 - Recommended Specifications for Standard Steel Doors and Frames.
2. ANSI/SDI A250.4 - Test Procedure and Acceptance Criteria for Physical Endurance for Steel Doors, Frames, Frames Anchors and Hardware Reinforcing.
3. ANSI/SDI A250.6 - Recommended Practice for Hardware Reinforcing on Standard Steel Doors and Frames.
4. ANSI/SDI A250.10 - Test Procedure and Acceptance Criteria for Prime Painted Steel Surfaces for Steel Doors and Frames.
5. ANSI/SDI A250.11 - Recommended Erection Instructions for Steel Frames.
6. ASTM A1008 - Standard Specification for Steel Sheet, Cold-Rolled, Carbon, Structural, High-Strength Low-Alloy and High-Strength Low-Alloy with Improved Formability.
7. ASTM A653 - Standard Specification for Steel Sheet, Zinc-Coated (Galvanized) or Zinc-Iron Alloy-Coated (Galvannealed) by the Hot-Dip Process.
10. ANSI/BHMA A156.115 - Hardware Preparation in Steel Doors and Frames.
15. UL 10C - Positive Pressure Fire Tests of Door Assemblies.

1.2 SUBMITTALS

A. Product Data: For each type of product indicated. Include construction details, material descriptions, core descriptions, hardware reinforcements, profiles, anchors, fire-resistance rating, and finishes.

B. Door hardware supplier is to furnish templates, template reference number and/or physical hardware to the steel door and frame supplier in order to prepare the doors and frames to receive the finish hardware items.

C. Shop Drawings: Include the following:
   1. Elevations of each door design.
   2. Details of doors, including vertical and horizontal edge details and metal thicknesses.
   3. Frame details for each frame type, including dimensioned profiles and metal thicknesses.
   4. Locations of reinforcement and preparations for hardware.
   5. Details of anchorages, joints, field splices, and connections.
   6. Details of accessories.
   7. Details of moldings, removable stops, and glazing.
   8. Details of conduit and preparations for power, signal, and control systems.

D. Samples for Verification:
   1. Samples are only required by request of the architect and for manufacturers that are not current members of the Steel Door Institute.

1.3 QUALITY ASSURANCE

A. Source Limitations: Obtain hollow metal doors and frames through one source from a single manufacturer wherever possible.

B. Quality Standard: In addition to requirements specified, furnish SDI-Certified manufacturer products that comply with ANSI/SDI A250.8, latest edition, "Recommended Specifications for Standard Steel Doors and Frames".

C. Fire-Rated Door Assemblies: Assemblies complying with NFPA 80 that are listed and labeled by a qualified testing agency, for fire-protection ratings indicated, based on testing at positive pressure according to UL10C (neutral pressure at 40" above sill) or UL 10C.

   1. Oversize Fire-Rated Door Assemblies Construction: For units exceeding sizes of tested assemblies, attach construction label certifying doors are built to standard construction requirements for tested and labeled fire rated door assemblies except for size.
2. Temperature-Rise Limit: Where indicated and at vertical exit enclosures (stairwell openings) and exit passageways, provide doors that have a maximum transmitted temperature end point of not more than 450 deg F (250 deg C) above ambient after 30 minutes of standard fire-test exposure.

   
a. Smoke "S" Label: Doors to bear “S” label, and include smoke and draft control gasketing applied to frame and on meeting stiles of pair doors.

D. Fire-Rated, Borrowed-Light Frame Assemblies: Assemblies complying with NFPA 80 that are listed and labeled, by a testing and inspecting agency acceptable to authorities having jurisdiction, for fire-protection ratings indicated, based on testing according to NFPA 257. Provide labeled glazing material.

E. Pre-Submittal Conference: Conduct conference in compliance with requirements in Division 01 Section "Project Meetings" with attendance by representatives of Supplier, Installer, and Contractor to review proper methods and procedures for installing hollow metal doors and frames and to verify installation of electrical knockout boxes and conduit at frames with electrified or access control hardware.

1.4 DELIVERY, STORAGE, AND HANDLING

A. Deliver hollow metal work palletized, wrapped, or crated to provide protection during transit and Project site storage. Do not use non-vented plastic.

B. Deliver welded frames with two removable spreader bars across bottom of frames, tack welded to jambs and mullions.

C. Store hollow metal work under cover at Project site. Place in stacks of five units maximum in a vertical position with heads up, spaced by blocking, on minimum 4-inch high wood blocking. Do not store in a manner that traps excess humidity.

1. Provide minimum 1/4-inch space between each stacked door to permit air circulation.
   Door and frames to be stacked in a vertical upright position.

1.5 PROJECT CONDITIONS

A. Field Measurements: Verify actual dimensions of openings by field measurements before fabrication.

1.6 COORDINATION

A. Coordinate installation of anchorages for hollow metal frames. Furnish setting drawings, templates, and directions for installing anchorages, including sleeves, concrete inserts, anchor bolts, and items with integral anchors. Deliver such items to Project site in time for installation.
1.7 WARRANTY

A. Special Warranty: Manufacturer's standard form in which manufacturer agrees to repair or replace doors that fail in materials or workmanship within specified warranty period.

B. Warranty includes installation and finishing that may be required due to repair or replacement of defective doors.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

A. Manufacturers: Subject to compliance with requirements, provide steel doors and frames from a SDI Certified manufacturer:

1. CECO Door Products (C).
2. Curries Company (CU).
3. Steelcraft (S).

2.2 MATERIALS

A. Cold-Rolled Steel Sheet: ASTM A 1008/A 1008M, Commercial Steel (CS), Type B; suitable for exposed applications.

B. Metallic-Coated Steel Sheet: ASTM A 653/A 653M, Commercial Steel (CS), Type B; with minimum G60 (Z180) or A60 (ZF180) metallic coating.

C. Frame Anchors: ASTM A 653/A 653M, Commercial Steel (CS), Commercial Steel (CS), Type B; with minimum G60 (Z180) or A60 (ZF180) metallic coating.

2.3 HOLLOW METAL DOORS

A. General: Provide 1-3/4 inch doors of design indicated, not less than thickness indicated; fabricated with smooth surfaces, without visible joints or seams on exposed faces unless otherwise indicated. Comply with ANSI/SDI A250.8 and ANSI/NAAMM HMMA 867.

B. Interior Doors: Face sheets fabricated of commercial quality cold rolled steel that complies with ASTM A 1008/A 1008M. Provide doors complying with requirements indicated below by referencing ANSI/SDI A250.8 for level and model and ANSI/SDI A250.4 for physical performance level:

1. Design: Flush panel.
2. Core Construction: Manufacturer's standard kraft-paper honeycomb, or one-piece polystyrene core, securely bonded to both faces.

a. Fire Door Core: As required to provide fire-protection and temperature-rise ratings indicated.
3. Level/Model: Level 2 and Physical Performance Level B (Heavy Duty), Minimum 18 gauge (0.042-inch - 1.0-mm) thick steel, Model 2.
4. Top and Bottom Edges: Reinforce tops and bottoms of doors with a continuous steel channel not less than 16 gauge, extending the full width of the door and welded to the face sheet.
5. Hinge Reinforcement: Minimum 7 gauge (3/16") plate 1-1/4" x 9" or minimum 14 gauge continuous channel with pierced holes, drilled and tapped.
6. Hardware Reinforcements: Fabricate according to ANSI/SDI A250.6 with reinforcing plates from same material as door face sheets.

C. Manufacturers Basis of Design:

1. Curries Company (CU) - Polystyrene Core - 707 Series.

2.4 HOLLOW METAL FRAMES

A. General: Comply with ANSI/SDI A250.8 and with details indicated for type and profile.

B. Interior Frames: Fabricated from cold-rolled steel sheet that complies with ASTM A 1008/A 1008M.

1. Fabricate frames with mitered or coped corners. Profile as indicated on drawings.
2. Frames: Minimum 16 gauge (0.053-inch -1.3-mm) thick steel sheet.
3. Manufacturers Basis of Design:
   a. CECO Door Products (C) - BU DU Series.
   b. Curries Company (CU) - M Series.

C. Fire rated frames: Fabricate frames in accordance with NFPA 80, listed and labeled by a qualified testing agency, for fire-protection ratings indicated.

D. Hardware Reinforcement: Fabricate according to ANSI/SDI A250.6 Table 4 with reinforcement plates from same material as frames.

2.5 FRAME ANCHORS

A. Jamb Anchors:

1. Masonry Type: Adjustable strap-and-stirrup or T-shaped anchors to suit frame size, formed from A60 metallic coated material, not less than 0.042 inch thick, with corrugated or perforated straps not less than 2 inches wide by 10 inches long; or wire anchors not less than 0.177 inch thick.
2. Stud Wall Type: Designed to engage stud and not less than 0.042 inch thick.

B. Floor Anchors: Floor anchors to be provided at each jamb, formed from A60 metallic coated material, not less than 0.042 inches thick.

C. Mortar Guards: Formed from same material as frames, not less than 0.016 inches thick.
2.6 LOUVERS

A. Metal Louvers: Door manufacturer’s standard metal louvers unless otherwise indicated.
   1. Blade Type: Vision proof inverted V or inverted Y.
   2. Metal and Finish: Galvanized steel, 0.040 inch thick, factory primed for paint finish with baked enamel or powder coated finish. Match pre-finished door paint color where applicable.

B. Louvers for Fire Rated Doors: Metal louvers with fusible link and closing device, listed and labeled for use in doors with fire protection rating of 1-1/2 hours and less.
   1. Manufacturers: Subject to compliance with requirements, provide door manufacturers standard louver to meet rating indicated.
   2. Metal and Finish: Galvanized steel, 0.040 inch thick, factory primed for paint finish with baked enamel or powder coated finish. Match pre-finished door paint color where applicable.

2.7 LIGHT OPENINGS AND GLAZING

A. Stops and Moldings: Provide stops and moldings around glazed lites where indicated. Form corners of stops and moldings with butted or mitered hairline joints at fabricator’s shop. Fixed and removable stops to allow multiple glazed lites each to be removed independently. Coordinate frame rabbet widths between fixed and removable stops with the type of glazing and installation indicated.

B. Moldings for Glazed Lites in Doors and Loose Stops for Glazed Lites in Frames: Minimum 20 gauge thick, fabricated from same material as door face sheet in which they are installed.

C. Fixed Frame Moldings: Formed integral with hollow metal frames, a minimum of 5/8 inch (16 mm) high unless otherwise indicated. Provide fixed frame moldings and stops on outside of exterior and on secure side of interior doors and frames.

D. Preformed Metal Frames for Light Openings: Manufacturer's standard frame formed of 0.048-inch-thick, cold rolled steel sheet; with baked enamel or powder coated finish; and approved for use in doors of fire protection rating indicated. Match pre-finished door paint color where applicable.

2.8 ACCESSORIES

A. Mullions and Transom Bars: Join to adjacent members by welding or rigid mechanical anchors.

B. Grout Guards: Formed from same material as frames, not less than 0.016 inches thick.

2.9 FABRICATION

A. Fabricate hollow metal work to be rigid and free of defects, warp, or buckle. Accurately form metal to required sizes and profiles, with minimum radius for thickness of metal. Where
practical, fit and assemble units in manufacturer's plant. When shipping limitations so dictate, frames for large openings are to be fabricated in sections for splicing or splining in the field by others.

B. Tolerances: Fabricate hollow metal work to tolerances indicated in ANSI/SDI A250.8.

C. Hollow Metal Doors:

1. Exterior Doors: Provide optional weep-hole openings in bottom of exterior doors to permit moisture to escape where specified.
2. Glazed Lites: Factory cut openings in doors with applied trim or kits to fit. Factory install glazing where indicated.
3. Astragals: Provide overlapping astragals as noted in door hardware sets in Division 08 Section "Door Hardware" on one leaf of pairs of doors where required by NFPA 80 for fire-performance rating or where indicated. Extend minimum 3/4 inch beyond edge of door on which astragal is mounted.
4. Continuous Hinge Reinforcement: Provide welded continuous 12 gauge strap for continuous hinges specified in hardware sets in Division 08 Section "Door Hardware".
5. Electrical Raceways: Provide hollow metal doors to receive electrified hardware with concealed wiring harness and standardized Molex™ plug connectors on both ends to accommodate up to twelve wires. Coordinate connectors on end of the wiring harness to plug directly into the electrified hardware and the through-wire transfer hardware or wiring harness specified in hardware sets in Division 08 Sections "Door Hardware" and "Access Control Hardware". Wire nut connections are not acceptable.

D. Hollow Metal Frames:

1. Shipping Limitations: 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.
2. Welded Frames: Weld flush face joints continuously; grind, fill, dress, and make smooth, flush, and invisible.
   a. Welded frames are to be provided with two steel spreaders temporarily attached to the bottom of both jambs to serve as a brace during shipping and handling. Spreader bars are for bracing only and are not to be used to size the frame opening.
3. Sidelight and Transom Bar Frames: Provide closed tubular members with no visible face seams or joints, fabricated from same material as door frame. Fasten members at crossings and to jambs by butt welding.
4. High Frequency Hinge Reinforcement: Provide high frequency hinge reinforcements at door openings 48-inches and wider with mortise butt type hinges at top hinge locations.
5. Continuous Hinge Reinforcement: Provide welded continuous 12 gauge straps for continuous hinges specified in hardware sets in Division 08 Section "Door Hardware".
6. Provide countersunk, flat- or oval-head exposed screws and bolts for exposed fasteners unless otherwise indicated for removable stops, provide security screws at exterior locations.
7. Mortar Guards: Provide guard boxes at back of hardware mortises in frames at all hinges and strike preps regardless of grouting requirements.
8. Electrical Thru-Wiring: Provide hollow metal frames receiving electrified hardware with loose wiring harness (not attached to open throat components or installed in closed mullion tubes) and standardized Molex™ plug connectors on one end to accommodate up to twelve wires. Coordinate connectors on end of the wiring harness to plug directly into the electric through-wire transfer hardware or wiring harness specified in hardware sets in Division 08 Sections "Door Hardware" and "Access Control Hardware".

9. Electrical Knock Out Boxes: Factory weld 18 gauge electrical knock out boxes to frame for electrical hardware preps; including but not limited to, electric through wire transfer hardware, electrical raceways and wiring harnesses, door position switches, electric strikes, magnetic locks, and jamb mounted card readers as specified in hardware sets in Division 08 Sections "Door Hardware" and "Access Control Hardware".
   a. Provide electrical knock out boxes with a dual 1/2-inch and 3/4-inch knockouts.
   b. Conduit to be coordinated and installed in the field (Division 26) from middle hinge box and strike box to door position box.
   c. Electrical knock out boxes to comply with NFPA requirements and fit electrical door hardware as specified in hardware sets in Division 08 Section "Door Hardware".
   d. Electrical knock out boxes for continuous hinges should be located in the center of the vertical dimension on the hinge jamb.

10. Floor Anchors: Weld anchors to bottom of jambs and mullions with at least four spot welds per anchor.

11. Jamb Anchors: Provide number and spacing of anchors as follows:
   a. Masonry Type: Locate anchors not more than 18 inches from top and bottom of frame. Space anchors not more than 32 inches o.c. and as follows:
      1) Two anchors per jamb up to 60 inches high.
      2) Three anchors per jamb from 60 to 90 inches high.
      3) Four anchors per jamb from 90 to 120 inches high.
      4) Four anchors per jamb plus 1 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 o.c. and as follows:
      1) Three anchors per jamb up to 60 inches high.
      2) Four anchors per jamb from 60 to 90 inches high.
      3) Five anchors per jamb from 90 to 96 inches high.
      4) Five anchors per jamb plus 1 additional anchor per jamb for each 24 inches or fraction thereof above 96 inches high.
      5) Two anchors per head for frames above 42 inches wide and mounted in metal stud partitions.

12. Door Silencers: Except on weatherstripped or gasketed doors, drill stops to receive door silencers. Silencers to be supplied by frame manufacturer regardless if specified in Division 08 Section "Door Hardware".
E. Hardware Preparation: Factory prepare hollow metal work to receive template mortised hardware; include cutouts, reinforcement, mortising, drilling, and tapping according to the Door Hardware Schedule and templates furnished as specified in Division 08 Section "Door Hardware."

1. Locate hardware as indicated, or if not indicated, according to ANSI/SDI A250.8.
2. Reinforce doors and frames to receive non-template, mortised and surface mounted door hardware.
3. Comply with applicable requirements in ANSI/SDI A250.6 and ANSI/DHI A115 Series specifications for preparation of hollow metal work for hardware.
4. Coordinate locations of conduit and wiring boxes for electrical connections with Division 26 Sections.

2.10 STEEL FINISHES

A. Prime Finishes: Doors and frames to be cleaned, and chemically treated to insure maximum finish paint adhesion. Surfaces of the door and frame exposed to view to receive a factory applied coat of rust inhibiting shop primer.

1. Shop Primer: Manufacturer's standard, fast-curing, lead and chromate free primer complying with ANSI/SDI A250.10 acceptance criteria; recommended by primer manufacturer for substrate; and compatible with substrate and field-applied coatings.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Examine substrates, areas, and conditions, with Installer present, for compliance with requirements for installation tolerances and other conditions affecting performance of the Work.

B. General Contractor to verify the accuracy of dimensions given to the steel door and frame manufacturer for existing openings or existing frames (strike height, hinge spacing, hinge back set, etc.).

C. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 PREPARATION

A. Remove welded in shipping spreaders installed at factory. Restore exposed finish by grinding, filling, and dressing, as required to make repaired area smooth, flush, and invisible on exposed faces.

B. Prior to installation, adjust and securely brace welded hollow metal frames for square, level, twist, and plumb condition.

C. Tolerances shall comply with SDI-117 "Manufacturing Tolerances Standard Steel Doors and Frames."
D. Drill and tap doors and frames to receive non-template, mortised, and surface-mounted door hardware.

3.3 INSTALLATION

A. General: Install hollow metal work plumb, rigid, properly aligned, and securely fastened in place; comply with Drawings and manufacturer’s written instructions.

B. Hollow Metal Frames: Install hollow metal frames of size and profile indicated. Comply with ANSI/SDI A250.11 and NFPA 80 at fire rated openings.
   1. Set frames accurately in position, plumbed, leveled, aligned, and braced securely until permanent anchors are set. After wall construction is complete and frames properly set and secured, remove temporary braces, leaving surfaces smooth and undamaged. Shim as necessary to comply with installation tolerances.
   2. Floor Anchors: Provide floor anchors for each jamb and mullion that extends to floor, and secure with post-installed expansion anchors.
   3. Masonry Walls: Coordinate installation of frames to allow for solidly filling space between frames and masonry with mortar.
   4. Grout Requirements: Do not grout head of frames unless reinforcing has been installed in head of frame. Do not grout vertical or horizontal closed mullion members.

C. Hollow Metal Doors: Fit hollow metal doors accurately in frames, within clearances specified below. Shim as necessary.
   1. Non-Fire-Rated Standard Steel Doors:
      a. Jambs and Head: 1/8 inch plus or minus 1/16 inch.
      b. Between Edges of Pairs of Doors: 1/8 inch plus or minus 1/16 inch.
      c. Between Bottom of Door and Top of Threshold: Maximum 3/8 inch.
   2. Fire-Rated Doors: Install doors with clearances according to NFPA 80.

D. Field Glazing: Comply with installation requirements in Division 08 Section "Glazing” and with hollow metal manufacturer's written instructions.

3.4 ADJUSTING AND CLEANING

A. Final Adjustments: Check and readjust operating hardware items immediately before final inspection. Leave work in complete and proper operating condition. Remove and replace defective work, including hollow metal work that is warped, bowed, or otherwise unacceptable.

B. Remove grout and other bonding material from hollow metal work immediately after installation.
C. Prime-Coat and Painted Finish Touchup: Immediately after erection, sand smooth rusted or damaged areas of prime coat, or painted finishes, and apply touchup of compatible air drying, rust-inhibitive primer, zinc rich primer (exterior and galvanized openings) or finish paint.

END OF SECTION 081113
PART 1 GENERAL

1.01 SECTION INCLUDES

Flush wood doors; flush configuration factory machined and finishes; non-rated.

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 08 11 13 - Hollow Metal Doors and Frames
   Section 08 71 00 - Door Hardware
   Section 08 80 00 - Glazing
   Division 26 Sections – Electrical General Provisions
   Division 27 Sections – Data Cabling System

1.04 REFERENCE STANDARDS

A. Reference standards include, but are not limited to, the following:
   ASTM E 413 - Classification for Rating Sound Insulation; 2004
   AWI/AWMAC/WI (AWS) - Architectural Woodwork Standards; 2009
   NFPA 80 - Standard for Fire Doors and Other Opening Protectives; 2010
   NFPA 105 - Standard for Smoke Door Assemblies and Other Opening Protectives; 2010
   NFPA 252 - Standard Methods of Fire Tests of Door Assemblies; National Fire Protection Association; 2008
   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
   WDMA I.S.1-A - Architectural Wood Flush Doors; Window and Door Manufacturers Association; 2004

1.05 SUBMITTALS

A. See Section 01 33 00 - Submittals, for submittal procedures.

B. Product Data: Indicate door core materials and construction; veneer species, type and characteristics.

C. Shop Drawings: Illustrate door opening criteria, elevations, sizes, types, swings and handing, undercuts, special beveling, special blocking for hardware, factory machining criteria, veneer
matching criteria, factory finishing criteria, cutouts for glazing and louveres, and other details.
1. For factory machined doors, indicate dimensions and locations of cutouts for locksets, closers, exit devices, and other cutouts adjacent to lite and/or louver openings.
2. For fire- and acoustical-rated doors, indicate fire-protection and acoustical ratings, respectively.

D. Test Reports: Show compliance with specified requirements for the following:
1. Sound-retardant doors and frames; sealed panel tests are not acceptable.

E. Samples: Submit samples, 1'-0" square or as indicated, for the following:
1. Doors for Transparent Finish: Door faces with solid wood edging representing typical range of color and grain for each species of veneer and solid lumber required. Provide set of 3 samples showing typical range of color and grain to be expected in the finished work.
2. Factory-Finished Doors: Each type of factory finish required.
3. Frames for Lite Openings: Light frames in 6" lengths; for each material, type and finish required.

F. Quality Certification Letter: Provide AWI Quality Certification labels on each door, or an AWI letter of licensing for project indicating that doors comply with requirements of grades specified.

G. Oversize Fire-Resistance Rated Door Assembly Certification: For door assemblies exceeding sizes of tested assemblies, submit certifications by a qualified testing agency acceptable to the authorities having jurisdiction that each assembly comply with standard construction requirements for tested and labeled fire-resistance rated door assemblies except for size.

H. Manufacturer’s Installation Instructions: Indicate special installation instructions.

1.06 QUALITY ASSURANCE

A. Source Limitations: Obtain flush wood doors from single manufacturer.

B. Door Quality Standards
1. Comply with WDMA I.S.1-A; and with AWI/AWMAC/WI (AWS), Architectural Flush Doors Section 1300, for grade of door, core construction, finish and other requirements exceeding those of WDMA I.S.1-A. Maintain one copy of the specified door quality standards on site for review during installation and finishing.
2. Provide AWI Quality Certification labels, or an AWI letter of licensing for project indicating that doors comply with requirements of grades specified.

C. Manufacturer Qualifications: Company specializing in manufacturing the products specified in this Section with minimum ten years of documented experience, and certified for chain of custody by a Forest Stewardship Council (FSC) accredited certification body.

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.

3. Oversize Fire-Resistance Rated Door Assemblies: For door assemblies exceeding sizes of tested assemblies, provide certification by a qualified testing agency acceptable to the authorities having jurisdiction that each assembly comply with standard construction requirements for tested and labeled fire-resistance rated door assemblies except for size.

E. Environmental Certification: Mark doors with Forest Stewardship Council (FSC) authorized certificate.

F. Field measure all reused existing hollow metal frames for proper height and width (no less than at top, middle and bottom between jambs). Verify hardware rough-in sizes and configurations.

1.07 DELIVERY, STORAGE, AND HANDLING

A. Package, deliver and store doors in accordance with specified quality standard and manufacturer's instructions.

B. Accept doors on site in manufacturer's packaging. Inspect for damage.

C. Protect doors with resilient packaging sealed with heat shrunk plastic. Seal top and bottom edges with tinted sealer if stored more than one week. Break seal on site to permit ventilation.

D. Store doors flat and off the floor on level surfaces in a dry, well-ventilated building; do not store doors on edge.
   1. Protect/cover doors from dirt, water and abuse.
   2. Protect doors from exposure to light (artificial or natural).
   3. Do not subject doors to extremes in either heat or humidity; maintain a temperature range of 50 to 90 degrees F and relative humidity within a 25- to 55-percent range.

E. When handling doors, always lift and carry; do not drag across other doors or surfaces. Handle with clean hands or gloves.

F. Identify each door with individual opening numbers that correlate with designation system used on shop drawings for doors, frames, hardware; use temporary, removable or concealed markings.

1.08 WARRANTY

A. Interior Doors: Provide manufacturer's signed warranty covering manufacturing or material defects for life of original installation, including repairs, replacement, machining, detailing glazing and/or prefinishing, as well as rehanging.
   1. Include coverage for delamination of veneer, warping beyond specified installation tolerances, defective materials, and telegraphing core construction.
   2. The Contractor shall be responsible for replacement and refinishing doors where the Contractor's work contributed to rejection or to voiding of manufacturer's warranty.

PART 2 PRODUCTS

2.01 MANUFACTURERS

A. Wood Veneer Faced Doors: Subject to compliance with the specified requirements, provide flush wood doors from one of the following manufacturers:
2.02 DOORS

A. All Doors: See drawings for locations and additional requirements.
   1. Quality Level: Custom Grade, in accordance with AWI/AWMAC/WI Architectural Woodwork Standards.
   2. Construction: Construct doors using Hot Press Method for laminating face veneers and crossbanding to cores. Stiles and rails shall be securely bonded to the core and then abratively planed prior to veneering. Cold Press Method is not acceptable.

B. Interior Doors: 1-3/4 inches thick, flush Type PC-5 (particleboard core, 5-ply) construction, unless otherwise indicated or scheduled, or required for fire- or acoustical-rating.
   1. Provide solid core doors at all locations.

2.03 DOOR FACINGS

A. Wood Veneer Facing for Transparent Finish: Select White Maple, Grade A, plain sliced, running veneer match, running assembly match; unless otherwise indicated.
   1. Vertical Edges: Same species as face veneer.
   2. Face and Grade Matching
      a. Door-To-Door Match: Provide door leaf faces pair or set matched for openings with more than one door leaf; this includes door leaves separated by mullions.
   3. Transoms: Continuous match to doors.

2.04 ACCESSORIES

A. Glazing Stops and Beads: Trim openings with moldings of material and profiles indicated.
   1. Non-Fire Rated Doors: Wood, of same species as door facing, mitered corners, thickness as required to be flush with door face.
   2. Fire-Rated Doors: Fire-resistance rated wood veneer beads matching door face veneer species as standard with door manufacturer.
   3. Acoustical (Sound-Rated) Doors: All gaskets, drop seals and astragals shall be provided by the acoustical door manufacturer.

2.05 DOOR CONSTRUCTION

A. Fabricate doors in accordance with door quality standard specified.

B. Cores Constructed with Stiles and Rails: Door stiles and rails shall be heavy-duty reinforced with 5-inch wide rails and 4-1/2 inch by 10 inches lock blocks so as to eliminate through bolting of hardware. Door stiles shall match face veneer species and cut (no edge banding allowed).
   1. Provide solid blocks at lock edge and top of door for closer for hardware reinforcement.
   2. Provide 5-inch top rails and bottom rails.

C. Factory machine doors for hardware other than surface-mounted hardware, in accordance with hardware requirements and dimensions.
   1. Comply with final finish hardware schedule, door frame shop drawings, and hardware templates. Confirm existing frame rough in requirements, where applicable, prior to submitting shop drawings. Provide notation on the submittal that the existing conditions...
have been verified/confirmed.
2. Coordinate measurements of hardware mortises in metal frames; verify dimensions and alignment before proceeding with machining.
3. Bevel non-fire resistance rated doors 1/8-inch in 2 inches (3-1/2 degrees) on both stiles; bevel fire-resistance rated doors 1/8-inch in 2 inches (3-1/2 degrees) on lock stiles only
D. Factory fit doors for frame opening dimensions identified on shop drawings, with edge clearances in accordance with specified quality standard.
E. Provide edge clearances in accordance with the quality standard specified.

2.06 FACTORY FINISHING - WOOD VENEER DOORS
A. Finish work in accordance with AWI/AWMAC/WI Architectural Woodwork Standards, Section 5 - Finishing for Grade specified and as follows:
   1. Transparent Finish: Comply with requirements indicated for grade, finish system, staining effect and sheen.
      a. AWI Grade: Premium.
      b. Finish System: AWI TR-6 Catalyzed Polyurethane, except 3 top coats shall be provided.
      c. Finish System (Option): Manufacturer's standard finish system providing equivalent performance comparable to the modified AWI TR-6 Catalyzed Polyurethane System specified hereinbefore.
      d. Staining: Match existing adjacent door surfaces.
      e. Effect: Open grain
      f. Sheen: 40 Satin 30 to 50 degrees when tested in accordance with ASTM D 523 on a 60-degree gloss meter.
B. Seal door top and bottom edges with color sealer to match door facing.

PART 3 EXECUTION
3.01 EXAMINATION
A. Examine doors prior to installation; reject doors with defects.
B. Examine installed door frames prior to hanging doors. Verify that frames comply with indicated requirements for type, size, location, clearances, swing and handing characteristics; and have been installed in correct alignment and position with plumb jambs and level heads.
C. Do not proceed with installation until unsatisfactory conditions have been corrected.

3.02 INSTALLATION
A. Install doors in accordance with manufacturer's instructions and specified quality standard.
B. Factory-Finished Doors: Do not field cut or trim; if fit or clearance is not correct, replace door.
C. Use machine tools to cut or drill for hardware.
D. Coordinate installation of doors with installation of frames and hardware.
E. Coordinate installation of glazing. Install wood glazing stops with double face tape, both sides, and finish nails.

F. 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.

3.03 TOLERANCES

A. Conform to specified quality standard for fit and clearance tolerances, and the following:
   1. Non-Fire-Resistance Rated Doors
      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. Clearances shall be maintained without shimming or springing hinges.

B. Conform to specified quality standard for telegraphing, warp, and squareness.

3.04 ADJUSTING AND PROTECTION

A. Operational Adjustments: Coordinate with the work of Section 08 71 00.
   1. Adjust doors and hardware for smooth and balanced door movement.
   2. Adjust closers for full closure.
   3. Rehang or replace doors which do not swing or operate freely.
   4. Adjust wood doors to required tolerances.

B. Protection
   1. Doors damaged during installation shall be refinished or replaced as acceptable to the Architect.
   2. Protect doors in accordance with manufacturer's instructions and recommendations, and ensure doors will be without damage or deterioration at time of Substantial Completion.

C. Provide tolerance adjustments to wood doors eleven (11) months after Substantial Completion. Repair or replace wood doors that bind or cannot be adjusted to required tolerances.

