# TABLE OF CONTENTS

## VOLUME 1

### DIVISION 00 - PROCUREMENT AND CONTRACTING REQUIREMENTS

<table>
<thead>
<tr>
<th>Code</th>
<th>Description</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>00 00 01</td>
<td>SEALS AND SIGNATURES</td>
<td>2</td>
</tr>
<tr>
<td>00 01 02</td>
<td>PROJECT INFORMATION</td>
<td>2</td>
</tr>
<tr>
<td>00 11 10</td>
<td>NOTICE OF HEARING</td>
<td>2</td>
</tr>
<tr>
<td>00 11 13</td>
<td>NOTICE TO BIDDERS</td>
<td>2</td>
</tr>
<tr>
<td>00 21 13</td>
<td>INSTRUCTIONS TO BIDDERS</td>
<td>2</td>
</tr>
<tr>
<td>00 22 13</td>
<td>SUPPLEMENTARY INSTRUCTIONS TO BIDDERS</td>
<td>4</td>
</tr>
<tr>
<td>00 22 15</td>
<td>SPECIAL INSTRUCTIONS</td>
<td>2</td>
</tr>
<tr>
<td>00 31 00</td>
<td>AVAILABLE PROJECT INFORMATION</td>
<td>2</td>
</tr>
<tr>
<td></td>
<td>GEOTECHNICAL REPORT</td>
<td>43</td>
</tr>
<tr>
<td>00 41 13</td>
<td>BID FORMS</td>
<td>4</td>
</tr>
<tr>
<td>00 43 13</td>
<td>SUPPLEMENTS TO BID FORMS</td>
<td>2</td>
</tr>
<tr>
<td>00 43 25</td>
<td>SUBSTITUTION REQUEST FORM - DURING BIDDING</td>
<td>2</td>
</tr>
<tr>
<td>00 52 00</td>
<td>AGREEMENT FORM</td>
<td>2</td>
</tr>
<tr>
<td>00 61 13</td>
<td>BONDS AND CERTIFICATES</td>
<td>2</td>
</tr>
<tr>
<td>00 63 25</td>
<td>SUBSTITUTION REQUEST FORM - DURING CONSTRUCTION</td>
<td>2</td>
</tr>
<tr>
<td>00 72 00</td>
<td>GENERAL CONDITIONS</td>
<td>2</td>
</tr>
<tr>
<td>00 73 00</td>
<td>SUPPLEMENTARY CONDITIONS</td>
<td>8</td>
</tr>
<tr>
<td>00 73 10</td>
<td>SPECIAL CONDITIONS</td>
<td>2</td>
</tr>
</tbody>
</table>

### DIVISION 01 - GENERAL REQUIREMENTS

<table>
<thead>
<tr>
<th>Code</th>
<th>Description</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>01 10 00</td>
<td>SUMMARY</td>
<td>2</td>
</tr>
<tr>
<td>01 20 00</td>
<td>PRICE AND PAYMENT PROCEDURES</td>
<td>6</td>
</tr>
<tr>
<td>01 22 00</td>
<td>UNIT PRICES</td>
<td>2</td>
</tr>
<tr>
<td>01 23 00</td>
<td>ALTERNATES</td>
<td>2</td>
</tr>
<tr>
<td>01 25 00</td>
<td>SUBSTITUTION PROCEDURES</td>
<td>2</td>
</tr>
<tr>
<td>01 30 00</td>
<td>ADMINISTRATIVE REQUIREMENTS</td>
<td>10</td>
</tr>
<tr>
<td></td>
<td>TERMS AND CONDITIONS FOR USE OF ELECTRONIC FILES</td>
<td>1</td>
</tr>
<tr>
<td>01 32 16</td>
<td>CONSTRUCTION PROGRESS SCHEDULE</td>
<td>4</td>
</tr>
<tr>
<td>01 40 00</td>
<td>QUALITY REQUIREMENTS</td>
<td>4</td>
</tr>
<tr>
<td>01 42 16</td>
<td>DEFINITIONS</td>
<td>2</td>
</tr>
<tr>
<td>01 45 40</td>
<td>MOCK-UP REQUIREMENTS</td>
<td>4</td>
</tr>
<tr>
<td>01 50 00</td>
<td>TEMPORARY FACILITIES AND CONTROLS</td>
<td>6</td>
</tr>
<tr>
<td>01 60 00</td>
<td>PRODUCT REQUIREMENTS</td>
<td>4</td>
</tr>
<tr>
<td>01 70 00</td>
<td>EXECUTION AND CLOSEOUT REQUIREMENTS</td>
<td>12</td>
</tr>
<tr>
<td>01 78 00</td>
<td>CLOSEOUT SUBMITTALS</td>
<td>4</td>
</tr>
<tr>
<td>01 79 00</td>
<td>DEMONSTRATION AND TRAINING</td>
<td>2</td>
</tr>
</tbody>
</table>

### DIVISION 03 – CONCRETE

<table>
<thead>
<tr>
<th>Code</th>
<th>Description</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>03 30 00</td>
<td>CAST-IN-PLACE CONCRETE</td>
<td>7</td>
</tr>
</tbody>
</table>

### DIVISION 04 – MASONRY

<table>
<thead>
<tr>
<th>Code</th>
<th>Description</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>04 20 00</td>
<td>UNIT MASONRY ASSEMBLIES</td>
<td>6</td>
</tr>
</tbody>
</table>
### DIVISION 05 - METALS

<table>
<thead>
<tr>
<th>Code</th>
<th>Description</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>05 12 00</td>
<td>STRUCTURAL STEEL FRAMING</td>
<td>4</td>
</tr>
<tr>
<td>05 31 00</td>
<td>STEEL DECKING</td>
<td>3</td>
</tr>
<tr>
<td>05 40 00</td>
<td>COLD-FORMED METAL FRAMING</td>
<td>5</td>
</tr>
<tr>
<td>05 44 00</td>
<td>COLD-FORMED METAL TRUSSES</td>
<td>3</td>
</tr>
<tr>
<td>05 50 00</td>
<td>METAL FABRICATIONS</td>
<td>4</td>
</tr>
</tbody>
</table>

### DIVISION 06 - WOOD, PLASTICS, AND COMPOSITES

<table>
<thead>
<tr>
<th>Code</th>
<th>Description</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>06 10 00</td>
<td>ROUGH CARPENTRY</td>
<td>4</td>
</tr>
<tr>
<td>06 20 00</td>
<td>FINISH CARPENTRY</td>
<td>2</td>
</tr>
<tr>
<td>06 41 00</td>
<td>ARCHITECTURAL WOOD CASEWORK</td>
<td>6</td>
</tr>
<tr>
<td>06 64 01</td>
<td>FIBER-REINFORCED LAMINATES</td>
<td>2</td>
</tr>
</tbody>
</table>

### DIVISION 07 - THERMAL AND MOISTURE PROTECTION

<table>
<thead>
<tr>
<th>Code</th>
<th>Description</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>07 05 33</td>
<td>FIRE AND SMOKE ASSEMBLY IDENTIFICATION</td>
<td>2</td>
</tr>
<tr>
<td>07 14 00</td>
<td>FLUID-APPLIED WATERPROOFING</td>
<td>4</td>
</tr>
<tr>
<td>07 21 00</td>
<td>THERMAL INSULATION</td>
<td>2</td>
</tr>
<tr>
<td>07 25 00</td>
<td>WEATHER BARRIERS</td>
<td>6</td>
</tr>
<tr>
<td>07 31 13</td>
<td>ASPHALT SHINGLES</td>
<td>4</td>
</tr>
<tr>
<td>07 41 13</td>
<td>METAL ROOF PANELS</td>
<td>6</td>
</tr>
<tr>
<td>07 42 33</td>
<td>EXTERIOR SOLID PHENOLIC RAINFOOD PANEL SYSTEM</td>
<td>6</td>
</tr>
<tr>
<td>07 46 46</td>
<td>FIBER CEMENT SIDING</td>
<td>4</td>
</tr>
<tr>
<td>07 46 49</td>
<td>POLY-ASH TRIM</td>
<td>4</td>
</tr>
<tr>
<td>07 53 00</td>
<td>ELASTOMERIC MEMBRANE ROOFING</td>
<td>8</td>
</tr>
<tr>
<td>07 62 00</td>
<td>SHEET METAL FLASHING AND TRIM</td>
<td>4</td>
</tr>
<tr>
<td>07 84 00</td>
<td>FIRESTopping</td>
<td>4</td>
</tr>
<tr>
<td>07 92 00</td>
<td>JOINT SEALANTS</td>
<td>6</td>
</tr>
</tbody>
</table>

### DIVISION 08 - OPENINGS

<table>
<thead>
<tr>
<th>Code</th>
<th>Description</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>08 11 13</td>
<td>HOLLOW METAL DOORS AND FRAMES</td>
<td>8</td>
</tr>
<tr>
<td>08 14 16</td>
<td>FLUSH WOOD DOORS</td>
<td>4</td>
</tr>
<tr>
<td>08 43 13</td>
<td>ALUMINUM-FRAMED STOREFRONTS</td>
<td>6</td>
</tr>
<tr>
<td>08 55 00</td>
<td>ALUMINUM CLAD WOOD WINDOWS</td>
<td>4</td>
</tr>
<tr>
<td>08 55 10</td>
<td>REINFORCED ALUMINUM WINDOWS WITH IMPACT GLAZING</td>
<td>6</td>
</tr>
<tr>
<td>08 71 00</td>
<td>DOOR HARDWARE</td>
<td>30</td>
</tr>
<tr>
<td>08 80 00</td>
<td>GLAZING</td>
<td>6</td>
</tr>
</tbody>
</table>

### DIVISION 09 - FINISHES

<table>
<thead>
<tr>
<th>Code</th>
<th>Description</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>09 21 16</td>
<td>GYPSUM BOARD ASSEMBLIES</td>
<td>6</td>
</tr>
<tr>
<td>09 30 00</td>
<td>TILING</td>
<td>4</td>
</tr>
<tr>
<td>09 51 00</td>
<td>ACOUSTICAL CEILINGS</td>
<td>4</td>
</tr>
<tr>
<td>09 65 00</td>
<td>RESILIENT FLOORING</td>
<td>4</td>
</tr>
<tr>
<td>09 67 14</td>
<td>FLUID APPLIED EPOXY FLOORING</td>
<td>2</td>
</tr>
<tr>
<td>09 68 13</td>
<td>TILE CARPETING</td>
<td>4</td>
</tr>
<tr>
<td>09 77 00</td>
<td>FIBERGLASS REINFORCED PANELS</td>
<td>2</td>
</tr>
<tr>
<td>09 84 30</td>
<td>SOUND-ABSORBING PANELS</td>
<td>2</td>
</tr>
<tr>
<td>09 91 13</td>
<td>EXTERIOR PAINTING</td>
<td>4</td>
</tr>
<tr>
<td>09 91 23</td>
<td>INTERIOR PAINTING</td>
<td>6</td>
</tr>
</tbody>
</table>
## DIVISION 10 - SPECIALTIES

<table>
<thead>
<tr>
<th>Code</th>
<th>Description</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>10 11 01</td>
<td>VISUAL DISPLAY BOARDS</td>
<td>2</td>
</tr>
<tr>
<td>10 14 00</td>
<td>SIGNAGE</td>
<td>2</td>
</tr>
<tr>
<td>10 21 13.19</td>
<td>SOLID COLOR REINFORCED TOILET SCREENS</td>
<td>2</td>
</tr>
<tr>
<td>10 26 01</td>
<td>CORNER GUARDS</td>
<td>2</td>
</tr>
<tr>
<td>10 28 00</td>
<td>TOILET ACCESSORIES</td>
<td>2</td>
</tr>
<tr>
<td>10 44 00</td>
<td>FIRE PROTECTION SPECIALTIES</td>
<td>2</td>
</tr>
<tr>
<td>10 75 00</td>
<td>FLAGPOLES</td>
<td>2</td>
</tr>
</tbody>
</table>

## DIVISION 11 - EQUIPMENT

<table>
<thead>
<tr>
<th>Code</th>
<th>Description</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>11 40 00</td>
<td>FOOD SERVICE EQUIPMENT</td>
<td>14</td>
</tr>
<tr>
<td>11 68 13</td>
<td>PLAYGROUND EQUIPMENT</td>
<td>8</td>
</tr>
</tbody>
</table>

## DIVISION 12 - FURNISHINGS

<table>
<thead>
<tr>
<th>Code</th>
<th>Description</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>12 24 13</td>
<td>ROLLER WINDOW SHADES</td>
<td>2</td>
</tr>
<tr>
<td>12 36 00</td>
<td>COUNTERTOPS</td>
<td>4</td>
</tr>
</tbody>
</table>

## VOLUME 2

## DIVISION 21 - FIRE SUPPRESSION

<table>
<thead>
<tr>
<th>Code</th>
<th>Description</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>21 00 10</td>
<td>FIRE SUPPRESSION GENERAL PROVISIONS</td>
<td>10</td>
</tr>
<tr>
<td>21 05 00</td>
<td>COMMON WORK RESULTS FOR FIRE SUPPRESSION</td>
<td>4</td>
</tr>
<tr>
<td>21 05 53</td>
<td>IDENTIFICATION FOR FIRE SUPPRESSION PIPING AND EQUIPMENT</td>
<td>4</td>
</tr>
<tr>
<td>21 10 00</td>
<td>WATER-BASED FIRE-SUPPRESSION SYSTEMS</td>
<td>8</td>
</tr>
</tbody>
</table>

## DIVISION 22 - PLUMBING

<table>
<thead>
<tr>
<th>Code</th>
<th>Description</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>22 00 10</td>
<td>PLUMBING GENERAL PROVISIONS</td>
<td>10</td>
</tr>
<tr>
<td>22 05 00</td>
<td>COMMON WORK RESULTS FOR PLUMBING</td>
<td>4</td>
</tr>
<tr>
<td>22 05 13</td>
<td>COMMON MOTOR REQUIREMENTS FOR PLUMBING EQUIPMENT</td>
<td>4</td>
</tr>
<tr>
<td>22 05 16</td>
<td>EXPANSION FITTINGS AND LOOPS FOR PLUMBING PIPING</td>
<td>2</td>
</tr>
<tr>
<td>22 05 19</td>
<td>METERS AND GAGES FOR PLUMBING PIPING</td>
<td>2</td>
</tr>
<tr>
<td>22 05 23</td>
<td>GENERAL DUTY VALVES FOR PLUMBING PIPING</td>
<td>4</td>
</tr>
<tr>
<td>22 05 29</td>
<td>HANGERS AND SUPPORTS FOR PLUMBING PIPING AND EQUIPMENT</td>
<td>4</td>
</tr>
<tr>
<td>22 05 48</td>
<td>VIBRATION CONTROLS FOR PLUMBING PIPING AND EQUIPMENT</td>
<td>6</td>
</tr>
<tr>
<td>22 05 53</td>
<td>IDENTIFICATION FOR PLUMBING PIPING AND EQUIPMENT</td>
<td>4</td>
</tr>
<tr>
<td>22 07 00</td>
<td>PLUMBING INSULATION</td>
<td>4</td>
</tr>
<tr>
<td>22 11 16</td>
<td>DOMESTIC WATER PIPING</td>
<td>8</td>
</tr>
<tr>
<td>22 11 23</td>
<td>DOMESTIC WATER PUMPS</td>
<td>4</td>
</tr>
<tr>
<td>22 13 16</td>
<td>SANITARY WASTE AND VENT PIPING</td>
<td>6</td>
</tr>
<tr>
<td>22 13 19</td>
<td>SANITARY WASTE PIPING SPECIALTIES</td>
<td>2</td>
</tr>
<tr>
<td>22 14 13</td>
<td>FACILITY STORM DRAINAGE PIPING</td>
<td>6</td>
</tr>
<tr>
<td>22 15 16</td>
<td>FACILITY NATURAL GAS AND COMPRESSED AIR PIPING</td>
<td>6</td>
</tr>
<tr>
<td>22 34 00</td>
<td>FUEL-FIRED DOMESTIC WATER HEATERS</td>
<td>4</td>
</tr>
<tr>
<td>22 40 00</td>
<td>PLUMBING FIXTURES</td>
<td>6</td>
</tr>
<tr>
<td>22 47 00</td>
<td>DRINKING FOUNTAINS AND WATER COOLERS</td>
<td>2</td>
</tr>
</tbody>
</table>
# TABLE OF CONTENTS