END OF SECTION 08 14 16
SECTION 08 43 13
ALUMINUM-FRAMED STOREFRONTS

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Aluminum-framed storefront systems including, but not limited to, fixed windows, perimeter trims, accessories, shims and anchors, and perimeter sealing of storefront units; systems types include the following:

Thermally broken, center glazed systems (exterior systems)
Non-thermally broken, center glazed systems (interior systems)
Aluminum doors

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 07 90 05 – Joint Sealers
Section 08 14 16 – Flush Wood Doors
Section 08 71 00 – Door Hardware
Section 08 80 00 – Glazing

1.04 REFERENCE STANDARDS

A. Reference standards include, but are not limited to, the following:

AAMA 501 – Method of Test for Exterior Walls; American Architectural Manufacturers Association; 2005
AAMA 501.2 – Quality Assurance and Diagnostic Water Leakage Field Check of Installed Storefronts, Curtain Walls, and Sloped Glazing Systems; American Architectural Manufacturers Association; 2009
AAMA 505 – Dry Shrinkage and Composite Performance Thermal Cycling Test Procedure; American Architectural Manufacturers Association; 2009
AAMA AG-09 – AAMA Glossary; American Architectural Manufacturers Association; 2010
AAMA CW-10 – Care and Handling of Architectural Aluminum from Shop to Site; American Architectural Manufacturers Association; 2004
AAMA TIR A8 – Structural Performance of Composite Thermal Barrier Framing Systems; American Architectural Manufacturers Association; 2008
ADA ADA-AG – Americans with Disabilities Act Accessibility Guidelines for Buildings and Facilities; 2004
ANSI/ICC A117.1 – Accessible and Usable Buildings and Facilities; 2003
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 E 283 – Standard Test Method for Determining the Rate of Air Leakage Through Exterior Windows, Curtain Walls, and Doors Under Specified Pressure Differences Across the Specimen; 2004
AWS D1.1/D1.1M – Structural Welding Code - Steel; American Welding Society; 2010
AWS D1.2/D1.2M – Structural Welding Code – Aluminum; 2008
SSPC-SP COM – Surface Preparation Commentary for Steel and Concrete Substrates; 2002(Rev 2004)

1.05 DEFINITIONS
A. For fenestration industry standard terminology and definitions refer to AAMA AG-09.

1.06 PERFORMANCE REQUIREMENTS
A. General Performance: Aluminum-framed systems shall withstand the effects of the following performance requirements without exceeding performance criteria or failure due to defective manufacture, fabrication, installation, or other defects in construction:
1. Movements of supporting structure indicated on Drawings including, but not limited to, story drift and deflection from uniformly distributed and concentrated live loads.
2. Dimensional tolerances of building frame and other adjacent construction.
3. Failure includes the following:
   Deflection exceeding specified limits
   Thermal stresses transferring to building structure
   Framing members transferring stresses, including those caused by thermal and structural movements to glazing
   Noise or vibration created by wind and by thermal and structural movements
   Loosening or weakening of fasteners, attachments, and other components
   Sealant failure
   Failure of operating units
B. Storefront System Performance Requirements
1. Wind Loads: For exterior systems, the manufacturer shall be responsible for the configuration and fabrication of the complete system, including structural analysis data signed and sealed by a qualified professional engineer licensed in the Commonwealth of Virginia and responsible for their preparation. Provide systems capable of withstand wind loads developed from the Wind Design Criteria and Component and Cladding Wind Pressures for Typical Building Areas indicated on the Structural Drawings.
2. Air Infiltration: For exterior systems, the test specimen shall be tested in accordance with ASTM E 283. Air infiltration rate shall not exceed 0.06 cfm/ft² at a static air pressure differential of 6.24 psf.
3. Water Resistance: For exterior systems, the test specimen shall be tested in accordance with ASTM E 331; there shall be no leakage at a minimum static air pressure differential of 10 psf as defined in AAMA 501.
4. Uniform Load: A static air design load of 30 psf shall be applied in the positive and negative direction in accordance with ASTM E 330; there shall be no deflection in excess of L/175 of the span of any framing member. At a structural test load equal to 1.5 times the specified design load, no glass breakage or permanent set in the framing members in excess of 0.2-percent of their clear spans shall occur.
5. Thermal Movements: Provide aluminum-framed systems that allow for thermal movements resulting from 120 degrees F ambient and 180 degrees F material surface maximum temperature change (range).
6. Thermal Conductance: For exterior systems, provide aluminum-framed systems with fixed glazing, of types indicated, and framing areas having an average U-factor of not more than 0.495 Btu/sf×h×deg F when tested according to AAMA 1503.

7. Condensation Resistance: For exterior systems, provide aluminum-framed systems with fixed glazing, of types indicated, and framing areas having condensation-resistance factor (CRF) of not less than 68 at frame and 68 at glass when tested according to AAMA 1503.

C. Window Performance Requirements
1. Air Infiltration: The test specimen shall be tested in accordance with ASTM E 283 at a minimum frame size of 36×60 inches; air infiltration rate shall not exceed 0.06 cfm/ft² at a static air pressure differential of 6.24 psf.

3. Water Resistance: The test specimen shall be tested in accordance with ASTM E 331 and ASTM 547 at a minimum frame size of 36×60 inches; there shall be no leakage at a minimum static air pressure differential of 12 psf.

4. Uniform Load: When closed and locked, a minimum static air pressure difference of 40 psf and 70 psf shall be applied in the positive and negative direction in accordance with ASTM 330; there shall be no deflection in excess of L/175 of the span of any framing member. At a structural test load of 105 psf, no glass breakage or permanent set in the framing members in excess of 0.2-percent of their clear spans shall occur.

5. Thermal Conductance: When tested in accordance with AAMA 1503, the U-factor shall not be more than 0.67 Btu/sf×h×deg F.

6. Condensation Resistance: When tested in accordance with AAMA 1503, the condensation resistance factor (CRF) shall not be less than 47 at frame and 48 at glass.

1.07 SUBMITTALS

A. General: See Section 01 33 00 - Submittals Specification Sections.

B. Product Data: For each type of product indicated. Include construction details, material descriptions, dimensions of individual components and profiles, awning window hardware, insect screening and accessories, and finishes for aluminum-framed systems.

C. LEED Submittals
1. Laboratory Test Reports for Credit Low-Emitting Materials: For adhesives and sealants used inside the weatherproofing system, documentation indicating that products 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."

D. Shop Drawings: Include dimensioned plans, elevations, sections, details, attachments to other work, and provisions for system expansion and contraction and for drainage of moisture in the system to the exterior.

E. Certifications and Reports
1. Wind Design Performance Certificates: Submit certification, signed and sealed by a qualified professional engineer licensed within the Commonwealth of Virginia and responsible for the wind design performance analysis, showing compliance with wind design performance requirements specified hereinbefore.

2. Welders' Certificates: Submit certification for welders employed on the project, verifying AWS qualification within the previous 12 months.
3. Product Test Reports: Based on evaluation of comprehensive tests performed by a qualified testing agency, for aluminum-framed systems, indicating compliance with performance requirements.

F. Samples
1. Initial Selection: Submit manufacturer's full range of colors, 3-inch square minimum size, for the Architect's selection. Samples shall be of finish colors applied to materials that shall be provided, paper samples are not acceptable.
2. Verification: For each type of exposed finish required, in manufacturer's standard sizes.

G. Maintenance Data: For aluminum-framed systems and awning windows to include in maintenance manuals.

1.08 QUALITY ASSURANCE

A. Source Limitation: Obtain aluminum-framed storefront systems from single source from single manufacturer.

B. Accessibility: Conform to the requirements of ADA-AG, ANSI/ICC A117.1, and the local Code.

C. Installer Qualifications: Company specializing in installing aluminum glazing systems with minimum five (5) years of experience, and who is trained and approved by the manufacturer for installation of units required for this project.

D. Welding Qualifications: Qualify procedures and personnel according to AWS D1.2/D1.2M for welding of aluminum and AWS D1.1/D1.1M for welding of steel.

E. Field Measurements: Verify actual locations of structural supports and rough opening dimensions for aluminum-framed systems by field measurements before fabrication and indicate measurements on Shop Drawings.

F. Sealants: Installation shall comply with the requirements of Section 07 90 05 – Sealants and sealant manufacturer’s installation instructions. Do not install sealants when ambient temperature is less than 40 degrees F; maintain this minimum temperature during and 48 hours after installation.

G. Preinstallation Conference: Convene one week before starting work of this section; conduct conference at project site.

1.09 DELIVERY, STORAGE, AND HANDLING

A. Handle products of this Section in accordance with AAMA CW-10. Deliver materials in manufacturer's original, unopened, undamaged containers with identification labels intact.

B. Protect finished aluminum surfaces with wrapping. Do not use adhesive papers or sprayed coatings that bond to aluminum when exposed to sunlight or weather.

C. Storage and Protection: Store materials protected from exposure to harmful weather conditions. Handle storefront material and components to avoid damage. Protect storefront material against damage from elements, construction activities, and other hazards before, during and after storefront installation.

1.10 WARRANTY
A. Manufacturer's standard form in which manufacturer agrees to repair or replace components of aluminum-framed systems that do not comply with requirements or that fail in materials or workmanship within specified warranty period.
   1. Failures include, but are not limited to, the following:
      - Structural failures including, but not limited to, excessive deflection
      - Noise or vibration caused by thermal movements
      - Water leakage through fixed glazing and framing areas
      - Perimeter sealant failure
      - Failure of operating components

2. Warranty Period: Two (2) years from date of Substantial Completion.

B. Manufacturer's standard form in which manufacturer agrees to repair or replace components on which finishes do not comply with requirements or that fail in materials or workmanship within five (5) years from date of Substantial Completion. Warranty does not include normal weathering.

PART 2 PRODUCTS

2.01 MANUFACTURERS

A. Basis of Design: YKK AP America Inc., storefront and fixed windows.
   b. Interior Systems: YES 40 FS System (non-thermally broken), Center Glass Glazing Plane, 4” ×1-3/4 inch System Dimensions

B. Storefront Framing Systems:
   a. Description: Center set, exterior flush glazed; jambs and vertical mullions continuous; head, sill, intermediate horizontal attached by screw spline joinery. Continuous and wept sill flashing.
   b. Components: Manufacturer’s standard extruded aluminum mullions, entrance doors, framing, and indicated shapes, perimeter anchor fillers and steel reinforcing as required.
   c. Glazing: Manufacturer’s standard glazing stops with EPDM glazing gaskets to prevent water infiltration at the exterior and Dow Corning® 995 Structural Silicone Sealant with fixed stops at the interior.
   d. Thermal Barrier: Provide continuous thermal barrier by means of a poured and debrided pocket consisting of a two-part, chemically curing high density polyurethane which is bonded to the aluminum by YKK ThermaBond Plus®. Systems employing non
structural thermal barriers are not acceptable.


2.02 MATERIALS

A. Aluminum: Alloy and temper recommended by manufacturer for type of use and finish indicated.

- Sheet and Plate: ASTM B 209
- Extruded Bars, Rods, Profiles, and Tubes: ASTM B 221
- Structural Profiles: ASTM B 308/B 308M
- Extruded Structural Pipe and Tubes: ASTM B 429/B 429M

B. Steel Reinforcement: Manufacturer's standard zinc-rich, corrosion-resistant primer, complying with SSPC-PS Guide 12.00; applied immediately after surface preparation and pretreatment. Select surface preparation methods according to recommendations in SSPC-SP COM and prepare surfaces according to applicable SSPC standard.

- Structural Shapes, Plates, and Bars: ASTM A 36/A 36M
- Cold-Rolled Sheet and Strip: ASTM A 1008/A 1008M
- Hot-Rolled Sheet and Strip: ASTM A 1011/A 1011M

C. Bituminous Paint: Cold-applied asphalt emulsion complying with ASTM D 1187, containing no asbestos; formulated for 30-mil thickness per coat.

2.03 FRAMING SYSTEM

A. Framing Members: Manufacturer's standard extruded-aluminum framing members of thickness required and reinforced as required to support imposed loads.

1. Construction

- Exterior Systems Thermally Broken
- Interior Systems Non-thermally Broken

2. Glazing System: Retained mechanically with gaskets on four sides

3. Glazing Plane: Center

B. Thermal Barrier: For exterior systems, thermal break with 1/4-inch separation consisting of a 2-part chemically curing, high-density polyurethane, which is mechanically and adhesively joined to aluminum storefront sections; designed in accordance with AAMA TIR-A8 and tested in accordance with AAMA 505.

C. Brackets and Reinforcements: Manufacturer’s standard high-strength aluminum with non-staining, non-ferrous shims for aligning system components.

D. Fasteners and Accessories: Manufacturer's standard stainless steel fasteners and accessories compatible with adjacent materials.

1. Use self-locking devices where fasteners are subject to loosening or turning out from thermal and structural movements, wind loads, or vibration.

2. Reinforce members as required to receive fastener threads.

3. Where exposed fastener use cannot be avoided, use exposed fasteners with countersunk Phillips screw heads.
E. Framing System Gaskets and Sealants: Manufacturer's standard, recommended by manufacturer for joint type.
   1. Joint sealants for installation at perimeter of aluminum-framed systems, as specified in Section 07 90 05 – Joint Sealers.
   2. Sealants 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."

2.04 GLAZING SYSTEMS

A. Glazing: As specified in Section 08 80 00 – Glazing.
B. Glazing Gaskets: Manufacturer's standard compression types; replaceable, extruded EPDM rubber of profile and hardness required to maintain watertight seal.
C. Spacers and Setting Blocks: Manufacturer's standard elastomeric type.
D. Bond-Breaker Tape: Manufacturer's standard TFE-fluorocarbon or polyethylene material to which sealants will not develop adhesion.
E. Glazing Sealants: As recommended by manufacturer for joint type, and as follows:
   1. Weatherseal Sealant: ASTM C 920 for Type S, Grade NS, Class 25, Uses NT, G, A, and O; single-component neutral-curing formulation that is compatible with structural sealant and other system components with which it comes in contact; recommended by structural-sealant, weatherseal-sealant, and aluminum-framed-system manufacturers for this use.
   2. Sealants 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."

2.05 FABRICATION

A. General
   1. Form or extrude aluminum shapes before finishing. Fabricate with minimum clearances and shim spacing around perimeter of assembly, yet enabling installation and dynamic movement of perimeter seal. Fabricate for flush glazing without projecting stops. Reinforce framing members for imposed loads.
   2. Where required, weld in concealed locations to greatest extent possible to minimize distortion or discoloration of finish. Remove weld spatter and welding oxides from exposed surfaces by descaling or grinding.
   3. After fabrication, clearly mark components to identify their locations in project according to shop drawings.
   4. Coat concealed metal surfaces that will be in contact with cementitious materials or dissimilar metals with bituminous paint.
B. Framing Members: Fabricate components that, when assembled, have the following characteristics:
   1. Profiles that are sharp, straight, and free of defects or deformations.
   2. Accurately fitted and secured joints and corners with ends coped or mitered, joints flush, hairline, and weatherproof.
3. Means to drain water passing joints, condensation within framing members, and moisture migrating within the system to exterior.
4. Physical and thermal isolation of glazing from framing members.
5. Accommodations for thermal and mechanical movements of glazing and framing to maintain required glazing edge clearances.
7. Fasteners, anchors, and connection devices that are concealed from view to greatest extent possible.

C. Fiberglass and Wood Door Finish Hardware Preparation: Prepare frames to receive mortised and concealed finish hardware for fiberglass and wood doors in accordance with final door hardware schedule and templates provided by hardware supplier. Reinforce components internally for door hardware. Coordinate preparation with the work of the following Sections:

Section 08 14 16 – Flush Wood Doors
Section 08 71 00 – Door Hardware

2.06 ALUMINUM FINISHES

A. General: Apply factory finish after fabrication to all surfaces that will be exposed in completed assemblies; surfaces shall be free of scratches and other blemishes.

B. Interior and Exterior Systems: AAMA 611, Class I, clear anodic finish (AA-M12C22A41), not less than 0.7-mil dry-film thickness.

C. Oscar Smith HS: At the school noted, provide High-performance organic 2-coat fluoropolymer finish complying with AAMA 2605 and containing not less than 70-percent PVDF resin by weight in color coat. Prepare, pretreat, and apply coating to exposed metal surfaces to comply with coating and resin manufacturers' written instructions. Color as indicated or if not indicated as selected by the Architect from coating manufacturer's full range of standard and custom colors.

PART 3 EXECUTION

3.01 EXAMINATION AND PREPARATION

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 work. Verify rough opening dimensions, levelness of sill plate and operational clearances. Examine wall flashings and other built-in components to ensure a coordinated, weather tight aluminum-framed storefront system installation. Proceed with installation only after unsatisfactory conditions have been corrected.

1. Masonry Surfaces: Visibly dry and free of excess mortar, sand, and other construction debris.
2. Metal Surfaces: Dry; clean; free of grease, oil, dirt, rust, corrosion, and welding slag; without sharp edges or offsets at joints.
3. Awning Windows: Verify substrate conditions, which have been previously installed, are acceptable for product installation in accordance with manufacturer’s instructions.
Verify openings are sized to receive window units and sill plate is level in accordance with manufacturer’s acceptable tolerances.

B. Metal Protection
   1. Where aluminum will contact dissimilar metals, protect against galvanic action by painting contact surfaces with primer or applying sealant or tape, or by installing nonconductive spacers as recommended by manufacturer for this purpose.
   2. Where aluminum will contact concrete or masonry, protect against corrosion by painting contact surfaces with bituminous paint.

C. Adjacent Surfaces Protection: Protect adjacent work areas and finish surfaces from damage during product installation.

3.02 INSTALLATION

A. Comply with the Drawings, shop drawings, and manufacturer’s written instructions for installing aluminum-framed storefront system, awning windows, accessories, and other components.
   1. Do not install damaged components.
   2. Fit joints to produce hairline joints free of burrs and distortion.
   3. Rigidly secure non-movement joints.
   4. Install anchors with separators and isolators to prevent metal corrosion and electrolytic deterioration.
   5. Seal joints watertight unless otherwise indicated.
   6. Provide thermal isolation where components penetrate or disrupt building insulation.

B. Install storefront systems and awning 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.

C. Set sill members in bed of sealant or with gaskets for weather tight construction. Where fasteners penetrate sill flashings, make watertight by seating and sealing fastener heads to sill flashing.

D. Install storefront systems, awning windows and components to drain condensation within framing members, water passing joints, and moisture migrating within the system to the exterior.

E. Install glazing in accordance with Section 08 80 00 – Glazing.

F. Install perimeter joint sealants as specified in Section 07 90 05 – Joint Sealers, to produce weathertight installation.

G. Touch-up minor damage to factory applied finish; replace components that cannot be satisfactorily repaired.

3.03 ERECTION TOLERANCES

A. Install aluminum-framed systems to comply with the following maximum erection tolerances:
   1. Location and Plane: Limit variation from true location and plane to 1/8 inch in 12 feet; 1/4 inch over total length.
   2. Alignment:
      a. Where surfaces abut in line, limit offset from true alignment to 1/16.
b. Where surfaces meet at corners, limit offset from true alignment to 1/32 inch.

3. Diagonal Measurements: Limit difference between diagonal measurements to 1/8 inch.

3.04 FIELD QUALITY CONTROL

A. Testing Agency: Owner will engage a qualified testing agency to perform tests and inspections, and prepare test and inspection reports.

B. Testing Services: Testing and inspecting of representative areas of exterior storefront systems shall take place as installation proceeds to determine compliance of installed assemblies with specified requirements.

C. Water Penetration: Areas shall be tested according to ASTM E 1105 at a minimum uniform and cyclic static-air-pressure differential of 0.67 times the static-air-pressure differential specified for laboratory testing in "Performance Requirements" Article, but not less than 6.24 psf, and shall not evidence water penetration.
   1. Test Area: One bay wide, but not less than 20 feet, by one story of exterior storefront system.
   2. Perform a minimum of three tests in areas as directed by Architect.

D. Water Spray Test: Before installation of interior finishes has begun, areas designated by Architect shall be tested according to AAMA 501.2 and shall not evidence water penetration; minimum test area of 50 feet by one story of exterior storefront system.

E. Exterior storefront systems will be considered defective if they do not pass tests and inspections.
   1. Repair or replace work if test results and inspections indicate that it does not comply with specified requirements.
   2. Additional testing and inspecting, at Contractor's expense, will be performed to determine compliance of repaired, replaced or additional work with specified requirements.

3.05 ADJUSTMENT, CLEANING AND PROTECTION

A. Adjusting: Adjust operating window components to provide a tight fit at contact points and at weatherstripping for smooth operation and a weathertight closure.

B. Cleaning: Remove temporary coverings and protection of adjacent work areas. Remove excess sealants, glazing materials, dirt, and other substances. Repair or replace damaged glazing and installed products. Clean glazing and installed products in accordance with manufacturer’s instructions.

C. Protection: Protect installed product’s finish surfaces from damage during construction. Protect aluminum from damage from grinding and polishing compounds, plaster, lime, acid, cement, or other harmful contaminants. Remove and replace damaged aluminum and glass that has been broken, chipped, cracked, abraded, or damaged at no extra cost to the Owner.
SECTION 087100a – DOOR HARDWARE (GRASSFIELD HS)

PART 1 - GENERAL

1.1 SUMMARY

A. This Section includes commercial door hardware for the following:
   1. Swinging doors.

B. Door hardware includes, but is not necessarily limited to, the following:
   1. Mechanical door hardware.
   2. Electromechanical door hardware.
   3. Cylinders specified for doors in other sections.

C. Related Sections:
   1. Division 08 Section “Hollow Metal Doors and Frames”.

D. Codes and References: Comply with the version year adopted by the Authority Having Jurisdiction.
   6. NFPA 105 - Installation of Smoke Door Assemblies.
   7. State Building Codes, Local Amendments.

E. Standards: All hardware specified herein shall comply with the following industry standards:
   1. ANSI/BHMA Certified Product Standards - A156 Series
   2. UL10C – Positive Pressure Fire Tests of Door Assemblies

1.2 SUBMITTALS

A. Product Data: Manufacturer's product data sheets including installation details, material descriptions, dimensions of individual components and profiles, operational descriptions and finishes.

B. 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. Organize door hardware sets in same order as in the Door Hardware Sets at the end of Part 3. Submittals that do not follow the same format and order as the Door Hardware Sets will be rejected and subject to resubmission.

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 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.
   h. Warranty information for each product.

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.

C. Shop Drawings: Details of electrified access control hardware indicating the following:

1. Wiring Diagrams: Upon receipt of approved schedules, submit detailed system wiring diagrams for power, signaling, monitoring, communication, and control of the access control system electrified hardware. Differentiate between manufacturer-installed and field-installed wiring. Include the following:
   a. Elevation diagram of each unique access controlled opening showing location and interconnection of major system components with respect to their placement in the respective door openings.
   b. Complete (risers, point-to-point) access control system block wiring diagrams.
   c. Wiring instructions for each electronic component scheduled herein.

2. Electrical Coordination: Coordinate with related sections the voltages and wiring details required at electrically controlled and operated hardware openings.

D. Keying Schedule: After a keying meeting with the owner has taken place prepare a separate keying schedule detailing final instructions. Submit the keying schedule in electronic format. Include keying system explanation, door numbers, key set symbols, hardware set numbers and
special instructions. Owner must approve submitted keying schedule prior to the ordering of permanent cylinders/cores.

E. Informational Submittals:

1. Product Test Reports: Indicating compliance with cycle testing requirements, based on evaluation of comprehensive tests performed by manufacturer and witnessed by a qualified independent testing agency.

F. Operating and Maintenance Manuals: Provide manufacturers operating and maintenance manuals for each item comprising the complete door hardware installation in quantity as required in Division 01, Closeout Submittals.

1.3 QUALITY ASSURANCE

A. Manufacturers Qualifications: Engage qualified manufacturers with a minimum 5 years of documented experience in producing hardware and equipment similar to that indicated for this Project and that have a proven record of successful in-service performance.

B. Installer Qualifications: A minimum 3 years documented experience installing both standard and electrified 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.

C. Door Hardware Supplier Qualifications: Experienced commercial door hardware distributors with a minimum 5 years documented experience supplying both mechanical and electromechanical hardware installations comparable in material, design, and extent to that indicated for this Project. Supplier recognized as a factory direct distributor by the manufacturers of the primary materials with a warehousing facility in Project's vicinity.

D. Source Limitations: Obtain each type and variety of door hardware specified in this section from a single source unless otherwise indicated.

1. Electrified modifications or enhancements made to a source manufacturer's product line by a secondary or third party source will not be accepted.

2. Provide electromechanical door hardware from the same manufacturer as mechanical door hardware, unless otherwise indicated.

E. Each unit to bear third party permanent label demonstrating compliance with the referenced standards.

F. Keying Conference: Conduct conference to comply with requirements in Division 01 Section "Project Meetings." Keying conference to incorporate the following criteria into the final keying schedule document:

1. Function of building, purpose of each area and degree of security required.

2. Plans for existing and future key system expansion.
3. Requirements for key control storage and software.
4. Installation of permanent keys, cylinder cores and software.
5. Address and requirements for delivery of keys.

G. Pre-Submittal Conference: Conduct coordination conference in compliance with requirements in Division 01 Section "Project Meetings" with attendance by representatives of Supplier(s), Installer(s), and Contractor(s) to review proper methods and the procedures for receiving, handling, and installing door hardware.

1. Prior to installation of door hardware, conduct a project specific training meeting to instruct the installing contractors' personnel on the proper installation and adjustment of their respective products. Product training to be attended by installers of door hardware (including electromechanical hardware) for aluminum, hollow metal and wood doors. Training will include the use of installation manuals, hardware schedules, templates and physical product samples as required.
2. Inspect and discuss electrical roughing-in, power supply connections, and other preparatory work performed by other trades.
3. Review sequence of operation narratives for each unique access controlled opening.
4. Review and finalize construction schedule and verify availability of materials.
5. Review the required inspecting, testing, commissioning, and demonstration procedures

H. At completion of installation, provide written documentation that components were applied to manufacturer's instructions and recommendations and according to approved schedule.

1.4 DELIVERY, STORAGE, AND HANDLING

A. Inventory door hardware on receipt and provide secure lock-up and shelving for door hardware delivered to Project site. Do not store electronic access control hardware, software or accessories at Project site without prior authorization.

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, as applicable, permanent keys, cylinders, cores, access control credentials, software and related accessories directly to Owner via registered mail or overnight package service. Instructions for delivery to the Owner shall be established at the "Keying Conference".

1.5 COORDINATION

A. Templates: Obtain and distribute to the parties involved templates for doors, frames, and other work specified to be factory prepared for installing standard and electrified hardware. Check Shop Drawings of other work to confirm that adequate provisions are made for locating and installing hardware to comply with indicated requirements.

B. Door Hardware and Electrical Connections: Coordinate the layout and installation of scheduled electrified door hardware and related access control equipment with required connections to
source power junction boxes, low voltage power supplies, detection and monitoring hardware, and fire and detection alarm systems.

C. Door and Frame Preparation: Doors and corresponding frames are to be prepared, reinforced and pre-wired (if applicable) to receive the installation of the specified electrified, monitoring, signaling and access control system hardware without additional in-field modifications.

1.6 WARRANTY

A. General Warranty: Reference Division 01, General Requirements. Special warranties specified in this Article shall not deprive Owner of other rights Owner may have under other provisions of the Contract Documents and shall be in addition to, and run concurrent with, other warranties made by Contractor under requirements of the Contract Documents.

B. Warranty Period: Written warranty, executed by manufacturer(s), agreeing to repair or replace components of standard and electrified door hardware that fails in materials or workmanship within specified warranty period after final acceptance by the Owner. Failures include, but are not limited to, the following:

1. Structural failures including excessive deflection, cracking, or breakage.
2. Faulty operation of the hardware.
3. Deterioration of metals, metal finishes, and other materials beyond normal weathering.
4. Electrical component defects and failures within the systems operation.

C. Standard Warranty Period: One year from date of Substantial Completion, unless otherwise indicated.

D. Special Warranty Periods:

1. Ten years for mortise locks and latches.
2. Five years for exit hardware.
3. Twenty five years for manual surface door closer bodies.
4. Five years for motorized electric latch retraction exit devices.
5. Two years for electromechanical door hardware.

1.7 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.
PART 2 - PRODUCTS

2.1 SCHEDULED DOOR HARDWARE

A. General: Provide door hardware for each door to comply with requirements in Door Hardware Sets and each referenced section that products are to be supplied under.

B. Designations: Requirements for quantity, item, size, finish or color, grade, function, and other distinctive qualities of each type of door hardware are indicated in the Door Hardware Sets 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 requirements. Manufacturers' names are abbreviated in the Door Hardware Schedule.

C. Substitutions: Requests for substitution and product approval for inclusive mechanical and electromechanical door hardware in compliance with the specifications must be submitted in writing and in accordance with the procedures and time frames outlined in Division 01, Substitution Procedures. Approval of requests is at the discretion of the architect, owner, and their designated consultants.

2.2 HANGING DEVICES

A. Hinges: ANSI/BHMA A156.1 certified butt hinges with number of hinge knuckles and other options as specified in the Door Hardware Sets.

1. Quantity: Provide the following hinge quantity:
   a. Two Hinges: For doors with heights up to 60 inches.
   b. Three Hinges: For doors with heights 61 to 90 inches.
   c. Four Hinges: For doors with heights 91 to 120 inches.
   d. For doors with heights more than 120 inches, provide 4 hinges, plus 1 hinge for every 30 inches of door height greater than 120 inches.

2. Hinge Size: Provide the following, unless otherwise indicated, with hinge widths sized for door thickness and clearances required:
   a. Widths up to 3’0”: 4-1/2” standard or heavy weight as specified.
   b. Sizes from 3’1” to 4’0”: 5” standard or heavy weight as specified.

3. Hinge Weight and Base Material: Unless otherwise indicated, provide the following:
   a. Exterior Doors: Heavy weight, non-ferrous, ball bearing or oil impregnated bearing hinges unless Hardware Sets indicate standard weight.
   b. Interior Doors: Standard weight, steel, ball bearing or oil impregnated bearing hinges unless Hardware Sets indicate heavy weight.
4. **Hinge Options:** Comply with the following:
   a. **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 all outswinging lockable doors.

5. **Manufacturers:**
   a. Bommer Industries (BO) - LB Series.
   b. Hager Companies (HA) - CB Series.
   c. McKinney Products; ASSA ABLOY Architectural Door Accessories (MK) - TA Series.

B. **Continuous Geared Hinges:** ANSI/BHMA A156.26 Grade 1-600 certified continuous geared hinge, with minimum 0.120-inch thick extruded 6060 T6 aluminum alloy hinge leaves and a minimum overall width of 4 inches. Hinges are non-handed, reversible and fabricated to template screw locations. Factory trim hinges to suit door height and prepare for electrical cutouts.

   1. **Manufacturers:**
      a. Bommer Industries (BO).
      b. Hager Companies (HA).
      c. Pemko Products; ASSA ABLOY Architectural Door Accessories (PE).

2.3 **POWER TRANSFER DEVICES**

A. **Electrified Quick Connect Transfer Hinges:** Provide electrified transfer hinges with Molex™ standardized plug connectors and sufficient number of concealed wires (up to 12) to accommodate the electrified functions specified in the Door Hardware Sets. Connectors plug directly to through-door wiring harnesses for connection to electric locking devices and power supplies. Wire nut connections are not acceptable.

   1. **Manufacturers:**
      a. Hager Companies (HA) - ETW-QC (# wires) Option.
      b. McKinney Products; ASSA ABLOY Architectural Door Accessories (MK) - QC (# wires) Option.

B. **Concealed Quick Connect Electric Power Transfers:** Provide concealed wiring pathway housing mortised into the door and frame for low voltage electrified door hardware. Furnish with Molex™ standardized plug connectors and sufficient number of concealed wires (up to 12) to accommodate the electrified functions specified in the Door Hardware Sets. Connectors plug directly to through-door wiring harnesses for connection to electric locking devices and power supplies. Wire nut connections are not acceptable.

   1. **Manufacturers:**
SECURITY VESTIBULE PROJECT - 18061.07 APN
GRASSFIELD, GREAT BRIDGE, HICKORY, and OSCAR SMITH HIGH SCHOOLS - CHESAPEAKE PUBLIC SCHOOLS
BID 38-1920

a. Pemko Products; ASSA ABLOY Architectural Door Accessories (PE) – EL-CEPT Series.
b. Securitron (SU) - EL-CEPT Series.
c. Von Duprin (VD) - EPT-10 Series.

C. Electric Door Wire Harnesses: Provide electric/data transfer wiring harnesses with standardized plug connectors to accommodate up to twelve (12) wires. Connectors plug directly to through-door wiring harnesses for connection to electric locking devices and power supplies. Provide sufficient number and type of concealed wires to accommodate electric function of specified hardware. Provide a connector for through-door electronic locking devices and from hinge to junction box above the opening. Wire nut connections are not acceptable. Determine the length required for each electrified hardware component for the door type, size and construction, minimum of two per electrified opening.

1. Provide one each of the following tools as part of the base bid contract:
   b. McKinney Products; ASSA ABLOY Architectural Door Accessories (MK) - Connector Hand Tool: QC-R003.

2. Manufacturers:
   a. Hager Companies (HA) - Quick Connect.
   b. McKinney Products; ASSA ABLOY Architectural Door Accessories (MK) – QC-C Series.

2.4 DOOR OPERATING TRIM

A. Door Push Plates and Pulls: ANSI/BHMA A156.6 certified door pushes and pulls of type and design specified in the Hardware Sets. Coordinate and provide proper width and height as required where conflicting hardware dictates.

1. Push/Pull Plates: Minimum .050 inch thick, size as indicated in hardware sets, with beveled edges, secured with exposed screws unless otherwise indicated.
2. Door Pull and Push Bar Design: Size, shape, and material as indicated in the hardware sets. Minimum clearance of 2 1/2-inches from face of door unless otherwise indicated.
3. Offset Pull Design: Size, shape, and material as indicated in the hardware sets. Minimum clearance of 2 1/2-inches from face of door and offset of 90 degrees unless otherwise indicated.
4. Fasteners: Provide manufacturer's designated fastener type as indicated in Hardware Sets.

5. Manufacturers:
   a. Hiawatha, Inc. (HI).
   b. Rockwood Products; ASSA ABLOY Architectural Door Accessories (RO).
   c. Trimco (TC).
2.5 CYLINDERS AND KEYING

A. General: Cylinder manufacturer to have minimum (10) years experience designing secured master key systems and have on record a published security keying system policy.

B. Source Limitations: Obtain each type of keyed cylinder and keys from the same source manufacturer as locksets and exit devices, unless otherwise indicated.

1. Manufacturers:
   a. Sargent Manufacturing (SA) – To Match Existing.

C. Cylinders: Original manufacturer cylinders complying with the following:

1. Mortise Type: Threaded cylinders with rings and cams to suit hardware application.
2. Rim Type: Cylinders with back plate, flat-type vertical or horizontal tailpiece, and raised trim ring.
3. Bored-Lock Type: Cylinders with tailpieces to suit locks.
4. Mortise and rim cylinder collars to be solid and recessed to allow the cylinder face to be flush and be free spinning with matching finishes.

D. Permanent Cores: Manufacturer's standard; finish face to match lockset; complying with the following:

1. Removable Cores: Core insert, removable by use of a special key, and for use with only the core manufacturer's cylinder and door hardware. Provide removable core (small or large format) as specified in Hardware Sets.

E. Keying System: Each type of lock and cylinders to be factory keyed.

1. Conduct specified "Keying Conference" to define and document keying system instructions and requirements.
2. Furnish factory cut, nickel-silver large bow permanently inscribed with a visual key control number as directed by Owner.
3. Existing System: Key locks to Owner's existing system.

F. Key Quantity: Provide the following minimum number of keys:

1. Change Keys per Cylinder: Three (3).
2. Master Keys (per Master Key Level/Group): Five (5).
4. Construction Control Keys (where required): Two (2).
5. Permanent Control Keys (where required): Two (2).

G. Construction Keying: Provide temporary keyed construction cores.

H. Key Registration List (Bitting List):
1. Provide keying transcript list to Owner's representative in the proper format for importing into key control software.
2. Provide transcript list in writing or electronic file as directed by the Owner.

2.6 MECHANICAL LOCKS AND LATCHING DEVICES

A. Mortise Locksets, Grade 1 (Heavy Duty): ANSI/BHMA A156.13, Series 1000, Operational Grade 1 certified. Locksets are to be manufactured with a corrosion resistant steel case and be field-reversible for handing without disassembly of the lock body.

1. Manufacturers:
   a. Sargent Manufacturing (SA) – 8200 Series – To Match Existing.

2.7 LOCK AND LATCH STRIKES

A. Strikes: Provide manufacturer's standard strike with strike box for each latch or lock bolt, with curved lip extended to protect frame, finished to match door hardware set, unless otherwise indicated, and as follows:

1. Flat-Lip Strikes: For locks with three-piece antifriction latchbolts, as recommended by manufacturer.
2. Extra-Long-Lip Strikes: For locks used on frames with applied wood casing trim.
3. Aluminum-Frame Strike Box: Provide manufacturer's special strike box fabricated for aluminum framing.
4. Double-lipped strikes: For locks at double acting doors. Furnish with retractable stop for rescue hardware applications.

B. Standards: Comply with the following:

2. Strikes for Bored Locks and Latches: BHMA A156.2.
3. Strikes for Auxiliary Deadlocks: BHMA A156.36.
4. Dustproof Strikes: BHMA A156.16.

2.8 ELECTRIC STRIKES

A. Standard Electric Strikes: Heavy duty, cylindrical and mortise lock electric strikes conforming to ANSI/BHMA A156.31, Grade 1, UL listed for both Burglary Resistance and for use on fire rated door assemblies. Stainless steel construction with dual interlocking plunger design tested to exceed 3000 lbs. of static strength and 350 ft-lbs. of dynamic strength. Strikes tested for a minimum 1 million operating cycles. Provide strikes with 12 or 24 VDC capability and supplied standard as fail-secure unless otherwise specified. Provide latchbolt and latchbolt strike monitoring indicating both the position of the latchbolt and locked condition of the strike where specified.
1. Manufacturers:
   a. HES (HS).

B. Provide electric strikes with in-line power controller and surge suppressor by the same manufacturer as the strike with the combined products having a five year warranty.

2.9 CONVENTIONAL EXIT DEVICES

A. General Requirements: All exit devices specified herein shall meet or exceed the following criteria:

1. At doors not requiring a fire rating, provide devices complying with NFPA 101 and listed and labeled for "Panic Hardware" according to UL305. Provide proper fasteners as required by manufacturer including sex nuts and bolts at openings specified in the Hardware Sets.

2. Where exit devices are required on fire rated doors, provide devices complying with NFPA 80 and with UL labeling indicating "Fire Exit Hardware". Provide devices with the proper fasteners for installation as tested and listed by UL. Consult manufacturer’s catalog and template book for specific requirements.

3. Except on fire rated doors, provide exit devices with hex key dogging device to hold the pushbar and latch in a retracted position. Provide optional keyed cylinder dogging on devices where specified in Hardware Sets.

4. Devices must fit flat against the door face with no gap that permits unauthorized dogging of the push bar. The addition of filler strips is required in any case where the door light extends behind the device as in a full glass configuration.

5. Electromechanical Options: Subject to same compliance standards and requirements as mechanical exit devices, electrified devices to be of type and design as specified in hardware sets. Include any specific controllers when conventional power supplies are not sufficient to provide the proper inrush current.

6. Motorized Electric Latch Retraction: Devices with an electric latch retraction feature must use motors which have a maximum current draw of 600mA. Solenoid driven latch retraction is not acceptable.

7. Lever Operating Trim: Where exit devices require lever trim, furnish manufacturer's heavy duty escutcheon trim with threaded studs for thru-bolts.
   a. Lock Trim Design: As indicated in Hardware Sets, provide finishes and designs to match that of the specified locksets.
   b. Where function of exit device requires a cylinder, provide a cylinder (Rim or Mortise) as specified in Hardware Sets.
8. Vertical Rod Exit Devices: Where surface or concealed vertical rod exit devices are used at interior openings, provide as less bottom rod (LBR) unless otherwise indicated. Provide dust proof strikes where thermal pins are required to project into the floor.

9. Narrow Stile Applications: At doors constructed with narrow stiles, or as specified in Hardware Sets, provide devices designed for maximum 2” wide stiles.


11. Rail Sizing: Provide exit device rails factory sized for proper door width application.

12. Through Bolt Installation: For exit devices and trim as indicated in Door Hardware Sets.

B. Conventional Push Rail Exit Devices (Heavy Duty): ANSI/BHMA A156.3, Grade 1 certified panic and fire exit hardware devices furnished in the functions specified in the Hardware Sets. Exit device latch to be stainless steel, pullman type, with deadlock feature.

1. Manufacturers:
   a. Sargent Manufacturing (SA) - 80 Series – To Match Existing.

C. Extruded Aluminum Removable Mullions: ANSI/BHMA A156.3 anodized, removable mullions with malleable-iron top and bottom retainers. Mullions to be provided standard with stabilizers and imbedded weatherstrip.

1. Manufacturers:
   a. Sargent Manufacturing (SA) - 980/980A Series.

D. Tube Steel Removable Mullions: ANSI/BHMA A156.3 removable steel mullions with malleable-iron top and bottom retainers and a primed paint finish.

1. Provide keyed removable feature where specified in the Hardware Sets.
2. Provide stabilizers and mounting brackets as required.
3. Provide electrical quick connection wiring options as specified in the hardware sets.
4. Manufacturers:
   a. Sargent Manufacturing (SA) - 980S Series.

2.10 DOOR CLOSERS

A. All door closers specified herein shall meet or exceed the following criteria:

1. General: Door closers to be from one manufacturer, matching in design and style, with the same type door preparations and templates regardless of application or spring size.
Closers to be non-handed with full sized covers including installation and adjusting information on inside of cover.

2. Standards: Closers to comply with UL-10C for Positive Pressure Fire Test and be U.L. listed for use of fire rated doors.

3. Cycle Testing: Provide closers which have surpassed 15 million cycles in a test witnessed and verified by UL.

4. Size of Units: Comply with manufacturer's written recommendations for sizing of door closers depending on size of door, exposure to weather, and anticipated frequency of use. Where closers are indicated for doors required to be accessible to the physically handicapped, provide units complying with ANSI ICC/A117.1.

5. Closer Arms: Provide heavy duty, forged steel closer arms unless otherwise indicated in Hardware Sets.

6. Closers shall not be installed on exterior or corridor side of doors; where possible install closers on door for optimum aesthetics.

7. Closer Accessories: Provide door closer accessories including custom templates, special mounting brackets, spacers and drop plates as required for proper installation. Provide through-bolt and security type fasteners as specified in the hardware sets.

B. Door Closers, Surface Mounted (Heavy Duty): ANSI/BHMA A156.4, Grade 1 surface mounted, heavy duty door closers with complete spring power adjustment, sizes 1 thru 6; and fully operational adjustable according to door size, frequency of use, and opening force. Closers to be rack and pinion type, one piece cast iron or aluminum alloy body construction, with adjustable backcheck and separate non-critical valves for closing sweep and latch speed control. Provide non-handed units standard.

1. Manufacturers:
   a. Sargent Manufacturing (SA) - 351 Series – To Match Existing.

2.11 ARCHITECTURAL TRIM

A. Door Protective Trim

1. General: Door protective trim units to be of type and design as specified below or in the Hardware Sets.

2. Size: Fabricate protection plates (kick, armor, or mop) not more than 2” less than door width (LDW) on stop side of single doors and 1” LDW on stop side of pairs of doors, and not more than 1” less than door width on pull side. Coordinate and provide proper width and height as required where conflicting hardware dictates. Height to be as specified in the Hardware Sets.
3. Where plates are applied to fire rated doors with the top of the plate more than 16” above the bottom of the door, provide plates complying with NFPA 80. Consult manufacturer’s catalog and template book for specific requirements for size and applications.

4. Protection Plates: ANSI/BHMA A156.6 certified protection plates (kick, armor, or mop), fabricated from the following:
   a. Stainless Steel: 300 grade, 050-inch thick.

5. Options and fasteners: Provide manufacturer’s designated fastener type as specified in the Hardware Sets. Provide countersunk screw holes.

6. Manufacturers:
   a. Hiawatha, Inc. (HI).
   b. Rockwood Products; ASSA ABLOY Architectural Door Accessories (RO).
   c. Trimco (TC).

2.12 DOOR STOPS AND HOLDERS

A. General: Door stops and holders to be of type and design as specified below or in the Hardware Sets.

B. Door Stops and Bumpers: ANSI/BHMA A156.16, Grade 1 certified door stops and wall bumpers. Provide wall bumpers, either convex or concave types with anchorage as indicated, unless floor or other types of door stops are specified in Hardware Sets. Do not mount floor stops where they will impede traffic. Where floor or wall bumpers are not appropriate, provide overhead type stops and holders.

1. Manufacturers:
   a. Hiawatha, Inc. (HI).
   b. Rockwood Products; ASSA ABLOY Architectural Door Accessories (RO).
   c. Trimco (TC).

2.13 ARCHITECTURAL SEALS

A. General: Thresholds, weatherstripping, and gasket seals to be of type and design as specified below or in the Hardware Sets. Provide continuous weatherstrip gasketing on exterior doors and provide smoke, light, or sound gasketing on interior doors where indicated. At exterior applications provide non-corrosive fasteners and elsewhere where indicated.

B. Smoke Labeled Gasketing: Assemblies complying with NFPA 105 that are listed and labeled by a testing and inspecting agency acceptable to authorities having jurisdiction, for smoke control ratings indicated, based on testing according to UL 1784.

1. Provide smoke labeled perimeter gasketing at all smoke labeled openings.
C. Fire Labeled Gasketing: Assemblies complying with NFPA 80 that are listed and labeled by a testing and inspecting agency acceptable to authorities having jurisdiction, for fire ratings indicated, based on testing according to UL-10C.

1. Provide intumescent seals as indicated to meet UL10C Standard for Positive Pressure Fire Tests of Door Assemblies, and NPFA 252, Standard Methods of Fire Tests of Door Assemblies.

D. Sound-Rated Gasketing: Assemblies that are listed and labeled by a testing and inspecting agency, for sound ratings indicated.

E. Replaceable Seal Strips: Provide only those units where resilient or flexible seal strips are easily replaceable and readily available from stocks maintained by manufacturer.

F. Manufacturers:

1. National Guard Products (NG).
2. Pemko Products; ASSA ABLOY Architectural Door Accessories (PE).

2.14 ELECTRONIC ACCESSORIES

A. Push-Button Switches: Industrial grade momentary or alternate contact, back-lighted push buttons with stainless-steel switch enclosures. 12/24 VDC bi-color illumination suitable for either flush or surface mounting.

1. Manufacturers:

   a. Security Door Controls (SD) - 400 Series.
   b. Securitron (SU) - PB Series.

B. Door Position Switches: Door position magnetic reed contact switches specifically designed for use in commercial door applications. On recessed models the contact and magnetic housing snap-lock into a 1” diameter hole. Surface mounted models include wide gap distance design complete with armored flex cabling. Provide SPDT, N/O switches with optional Rare Earth Magnet installation on steel doors with flush top channels.

1. Manufacturers:

   a. Sargent Manufacturing (SA) – 3280 Series.
   b. Security Door Controls (SD) - DPS Series.
   c. Securitron (SU) - DPS Series.

C. Switching Power Supplies: NOT in Div. 8, to be provided and installed by Security Integrator in Div. 28

D. Manufacturers:
a. Securitron (SU) - AQ Series.

2.15 FABRICATION
A. Fasteners: Provide door hardware manufactured to comply with published templates generally prepared for machine, wood, and sheet metal screws. Provide screws according to manufacturers recognized installation standards for application intended.

2.16 FINISHES
A. Standard: Designations used in the Hardware Sets and elsewhere indicate hardware finishes complying with ANSI/BHMA A156.18, including coordination with traditional U.S. finishes indicated by certain manufacturers for their products.
B. Provide quality of finish, including thickness of plating or coating (if any), composition, hardness, and other qualities complying with manufacturer's standards, but in no case less than specified by referenced standards for the applicable units of hardware.
C. Protect mechanical finishes on exposed surfaces from damage by applying a strippable, temporary protective covering before shipping.

PART 3 - EXECUTION

3.1 EXAMINATION
A. Examine scheduled openings, 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. Notify architect of any discrepancies or conflicts between the door schedule, door types, drawings and scheduled hardware. Proceed only after such discrepancies or conflicts have been resolved in writing.

3.2 PREPARATION
A. Hollow Metal Doors and Frames: Comply with ANSI/DHI A115 series.

3.3 INSTALLATION
A. Install each item of mechanical and electromechanical hardware and access control equipment to comply with manufacturer's written instructions and according to specifications.
Installers are to be trained and certified by the manufacturer on the proper installation and adjustment of fire, life safety, and security products including: hanging devices; locking devices; closing devices; and seals.

B. Mounting Heights: Mount door hardware units at heights indicated in following applicable publications, unless specifically indicated or required to comply with governing regulations:

2. Wood Doors: DHI WDHS.3, "Recommended Locations for Architectural Hardware for Wood Flush Doors."
3. Where indicated to comply with accessibility requirements, comply with ANSI A117.1 "Accessibility Guidelines for Buildings and Facilities."
4. Provide blocking in drywall partitions where wall stops or other wall mounted hardware is located.

C. Retrofitting: Install door hardware to comply with manufacturer's published templates and 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.

D. Thresholds: Set thresholds for exterior and acoustical doors in full bed of sealant complying with requirements specified in Division 7 Section "Joint Sealants."

E. Storage: Provide a secure lock up for hardware delivered to the project but not yet installed. Control the handling and installation of hardware items so that the completion of the work will not be delayed by hardware losses before and after installation.

3.4 FIELD QUALITY CONTROL

A. Field Inspection: Supplier will perform a final inspection of installed door hardware and state in report whether work complies with or deviates from requirements, including whether door hardware is properly installed, operating and adjusted.

3.5 ADJUSTING

A. Initial Adjustment: Adjust and check each operating item of door hardware and each door to ensure proper operation or function of every unit. Replace units that cannot be adjusted to operate as intended. Adjust door control devices to compensate for final operation of heating and ventilating equipment and to comply with referenced accessibility requirements.
3.6 CLEANING AND PROTECTION

A. Protect all hardware stored on construction site in a covered and dry place. Protect exposed hardware installed on doors during the construction phase. Install any and all hardware at the latest possible time frame.

B. Clean adjacent surfaces soiled by door hardware installation.

C. Clean operating items as necessary to restore proper finish. Provide final protection and maintain conditions that ensure door hardware is without damage or deterioration at time of owner occupancy.

3.7 DEMONSTRATION

A. Instruct Owner's maintenance personnel to adjust, operate, and maintain mechanical and electromechanical door hardware.

3.8 DOOR HARDWARE SETS

A. The hardware sets represent the design intent and direction of the owner and architect. They are a guideline only and should not be considered a detailed hardware schedule. Discrepancies, conflicting hardware and missing items should be brought to the attention of the architect with corrections made prior to the bidding process. Omitted items not included in a hardware set should be scheduled with the appropriate additional hardware required for proper application and functionality.

B. The supplier is responsible for handing and sizing all products and providing the correct option for the appropriate door type and material where more than one is presented in the hardware sets. Quantities listed are for each pair of doors, or for each single door.

C. Manufacturer’s Abbreviations:

1. MK - McKinney
2. PE - Pemko
3. SA - SARGENT
4. HS - HES
5. RO - Rockwood
6. SU - Securitron

**Hardware Sets**

**Set: 1.0**
SECURITY VESTIBULE PROJECT - 18061.07 APN
GRASSFIELD, GREAT BRIDGE, HICKORY, and OSCAR SMITH HIGH SCHOOLS -
CHESAPEAKE PUBLIC SCHOOLS
BID 38-1920


1 Continuous Hinge CFM__HD1 PT - DOOR HEIGHT PE
1 Rim Exit Device, Storeroom 16 55 56 60 8804 ETJ US32D SA ∙
2 Core 6300 US15 SA
1 Door Closer 351 CPS EN SA
1 Kick Plate K1050 10" CSK US32D RO
3 Silencer 608/609 (TO SUIT) RO
1 Frame Harness QC-C1500P MK ∙
1 Door Harness QC-CXXX- LENGTH TO SUIT MK ∙
1 Electric Power Transfer EL-CEPT SU ∙
1 Wiring Diagram Elevation and Point to Point as Specified

Notes: • Remote release by aiphone system on door 101D.
• Card reader by security integrator on door 101D.
• Electronic Operation: Remote push button/valid card (on door 101D) or key retracts latchbolt. Request to exit shows authorized egress. Free egress at all times. In case of power loss, door remains locked and latched.

Set: 2.0

Doors: 103, 104

3 Hinge (heavy weight) T4A3786 US26D MK
1 Classroom Security Intruder Lock 60 8238 LNJ US26D SA
2 Core 6300 US15 SA
1 Door Closer 351 O/P10 (TO SUIT) EN SA
1 Kick Plate K1050 10" CSK US32D RO
1 Door Stop 403/441CU (TO SUIT) US26D RO
3 Silencer 608/609 (TO SUIT) RO

Set: 3.0

Doors: 102, 105

1 Storeroom/Closet Lock 60 8204 LNJ US26D SA
1 Core 6300 US15 SA
1 Electric Strike 1006CLB 630 HS ∙
1 SMART Pac Bridge Rectifier 2005M3 HS ∙
1 Wiring Diagram Elevation and Point to Point as Specified
SECURITY VESTIBULE PROJECT - 18061.07 APN
GRASSFIELD, GREAT BRIDGE, HICKORY, and OSCAR SMITH HIGH SCHOOLS - CHESAPEAKE PUBLIC SCHOOLS
BID 38-1920

Notes:
• Balance of existing hardware to remain.
• Card reader by security integrator.
• Electronic Operation: Valid card releases electric strike or key retracts latchbolt. Request to exit shows authorized egress. Free egress at all times. In case of power loss, door remains locked and latched.

END OF SECTION 087100a
SECTIONS 087100a – DOOR HARDWARE (GREAT BRIDGE HS)

PART 1 - GENERAL

1.1 SUMMARY

A. This Section includes commercial door hardware for the following:

1. Swinging doors.

B. Door hardware includes, but is not necessarily limited to, the following:

1. Mechanical door hardware.
2. Electromechanical door hardware.
3. Cylinders specified for doors in other sections.

C. Related Sections:

1. Division 08 Section “Hollow Metal Doors and Frames”.

D. Codes and References: Comply with the version year adopted by the Authority Having Jurisdiction.

6. NFPA 105 - Installation of Smoke Door Assemblies.
7. State Building Codes, Local Amendments.

E. Standards: All hardware specified herein shall comply with the following industry standards:

1. ANSI/BHMA Certified Product Standards - A156 Series
2. UL10C – Positive Pressure Fire Tests of Door Assemblies

1.2 SUBMITTALS

A. Product Data: Manufacturer’s product data sheets including installation details, material descriptions, dimensions of individual components and profiles, operational descriptions and finishes.

B. 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. Organize door hardware sets in same order as in the Door Hardware Sets at the end of Part 3. Submittals that do not follow the same format and order as the Door Hardware Sets will be rejected and subject to resubmission.

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 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.
   h. Warranty information for each product.

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.

C. Shop Drawings: Details of electrified access control hardware indicating the following:

1. Wiring Diagrams: Upon receipt of approved schedules, submit detailed system wiring diagrams for power, signaling, monitoring, communication, and control of the access control system electrified hardware. Differentiate between manufacturer-installed and field-installed wiring. Include the following:
   a. Elevation diagram of each unique access controlled opening showing location and interconnection of major system components with respect to their placement in the respective door openings.
   b. Complete (risers, point-to-point) access control system block wiring diagrams.
   c. Wiring instructions for each electronic component scheduled herein.

2. Electrical Coordination: Coordinate with related sections the voltages and wiring details required at electrically controlled and operated hardware openings.

D. Keying Schedule: After a keying meeting with the owner has taken place prepare a separate keying schedule detailing final instructions. Submit the keying schedule in electronic format. Include keying system explanation, door numbers, key set symbols, hardware set numbers and
special instructions. Owner must approve submitted keying schedule prior to the ordering of permanent cylinders/cores.

E. Informational Submittals:

1. Product Test Reports: Indicating compliance with cycle testing requirements, based on evaluation of comprehensive tests performed by manufacturer and witnessed by a qualified independent testing agency.

F. Operating and Maintenance Manuals: Provide manufacturers operating and maintenance manuals for each item comprising the complete door hardware installation in quantity as required in Division 01, Closeout Submittals.

1.3 QUALITY ASSURANCE

A. Manufacturers Qualifications: Engage qualified manufacturers with a minimum 5 years of documented experience in producing hardware and equipment similar to that indicated for this Project and that have a proven record of successful in-service performance.

B. Installer Qualifications: A minimum 3 years documented experience installing both standard and electrified 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.

C. Door Hardware Supplier Qualifications: Experienced commercial door hardware distributors with a minimum 5 years documented experience supplying both mechanical and electromechanical hardware installations comparable in material, design, and extent to that indicated for this Project. Supplier recognized as a factory direct distributor by the manufacturers of the primary materials with a warehousing facility in Project's vicinity.

D. Source Limitations: Obtain each type and variety of door hardware specified in this section from a single source unless otherwise indicated.

1. Electrified modifications or enhancements made to a source manufacturer's product line by a secondary or third party source will not be accepted.

2. Provide electromechanical door hardware from the same manufacturer as mechanical door hardware, unless otherwise indicated.

E. Each unit to bear third party permanent label demonstrating compliance with the referenced standards.

F. Keying Conference: Conduct conference to comply with requirements in Division 01 Section "Project Meetings." Keying conference to incorporate the following criteria into the final keying schedule document:

1. Function of building, purpose of each area and degree of security required.
2. Plans for existing and future key system expansion.
3. Requirements for key control storage and software.
4. Installation of permanent keys, cylinder cores and software.
5. Address and requirements for delivery of keys.

G. Pre-Submittal Conference: Conduct coordination conference in compliance with requirements in Division 01 Section "Project Meetings" with attendance by representatives of Supplier(s), Installer(s), and Contractor(s) to review proper methods and the procedures for receiving, handling, and installing door hardware.

1. Prior to installation of door hardware, conduct a project specific training meeting to instruct the installing contractors' personnel on the proper installation and adjustment of their respective products. Product training to be attended by installers of door hardware (including electromechanical hardware) for aluminum, hollow metal and wood doors. Training will include the use of installation manuals, hardware schedules, templates and physical product samples as required.
2. Inspect and discuss electrical roughing-in, power supply connections, and other preparatory work performed by other trades.
3. Review sequence of operation narratives for each unique access controlled opening.
4. Review and finalize construction schedule and verify availability of materials.
5. Review the required inspecting, testing, commissioning, and demonstration procedures

H. At completion of installation, provide written documentation that components were applied to manufacturer's instructions and recommendations and according to approved schedule.

1.4 DELIVERY, STORAGE, AND HANDLING

A. Inventory door hardware on receipt and provide secure lock-up and shelving for door hardware delivered to Project site. Do not store electronic access control hardware, software or accessories at Project site without prior authorization.

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, as applicable, permanent keys, cylinders, cores, access control credentials, software and related accessories directly to Owner via registered mail or overnight package service. Instructions for delivery to the Owner shall be established at the "Keying Conference".

1.5 COORDINATION

A. Templates: Obtain and distribute to the parties involved templates for doors, frames, and other work specified to be factory prepared for installing standard and electrified hardware. Check Shop Drawings of other work to confirm that adequate provisions are made for locating and installing hardware to comply with indicated requirements.

B. Door Hardware and Electrical Connections: Coordinate the layout and installation of scheduled electrified door hardware and related access control equipment with required connections to
source power junction boxes, low voltage power supplies, detection and monitoring hardware, and fire and detection alarm systems.

C. Door and Frame Preparation: Doors and corresponding frames are to be prepared, reinforced and pre-wired (if applicable) to receive the installation of the specified electrified, monitoring, signaling and access control system hardware without additional in-field modifications.

1.6 WARRANTY

A. General Warranty: Reference Division 01, General Requirements. Special warranties specified in this Article shall not deprive Owner of other rights Owner may have under other provisions of the Contract Documents and shall be in addition to, and run concurrent with, other warranties made by Contractor under requirements of the Contract Documents.

B. Warranty Period: Written warranty, executed by manufacturer(s), agreeing to repair or replace components of standard and electrified door hardware that fails in materials or workmanship within specified warranty period after final acceptance by the Owner. Failures include, but are not limited to, the following:

1. Structural failures including excessive deflection, cracking, or breakage.
2. Faulty operation of the hardware.
3. Deterioration of metals, metal finishes, and other materials beyond normal weathering.
4. Electrical component defects and failures within the systems operation.

C. Standard Warranty Period: One year from date of Substantial Completion, unless otherwise indicated.

D. Special Warranty Periods:

1. Ten years for mortise locks and latches.
2. Five years for exit hardware.
3. Twenty five years for manual surface door closer bodies.
4. Five years for motorized electric latch retraction exit devices.
5. Two years for electromechanical door hardware.

1.7 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.
PART 2 - PRODUCTS

2.1 SCHEDULED DOOR HARDWARE

A. General: Provide door hardware for each door to comply with requirements in Door Hardware Sets and each referenced section that products are to be supplied under.

B. Designations: Requirements for quantity, item, size, finish or color, grade, function, and other distinctive qualities of each type of door hardware are indicated in the Door Hardware Sets 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 requirements. Manufacturers' names are abbreviated in the Door Hardware Schedule.

C. Substitutions: Requests for substitution and product approval for inclusive mechanical and electromechanical door hardware in compliance with the specifications must be submitted in writing and in accordance with the procedures and time frames outlined in Division 01, Substitution Procedures. Approval of requests is at the discretion of the architect, owner, and their designated consultants.

2.2 HANGING DEVICES

A. Hinges: ANSI/BHMA A156.1 certified butt hinges with number of hinge knuckles and other options as specified in the Door Hardware Sets.

1. Quantity: Provide the following hinge quantity:
   a. Two Hinges: For doors with heights up to 60 inches.
   b. Three Hinges: For doors with heights 61 to 90 inches.
   c. Four Hinges: For doors with heights 91 to 120 inches.
   d. For doors with heights more than 120 inches, provide 4 hinges, plus 1 hinge for every 30 inches of door height greater than 120 inches.

2. Hinge Size: Provide the following, unless otherwise indicated, with hinge widths sized for door thickness and clearances required:
   a. Widths up to 3’0”: 4-1/2” standard or heavy weight as specified.
   b. Sizes from 3’1” to 4’0”: 5” standard or heavy weight as specified.

3. Hinge Weight and Base Material: Unless otherwise indicated, provide the following:
   a. Exterior Doors: Heavy weight, non-ferrous, ball bearing or oil impregnated bearing hinges unless Hardware Sets indicate standard weight.
   b. Interior Doors: Standard weight, steel, ball bearing or oil impregnated bearing hinges unless Hardware Sets indicate heavy weight.
4. Hinge Options: Comply with the following:
   a. 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 all outswinging lockable doors.

5. Manufacturers:
   a. Bommer Industries (BO) - LB Series.
   b. Hager Companies (HA) - CB Series.
   c. McKinney Products; ASSA ABLOY Architectural Door Accessories (MK) - TA Series.

B. Continuous Geared Hinges: ANSI/BHMA A156.26 Grade 1-600 certified continuous geared hinge, with minimum 0.120-inch thick extruded 6060 T6 aluminum alloy hinge leaves and a minimum overall width of 4 inches. Hinges are not-handed, reversible and fabricated to template screw locations. Factory trim hinges to suit door height and prepare for electrical cutouts.

   1. Manufacturers:
      a. Bommer Industries (BO).
      b. Hager Companies (HA).
      c. Pemko Products; ASSA ABLOY Architectural Door Accessories (PE).

2.3 POWER TRANSFER DEVICES

A. Electrified Quick Connect Transfer Hinges: Provide electrified transfer hinges with Molex™ standardized plug connectors and sufficient number of concealed wires (up to 12) to accommodate the electrified functions specified in the Door Hardware Sets. Connectors plug directly to through-door wiring harnesses for connection to electric locking devices and power supplies. Wire nut connections are not acceptable.

   1. Manufacturers:
      a. Hager Companies (HA) - ETW-QC (# wires) Option.
      b. McKinney Products; ASSA ABLOY Architectural Door Accessories (MK) - QC (# wires) Option.

B. Concealed Quick Connect Electric Power Transfers: Provide concealed wiring pathway housing mortised into the door and frame for low voltage electrified door hardware. Furnish with Molex™ standardized plug connectors and sufficient number of concealed wires (up to 12) to accommodate the electrified functions specified in the Door Hardware Sets. Connectors plug directly to through-door wiring harnesses for connection to electric locking devices and power supplies. Wire nut connections are not acceptable.

   1. Manufacturers:
SECURITY VESTIBULE PROJECT - 18061.07 APN
GRASSFIELD, GREAT BRIDGE, HICKORY, and OSCAR SMITH HIGH SCHOOLS - CHESAPEAKE PUBLIC SCHOOLS
BID 39-1920

C. Electric Door Wire Harnesses: Provide electric/data transfer wiring harnesses with standardized plug connectors to accommodate up to twelve (12) wires. Connectors plug directly to through-door wiring harnesses for connection to electric locking devices and power supplies. Provide sufficient number and type of concealed wires to accommodate electric function of specified hardware. Provide a connector for through-door electronic locking devices and from hinge to junction box above the opening. Wire nut connections are not acceptable. Determine the length required for each electrified hardware component for the door type, size and construction, minimum of two per electrified opening.

1. Provide one each of the following tools as part of the base bid contract:
   b. McKinney Products; ASSA ABLOY Architectural Door Accessories (MK) - Connector Hand Tool: QC-R003.

2. Manufacturers:
   a. Hager Companies (HA) - Quick Connect.
   b. McKinney Products; ASSA ABLOY Architectural Door Accessories (MK) – QC-C Series.