## DIVISION 23 - HEATING, VENTILATING AND AIR CONDITIONING (HVAC)

<table>
<thead>
<tr>
<th>Code</th>
<th>Description</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>23 00 10</td>
<td>HVAC GENERAL PROVISIONS</td>
<td>12</td>
</tr>
<tr>
<td>23 05 00</td>
<td>COMMON WORK RESULTS FOR HVAC</td>
<td>4</td>
</tr>
<tr>
<td>23 05 13</td>
<td>COMMON MOTOR REQUIREMENTS FOR HVAC EQUIPMENT</td>
<td>4</td>
</tr>
<tr>
<td>23 05 16</td>
<td>EXPANSION FITTINGS AND LOOPS FOR HVAC PIPING</td>
<td>2</td>
</tr>
<tr>
<td>23 05 19</td>
<td>METERS AND GAUGES FOR HVAC PIPING</td>
<td>2</td>
</tr>
<tr>
<td>23 05 23</td>
<td>GENERAL DUTY VALVES FOR HVAC PIPING</td>
<td>4</td>
</tr>
<tr>
<td>23 05 29</td>
<td>HANGERS AND SUPPORTS FOR HVAC PIPING AND EQUIPMENT</td>
<td>4</td>
</tr>
<tr>
<td>23 05 48</td>
<td>VIBRATION CONTROLS FOR HVAC PIPING AND EQUIPMENT</td>
<td>6</td>
</tr>
<tr>
<td>23 05 53</td>
<td>IDENTIFICATION FOR HVAC PIPING AND EQUIPMENT</td>
<td>4</td>
</tr>
<tr>
<td>23 05 93</td>
<td>TESTING, ADJUSTING, AND BALANCING FOR HVAC</td>
<td>8</td>
</tr>
<tr>
<td>23 07 00</td>
<td>HVAC INSULATION</td>
<td>8</td>
</tr>
<tr>
<td>23 09 00</td>
<td>BUILDING AUTOMATION SYSTEM (BAS)</td>
<td>28</td>
</tr>
<tr>
<td>23 21 13</td>
<td>HYDRONIC PIPING</td>
<td>12</td>
</tr>
<tr>
<td>23 21 23</td>
<td>HYDRONIC PUMPS</td>
<td>6</td>
</tr>
<tr>
<td>23 23 00</td>
<td>REFRIGERANT PIPING</td>
<td>4</td>
</tr>
<tr>
<td>23 31 13</td>
<td>METAL DUCTS</td>
<td>10</td>
</tr>
<tr>
<td>23 31 16</td>
<td>NONMETAL DUCTS</td>
<td>6</td>
</tr>
<tr>
<td>23 33 00</td>
<td>AIR DUCT ACCESSORIES</td>
<td>4</td>
</tr>
<tr>
<td>23 34 16</td>
<td>CENTRIFUGAL HVAC FANS</td>
<td>6</td>
</tr>
<tr>
<td>23 37 13</td>
<td>DIFFUSERS, REGISTERS, AND GRILLES</td>
<td>2</td>
</tr>
<tr>
<td>23 38 13</td>
<td>COMMERCIAL KITCHEN EXHAUST EQUIPMENT</td>
<td>4</td>
</tr>
<tr>
<td>23 52 16</td>
<td>CONDENSING BOILERS</td>
<td>4</td>
</tr>
<tr>
<td>23 62 00</td>
<td>PACKAGED COMPRESSOR AND CONDENSER UNITS</td>
<td>6</td>
</tr>
<tr>
<td>23 72 00</td>
<td>AIR TO AIR ENERGY RECOVERY EQUIPMENT</td>
<td>4</td>
</tr>
<tr>
<td>23 74 00</td>
<td>PACKAGED OUTDOOR HVAC EQUIPMENT</td>
<td>4</td>
</tr>
<tr>
<td>23 81 28</td>
<td>DUCTLESS SPLIT-SYSTEM AIR CONDITIONERS</td>
<td>6</td>
</tr>
<tr>
<td>23 82 20</td>
<td>BLOWER COIL UNITS</td>
<td>4</td>
</tr>
<tr>
<td>23 82 39</td>
<td>UNIT HEATERS</td>
<td>2</td>
</tr>
<tr>
<td>23 83 16</td>
<td>RADIANT FLOOR HEATING SYSTEM</td>
<td>4</td>
</tr>
</tbody>
</table>

## DIVISION 26 - ELECTRICAL

<table>
<thead>
<tr>
<th>Code</th>
<th>Description</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>26 00 10</td>
<td>ELECTRICAL GENERAL PROVISIONS</td>
<td>10</td>
</tr>
<tr>
<td>26 05 19</td>
<td>LOW-VOLTAGE ELECTRICAL POWER CONDUCTORS AND CABLES</td>
<td>4</td>
</tr>
<tr>
<td>26 05 26</td>
<td>GROUNDING AND BONDING FOR ELECTRICAL SYSTEMS</td>
<td>6</td>
</tr>
<tr>
<td>26 05 29</td>
<td>HANGERS AND SUPPORTS FOR ELECTRICAL SYSTEMS</td>
<td>4</td>
</tr>
<tr>
<td>26 05 33</td>
<td>RACEWAY AND BOXES FOR ELECTRICAL SYSTEMS</td>
<td>10</td>
</tr>
<tr>
<td>26 05 53</td>
<td>IDENTIFICATION FOR ELECTRICAL SYSTEMS</td>
<td>4</td>
</tr>
<tr>
<td>26 05 73</td>
<td>SHORT-CIRCUIT/COORDINATION STUDY/ARC FLASH HAZARD ANALYSIS</td>
<td>6</td>
</tr>
<tr>
<td>26 09 23</td>
<td>LIGHTING CONTROL SYSTEMS</td>
<td>8</td>
</tr>
<tr>
<td>26 24 16</td>
<td>PANELBOARDS</td>
<td>6</td>
</tr>
<tr>
<td>26 27 26</td>
<td>WIRING DEVICES</td>
<td>4</td>
</tr>
<tr>
<td>26 28 15</td>
<td>MOTOR AND SERVICE DISCONNECTS</td>
<td>2</td>
</tr>
<tr>
<td>26 28 16</td>
<td>ENCLOSED SWITCHES AND CIRCUIT BREAKERS</td>
<td>4</td>
</tr>
<tr>
<td>26 29 13</td>
<td>ENCLOSED CONTROLLERS</td>
<td>4</td>
</tr>
<tr>
<td>26 29 23</td>
<td>VARIABLE-FREQUENCY MOTOR CONTROLLERS</td>
<td>6</td>
</tr>
<tr>
<td>26 33 23</td>
<td>CENTRAL BATTERY EQUIPMENT</td>
<td>4</td>
</tr>
<tr>
<td>26 43 13</td>
<td>SURGE PROTECTIVE DEVICES FOR LOW-VOLTAGE ELECTRICAL POWER CIRCUITS</td>
<td>4</td>
</tr>
<tr>
<td>26 50 00</td>
<td>LIGHTING</td>
<td>6</td>
</tr>
</tbody>
</table>
# TABLE OF CONTENTS

<table>
<thead>
<tr>
<th>Division</th>
<th>Description</th>
<th>Pages</th>
</tr>
</thead>
<tbody>
<tr>
<td>26 82 39</td>
<td>UNIT HEATERS</td>
<td>4</td>
</tr>
</tbody>
</table>

## DIVISION 27 - TELECOMMUNICATIONS

<table>
<thead>
<tr>
<th>Code</th>
<th>Description</th>
<th>Pages</th>
</tr>
</thead>
<tbody>
<tr>
<td>27 00 10</td>
<td>TELECOMMUNICATIONS GENERAL PROVISIONS</td>
<td>12</td>
</tr>
<tr>
<td>27 05 53</td>
<td>IDENTIFICATION FOR COMMUNICATIONS SYSTEMS</td>
<td>12</td>
</tr>
<tr>
<td>27 10 00</td>
<td>TELECOMMUNICATIONS GROUNDING AND BONDING</td>
<td>4</td>
</tr>
<tr>
<td>27 11 00</td>
<td>TELECOMMUNICATIONS CABLING AND EQUIPMENT</td>
<td>8</td>
</tr>
<tr>
<td>27 12 00</td>
<td>TELECOMMUNICATIONS TESTING AND DOCUMENTATION</td>
<td>4</td>
</tr>
<tr>
<td>27 40 00</td>
<td>AUDIOVISUAL SYSTEM</td>
<td>4</td>
</tr>
<tr>
<td>27 50 00</td>
<td>INTERCOM SYSTEM</td>
<td>4</td>
</tr>
<tr>
<td>27 6000</td>
<td>SCHOOL CLOCK SYSTEM</td>
<td>2</td>
</tr>
</tbody>
</table>

## DIVISION 28 – ELECTRONIC SAFETY AND SECURITY

<table>
<thead>
<tr>
<th>Code</th>
<th>Description</th>
<th>Pages</th>
</tr>
</thead>
<tbody>
<tr>
<td>28 00 10</td>
<td>ELECTRONIC SAFETY AND SECURITY GENERAL PROVISIONS</td>
<td>8</td>
</tr>
<tr>
<td>28 31 00</td>
<td>FIRE ALARM AND DETECTION SYSTEM (ADDRESSABLE)</td>
<td>18</td>
</tr>
<tr>
<td>28 50 00</td>
<td>ACCESS CONTROL SYSTEM</td>
<td>4</td>
</tr>
<tr>
<td>28 60 00</td>
<td>VIDEO SURVEILLANCE</td>
<td>4</td>
</tr>
</tbody>
</table>

## DIVISION 31 – EARTHWORK

<table>
<thead>
<tr>
<th>Code</th>
<th>Description</th>
<th>Pages</th>
</tr>
</thead>
<tbody>
<tr>
<td>31 10 00</td>
<td>SITE CLEARING</td>
<td>5</td>
</tr>
<tr>
<td>31 20 00</td>
<td>EARTH MOVING</td>
<td>7</td>
</tr>
<tr>
<td>31 22 00</td>
<td>GRADING</td>
<td>2</td>
</tr>
<tr>
<td>31 23 23</td>
<td>FILL</td>
<td>5</td>
</tr>
<tr>
<td>31 23 33</td>
<td>TRENCHING AND BACKFILLING</td>
<td>4</td>
</tr>
</tbody>
</table>

## DIVISION 32 - EXTERIOR IMPROVEMENTS

<table>
<thead>
<tr>
<th>Code</th>
<th>Description</th>
<th>Pages</th>
</tr>
</thead>
<tbody>
<tr>
<td>32 11 23</td>
<td>AGGREGATE BASE COURSES</td>
<td>3</td>
</tr>
<tr>
<td>32 12 16</td>
<td>HOT MIX ASPHALT PAVEMENT</td>
<td>14</td>
</tr>
<tr>
<td>32 13 13</td>
<td>CONCRETE PAVING</td>
<td>17</td>
</tr>
<tr>
<td>32 17 23.13</td>
<td>PAINTED PAVEMENT MARKINGS</td>
<td>2</td>
</tr>
<tr>
<td>32 18 16.13</td>
<td>PLAYGROUND PROTECTIVE SURFACING</td>
<td>6</td>
</tr>
<tr>
<td>32 31 16</td>
<td>WELDED WIRE FENCES AND GATES</td>
<td>4</td>
</tr>
<tr>
<td>32 92 19</td>
<td>LAWN SEEDING</td>
<td>4</td>
</tr>
<tr>
<td>32 92 23</td>
<td>SODDING</td>
<td>4</td>
</tr>
<tr>
<td>32 93 00</td>
<td>PLANTS</td>
<td>4</td>
</tr>
</tbody>
</table>

## DIVISION 33 – UTILITIES

<table>
<thead>
<tr>
<th>Code</th>
<th>Description</th>
<th>Pages</th>
</tr>
</thead>
<tbody>
<tr>
<td>33 11 16</td>
<td>SITE WATER UTILITY DISTRIBUTION PIPING</td>
<td>21</td>
</tr>
<tr>
<td>33 31 11</td>
<td>SITE SANITARY UTILITY SEWERAGE PIPING</td>
<td>13</td>
</tr>
<tr>
<td>33 41 00</td>
<td>STORM UTILITY DRAINAGE PIPING</td>
<td>6</td>
</tr>
<tr>
<td>33 46 00</td>
<td>SUBDRAINAGE</td>
<td>3</td>
</tr>
</tbody>
</table>
I hereby certify that the portion of this technical submission described below was prepared by me or under my direct supervision and responsible charge. I am a duly Registered Architect under the laws of the State of Iowa.

Steve Knierim

Signature                      Date
Registration expires 06.30.18  Iowa Reg No. 03162
Divisions 0, 1, 2, 5-12, 32*
*except sections listed under other seals.

I hereby certify that the portion of this technical submission described below was prepared by me or under my direct supervision and responsible charge. I am a duly Licensed Professional Engineer under the laws of the State of Iowa.

Brent Jackman

Signature                      Date
Iowa License No. 18193
License renewal 12.31.19
Divisions 31, 32, 33

I hereby certify that the portion of this technical submission described below was prepared by me or under my direct supervision and responsible charge. I am a duly Licensed Structural Engineer under the laws of the State of Iowa.

Bradley C. Hill

Signature                      Date
Iowa License No. 19593
License renewal 12.31.18
Sections 033000, 042000, 051200, 053100, 054000 054400
I hereby certify that the portion of this technical submission described below was prepared by me or under my direct supervision and responsible charge. I am a duly Licensed Professional Engineer under the laws of the State of Iowa.

Dwight Clopton Schumm

Signature ___________________________ Date __________________

Iowa License No. 13694

License renewal 12.21.19

Divisions 21, 22, 23, 26, 27, 28
PART 1 GENERAL

1.01 PROJECT IDENTIFICATION
A. Project Name: Prairie Early Childhood Center, College Community School District, Cedar Rapids, Iowa.
B. Project Number: 15290000.
C. The Owner, hereinafter referred to as Owner: College Community School District.
D. Owner’s Project Representative: Jim Rotter, Executive Director of Business Services.

1.02 PROJECT DESCRIPTION
A. Project Description: This project is a single prime contract to construct a new Early Childhood Center for College Community School District. The project is comprised of a series of classrooms that range from infants thru four years old, a headstart classroom, a pair of shared vision classrooms, administrative offices, mechanical spaces, toilets, cooking kitchen and large motor room. The project fully develops the site parcel. The building has a boiler heating system with DX cooling as well as make up air handlers and the building is fully sprinkled. The materials on the project are predominately light gage steel framing, gypsum wall board, siding materials over exterior sheathing and aluminum clad wood windows. The roof is a combination of low slope single ply roof membrane assembly and 9:12 slope standing seam metal roof panels. There is a storm shelter component in the project which complies with ICC-500 standards and is comprised of grouted CMU walls, steel beam / composite deck lid and ICC-500 rated doors and window systems.

1.03 PROJECT DESIGN TEAM
A. Architect:
   OPN Architects, Inc.
   200 Fifth Avenue SE, Suite 201
   Cedar Rapids, Iowa 52401
   (319) 363-6018
   Contact: Joseph Tursi.
   E-mail: jtursi@opnarchitects.com
B. Structural Engineer:
   Raker Rhodes
   112 East Washington Street, Suite B
   Iowa City, IA 52240
   (319) 333-7850
   Contact: Brad Hill
   E-mail: bhill@rakerrhoades.com
C. MEP/FP/Technology Engineer:
   Design Engineers, P.C.
   2801 6th Street SW
   Cedar Rapids, Iowa 52404
   (319) 364-1944
   Mechanical/Plumbing/Fire Protection Contact: Kelly Harrer
   E-mail: kelly.harrer@designengineers.com
   Electrical Contact: Jonathan Gettler
   E-mail: jonathan.gettler@designengineers.com
   Technology Contact: Ryan Betsworth
   E-mail: ryan.betsworth@designengineers.com
D. Civil Engineer:
   Hall & Hall Engineers, Inc.
   1860 Boyson Road
Hiawatha, Iowa 52233
(319)362-9548
Contact: Brent Jackman
E-mail: brent@halleng.com

PART 2 PRODUCTS (NOT USED)
PART 3 EXECUTION (NOT USED)

END OF SECTION
COLLEGE COMMUNITY SCHOOL DISTRICT
PRAIRIE EARLY CHILDHOOD CENTER

SECTION 00 11 10 - NOTICE OF HEARING

COLLEGE COMMUNITY SCHOOL DISTRICT

You are hereby notified that at 6:30 p.m., local time, on January 15, 2018 in the College Community Schools Board Room at 401 76th Avenue SW, Cedar Rapids, IA 52404, there will be a public hearing as provided under Section 73A.3 of the Code of Iowa for the purpose of hearing or receiving any objections to the adoption of the proposed drawings, specifications and form of contract, and the proposed cost for the furnishing of all necessary labor, material, and equipment for:

EARLY CHILDHOOD CENTER
for
COLLEGE COMMUNITY SCHOOL DISTRICT

Proposed drawings, specifications, and form of contract may be examined at the Office of the Director of Business Services, 401 76th Avenue SW, Cedar Rapids, IA and at OPN Architects, Inc., 500 5th Avenue SE, Cedar Rapids, IA, from 8:00 A.M. to 4:00 P.M.