2.4 DOOR OPERATING TRIM

A. Door Push Plates and Pulls: ANSI/BHMA A156.6 certified door pushes and pulls of type and design specified in the Hardware Sets. Coordinate and provide proper width and height as required where conflicting hardware dictates.

1. Push/Pull Plates: Minimum .050 inch thick, size as indicated in hardware sets, with beveled edges, secured with exposed screws unless otherwise indicated.
2. Door Pull and Push Bar Design: Size, shape, and material as indicated in the hardware sets. Minimum clearance of 2 1/2-inches from face of door unless otherwise indicated.
3. Offset Pull Design: Size, shape, and material as indicated in the hardware sets. Minimum clearance of 2 1/2-inches from face of door and offset of 90 degrees unless otherwise indicated.
4. Fasteners: Provide manufacturer's designated fastener type as indicated in Hardware Sets.

5. Manufacturers:
   a. Hiawatha, Inc. (HI).
   b. Rockwood Products; ASSA ABLOY Architectural Door Accessories (RO).
   c. Trimco (TC).
2.5 CYLINDERS AND KEYING

A. General: Cylinder manufacturer to have minimum (10) years experience designing secured master key systems and have on record a published security keying system policy.

B. Source Limitations: Obtain each type of keyed cylinder and keys from the same source manufacturer as locksets and exit devices, unless otherwise indicated.

1. Manufacturers:
   a. Sargent Manufacturing (SA) – To Match Existing.

C. Cylinders: Original manufacturer cylinders complying with the following:

1. Mortise Type: Threaded cylinders with rings and cams to suit hardware application.
2. Rim Type: Cylinders with back plate, flat-type vertical or horizontal tailpiece, and raised trim ring.
3. Bored-Lock Type: Cylinders with tailpieces to suit locks.
4. Mortise and rim cylinder collars to be solid and recessed to allow the cylinder face to be flush and be free spinning with matching finishes.

D. Permanent Cores: Manufacturer's standard; finish face to match lockset; complying with the following:

1. Removable Cores: Core insert, removable by use of a special key, and for use with only the core manufacturer's cylinder and door hardware. Provide removable core (small or large format) as specified in Hardware Sets.

E. Keying System: Each type of lock and cylinders to be factory keyed.

1. Conduct specified "Keying Conference" to define and document keying system instructions and requirements.
2. Furnish factory cut, nickel-silver large bow permanently inscribed with a visual key control number as directed by Owner.
3. Existing System: Key locks to Owner's existing system.

F. Key Quantity: Provide the following minimum number of keys:

1. Change Keys per Cylinder: Three (3).
2. Master Keys (per Master Key Level/Group): Five (5).
4. Construction Control Keys (where required): Two (2).
5. Permanent Control Keys (where required): Two (2).

G. Construction Keying: Provide temporary keyed construction cores.

H. Key Registration List (Bitting List):
1. Provide keying transcript list to Owner's representative in the proper format for importing into key control software.
2. Provide transcript list in writing or electronic file as directed by the Owner.

2.6 MECHANICAL LOCKS AND LATCHING DEVICES
A. Mortise Locksets, Grade 1 (Heavy Duty): ANSI/BHMA A156.13, Series 1000, Operational Grade 1 certified. Locksets are to be manufactured with a corrosion resistant steel case and be field-reversible for handing without disassembly of the lock body.
   1. Manufacturers:
      a. Sargent Manufacturing (SA) – 8200 Series – To Match Existing.

2.7 LOCK AND LATCH STRIKES
A. Strikes: Provide manufacturer's standard strike with strike box for each latch or lock bolt, with curved lip extended to protect frame, finished to match door hardware set, unless otherwise indicated, and as follows:
   1. Flat-Lip Strikes: For locks with three-piece antifriction latchbolts, as recommended by manufacturer.
   2. Extra-Long-Lip Strikes: For locks used on frames with applied wood casing trim.
   3. Aluminum-Frame Strike Box: Provide manufacturer's special strike box fabricated for aluminum framing.
   4. Double-lipped strikes: For locks at double acting doors. Furnish with retractable stop for rescue hardware applications.
B. Standards: Comply with the following:
   2. Strikes for Bored Locks and Latches: BHMA A156.2.
   3. Strikes for Auxiliary Deadlocks: BHMA A156.36.
   4. Dustproof Strikes: BHMA A156.16.

2.8 ELECTRIC STRIKES
A. Standard Electric Strikes: Heavy duty, cylindrical and mortise lock electric strikes conforming to ANSI/BHMA A156.31, Grade 1, UL listed for both Burglary Resistance and for use on fire rated door assemblies. Stainless steel construction with dual interlocking plunger design tested to exceed 3000 lbs. of static strength and 350 ft-lbs. of dynamic strength. Strikes tested for a minimum 1 million operating cycles. Provide strikes with 12 or 24 VDC capability and supplied standard as fail-secure unless otherwise specified. Provide latchbolt and latchbolt strike monitoring indicating both the position of the latchbolt and locked condition of the strike where specified.
1. Manufacturers:
   a. HES (HS).

B. Provide electric strikes with in-line power controller and surge suppressor by the same manufacturer as the strike with the combined products having a five year warranty.

2.9 CONVENTIONAL EXIT DEVICES

A. General Requirements: All exit devices specified herein shall meet or exceed the following criteria:

1. At doors not requiring a fire rating, provide devices complying with NFPA 101 and listed and labeled for "Panic Hardware" according to UL305. Provide proper fasteners as required by manufacturer including sex nuts and bolts at openings specified in the Hardware Sets.

2. Where exit devices are required on fire rated doors, provide devices complying with NFPA 80 and with UL labeling indicating "Fire Exit Hardware". Provide devices with the proper fasteners for installation as tested and listed by UL. Consult manufacturer’s catalog and template book for specific requirements.

3. Except on fire rated doors, provide exit devices with hex key dogging device to hold the pushbar and latch in a retracted position. Provide optional keyed cylinder dogging on devices where specified in Hardware Sets.

4. Devices must fit flat against the door face with no gap that permits unauthorized dogging of the pushbar. The addition of filler strips is required in any case where the door light extends behind the device as in a full glass configuration.

5. Electromechanical Options: Subject to same compliance standards and requirements as mechanical exit devices, electrified devices to be of type and design as specified in hardware sets. Include any specific controllers when conventional power supplies are not sufficient to provide the proper inrush current.

6. Motorized Electric Latch Retraction: Devices with an electric latch retraction feature must use motors which have a maximum current draw of 600mA. Solenoid driven latch retraction is not acceptable.

7. Lever Operating Trim: Where exit devices require lever trim, furnish manufacturer’s heavy duty escutcheon trim with threaded studs for thru-bolts.
   a. Lock Trim Design: As indicated in Hardware Sets, provide finishes and designs to match that of the specified locksets.
   b. Where function of exit device requires a cylinder, provide a cylinder (Rim or Mortise) as specified in Hardware Sets.
8. Vertical Rod Exit Devices: Where surface or concealed vertical rod exit devices are used at interior openings, provide as less bottom rod (LBR) unless otherwise indicated. Provide dust proof strikes where thermal pins are required to project into the floor.

9. Narrow Stile Applications: At doors constructed with narrow stiles, or as specified in Hardware Sets, provide devices designed for maximum 2” wide stiles.


11. Rail Sizing: Provide exit device rails factory sized for proper door width application.

12. Through Bolt Installation: For exit devices and trim as indicated in Door Hardware Sets.

B. Conventional Push Rail Exit Devices (Heavy Duty): ANSI/BHMA A156.3, Grade 1 certified panic and fire exit hardware devices furnished in the functions specified in the Hardware Sets. Exit device latch to be stainless steel, pullman type, with deadlock feature.

1. Manufacturers:
   a. Sargent Manufacturing (SA) - 80 Series – To Match Existing.

C. Extruded Aluminum Removable Mullions: ANSI/BHMA A156.3 anodized, removable mullions with malleable-iron top and bottom retainers. Mullions to be provided standard with stabilizers and imbedded weatherstrip.

1. Manufacturers:
   a. Sargent Manufacturing (SA) - 980/980A Series.

D. Tube Steel Removable Mullions: ANSI/BHMA A156.3 removable steel mullions with malleable-iron top and bottom retainers and a primed paint finish.

1. Provide keyed removable feature where specified in the Hardware Sets.
2. Provide stabilizers and mounting brackets as required.
3. Provide electrical quick connection wiring options as specified in the hardware sets.
4. Manufacturers:
   a. Sargent Manufacturing (SA) - 980S Series.

2.10 DOOR CLOSERS

A. All door closers specified herein shall meet or exceed the following criteria:

1. General: Door closers to be from one manufacturer, matching in design and style, with the same type door preparations and templates regardless of application or spring size.
Closers to be non-handed with full sized covers including installation and adjusting information on inside of cover.

2. Standards: Closers to comply with UL-10C for Positive Pressure Fire Test and be U.L. listed for use of fire rated doors.

3. Cycle Testing: Provide closers which have surpassed 15 million cycles in a test witnessed and verified by UL.

4. Size of Units: Comply with manufacturer's written recommendations for sizing of door closers depending on size of door, exposure to weather, and anticipated frequency of use. Where closers are indicated for doors required to be accessible to the physically handicapped, provide units complying with ANSI ICC/A117.1.

5. Closer Arms: Provide heavy duty, forged steel closer arms unless otherwise indicated in Hardware Sets.

6. Closers shall not be installed on exterior or corridor side of doors; where possible install closers on door for optimum aesthetics.

7. Closer Accessories: Provide door closer accessories including custom templates, special mounting brackets, spacers and drop plates as required for proper installation. Provide through-bolt and security type fasteners as specified in the hardware sets.

B. Door Closers, Surface Mounted (Heavy Duty): ANSI/BHMA A156.4, Grade 1 surface mounted, heavy duty door closers with complete spring power adjustment, sizes 1 thru 6; and fully operational adjustable according to door size, frequency of use, and opening force. Closers to be rack and pinion type, one piece cast iron or aluminum alloy body construction, with adjustable backcheck and separate non-critical valves for closing sweep and latch speed control. Provide non-handed units standard.

1. Manufacturers:
   a. Sargent Manufacturing (SA) - 351 Series – To Match Existing.

2.11 ARCHITECTURAL TRIM

A. Door Protective Trim

1. General: Door protective trim units to be of type and design as specified below or in the Hardware Sets.

2. Size: Fabricate protection plates (kick, armor, or mop) not more than 2” less than door width (LDW) on stop side of single doors and 1” LDW on stop side of pairs of doors, and not more than 1” less than door width on pull side. Coordinate and provide proper width and height as required where conflicting hardware dictates. Height to be as specified in the Hardware Sets.
3. Where plates are applied to fire rated doors with the top of the plate more than 16” above the bottom of the door, provide plates complying with NFPA 80. Consult manufacturer’s catalog and template book for specific requirements for size and applications.

4. Protection Plates: ANSI/BHMA A156.6 certified protection plates (kick, armor, or mop), fabricated from the following:
   a. Stainless Steel: 300 grade, 050-inch thick.

5. Options and fasteners: Provide manufacturer’s designated fastener type as specified in the Hardware Sets. Provide countersunk screw holes.

6. Manufacturers:
   a. Hiawatha, Inc. (HI).
   b. Rockwood Products; ASSA ABLOY Architectural Door Accessories (RO).
   c. Trimco (TC).

2.12 DOOR STOPS AND HOLDERS

A. General: Door stops and holders to be of type and design as specified below or in the Hardware Sets.

B. Door Stops and Bumpers: ANSI/BHMA A156.16, Grade 1 certified door stops and wall bumpers. Provide wall bumpers, either convex or concave types with anchorage as indicated, unless floor or other types of door stops are specified in Hardware Sets. Do not mount floor stops where they will impede traffic. Where floor or wall bumpers are not appropriate, provide overhead type stops and holders.

1. Manufacturers:
   a. Hiawatha, Inc. (HI).
   b. Rockwood Products; ASSA ABLOY Architectural Door Accessories (RO).
   c. Trimco (TC).

2.13 ARCHITECTURAL SEALS

A. General: Thresholds, weatherstripping, and gasket seals to be of type and design as specified below or in the Hardware Sets. Provide continuous weatherstrip gasketing on exterior doors and provide smoke, light, or sound gasketing on interior doors where indicated. At exterior applications provide non-corrosive fasteners and elsewhere where indicated.

B. Smoke Labeled Gasketing: Assemblies complying with NFPA 105 that are listed and labeled by a testing and inspecting agency acceptable to authorities having jurisdiction, for smoke control ratings indicated, based on testing according to UL 1784.

1. Provide smoke labeled perimeter gasketing at all smoke labeled openings.
C. Fire Labeled Gasketing: Assemblies complying with NFPA 80 that are listed and labeled by a testing and inspecting agency acceptable to authorities having jurisdiction, for fire ratings indicated, based on testing according to UL-10C.

1. Provide intumescent seals as indicated to meet UL10C Standard for Positive Pressure Fire Tests of Door Assemblies, and NPFA 252, Standard Methods of Fire Tests of Door Assemblies.

D. Sound-Rated Gasketing: Assemblies that are listed and labeled by a testing and inspecting agency, for sound ratings indicated.

E. Replaceable Seal Strips: Provide only those units where resilient or flexible seal strips are easily replaceable and readily available from stocks maintained by manufacturer.

F. Manufacturers:

1. National Guard Products (NG).
2. Pemko Products; ASSA ABLOY Architectural Door Accessories (PE).

2.14 ELECTRONIC ACCESSORIES

A. Push-Button Switches: Industrial grade momentary or alternate contact, back-lighted push buttons with stainless-steel switch enclosures. 12/24 VDC bi-color illumination suitable for either flush or surface mounting.

1. Manufacturers:

   a. Security Door Controls (SD) - 400 Series.
   b. Securitron (SU) - PB Series.

B. Door Position Switches: Door position magnetic reed contact switches specifically designed for use in commercial door applications. On recessed models the contact and magnetic housing snap-lock into a 1" diameter hole. Surface mounted models include wide gap distance design complete with armored flex cabling. Provide SPDT, N/O switches with optional Rare Earth Magnet installation on steel doors with flush top channels.

1. Manufacturers:

   a. Sargent Manufacturing (SA) – 3280 Series.
   b. Security Door Controls (SD) - DPS Series.
   c. Securitron (SU) - DPS Series.

C. Switching Power Supplies: NOT in Div. 8, to be provided and installed by Security Integrator in Div. 28

D. FABRICATION
E. Fasteners: Provide door hardware manufactured to comply with published templates generally prepared for machine, wood, and sheet metal screws. Provide screws according to manufacturers recognized installation standards for application intended.

2.15 FINISHES

A. Standard: Designations used in the Hardware Sets and elsewhere indicate hardware finishes complying with ANSI/BHMA A156.18, including coordination with traditional U.S. finishes indicated by certain manufacturers for their products.

B. Provide quality of finish, including thickness of plating or coating (if any), composition, hardness, and other qualities complying with manufacturer's standards, but in no case less than specified by referenced standards for the applicable units of hardware.

C. Protect mechanical finishes on exposed surfaces from damage by applying a strippable, temporary protective covering before shipping.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Examine scheduled openings, 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. Notify architect of any discrepancies or conflicts between the door schedule, door types, drawings and scheduled hardware. Proceed only after such discrepancies or conflicts have been resolved in writing.

3.2 PREPARATION

A. Hollow Metal Doors and Frames: Comply with ANSI/DHI A115 series.


3.3 INSTALLATION

A. Install each item of mechanical and electromechanical hardware and access control equipment to comply with manufacturer's written instructions and according to specifications.

1. Installers are to be trained and certified by the manufacturer on the proper installation and adjustment of fire, life safety, and security products including: hanging devices; locking devices; closing devices; and seals.
B. Mounting Heights: Mount door hardware units at heights indicated in following applicable publications, unless specifically indicated or required to comply with governing regulations:

2. Wood Doors: DHI WDHS.3, "Recommended Locations for Architectural Hardware for Wood Flush Doors."
3. Where indicated to comply with accessibility requirements, comply with ANSI A117.1 "Accessibility Guidelines for Buildings and Facilities."
4. Provide blocking in drywall partitions where wall stops or other wall mounted hardware is located.

C. Retrofitting: Install door hardware to comply with manufacturer's published templates and 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.

D. Thresholds: Set thresholds for exterior and acoustical doors in full bed of sealant complying with requirements specified in Division 7 Section "Joint Sealants."

E. Storage: Provide a secure lock up for hardware delivered to the project but not yet installed. Control the handling and installation of hardware items so that the completion of the work will not be delayed by hardware losses before and after installation.

3.4 FIELD QUALITY CONTROL

A. Field Inspection: Supplier will perform a final inspection of installed door hardware and state in report whether work complies with or deviates from requirements, including whether door hardware is properly installed, operating and adjusted.

3.5 ADJUSTING

A. Initial Adjustment: Adjust and check each operating item of door hardware and each door to ensure proper operation or function of every unit. Replace units that cannot be adjusted to operate as intended. Adjust door control devices to compensate for final operation of heating and ventilating equipment and to comply with referenced accessibility requirements.

3.6 CLEANING AND PROTECTION

A. Protect all hardware stored on construction site in a covered and dry place. Protect exposed hardware installed on doors during the construction phase. Install any and all hardware at the latest possible time frame.

B. Clean adjacent surfaces soiled by door hardware installation.
C. Clean operating items as necessary to restore proper finish. Provide final protection and maintain conditions that ensure door hardware is without damage or deterioration at time of owner occupancy.

3.7 DEMONSTRATION

A. Instruct Owner's maintenance personnel to adjust, operate, and maintain mechanical and electromechanical door hardware.

3.8 DOOR HARDWARE SETS

A. The hardware sets represent the design intent and direction of the owner and architect. They are a guideline only and should not be considered a detailed hardware schedule. Discrepancies, conflicting hardware and missing items should be brought to the attention of the architect with corrections made prior to the bidding process. Omitted items not included in a hardware set should be scheduled with the appropriate additional hardware required for proper application and functionality.

B. The supplier is responsible for handing and sizing all products and providing the correct option for the appropriate door type and material where more than one is presented in the hardware sets. Quantities listed are for each pair of doors, or for each single door.

C. Manufacturer’s Abbreviations:

1. PE - Pemko
2. SA - SARGENT
3. HS - HES
4. RO - Rockwood
5. MK - McKinney
6. SU - Securitron

**Hardware Sets**

**Set: 1.0**

Doors: 102A, 102B, 102C, 102D

<table>
<thead>
<tr>
<th>Item</th>
<th>Model/Description</th>
<th>Quantity</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 Continuous Hinge</td>
<td>CFM HD1 PT - DOOR HEIGHT</td>
<td>PE</td>
</tr>
<tr>
<td>1 Rim Exit Device, Storeroom</td>
<td>16 55 56 60 8804 ETJ</td>
<td>US32D</td>
</tr>
<tr>
<td>2 Core</td>
<td>6300</td>
<td>US15</td>
</tr>
<tr>
<td>1 Door Closer</td>
<td>351 CPS</td>
<td>EN</td>
</tr>
<tr>
<td>1 Kick Plate</td>
<td>K1050 10” CSK</td>
<td>US32D</td>
</tr>
</tbody>
</table>

39-1920 DOOR HARDWARE 087100 - 18
SECURITY VESTIBULE PROJECT - 18061.07 APN
GRASSFIELD, GREAT BRIDGE, HICKORY, and OSCAR SMITH HIGH SCHOOLS - CHESAPEAKE PUBLIC SCHOOLS
BID 39-1920

3 Silencer 608/609 (TO SUIT) RO
1 Frame Harness QC-C1500P MK
1 Door Harness QC-CXXX- LENGTH TO SUIT MK
1 Electric Power Transfer EL-CEPT SU
1 Wiring Diagram Elevation and Point to Point as Specified

Notes: • Remote release by aiphone system on door 102D.
• Card reader by security integrator on door 102D.
• Electronic Operation: Remote push button/valid card (on door 102D) or key retracts latchbolt. Request to exit shows authorized egress. Free egress at all times. In case of power loss, door remains locked and latched.

Set: 2.0

1 Continuous Hinge CFM__HD1 - DOOR HEIGHT PE
1 Mullion L980A US28 SA
1 Rim Exit Device, Passage 8815 ETJ US32D SA
1 Core 6300 US15 SA
1 Mullion Cylinder 60 980C1 US26D SA
1 Door Closer 351 CPS EN SA
1 Kick Plate K1050 10" CSK US32D RO
3 Silencer 608/609 (TO SUIT) RO

Set: 3.0
Doors: 101E

1 Storeroom/Closet Lock 60 8204 LNJ US26D SA
1 Core 6300 US15 SA
1 Electric Strike 1006CLB 630 HS
1 SMART Pac Bridge Rectifier 2005M3 HS
1 Wiring Diagram Elevation and Point to Point as Specified

Notes: • Balance of existing hardware to remain.
• Card reader by security integrator.
• Electronic Operation: Valid card releases electric strike or key retracts latchbolt. Request to exit shows authorized egress. Free egress at all times. In case of power loss, door remains locked and latched.
SECURITY VESTIBULE PROJECT - 18061.07 APN
GRASSFIELD, GREAT BRIDGE, HICKORY, and OSCAR SMITH HIGH SCHOOLS - 
CHESAPEAKE PUBLIC SCHOOLS
BID 39-1920

END OF SECTION 087100
SECTION 087100c – DOOR HARDWARE (HICKORY HS)

PART 1 - GENERAL

1.1 SUMMARY

A. This Section includes commercial door hardware for the following:
   1. Swinging doors.

B. Door hardware includes, but is not necessarily limited to, the following:
   1. Mechanical door hardware.
   2. Electromechanical door hardware.
   3. Cylinders specified for doors in other sections.

C. Related Sections:
   1. Division 08 Section “Hollow Metal Doors and Frames”.

D. Codes and References: Comply with the version year adopted by the Authority Having Jurisdiction.
   6. NFPA 105 - Installation of Smoke Door Assemblies.
   7. State Building Codes, Local Amendments.

E. Standards: All hardware specified herein shall comply with the following industry standards:
   1. ANSI/BHMA Certified Product Standards - A156 Series
   2. UL10C – Positive Pressure Fire Tests of Door Assemblies

1.2 SUBMITTALS

A. Product Data: Manufacturer’s product data sheets including installation details, material descriptions, dimensions of individual components and profiles, operational descriptions and finishes.

B. 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. Organize door hardware sets in same order as in the Door Hardware Sets at the end of Part 3. Submittals that do not follow the same format and order as the Door Hardware Sets will be rejected and subject to resubmission.

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 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.
   h. Warranty information for each product.

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.

C. Shop Drawings: Details of electrified access control hardware indicating the following:

1. Wiring Diagrams: Upon receipt of approved schedules, submit detailed system wiring diagrams for power, signaling, monitoring, communication, and control of the access control system electrified hardware. Differentiate between manufacturer-installed and field-installed wiring. Include the following:
   a. Elevation diagram of each unique access controlled opening showing location and interconnection of major system components with respect to their placement in the respective door openings.
   b. Complete (risers, point-to-point) access control system block wiring diagrams.
   c. Wiring instructions for each electronic component scheduled herein.

2. Electrical Coordination: Coordinate with related sections the voltages and wiring details required at electrically controlled and operated hardware openings.

D. Keying Schedule: After a keying meeting with the owner has taken place prepare a separate keying schedule detailing final instructions. Submit the keying schedule in electronic format. Include keying system explanation, door numbers, key set symbols, hardware set numbers and
special instructions. Owner must approve submitted keying schedule prior to the ordering of permanent cylinders/cores.

E. Informational Submittals:

1. Product Test Reports: Indicating compliance with cycle testing requirements, based on evaluation of comprehensive tests performed by manufacturer and witnessed by a qualified independent testing agency.

F. Operating and Maintenance Manuals: Provide manufacturers operating and maintenance manuals for each item comprising the complete door hardware installation in quantity as required in Division 01, Closeout Submittals.

1.3 QUALITY ASSURANCE

A. Manufacturers Qualifications: Engage qualified manufacturers with a minimum 5 years of documented experience in producing hardware and equipment similar to that indicated for this Project and that have a proven record of successful in-service performance.

B. Installer Qualifications: A minimum 3 years documented experience installing both standard and electrified 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.

C. Door Hardware Supplier Qualifications: Experienced commercial door hardware distributors with a minimum 5 years documented experience supplying both mechanical and electromechanical hardware installations comparable in material, design, and extent to that indicated for this Project. Supplier recognized as a factory direct distributor by the manufacturers of the primary materials with a warehousing facility in Project’s vicinity.

D. Source Limitations: Obtain each type and variety of door hardware specified in this section from a single source unless otherwise indicated.

1. Electrified modifications or enhancements made to a source manufacturer's product line by a secondary or third party source will not be accepted.

2. Provide electromechanical door hardware from the same manufacturer as mechanical door hardware, unless otherwise indicated.

E. Each unit to bear third party permanent label demonstrating compliance with the referenced standards.

F. Keying Conference: Conduct conference to comply with requirements in Division 01 Section "Project Meetings." Keying conference to incorporate the following criteria into the final keying schedule document:

1. Function of building, purpose of each area and degree of security required.

2. Plans for existing and future key system expansion.
3. Requirements for key control storage and software.
4. Installation of permanent keys, cylinder cores and software.
5. Address and requirements for delivery of keys.

G. Pre-Submittal Conference: Conduct coordination conference in compliance with requirements in Division 01 Section "Project Meetings" with attendance by representatives of Supplier(s), Installer(s), and Contractor(s) to review proper methods and the procedures for receiving, handling, and installing door hardware.

1. Prior to installation of door hardware, conduct a project specific training meeting to instruct the installing contractors' personnel on the proper installation and adjustment of their respective products. Product training to be attended by installers of door hardware (including electromechanical hardware) for aluminum, hollow metal and wood doors. Training will include the use of installation manuals, hardware schedules, templates and physical product samples as required.
2. Inspect and discuss electrical roughing-in, power supply connections, and other preparatory work performed by other trades.
3. Review sequence of operation narratives for each unique access controlled opening.
4. Review and finalize construction schedule and verify availability of materials.
5. Review the required inspecting, testing, commissioning, and demonstration procedures

H. At completion of installation, provide written documentation that components were applied to manufacturer's instructions and recommendations and according to approved schedule.

1.4 DELIVERY, STORAGE, AND HANDLING

A. Inventory door hardware on receipt and provide secure lock-up and shelving for door hardware delivered to Project site. Do not store electronic access control hardware, software or accessories at Project site without prior authorization.

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, as applicable, permanent keys, cylinders, cores, access control credentials, software and related accessories directly to Owner via registered mail or overnight package service. Instructions for delivery to the Owner shall be established at the "Keying Conference".

1.5 COORDINATION

A. Templates: Obtain and distribute to the parties involved templates for doors, frames, and other work specified to be factory prepared for installing standard and electrified hardware. Check Shop Drawings of other work to confirm that adequate provisions are made for locating and installing hardware to comply with indicated requirements.

B. Door Hardware and Electrical Connections: Coordinate the layout and installation of scheduled electrified door hardware and related access control equipment with required connections to
source power junction boxes, low voltage power supplies, detection and monitoring hardware, and fire and detection alarm systems.

C. Door and Frame Preparation: Doors and corresponding frames are to be prepared, reinforced and pre-wired (if applicable) to receive the installation of the specified electrified, monitoring, signaling and access control system hardware without additional in-field modifications.

1.6 WARRANTY

A. General Warranty: Reference Division 01, General Requirements. Special warranties specified in this Article shall not deprive Owner of other rights Owner may have under other provisions of the Contract Documents and shall be in addition to, and run concurrent with, other warranties made by Contractor under requirements of the Contract Documents.

B. Warranty Period: Written warranty, executed by manufacturer(s), agreeing to repair or replace components of standard and electrified door hardware that fails in materials or workmanship within specified warranty period after final acceptance by the Owner. Failures include, but are not limited to, the following:

1. Structural failures including excessive deflection, cracking, or breakage.
2. Faulty operation of the hardware.
3. Deterioration of metals, metal finishes, and other materials beyond normal weathering.
4. Electrical component defects and failures within the systems operation.

C. Standard Warranty Period: One year from date of Substantial Completion, unless otherwise indicated.

D. Special Warranty Periods:

1. Ten years for mortise locks and latches.
2. Five years for exit hardware.
3. Twenty five years for manual surface door closer bodies.
4. Five years for motorized electric latch retraction exit devices.
5. Two years for electromechanical door hardware.

1.7 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.
PART 2 - PRODUCTS

2.1 SCHEDULED DOOR HARDWARE

A. General: Provide door hardware for each door to comply with requirements in Door Hardware Sets and each referenced section that products are to be supplied under.

B. Designations: Requirements for quantity, item, size, finish or color, grade, function, and other distinctive qualities of each type of door hardware are indicated in the Door Hardware Sets 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 requirements. Manufacturers' names are abbreviated in the Door Hardware Schedule.

C. Substitutions: Requests for substitution and product approval for inclusive mechanical and electromechanical door hardware in compliance with the specifications must be submitted in writing and in accordance with the procedures and time frames outlined in Division 01, Substitution Procedures. Approval of requests is at the discretion of the architect, owner, and their designated consultants.

2.2 HANGING DEVICES

A. Hinges: ANSI/BHMA A156.1 certified butt hinges with number of hinge knuckles and other options as specified in the Door Hardware Sets.

1. Quantity: Provide the following hinge quantity:

   a. Two Hinges: For doors with heights up to 60 inches.
   b. Three Hinges: For doors with heights 61 to 90 inches.
   c. Four Hinges: For doors with heights 91 to 120 inches.
   d. For doors with heights more than 120 inches, provide 4 hinges, plus 1 hinge for every 30 inches of door height greater than 120 inches.

2. Hinge Size: Provide the following, unless otherwise indicated, with hinge widths sized for door thickness and clearances required:

   a. Widths up to 3’0”: 4-1/2” standard or heavy weight as specified.
   b. Sizes from 3’1” to 4’0”: 5” standard or heavy weight as specified.

3. Hinge Weight and Base Material: Unless otherwise indicated, provide the following:

   a. Exterior Doors: Heavy weight, non-ferrous, ball bearing or oil impregnated bearing hinges unless Hardware Sets indicate standard weight.
   b. Interior Doors: Standard weight, steel, ball bearing or oil impregnated bearing hinges unless Hardware Sets indicate heavy weight.
4. Hinge Options: Comply with the following:
   a. 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 all out-swinging lockable doors.

5. Manufacturers:
   a. Bommer Industries (BO) - LB Series.
   b. Hager Companies (HA) - CB Series.
   c. McKinney Products; ASSA ABLOY Architectural Door Accessories (MK) - TA Series.

B. Continuous Geared Hinges: ANSI/BHMA A156.26 Grade 1-600 certified continuous geared hinge, with minimum 0.120-inch thick extruded 6060 T6 aluminum alloy hinge leaves and a minimum overall width of 4 inches. Hinges are non-handed, reversible and fabricated to template screw locations. Factory trim hinges to suit door height and prepare for electrical cut-outs.

1. Manufacturers:
   a. Bommer Industries (BO).
   b. Hager Companies (HA).
   c. Pemko Products; ASSA ABLOY Architectural Door Accessories (PE).

2.3 POWER TRANSFER DEVICES

A. Electrified Quick Connect Transfer Hinges: Provide electrified transfer hinges with Molex™ standardized plug connectors and sufficient number of concealed wires (up to 12) to accommodate the electrified functions specified in the Door Hardware Sets. Connectors plug directly to through-door wiring harnesses for connection to electric locking devices and power supplies. Wire nut connections are not acceptable.

1. Manufacturers:
   a. Hager Companies (HA) - ETW-QC (# wires) Option.
   b. McKinney Products; ASSA ABLOY Architectural Door Accessories (MK) - QC (# wires) Option.

B. Concealed Quick Connect Electric Power Transfers: Provide concealed wiring pathway housing mortised into the door and frame for low voltage electrified door hardware. Furnish with Molex™ standardized plug connectors and sufficient number of concealed wires (up to 12) to accommodate the electrified functions specified in the Door Hardware Sets. Connectors plug directly to through-door wiring harnesses for connection to electric locking devices and power supplies. Wire nut connections are not acceptable.

1. Manufacturers:
a. Pemko Products; ASSA ABLOY Architectural Door Accessories (PE) – EL-CEPT Series.
b. Securitron (SU) - EL-CEPT Series.
c. Von Duprin (VD) - EPT-10 Series.