Published upon order of James A. Rotter, Board Secretary.

END OF SECTION
SECTION 00 11 13 - NOTICE TO BIDDERS

NOTICE IS HEREBY GIVEN: That sealed bids will be received by College Community School District, at the College Community School District ESC (Educational Services Center) at 401 76th Avenue SW, Cedar Rapids, IA 52404, until 3:00 p.m. on the 15 day of February, 2018. The bids will be opened shortly thereafter in the Board Room and publicly read by the owner. All bidders are welcome to attend. The project consists of furnishing the following supplies, equipment, and/or service.

Board Approval of Contract shall be at the scheduled board meeting on February 19, 2018.

COLLEGE COMMUNITY SCHOOL DISTRICT

EARLY CHILDHOOD CENTER

PROJECT NO. 15290000

The bids are for a single Prime Contract (civil, general, mechanical and electrical combined) for new early childhood center. Bids shall be on a lump sum basis; segregated sub-bids will not be accepted.

Work is anticipated to commence upon award of contract, and be completed by July 15, 2019.

A pre-bid conference is scheduled for January 30, 2018 at 2:00 p.m. in the College Community School District Board Room at 401 76th Avenue SW, Cedar Rapids, IA 52404.

Plans and specifications governing the construction of the proposed Work have been prepared by OPN Architects, Inc of Cedar Rapids, Iowa.

Bidders for the Contract may obtain a maximum of two copies of the Bidding Documents by contacting Rapids Reproductions, Cedar Rapids, IA Ph. 319-364 24 73 in accordance with the Instructions to Bidders upon depositing the sum of $250 (written to OPN Architects) or a MBI Plan Deposit card for each set of documents.

All Bidders may log on to view this Project at www.rapidsrepro.com. Once bidders have registered and are logged on, bidders can access bidding documents at no charge. Once logged onto the project though the public planroom, bidding documents may be downloaded, viewed and printed. Rapids Reproduction toll free phone number is 1-800-383-1223.

Documents may also be viewed at the following plan rooms:

- Greater Fort Dodge Growth Alliance Planroom, 24 North 9th Street, Suite A, Ft. Dodge, IA, 515-955-5500.
- Dodge Data & Analytics Planroom, 3315 Central Avenue, Hot Springs, AR, 501-321-4125
- Des Moines Construction Update Plan Room, 221 Park Street, Des Moines, IA
- Bid+Builders Exchange, 4814 E. Broadway, Madison, WI, 608-221-3148
- Minnesota Builders Exchange, 1123 Glenwood Avenue, Minneapolis, MN, 612-381-2647.
- Omaha Builders Exchange, 4255 S. 94th, Omaha, NE, 402-593-6908.

Bid security in the amount of 5% of the total bid in the form of certified check, credit union share draft, or surety bond written on an original AIA Document A310, Bid Bond is required for this project. The successful bidder will be required to provide surety Performance and Payment Bonds in an amount equal to one hundred percent (100%) of the Contract Sum.
The award of the contract may be made by College Community School Board to any responsible bidder or bidders offering suitable supplies, equipment and/or service at the lowest price taking into consideration the quality of materials or service in the best interest of the Owner. The right is reserved to reject any and all bids, or any part thereof, and to waive informalities, and to enter into such contract or contracts as shall be deemed in the best interest of the Owner.

By virtue of statutory authority, preference will be given to products and provisions grown and coal produced within the State of Iowa.

By: Jim Rotter, Board Secretary

College Community School District

END OF SECTION
SECTION 00 21 13 - INSTRUCTIONS TO BIDDERS

American Institute of Architects Document A701 - 1997, Instructions to Bidders, is hereby incorporated in this specification by reference and is available from the Architect: OPN Architects, Inc., 200 Fifth Avenue SE, Suite 201, Cedar Rapids, Iowa 52401. The Instructions to Bidders, including modifications and special instructions, shall apply to all Bidders and Sub-Bidders.

END OF SECTION
SECTION 00 22 13 - SUPPLEMENTARY INSTRUCTIONS TO BIDDERS

The following supplements modify, change, delete from or add to the "Instructions to Bidders", AIA Document A701, 1997 Edition. Where any Article of the Instructions is modified or any Paragraph, Subparagraph or Clause thereof is modified or deleted by these Supplementary Conditions, the unaltered provisions of that Article, Paragraph, Subparagraph or Clause shall remain in effect.

ARTICLE 3: BIDDING DOCUMENTS

1. Paragraph 3.1 Copies
   A. Sub-paragraph 3.1.1; delete this paragraph and add the following:
      3.1.1 All Bidders may obtain complete printed sets of the Bidding Documents from the issuing office designated in the Notice to Bidders in the number and for the deposit sum stated therein. The deposit will be refunded to Bidders who submit a bona fide Bid and return the Bidding Documents in good condition within fourteen days after award of Contract. The cost of replacement of missing or damaged documents will be deducted from the deposit. A Bidder receiving a Contract award may retain the Bidding Documents and the Bidder’s deposit will be refunded.
   B. Sub-paragraph 3.1.2; delete the paragraph and add the following:
      1. "3.1.2 A Bidder receiving a Contract award may retain the Bidding Documents."

2. Paragraph 3.2 Interpretation or Correction of Bidding Documents
   A. Sub-paragraph 3.2.2; add the following:
      "An ambiguity, inconsistency, or error discovered too late to be clarified or interpreted by Addendum shall be handled in the following manner:
      .1 The Bidder or Sub-bidder shall promptly notify the Architect.
      .2 The Bidder or Sub-bidder shall determine, to the best of his ability, the proper methods or materials required to fulfill the design intent of the Architect and shall include the cost of providing such methods or materials in this Bid or Sub-bid.
      .3 The Bidder or Sub-bidder shall submit with the Bid, as supplemental information, descriptions of the ambiguity, inconsistency, or error and the methods or materials which he has included in the Bid.
      .4 The Owner, Construction Manager and Architect will review the supplemental information prior to awarding the Contract."

3. Paragraph 3.3 Substitutions
   A. Sub-paragraph 3.3.2; add the following:
      ".1 All substitution requests shall be submitted on the Substitution Request Form included in the Project Specification Manual. All substitution requests submitted must be complete with all requested information. Incomplete forms and requests submitted on other forms shall be disregarded."

4. Paragraph 3.4 Addenda
   A. Paragraph 3.4.3; add the following to the end of paragraph:
      ".......or in a case deemed an emergency by the Architect or Owner."

ARTICLE 4: BIDDING PROCEDURES

1. Paragraph 4.1 Preparation of Bids
   A. Sub-paragraph 4.1.1; add the following sentence:
      1. "Bidders shall include an original and a copy of the Bid in the submittal envelope."
2. **Paragraph 4.2 Bid Security**
   A. **Sub-paragraph 4.2.4; add the following:**

   "4.2.4 Bid Security in the amount of 5% of the Bid shall be presented as:
   .1 A certified check on a solvent Iowa bank, made payable to the Owner; or,
   .2 A surety bond from a surety company authorized to do business in the state of Iowa; or
   .3 A certified share draft on a solvent Iowa credit union, made payable to the Owner."

3. **Paragraph 4.3 Submission of Bids**
   A. **Sub-paragraph 4.3.1; delete this paragraph and add the following:**

   "4.3.1 Bids, required submittals, and supplementary information shall be presented in two separate sealed opaque envelopes identified with the Project title, the Bidder's name, and a list of the contents. The contents of the envelopes shall be as follows:
   .1 Envelope No. One shall contain an original and a copy of the Bid.
   .2 Envelope No. Two shall contain the Bid Security and supplemental information offered by the Bidder.
   Both envelopes shall be sealed in a mailing envelope addressed to the party receiving the Bids and identified with the Project name, the Bidder's name and address and, if applicable, the designated portion of the Work for which the Bid is submitted. The mailing envelope shall be noted "SEALED BID ENCLOSED".

   B. **Sub-paragraph 4.3.5; add the following:**

   "4.3.5 Bids shall remain in force and effect for thirty (30) days after opening of the Bid.

ARTICLE 6: POST-BID INFORMATION

   **Sub-paragraph 6.3.1; delete "as soon as practicable or as stipulated in the Bidding Documents" and insert "within three (3) business days."**

ARTICLE 7: PERFORMANCE BOND AND PAYMENT BOND

1. **Paragraph 7.1 Bond Requirements**
   A. **Sub-paragraph 7.1.1; delete this paragraph and add the following:**

   "7.1.1 The Bidder shall furnish bonds covering the faithful performance of the Contract and the payment of all obligations arising thereunder in an amount equal to the total Contract Sum. Bonds may be secured through the Bidder's usual sources. The cost of the Bonds shall be included in the Bid."

   B. **Sub-paragraph 7.1.2; delete this paragraph.**

ARTICLE 9: WARRANTY EXTENSION

1. **Paragraph 9.1 Correction of Work after Substantial Completion; add the following:**

   A. **The Bidder shall be required to extend the one-year warranty period called out in Paragraph 12.2.2 of the General Conditions of the Contract for Construction by one year, resulting in a two year period from the date of Substantial Completion where he will be required to correct deficiencies in materials and workmanship and non-conforming work. The cost of the extension shall be included in the Bid."**

ARTICLE 10: SUPPLEMENTARY INSTRUCTIONS

1. **Paragraph 10.1 Reference**
   A. "10.1 Reference; add the following
1. All references to provisions in Article 10 - Supplementary Instructions to Bidders are hereby transferred to Section 00120 - Supplementary Instructions to Bidders. Any modifications stated in Section 00120 shall have the same force and effect as if stated in Article 10."

END OF SECTION
SECTION 00 22 15 - SPECIAL INSTRUCTIONS

Special Instructions to bidders, as herein stated, are hereby incorporated in this specification. The Special Instructions shall apply to all Bidders and Sub-bidders.

1. EQUAL EMPLOYMENT OPPORTUNITY: “Bidder agrees that if awarded contract to supply any part of the above material, bidder will not engage in any discriminatory employment practices based on race, color, religion, sexual orientation or national origin and that they will in all contracts comply with all statutes of the State of Iowa against discrimination. Failure to do so could be deemed a material breach of contract.

END OF SECTION
SECTION 00 31 00 - AVAILABLE PROJECT INFORMATION

PART 1 GENERAL

1.01 EXISTING CONDITIONS

A. Certain information relating to existing surface and subsurface conditions and structures is available to bidders but will not be part of the Contract Documents, as follows:

   1. A copy of the geotechnical report is included after this section.
   2. The recommendations described shall not be construed as a requirement of this Contract, unless specifically referenced in the Contract Documents.
   3. This report, by its nature, cannot reveal all conditions that exist on the site. It is expressly understood that the Owner will not be responsible for interpretations or conclusions drawn there.
   4. The contractor may perform additional subsurface investigation at own expense.

PART 2 PRODUCTS (NOT USED)

PART 3 EXECUTION (NOT USED)

END OF SECTION
SECTION 00 41 13 - BID FORMS

Bids for construction contracts must be submitted on a copy of the attached bid form.
TO: __________________________

herein called “Owner”

FROM: ________________________ (Contractor’s Name)

DATE: ________________________

1. In compliance with the Advertisement for Bids and the proposed Contract Documents relating to the:

COLLEGE COMMUNITY SCHOOL DISTRICT
PRAIRIE EARLY CHILDHOOD CENTER
Project Number: 16269000

including Addenda ______, ______, ______, ______.

the undersigned hereby proposes and agrees to fully perform the Work within the time stated and in strict accordance with the proposed Contract Documents dated January 16, 2018, including furnishing labor and/or materials, and to do all of the work required to construct and complete said Work in accordance with the Contract Documents as follows:

For complete Construction as described in the Bidding Documents:

BASE BID:

____________________________________________ dollars ($_________________)

ALTERNATE BIDS: Bidder agrees to perform all work shown or specified in the bidding documents required for completion of the listed Alternate Bids, when accepted and incorporated into the Contract. Refer to Division 1 Section “Alternates” for alternate descriptions.

ALTERNATE NO. 1 - ADDITIONAL CLASSROOM: Add cost to construct 3-year old classroom at South end of East classroom wing per drawings.

ADD/DEDUCT ___________________________________ dollars ($_______________)

ALTERNATE NO. 2 - ADDITIONAL SITE GRADING AREA: Add cost to grade area at South end of building for future additions as indicated on Drawing Sheet C301.

ADD/DEDUCT ___________________________________ dollars ($_______________)

ALTERNATE NO. 3 - ROOFING: Deduct cost to install asphalt shingle roofing in lieu of standing seam metal roofing at all 9:12 sloped roof areas.

ADD/DEDUCT ___________________________________ dollars ($_______________)

ALTERNATE NO. 4 - KITCHEN CABINETS: Add cost to replace plastic laminate casework and solid surface countertops in Kitchen 204 with stainless steel units as indicated in Kitchen drawings and specifications.

ADD/DEDUCT ___________________________________ dollars ($_______________)
UNIT PRICES: Bidder agrees to add to the Contract Sum the following unit prices if quantities included in the Base Bid as indicated in the Contract Documents, are increased. Refer to Division 1 section "Unit Prices" for unit price descriptions.

UNIT PRICE NO. 1: Provide subgrade stabilization with suitable soil:
Unit of Measure: Dollars per cubic yard.
UNIT ADD PRICE: ________________________________ dollars ($ ______________ )

UNIT PRICE NO. 2: Provide subgrade stabilization with crushed rock:
Unit of Measure: Dollars per cubic yard.
UNIT ADD PRICE: ________________________________ dollars ($ ______________ )

UNIT PRICE NO. 3: Replace unsatisfactory subgrade material under footing bearing surfaces:
Unit of Measure: Dollars per cubic yard.
UNIT ADD PRICE: ________________________________ dollars ($ ______________ )

UNIT PRICE NO. 4: Relocate remaining un-used topsoil stockpile:
Unit of Measure: Dollars per cubic yard.
UNIT ADD PRICE: ________________________________ dollars ($ ______________ )

2. I understand that the Owner reserves the right to reject this Bid, but that this Bid shall remain open and not be withdrawn for a period of thirty days from the date of the Bid Opening.

3. Notice of acceptance, or request for additional information, may be addressed to the undersigned at the address set forth below.

4. I agree to complete the work within the schedule of completion stated in the Bidding Documents.

SIGN HERE:

________________________________________________________________________
________________________________________________________________________
________________________________________________________________________

Signature of Bidder

Note: If bidder is a corporation, set forth the legal name of the corporation together with the signature of the officer or officers authorized to sign contracts on behalf of the corporation. If bidder is a partnership, set forth the name of the firm together with the signature of the partner or partners authorized to sign contracts on behalf of the partnership.

BUSINESS ADDRESS:

________________________________________________________________________
________________________________________________________________________
________________________________________________________________________
TELEPHONE NUMBER:

______________________________________________________________

END OF SECTION
SECTION 00 43 13 - SUPPLEMENTS TO BID FORMS

In accordance with the Instructions to Bidders and Supplementary Instructions to Bidders, submit the following forms:

1. Bid Security: A certified check, a surety bond written on an original AIA Document A310, Bid Bond, Current Edition, or a certified share draft. The Bid Security shall be in an amount to cover five percent (5%) of the total bid amount (including all Add Alternates).