C. Electric Door Wire Harnesses: Provide electric/data transfer wiring harnesses with standardized plug connectors to accommodate up to twelve (12) wires. Connectors plug directly to through-door wiring harnesses for connection to electric locking devices and power supplies. Provide sufficient number and type of concealed wires to accommodate electric function of specified hardware. Provide a connector for through-door electronic locking devices and from hinge to junction box above the opening. Wire nut connections are not acceptable. Determine the length required for each electrified hardware component for the door type, size and construction, minimum of two per electrified opening.

1. Provide one each of the following tools as part of the base bid contract:
   b. McKinney Products; ASSA ABLOY Architectural Door Accessories (MK) - Connector Hand Tool: QC-R003.

2. Manufacturers:
   a. Hager Companies (HA) - Quick Connect.
   b. McKinney Products; ASSA ABLOY Architectural Door Accessories (MK) – QC-C Series.

2.4 DOOR OPERATING TRIM

A. Door Push Plates and Pulls: ANSI/BHMA A156.6 certified door pushes and pulls of type and design specified in the Hardware Sets. Coordinate and provide proper width and height as required where conflicting hardware dictates.

1. Push/Pull Plates: Minimum .050 inch thick, size as indicated in hardware sets, with beveled edges, secured with exposed screws unless otherwise indicated.
2. Door Pull and Push Bar Design: Size, shape, and material as indicated in the hardware sets. Minimum clearance of 2 1/2-inches from face of door unless otherwise indicated.
3. Offset Pull Design: Size, shape, and material as indicated in the hardware sets. Minimum clearance of 2 1/2-inches from face of door and offset of 90 degrees unless otherwise indicated.
4. Fasteners: Provide manufacturer's designated fastener type as indicated in Hardware Sets.
5. Manufacturers:
   a. Hiawatha, Inc. (HI).
   b. Rockwood Products; ASSA ABLOY Architectural Door Accessories (RO).
   c. Trimco (TC).
2.5 CYLINDERS AND KEYING

A. General: Cylinder manufacturer to have minimum (10) years experience designing secured master key systems and have on record a published security keying system policy.

B. Source Limitations: Obtain each type of keyed cylinder and keys from the same source manufacturer as locksets and exit devices, unless otherwise indicated.

1. Manufacturers:
   a. Sargent Manufacturing (SA) – To Match Existing.

C. Cylinders: Original manufacturer cylinders complying with the following:

1. Mortise Type: Threaded cylinders with rings and cams to suit hardware application.
2. Rim Type: Cylinders with back plate, flat-type vertical or horizontal tailpiece, and raised trim ring.
3. Bored-Lock Type: Cylinders with tailpieces to suit locks.
4. Mortise and rim cylinder collars to be solid and recessed to allow the cylinder face to be flush and be free spinning with matching finishes.

D. Permanent Cores: Manufacturer's standard; finish face to match lockset; complying with the following:

1. Removable Cores: Core insert, removable by use of a special key, and for use with only the core manufacturer's cylinder and door hardware. Provide removable core (small or large format) as specified in Hardware Sets.

E. Keying System: Each type of lock and cylinders to be factory keyed.

1. Conduct specified "Keying Conference" to define and document keying system instructions and requirements.
2. Furnish factory cut, nickel-silver large bow permanently inscribed with a visual key control number as directed by Owner.
3. Existing System: Key locks to Owner's existing system.

F. Key Quantity: Provide the following minimum number of keys:

1. Change Keys per Cylinder: Three (3).
2. Master Keys (per Master Key Level/Group): Five (5).
4. Construction Control Keys (where required): Two (2).
5. Permanent Control Keys (where required): Two (2).

G. Construction Keying: Provide temporary keyed construction cores.

H. Key Registration List (Bitting List):
1. Provide keying transcript list to Owner's representative in the proper format for importing into key control software.
2. Provide transcript list in writing or electronic file as directed by the Owner.

2.6 MECHANICAL LOCKS AND LATCHING DEVICES

A. Mortise Locksets, Grade 1 (Heavy Duty): ANSI/BHMA A156.13, Series 1000, Operational Grade 1 certified. Locksets are to be manufactured with a corrosion resistant steel case and be field-reversible for handing without disassembly of the lock body.

1. Manufacturers:
   a. Sargent Manufacturing (SA) – 8200 Series – To Match Existing.

2.7 LOCK AND LATCH STRIKES

A. Strikes: Provide manufacturer's standard strike with strike box for each latch or lock bolt, with curved lip extended to protect frame, finished to match door hardware set, unless otherwise indicated, and as follows:

1. Flat-Lip Strikes: For locks with three-piece antifriction latchbolts, as recommended by manufacturer.
2. Extra-Long-Lip Strikes: For locks used on frames with applied wood casing trim.
3. Aluminum-Frame Strike Box: Provide manufacturer's special strike box fabricated for aluminum framing.
4. Double-lipped strikes: For locks at double acting doors. Furnish with retractable stop for rescue hardware applications.

B. Standards: Comply with the following:

2. Strikes for Bored Locks and Latches: BHMA A156.2.
3. Strikes for Auxiliary Deadlocks: BHMA A156.36.
4. Dustproof Strikes: BHMA A156.16.

2.8 ELECTRIC STRIKES

A. Standard Electric Strikes: Heavy duty, cylindrical and mortise lock electric strikes conforming to ANSI/BHMA A156.31, Grade 1, UL listed for both Burglary Resistance and for use on fire rated door assemblies. Stainless steel construction with dual interlocking plunger design tested to exceed 3000 lbs. of static strength and 350 ft-lbs. of dynamic strength. Strikes tested for a minimum 1 million operating cycles. Provide strikes with 12 or 24 VDC capability and supplied standard as fail-secure unless otherwise specified. Provide latchbolt and latchbolt strike monitoring indicating both the position of the latchbolt and locked condition of the strike where specified.
1. Manufacturers:
   a. HES (HS).

B. Provide electric strikes with in-line power controller and surge suppressor by the same manufacturer as the strike with the combined products having a five year warranty.

2.9 CONVENTIONAL EXIT DEVICES

A. General Requirements: All exit devices specified herein shall meet or exceed the following criteria:

1. At doors not requiring a fire rating, provide devices complying with NFPA 101 and listed and labeled for "Panic Hardware" according to UL305. Provide proper fasteners as required by manufacturer including sex nuts and bolts at openings specified in the Hardware Sets.

2. Where exit devices are required on fire rated doors, provide devices complying with NFPA 80 and with UL labeling indicating "Fire Exit Hardware". Provide devices with the proper fasteners for installation as tested and listed by UL. Consult manufacturer’s catalog and template book for specific requirements.

3. Except on fire rated doors, provide exit devices with hex key dogging device to hold the pushbar and latch in a retracted position. Provide optional keyed cylinder dogging on devices where specified in Hardware Sets.

4. Devices must fit flat against the door face with no gap that permits unauthorized dogging of the push bar. The addition of filler strips is required in any case where the door light extends behind the device as in a full glass configuration.

5. Electromechanical Options: Subject to same compliance standards and requirements as mechanical exit devices, electrified devices to be of type and design as specified in hardware sets. Include any specific controllers when conventional power supplies are not sufficient to provide the proper inrush current.

6. Motorized Electric Latch Retraction: Devices with an electric latch retraction feature must use motors which have a maximum current draw of 600mA. Solenoid driven latch retraction is not acceptable.

7. Lever Operating Trim: Where exit devices require lever trim, furnish manufacturer's heavy duty escutcheon trim with threaded studs for thru-bolts.
   a. Lock Trim Design: As indicated in Hardware Sets, provide finishes and designs to match that of the specified locksets.
   b. Where function of exit device requires a cylinder, provide a cylinder (Rim or Mortise) as specified in Hardware Sets.
8. Vertical Rod Exit Devices: Where surface or concealed vertical rod exit devices are used at interior openings, provide as less bottom rod (LBR) unless otherwise indicated. Provide dust proof strikes where thermal pins are required to project into the floor.

9. Narrow Stile Applications: At doors constructed with narrow stiles, or as specified in Hardware Sets, provide devices designed for maximum 2” wide stiles.


11. Rail Sizing: Provide exit device rails factory sized for proper door width application.

12. Through Bolt Installation: For exit devices and trim as indicated in Door Hardware Sets.

B. Conventional Push Rail Exit Devices (Heavy Duty): ANSI/BHMA A156.3, Grade 1 certified panic and fire exit hardware devices furnished in the functions specified in the Hardware Sets. Exit device latch to be stainless steel, pullman type, with deadlock feature.

1. Manufacturers:
   a. Sargent Manufacturing (SA) - 80 Series – To Match Existing.

C. Extruded Aluminum Removable Mullions: ANSI/BHMA A156.3 anodized, removable mullions with malleable-iron top and bottom retainers. Mullions to be provided standard with stabilizers and imbedded weatherstrip.

1. Manufacturers:
   a. Sargent Manufacturing (SA) - 980/980A Series.

D. Tube Steel Removable Mullions: ANSI/BHMA A156.3 removable steel mullions with malleable-iron top and bottom retainers and a primed paint finish.

1. Provide keyed removable feature where specified in the Hardware Sets.
2. Provide stabilizers and mounting brackets as required.
3. Provide electrical quick connection wiring options as specified in the hardware sets.
4. Manufacturers:
   a. Sargent Manufacturing (SA) - 980S Series.

2.10 DOOR CLOSERS

A. All door closers specified herein shall meet or exceed the following criteria:

1. General: Door closers to be from one manufacturer, matching in design and style, with the same type door preparations and templates regardless of application or spring size.
Closers to be non-handed with full sized covers including installation and adjusting information on inside of cover.

2. Standards: Closers to comply with UL-10C for Positive Pressure Fire Test and be U.L. listed for use of fire rated doors.

3. Cycle Testing: Provide closers which have surpassed 15 million cycles in a test witnessed and verified by UL.

4. Size of Units: Comply with manufacturer's written recommendations for sizing of door closers depending on size of door, exposure to weather, and anticipated frequency of use. Where closers are indicated for doors required to be accessible to the physically handicapped, provide units complying with ANSI ICC/A117.1.

5. Closer Arms: Provide heavy duty, forged steel closer arms unless otherwise indicated in Hardware Sets.

6. Closers shall not be installed on exterior or corridor side of doors; where possible install closers on door for optimum aesthetics.

7. Closer Accessories: Provide door closer accessories including custom templates, special mounting brackets, spacers and drop plates as required for proper installation. Provide through-bolt and security type fasteners as specified in the hardware sets.

B. Door Closers, Surface Mounted (Heavy Duty): ANSI/BHMA A156.4, Grade 1 surface mounted, heavy duty door closers with complete spring power adjustment, sizes 1 thru 6; and fully operational adjustable according to door size, frequency of use, and opening force. Closers to be rack and pinion type, one piece cast iron or aluminum alloy body construction, with adjustable backcheck and separate non-critical valves for closing sweep and latch speed control. Provide non-handed units standard.

1. Manufacturers:
   a. Sargent Manufacturing (SA) - 351 Series – To Match Existing.

2.11 ARCHITECTURAL TRIM

A. Door Protective Trim

1. General: Door protective trim units to be of type and design as specified below or in the Hardware Sets.

2. Size: Fabricate protection plates (kick, armor, or mop) not more than 2” less than door width (LDW) on stop side of single doors and 1” LDW on stop side of pairs of doors, and not more than 1” less than door width on pull side. Coordinate and provide proper width and height as required where conflicting hardware dictates. Height to be as specified in the Hardware Sets.
3. Where plates are applied to fire rated doors with the top of the plate more than 16” above the bottom of the door, provide plates complying with NFPA 80. Consult manufacturer’s catalog and template book for specific requirements for size and applications.

4. Protection Plates: ANSI/BHMA A156.6 certified protection plates (kick, armor, or mop), fabricated from the following:
   a. Stainless Steel: 300 grade, 050-inch thick.

5. Options and fasteners: Provide manufacturer’s designated fastener type as specified in the Hardware Sets. Provide countersunk screw holes.

6. Manufacturers:
   a. Hiawatha, Inc. (HI).
   b. Rockwood Products; ASSA ABLOY Architectural Door Accessories (RO).
   c. Trimco (TC).

2.12 DOOR STOPS AND HOLDERS

A. General: Door stops and holders to be of type and design as specified below or in the Hardware Sets.

B. Door Stops and Bumpers: ANSI/BHMA A156.16, Grade 1 certified door stops and wall bumpers. Provide wall bumpers, either convex or concave types with anchorage as indicated, unless floor or other types of door stops are specified in Hardware Sets. Do not mount floor stops where they will impede traffic. Where floor or wall bumpers are not appropriate, provide overhead type stops and holders.

1. Manufacturers:
   a. Hiawatha, Inc. (HI).
   b. Rockwood Products; ASSA ABLOY Architectural Door Accessories (RO).
   c. Trimco (TC).

2.13 ARCHITECTURAL SEALS

A. General: Thresholds, weatherstripping, and gasket seals to be of type and design as specified below or in the Hardware Sets. Provide continuous weatherstrip gasketing on exterior doors and provide smoke, light, or sound gasketing on interior doors where indicated. At exterior applications provide non-corrosive fasteners and elsewhere where indicated.

B. Smoke Labeled Gasketing: Assemblies complying with NFPA 105 that are listed and labeled by a testing and inspecting agency acceptable to authorities having jurisdiction, for smoke control ratings indicated, based on testing according to UL 1784.

1. Provide smoke labeled perimeter gasketing at all smoke labeled openings.
C. Fire Labeled Gasketing: Assemblies complying with NFPA 80 that are listed and labeled by a testing and inspecting agency acceptable to authorities having jurisdiction, for fire ratings indicated, based on testing according to UL-10C.

1. Provide intumescent seals as indicated to meet UL10C Standard for Positive Pressure Fire Tests of Door Assemblies, and NPFA 252, Standard Methods of Fire Tests of Door Assemblies.

D. Sound-Rated Gasketing: Assemblies that are listed and labeled by a testing and inspecting agency, for sound ratings indicated.

E. Replaceable Seal Strips: Provide only those units where resilient or flexible seal strips are easily replaceable and readily available from stocks maintained by manufacturer.

F. Manufacturers:

1. National Guard Products (NG).
2. Pemko Products; ASSA ABLOY Architectural Door Accessories (PE).

2.14 ELECTRONIC ACCESSORIES

A. Push-Button Switches: Industrial grade momentary or alternate contact, back-lighted push buttons with stainless-steel switch enclosures. 12/24 VDC bi-color illumination suitable for either flush or surface mounting.

1. Manufacturers:

   a. Security Door Controls (SD) - 400 Series.
   b. Securitron (SU) - PB Series.

B. Door Position Switches: Door position magnetic reed contact switches specifically designed for use in commercial door applications. On recessed models the contact and magnetic housing snap-lock into a 1” diameter hole. Surface mounted models include wide gap distance design complete with armored flex cabling. Provide SPDT, N/O switches with optional Rare Earth Magnet installation on steel doors with flush top channels.

1. Manufacturers:

   a. Sargent Manufacturing (SA) – 3280 Series.
   b. Security Door Controls (SD) - DPS Series.
   c. Securitron (SU) - DPS Series.

C. Switching Power Supplies: NOT in Div. 8, to be provided and installed by Security Integrator in Div. 28

D. FABRICATION
E. Fasteners: Provide door hardware manufactured to comply with published templates generally prepared for machine, wood, and sheet metal screws. Provide screws according to manufacturers recognized installation standards for application intended.

2.15 FINISHES

A. Standard: Designations used in the Hardware Sets and elsewhere indicate hardware finishes complying with ANSI/BHMA A156.18, including coordination with traditional U.S. finishes indicated by certain manufacturers for their products.

B. Provide quality of finish, including thickness of plating or coating (if any), composition, hardness, and other qualities complying with manufacturer's standards, but in no case less than specified by referenced standards for the applicable units of hardware.

C. Protect mechanical finishes on exposed surfaces from damage by applying a strippable, temporary protective covering before shipping.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Examine scheduled openings, 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. Notify architect of any discrepancies or conflicts between the door schedule, door types, drawings and scheduled hardware. Proceed only after such discrepancies or conflicts have been resolved in writing.

3.2 PREPARATION

A. Hollow Metal Doors and Frames: Comply with ANSI/DHI A115 series.


3.3 INSTALLATION

A. Install each item of mechanical and electromechanical hardware and access control equipment to comply with manufacturer's written instructions and according to specifications.

1. Installers are to be trained and certified by the manufacturer on the proper installation and adjustment of fire, life safety, and security products including: hanging devices; locking devices; closing devices; and seals.
B. Mounting Heights: Mount door hardware units at heights indicated in following applicable publications, unless specifically indicated or required to comply with governing regulations:

2. Wood Doors: DHI WDHS.3, "Recommended Locations for Architectural Hardware for Wood Flush Doors."
3. Where indicated to comply with accessibility requirements, comply with ANSI A117.1 "Accessibility Guidelines for Buildings and Facilities."
4. Provide blocking in drywall partitions where wall stops or other wall mounted hardware is located.

C. Retrofitting: Install door hardware to comply with manufacturer's published templates and 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.

D. Thresholds: Set thresholds for exterior and acoustical doors in full bed of sealant complying with requirements specified in Division 7 Section "Joint Sealants."

E. Storage: Provide a secure lock up for hardware delivered to the project but not yet installed. Control the handling and installation of hardware items so that the completion of the work will not be delayed by hardware losses before and after installation.

3.4 FIELD QUALITY CONTROL

A. Field Inspection: Supplier will perform a final inspection of installed door hardware and state in report whether work complies with or deviates from requirements, including whether door hardware is properly installed, operating and adjusted.

3.5 ADJUSTING

A. Initial Adjustment: Adjust and check each operating item of door hardware and each door to ensure proper operation or function of every unit. Replace units that cannot be adjusted to operate as intended. Adjust door control devices to compensate for final operation of heating and ventilating equipment and to comply with referenced accessibility requirements.

3.6 CLEANING AND PROTECTION

A. Protect all hardware stored on construction site in a covered and dry place. Protect exposed hardware installed on doors during the construction phase. Install any and all hardware at the latest possible time frame.

B. Clean adjacent surfaces soiled by door hardware installation.
C. Clean operating items as necessary to restore proper finish. Provide final protection and maintain conditions that ensure door hardware is without damage or deterioration at time of owner occupancy.

3.7 DEMONSTRATION

A. Instruct Owner's maintenance personnel to adjust, operate, and maintain mechanical and electromechanical door hardware.

3.8 DOOR HARDWARE SETS

A. The hardware sets represent the design intent and direction of the owner and architect. They are a guideline only and should not be considered a detailed hardware schedule. Discrepancies, conflicting hardware and missing items should be brought to the attention of the architect with corrections made prior to the bidding process. Omitted items not included in a hardware set should be scheduled with the appropriate additional hardware required for proper application and functionality.

B. The supplier is responsible for handing and sizing all products and providing the correct option for the appropriate door type and material where more than one is presented in the hardware sets. Quantities listed are for each pair of doors, or for each single door.

C. Manufacturer’s Abbreviations:

1. MK - McKinney
2. PE - Pemko
3. SA - Sargent
4. RO - Rockwood
5. SU - Securitron

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### Hardware Sets

**Set: 1.0**

Doors: 101B, 101C

<table>
<thead>
<tr>
<th>Description</th>
<th>Code</th>
<th>Manufacturer</th>
</tr>
</thead>
<tbody>
<tr>
<td>Continuous Hinge</td>
<td>CFM__SLF-HD1 PT - DOOR HEIGHT</td>
<td>PE</td>
</tr>
<tr>
<td>Rim Exit Device, Storeroom</td>
<td>16 55 56 60 8804 ETJ</td>
<td>US32D SA s</td>
</tr>
<tr>
<td>Core</td>
<td>6300</td>
<td>US15 SA</td>
</tr>
<tr>
<td>Door Closer</td>
<td>351 CPS</td>
<td>EN SA</td>
</tr>
<tr>
<td>Drop Plate</td>
<td>351D</td>
<td>EN SA</td>
</tr>
</tbody>
</table>

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38-1920 DOOR HARDWARE 087100c - 18
SECURITY VESTIBULE PROJECT - 18061.07 APN
GRASSFIELD, GREAT BRIDGE, HICKORY, and OSCAR SMITH HIGH SCHOOLS
CHESAPEAKE PUBLIC SCHOOLS
BID 38-1920

<table>
<thead>
<tr>
<th>Item Description</th>
<th>Specification</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 Frame Harness</td>
<td>QC-C1500P</td>
</tr>
<tr>
<td>1 Door Harness</td>
<td>QC-CXXX- LENGTH TO SUIT</td>
</tr>
<tr>
<td>1 Electric Power Transfer</td>
<td>EL-CEPT</td>
</tr>
<tr>
<td>1 Wiring Diagram</td>
<td>Elevation and Point to Point as Specified</td>
</tr>
</tbody>
</table>

Notes: • Perimeter/meeting stile seals by frame/door supplier.
• Remote release by aiphone system on door 101C.
• Card reader by security integrator on door 101C.
• Electronic Operation: Remote push button/valid card (on door 101C) or key retracts latchbolt. Request to exit shows authorized egress. Free egress at all times. In case of power loss, door remains locked and latched.

Set: 2.0

Doors: 101A

<table>
<thead>
<tr>
<th>Item Description</th>
<th>Specification</th>
</tr>
</thead>
<tbody>
<tr>
<td>3 Hinge (heavy weight)</td>
<td>T4A3786</td>
</tr>
<tr>
<td>1 Classroom Security Intruder Lock</td>
<td>60 8238 LNJ</td>
</tr>
<tr>
<td>2 Core</td>
<td>6300</td>
</tr>
<tr>
<td>1 Door Closer</td>
<td>351 O/P10 (TO SUIT)</td>
</tr>
<tr>
<td>1 Drop Plate</td>
<td>351D</td>
</tr>
<tr>
<td>1 Door Stop</td>
<td>403/441CU (TO SUIT)</td>
</tr>
</tbody>
</table>

Notes: • Perimeter/meeting stile seals by frame/door supplier.

END OF SECTION 087100c
SECTION 087100d – DOOR HARDWARE (OSCAR SMITH HS)

PART 1 - GENERAL

1.1 SUMMARY

A. This Section includes commercial door hardware for the following:
   1. Swinging doors.

B. Door hardware includes, but is not necessarily limited to, the following:
   1. Mechanical door hardware.
   2. Electromechanical door hardware.
   3. Cylinders specified for doors in other sections.

C. Related Sections:
   1. Division 08 Section “Hollow Metal Doors and Frames”.

D. Codes and References: Comply with the version year adopted by the Authority Having Jurisdiction.
   6. NFPA 105 - Installation of Smoke Door Assemblies.
   7. State Building Codes, Local Amendments.

E. Standards: All hardware specified herein shall comply with the following industry standards:
   1. ANSI/BHMA Certified Product Standards - A156 Series
   2. UL10C – Positive Pressure Fire Tests of Door Assemblies

1.2 SUBMITTALS

A. Product Data: Manufacturer's product data sheets including installation details, material descriptions, dimensions of individual components and profiles, operational descriptions and finishes.

B. 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. Organize door hardware sets in same order as in the Door Hardware Sets at the end of Part 3. Submittals that do not follow the same format and order as the Door Hardware Sets will be rejected and subject to resubmission.

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 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.
   h. Warranty information for each product.

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.

C. Shop Drawings: Details of electrified access control hardware indicating the following:

1. Wiring Diagrams: Upon receipt of approved schedules, submit detailed system wiring diagrams for power, signaling, monitoring, communication, and control of the access control system electrified hardware. Differentiate between manufacturer-installed and field-installed wiring. Include the following:
   a. Elevation diagram of each unique access controlled opening showing location and interconnection of major system components with respect to their placement in the respective door openings.
   b. Complete (risers, point-to-point) access control system block wiring diagrams.
   c. Wiring instructions for each electronic component scheduled herein.

2. Electrical Coordination: Coordinate with related sections the voltages and wiring details required at electrically controlled and operated hardware openings.

D. Keying Schedule: After a keying meeting with the owner has taken place prepare a separate keying schedule detailing final instructions. Submit the keying schedule in electronic format. Include keying system explanation, door numbers, key set symbols, hardware set numbers and
special instructions. Owner must approve submitted keying schedule prior to the ordering of permanent cylinders/cores.

E. Informational Submittals:

1. Product Test Reports: Indicating compliance with cycle testing requirements, based on evaluation of comprehensive tests performed by manufacturer and witnessed by a qualified independent testing agency.

F. Operating and Maintenance Manuals: Provide manufacturers operating and maintenance manuals for each item comprising the complete door hardware installation in quantity as required in Division 01, Closeout Submittals.

1.3 QUALITY ASSURANCE

A. Manufacturers Qualifications: Engage qualified manufacturers with a minimum 5 years of documented experience in producing hardware and equipment similar to that indicated for this Project and that have a proven record of successful in-service performance.

B. Installer Qualifications: A minimum 3 years documented experience installing both standard and electrified 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.

C. Door Hardware Supplier Qualifications: Experienced commercial door hardware distributors with a minimum 5 years documented experience supplying both mechanical and electromechanical hardware installations comparable in material, design, and extent to that indicated for this Project. Supplier recognized as a factory direct distributor by the manufacturers of the primary materials with a warehousing facility in Project’s vicinity.

D. Source Limitations: Obtain each type and variety of door hardware specified in this section from a single source unless otherwise indicated.

1. Electrified modifications or enhancements made to a source manufacturer's product line by a secondary or third party source will not be accepted.

2. Provide electromechanical door hardware from the same manufacturer as mechanical door hardware, unless otherwise indicated.

E. Each unit to bear third party permanent label demonstrating compliance with the referenced standards.

F. Keying Conference: Conduct conference to comply with requirements in Division 01 Section "Project Meetings." Keying conference to incorporate the following criteria into the final keying schedule document:

1. Function of building, purpose of each area and degree of security required.

2. Plans for existing and future key system expansion.
3. Requirements for key control storage and software.
4. Installation of permanent keys, cylinder cores and software.
5. Address and requirements for delivery of keys.

G. Pre-Submittal Conference: Conduct coordination conference in compliance with requirements in Division 01 Section "Project Meetings" with attendance by representatives of Supplier(s), Installer(s), and Contractor(s) to review proper methods and the procedures for receiving, handling, and installing door hardware.

1. Prior to installation of door hardware, conduct a project specific training meeting to instruct the installing contractors' personnel on the proper installation and adjustment of their respective products. Product training to be attended by installers of door hardware (including electromechanical hardware) for aluminum, hollow metal and wood doors. Training will include the use of installation manuals, hardware schedules, templates and physical product samples as required.
2. Inspect and discuss electrical roughing-in, power supply connections, and other preparatory work performed by other trades.
3. Review sequence of operation narratives for each unique access controlled opening.
4. Review and finalize construction schedule and verify availability of materials.
5. Review the required inspecting, testing, commissioning, and demonstration procedures

H. At completion of installation, provide written documentation that components were applied to manufacturer's instructions and recommendations and according to approved schedule.

1.4 DELIVERY, STORAGE, AND HANDLING

A. Inventory door hardware on receipt and provide secure lock-up and shelving for door hardware delivered to Project site. Do not store electronic access control hardware, software or accessories at Project site without prior authorization.

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, as applicable, permanent keys, cylinders, cores, access control credentials, software and related accessories directly to Owner via registered mail or overnight package service. Instructions for delivery to the Owner shall be established at the "Keying Conference".

1.5 COORDINATION

A. Templates: Obtain and distribute to the parties involved templates for doors, frames, and other work specified to be factory prepared for installing standard and electrified hardware. Check Shop Drawings of other work to confirm that adequate provisions are made for locating and installing hardware to comply with indicated requirements.

B. Door Hardware and Electrical Connections: Coordinate the layout and installation of scheduled electrified door hardware and related access control equipment with required connections to
source power junction boxes, low voltage power supplies, detection and monitoring hardware, and fire and detection alarm systems.

C. Door and Frame Preparation: Doors and corresponding frames are to be prepared, reinforced and pre-wired (if applicable) to receive the installation of the specified electrified, monitoring, signaling and access control system hardware without additional in-field modifications.

1.6 WARRANTY

A. General Warranty: Reference Division 01, General Requirements. Special warranties specified in this Article shall not deprive Owner of other rights Owner may have under other provisions of the Contract Documents and shall be in addition to, and run concurrent with, other warranties made by Contractor under requirements of the Contract Documents.

B. Warranty Period: Written warranty, executed by manufacturer(s), agreeing to repair or replace components of standard and electrified door hardware that fails in materials or workmanship within specified warranty period after final acceptance by the Owner. Failures include, but are not limited to, the following:

1. Structural failures including excessive deflection, cracking, or breakage.
2. Faulty operation of the hardware.
3. Deterioration of metals, metal finishes, and other materials beyond normal weathering.
4. Electrical component defects and failures within the systems operation.

C. Standard Warranty Period: One year from date of Substantial Completion, unless otherwise indicated.

D. Special Warranty Periods:

1. Ten years for mortise locks and latches.
2. Five years for exit hardware.
3. Twenty five years for manual surface door closer bodies.
4. Five years for motorized electric latch retraction exit devices.
5. Two years for electromechanical door hardware.

1.7 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.
PART 2 - PRODUCTS

2.1 SCHEDULED DOOR HARDWARE

A. General: Provide door hardware for each door to comply with requirements in Door Hardware Sets and each referenced section that products are to be supplied under.

B. Designations: Requirements for quantity, item, size, finish or color, grade, function, and other distinctive qualities of each type of door hardware are indicated in the Door Hardware Sets 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 requirements. Manufacturers' names are abbreviated in the Door Hardware Schedule.

C. Substitutions: Requests for substitution and product approval for inclusive mechanical and electromechanical door hardware in compliance with the specifications must be submitted in writing and in accordance with the procedures and time frames outlined in Division 01, Substitution Procedures. Approval of requests is at the discretion of the architect, owner, and their designated consultants.

2.2 HANGING DEVICES

A. Hinges: ANSI/BHMA A156.1 certified butt hinges with number of hinge knuckles and other options as specified in the Door Hardware Sets.

1. Quantity: Provide the following hinge quantity:

   a. Two Hinges: For doors with heights up to 60 inches.
   b. Three Hinges: For doors with heights 61 to 90 inches.
   c. Four Hinges: For doors with heights 91 to 120 inches.
   d. For doors with heights more than 120 inches, provide 4 hinges, plus 1 hinge for every 30 inches of door height greater than 120 inches.

2. Hinge Size: Provide the following, unless otherwise indicated, with hinge widths sized for door thickness and clearances required:

   a. Widths up to 3’0”: 4-1/2” standard or heavy weight as specified.
   b. Sizes from 3’1” to 4’0”: 5” standard or heavy weight as specified.

3. Hinge Weight and Base Material: Unless otherwise indicated, provide the following:

   a. Exterior Doors: Heavy weight, non-ferrous, ball bearing or oil impregnated bearing hinges unless Hardware Sets indicate standard weight.
   b. Interior Doors: Standard weight, steel, ball bearing or oil impregnated bearing hinges unless Hardware Sets indicate heavy weight.
4. Hinge Options: Comply with the following:
   
a. 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 all out-swinging lockable doors.

5. Manufacturers:
   
a. Bommer Industries (BO) - LB Series.
   b. Hager Companies (HA) - CB Series.
   c. McKinney Products; ASSA ABLOY Architectural Door Accessories (MK) - TA Series.

B. Continuous Geared Hinges: ANSI/BHMA A156.26 Grade 1-600 certified continuous geared hinge, with minimum 0.120-inch thick extruded 6060 T6 aluminum alloy hinge leaves and a minimum overall width of 4 inches. Hinges are non-handed, reversible and fabricated to template screw locations. Factory trim hinges to suit door height and prepare for electrical cut-outs.

1. Manufacturers:
   
a. Bommer Industries (BO).
   b. Hager Companies (HA).
   c. Pemko Products; ASSA ABLOY Architectural Door Accessories (PE).

2.3 POWER TRANSFER DEVICES

A. Electrified Quick Connect Transfer Hinges: Provide electrified transfer hinges with Molex™ standardized plug connectors and sufficient number of concealed wires (up to 12) to accommodate the electrified functions specified in the Door Hardware Sets. Connectors plug directly to through-door wiring harnesses for connection to electric locking devices and power supplies. Wire nut connections are not acceptable.

1. Manufacturers:
   
a. Hager Companies (HA) - ETW-QC (# wires) Option.
   b. McKinney Products; ASSA ABLOY Architectural Door Accessories (MK) - QC (# wires) Option.

B. Concealed Quick Connect Electric Power Transfers: Provide concealed wiring pathway housing mortised into the door and frame for low voltage electrified door hardware. Furnish with Molex™ standardized plug connectors and sufficient number of concealed wires (up to 12) to accommodate the electrified functions specified in the Door Hardware Sets. Connectors plug directly to through-door wiring harnesses for connection to electric locking devices and power supplies. Wire nut connections are not acceptable.

1. Manufacturers:
a. Pemko Products; ASSA ABLOY Architectural Door Accessories (PE) – EL-CEPT Series.
b. Securitron (SU) - EL-CEPT Series.
c. Von Duprin (VD) - EPT-10 Series.

C. Electric Door Wire Harnesses: Provide electric/data transfer wiring harnesses with standardized plug connectors to accommodate up to twelve (12) wires. Connectors plug directly to through-door wiring harnesses for connection to electric locking devices and power supplies. Provide sufficient number and type of concealed wires to accommodate electric function of specified hardware. Provide a connector for through-door electronic locking devices and from hinge to junction box above the opening. Wire nut connections are not acceptable. Determine the length required for each electrified hardware component for the door type, size and construction, minimum of two per electrified opening.

1. Provide one each of the following tools as part of the base bid contract:
   b. McKinney Products; ASSA ABLOY Architectural Door Accessories (MK) - Connector Hand Tool: QC-R003.

2. Manufacturers:
   a. Hager Companies (HA) - Quick Connect.
   b. McKinney Products; ASSA ABLOY Architectural Door Accessories (MK) – QC-C Series.

2.4 DOOR OPERATING TRIM

A. Door Push Plates and Pulls: ANSI/BHMA A156.6 certified door pushes and pulls of type and design specified in the Hardware Sets. Coordinate and provide proper width and height as required where conflicting hardware dictates.

1. Push/Pull Plates: Minimum .050 inch thick, size as indicated in hardware sets, with beveled edges, secured with exposed screws unless otherwise indicated.
2. Door Pull and Push Bar Design: Size, shape, and material as indicated in the hardware sets. Minimum clearance of 2 1/2-inches from face of door unless otherwise indicated.
3. Offset Pull Design: Size, shape, and material as indicated in the hardware sets. Minimum clearance of 2 1/2-inches from face of door and offset of 90 degrees unless otherwise indicated.
4. Fasteners: Provide manufacturer's designated fastener type as indicated in Hardware Sets.
5. Manufacturers:
   a. Hiawatha, Inc. (HI).
   b. Rockwood Products; ASSA ABLOY Architectural Door Accessories (RO).
   c. Trimco (TC).
2.5 CYLINDERS AND KEYING

A. General: Cylinder manufacturer to have minimum (10) years experience designing secured master key systems and have on record a published security keying system policy.

B. Source Limitations: Obtain each type of keyed cylinder and keys from the same source manufacturer as locksets and exit devices, unless otherwise indicated.

1. Manufacturers:
   a. Sargent Manufacturing (SA) – To Match Existing.

C. Cylinders: Original manufacturer cylinders complying with the following:

1. Mortise Type: Threaded cylinders with rings and cams to suit hardware application.
2. Rim Type: Cylinders with back plate, flat-type vertical or horizontal tailpiece, and raised trim ring.
3. Bored-Lock Type: Cylinders with tailpieces to suit locks.
4. Mortise and rim cylinder collars to be solid and recessed to allow the cylinder face to be flush and be free spinning with matching finishes.

D. Permanent Cores: Manufacturer's standard; finish face to match lockset; complying with the following:

1. Removable Cores: Core insert, removable by use of a special key, and for use with only the core manufacturer's cylinder and door hardware. Provide removable core (small or large format) as specified in Hardware Sets.

E. Keying System: Each type of lock and cylinders to be factory keyed.

1. Conduct specified "Keying Conference" to define and document keying system instructions and requirements.
2. Furnish factory cut, nickel-silver large bow permanently inscribed with a visual key control number as directed by Owner.
3. Existing System: Key locks to Owner's existing system.

F. Key Quantity: Provide the following minimum number of keys:

1. Change Keys per Cylinder: Three (3).
2. Master Keys (per Master Key Level/Group): Five (5).
4. Construction Control Keys (where required): Two (2).
5. Permanent Control Keys (where required): Two (2).

G. Construction Keying: Provide temporary keyed construction cores.

H. Key Registration List (Bitting List):
1. Provide keying transcript list to Owner's representative in the proper format for importing into key control software.
2. Provide transcript list in writing or electronic file as directed by the Owner.

2.6 MECHANICAL LOCKS AND LATCHING DEVICES

A. Mortise Locksets, Grade 1 (Heavy Duty): ANSI/BHMA A156.13, Series 1000, Operational Grade 1 certified. Locksets are to be manufactured with a corrosion resistant steel case and be field-reversible for handing without disassembly of the lock body.

1. Manufacturers:
   a. Sargent Manufacturing (SA) – 8200 Series – To Match Existing.

2.7 LOCK AND LATCH STRIKES

A. Strikes: Provide manufacturer's standard strike with strike box for each latch or lock bolt, with curved lip extended to protect frame, finished to match door hardware set, unless otherwise indicated, and as follows:

1. Flat-Lip Strikes: For locks with three-piece antifriction latchbolts, as recommended by manufacturer.
2. Extra-Long-Lip Strikes: For locks used on frames with applied wood casing trim.
3. Aluminum-Frame Strike Box: Provide manufacturer's special strike box fabricated for aluminum framing.
4. Double-lipped strikes: For locks at double acting doors. Furnish with retractable stop for rescue hardware applications.

B. Standards: Comply with the following:

2. Strikes for Bored Locks and Latches: BHMA A156.2.
3. Strikes for Auxiliary Deadlocks: BHMA A156.36.
4. Dustproof Strikes: BHMA A156.16.

2.8 ELECTRIC STRIKES

A. Standard Electric Strikes: Heavy duty, cylindrical and mortise lock electric strikes conforming to ANSI/BHMA A156.31, Grade 1, UL listed for both Burglary Resistance and for use on fire rated door assemblies. Stainless steel construction with dual interlocking plunger design tested to exceed 3000 lbs. of static strength and 350 ft-lbs. of dynamic strength. Strikes tested for a minimum 1 million operating cycles. Provide strikes with 12 or 24 VDC capability and supplied standard as fail-secure unless otherwise specified. Provide latchbolt and latchbolt strike monitoring indicating both the position of the latchbolt and locked condition of the strike where specified.
1. Manufacturers:
   
a. HES (HS).

B. Provide electric strikes with in-line power controller and surge suppressor by the same manufacturer as the strike with the combined products having a five year warranty.

2.9 CONVENTIONAL EXIT DEVICES

A. General Requirements: All exit devices specified herein shall meet or exceed the following criteria:

1. At doors not requiring a fire rating, provide devices complying with NFPA 101 and listed and labeled for "Panic Hardware" according to UL305. Provide proper fasteners as required by manufacturer including sex nuts and bolts at openings specified in the Hardware Sets.

2. Where exit devices are required on fire rated doors, provide devices complying with NFPA 80 and with UL labeling indicating "Fire Exit Hardware". Provide devices with the proper fasteners for installation as tested and listed by UL. Consult manufacturer’s catalog and template book for specific requirements.

3. Except on fire rated doors, provide exit devices with hex key dogging device to hold the pushbar and latch in a retracted position. Provide optional keyed cylinder dogging on devices where specified in Hardware Sets.

4. Devices must fit flat against the door face with no gap that permits unauthorized dogging of the push bar. The addition of filler strips is required in any case where the door light extends behind the device as in a full glass configuration.

5. Electromechanical Options: Subject to same compliance standards and requirements as mechanical exit devices, electrified devices to be of type and design as specified in hardware sets. Include any specific controllers when conventional power supplies are not sufficient to provide the proper inrush current.

6. Motorized Electric Latch Retraction: Devices with an electric latch retraction feature must use motors which have a maximum current draw of 600mA. Solenoid driven latch retraction is not acceptable.

7. Lever Operating Trim: Where exit devices require lever trim, furnish manufacturer's heavy duty escutcheon trim with threaded studs for thru-bolts.

   a. Lock Trim Design: As indicated in Hardware Sets, provide finishes and designs to match that of the specified locksets.

   b. Where function of exit device requires a cylinder, provide a cylinder (Rim or Mortise) as specified in Hardware Sets.
8. Vertical Rod Exit Devices: Where surface or concealed vertical rod exit devices are used at interior openings, provide as less bottom rod (LBR) unless otherwise indicated. Provide dust proof strikes where thermal pins are required to project into the floor.

9. Narrow Stile Applications: At doors constructed with narrow stiles, or as specified in Hardware Sets, provide devices designed for maximum 2” wide stiles.


11. Rail Sizing: Provide exit device rails factory sized for proper door width application.

12. Through Bolt Installation: For exit devices and trim as indicated in Door Hardware Sets.

B. Conventional Push Rail Exit Devices (Heavy Duty): ANSI/BHMA A156.3, Grade 1 certified panic and fire exit hardware devices furnished in the functions specified in the Hardware Sets. Exit device latch to be stainless steel, pullman type, with deadlock feature.

1. Manufacturers:
   a. Sargent Manufacturing (SA) - 80 Series – To Match Existing.

C. Extruded Aluminum Removable Mullions: ANSI/BHMA A156.3 anodized, removable mullions with malleable-iron top and bottom retainers. Mullions to be provided standard with stabilizers and imbedded weatherstrip.

1. Manufacturers:
   a. Sargent Manufacturing (SA) - 980/980A Series.

D. Tube Steel Removable Mullions: ANSI/BHMA A156.3 removable steel mullions with malleable-iron top and bottom retainers and a primed paint finish.

1. Provide keyed removable feature where specified in the Hardware Sets.
2. Provide stabilizers and mounting brackets as required.
3. Provide electrical quick connection wiring options as specified in the hardware sets.
4. Manufacturers:
   a. Sargent Manufacturing (SA) - 980S Series.

2.10 DOOR CLOSERS

A. All door closers specified herein shall meet or exceed the following criteria:

1. General: Door closers to be from one manufacturer, matching in design and style, with the same type door preparations and templates regardless of application or spring size.
Closers to be non-handed with full sized covers including installation and adjusting information on inside of cover.

2. Standards: Closers to comply with UL-10C for Positive Pressure Fire Test and be U.L. listed for use of fire rated doors.

3. Cycle Testing: Provide closers which have surpassed 15 million cycles in a test witnessed and verified by UL.

4. Size of Units: Comply with manufacturer's written recommendations for sizing of door closers depending on size of door, exposure to weather, and anticipated frequency of use. Where closers are indicated for doors required to be accessible to the physically handicapped, provide units complying with ANSI ICC/A117.1.

5. Closer Arms: Provide heavy duty, forged steel closer arms unless otherwise indicated in Hardware Sets.

6. Closers shall not be installed on exterior or corridor side of doors; where possible install closers on door for optimum aesthetics.

7. Closer Accessories: Provide door closer accessories including custom templates, special mounting brackets, spacers and drop plates as required for proper installation. Provide through-bolt and security type fasteners as specified in the hardware sets.

B. Door Closers, Surface Mounted (Heavy Duty): ANSI/BHMA A156.4, Grade 1 surface mounted, heavy duty door closers with complete spring power adjustment, sizes 1 thru 6; and fully operational adjustable according to door size, frequency of use, and opening force. Closers to be rack and pinion type, one piece cast iron or aluminum alloy body construction, with adjustable backcheck and separate non-critical valves for closing sweep and latch speed control. Provide non-handed units standard.

1. Manufacturers:
   a. Sargent Manufacturing (SA) - 351 Series – To Match Existing.

2.11 ARCHITECTURAL TRIM

A. Door Protective Trim

1. General: Door protective trim units to be of type and design as specified below or in the Hardware Sets.

2. Size: Fabricate protection plates (kick, armor, or mop) not more than 2” less than door width (LDW) on stop side of single doors and 1” LDW on stop side of pairs of doors, and not more than 1” less than door width on pull side. Coordinate and provide proper width and height as required where conflicting hardware dictates. Height to be as specified in the Hardware Sets.
3. Where plates are applied to fire rated doors with the top of the plate more than 16” above the bottom of the door, provide plates complying with NFPA 80. Consult manufacturer’s catalog and template book for specific requirements for size and applications.

4. Protection Plates: ANSI/BHMA A156.6 certified protection plates (kick, armor, or mop), fabricated from the following:
   a. Stainless Steel: 300 grade, 050-inch thick.

5. Options and fasteners: Provide manufacturer’s designated fastener type as specified in the Hardware Sets. Provide countersunk screw holes.

6. Manufacturers:
   a. Hiawatha, Inc. (HI).
   b. Rockwood Products; ASSA ABLOY Architectural Door Accessories (RO).
   c. Trimco (TC).

2.12 DOOR STOPS AND HOLDERS

A. General: Door stops and holders to be of type and design as specified below or in the Hardware Sets.

B. Door Stops and Bumpers: ANSI/BHMA A156.16, Grade 1 certified door stops and wall bumpers. Provide wall bumpers, either convex or concave types with anchorage as indicated, unless floor or other types of door stops are specified in Hardware Sets. Do not mount floor stops where they will impede traffic. Where floor or wall bumpers are not appropriate, provide overhead type stops and holders.

1. Manufacturers:
   a. Hiawatha, Inc. (HI).
   b. Rockwood Products; ASSA ABLOY Architectural Door Accessories (RO).
   c. Trimco (TC).

2.13 ARCHITECTURAL SEALS

A. General: Thresholds, weatherstripping, and gasket seals to be of type and design as specified below or in the Hardware Sets. Provide continuous weatherstrip gasketing on exterior doors and provide smoke, light, or sound gasketing on interior doors where indicated. At exterior applications provide non-corrosive fasteners and elsewhere where indicated.

B. Smoke Labeled Gasketing: Assemblies complying with NFPA 105 that are listed and labeled by a testing and inspecting agency acceptable to authorities having jurisdiction, for smoke control ratings indicated, based on testing according to UL 1784.

1. Provide smoke labeled perimeter gasketing at all smoke labeled openings.
C. Fire Labeled Gasketing: Assemblies complying with NFPA 80 that are listed and labeled by a testing and inspecting agency acceptable to authorities having jurisdiction, for fire ratings indicated, based on testing according to UL-10C.


D. Sound-Rated Gasketing: Assemblies that are listed and labeled by a testing and inspecting agency, for sound ratings indicated.

E. Replaceable Seal Strips: Provide only those units where resilient or flexible seal strips are easily replaceable and readily available from stocks maintained by manufacturer.

F. Manufacturers:

1. National Guard Products (NG).
2. Pemko Products; ASSA ABLOY Architectural Door Accessories (PE).

2.14 ELECTRONIC ACCESSORIES

A. Push-Button Switches: Industrial grade momentary or alternate contact, back-lighted push buttons with stainless-steel switch enclosures. 12/24 VDC bi-color illumination suitable for either flush or surface mounting.

1. Manufacturers:

   a. Security Door Controls (SD) - 400 Series.
   b. Securitron (SU) - PB Series.

B. Door Position Switches: Door position magnetic reed contact switches specifically designed for use in commercial door applications. On recessed models the contact and magnetic housing snap-lock into a 1” diameter hole. Surface mounted models include wide gap distance design complete with armored flex cabling. Provide SPDT, N/O switches with optional Rare Earth Magnet installation on steel doors with flush top channels.

1. Manufacturers:

   a. Sargent Manufacturing (SA) – 3280 Series.
   b. Security Door Controls (SD) - DPS Series.
   c. Securitron (SU) - DPS Series.

C. Switching Power Supplies: NOT in Div 8, to be provided and installed by Security Integrator in Div. 28
2.15 FABRICATION
A. Fasteners: Provide door hardware manufactured to comply with published templates generally prepared for machine, wood, and sheet metal screws. Provide screws according to manufacturers recognized installation standards for application intended.

2.16 FINISHES
A. Standard: Designations used in the Hardware Sets and elsewhere indicate hardware finishes complying with ANSI/BHMA A156.18, including coordination with traditional U.S. finishes indicated by certain manufacturers for their products.
B. Provide quality of finish, including thickness of plating or coating (if any), composition, hardness, and other qualities complying with manufacturer's standards, but in no case less than specified by referenced standards for the applicable units of hardware.
C. Protect mechanical finishes on exposed surfaces from damage by applying a strippable, temporary protective covering before shipping.

PART 3 - EXECUTION

3.1 EXAMINATION
A. Examine scheduled openings, 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. Notify architect of any discrepancies or conflicts between the door schedule, door types, drawings and scheduled hardware. Proceed only after such discrepancies or conflicts have been resolved in writing.

3.2 PREPARATION
A. Hollow Metal Doors and Frames: Comply with ANSI/DHI A115 series.

3.3 INSTALLATION
A. Install each item of mechanical and electromechanical hardware and access control equipment to comply with manufacturer's written instructions and according to specifications.

1. Installers are to be trained and certified by the manufacturer on the proper installation and adjustment of fire, life safety, and security products including: hanging devices; locking devices; closing devices; and seals.
B. Mounting Heights: Mount door hardware units at heights indicated in following applicable publications, unless specifically indicated or required to comply with governing regulations:

2. Wood Doors: DHI WDHS.3, "Recommended Locations for Architectural Hardware for Wood Flush Doors."
3. Where indicated to comply with accessibility requirements, comply with ANSI A117.1 "Accessibility Guidelines for Buildings and Facilities."
4. Provide blocking in drywall partitions where wall stops or other wall mounted hardware is located.

C. Retrofitting: Install door hardware to comply with manufacturer's published templates and 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.

D. Thresholds: Set thresholds for exterior and acoustical doors in full bed of sealant complying with requirements specified in Division 7 Section "Joint Sealants."

E. Storage: Provide a secure lock up for hardware delivered to the project but not yet installed. Control the handling and installation of hardware items so that the completion of the work will not be delayed by hardware losses before and after installation.

3.4 FIELD QUALITY CONTROL

A. Field Inspection: Supplier will perform a final inspection of installed door hardware and state in report whether work complies with or deviates from requirements, including whether door hardware is properly installed, operating and adjusted.

3.5 ADJUSTING

A. Initial Adjustment: Adjust and check each operating item of door hardware and each door to ensure proper operation or function of every unit. Replace units that cannot be adjusted to operate as intended. Adjust door control devices to compensate for final operation of heating and ventilating equipment and to comply with referenced accessibility requirements.

3.6 CLEANING AND PROTECTION

A. Protect all hardware stored on construction site in a covered and dry place. Protect exposed hardware installed on doors during the construction phase. Install any and all hardware at the latest possible time frame.

B. Clean adjacent surfaces soiled by door hardware installation.
C. Clean operating items as necessary to restore proper finish. Provide final protection and maintain conditions that ensure door hardware is without damage or deterioration at time of owner occupancy.

3.7 DEMONSTRATION

A. Instruct Owner's maintenance personnel to adjust, operate, and maintain mechanical and electromechanical door hardware.

3.8 DOOR HARDWARE SETS

A. The hardware sets represent the design intent and direction of the owner and architect. They are a guideline only and should not be considered a detailed hardware schedule. Discrepancies, conflicting hardware and missing items should be brought to the attention of the architect with corrections made prior to the bidding process. Omitted items not included in a hardware set should be scheduled with the appropriate additional hardware required for proper application and functionality.

B. The supplier is responsible for handing and sizing all products and providing the correct option for the appropriate door type and material where more than one is presented in the hardware sets. Quantities listed are for each pair of doors, or for each single door.

C. Manufacturer’s Abbreviations:

1. MK - McKinney
2. PE - Pemko
3. SA - SARGENT
4. RO - Rockwood
5. SU - Securitron

Hardware Sets

**Set: 1.0**

Doors: 101

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38-1920 DOOR HARDWARE 087100d - 18
SECURITY VESTIBULE PROJECT - 18061.07 APN
GRASSFIELD, GREAT BRIDGE, HICKORY, and OSCAR SMITH HIGH SCHOOLS
CHESAPEAKE PUBLIC SCHOOLS
BID 38-1920

2 Drop Plate 351D EN SA
1 Mullion Gasketing 5110BL PE
2 Frame Harness QC-C1500P MK ⏬
2 Door Harness QC-CXXX- LENGTH TO SUIT MK ⏬
2 Electric Power Transfer EL-CEPT SU ⏬
1 Wiring Diagram Elevation and Point to Point as Specified

Notes: • Perimeter/meeting stile seals by frame/door supplier.
• Remote release by aiphone system on door 101.
• Card reader by security integrator on door 101.
• Electronic Operation: Remote push button/valid card or key retracts latchbolt. Request to exit shows authorized egress. Free egress at all times. In case of power loss, door remains locked and latched.

Set: 2.0

Doors: 102

3 Hinge TA2714 US26D MK
1 Office/Entry Lock 60 8205 LNJ US26D SA
1 Core 6300 US15 SA
1 Door Stop 403/441CU (TO SUIT) US26D RO

Notes:
• Perimeter/meeting stile seals by frame/door supplier.

END OF SECTION 087100d
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 and metal panel glazing for the following products, including those specified in other Sections where glazing requirements are specified by reference to this Section:
      1. Hollow Metal Doors and Frames.
      2. Flush Wood Doors.
      3. Aluminum storefront.

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
   1. General: Submit the following according to Conditions of Contract and Division 1 Specification Sections.
2. Product data for each glass product and glazing material indicated.

3. 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.

4. Product certificates signed by glazing materials manufacturers certifying that their products comply with specified requirements.
   a. 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.
   b. 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.
   c. 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.
   d. Product test reports for each type of glazing sealant and gasket indicated, evidencing compliance with requirements specified.
   e. 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.
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.
   Glasstemp, Inc.
   Guardian Industries Corp.
   HGP Industries.
   PPG Industries, Inc.
   Libbey Owens Ford (LOF)
   Spectrum Glass Products, Inc.
   Tempglass.
   Viracon, Inc.

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 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).

2.05 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 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.

3.04 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.

3.05 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.

3.06 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.

3.07 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.

3.08 LAMINATED GLASS SCHEDULE

A. Clear laminated glass with two plies of fully tempered float glass. Safety glazing required.

B. All new glazing applications that are directly off of the security vestibule space at each school shall be laminated glass.

3.09 MONOLITHIC GLASS SCHEDULE

A. Glass type fully tempered float glass. Safety glazing required.

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
Acoustic 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: Wood blocking product and execution requirements.
Section 08 11 13 - Hollow Metal Doors and Frames.

1.04 REFERENCE STANDARDS
A. Reference standards include, but are not limited to, the following:
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 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 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. 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."
C. 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:
Marino\Ware: 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.

C. 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 hager 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.

D. 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.

C. Ceiling Board: Special sag-resistant gypsum ceiling board as defined in ASTM C 1396/C 1396M; sizes to minimize joints in place; ends square cut.
   1. Application: Ceilings and horizontal soffit surfaces unless otherwise indicated.
   2. Thickness: 1/2 inch.

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.

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 corner bead 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

D. 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.
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.

E. 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.

F. 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."

G. 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."; recommended for spout grouting hollow metal frame anchors.

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 jambs 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. 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.
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 manufacturer.
   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 09 21 16
PART 1 - GENERAL

1.01 DESCRIPTION OF WORK
   A. Section includes:
      1. Vinyl Composition Tile
      2. Rubber Wall Base
      3. Rubber Stair Treads

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. 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.
      1. Full size tile samples.
      2. 6" x 9" samples of sheet flooring.
      3. 12' long samples of resilient flooring accessories.
      4. Other materials as requested.
      5. Maintenance Instructions: Submit 2 copies of manufacturer's recommended maintenance practices for each type of resilient flooring and accessory required.

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 standard colors and patterns. Assume a maximum three color pattern.

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
11. Environmental Data: Recycled Content: 27.5% Pre-consumer.

2.03 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.

2.04 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.
   a. 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.
      i. Anhydrous Calcium Chloride Test: ASTM F 1869. Proceed with installation only after substrates have maximum moisture-vapor-emission rates in accordance with the manufacturers 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 "checkerboard" fashion with grain reversed in adjacent tiles.
   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 09 65 00
SECTION 09 68 13
CARPET TILE

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 carpet tile, walk-off mats, and vinyl accessories.

1.03 SUBMITTALS

A. General: Submit the following in accordance with Conditions of Contract and Division 1 Specification Sections.

B. Product data for each type of carpet material and installation accessory required. Submit written data on physical characteristics, durability, resistance to fading, and flame resistance characteristics. Submit Material Safety Data Sheets (MSDS) for carpet and adhesive proposed.

C. Shop drawings showing layout and seaming diagrams. Indicate pile or pattern direction and locations and types of edge strips. Indicate columns, doorways, enclosing walls or partitions, built-in cabinets, and locations where cutouts are required in carpet. Show installation details at special conditions.

D. Samples for color selection by the Architect.

E. Samples for verification purposes in manufacturer's standard size, showing full range of color, texture, and pattern variations expected. Prepare samples from same material to be used for the Work. Submit the following:
   1. 12-inch-square samples of each type of carpet material required.
   2. 12-inch-long samples of each type exposed edge stripping and accessory item.

F. LEED Submittals
   1. Laboratory Test Reports for Credit Low-Emitting Materials: For carpet and installation adhesives, documentation indicating that products 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. Product Data for Credit Building Product Disclosure and Optimization: For products having recycled content, documentation indicating percentages by weight of post-consumer and pre-consumer recycled content. Include statement indicating costs for each product having recycled content.
   3. Location of material source and place of manufacture.

1.04 QUALITY ASSURANCE

A. Manufacturer's Qualification: Firm whose carpet materials comply with "Use of Materials Bulletin UM-44C" published by U.S. Department of Housing and Urban Development (HUD) and are currently listed in HUD "Certified Products Directory" and so identified by imprint on back of carpet.

B. Carpet Surface Burning Characteristics: Provide carpet identical to that tested for the following fire performance characteristics, per test method indicated below, by UL or other testing and inspecting organizations acceptable to authorities having jurisdiction. Identify carpet with appropriate markings of applicable testing and inspecting organization.

C. Test Method: DOC FF 1-70.
D. Rating: Pass.
E. Cushion Surface Burning Characteristics: Provide carpet cushion identical to that tested for the following fire performance characteristics, per test method indicated below, by UL or other testing and inspecting organizations acceptable to authorities having jurisdiction. Identify carpet cushion with appropriate markings of applicable testing and inspecting organization.
F. Test Method: DOC FF 1-70.
H. Test Method: ASTM E 84.
I. Flame Spread: 25 or less.
J. Smoke Developed: 450 or less.

1.05 WARRANTY
A. If the product fails to perform as warranted when properly installed and maintained, the affected area shall be repaired or replaced at the discretion of the Manufacturer.
B. Provide non-prorated lifetime limited warranty that shall specifically warranty against:
   1. Excessive Surface Wear: More than 15% loss of pile fiber weight
   2. Excessive Static Electricity: More than 3 kV per AATCC 134
   3. Resiliency Loss of the Backing: More than 10% loss of backing resiliency
   4. Delamination
   5. Edge Ravel
   6. Zippering

1.06 DELIVERY, STORAGE, AND HANDLING
A. Deliver materials to project site in original factory wrappings and containers, labeled with identification of manufacturer, brand name, and lot number.
B. Store materials in original undamaged packages and containers, inside well-ventilated area protected from weather, moisture, soilage, extreme temperatures, and humidity. Lay flat, blocked off ground. Maintain minimum temperature of 68 deg F (20 deg C) at least three days prior to and during installation in area where materials are stored.

1.07 PROJECT CONDITIONS
A. Substrate Conditions: No condensation within 48 hours on underside of 4-foot by 4-foot polyethylene sheet, fully taped at perimeter to substrate.
B. Substrate Conditions: pH of 9 or less when substrate wetted with potable water and pHhydrion paper applied.

1.08 EXTRA MATERIALS
A. Deliver extra materials to Owner. Furnish extra materials matching products installed as described below, packaged with protective covering for storage and identified with labels describing contents.
B. Carpet: Before installation begins, furnish quantity of full width for each type of material equal to 10 percent of amount installed.

PART 2 - PRODUCTS
2.01 MANUFACTURERS
   A. Available Products: Products specified in each carpet Product Data sheet at end of this Section establish the basis of design for this project.

2.02 ACCESSORIES
   A. Adapter strips: Extruded or molded heavy duty vinyl of size and profile, indicated on the drawings, compatible with ADA requirements.
      1. Color as selected by the Architect.
   B. Carpet Adhesive: Water resistant and nonstaining as recommended by carpet manufacturer to comply with flammability requirements for installed carpet.

PART 3 - EXECUTION

3.01 PREPARATION
   A. Clear away debris and scrape up cementitious deposits from concrete surfaces to receive carpet; apply sealer to prevent dusting.
   B. Vacuum and wet mop surfaces to be covered.

3.02 INSTALLATION
   A. Comply with manufacturer's recommendations for seam locations and direction of carpet; maintain uniformity of carpet direction and lay of pile. At doorways, center seams under door in closed position; do not place seams perpendicular to door frame, in direction of traffic through doorway. Do not bridge building expansion joints with continuous carpet.
   B. Extend carpet under removable flanges and furnishings and into alcoves and closets of each space.
   C. Provide cutouts where required, and bind cut edges where not concealed by protective edge guards or overlapping flanges.
   D. Install carpet edge guard where edge of carpet is exposed; anchor guards to substrate.
   E. Fit sections of carpet prior to application of adhesive. Trim edges and butt cuts with seaming cement.
   F. Apply adhesive uniformly to substrate in accordance with manufacturer's instructions. Butt edges tight to form seams without gaps. Roll entire area lightly to eliminate air pockets and ensure uniform bond.

3.03 CLEANING
   A. Remove adhesive from carpet surface with manufacturer's recommended cleaning agent.
   C. Vacuum carpet.

3.04 PROTECTION
   A. Provide final protection and maintain conditions, in a manner acceptable to manufacturer and installer, to ensure carpet is not damaged or deteriorated at time of Substantial Completion.
3.05 CARPET TILE DATA SHEET

A. Carpet Tile CPT-1 Data Sheet:

Manufacturer: Tandus Centiva, a Tarkett Company

Basis of Design: 2nd Power 04987

Color: Blue Spirit 71602

Backing: Ethos Modular- Direct Glue

Product Specifications:
Reclamation: 100% recyclable in the ReStart® Program

Product Size: 24” x 24” Tile

Total Product Thickness: 0.284 in (7.2136 mm)

Pattern Scale: Medium

Pattern Type: Linear

Collection: Sero / Jhane Barnes

Coordinating Group: Coordinate Group 16

Primary Backing: Non-woven synthetic fiber

Construction: Stratatec® Pattemed Loop

Gauge: 5/64 50.4 rows/10 cm

Stitches Per Inch: 10.4 stitches / inch 40.9 stitches/10 cm

Pile Height Average: .187 inch 4.7 mm

Fiber System: Antron Lumena® Nylon

Dye Method: 100% Solution Dyed

Fluorine-Free Soil Protection: DuraTech®

Pattern Match: Not Required

Colorfastness to Light: > 4 after 100 hours (AATCC 16E)

Soil Protection: Application rate: 2% of face weight

Third Party Certification NSF-140: Platinum

Electrostatic Propensity: 3.0 kV (AATCC 134); Permanent Conductive Fiber

Surface Flammability: Passes CPSC FF 1-70 (ASTM D-2859)

Smoke Generation: Less than 450 (ASTM E-662)

Wet Spread: Backing specific Tandus Adhesives

Environmental Attributes:

Total Recycled Content: 56.0% (39.0% Pre-Consumer, 17.9% Post-Consumer)

Performance Testing:

Flooring Radiant Panel: Class 1 (mean average CRF: 0.45w/sq cm or higher) (ASTM E-648)

Installation Method: Vertical Ashlar

END OF SECTION 09 68 13
SECTION 09 90 00

PAINTING

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
- Section 09 96 00 - High Performance Coatings, for special coatings
- 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).
   5. The Sherwin-Williams Company (S-W).
   6. Valspar Corporation (Valspar).

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 beltsanded 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, convectors, 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.

3.07 PROTECTION
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). Recoat 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 Latex 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 Suprime "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.
      5) PPG 88-110 Satinhide Interior Enamel Wall & Trim Lo-Lustre Semi-Gloss Latex.