END OF SECTION
SECTION 00 43 25 - SUBSTITUTION REQUEST FORM - DURING BIDDING

Project:

Bid Date: _________________________________________________________________________

We hereby submit for your consideration the following product instead of the specified item for the above project:

**Drawings/Specifications:**

Drawing Name/Number: __________________________________________________________________

Spec Section/Name: _____________________________________________________________________

Paragraph: __________________________________________________________________________

Specified Item: ______________________________________________________________________

**Proposed Substitution:**

__________________________________________________________

Attach complete information on changes to Drawings and/or Specifications which proposed substitution will require for its proper installation. Failure to fully complete this form is basis to not accept this Substitution Request.

Submit, with request, all necessary samples and substantiating data to prove equal quality and performance to that which is specified. Clearly mark manufacturer's literature to indicate equality in performance.

**CERTIFICATION OF EQUAL PERFORMANCE AND ASSUMPTION OF LIABILITY FOR EQUAL PERFORMANCE**

The undersigned states that the function, appearance, and quality are equivalent or superior to the specified item.

SUBMITTED BY: ______________________________________________________________

SIGNATURE: _______________________________________________ TITLE: ___________________

FIRM: __________________________________________________________________________

ADDRESS: _________________________________________________________________________

TELEPHONE: __________________ E-MAIL: ______________________ DATE: _________________

Signature shall be by person having authority to legally bind firm to the above items. Failure to provide binding signature will result in retraction of approval.

For Use by Owner's Representative or Owner:

O  Accepted          O  Accepted as Noted          O  Not Accepted          O  Received Too Late

By: ________________________________

Date: ________________________________

SUBSTITUTION REQUEST FORM - DURING BIDDING 00 43 25 - 1
Fill in Blanks Below (All items must be completed):

A. Does the substitution affect dimensions shown on Drawings? Yes ________ No _________
   If yes, clearly indicated changes:
   _______________________________________________________________________
   _______________________________________________________________________

B. Will the undersigned pay for changes to the building design, including engineering and detailing costs caused by the requested substitution? Yes ________ No _________
   If no, fully explain: _______________________________________________________
   _______________________________________________________________________
   _______________________________________________________________________

C. What effect does substitution have on other Contracts or other trades?
   _______________________________________________________________________
   _______________________________________________________________________
   _______________________________________________________________________

D. What effect does substitution have on construction schedule.
   _______________________________________________________________________
   _______________________________________________________________________
   _______________________________________________________________________

E. Manufacturer's warranties of the proposed and specified items are:
   __________ Same __________ Different (Explain on Attachment)

F. Reason for Substitution Request: ___________________________________________
   _______________________________________________________________________
   _______________________________________________________________________
   _______________________________________________________________________

G. Itemized comparison of specified item(s) with the proposed substitution.
   List significant variations:
   _______________________________________________________________________
   _______________________________________________________________________
   _______________________________________________________________________

H. Accurate cost data comparing proposed substitution with product specified.
   _______________________________________________________________________
   _______________________________________________________________________
   _______________________________________________________________________

I. Designation of maintenance services and sources:
   _______________________________________________________________________
   _______________________________________________________________________

(ATTACH ADDITIONAL SHEETS IF REQUIRED)

END OF SECTION
SECTION 00 52 00 - AGREEMENT FORM

PART 1  GENERAL

1.01  FORM OF AGREEMENT

   A.  American Institute of Architects Document A101-2007, Standard Form of Agreement Between
   Owner and Contractor, is hereby incorporated by reference in this specification and is available
   from the Architect: OPN Architects, Inc., 200 Fifth Avenue SE, Suite 201, Cedar Rapids, Iowa. It
   shall be the Agreement for the Work.

END OF SECTION
SECTION 00 61 13 - BONDS AND CERTIFICATES


END OF SECTION
SECTION 00 63 25 - SUBSTITUTION REQUEST FORM - DURING CONSTRUCTION

Project:

We hereby submit for your consideration the following product instead of the specified item for the above project:

**Drawings/Specifications:**

Drawing Name/Number: ___________________________________________________________

Spec Section/Name: ______________________________________________________________

Paragraph: _____________________________________________________________________

Specified Item: __________________________________________________________________

**Proposed Substitution:**

__________________________________________________________

Attach complete information on changes to Drawings and/or Specifications which proposed substitution will require for its proper installation. Failure to fully complete this form is basis to not accept this Substitution Request.

Submit, with request, all necessary samples and substantiating data to prove equal quality and performance to that which is specified. Clearly mark manufacturer's literature to indicate equality in performance.

**CERTIFICATION OF EQUAL PERFORMANCE AND ASSUMPTION OF LIABILITY FOR EQUAL PERFORMANCE**

The undersigned states that the function, appearance, and quality are equivalent or superior to the specified item.

**SUBMITTED BY:** ______________________________________________________________

SIGNATURE: _________________________________________ TITLE: ___________________

FIRM: _________________________________________________________________________

ADDRESS: _____________________________________________________________________

TELEPHONE: ______________ E-MAIL: _______________ DATE: ________________

Signature shall be by person having authority to legally bind firm to the above items. Failure to provide binding signature will result in retraction of approval.

____________________________

For Use by Owner's Representative or Owner:

O Accepted   O Accepted as Noted   O Not Accepted   O Received Too Late

By: __________________________________________________________

Date: __________________________________________________________

Fill in Blanks Below (All items must be completed):
A. Does the substitution affect dimensions shown on Drawings? Yes _______ No ________
   If yes, clearly indicated changes:
   ___________________________________________________________________________
   ___________________________________________________________________________

B. Will the undersigned pay for changes to the building design, including engineering and
costs caused by the requested substitution? Yes _______ No _______
   If no, fully explain: __________________________________________________________________________
   __________________________________________________________________________

C. What effect does substitution have on other Contracts or other trades?
   __________________________________________________________________________
   __________________________________________________________________________
   __________________________________________________________________________

D. What effect does substitution have on construction schedule.
   __________________________________________________________________________
   __________________________________________________________________________
   __________________________________________________________________________

E. Manufacturer's warranties of the proposed and specified items are:
   __________ Same __________ Different (Explain on Attachment)
F. Reason for Not Providing Specified Product: _____________________________________
   __________________________________________________________________________
   __________________________________________________________________________
   __________________________________________________________________________

G. Itemized comparison of specified item(s) with the proposed substitution.
   List significant variations:
   __________________________________________________________________________
   __________________________________________________________________________
   __________________________________________________________________________

H. Accurate cost data comparing proposed substitution with product specified.
   __________________________________________________________________________
   __________________________________________________________________________
   __________________________________________________________________________

I. Designation of maintenance services and sources:
   __________________________________________________________________________
   __________________________________________________________________________
   __________________________________________________________________________

J. Savings to Owner for Accepting Substitution: $_______________________________

(ATTACH ADDITIONAL SHEETS IF REQUIRED)
SECTION 00 72 00 - GENERAL CONDITIONS

FORM OF GENERAL CONDITIONS

1. American Institute of Architects Document A201 - 2007, General Conditions of the Contract for Construction, is hereby incorporated in this specification by reference and is available from the Architect: OPN Architects, Inc., 200 Fifth Avenue SE, Suite 201, Cedar Rapids, Iowa. The General Conditions, including modifications and special conditions shall apply to all contractors and subcontractors.

END OF SECTION
SECTION 00 73 00 - SUPPLEMENTARY CONDITIONS

The following supplements modify, change, delete from or add to the "General Conditions of the Contract for Construction", AIA Document A201 - 2007. Where any article of the General Conditions is modified or any paragraph, subparagraph, or clause thereof is modified or deleted by these Supplementary Conditions, the unaltered provisions of that article, paragraph, subparagraph or clause shall remain in effect.

ARTICLE 2 – OWNER

1. Paragraph 2.2 Information and Services Required of the Owner
   A. Sub-paragraph 2.2.3: Add the following to the end of paragraph:
      "The Contractor shall compare information furnished by the Owner (including surveys and soil tests with observable physical conditions) and the Contract Documents and on the basis of such review, shall report to the Owner and Architect any conflicts, errors or omissions."

2. Paragraph 2.2 Information and Services Required of the Owner
   A. Sub-paragraph 2.2.5: Delete and add the following:
      "2.2.5 The Contractor will be furnished, free of charge, 25 copies of Drawings and Project Manuals for execution of Work. Costs for copies of drawings and Project Manuals in excess of this number shall be the responsibility of the Contractor."

ARTICLE 3 – CONTRACTOR

1. Paragraph 3.2 Review of Contract Documents and Field Conditions by Contractor
   A. Add the following language to the end of Paragraph 3.2.1
      "The Contractor also represents that all Contract Documents for the Project have been examined; including those intended for work of trades not normally performed by the Contractor's own forces, and has become thoroughly familiar with all conditions which may pertain to or affect the Work under the Contract."

2. Paragraph 3.4 Labor and Materials
   A. Add the following language to the end of Paragraph 3.4.1:
      "Work required by the Contract Documents to be performed after working hours or work the Contractor elects to perform after hours shall be completed at no additional cost to the Owner."
   B. Add Sub-subparagraph 3.4.3.1 to Sub-paragraph 3.4.3:
      "The Contractor (Company) shall not be owned, operated, or managed by a registered sex offender who has been convicted of a sex offense against a minor in accordance with Iowa Code 692A.113. In addition, the Contractor shall not permit an employee, Subcontractor (Company) owned, operated, or managed by, or Subcontractor employee who is a registered sex offender convicted of a sex offense against a minor on real property of the schools of the Owner in accordance with Iowa Code 692A.113. The Contractor shall further acknowledge and certify services provided under this Contract comply with Iowa Code 692A.113.

3. Add new Paragraph 3.4.4 as follows:
   A. "Contractor shall perform the Work so as to cause a minimum of inconvenience to and interruption of the Owner's operations. Any and all interruptions of the operations of the Owner necessary for the performance of the Work shall be noted in the progress schedule and the Contractor shall additionally give the Owner sufficient advance notice of such interruption as to allow the Owner to adjust operations accordingly. Contractor's failure to give the Owner timely
notice of such intentions shall place the responsibility of any resulting delays or additional costs solely with the Contractor."

4. Paragraph 3.6 Taxes
   A. Sub-paragraph 3.6.1: Change to the following:
      1. "3.6.1 This Project is Exempt from all Iowa Sales Tax. In accordance with provisions of the Code of Iowa and of the Iowa Administrative Rules, "Iowa Construction Sales Tax Exemption Certificate" will be issued for this project. A copy of that certificate and a "Letter of Authorization" will be provided to the successful bidder pursuant to Iowa Code Sections 422.42 (15) & (16), and 422.47 (5). The general contractor and all of his sub-contractors, who have been identified at or before filing of the Performance Bond, are duly authorized to purchase building materials for this project without the payment of Iowa Sales Tax. All contractors associated with this project are advised to keep accurate records of their tax exempt purchases that pertain to this project in case they are audited by the Iowa Department of Revenue and Finance. For additional information regarding this Tax Exempt Status, go to http://www.state.ia.us/tax/locgov/locgov.html. A copy of the Iowa Contractors Guide is also available at http://www.state.ia.us/tax/educate/78527.html which further explains this exempt status. This exemption applies only to Iowa Sales tax and does not exempt the contractor’s obligations for other state or federal requirements and taxes such as social security taxes, unemployment taxes, withholding, etc."

   B. Add Sub-paragraphs 3.6.2 and 3.6.3:
      "3.6.2 At or before the time the Performance Bond is filed, Contractor shall provide a listing to the Owner identifying all subcontractors. Contractor and subcontractors may make copies of the exemption certificate and shall provide, at the time of purchase, a copy of the tax exemption certificate to each supplier providing construction material for the Project. The Contractor or subcontractors may then purchase from the suppliers building materials for the project under this Contract free from sales tax.

      3.6.3. The Contractor and subcontractors shall be responsible for keeping records identifying the property purchased exempt from tax and verifying that the property purchased was used in this contract with this Owner. Any property purchased tax-free and not used in this contract is subject to tax which must be paid directly to the Iowa Department of Revenue and Finance."

5. Paragraph 3.7 Permits, Fees, Notices and Compliance with Laws
   A. Sub-paragraph 3.7.4: Claims for Concealed or Unknown Conditions; add the following before the last line: "Failure to properly register a claim within the 21 day period shall be grounds for denial of the claim."

   B. Sub-paragraph 3.7.5: Modify by adding the underlined words so that the section now reads as follows:
      1. "3.7.5 If, in the course of the Work, the Contractor knowingly encounters and recognizes human remains, burial markers, archeological sites or previously undelineated wetlands not indicated in the Contract Documents, the Contractor shall immediately suspend any operations that would affect them and shall notify the Owner and Architect. Upon receipt of such notice, the Owner shall promptly take any action necessary to obtain governmental authorization required to resume the operations. The Contractor shall continue to suspend such operations until otherwise instructed by the Owner but shall continue with all other operations that do not affect those remains or features. Requests for adjustments in the Contract Sum and Contract Time arising from the existence or good faith belief of such existence of such remains or features may be made as provided in Article 15.

6. Add Sub-paragraph 3.7.6:
   A. "The Contractor is responsible for scheduling inspections related to the performance of its work and ensuring work is complete for inspections. Any costs associated with reinspection caused by irregularities, deficiencies or non-conforming work will be borne by the responsible contractor
including all Architectural and Engineering Services related to evaluation of the problem and
development of an acceptable solution."

7. Paragraph 3.10 Contractor's Construction Schedules
   A. Refer to Sub-paragraph 3.10.1 in the last sentence after “Work and Project,” add the following
text before the word "shall...:"
   "or as requested by the Owner or Architect"

8. Paragraph 3.10.2; delete the last sentence in this paragraph.

ARTICLE 4 – ARCHITECT

1. Paragraph 4.2.4 Communications Facilitating Contract Administration
   A. Sub-paragraph 4.2.4; delete and add the following:
      1. "4.2.4.1 All notices, demands, requests, instructions, approvals, proposals and claims
         must be in writing. Any notice or demand upon the Contractor shall be sufficiently given if
delivered at the office of the Contractor stated on the signature page of the agreement (or
at such other office as the contractor may from time to time designate in writing to the
Owner), or if deposited in the United States mail in a sealed, postage-paid envelope or
delivered with charges prepaid to any telegraph company for transportation, in each case
addressed to such office."
      2. "4.2.4.2 All papers required to be delivered to the Owner shall, unless otherwise specified
in writing to the Contractor, be delivered to the office of OPN Architects, Inc.,
200 Fifth Avenue S.E., Suite 201, Cedar Rapids, Iowa 52401 and any notice to or demand upon the
Owner shall be sufficiently given if so delivered, or if deposited in the United States mail in
a sealed, postage prepaid envelope, or delivered with charges prepaid to any telegraph
company for transmission to said Owner at such address, or to such other representatives
of the Owner may subsequently specify in writing to the Contractor for such purpose."
      3. "4.2.4.3 Any such notice shall be deemed to have been given as of the time of actual
delivery of (in the case of mailing) when the same should have been received in due
course of post, or in the case of telegrams, at the time of actual receipt, as the case may
be."

ARTICLE 7 - CHANGES IN THE WORK

1. Paragraph 7.1 Changes
   A. Sub-paragraph 7.1.4: Add the following sub-paragraph:
      "7.1.4 Supporting data used to determine the costs and allowances claimed in
Sub-paragraph 7.3.7 must be made available to the Architect upon request."

2. Paragraph 7.2 Change Orders
   A. Sub-paragraph 7.2.2: Add the following sub-paragraph:
      1. "7.2.2 The forms used to process a Change Order will include AIA Document G701,
Change Order."

3. Paragraph 7.3 Construction Change Directives
   A. Sub-paragraph 7.3.3; Substitute the following: ".3 cost to be determined in a manner agreed
upon by the parties, plus the percentage of combined overhead and profit.
   B. Sub-paragraph 7.3.7; Line 4:
      Replace "set forth in the Agreement, or if no such amount is set forth in the Agreement, a
reasonable amount." with "indicated in sub-paragraph 7.3.11."
   C. Add sub-paragraph 7.3.11:
      "7.3.11 The maximum percentage of combined overhead and profit for changes in the
work performed by the Contractor shall be 10%. If the changed work is performed by a
Subcontractor, a maximum of 5% may be added by that Subcontractor on his work for combined overhead and profit and an additional maximum of 5% may be added by the Contractor for administration and coordination of said Subcontractor work. This paragraph shall apply to the methods set forth in sub-paragraphs 7.3.3.1 and 7.3.3.4 for determining the costs of changed work unless waived in writing by the Owner. The Contractor shall verify compliance of the Subcontractors and shall not sign Change Orders which do not comply with the maximum limits."

ARTICLE 8 - TIME

1. Paragraph 8.3 Delays and Extensions of Time
   A. Sub-paragraph 8.3.1, line 4: delete “… and arbitration …”
   Add the following language to the end of Paragraph 8.3.1:
   "A time extension shall be Contractor’s sole remedy and compensation for all such delays other than those resulting from the acts or negligence of the Owner, the Architect, or the Owner’s separate contractors (collectively “Owner Caused Delays”). For proven Owner Caused Delays, the Contractor may recoup the actual costs resulting from such delays, but not for any additional profit or fee.”

ARTICLE 9 - PAYMENTS AND COMPLETION

1. Paragraph 9.3 Applications for Payment
   A. Sub-paragraph 9.3.1; change to read as follows:
      1. "At least thirty days before .........., and shall reflect retainage of five percent of the total amount due the Contractor."
   B. Add the following new text to the end of Sub-paragraph 9.3.1:
      1. "Once the Application is approved by the Architect, the Application for Payment must be submitted for approval to the College Community School District Board of Directors at their next regularly scheduled meeting. Meetings are the 3rd Monday of every month. The approved application must be received at the Board office at least 15 days prior to the scheduled meeting for it to be included in that meeting's scheduled business. AIA Documents G702 - Application and Certificate for Payment and G703 are to be used for Applications for Payment."

2. Paragraph 9.5 Decisions to Withhold Certification
   A. Delete Sub-paragraph 9.5.3 and replace with the following:
      1. "9.5.3 The Contractor shall make accessible and available to the Architect all labor, material, and equipment accounts related to the work in question, insofar as they may in any way affect a disputed amount due the Contractor from the Owner."

3. Paragraph 9.6. Progress Payments
   A. Sub-paragraph 9.6.4; Delete the first two sentences of paragraph.

4. Paragraph 9.7 Failure of Payment
   A. Sub-paragraph 9.7.1; revise the sub-paragraph as follows:
      In the first line, change “…seven days...” to “… fifteen days...”
      In the second line, change “…seven days...” to “… fifteen days...”

5. Paragraph 9.8 Substantial Completion
   A. Sub-paragraph 9.8.1; add the following to the end of the sub-paragraph:
      1. "...subject only to completion of minor punch list items, the absence of completion of which does not interfere with the Owner’s intended use of the Project.”
   B. Sub-paragraph 9.8.6; add the following new sub-paragraph:
The Contractor shall reimburse the Owner for any Architect's additional services made necessary by the Contractor's failure to finally complete the Work within sixty (60) days after the date of Project Substantial Completion.

C. Sub-paragraph 9.8.7; add the following new sub-paragraph:

"9.8.7 Request for Early Release of Retainage Funds: If the Contractor makes a proper request for early release of retainage funds, the Owner will release all retainage funds at the next monthly Board meeting or within thirty (30) days of receipt of the request, whichever is less, except it may retain from the released retainage the following:

- An amount equal to 200% of the value of labor or materials yet to be provided on the Project as determined by the Owner and its authorized contract representative. For purposes of this section, "authorized contract representative" means the Architect of record on the Project, unless otherwise specified.
- An amount equal to 200% of the value of any Chapter 573 claims currently on file at the time the Request for Release of Retainage is approved. If the Owner withholds an amount from the retainage payment to the Contractor, the Owner will provide a reason the request is being denied to the Contractor within thirty (30) calendar days of the receipt of the request."

ARTICLE 10 - PROTECTION OF PERSONS AND PROPERTY

1. Paragraph 10.1 Safety Precautions and Programs
   A. Add sub-paragraph 10.1.1 as follows:
      "10.1.1 Contractor shall take all necessary precautions to keep the site and work in compliance with the safety and health regulations for construction issued by the Bureau of Labor Standards of the U.S. Department of Labor as well as the Occupational Safety and Health Standards parts 1910 and 1926 as amended and as enforced by the State of Iowa."

2. Paragraph 10.2 Safety of Persons and Property
   A. Add the following text to Sub-paragraph 10.2.2:
      "Contractors shall also comply with the Iowa Smoke Free Air Act while on Owner Property and shall not use any tobacco product while on Owner property. For purposes of this subparagraph, Owner property shall include inside private Contractor or employee owned vehicles while parked on Owner property."

ARTICLE 11 - INSURANCE AND BONDS

1. Paragraph 11.1 Contractor's Liability Insurance
   A. Sub-Paragraph 11.1.1.1: Delete the semicolon at the end of Clause 11.1.1.1 and add "..., including private entities performing Work at the site and exempt from the coverage on account of number of employees or occupation, which entities shall maintain voluntary compensation coverage at the same limits specified for mandatory coverage for the duration of the Project;"
   B. Sub-Paragraph 11.1.1.2: Delete the semicolon at the end of Clause 11.1.1.2 and add ", or persons or entities excluded by statute from the requirements of Clause 11.1.1.1 but required by the Contract Documents to provide the insurance required by the Clause;"
   C. Sub-Paragraph 11.1.1.9: Add the following sub-paragraph:
      1. "11.1.1.9 Liability Insurance shall include all major divisions of coverage and be on a comprehensive basis including:
         a. Premises Operations (including X, C and U cover-ages as applicable).
         b. Independent Contractors' Protective.
         c. Products and Completed Operations insurance shall be maintained for a minimum period of at least two (2) years after either 90 days following Substantial Completion or final payment, whichever is earlier. Broad form property damage coverage shall include completed operations.
         d. Personal Injury Liability with Employment Exclusion deleted."
e. Contractual, including specified provision for Contractor's obligation under Paragraph 3.18.
f. Owned, non-owned and hired motor vehicles.
g. Broad Form Property Damage including Completed Operations.

D. Sub-Paragraph 11.1.1.10: Add the following sub-paragraph:
1. "11.1.1.10 Liability coverages shall be provided by a Commercial General Liability Policy on an occurrence basis, the policy date shall predate the Contract; the termination date of the policy shall be no earlier than the termination date of coverages required to be maintained after final payment, certified in accordance with sub-paragraph 9.10.2."

E. Sub-Paragraph 11.1.2.1: Add the following sub-paragraph:
1. "11.1.2.1 The insurance required by sub-paragraph 11.1.1 shall be written for not less than the following limits, or greater if required by law:
   a. Worker's Compensation
      1) State: Iowa: Statutory.
      2) Applicable Federal (e.g. Longshoremen's): statutory
      3) Employer's Liability:
         (a) $500,000 per Accident
         (b) $500,000 Disease, Policy Limit
         (c) $500,000 Disease, Each Employee
   b. Commercial General Liability (including Premises-Operations; Independent Contractors' Protective; Products and Completed Operations; Contractual Liability; Broad Form Property Damage):
      1) Combined Single Limit: $1,000,000 each occurrence.
      2) Fire or Explosion Damage: $100,000 on any one fire.
      3) Medical Expense: $5,000 on any one person.
      4) General Aggregate: $2,000,000.
      5) Products and Completed Operations: $2,000,000 aggregate;
      6) Liability insurance shall not excluded x, c, and u coverages. General aggregate shall apply in total to this project only.
   c. Personal and advertising Injury limit: $1,000,000.
   d. Business Auto Liability (include "any auto"):
      1) $1,000,000 combined single limit.
   e. Umbrella Excess Liability:
      1) $2,000,000 Each Occurrence.
      2) $2,000,000 Aggregate.

F. Sub-Paragraph 11.1.3: Add the following:
"The Certificate of Insurance form shall be AIA Document G705, Certificate of Insurance, or ACCORD form 25-S."

G. Sub-Paragraph 11.1.5: Add the following:
"11.1.4 "A certificate of the Contractor's insurance, shall be filed with the Owner evidencing this coverage. The Contractor shall provide property insurance for portions of the work stored off the site and also for portions of the work in transit. Portions of the work stored off site may be included in Applications for Payment per Paragraph 9.3.2 subject to submittal of detailed material lists, value statements, and certificate of insurance identifying same as work covered on the Owner's behalf for this Project."

H. Sub-Paragraph 11.1.6: Add the following:
"11.1.5 All certificates and/or policies of insurance furnished by the Contractor to be filed with the Owner and Architect shall include the name and address of the agency issuing the same. All certificates and/or policies shall be signed with an original signature. Signature stamps shall not be used."

I. Sub-Paragraph 11.1.7: Add the following:
"11.1.6 Also each document shall be accompanied by a power of attorney or other
evidence as may be necessary indicating that the person signing the certificate as the
authorized representative has the authority to do so."

J. Sub-Paragraph 11.1.8: Add the following:
"11.1.7 College Community School District and its agents or assigns shall be named
Additional Insured on such liability policy furnished by the Contractor on a primary basis.
The company and the insured expressly agree and state that the purchase of this policy of
insurance by the insured does not waive any of the defenses of governmental immunity
available to the insured under Iowa Code Section 670.4 as it now exists and as it may be
amended form time to time. The company and the insured further agree that this policy of
insurance shall cover only those claims not subject to the defense of governmental
immunity under Iowa Code Section 670.4 as it now exists and as it may be amended form
time to time."

2. Paragraph 11.3 Property Insurance
   A. Sub-Paragraph 11.3.1.1: delete "... earthquake, flood..." from the fourth line.
   B. Sub-Paragraph 11.3.2: delete this paragraph in its entirety.
   C. Sub-Paragraph 11.3.3: delete this paragraph in its entirety.

3. Paragraph 11.4 Performance Bond and Payment Bond
   A. Sub-Paragraph 11.4.1: Delete this paragraph and substitute the following:
      "11.4.1 The Contractor shall furnish bonds covering faithful performance of the Contract
      and payment of obligations arising thereunder. Bonds may be obtained through the
      Contractor's usual source and the cost thereof shall be included in the Contract Sum.
      Bonds shall be subject to approval of Owner. The amount of each bond shall be equal to
      100 percent of the Contract Sum.
      11.4.1.1 The Contractor shall deliver the required bonds to the Owner not later than
      ten days following the date the Agreement is entered into, or if the Work is to be
      commenced prior thereto in response to a letter of intent, the Contractor shall, prior to
      the commencement of the Work, submit evidence satisfactory to the Owner that such
      bonds will be furnished.
      11.4.1.2 The Contractor shall require the attorney-in fact who executes the required
      bonds on behalf of the surety to affix thereto a certified and current copy of the power
      of attorney."

ARTICLE 12 – CORRECTION OF WORK

1. Paragraph 12.2.2 After Substantial Completion:
   A. Sub-Paragraph 12.2.2.1 lines 1 and 8; change "one year" to "two years".
   B. Sub-Paragraph 12.2.2.2, line 1; change "one-year" to "two-year".
   C. Sub Paragraph 12.2.2.3, line 1; change "one-year" to "two-year".

2. Paragraph 12.2.5, line 3; change "one-year" to "two-year".

ARTICLE 13 – MISCELLANEOUS PROVISIONS

1. Paragraph 13.6: Substitute the following paragraph:
   Payments due and unpaid under the Contract Documents shall bear interest from the date the
   payment is due and shall bear interest at the rate established by Section 74A, Code of Iowa."

2. Paragraph 13.7 Time Limits on Claims
   Delete 13.7 and replace with the following:
   COMMENCEMENT OF STATUTORY LIMITATION PERIOD
13.7.1 As between the Owner and Contractor:

1. Before Substantial Completion. As to acts or failures to act occurring prior to the relevant date of Substantial Completion, any applicable statute of limitations shall commence to run and any alleged cause of action shall be deemed to have accrued in any and all events not later than such date of Substantial Completion;
2. Between Substantial Completion and Final Certificate for Payment. As to acts or failures to act occurring subsequent to the relevant date of Substantial Completion and prior to issuance of the final Certificate for Payment, any applicable statute of limitations shall commence to run and any alleged cause of action shall be deemed to have accrued in any and all events not later than the date of issuance of the final Certificate for Payment; and
3. After Final Certificate for Payment. As to acts or failures to act occurring after the relevant date of issuance of the final Certificate for Payment, any applicable statute of limitations shall commence to run and any alleged cause of action shall be deemed to have accrued in any and all events not later than the date of any act or failure to act by the Contractor pursuant to any Warranty provided under Section 3.5, the date of any correction of the Work or failure to correct the Work by the Contractor under Section 12.2, or the date of actual commission of any other act or failure to perform any duty or obligation by the Contractor or Owner, whichever occurs last."

ARTICLE 14 - TERMINATION OR SUSPENSION OF THE CONTRACT

1. Paragraph 14.2 Termination by the Owner for Cause
   A. Sub-paragraph 14.2.2, line 5; after the word "surety" insert, "and unless otherwise prohibited by applicable statutory law:"

ARTICLE 15 – CLAIMS AND DISPUTES

1. Subparagraph 15.2.8: delete current language in its entirety and replace with the following:

   "If a Claim relates to or is the subject of an Iowa Code Chapter 573 Claim, the party asserting such Claim may proceed in accordance with Iowa Code Chapter 573 to comply with the Iowa Code Chapter 573 notice and/or filing deadlines prior to resolution of the Claim by the Architect or by mediation."

2. Paragraph 15.3 Mediation:
   Sub-paragraph 15.3.2: delete the last two sentences in this sub-paragraph.

3. Paragraph 15.4 Arbitration: delete 15.4 in its entirety.

ARTICLE 16 – SUPPLEMENTARY CONDITIONS

1. Paragraph 16.1 Reference; add the following:

   "16.1 Reference
   All references to provisions in Article 16 – Supplementary Conditions are hereby transferred to Section 00 73 00 – Supplementary Conditions. Any modifications stated in Section 00 73 00 shall have the same force and effect as if stated in Article 16."

END OF SECTION
SECTION 00 73 10 - SPECIAL CONDITIONS

TARGETED SMALL BUSINESS PROCUREMENT GOAL:

It is hereby agreed that when entering into this contract with the Owner, the Prime Contractors will take documented steps to encourage participation from Targeted Small Businesses for the purpose of subcontracting or supplying material. The project has a Targeted Small Business participation goal of ten percent (10%). This is not a requirement.

END OF SECTION
PART 1 GENERAL
1.01 PROJECT
A. Project Name: Prairie Early Childhood Center.
B. Architect’s Name: OPN Architects, Inc.
C. The Project is a single prime contract for construction of a new early childhood center building.

1.02 WORK UNDER OTHER CONTRACTS
A. General: Cooperate fully with separate contractors so work on those contracts may be carried out smoothly, without interfering with or delaying work under this Contract. Coordinate the Work of this Contract with work performed under separate contracts.

1.03 WORK BY OWNER
A. Owner will furnish products indicated. The Work includes providing support systems to receive Owner's equipment and making plumbing, mechanical, and electrical connections, if applicable.
   1. Owner will furnish Contractor the earliest possible delivery date for Owner-furnished products. Using Owner-furnished earliest possible delivery dates, Contractor shall designate delivery dates of Owner-furnished items in Contractor’s Construction Schedule.
   2. Contractor is responsible for receiving, unloading, and handling Owner-furnished items at Project site.
   3. Contractor is responsible for protecting Owner-furnished items from damage during storage and handling, including damage from exposure to the elements.
   4. If Owner-furnished items are damaged as a result of Contractor's operations, Contractor shall repair or replace them.
   5. Contractor shall install and otherwise incorporate Owner-furnished items into the Work.

1.04 OWNER OCCUPANCY
A. Owner Occupancy of Completed Areas of Construction: Owner reserves the right to occupy and to place and install equipment in completed areas of building, before Substantial Completion, provided such occupancy does not interfere with completion of the Work. Such placement of equipment and partial occupancy shall not constitute acceptance of the total Work.
   1. Architect will prepare a Certificate of Substantial Completion for each specific portion of the Work to be occupied before Owner occupancy.
   2. Obtain a Certificate of Occupancy from authorities having jurisdiction before Owner occupancy.
   3. Before partial Owner occupancy, mechanical and electrical systems shall be fully operational, and required tests and inspections shall be successfully completed. On occupancy, Owner will operate and maintain mechanical and electrical systems serving occupied portions of building.
   4. On occupancy, Owner will assume responsibility for maintenance and custodial service for occupied portions of building.