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 Polyacrylic 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 Glid-Guard Tank & Structural Primer, White.
         4) Moore: IronClad Galvanished Metal Latex Primer #155.
         5) PPG: 90-709 Pitt-Tech One Pack Interior/Exterior Primer/Finish DTM
            Industrial Enamel.
         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.
         5) PPG: 88-110 Satinhide Interior Enamel Wall & Trim Lo-Lustre
            Semi-Gloss Latex.

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.
DIVISION 23 - MECHANICAL

SECTION 23 01 00 - GENERAL PROVISIONS

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.

1.4 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. All motor controllers and starters connected to equipment installed under Division 23 shall be furnished under those sections and shall be turned over to the Electrical Contractor for installation by the Electrical Contractor. Controllers shall be equipped with all auxiliary contacts, poles, or devices necessary to permit interlocking and control required.

C. Three-phase motors shall have magnetic across-the-line starters unless hereinafter indicated or required by the Power Company. Provide overload relay in each phase or motor lead. Operation of any overload relay shall simultaneously open all phases.

D. Manual starters shall be manual, single, double or three pole type designed for flush or surface mounting with overload protection in each phase.

E. Starters for motors under automatic control shall have a built-in, hand-off auto selector switch.

F. Push-button stations shall have “start-stop” momentary contacts having one normally open and one normally closed set with indicating lights to display when motors are running. Stations shall be heavy-duty type designed for flush or surface mountings as required.

G. All starters and controls shall be NEMA rated and NEMA 1 enclosed where mounted inside buildings. Starters and controls mounted outside or where specifically designated shall be NEMA IV enclosed.
H. Auxiliary 120 volt contacts shall be provided to give control and interlocking as required or as indicated. Where control voltages are different from motor voltages, a control voltage transformer shall be provided as a part of the starter.

I. 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.

J. Low voltage control cable specifically listed for application in accessible ceiling air plenums may be utilized in lieu of wiring in conduit.

K. 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 DIELECTRIC CONNECTIONS

A. Dielectric connections shall be provided at all connections between ferrous and nonferrous piping or metals, except drain piping connections at drain pans for cooling coils and valves may have cast-bronze adapters.

1.7 NOISE AND VIBRATION

A. All mechanical equipment shall be isolated from the building structure by means of noise and vibration isolators. Equipment to be isolated includes, but is not limited to, the following:

1. Roof Top Air Conditioning and Ventilation Units
2. Suspended Air Handling Equipment
3. Floor Mounted Air Handling Equipment
4. Base Mounted Pumps
5. Air Compressor
6. In-Line Exhaust/Supply Fans

B. All curb mounted roof air conditioning and ventilation equipment shall be mounted on vibration isolation rails and shall have sound barrier material installed throughout the area of the roof curb.

C. Vibration isolation shall be Model KSR-2 Isolation Rail System manufactured by Kinetics Noise Control or approved equal. System shall consist of two parallel aluminum rails with continuous neoprene air and water seal, incorporating steel spring isolators designed for 2" static deflection, all designed to be installed over the roof curb system furnished with each unit. Provide with curb adaptor flashing for the weatherproofing of field altered curb rails. Make up air ventilation units designed with heat pipe energy recovery components shall be excluded from this requirement.
D. Sound barrier material shall be RT-4S4 Composite System manufactured by Kinetics Noise Control, or approved equal. System shall consist of two layers of one-half inch (½”) 2 PSF sound board sandwiched between 2” thick RIM isolation material and two inch (2”) 3 PCF Kinetics fiberglass. Joints shall be staggered per Manufacturer's recommendations.

E. All horizontally suspended equipment shall be suspended from structure with combination spring and fiberglass hangers designed for static deflection of 1.0”. Springs shall be Model SFH.

F. Floor mounted air handling equipment shall be supported from the structure on Kinetics Model FDS, free-standing, unhoused, laterally stabile steel spring isolators with leveling bolts and 1/4” ribbed isolation pads.

G. In-line exhaust/supply fans shall be installed with Kinetics Noise Control Model RD neoprene isolators.

H. The Contractor shall provide to the Engineer written documentation that the Isolation System Manufacturer has observed the isolation installation and finds that it meets their requirements.

1.8 ACCESS PANELS

A. This Contractor shall furnish and the General Contractor shall install access panels where required for access to valves, dampers, etc. Access panels shall match the integrity of the wall and/or ceiling in which they are being installed. Access panels shall be a minimum of 12” x 12”.

1.9 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.

F. Equipment suitable for exterior installation shall not be delivered to the job site until it is ready to be installed in its permanent location.

G. The Contractor shall provide to the Engineer written documentation that the Isolation System Manufacturer has observed the isolation installation and finds that it meets their requirements.
1.10 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 per latest edition of the International Plumbing Code and all local requirements.

B. Water piping systems shall be thoroughly flushed and cleaned before being placed in operation.

C. Equipment, piping, strainers, ductwork and filters shall be cleaned thoroughly in accordance with the best practice or as specified herein.

D. Piping service and flow direction shall be indicated with vinyl labels identifying the service by name and the flow direction by arrows. Labels shall be used wherever piping is exposed and at all unit connections. For concealed piping located above accessible ceilings, label piping at 25 foot intervals with painted stencil-type lettering.

E. All valves in equipment room(s) shall be identified with 1-1/2” diameter, permanently stamped, brass tags. Secure tags to valve item or wheel with brass jack chain or copper meter seals. Provide framed and mounted, under clear plastic, valve chart (8-1/2” x 11” min.) identifying valve number by system served and function.

F. Exposed piping and equipment in mechanical equipment room shall be completely color code painted under this Section. Color code shall be as follows:

1. Natural Gas and Compressed Air Yellow
2. Chilled Water Supply and Return Blue
3. Heating Hot Water Supply and Return Orange

1.11 EQUIPMENT MARKING

A. Label all mechanical equipment, including starters, control panels, and air conditioning units.

B. Provide labels affixed to the ceiling grid for locations of all above ceiling HVAC components.

C. Labels shall be machine engraved, laminated, Bakelite nameplate type. Labels shall be black face with white letters.

D. Labels shall have 1/4” high letters.

E. Labels shall be rigidly attached using rivets or screws. Adhesive backing is not acceptable.

1.12 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.

B. Diagrams and instructions for the maintenance and operations of the following systems shall be included:

1. Plumbing:
   a. Plumbing Fixtures
   b. Water Heaters
   c. Kitchen Equipment
   d. Faucets
   e. Flush Valves
   f. Backflow Preventers
   g. Pumps

2. Mechanical:
   a. Air Handling Units
   b. Air Conditioning Units
   c. Heat Pump Units
   d. Rooftop Units
   e. Make-up Air Units
   f. Unit/Duct Heaters
   g. Exhaust Fans
   h. Cooking Hood System
   i. Temperature Controls

C. Provide a minimum of two 4-hour maintenance training sessions for the Owner’s Representative. These training sessions shall focus on preventative maintenance, regularly scheduled maintenance and trouble-shooting malfunctions on all equipment and systems furnished as a part of this Contract.
D. Provide a minimum of 8 hours additional training on the operation and maintenance of the temperature control system. This training shall provide a functional demonstration of the control systems, a review of the control and monitoring functions, as well as preventative and regular systems maintenance training.

OR

1.12 OPERATING AND MAINTENANCE INSTRUCTIONS

A. OPERATING AND MAINTENANCE INSTRUCTIONS -

Utilize the following form to certify completion of Owner training. Submit a completed form for each sub-system as required.

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: ______________
1.13 WARRANTY AND SERVICE

A. This Contractor shall service the installation for one year from date of final acceptance. This shall include emergency service, on all equipment. Maintain a log book on site for service entries (i.e. date, service performed, etc.).

1.14 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.

1.15 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.

1.16 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.

1.17 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.

1.18 TRENCH EXCAVATION AND BACKFILL

A. Excavate trenches to line and grades indicated or required. Excavate sufficient distance in advance of pipe laying but open trench shall not exceed 200 feet in advance of completed pipe work. Excavate trenches with 8" clearance on each side of barrel. Do not carry excavation below bottom of pipe. Before pipe is laid, fill space between bottom
of pipe and existing surface with gravel. Excavation below required level shall be
backfilled at the Contractor’s expense and thoroughly tamped as directed. Tamp bottom
of trenches hard and grade to secure required fall. Remove unstable soil to depth
determined by Architect and replace with gravel or crushed stone. Do the last 2” of
excavation by hand and make suitable channel for barrel of pipe. Excavate bell holes
accurately by hand so pipe shall rest on solid ground the entire length. Lay sewer and
water pipes in separate trenches. Banks of trenches shall be vertical and the Contractor
shall be responsible for providing sheathing, bracing, and shoring necessary for safety to
conform with governing laws and ordinances. Erect, maintain and safeguard temporary
bridges, walks, barricades, or crossings where necessary to maintain traffic. Protect the
public from sunset to sunrise with sufficient lights or flares to prevent accidents.

B. Perform necessary pumping and bailing as required to keep trench in satisfactory
condition for pipe laying. All excavation and backfilling shall be in accordance with the
applicable requirements of Division 02 - Site Work.

C. Backfill after pipe lines have been tested, inspected, approved and the forms removed.
Backfill shall be material from excavation, borrow of sand, gravel or other approved
material free from large clods and undesirable matter. Place evenly and carefully in
horizontal layers around and over pipe in 6” maximum layers. Compact and tamp each
layer by hand or with suitable equipment to density that shall prevent excessive
settlement or shrinkage and until pipe has 18” of cover. Continue backfill in 12” layers
and tamp in an approved manner. Where excavation is made through permanent
pavements, curbs, driveways, and sidewalks or where structures are undercut by
excavations, make backfill of material selected by the Architect in 3” layers. Each layers
shall be thoroughly compacted. Water tamping shall be permitted after compacted
backfill has been placed to depth of 18” above the top of the pipe. Contractor shall
compact fill so that subsidence of backfill shall not be detrimental to the structure or
paved area for a period of six months. Dispose of the surplus material.

1.19 CONCRETE PADS

A. Provide at least 24”x24”x6” concrete pad flush with grade around the storm and sanitary
sewer cleanouts and other pipe projections above grade.

B. Concrete shall conform to the requirements of the concrete section of this specification.

1.20 FLASHING

A. Provide cap flashing for roof-mounted fans, goosenecks, air intakes, vents, etc.

1.21 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
Hydronic Piping (material)
Hydronic Piping (labor)
Pipe Hangers (material)
Pipe Hangers (labor)
Hydronic Valves and Fittings (material)
Hydronic Valves and Fittings (labor)
Hydronic Pipe Insulation (material)
Hydronic Pipe Insulation (labor)
Gas Piping (material)
Gas Piping (labor)
Refrigerant Piping and Accessories (material)
Refrigerant Piping and Accessories (labor)
Air Separators (material)
Air Separators (labor)
Thermometers and Gauges (material)
Thermometers and Gauges (labor)
HVAC Pumps and Accessories (material)
HVAC Pumps and Accessories (labor)
Expansion Tank (material)
Expansion Tank (labor)
Boiler (material)
Boiler (labor)
Chiller (material)
Chiller (labor)
Cooling Tower (material)
Cooling Tower (labor)
Air Handling Units (material)
Air Handling Units (labor)
Condensing Units (material)
Condensing Units (labor)
Heat Pump Units (material)

1.22 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.
10. Approved Pre-Commissioning and Final Commissioning Reports

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:

- Vibration Isolation and/or Sound Attenuation
- Sample Warranty Service & Filter Replacement Logs
- Mechanical Pipe and Pipefittings
  - Pre-insulated Underground Pressure Piping
  - Hot water heating piping
  - Chilled water piping
  - Dual temperature water piping
  - Condenser water piping
  - Solder
  - Piping supports
• Gate valves
• Globe valves
• Ball valves
• Butterfly valves
• Check valves
• Air separator
• Boiler fittings
• Automatic air vents
• Triple duty valves
• Compression tanks and tank fittings
• Circuit setter balance valves
• Automatic flow control valves
• Thermometers & gauges
• Flexible pipe connectors

Freeze Protection for Piping
• Heat tape

Duct Insulation
• Flexible blanket duct insulation
• Rigid duct insulation
• Cooking system fire blanket wrap

Piping and Equipment Insulation
• Interior hot and chiller water pipe insulation
• Refrigerant suction pipe insulation
• Chilled water pumps

HVAC Water Treatment
• Product
• Diagram of component arrangement and wiring
• MSDS sheet on cleaning and treatment chemicals
• Clean system certification

Refrigerant Piping and Accessories

Mechanical Equipment
• Packaged roof top unit/pool de-humidification unit
• Exhaust fans
• Intake & relief vents
• Unit heater & wall heaters
• Cooking hood system
• Heating hot water pump(s)
• Chilled water pump(s)
• Condenser water pump(s)
• Wall louvers, brick vents & wall caps
• Mini-split systems
• Closed Circuit Cooling Tower
• Cooling Tower
SECURITY VESTIBULE PROJECT - 18061.07 APN
GRASSFIELD, GREAT BRIDGE, HICKORY, and OSCAR SMITH HIGH SCHOOLS
CHESAPEAKE PUBLIC SCHOOLS
BID 39 1920

MATERIALS AND METHODS 23 05 00 - 3

- Rotary Screw Water Chillers
- Air Handling Units with Coils
- Modular Air Handling Units
- Terminal Heating and Cooling Units-Blower Coil Units
- Humidifiers
- Unit Ventilators
- Packaged Pumping Equipment
- Packaged Rooftop Air Conditioners with Gas Heat
- Packaged Rooftop Heat Pumps
- Packaged Rooftop A/C Units with Energy Recovery Wheels
- Terminal Heat Transfer Units
- Water Source Heat Pump Units
- Fan Coil Units
- Flexible Water-tube Boilers
- Make Up Air Ventilation Units
- Make Up Air Ventilation Units ERV
- Geothermal Loop Heat Exchangers
- Packaged Variable Air Volume Rooftop Air Conditioning Unit
- VAV Terminal Units
- Packaged Variable Air Volume Rooftop Unit
- Electric Duct Heaters
- Heat Transfer Liquid

Sheet Metal Ductwork
- Acoustically line duct
- Flexible round duct
- Firemaster duct wrap
- Fire/smoke dampers
- Grilles and registers
- Spiral duct and fittings
- Duct sealer
- Flues and stacks

Controls & Instrumentation
- Temperature controls product data
- Sequence of Operation
- Points List
- Single Line Drawings

Starting Testing, Adjusting & Balancing
- Testing adjusting and balancing qualifications

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.
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:

Vibration Isolation and/or Sound Attenuation
Sample Warranty Service & Filter Replacement Logs
Mechanical Pipe and Pipefittings
• Pre-insulated Underground Pressure Piping
• Hot water heating piping
• Chilled water piping
• Dual temperature water piping
• Condenser water piping
• Solder
• Piping supports
MATERIALS AND METHODS

- Gate valves
- Globe valves
- Ball valves
- Butterfly valves
- Check valves
- Air separator
- Boiler fittings
- Automatic air vents
- Triple duty valves
- Compression tanks and tank fittings
- Circuit setter balance valves
- Automatic flow control valves
- Thermometers & gauges
- Flexible pipe connectors

Freeze Protection for Piping
- Heat tape

Duct Insulation
- Flexible blanket duct insulation
- Rigid duct insulation
- Cooking system fire blanket wrap

Piping and Equipment Insulation
- Interior hot and chiller water pipe insulation
- Refrigerant suction pipe insulation
- Chilled water pumps

HVAC Water Treatment
- Product
- Diagram of component arrangement and wiring
- MSDS sheet on cleaning and treatment chemicals
- Clean system certification

Refrigerant Piping and Accessories

Mechanical Equipment
- Packaged roof top unit/pool de-humidification unit
- Exhaust fans
- Intake& relief vents
- Unit heater & wall heaters
- Cooking hood system
- Heating hot water pump(s)
- Chilled water pump(s)
- Condenser water pump(s)
- Wall louvers, brick vents & wall caps
- Mini-split systems
- Closed Circuit Cooling Tower
- Cooling Tower
MATERIALS AND METHODS

- Rotary Screw Water Chillers
- Air Handling Units with Coils
- Modular Air Handling Units
- Terminal Heating and Cooling Units-Blower Coil Units
- Humidifiers
- Unit Ventilators
- Packaged Pumping Equipment
- Packaged Rooftop Air Conditioners with Gas Heat
- Packaged Rooftop Heat Pumps
- Packaged Rooftop A/C Units with Energy Recovery Wheels
- Terminal Heat Transfer Units
- Water Source Heat Pump Units
- Fan Coil Units
- Flexible Water-tube Boilers
- Make Up Air Ventilation Units
- Make Up Air Ventilation Units ERV
- Geothermal Loop Heat Exchangers
- Packaged Variable Air Volume Rooftop Air Conditioning Unit
- VAV Terminal Units
- Packaged Variable Air Volume Rooftop Unit
- Electric Duct Heaters
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- Fire/smoke dampers
- Grilles and registers
- Spiral duct and fittings
- Duct sealer
- Flues and stacks

Controls & Instrumentation
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- Points List
- Single Line Drawings

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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.
PART 1 - GENERAL

1.1 WORK INCLUDED

A. The work under this Section shall include the adjustment of each air and water system to design quantities, the balance of all air and 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.

C. The TAB Contractor shall be a direct Subcontractor to the General Contractor and shall not be associated with the Mechanical Contractor.

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, thermometer wells and other appurtenances as required. He shall coordinate the location of these devices as construction progresses to avoid disturbing the finished systems. He shall also provide new belts and sheaves for air moving equipment as required to attain desired air quantities. These items shall be provided at no additional cost to the Owner.

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.

3.3 WATER BALANCE PROCEDURE

A. Calibrated orifices and portable flow meters shall be used to balance water flow at all points. All air must be purged from system after start up and before balancing.

B. Pump capacities shall be determined by differential pressure measurements. Water circuits shall be adjusted by balancing cocks previously specified. All balancing cocks shall be permanently marked after balance is complete so that they may be restored to their correct position if disturbed.

C. Circuit setters shall be installed permanently where indicated on the Drawings. The circuit setters shall be installed as recommended by the Manufacturer.

3.4 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.

3.5 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. Air pressure drop across each air handling unit coil, heating coil or fan.
4. Supply air and mixed air temperature for each air handling unit.
5. Fan CFM and RPM.
6. Location, Manufacturer, serial number, model number, size, HP, RPM, frame size, amp draw, operating BHP and motor controller heater size, for each pump.
7. Tabulated flow setting of each balancing device and circuit setter valve.
8. Manufacturer, location, size, design and actual CFM air quantities, of each supply, return, or exhaust grille or diffuser.

3.6 FIELD QUALITY CONTROL

A. Air side balancing tolerance shall be +10% of design values unless otherwise noted. Direct drive fans associated with systems having a design of 800 cubic feet per minute or less shall have a tolerance of +15% of design values.

B. Waterside balancing shall be +10%, - 0% of design values.

C. Use duct mounted dampers for rough air balance. Trim with register or diffuser mounted dampers to avoid excessive room air noise.

D. 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.
3.7 FINAL INSPECTION

A. Upon submittal and review of TAB Reports, the Contractor shall conduct a building walk-through at which time a selection of up to 10% of the air side and water side systems may be spot-checked. If the total air flow or fluid flow as reported within the TAB Report differs from the verified flows then, at the discretion of the Project Engineer, that system shall be re-balanced at no additional cost to the Owner, and additional systems shall be spot checked.
SECTION 23 07 00 - MECHANICAL EQUIPMENT

PART 1 - GENERAL

1.1 Heating, ventilating and air conditioning equipment shall be furnished and installed as scheduled on drawings or as specified within this division.

PART 2 - PRODUCTS

2.1 Sealed refrigeration systems of packaged equipment, refrigeration compressors and condensing units shall be furnished with Manufacturer's standard five-year term warranty.

2.2 Equipment, dampers and fans, which are specified or required by applicable codes to have UL or similar listing, shall be installed as required to meet those listings.

2.3 Types of refrigerants used shall meet current EPA recommendations with regard to CFC/ozone depletion restrictions. Equipment using refrigerant R-11, R-12, R-113, R-114, R-115, R-500 or refrigerants with ozone depletion factor (ODF) greater than 0.05 shall not be permitted.

PART 3 - EXECUTION

3.1 Equipment shall be of suitable dimension for the area in which it is to be installed. If the equipment dimensions and/or arrangements differ materially from that shown on the drawings, the Contractor shall be responsible for any redesign that is necessary at no additional cost to the Owner.

3.2 Unless otherwise specified or shown on the drawings, equipment installation, duct connections, supports, vibration isolation, suspension, piping and related arrangements shall be in accordance with the Manufacturer's recommended installation for the service.

END OF SECTION 15700
SECTION 23 07 13 - DUCT INSULATION

PART 1 - GENERAL

1.1 SCOPE

A. Supply, return and outside air ductwork shall be insulated as specified herein unless otherwise indicated on the contract drawings.

PART 2 - PRODUCTS

2.1 Interior supply, return and outside 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.

2.2 Exterior supply and exterior return air ductwork shall be insulated with 3" thick, 3.0 PCF, rigid fiberglass 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 Rigid insulation shall have pins on maximum 12" centers. Self adhesive pins are not allowed.

3.4 Insulation that terminates at AHU’s, VAV’s, coils, etc. shall be sealed to the equipment with 3" wide strips same as vapor barrier jackets.

3.5 All transitions to and from flexible duct shall be sealed with 3" wide strips same as vapor barrier jackets.

3.6 Exterior insulation shall receive one coat of bitumastic, then wrapped completely with Fab-Cloth, and then receive two more complete coats of bitumastic sealer.

3.7 Insulation and accessories shall be applied in accordance with the Manufacturer's recommendations unless indicated otherwise.

3.8 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 07 16 - PIPING AND EQUIPMENT INSULATION

PART 1 - GENERAL

1.1 SCOPE

A. Piping shall be insulated as specified below, unless otherwise indicated on the contract drawings.

PART 2 - PRODUCTS

2.1 Hot water supply and return piping shall be insulated with preformed fire retardant fiberglass pipe insulation with factory applied all purpose jacket. Insulation shall be 1” thick for pipe sizes up through 3” and 1-1/2” thick for pipe sizes 4” and larger.

2.2 Chilled water supply and return piping shall be insulated with preformed fire retardant fiberglass pipe insulation with factory applied vapor barrier jacket. Thickness of insulation shall be as recommended by the Manufacturer but in no case less than 1” thick for pipe sizes up through 3” and 1-1/2” thick for pipe sizes 4” and larger.

2.3 Interior refrigerant suction piping shall be insulated with 1” thick preformed fire retardant fiberglass pipe insulation with factory applied vapor barrier jacket or 3/4” thick closed cell foam insulation. Exterior refrigerant suction piping shall be insulated with 3/4” thick closed cell foam insulation.

2.4 Interior condensate drain piping shall be insulated with 1” thick preformed fire retardant fiberglass pipe insulation with vapor barrier jacket or 3/8” thick closed cell foam insulation.

2.5 Domestic hot water, cold water, hot water recirculation, horizontal roof drainage and overflow piping up to and including roof drain sump and Mezzanine floor drain waste piping and p-traps shall be insulated with 1” thick preformed fire retardant fiberglass pipe insulation with vapor barrier jacket or 3/8” thick flexible closed cell type for piping up to 3” diameter.

2.6 Chilled water pumps shall be insulated with 2” thick fire retardant fiberglass insulation lining within an 18 gauge galvanized sheet metal, removable and replaceable pumphead cover casing. All voids between insulation and pump housing shall be filled with fiberglass insulation. Casing joints shall be coated with vapor barrier sealant.

2.7 Water piping and electrically traced piping exposed above grade shall be insulated with 2” thick preformed fire retardant fiberglass insulation with aluminum jacket, completely weatherproofed per Manufacturer’s recommendations.

2.8 Heating water converter and storage water heaters shall be insulated with 2-1/2” thick rigid fiberglass insulation held in place with bands and studs as recommended by the Manufacturer and finished with insulating and finishing cement over 2” hexagonal mesh wire.

2.9 Fittings, valves, flanges, strainers and piping accessories shall be insulated similar to piping systems in which they occur and finished with cement and jackets as specified for piping system. Interior exposed elbows, tees, and valves shall have one piece PVC insulated fitting covers.
Piping specified with vapor barriers shall have all seam edges of fitting covers sealed with vapor barrier adhesive mastic prior to taping.

PART 3 - EXECUTION

3.1 Insulation shall be applied on clean, dry surfaces and, after inspection, released for insulation application. Insulation shall be run continuously through wall and ceiling openings and sleeves. 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.

3.2 Insulation shall be applied in accordance with the Manufacturer's recommendations unless specified otherwise. No insulation will be required at immediate fixture connections or on buried pipe.

3.3 Insulation protection shields or saddles shall be provided at pipe supports for insulated pipes 1/2" in size and larger.

3.4 No piping shall be run above the Electrical equipment rooms.

END OF SECTION 23 07 16
SECTION 23 09 00- CONTROLS AND INSTRUMENTATIONS

PART 1 - GENERAL

1.1 Heating, ventilating and air conditioning equipment shall be controlled as indicated within the sequence of operation or as specified herein.

1.2 DUCT MOUNTED SMOKE DETECTORS

   A. A UL listed, ionization type, duct mounted smoke detector shall be mounted in the return air duct of each unit supplying more than 2000 CFM. On a detection of products of combustion, the unit supply fan shall stop. The detectors shall be furnished by Division 26 and installed by the Mechanical Contractor.

   B. Power wiring to the smoke detector and from the smoke detector to the Fire Alarm Control Panel shall be furnished under Division 26. Unit shutdown wiring and control shall be the responsibility of the Mechanical Contractor.

   C. The Mechanical Contractor shall coordinate with the Electrical Contractor fully. Where ductwork installation prohibits the use of a single detector due to an insufficient straight length of duct (or similar condition), additional detectors shall be furnished and installed by the Mechanical Contractor.

PART 2 - PRODUCTS - Not Applicable

PART 3 - EXECUTION - Not Applicable

END OF SECTION 23 09 00
SECTION 23 23 00 - REFRIGERANT PIPING SYSTEM

PART 1 - GENERAL

1.1 Refrigerant piping system shall be furnished and installed as indicated on the contract drawings and/or as specified within this division.

PART 2 - PRODUCTS

2.1 Refrigerant piping shall be Type "L" copper, assembled with copper soldering fittings using silver solder.

2.2 Accessories including expansion valves, solenoid valves, service valves, charging valves, sight glasses, filter-driers, etc. shall be provided as indicated or as required by the Equipment Manufacturer for a complete installation.

PART 3 - EXECUTION

3.1 Piping shall be run concealed unless otherwise indicated.

3.2 Piping and accessories shall be sized, provided, and installed in accordance with refrigeration equipment Manufacturer's recommendations for the particular equipment installed and the actual piping arrangement as installed in the field.

3.3 Piping shall be assembled, adhering to accepted industry standards and applicable codes, including the maintenance of piping cleanliness and the passage of dry Nitrogen gas through fittings, accessories, and/or piping during brazing operations.

3.4 Bare copper piping shall be protected from direct contact with ferrous materials.

END OF SECTION 23 23 00
SECTION 23 31 13 - SHEET METAL DUCTWORK

PART 1 - GENERAL

1.1 Provide complete systems of supply, return, relief, outside and exhaust ducts as shown on the drawings. Submit ductwork shop drawings (minimum scale of 1/4” = 1’-0”) for review by the Engineer prior to fabrication.

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 Whenever practicable, elbows shall be radius type with a centerline radius of 1-1/2 times the width or diameter of the duct. Where space does not permit, the use of short radius elbows having a minimum radius of 1.0 times the width or diameter of the duct or square elbows with factory fabricated turning vanes may be used.

2.4 Flexible connections shall be made of neoprene covered 20 ounce glass fabric cloth and shall be installed at duct connections to all air handling equipment to prevent transmission of vibration.

2.5 Exposed spiral round ductwork shall be double wall insulated with solid inner liner and have a minimum 1” fiberglass insulation. Duct shall be of spiral lockseam construction fabricated from galvanized steel meeting ASTM-A527 Standards. All fittings shall be of the same construction and material. Elbows shall be of die-stamped, gored, pleated or mitered construction. Ductwork shall be supported per Manufacturer’s recommendations with factory provided hanging rings. All ductwork shall be provided with primer finish and be free of any dents for field painting (color as selected by the Architect). Any ductwork that is damaged shall be rejected and, at the Engineer’s discretion, replaced with a new section at no additional cost to the Owner.

2.6 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.

2.7 Provide duct access doors at the following locations:

A. As required for access to fire dampers, duct mounted sensors, smoke detectors and devices requiring periodic service.
B. Access doors shall be double wall, 1" thick internally insulated with solid inner panel. Provide gasketed frame with double cam-lock, hinged assembly. Doors shall be 12”x12” except where duct dimensions prohibits a door of this size. In smaller ducts, door shall be as large as possible. Doors may be omitted in ducts smaller than 10 inches in largest dimension.

2.8 Fire dampers shall be installed at locations shown on the drawings. Fire dampers shall be UL classified and shall be installed in accordance to the UL listing and SMACNA guidelines, including the installation of fire seal access doors and mounting sleeves and angles on each side of fire rated partitions, floors or roof. All firedampers shall be “Dynamic Rated” unless otherwise noted.

2.9 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.

2.10 Tie wraps and other duct accessories and materials shall be plenum-rated when located in plenum areas.

2.11 KITCHEN GREASE HOOD EXHAUST DUCT

A. Ducts shall be constructed of minimum No. 16 Manufacturers' Standard Gauge (0.060 inch) or heavier steel, or No. 18 United States Standard Gauge (0.050 inch) or heavier stainless steel with liquid-tight continuous external weld of all seams and joints. Inside laps on duct joints shall project in a direct ion against the air flow. Slope duct per code.

B. Access doors for inspection and cleaning purposes, equipped with tight-fitting doors and latches, shall be provided in horizontal sections of exhaust ducts. Such openings shall be at the sides of the horizontal run in order to prevent dripping of residue. Spacing of such openings shall not exceed 25 ft. on straight runs, and/or after each turn. Openings shall have a minimum dimension of twelve (12) inches.

C. The duct shall be enclosed in a “3M Firemaster” duct wrap. Intent of duct wrap is to satisfy code required duct chase.

D. System shall be constructed such that grease cannot be trapped and the duct shall be sloped toward the hood or grease reservoir.

E. Entire installation shall conform to code. Meet with local inspector or code official prior to fabrication to confirm requirements.

F. Provide dimensioned drawings for review prior to fabrication.

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 Exposed ductwork shall receive a minimum of two coats of paint suitable for the service as intended. Colors shall be as selected or approved by the Architect.

3.3 After the installation is complete and prior to insulation application, the Contractor shall clean inside and outside of duct system.

3.4 No ductwork shall be run above the Electrical equipment rooms.

END OF SECTION 23 31 13
DIVISION 26 - ELECTRICAL

SECTION 26 00 10 - GENERAL PROVISIONS

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. 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)
17. Virginia Uniform Statewide Building Code (VUSBC)
B. The Contractor shall give the required notices, obtain the necessary permits, and pay the permit and inspection fees.

C. 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 that any 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 and NFPA.

B. Provide temporary service and wiring as required to support construction of the project. Permanent wiring provided by this project shall not at any time 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) and the General Contractor during the Submittal/Shop Drawing phase. Any electrical modifications required to support the intended motors and/or equipment shall be the responsibility of the Contractor providing the motor and/or equipment.

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. Equipment, 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, 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.

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.

260513 - Wire and Cable  260534 - Outlet Boxes
260533 - Conduit and Fittings  262726 - Wiring Devices

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
Fire Alarm System (material)
Fire Alarm System (labor)
Conduit, Boxes and Fittings (material)
Conduit, Boxes and Fittings (labor)
Lighting Fixtures (material)
Lighting Fixtures (labor)
Wiring Devices (material)
Wiring Devices (labor)
Wire and Cable (material)
Wire and Cable (labor)

PART 2 - PRODUCTS - NOT APPLICABLE

PART 3 - EXECUTION - NOT APPLICABLE

END OF SECTION 26 00 10
SECTION 26 00 50 - 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. 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 260010 - 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 always be kept on the job site 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:

   Surface Non-metallic Raceway
   • Raceway, covers, fittings and end caps
   • Outlets

   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

   Lighting Fixtures
   • Aiming charts (where applicable)
   • Foot candle point grips (where applicable)

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. 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 Electrical Equipment 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 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.

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 75°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.