B. Cooperate with Owner to minimize conflict and to facilitate Owner's operations.
C. Schedule the Work to accommodate Owner occupancy.

1.05 CONTRACTOR USE OF SITE AND PREMISES
A. Construction Operations: Limited to areas noted on Drawings.
   1. General Contractor shall provide site construction fence and gates as required to enclose construction areas.

B. Arrange use of site and premises to allow:
   1. Owner occupancy.
   2. Work by Others.
   3. Work by Owner.
   4. Use of site and premises by the public.
C. Provide access to and from site as required by law and by Owner:
   1. Emergency Building Exits During Construction: Keep all exits required by code open during construction period; provide temporary exit signs if exit routes are temporarily altered.
   2. Do not obstruct roadways, sidewalks, or other public ways without permit.
D. Nonsmoking Campus: Smoking or any tobacco use is not permitted on the school campus.

1.06 SPECIFICATION FORMATS AND CONVENTIONS

A. Specification Format: The Specifications are organized into Divisions and Sections using the 50-division format and CSI/CSC's "MasterFormat" numbering system.
   1. Section Identification: The Specifications use Section numbers and titles to help cross-referencing in the Contract Documents. Sections in the Project Manual are in numeric sequence; however, the sequence is incomplete because all available Section numbers are not used. Consult the table of contents at the beginning of the Project Manual to determine numbers and names of Sections in the Contract Documents.
   2. Division 01: Sections in Division 01 govern the execution of the Work of all Sections in the Specifications.

B. Specification Content: The Specifications use certain conventions for the style of language and the intended meaning of certain terms, words, and phrases when used in particular situations. These conventions are as follows:
   1. Abbreviated Language: Language used in the Specifications and other Contract Documents is abbreviated. Words and meanings shall be interpreted as appropriate. Words implied, but not stated, shall be inferred as the sense requires. Singular words shall be interpreted as plural, and plural words shall be interpreted as singular where applicable as the context of the Contract Documents indicates.
   2. Imperative mood and streamlined language are generally used in the Specifications. Requirements expressed in the imperative mood are to be performed by Contractor. Occasionally, the indicative or subjunctive mood may be used in the Section Text for clarity to describe responsibilities that must be fulfilled indirectly by Contractor or by others when so noted.
      a. The words "shall," "shall be," or "shall comply with," depending on the context, are implied where a colon (:) is used within a sentence or phrase.

PART 2 PRODUCTS - NOT USED

PART 3 EXECUTION - NOT USED

END OF SECTION
SECTION 01 20 00 - PRICE AND PAYMENT PROCEDURES

PART 1 GENERAL
1.01 SECTION INCLUDES
   A. Procedures for preparation and submittal of applications for progress payments.
   B. Documentation of changes in Contract Sum and Contract Time.
   C. Change procedures.
   D. Procedures for preparation and submittal of application for final payment.

1.02 RELATED REQUIREMENTS
   A. Section 00 72 00 - General Conditions: Additional requirements for progress payments, final payment, changes in the Work.
   B. Section 00 73 00 - Supplementary Conditions: Percentage allowances for Contractor's overhead and profit.

1.03 SCHEDULE OF VALUES
   A. Coordination: Coordinate preparation of the schedule of values with preparation of Contractor's construction schedule.
      1. Coordinate line items in the schedule of values with other required administrative forms and schedules, including the following:
         a. Application for Payment forms with continuation sheets.
         b. Submittal schedule.
         c. Items required to be indicated as separate activities in Contractor's construction schedule.
      2. Submit the schedule of values to Architect at earliest possible date, but no later than seven days before the date scheduled for submittal of initial Applications for Payment.
      3. Subschedules for Separate Design Contracts: Where the Owner has retained design professionals under separate contracts who will each provide certification of payment requests, provide subschedules showing values coordinated with the scope of each design services contract as described in Division 01 Section "Summary."
   B. Format and Content: Use Project Manual table of contents as a guide to establish line items for the schedule of values. Provide at least one line item for each Specification Section.
      1. Identification: Include the following Project identification on the schedule of values:
         a. Project name and location.
         b. Name of Architect.
         c. Architect's project number.
         d. Contractor's name and address.
         e. Date of submittal.
      2. Arrange schedule of values consistent with format of AIA Document G703.
      3. Arrange the schedule of values in tabular form with separate columns to indicate the following for each item listed:
         a. Related Specification Section or Division.
         b. Description of the Work.
         c. Name of subcontractor.
         d. Name of manufacturer or fabricator.
         e. Name of supplier.
         f. Change Orders (numbers) that affect value.
         g. Dollar value of the following, as a percentage of the Contract Sum to nearest one-hundredth percent, adjusted to total 100 percent.
            1) Labor.
            2) Materials.
            3) Equipment.
      4. Provide a breakdown of the Contract Sum in enough detail to facilitate continued evaluation of Applications for Payment and progress reports. Coordinate with Project
Manual table of contents. Provide multiple line items for principal subcontract amounts in excess of five percent of the Contract Sum.

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

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

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

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

9. Purchase Contracts: Provide a separate line item in the schedule of values for each purchase contract. Show line-item value of purchase contract. Indicate owner payments or deposits, if any, and balance to be paid by Contractor.

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

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

1.04 APPLICATIONS FOR PROGRESS PAYMENTS

A. Payment Period: Submit at intervals stipulated in the Agreement.

B. Form to be used: AIA Document G702 and AIA Document G703 as form for Applications for Payment.

C. For each item, provide a column for listing each of the following:
   1. Item Number.
   2. Description of work.
   3. Previous Applications.
   4. Work in Place and Stored Materials under this Application.
   5. Authorized Change Orders.
   6. Total Completed and Stored to Date of Application.
   7. Percentage of Completion.
   9. Retainage.

D. Execute certification by signature of authorized officer. Applications shall be notarized. Architect will return incomplete applications without action.
   1. Use data from approved Schedule of Values. Provide dollar value in each column for each line item for portion of work performed and for stored products.
   2. List each authorized Change Order as a separate line item, listing Change Order number and dollar amount as for an original item of work.
   3. Submit one electronic and three hard-copies of each Application for Payment.

E. Stored Materials: Include in Application for Payment amounts applied for materials or equipment purchased or fabricated and stored, but not yet installed. Differentiate between items stored on-site and items stored off-site.
   1. Provide certificate of insurance, evidence of transfer of title to Owner, and consent of surety to payment, for stored materials.
2. Provide supporting documentation that verifies amount requested, such as paid invoices. Match amount requested with amounts indicated on documentation; do not include overhead and profit on stored materials.

3. Provide summary documentation for stored materials indicating the following:
   a. Value of materials previously stored and remaining stored as of date of previous Applications for Payment.
   b. Value of previously stored materials put in place after date of previous Application for Payment and on or before date of current Application for Payment.
   c. Value of materials stored since date of previous Application for Payment and remaining stored as of date of current Application for Payment.

F. Waivers of Mechanic's Lien: With each Application for Payment, submit waivers of mechanic's lien from every entity who is lawfully entitled to file a mechanic's lien arising out of the Contract and related to the Work covered by the payment.
   1. Submit partial waivers on each item for amount requested in previous application, after deduction for retainage, on each item.
   2. When an application shows completion of an item, submit final or full waivers.
   3. Owner reserves the right to designate which entities involved in the Work must submit waivers.
   4. Waivers: Submit each Application for Payment with Contractor's waiver of mechanic's lien for construction period covered by the application.
   5. Submit final Application for Payment with or preceded by final waivers from every entity involved with performance of the Work covered by the application who is lawfully entitled to a lien.

G. Initial Application for Payment: Administrative actions and submittals that must precede or coincide with submittal of first Application for Payment include the following:
   1. List of subcontractors.
   2. Schedule of Values.
   3. Contractor's Construction Schedule (preliminary if it's not final).
   4. Schedule of unit prices, if applicable.
   5. Submittals Schedule (preliminary if not final).
   6. List of Contractor's staff assignments.
   7. Copies of building permits.
   9. Certificates of insurance and insurance policies.
   11. Information required for Owner's insurance.

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

I. Final Payment Application: Submit final Application for Payment with releases and supporting documentation not previously submitted and accepted, including but not limited to the following:
   1. Evidence of completion of Project closeout requirements.
   2. Insurance certificates for products and completed operations where required and proof that taxes, fees, and similar obligations were paid.
   3. Updated final statement, accounting for final changes to the Contract Sum.
   4. AIA Document G706, "Contractor's Affidavit of Payment of Debts and Claims."
   6. AIA Document G707, "Consent of Surety to Final Payment."
   7. Evidence that claims have been settled.
8. Final meter readings for utilities, a measured record of stored fuel, and similar data as of date of Substantial Completion or when Owner took possession of and assumed responsibility for corresponding elements of the Work.
9. Removal of temporary facilities and services.
10. Change of door locks to Owner's access.

1.05 MODIFICATION PROCEDURES
A. Architect will issue supplemental instructions authorizing Minor Changes in the Work, not involving adjustment to the Contract Sum or the Contract Time, on "Architect's Instruction to Contractor" (ITC) form.
B. For minor changes not involving an adjustment to the Contract Sum or Contract Time, Architect will issue instructions directly to Contractor by ITC.
C. Owner-Initiated Proposal Requests or ITC's: Architect will issue a detailed description of proposed changes in the Work that may require adjustment to the Contract Sum or the Contract Time. If necessary, the description will include supplemental or revised Drawings and Specifications.
   1. Proposal Requests or ITC's issued by Architect 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 or ITC, 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.
D. For other required changes, Architect will issue a document signed by Owner instructing Contractor to proceed with the change, for subsequent inclusion in a Change Order.
   1. The document will describe the required changes and will designate method of determining any change in Contract Sum or Contract Time.
   2. Promptly execute the change.
E. For changes for which advance pricing is desired, Architect will issue a document that includes a detailed description of a proposed change with supplementary or revised drawings and specifications, a change in Contract Time for executing the change with a stipulation of any overtime work required and the period of time during which the requested price will be considered valid. Contractor shall prepare and submit a fixed price quotation within 10 days.
F. Contractor may propose a change by submitting a request for change to Architect, describing the proposed change and its full effect on the work, with a statement describing the reason for the change, and the effect on the Contract Sum and Contract Time with full documentation.
   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 1 Section "Product Requirements" if the proposed change requires substitution of one product or system for product or system specified.

G. Allowances:
   1. Allowance Adjustment: To adjust allowance amounts, base each Change Order proposal on the difference between purchase amount and the allowance, multiplied by final measurements of work-in-place. If applicable, include reasonable allowances for cutting losses, tolerances, mixing wastes, normal product imperfections, and similar margins.
      a. Include installation costs in purchase amount only where indicated as part of the allowance.
      b. If requested, prepare explanation and documentation to substantiate distribution of overhead costs and other margins claimed.
      c. Submit substantiation of a change in scope of work, if any, claimed in Change Orders related to unit-cost allowances.
      d. Owner reserves the right to establish the quantity of work-in-place by independent quantity survey, measure, or count.
   2. Submit claims for increased cost because of a change in scope or nature of the allowance described in the Contract Documents, whether for the Purchase Order amount or Contractor's handling, labor, installation, overhead, and profit. Submit claims within 21 days of receipt of the Change Order or Construction Change Directive authorizing work to proceed. Owner will reject claims submitted later than 21 days after such authorization.
      a. Do not include Contractor's or subcontractor's indirect expense in the Change Order cost amount unless it is clearly shown that the nature or extent of work has changed from what could have been foreseen from information in the Contract Documents.

PART 2 PRODUCTS - NOT USED

PART 3 EXECUTION - NOT USED

END OF SECTION
SECTION 01 22 00 - UNIT PRICES

PART 1 GENERAL

1.01 SECTION INCLUDES
A. List of unit prices, for use in preparing Bids.

1.02 COSTS INCLUDED
A. Unit Prices included on the Bid Form shall include full compensation for all required labor, products, tools, equipment, plant, transportation, services and incidentals; erection, application or installation of an item of the Work; overhead and profit.

1.03 UNIT QUANTITIES SPECIFIED
A. Quantities indicated in the Bid Form are for bidding and contract purposes only. Quantities and measurements of actual Work will determine the payment amount.

1.04 MEASUREMENT OF QUANTITIES
A. Assist by providing necessary equipment, workers, and survey personnel as required.
B. Measurement by Volume: Measured by cubic dimension using mean length, width and height or thickness.

1.05 PAYMENT
A. Payment for Work governed by unit prices will be made on the basis of the actual measurements and quantities of Work that is incorporated in or made necessary by the Work and accepted by the Architect, multiplied by the unit price.

1.06 SCHEDULE OF UNIT PRICES
A. Unit Price No. 1: Provide subgrade stabilization with suitable soil prior to placement of fill.
   1. Includes: Over excavation of unsuitable materials at the direction of the Geotechnical Engineer. Loading and removal of unsuitable materials from the site and disposed of at an acceptable off-site location. Backfilling with suitable soil compacting to required density. Work in accordance the the Cedar Rapids Metropolitan Area Design Specification (current edition), Section 02100.
   2. Does Not Include Excess Excavation: Payment will not be made for excess excavation work not specifically authorized by the Geotechnical Engineer.
   3. Unit of Measurement: Dollars per cubic yard.
B. Unit Price No. 1: Provide subgrade stabilization with crushed rock prior to placement of fill.
   1. Includes: Over excavation of unsuitable materials at the direction of the Geotechnical Engineer. Loading and removal of unsuitable materials from the site and disposed of at an acceptable off-site location. Backfilling with macadam stone (Iowa DOT gradation 13, Section 4122.02) on geo-grid, compacting to required density.
   2. Does Not Include Excess Excavation: Payment will not be made for excess excavation work not specifically authorized by the Geotechnical Engineer.
   3. Unit of Measurement: Dollars per cubic yard.
C. Unit Price No. 3: Replace unsatisfactory subgrade material under footing bearing surfaces (over the amount included in Base Bid).
   1. Includes: Excavating to required elevations, loading and removing unsuitable materials from the site and disposal at an acceptable off-site location. Backfilling with structural fill to required sub-grade elevations, compacting to required density. Importing acceptable soil material for use as structural fill.
   2. Does Not Include Excess Excavation: Payment will not be made for excess excavation work not specifically authorized by the Geotechnical Engineer.
   3. Unit of Measurement: Dollars per cubic yard.
D. Unit Price No. 4: Relocate remaining un-used topsoil stockpile.(over the amount included in Base Bid.)
   1. Includes: Loading and relocating un-used excess topsoil (fat clay with organics that is not included in the base bid price) to the CCSD Tower site. The CCSD Tower site is located
approximately 2500 feet southeast of the project site and east of Kirkwood Boulevard directly across from the CCSD new ball field complex.

2. Relocated topsoil shall be neatly stockpiled and seeded with Type 5 Stabilizing crop per the Cedar Rapids Metropolitan Areas Standard Specifications for Public Improvements, (current edition), Section 02900.

3. Unit of Measurement: Dollars per cubic yard.

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

END OF SECTION
SECTION 01 23 00 - ALTERNATES

PART 1 GENERAL

1.01 SECTION INCLUDES
   A. Description of Alternates.

1.02 ACCEPTANCE OF ALTERNATES
   A. Alternates quoted on Bid Forms will be reviewed and accepted or rejected at Owner's option. Accepted Alternates will be identified in the Owner-Contractor Agreement.
   B. Coordinate related work and modify surrounding work to integrate the Work of each Alternate.

1.03 SCHEDULE OF ALTERNATES
   A. Alternate No. 1 - Additional Classroom:
      1. Provide ADD cost to construct for the additional 3 year old classroom at the South End of the East classroom wing as outlined on A700 and all associated consultant sheets.

   B. Alternate No. 2 - Additional Site Grading Area:
      1. Provide ADD cost to grade the area at the South end of the building for future additions as outlined on sheet C301.

   C. Alternate No. 3 - Roofing Alternate:
      1. Provide DEDUCT cost to install asphalt shingle roofing in lieu of standing seam metal roofing at all 9:12 sloped roof areas.