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>120/208 Volt System</th>
<th>277/480 Volt System</th>
</tr>
</thead>
<tbody>
<tr>
<td>Phase A Black</td>
<td>Phase A Brown</td>
</tr>
<tr>
<td>Phase B Red</td>
<td>Phase B Orange</td>
</tr>
<tr>
<td>Phase C Blue</td>
<td>Phase C Yellow</td>
</tr>
<tr>
<td>Neutral White</td>
<td>Neutral Grey</td>
</tr>
<tr>
<td>Ground Green</td>
<td>Ground Green</td>
</tr>
</tbody>
</table>

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
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

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 ½” 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.

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 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 non-metallic 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. 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 Conduits installed above grade in damp or wet locations shall be rigid galvanized steel.

END OF SECTION 26 05 33
SECURITY VESTIBULE PROJECT - 18061.07 APN
GRASSFIELD, GREAT BRIDGE, HICKORY, and OSCAR SMITH HIGH SCHOOLS
CHESAPEAKE PUBLIC SCHOOLS
BID 38-1920

SECTION 26 05 34 - OUTLET BOXES

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
   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. 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.

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 indicate clearly their electrical characteristics, circuit number, and panel designation. Paint same information on cover of the box.

END OF SECTION 26 05 34
SECTION 26 27 26 - WIRING DEVICES

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. Device Plates - UL-514
5. 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

B. 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
SECTION 27 10 00 – ACCESS CONTROL SYSTEM CABLING

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

B. Specification Section 28 10 00 Access Control System (ACS).

C. Electrical Drawings E000 Series.

1.2 DESCRIPTION OF WORK

A. Contractor shall provide materials for and install a complete, functional cable distribution system (CDS) and access control/intercom and video (IV) system infrastructure in accordance with the drawings, these specifications and Specification Section 281000.

B. The installation shall include cable, interconnect/patching equipment, connectors, jumpers, wiring blocks, telecommunications outlets, and other equipment as described herein or shown on the drawings. In addition to material and equipment, the CDS Contractor shall provide labor and any incidental material required for a complete installation. Upon completion of the installation, the CDS Contractor shall test all copper pathways and record the test results, as specified.

C. The work performed under this specification shall be of good quality and performed in a workmanlike manner. In this context "good quality" means the work shall meet the industry technical standards referenced by this specification. The Architect/Owner reserves the right to reject all or a portion of the work performed, either on technical or aesthetic grounds.

D. The Access Control distribution system contractor shall provide Category 6 (CAT 6) UTp and communication cabling infrastructure for a complete system as listed in Div. 28 specifications.

E. All cabling shall be included in the Div. 28 allowance. Cabling contractor will be responsible for all necessary wiring, cabling and labor requirements to support Access Control System and Intercom/Video Entry system.

1.3 WORK INCLUDED

A. The work under this section of the specifications shall consist of furnishing all labor, equipment, materials, supplies and incidentals and in performing all operations necessary for the “TURNKEY”, fully operational and tested cabling to support the electronic access control system (refer to Div. 28 specifications) in complete accordance with the specifications and the accompanying drawings unless specifically noted otherwise.
B. The work shall include, but not be limited to, the following:
   1. Coordination of raceway and rough-in.
   2. Provide and install cables and terminations.
   3. Provide modification to existing cabling and devices, as required for new Access Control and I/V Entry Devices.
   4. Provide cabling support and management. Coordinate with existing system configuration and school system’s technology representative.
   5. Provide testing and certification as required by these specifications.

1.4 PERMITS AND INSPECTIONS

A. Obtain and pay for all permits and inspections required by all legal authorities and agencies having jurisdiction for the work. These permits or inspections shall be part of the work of the Contractor performing the work prior to cable installation.

1.5 SUBMITTALS

A. Submit the following shop drawings and submittals per schedule as listed below for review by the Architect/Owner:
   1. Prior to proceeding with the work:
      a. A complete schedule of ALL equipment and materials that are to be furnished for the work shall be provided. Accompanying the schedule shall be Manufacturer's specification or cut sheets for all components listed in Part 2 of this specification.
      b. Shop Drawings. Provide complete shop drawings for all systems and assemblies specified. Each drawing shall have a descriptive title and all subparts of each drawing shall be labeled.
      c. Device Layout. Provide complete CAD-generated, 1/8" scale drawings detailing the location of all device plates and device locations. Show all connectors, mounting devices and engraving detail on these drawings.
      d. Device Locations: Complete CAD generated, 1/8" scale building floor plan detailing installation locations of all equipment, such as existing MDF/IDF location, door access devices and intercom/video entry device.
      e. System Diagrams. Provide detailed one-line drawings of the cabling system. Each system drawing shall detail cable routing and cable types. Each drawing shall show proposed (and eventually as built) circuit numbers for all cables and terminal connections. Provide typical wiring termination details for all devices.
      f. Details and descriptions of any other aspect of the system which differ from the contract drawings due to field conditions or due to the equipment furnished.
      g. Submittal as otherwise noted on the drawings and/or as noted herein.
      h. Approved shop drawings shall be present at the job site during the period set aside for system testing.

B. At project completion, the following shall be provided.
   1. As-Builts. Prior to final acceptance, provide three complete sets of drawings and one (1) electronic copy of CD-Rom showing all cable identifiers and construction details in accordance with the actual system installation. Revise all shop drawings to represent actual installation conditions.
2. Test Reports. Prior to final acceptance, provide three complete sets of data test reports for copper cabling. The test reports shall indicate the cable number referenced on the as-built drawing, the technician’s name, and the date of the test.

3. System Warranty. Prior to final acceptance, provide a factory issued system warranty statement to the Architect/Owner. Final payment will not be made until the system warranty has been delivered and the system meets the complete satisfaction of the Architect/Owner.

1.6 CONTRACTOR QUALIFICATIONS

A. The CDS Contractor must have at least one project manager and two technicians trained and certified for the fiber and copper hardware to be installed. The CDS Contractor shall be authorized to provide a minimum 15-year system warranty offered by the manufacturer. The CDS Contractor shall provide proof of performance on at least three projects of similar size and scope. The proof of performance information shall include a brief description of the project, location, and point of contact for the three projects referenced. Furnish proof of performance information and factory certifications with the submittal.

B. The DDS Contractor shall demonstrate to the satisfaction of the Architect/Owner that it has:
   1. The plant and equipment to pursue and complete the work satisfactorily and expeditiously.
   2. Adequate staff and technical experience to implement the work.
   3. Technically capable service personnel at a local service facility to provide routine and emergency service for all products used in the project.

C. The DDS Contractor shall be bondable and hold a Class A Contractors License which is accepted as valid within the State of Virginia.

D. The DDS Contractor shall be manufacturer certified. Submit manufacturer’s certifications for review.

E. Any contractor, who intends to bid on this work and does not meet the requirements of the "Contractor Qualifications" listed above, shall employ the services of a "CDS Contractor" who does meet the requirements and who shall furnish the equipment, make all connections to equipment and equipment’s racks, make all connections to wall plates and panels, and continuously supervise the installation and connections of all system cable and equipment. A subcontractor so employed as the "CDS Contractor" shall be acceptable to the Architect/Owner and shall be identified in the submittal.

1.7 QUALITY ASSURANCE

A. All equipment and materials required for installation under these specifications shall be new and less than one year from date of manufacture. Said equipment shall be without blemish or otherwise known as "factory seconds".

B. Each major component of equipment shall have the Manufacturer's name, address, and
model number on a plate securely affixed in a conspicuous place. NEMA code ratings, UL label, and other data which is die-stamped into the surface of the equipment shall be easily visible.

C. Substitutions
1. Substitutions are not permitted.

1.8 TECHNICAL REFERENCES


C. EIA/TIA-569A. "Commercial Building Standard for Telecommunications Pathways and Spaces."


F. IEEE 802.3 "Carrier Sense Multiple Access With Collision Detection."


PART 2 – PRODUCTS

2.1 SINGLE SOURCE RESPONSIBILITY

A. Except where specifically noted otherwise, all equipment supplied for Intercom/Video Entry distribution system shall be standard product of a single manufacturer of known reputation and experience in the industry. The Contractor shall have attended the manufacturer’s installation and service schools. Certificates of this training shall be provided with the Contractor’s submittal.

2.2 INTERCOM-VIDEO ENTRY INFRASTRUCTURE (TWISTED PAIR CABLE) (SECURITY)

A. Aiphone Communication System Cabling shall be four pair, unshielded twisted pair (UTP) purple jacket (security) shall meet EIA/TIA-568, TSB-36 requirements for CAT 6. Twisted pair cable shall meet the following minimum specifications:
1. Conductors: 24 AWG solid copper, 4 pair.
2. DC Resistance: 9.38V/100M maximum at 20 degrees C.
3. Mutual Capacitance: 330 pF/100M nominal at 0.001 MHz.
4. Attenuation (per 100M):
   a. 2.0 dB at 1 MHz
   b. 3.8 dB at 4 MHz
ACCESS CONTROL SYSTEM CABLELING

27 10 00 - 5

SECURITY VESTIBULE PROJECT - 18061.07 APN
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BID 39-1920

c. 6.0 dB at 10 MHz
d. 7.6 dB at 16 MHz
e. 8.5 dB at 20 MHz
f. 15.4 dB at 62.5 MHz
g. 19.8 dB at 100 MHz
h. 29.0 dB at 200 MHz
i. 39.8 dB at 250 MHz

B. Provide one "homerun" 4UTP CAT 6 cable between each device (coordinate with Div. 28 specifications) shown on the drawings and the nearest existing IDF/MDF Closet. A data station outlet containing multiple data ports shall not be considered as one port. In-field splicing of UTP cables shall not be permitted.
1. 4UTP CAT 6 cables shall not exceed 90 meters from the data outlet port to the nearest existing IDF/MDF closet.
2. The 2014 National Electric Code Article 800 Type CMP specification shall be considered when cables are installed, without benefit of adequate raceway, in a plenum air return.
3. Provide Cat 6 for Aiphone Intercom/Video Entry and master stations.

C. The 2014 National Electric Code Article 800 Type CMP specification shall be considered when UTP cables are installed, without benefit of adequate raceway, in a plenum air return.

2.3 INTERCOM/VIDEO ENTRY SYSTEM OUTLET

A. Face plates
1. Intercom/Video Entry station outlets shall be provided as indicated on the drawings and shall be capable of the following minimum specifications:
   a. Single gang, plastic construction.
   b. Configurable to accept up to six individual data ports.
   c. Inserts shall snap in and out from the front of the Station Outlet.
   d. Provide space for permanent labeling of the port and outlet with pressure-sensitive, icon labels.
   e. Shall accept blank insert and modules.

B. Inserts
1. Entry station outlet inserts shall meet the following minimum specifications:
   a. RJ-45 type rated for CAT 6 cable and purple in color for security.
   b. RJ-45 insert shall be configured to EIA-568A wiring standard.
   c. Attenuation through the RJ-45 port at 10/16 MHz shall be less than .015/.025 dB.
   d. Provide 110 style IDC terminations for all four pairs of a UTP cable.
   e. Blank inserts shall be provided for all positions not occupied by a device insert and shall be ivory in color.

C. Station Patch Cables
1. Provide a ten feet CAT 6 patch cable for every installed data station port in the system. These cables shall be “tie-wrapped” and turned over to the Owner as a
part of project closeout.

2.4 PATCH PANELS

A. 4UTP CAT 6 Cable for Access Control and Entry Station.
   1. DDS shall coordinate connection to existing patch panel space for new network cabling drops at existing IDF/MDF racks. Field verify prior to bid termination availability in existing racks for new cables. If ports are not available in existing patch panels, the DDS shall notify Owner’s representative of required quantities and locations.

2.5 ACCESS CONTROL CABLING

A. Provide plenum rated communication cabling between access control devices. Cabling shall be sized/selected based on distance and control function between devices. Refer to Specification 28 10 00 for Access Control System description. Verify cabling requirements with existing Access Control System and new devices.
   1. Provide 18/6 twisted pair shielded between card reader and access control point.
   2. Provide 18/2 twisted pair cabling between electronic latch and magnetic door contact (door monitor).
   3. Provide Trunk-Line able to access control remote panels.

2.6 MISCELLANEOUS

A. CAT 6 station cabling, and communication will be run above T-Bar suspended ceilings. Temporarily remove ceiling tiles as needed to install network cabling and avoid damage. Re-install tiles. Cables outside of the cable tray shall be run at right angles with the building structure in J-hooks or bridle rings and well clear of any light fixtures or other electrical appliances. Diagonal crossings are unacceptable.

B. Loops shall be provided above the ceiling at each security devices location.

C. Cabling color coding shall be in compliance with ANSI/TIA/EIA-606.

D. Provide each master intercom/video station outlet and 18” with 10’-0” long (outlet-to-handset), blue color data(s) with RJ-45 male connectors on each end.

PART 3 - EXECUTION

3.1 GENERAL

A. Perform the work in accordance with acknowledged industry and professional standards and practices, existing buildings’ network configuration and the procedures specified herein.

B. Furnish and install all materials, devices, components, and equipment for complete operational systems.

C. Maintain a competent supervisor and supporting technical personnel, acceptable to the Owner, during the entire installation.
D. Coordinate all efforts with those of related trades. In the event of any conflicts, delayed or improper preparatory work by others, notify the Owner. The Owner's decision shall be binding. Verify all field conditions.

E. The DDS Contractor shall be factory certified by the manufacturer of the passive, data connectivity components to be installed on this project.

3.2 INSTALLATION OF SYSTEMS

A. Locate all apparatus requiring adjustments, cleaning, or similar attention so that it shall be accessible for such attention. Equipment racks shall be positioned to permit full access for operation and service.

B. Blank and Custom Panels: Finish of blank panels and custom assembly panels shall match adjacent equipment panels as closely as possible.

C. Environment: The equipment must be designed to operate in environments of normal humidity, dust, and temperature. Protect equipment and related wiring during installation where extreme environmental conditions can occur.

D. The DDS Contractor shall be responsible for reviewing and coordinating conduit and rough-in installation for the DDS system with the Division 26 Prime Contractor.

3.3 ELECTRICAL POWER

A. Grounding: Review and coordinate electrical power system installation including grounding, with the Division 26 Contractor to ensure proper operation of the system.

B. Verification: Verify that all AC power circuits designated for the system are properly wired, phased, and grounded. Report in writing any discrepancies found to the Division 26 contractor for corrective action.

3.4 CLEANING

A. Clean all junction and terminal box interiors thoroughly before installing plates, panels, or covers.

B. Clean all equipment and rack interiors of dirt, dust, and debris before final acceptance of the systems.

3.5 WIRING METHODS & PRACTICES

A. Identification: All wires shall be permanently identified at each wire end by marking with self-laminating cable markers by Brady or equivalent.

B. Splicing: Splicing of cables shall not be permitted between terminations at the wall plate and the IDF/MDF location.
C. Pulling Cable: Do not bend conductors to less than recommended radius. Do not exceed the pulling tension specified by the manufacturer. Employ temporary guides, sheaves, rollers, and other necessary items to protect cables from excess tension, abrasion, or damaging bending during installation.

D. Wiring Harnesses: Harnessed cables shall be formed in either a vertical or horizontal relationship to equipment, controls, components, or terminations. Cables shall be “combed” for a neat appearance.

E. Cable Tie: In a neat and orderly manner all cables in enclosures and boxes, wireways and wiring troughs, providing circuit and conductor identification, tie as required using plenum rated T7B “Ty-Raps” or equal of appropriate size and type. Limit spacing between ties to 6” provide circuit number and identification.

F. Service Loops: provide ample service loops at each terminator so that plates, panels and equipment can be demanded for service and inspection.

3.6 EQUIPMENT INSTALLATION

A. Equipment Location: Placement of equipment should be for maximum operator convenience. Verify any changes in placement prior to assembly. All system components and related wiring shall be located with due regard for the minimization of induced electromagnetic and electrostatic noise, for the minimization of wiring length, for proper ventilation, and to provide reasonable safety and convenience for the operator.

B. Identification: All rack mounted equipment for the system shall be clearly and logically labeled as to their function, circuit, or system as appropriate. Labeling on manufactured equipment shall be engraved plastic laminate with white lettering on black or dark background that is similar to panel finish.

3.7 ACCEPTANCE TESTING AND DOCUMENTATION

A. Contractor shall test each pair of each twisted-pair CAT6 cable. The Owner reserves the right to have a representative present during all or a portion of the testing process. If the Owner elects to be present during testing, test results will only be acceptable when conducted in the presence of the Owner.

1. CAT 6: Each CAT 6 cable shall be tested from the patch panel to the data outlet.
   a. Testing shall conform to TIA/EIA TSB-67 transmission performance specifications for field testing of unshielded twisted cabling systems and ANSI/TIA/EIA – 568A-1, propagation delay and delay skew specifications for 100 OHM 4-pair cable.
   b. Tests required shall be Signal Attenuation, Noise, Near End Cross-talk, Cable Length, DC loop back resistance and pair-by-pair continuity.
   c. Test Criteria: The system shall be tested to Category 5 Level II compliance.

B. Retainage will not be released until System Documentation Manuals have been received
and meet the satisfaction of the Architect/Owner

3.8 SYSTEM DOCUMENTATION

A. Prior to final acceptance, submit to the Architect, three copies of the system documentation. These manuals shall be used during the final acceptance testing of the system. Each manual shall contain the following information:
   1. As built drawings.
   2. Data test reports.
   3. Manufacturer issued system warranty
      Provide one hard copy and one (thumb drive) compatible with Microsoft Office Excel for these results.

3.9 WARRANTY

A. The Cabling System shall meet the performance requirements of the ANSI/TIA/EIA-568-A standard (Annex E) and TIA/EIA Telecommunications Systems Bulletin 67. The warranty on the material, services, and operation of the cabling system to this specification must be for a period of at least 15 years. The connecting hardware shall have a lifetime extended warranty against defects in material and workmanship.

B. The warranty must include the following statements regarding the cabling system: "will support and conform to TIA/EIA-568-A specifications covering ANY CURRENT OR FUTURE APPLICATION which supports transmission over a properly constructed horizontal cabling system premises network which meets the channel and/or basic link performance as described in TIA/EIA-568-A Annex E and TIA/EIA TSB-67." “Will be free from defects in material or faulty workmanship."

C. The Contractor shall provide warranty service within eight (8) hours, after notification by the Owner or his representative, between the hours of 8:00 a.m. to 5:00 p.m. from Monday through Friday. Service Request forms shall be supplied to the Owner and the faxing or mailing of such a request form shall constitute notification by the Owner of a service request.

D. The ACS Contractor shall guarantee all components and labor of the work defined in this specification for a period of one year after final acceptance by the Owner.

END OF SECTION 27 10 00
SECTION 28 10 00
ACCESS CONTROL
SYSTEM
SPECIFICATIONS AND INSTALLATION GUIDELINES

28.10.00 SUMMARY
28.10.11 This specification document contains requirements on the access control system. Full and proper installation as specified is required.
Access control panels
Access control readers
User credentials
Intercom
All System Cabling directly related to ACS Install per Div. 27 Requirements
i. Cat 6
ii. Communication Cable
iii. Patch Cables
iv. Termination
v. UL Rated 110 VAC NEMA 5-15 x 6’ 16 GA Power Supply Cord

28.11.00 RELATED SPECIFICATIONS
27 00 00 Communications
27 15 00 Communications Horizontal Cabling
27 20 00 Data Communications

28.12.00 REFERENCES
28.12.11 Abbreviations
ACS: Access Control System
LAN: Local Area Network
REST API: Representational State Transfer Application Programming Interface
SSO: Single Sign-On
VPN: Virtual Private Network
28.12.12 Definitions
Credential: a token presented to a reader to gain access to an entry. Encompasses smart cards, fobs, and mobile phones.
Entrance: a door, gate, or turnstile secured with a reader.
Entrance State: Determines whether an entrance is locked or unlocked and defines what types of credentials and trigger methods are valid.
Remote Unlock: a feature that lets users unlock an entry without needing to be in range.
28.12.13 Reference Standards
Federal Communications Commission (FCC)
28.13.00 ACCESS CONTROL CONTRACTOR REQUIREMENTS

28.13.11 The access control contractor shall be responsible for coordinating the installation of all building electronic security devices. He/she shall meet the following minimum qualifications:
- Possess all applicable contractor’s licenses.
- The access control contractor personnel performing work shall be supervised by a person who has successfully installed similar systems by the same equipment manufacturers at five (5) locations.

28.13.12 All work shall be in accordance with acknowledged industry and professional standards and practices, existing building conditions, and as specified in this document.

28.13.13 Provide a complete working installation of all devices with all necessary equipment in proper operating condition. Documents do not purport to show or list every item to be provided. When an item not shown or listed is clearly necessary for proper installation and operation of the equipment and systems, provide, install and test/certify the item at no increase to the contract price.

28.13.14 The access control contractor shall maintain a competent supervisor and supporting technical personnel, acceptable to Kisi, during the entire installation. A personnel change of the supervisor during the project shall not be acceptable without prior written approval from client.

28.13.15 The Access Control Contractor shall provide all required cables, cable support materials, conduits, connectors, and mounting hardware (etc.) for a completely functional/operational system.

28.13.16 This Specification contains a combination of prescriptive and performance requirements. The access control contractor is responsible for fully implementing the functions described in the specifications. This will require the security contractor to select system components, integrate system functions, and integrate the various security systems with each other.
28.14.00 QUALITY ASSURANCE

28.14.11 Where applicable, all equipment supplied by the access control contractor shall be listed by a nationally recognized testing laboratory.

28.14.12 All equipment and accessories to be the product of a manufacturer regularly engaged in its manufacture.

28.14.13 All items shall be of the latest technology; no discontinued models or products are acceptable.

28.14.14 No ‘beta test’ products will be accepted.

28.14.15 The manufacturer, or their authorized representative, shall confirm that within 100 miles of the Project site there is an established agency which:
Stocks a full complement of parts.
Offers service during normal working hours as well as (24/7) emergency service on all equipment to be furnished.
Will supply parts and service without delay and at reasonable cost, as approved by Kisi.

28.14.16 The Access Control Contractor shall be capable of performing service or maintenance work on the specified or accepted systems. Access Control Contractor shall be factory certified where such certification is available.

28.15.00 SUBMITTALS

28.15.11 Submittals shall be provided for review and acceptance by client’s representative prior to commencement of the work. Specific products have been mandated in the specification. When the specified product is provided by the access control contractor, only the detailed bill of material need be provided.

28.15.12 All access control submittals shall be complete and in a similar format for ease of review. Client reserves the right to reject any submittals determined to be incomplete.

28.15.13 Informational Submittals

Product Data

i. Data sheets for all products, excluding those specifically requested in this document.

ii. Catalog references for all equipment supplied indicating UL Listings for all products excluding those specifically requested.

iii. Installation methods employed by the access control contractor.

iv. Rated capacities.

v. Operating instructions for all products.

vi. Component power requirements for all products.

Wiring Diagrams and Shop Drawings

Network Requirements and Settings
28.15.14 Closeout Submittals
Warranty documentation (specified in next section).
Test reports on all working parts (specified in the last section of document).
Installed asset listing.
Device settings.

28.16.00 WARRANTY
28.16.11 Installation, equipment, and all parts and labor shall be guaranteed by access control contractor and manufacturer for at least one year from written notification of acceptance by client.

28.16.12 The installing access control contractor shall provide, upon notification of any problem, a field service technician to correct the problem within 24 hours of notification at no cost to client.

28.16.13 At least 60 days prior to expiration of guarantee, contractor shall provide maintenance contract proposals for an additional year of service for each system to client.

28.13.0 Access Control Software and Database Management:
28.13.11 Reference Only, CPS currently has system installed
Access Control Software shall be Access Control System shall be **Access It! Universal.NET from RS2 Technologies LLC** no substitutions shall be acceptable. The ACS shall use a single seamlessly integrated Microsoft SQL relational database for all functions utilizing a fully multi-tasking multi-threading Microsoft Windows operating system.

28.14.00 Access Control System Hardware
Refer to Site Specific Parts List Section 28.17.00
To be connected to existing City Wide RS2 Server
28.14.11 The ACS shall communicate with, monitor, and use open architecture System Control Processor (SCPs), which shall support 64 controlled openings per, EP – 1502, EP – 2500, EP – 4502 EP-4502 with Auxiliary Authentication Module (AAM), the Lp4502, LP2500, LP1502, LP1501 SCPs. The EP – 1501 and LP-1501 (SCP) shall support a total of 17 openings. The ACS shall be capable of communicating with a minimum of 1,000 SCPs concurrently for a minimum of 64,000 controlled openings. The ACS shall not employ reader licenses which limit the number of Readers the ACS shall control. The ACS shall be capable of communicating with the SCPs using Hardwire (direct RS-232, or RS-485), Dialup modem using POTS (Plain Old Telephone system), and TCP/IP network communications. Each SCP shall be capable of maintaining in its memory a Real-time
clock, 256 Holidays, 128 TimeZones each having 12 start\stop Time Intervals, 32,000 Access Levels, 256 Tasks (predefined routines with 256 steps per Task), 16 Card Formats (up to 19 digit card codes, 16 Facility (Site) codes, supports Open Supervised Device Protocol (OSDP) multi-drop support with series 3 Mercury hardware, supports Anti-Passback (areas, hard, soft, timed, nested), occupancy count rules, device configurations for the devices (Readers, Inputs, Outputs) controlled by the SCP, and a minimum of 50,000 event transactions if the SCP is unable to communicate to the ACS, the SCP stores Card numbers for entry decisions.

28.14.13 System Input Output (SIO), Reader Interface Modules (RIM), such as the MR-50 single (opening) reader interface, MR-52 dual opening or single opening with in\out reader interface control, and MR-51E single opening control supports dual readers for IN\OUT control or the Series 3 MR-50, MR-52, MR-62e.

28.15.00 Access Control Credential Reading Devices and Credentials:

28.15.11 HID multiCLASS SE®
125 kHz contactless cards supported
HID Prox®, Indala® Prox, Dorado® Prox, and EM Prox legacy contactless credentials
13.56 MHz contactless smart cards supported
iCLASS Seos®, iCLASS SE, iCLASS®, MIFARE® Classic, and MIFARE DESFire®EV1 Protocol
Open Supervised Device Protocol (OSDP) mode
Wiegand or Clock & Data modes

28.16.00 Intercom System Aiphone IX Series (No Substitution)

SYSTEM DESIGN Refer to Site Specific Parts List Section 28.17.00

1. Master Station(s): Connect Audio Door Station to existing master station

2. Audio Only Door Stations:
a. Model IX-BA (Surface Mount): Provide 2
b. Units to have speakers disabled and to be mounted in MDF/IDF in near proximity to RS2 ACS Controllers for the new or retrofitted Openings
c. Connect Stations to CPS assigned Network POE Switch Port.

3. Master Station to be programmed to connect to Door Station using the “Speed Dial” keys.

5. Contact output at door station to utilized as follows
a. Contact NO to be connected to a Programmable Input on RS2 Controller controlling the assigned Opening.
b. When contact closes due to a command from the Master Station it will trigger an access granted command in the RS2 system for the assigned Opening.
c. Site Specific Parts Lists

### Great Bridge High School

<table>
<thead>
<tr>
<th>OPENING</th>
<th>MAN</th>
<th>PART NO.</th>
<th>CT</th>
<th>DESCRIPTION</th>
<th>NOTES</th>
</tr>
</thead>
<tbody>
<tr>
<td>102D, 101E</td>
<td>RS2</td>
<td>LP-1501</td>
<td>1</td>
<td>Two Portal Intelligent System Controller</td>
<td>Installed in Power Supply/Enclosure</td>
</tr>
<tr>
<td>Entry</td>
<td>RS2</td>
<td>MR-52-S3</td>
<td>1</td>
<td>Two portal four reader SIO with reader interface</td>
<td>Installed in Power Supply/Enclosure</td>
</tr>
<tr>
<td>Entry</td>
<td>HID</td>
<td>920PT</td>
<td>1</td>
<td>multiCLASS SE RP40 Wall Switch form factor reader</td>
<td>Surface Install near existing Door Station</td>
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<tr>
<td>101E</td>
<td>HID</td>
<td>910PT</td>
<td>1</td>
<td>multiCLASS SE RP15 Mullion Mount reader</td>
<td>Mount on Strike Side Mullion @ 43” C/L</td>
</tr>
<tr>
<td>102D</td>
<td>HID</td>
<td>920PT</td>
<td>1</td>
<td>multiCLASS SE RP40 Wall Switch form factor reader</td>
<td>Mount on Door inline above Exit Device Trim</td>
</tr>
<tr>
<td>102D, 101E</td>
<td>Aiphone</td>
<td>IX-BA</td>
<td>2</td>
<td>Audio Only Door Station</td>
<td>Locate in G41</td>
</tr>
<tr>
<td></td>
<td>RS2</td>
<td>FPO150-B100C8D8PE6M</td>
<td>1</td>
<td>Life Safety Power Supply Enclosure</td>
<td>Locate in G41 Use existing 110vac Outlet near existing rack</td>
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### Grassfield High School

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<tr>
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<th>CT</th>
<th>DESCRIPTION</th>
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<tr>
<td>105, 101D &amp; 102</td>
<td>RS2</td>
<td>MR-52-S3</td>
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<td>Two portal four reader SIO with reader interface</td>
<td>Installed in Power Supply/Enclosure. RS485 Connection to existing SIO</td>
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<td>101D</td>
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<td>1</td>
<td>multiCLASS SE RP40 Wall Switch form factor reader</td>
<td>Mount on Door inline above Exit Device Trim</td>
</tr>
<tr>
<td>102D</td>
<td>HID</td>
<td>910PT</td>
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<td>105D</td>
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<td>multiCLASS SE RP40 Mullion Mount reader</td>
<td>Mount on Strike Side Mullion @ 43” C/L</td>
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<td>105, 101D &amp; 102</td>
<td>Aiphone</td>
<td>IX-BA</td>
<td>3</td>
<td>Audio Only Door Station</td>
<td>Locate in 103</td>
</tr>
<tr>
<td></td>
<td>RS2</td>
<td>NCL-KIT-A</td>
<td>1</td>
<td>NCL Assembled Package – 18-gauge steel hardware enclosure 18”(H) x 15”(W) x 4”(D)</td>
<td>Locate in 103 Use existing 110vac Outlet near existing rack</td>
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### Hickory High School

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<tr>
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<th>PART NO.</th>
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<tr>
<td>101A, 101C</td>
<td>RS2</td>
<td>LP-1501</td>
<td>1</td>
<td>Two Portal Intelligent System Controller</td>
<td>Installed in Power Supply/Enclosure</td>
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<tr>
<td>Entry</td>
<td>RS2</td>
<td>MR-52-S3</td>
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<td>Two portal four reader SIO with reader interface</td>
<td>Installed in Power Supply/Enclosure</td>
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<tr>
<td>Entry</td>
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<td>Mount on Strike Side Mullion @ 43&quot; C/L</td>
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<tr>
<td>101C</td>
<td>HID</td>
<td>910PT</td>
<td>1</td>
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<td>Mount on Hinge Side Mullion @ 43&quot; C/L</td>
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<tr>
<td>101A, 101C</td>
<td>Aiphone</td>
<td>IX-BA</td>
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<td>Audio Only Door Station</td>
<td>Locate in IDF C142A</td>
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<tr>
<td>RS2</td>
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<td>FPO150-B100C8D8PE6M</td>
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<td>Life Safety Power Supply Enclosure</td>
<td>Locate in IDF C142A Use existing 110vac Outlet near existing rack</td>
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### Oscar Smith High School

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<th>PART NO.</th>
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<th>DESCRIPTION</th>
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<tbody>
<tr>
<td>Entry, 101</td>
<td>RS2</td>
<td>MR-52-S3</td>
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<td>Two portal four reader SIO with reader interface</td>
<td>Installed in Power Supply/Enclosure. RS485 Connection to existing SIO</td>
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<td>Entry</td>
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<td>HID</td>
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<td>1</td>
<td>multiCLASS SE RP15 Mullion Mount reader</td>
<td>Mount on Hinge Side Mullion @ 43&quot; C/L</td>
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<tr>
<td>101</td>
<td>Aiphone</td>
<td>IX-BA</td>
<td>1</td>
<td>Audio Only Door Station</td>
<td>Locate in Server Area</td>
</tr>
<tr>
<td>RS2</td>
<td></td>
<td>NCL-KIT-A</td>
<td>1</td>
<td>NCL Assembled Package – 18-gauge steel hardware enclosure 18&quot;(H) x 15&quot;(W) x 4&quot;(D)</td>
<td>Locate in Server Area Use existing 110vac Outlet near existing rack</td>
</tr>
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END OF SECTION 281000