   D. Alternate No. 4 - Kitchen Cabinet Alternate:
      1. Provide ADD cost to replace the plastic laminate casework and solid surface countertops in Kitchen 204 (base bid) with stainless steel units as indicated in Kitchen drawings and specifications.

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

END OF SECTION
SECTION 01 25 00 - SUBSTITUTION PROCEDURES

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Procedural requirements for proposed substitutions.

1.02 RELATED REQUIREMENTS

A. Section 00 21 13 - Instructions to Bidders: Restrictions on timing of substitution requests.

B. Section 00 43 25 - Substitution Request Form - During Procurement: Required form for substitution requests made before end of Bidding/Negotiation Phase (During Bidding).

C. Section 00 63 25 - Substitution Request Form - During Construction: Required form for substitution requests during construction.

1.03 DEFINITIONS

A. Substitutions: Changes from Contract Documents requirements proposed by Contractor to materials, products, assemblies, and equipment.

1. Substitutions for Cause: Proposed due to changed Project circumstances beyond Contractor's control.
   a. Unavailability.

2. Substitutions for Convenience: Proposed due to possibility of offering substantial advantage to the Project.
   a. Substitution requests offering advantages solely to the Contractor will not be considered.

PART 2 PRODUCTS - NOT USED

PART 3 EXECUTION

3.01 GENERAL REQUIREMENTS

A. A Substitution Request for products, assemblies, materials, and equipment constitutes a representation that the submitter:
   1. Has investigated proposed product and determined that it meets or exceeds the quality level of the specified product, equipment, assembly, or system.
   2. Agrees to provide the same warranty for the substitution as for the specified product.
   3. Agrees to provide same or equivalent maintenance service and source of replacement parts, as applicable.
   4. Agrees to coordinate installation and make changes to other work that may be required for the work to be complete, with no additional cost to Owner.
   5. Waives claims for additional costs or time extension that may subsequently become apparent.

B. Document each request with complete data substantiating compliance of proposed substitution with Contract Documents. Burden of proof is on proposer.

C. Content: Include information necessary for tracking the status of each Substitution Request, and information necessary to provide an actionable response.

D. Limit each request to a single proposed substitution item.
   1. Submit an electronic document, combining the request form with supporting data into single document.

3.02 SUBSTITUTION PROCEDURES DURING BIDDING PHASE

A. Instructions to Bidders specifies time restrictions for submitting requests for substitutions during the bidding period, and the documents required.

B. Submittal Form:
   1. Submit substitution requests by completing the form in Section 00 43 25. See this form for additional information and instructions. Use only this form; other forms of submission are unacceptable.
3.03 SUBSTITUTION PROCEDURES DURING CONSTRUCTION (AFTER BIDDING PHASE)

A. Submittal Form (after contract award):
   1. Submit substitution requests by completing the form in Section 00 63 25. See this section for additional information and instructions. Use only this form; other forms of submission are unacceptable.

B. Architect will consider requests for substitutions only within 15 days after date of Agreement.

C. Submit request for Substitution for Cause within 14 days of discovery of need for substitution, but not later than 14 days prior to time required for review and approval by Architect, in order to stay on approved project schedule.

D. Submit request for Substitution for Convenience immediately upon discovery of its potential advantage to the project, but not later than 14 days prior to time required for review and approval by Architect, in order to stay on approved project schedule.
   1. In addition to meeting general documentation requirements, document how the requested substitution benefits the Owner through cost savings, time savings, greater energy conservation, or in other specific ways.
   2. Document means of coordinating of substitution item with other portions of the work, including work by affected subcontractors.
   3. Bear the costs engendered by proposed substitution of:
      a. Owner's compensation to the Architect for any required redesign, time spent processing and evaluating the request.
      b. Other unanticipated project considerations.

E. Substitutions will not be considered under one or more of the following circumstances:
   1. When they are indicated or implied on shop drawing or product data submittals, without having received prior approval.
   2. Without a separate written request.
   3. When acceptance will require revisions to the Contract Documents.

3.04 RESOLUTION

A. Architect may request additional information and documentation prior to rendering a decision. Provide this data in an expeditious manner.

B. Architect will notify Contractor in writing of decision to accept or reject request.

END OF SECTION
SECTION 01 30 00 - ADMINISTRATIVE REQUIREMENTS

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Preconstruction meeting.
B. Site mobilization meeting.
C. Progress meetings.
D. Construction progress schedule.
E. Coordination drawings.
F. Requests for Information (RFI)
G. Electronic submittal procedures.
H. Number of copies of submittals.
I. Submittal procedures.

1.02 GENERAL COORDINATION PROCEDURES

A. Coordination: Coordinate construction operations included in different Sections of the Specifications to ensure efficient and orderly installation of each part of the Work. Coordinate construction operations, included in different Sections, that depend on each other for proper installation, connection, and operation.

1. Schedule construction operations in sequence required to obtain the best results where installation of one part of the Work depends on installation of other components, before or after its own installation.
2. Coordinate installation of different components to ensure maximum performance and accessibility for required maintenance, service, and repair.
3. Make adequate provisions to accommodate items scheduled for later installation.

B. Prepare memoranda for distribution to each party involved, outlining special procedures required for coordination. Include such items as required notices, reports, and list of attendees at meetings.

1. Prepare similar memoranda for Owner and separate contractors if coordination of their Work is required.

C. Administrative Procedures: Coordinate scheduling and timing of required administrative procedures with other construction activities to avoid conflicts and to ensure orderly progress of the Work. Such administrative activities include, but are not limited to, the following:

1. Preparation of Contractor's construction schedule.
2. Preparation of the schedule of values.
3. Installation and removal of temporary facilities and controls.
4. Delivery and processing of submittals.
5. Progress meetings.
6. Preinstallation conferences.
7. Project closeout activities.
8. Startup and adjustment of systems.

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

1. Salvage materials and equipment involved in performance of, but not actually incorporated into, the Work. See other Sections for disposition of salvaged materials that are designated as Owner's property.
PART 2 PRODUCTS - NOT USED

PART 3 EXECUTION

3.01 MEETINGS, GENERAL

A. General: Schedule and conduct meetings and conferences at Project site unless otherwise indicated.
   1. Attendees: Inform participants and others involved, and individuals whose presence is required, of date and time of each meeting. Notify Owner and Architect of scheduled meeting dates and times.
   2. Agenda: Prepare the meeting agenda. Distribute the agenda to all invited attendees.
   3. Minutes: Entity responsible for conducting meeting will record significant discussions and agreements achieved. Distribute the meeting minutes to everyone concerned, including Owner, and Architect, within three days of the meeting.

3.02 PRECONSTRUCTION MEETING

A. General Contractor shall schedule and conduct a preconstruction meeting before starting construction, at a time convenient to Owner and Architect, but not later than 15 days after execution of the Agreement.
   1. Conduct the conference to review responsibilities and personnel assignments.
   2. Attendees: Authorized representatives of Owner, Architect, and their consultants; Contractor and its superintendent; major subcontractors; suppliers; and other concerned parties shall attend the conference. Participants at the conference shall be familiar with Project and authorized to conclude matters relating to the Work.
   3. Agenda: Discuss items of significance that could affect progress, including the following:
      a. Tentative construction schedule.
      b. Phasing.
      c. Critical work sequencing and long-lead items.
      d. Designation of key personnel and their duties.
      e. Lines of communications.
      f. Procedures for processing field decisions and Change Orders.
      g. Procedures for RFI.s.
      h. Procedures for testing and inspecting.
      i. Procedures for processing Applications for Payment.
      j. Distribution of the Contract Documents.
      k. Submittal procedures.
      l. Preparation of record documents.
      m. Use of the premises.
      n. Work restrictions.
      o. Working hours.
      p. Owner’s occupancy requirements.
      q. Responsibility for temporary facilities and controls.
      r. Procedures for moisture and mold control.
      s. Procedures for disruptions and shutdowns.
      t. Construction waste management and recycling.
      u. Parking availability.
      v. Office, work, and storage areas.
      w. Equipment deliveries and priorities.
      x. First aid.
      y. Security.
      z. Progress cleaning.

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

A. Schedule and administer meetings throughout progress of the Work at weekly intervals or as otherwise agreed to by all parties.

B. Attendance Required: Job superintendent, major Subcontractors and suppliers, Owner, Architect, as appropriate to agenda topics for each meeting. All participants at the meeting shall be familiar with Project and authorized to conclude matters regarding the Work.

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

1. Review minutes of previous meetings.
2. Review of Work progress.
3. Field observations, problems, and decisions.
4. Identification of problems that impede, or will impede, planned progress.
5. Review of submittals schedule and status of submittals.
6. Quality and work standards.
7. Status of RFI's.
8. Status of proposal requests.
9. Pending changes,
10. Status of Change Orders.
11. Maintenance of progress schedule.
12. Corrective measures to regain projected schedules.
13. Planned progress during succeeding work period.
14. Coordination of projected progress.
15. Maintenance of quality and work standards.
16. Effect of proposed changes on progress schedule and coordination.
17. Other business relating to work.

D. Record minutes and distribute on submittal website within three days after meeting.

3.04 CONSTRUCTION PROGRESS SCHEDULE

A. Within 10 days after date of the Agreement, submit preliminary schedule defining planned operations for the first 60 days of work, with a general outline for remainder of work.

B. If preliminary schedule requires revision after review, submit revised schedule within 10 days.

C. Within 20 days after review of preliminary schedule, submit draft of proposed complete schedule for review.

1. Include written certification that major contractors have reviewed and accepted proposed schedule.

D. Within 10 days after joint review, submit complete schedule.

E. Submit updated schedule monthly and submit with Application for Payment.

3.05 COORDINATION DRAWINGS

A. Provide information required for preparation of coordination drawings. Complete information on a single drawing illustrating the following proposed materials and mounting heights:

1. Architectural walls and ceiling materials. Identify ceiling heights.
2. Structural framing and other structural elements above the proposed ceiling line. Identify sizes of structural members. Identify bottom of structure.
3. Mechanical ductwork (two line diagrams) and equipment. Identify size of ductwork and equipment. Identify top and bottom of ductwork and equipment.
4. Plumbing supply and drain lines. Identify size of plumbing lines. Identify bottom of piping. Identify top and bottom of piping at crossovers with other elements.
5. Fire protection piping lines. Identify size of plumbing lines. Identify bottom of piping. Identify top and bottom of piping at crossovers with other elements.
6. Electrical equipment mounted above the ceiling. Identify top and bottom side of equipment.
7. Locations of recessed light fixtures. Identify top of fixture.
8. Identify top and bottom side of equipment.
9. Data cable trays and equipment mounted above the ceiling. Identify bottom of cable trays.
10. Identify access panels necessary for equipment access or maintainance.
11. Identify other elements requiring above ceiling coordination.

B. Prepare Coordination Drawings for all areas of the building (new and existing) to facilitate installation coordination amongst all disciplines and trades. Each drawing shall be broken out by phase (for every phase of the project) and submitted separately after equipment submittals have been approved.
1. Content: Project-specific information, drawn accurately to scale. Do not base Coordination Drawings on reproductions of the Contract Documents or standard printed data. Include the following information, as applicable:
2. Indicate functional and spatial relationships of components of architectural, structural, civil, mechanical, and electrical systems. As part of the spatial relationship requirement, the Contractor shall take field dimensions in existing areas to confirm available space for installations prior to completing the coordination drawings.
3. Indicate required installation sequences.
4. Indicate dimensions shown on the Contract Drawings and make specific note of dimensions that appear to be in conflict with submitted equipment and minimum clearance requirements. Provide alternate sketches to Architect for resolution of such conflicts. Minor dimension changes and difficult installations will not be considered changes to the Contract.
5. Drawing scale: Coordination drawings shall be drawn at minimum ¼” =1'-0” scale.
6. Coordination meeting(s): A coordination meeting will be scheduled after coordination drawings are received from all sub-contractors for review and discussion. Subsequent meetings will be scheduled for follow up and resolution to conflicts. These meetings shall be led by the General Contractor.
7. Scheduling: Installation of system components will not be allowed until after coordination meeting(s) and all coordination issues are resolved.

C. It shall be the Contractors responsibility to confirm that the equipment physically fits in the space allotted. This will require the Contractor to field verify existing spatial elements and lay out their work prior to ordering equipment, ideally this will occur prior to submitting shop drawings. Where conflicts exist, notify the Design Professional prior to equipment order.

D. Coordination Drawing Organization: Organize coordination drawings as follows:
1. Floor Plans and Reflected Ceiling Plans: Show architectural and structural elements, and mechanical, plumbing, fire-protection, fire-alarm, and electrical Work. Show locations of visible ceiling-mounted devices relative to acoustical ceiling grid. Supplement plan drawings with section drawings where required to adequately represent the Work.
2. Plenum Space: Indicate subframing for support of ceiling and wall systems, mechanical and electrical equipment, and related Work. Locate components within ceiling plenum to accommodate layout of light fixtures indicated on Drawings. Indicate areas of conflict between light fixtures and other components.
3. Mechanical Rooms: Provide coordination drawings for mechanical rooms showing plans and elevations of mechanical, plumbing, fire-protection, fire-alarm, and electrical equipment.
4. Structural Penetrations: Indicate penetrations and openings required for all disciplines.
5. Slab Edge and Embedded Items: Indicate slab edge locations and sizes and locations of embedded items for metal fabrications, sleeves, anchor bolts, bearing plates, angles, door floor closers, slab depressions for floor finishes, curbs and housekeeping pads, and similar items.
6. Mechanical and Plumbing Work: Show the following:
   a. Sizes and bottom elevations of ductwork, piping, and conduit runs, including insulation, bracing, flanges, and support systems.
b. Dimensions of major components, such as dampers, valves, diffusers, access doors, cleanouts and electrical distribution equipment.

c. Fire-rated enclosures around ductwork.

7. Electrical Work: Show the following:
   a. Runs of vertical and horizontal conduit 1-1/4 inches in diameter and larger.
   b. Light fixture, exit light, emergency battery pack, smoke detector, and other fire-alarm locations.
   c. Panel board, switch board, switchgear, transformer, busway, generator, and motor control center locations.
   d. Location of pull boxes and junction boxes, dimensioned from column center lines.

8. Fire-Protection System: Show the following:
   a. Locations of standpipes, mains piping, branch lines, pipe drops, and sprinkler heads.

E. Review drawings prior to submission to Architect.

F. Architect Review: Architect will review coordination drawings to confirm that the Work is being coordinated, but not for the details of the coordination, which are Contractor's responsibility. If Architect determines that coordination drawings are not being prepared in sufficient scope or detail, or are otherwise deficient, Architect will so inform Contractor, who shall make changes as directed and resubmit.

3.06 REQUESTS FOR INFORMATION (RFI)

A. General: Immediately on discovery of the need for additional information or interpretation of the Contract Documents, Contractor shall prepare and submit an RFI in the form specified.
   1. Architect will return RFIs submitted to Architect by other entities controlled by Contractor without response.
   2. Coordinate and submit RFIs in a prompt manner so as to avoid delays in Contractor's work or work of subcontractors.

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

C. RFI Forms: AIA Document G716 or other form acceptable to Architect.
   1. Attachments shall be electronic files in Adobe Acrobat PDF format.

D. Architect's Action: Architect will review each RFI, determine action required, and respond. Allow seven working days for Architect's response for each RFI. RFIs received by Architect after 1:00 p.m. will be considered as received the following working day.
   1. The following Contractor-generated RFIs will be returned without action:
      a. Requests for approval of submittals.
b. Requests for approval of substitutions.
c. Requests for approval of Contractor's means and methods.
d. Requests for coordination information already indicated in the Contract Documents.
e. Requests for adjustments in the Contract Time or the Contract Sum.
f. Requests for interpretation of Architect's actions on submittals.
g. Incomplete RFIs or inaccurately prepared RFIs.

2. Architect's action may include a request for additional information, in which case Architect's time for response will date from time of receipt of additional information.

3. Architect's action on RFIs that may result in a change to the Contract Time or the Contract Sum may be eligible for Contractor to submit Change Proposal according to Division 01 Section "Contract Modification Procedures."
   a. If Contractor believes the RFI response warrants change in the Contract Time or the Contract Sum, notify Architect in writing within 10 days of receipt of the RFI response.

E. RFI Log: Prepare, maintain, and submit a tabular log of RFIs organized by the RFI number. Submit log weekly. Include the following:
   1. Project name.
   2. Name and address of Contractor.
   3. Name and address of Architect.
   4. RFI number including RFIs that were returned without action or withdrawn.
   5. RFI description.
   6. Date the RFI was submitted.
   7. Date Architect's response was received.

F. On receipt of Architect's action, update the RFI log and immediately distribute the RFI response to affected parties. Review response and notify Architect within seven days if Contractor disagrees with response.
   1. Identification of related Minor Change in the Work, Construction Change Directive, and Proposal Request, as appropriate.
   2. Identification of related Field Order, Work Change Directive, and Proposal Request, as appropriate.

3.07 CONTRACTOR'S USE OF ARCHITECT'S FILES

A. General: At Contractor's written request, the Architect will provide electronic files for Contractor's use in connection with Project, subject to the following conditions:
   1. Electronic CAD files shall only be provided for base site plans, base floor plans and base reflected ceiling plans, excluding dimensions and notes. No other electronic drawing files shall be provided.
   2. Contractor requesting files shall complete the "Terms and Conditions for Use of Electronic Files" form which follows this section and return to OPN Architects with applicable fee payment.
   3. Upon receipt of completed form and payment, Contractor shall be sent requested files either by e-mail or mailed CD as required by file properties. Allow two business days after receipt of form and payment for delivery of files.
   4. Requests for Civil, Structural, Fire Protection, Plumbing, Heating and Ventilation, Electrical and Technology electronic files shall be submitted directly to consultant responsible for their preparation. These requests shall be subject to applicable consultant's terms, conditions and fees.

3.08 SUBMITTALS FOR REVIEW

A. When the following are specified in individual sections, submit them for review:
   1. Product data.
   2. Shop drawings.
   3. Samples for selection.
   4. Samples for verification.

B. Submit to Architect for review for the limited purpose of checking for conformance with information given and the design concept expressed in the contract documents.
C. Samples will be reviewed for aesthetic, color, or finish selection.
D. After review, provide copies and distribute in accordance with SUBMITTAL PROCEDURES article below and for record documents purposes described in Section 01 78 00 - Closeout Submittals.

3.09 SUBMITTALS FOR INFORMATION
A. Subcontract List: Prepare a written summary identifying individuals or firms proposed for each portion of the Work, including those who are to furnish products or equipment fabricated to a special design. Include the following information in tabular form:
   1. Name, address, and telephone number of entity performing subcontract or supplying products.
   2. Number and title of related Specification Section(s) covered by subcontract.
   3. Drawing number and detail references, as appropriate, covered by subcontract.
B. Key Personnel Names: Within 15 days of starting construction operations, submit a list of key personnel assignments, including superintendent and other personnel in attendance at Project site. Identify individuals and their duties and responsibilities; list addresses and telephone numbers, including home, office, and cellular telephone numbers and e-mail addresses. Provide names, addresses, and telephone numbers of individuals assigned as alternates in the absence of individuals assigned to Project.
   1. Post copies of list in project meeting room, in temporary field office, and by each temporary telephone. Keep list current at all times.
C. When the following are specified in individual sections, submit them for information:
   1. Design data.
   2. Certificates.
   3. Test reports.
   4. Inspection reports.
   5. Manufacturer's instructions.
   6. Manufacturer's field reports.
   7. Photos of samples to be delivered.
   8. Other types indicated.
D. Submit for Architect's knowledge as contract administrator or for Owner.

3.10 SUBMITTALS FOR PROJECT CLOSEOUT
A. Submit Correction Punch List for Substantial Completion.
B. Submit Final Correction Punch List for Substantial Completion.
C. When the following are specified in individual sections, submit them at project closeout in conformance to requirements of Section 01 78 00 - Closeout Submittals:
   1. Project record documents.
   2. Operation and maintenance data.
   3. Warranties.
   5. Other types as indicated.
D. Submit for Owner's benefit during and after project completion.

3.11 ELECTRONIC SUBMITTAL PROCEDURES
A. Summary:
   1. Shop drawing and product data submittals shall be transmitted to Architect in electronic (PDF) format using Submittal Exchange, a website service designed specifically for transmitting submittals between construction team members.
   2. The intent of electronic submittals is to expedite the construction process by reducing paperwork, improving information flow, and decreasing turnaround time.
   3. The electronic submittal process is not intended for color samples, color charts, or physical material samples.
B. Procedures:
   1. Submittal Preparation - Contractor may use any or all of the following options:
      a. Subcontractors and Suppliers provide electronic (PDF) submittals to Contractor via
         the Submittal Exchange website.
      b. Subcontractors and Suppliers provide paper submittals to General Contractor who
         electronically scans and converts to PDF format.
      c. Subcontractors and Suppliers provide paper submittals to Scanning Service which
         electronically scans and converts to PDF format.
   2. Contractor shall review and apply electronic stamp certifying that the submittal
      complies with the requirements of the Contract Documents including verification of
      manufacturer/product, dimensions and coordination of information with other parts of the
      work.
   3. Contractor shall transmit each submittal to Architect using the Submittal Exchange
   4. Architect/Engineer review comments will be made available on the Submittal Exchange
      website for downloading. Contractor will receive email notice of completed review.
   5. Distribution of reviewed submittals to subcontractors and suppliers is the responsibility of
      the Contractor.
   6. Submit paper copies of reviewed submittals at project closeout for record purposes in
      accordance with Section 01 78 00 – Closeout Submittals.

C. Costs:
   1. Contractor shall include the cost of Submittal Exchange services in the Base Bid.
   2. At Contractor's option, training is available from Submittal Exchange regarding use of
      website and PDF submittals. Contact Submittal Exchange at 1-800-714-0024.
   3. Internet Service and Equipment Requirements:
      a. Email address and Internet access at Contractor's main office.
      b. Adobe Acrobat (www.adobe.com), Bluebeam PDF Revu (www.bluebeam.com), or
         other similar PDF review software for applying electronic stamps and comments.

3.12 NUMBER OF COPIES OF SUBMITTALS
   A. Documents for Information: Submit two copies.
   B. Samples: Submit the number specified in individual specification sections; in addition, submit
      photo of sample on electronic submittal website.

3.13 ADDITIONAL SUBMITTAL PROCEDURES
   A. Transmit each submittal with approved form.
   B. Sequentially number the transmittal form. Revise submittals with original number and a
      sequential alphabetic suffix.
   C. Identify Project, Contractor, Subcontractor or supplier; pertinent drawing and detail number, and
      specification section number, as appropriate on each copy.
   D. Apply Contractor's stamp, signed or initialed certifying that review, approval, verification of
      Products required, field dimensions, adjacent construction Work, and coordination of
      information is in accordance with the requirements of the Work and Contract Documents.
   E. Schedule submittals to expedite the Project, and coordinate submission of related items.
   F. For each submittal for review, allow 15 days excluding delivery time to and from the Contractor.
   G. Identify variations from Contract Documents and Product or system limitations that may be
      detrimental to successful performance of the completed Work.
   H. Provide space for Contractor and Architect review stamps.
   I. When revised for resubmission, identify all changes made since previous submission.
   J. Distribute reviewed submittals as appropriate. Instruct parties to promptly report any inability to
      comply with requirements.
K. Submittals not requested will not be recognized or processed.

END OF SECTION
1. OPN Architects, Inc. (hereinafter referred to as “OPN”) is providing data (electronic or otherwise) to you solely at your request and for your convenience and use. OPN makes no guarantee of compatibility of files with other software or hardware.

2. This information represents the current status of the project and is not guaranteed to represent the final design and/or the project as constructed. Changes to this data may occur without notice to the user of this data and it is the sole responsibility of the user to verify all elements included herein. Any use or reuse of the original or altered electronic files shall be at the user’s risk and full legal responsibility.

3. These files were prepared by OPN and are instruments of OPN’s service for use solely with respect to this Project. OPN will be deemed the Author of these documents and will retain all common law, statutory, and other reserved rights, including the copyright.

4. Notification of opened message shall be evidence of your receipt and agreement to these terms. Any disagreement or issue with these terms shall be submitted in writing to OPN within 7 days of this message otherwise it shall be deemed accepted by the user.

5. A standard fee payment of $100.00 per requested drawing file shall be submitted with this form. Payment shall be made by check payable to “OPN Architects, Inc.” Submit requests to the OPN Project Manager and payment to OPN Architects, Inc.

6. The person/company requesting these files is:

7. Specific drawing files covered under this agreement:

Accepted By: __________________________________________
Printed Name: __________________________________________
Date: __________________________________________
Title: __________________________________________
Company: __________________________________________
Address: __________________________________________
Phone: __________________________________________
Fax: __________________________________________
Email: __________________________________________
SECTION 01 32 16 - CONSTRUCTION PROGRESS SCHEDULE

PART 1 GENERAL

1.01 SECTION INCLUDES
   A. Preliminary schedule.
   B. Construction progress schedule, bar chart type.
   C. Construction reports.

1.02 SUBMITTALS
   A. Within 10 days after date of Agreement, submit preliminary schedule.
   B. Within 20 days after review of preliminary schedule, submit draft of proposed complete schedule for review.
   C. Within 10 days after joint review, submit complete schedule.
   D. Submit updated schedule monthly, submit with each Application for Payment.

1.03 SCHEDULE FORMAT
   A. Listings: In chronological order according to the start date for each activity. Identify each activity with the applicable specification section number.

PART 2 PRODUCTS - NOT USED

2.01 CONTRACTOR'S CONSTRUCTION SCHEDULE, GENERAL
   A. Time Frame: Extend schedule from date established for the Notice of Award to date of final completion.
      1. Contract completion date shall not be changed by submission of a schedule that shows an early completion date, unless specifically authorized by Change Order.
   B. Activities: Treat each story or separate area as a separate numbered activity for each main element of the Work. Comply with the following:
      1. Activity Duration: Define activities so no activity is longer than 14 days, unless specifically allowed by Architect.
      2. Procurement Activities: Include procurement process activities for the following long lead items and major items, requiring a cycle of more than 60 days, as separate activities in schedule. Procurement cycle activities include, but are not limited to, submittals, approvals, purchasing, fabrication, and delivery.
      3. Submittal Review Time: Include review and resubmittal times indicated in Division 01 Section "Submittal Procedures" in schedule. Coordinate submittal review times in Contractor's construction schedule with submittal schedule.
      4. Startup and Testing Time: Include no fewer than 15 days for startup and testing.
      5. Substantial Completion: Indicate completion in advance of date established for Substantial Completion, and allow time for Architect's administrative procedures necessary for certification of Substantial Completion.
      6. Punch List and Final Completion: Include not more than 30 days for completion of punch list items and final completion.
   C. Constraints: Include constraints and work restrictions indicated in the Contract Documents and as follows in schedule, and show how the sequence of the Work is affected.
      1. Phasing: Arrange list of activities on schedule by phase.
      2. Work by Owner: Include a separate activity for each portion of the Work performed by Owner.
      3. Work Restrictions: Show the effect of the following items on the schedule:
         a. Coordination with existing construction.
         b. Limitations of continued occupancies.
         c. Uninterruptible services.
         d. Partial occupancy before Substantial Completion.
         e. Use of premises restrictions.
4. Work Stages: Indicate important stages of construction for each major portion of the Work, including, but not limited to, the following:
   a. Subcontract awards.
   b. Submittals.
   c. Purchases.
   d. Mockups.
   e. Fabrication.
   f. Sample testing.
   g. Deliveries.
   h. Installation.
   i. Tests and inspections.
   j. Adjusting.
   k. Curing.
   l. Building flush-out.
   m. Startup and placement into final use and operation.

5. Construction Areas: Identify each major area of construction for each major portion of the Work. Indicate where each construction activity within a major area must be sequenced or integrated with other construction activities to provide for the following:
   a. Structural completion.
   b. Temporary enclosure and space conditioning.
   c. Permanent space enclosure.
   d. Completion of mechanical installation.
   e. Completion of electrical installation.
   f. Substantial Completion.

6. Other Constraints: Insert constraints not indicated elsewhere.

D. Milestones: Include milestones indicated in the Contract Documents in schedule, including, but not limited to, the Notice to Proceed, Substantial Completion, and final completion.
   1. Temporary enclosure and space conditioning.

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

F. Upcoming Work Summary: Prepare summary report indicating activities scheduled to occur or commence prior to submittal of next schedule update. Summarize the following issues:
   1. Unresolved issues.
   2. Unanswered Requests for Information.
   3. Rejected or unreturned submittals.
   4. Notations on returned submittals.

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

H. Computer Scheduling Software: Prepare schedules using current version of a program that has been developed specifically to manage construction schedules.

2.02 REPORTS

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

PART 3 EXECUTION

3.01 PRELIMINARY SCHEDULE
A. Prepare preliminary schedule in the form of a horizontal bar chart.

3.02 CONTENT
A. Show complete sequence of construction by activity, with dates for beginning and completion of each element of construction.
B. Identify each item by specification section number.
C. Identify work of separate stages and other logically grouped activities.
D. Show accumulated percentage of completion of each item, and total percentage of Work completed, as of the first day of each month.
E. Provide legend for symbols and abbreviations used.

3.03 BAR CHARTS
A. Include a separate bar for each major portion of Work or operation.
B. Identify the first work day of each week.

3.04 REVIEW AND EVALUATION OF SCHEDULE
A. Participate in joint review and evaluation of schedule with Architect at each submittal.
B. Evaluate project status to determine work behind schedule and work ahead of schedule.
C. After review, revise as necessary as result of review, and resubmit within 10 days.

3.05 UPDATING SCHEDULE
A. Maintain schedules to record actual start and finish dates of completed activities.
B. Indicate progress of each activity to date of revision, with projected completion date of each activity.
C. Annotate diagrams to graphically depict current status of Work.
D. Identify activities modified since previous submittal, major changes in Work, and other identifiable changes.
E. Indicate changes required to maintain Date of Substantial Completion.
F. Submit reports required to support recommended changes.
3.06 DISTRIBUTION OF SCHEDULE

A. Distribute copies of updated schedules to Contractor's project site file, to subcontractors, suppliers, Architect, Owner, and other concerned parties.

B. Instruct recipients to promptly report, in writing, problems anticipated by projections indicated in schedules.

END OF SECTION
SECTION 01 40 00 - QUALITY REQUIREMENTS

PART 1  GENERAL

1.01  SECTION INCLUDES
A. Submittals.
B. References and standards.
C. Testing and inspection agencies and services.
D. Control of installation.
E. Tolerances.
F. Defect Assessment.

1.02  RELATED REQUIREMENTS
A. Section 01 42 16 - Definitions.

1.03  SUBMITTALS
A. See Section 01 30 00 - Administrative Requirements, for submittal procedures.
B. Test Reports: After each test/inspection, promptly submit two copies of report to Architect and to Contractor.
C. Certificates: When specified in individual specification sections, submit certification by the manufacturer and Contractor or installation/application subcontractor to Architect, in quantities specified for Product Data.
   1. Indicate material or product conforms to or exceeds specified requirements. Submit supporting reference data, affidavits, and certifications as appropriate.
D. Manufacturer's Instructions: When specified in individual specification sections, submit printed instructions for delivery, storage, assembly, installation, start-up, adjusting, and finishing, for the Owner's information. Indicate special procedures, perimeter conditions requiring special attention, and special environmental criteria required for application or installation.
E. Manufacturer's Field Reports: Submit reports for Architect's benefit as contract administrator or for Owner.
   1. Submit for information for the limited purpose of assessing conformance with information given and the design concept expressed in the contract documents.

1.04  REFERENCES AND STANDARDS
A. For products and workmanship specified by reference to a document or documents not included in the Project Manual, also referred to as reference standards, comply with requirements of the standard, except when more rigid requirements are specified or are required by applicable codes.
B. Conform to reference standard of date of issue current on date of Contract Documents, except where a specific date is established by applicable code.
C. Obtain copies of standards where required by product specification sections.
D. Maintain copy at project site during submittals, planning, and progress of the specific work, until Substantial Completion.
E. Should specified reference standards conflict with Contract Documents, request clarification from Architect before proceeding.
F. Neither the contractual relationships, duties, or responsibilities of the parties in Contract nor those of Architect shall be altered from the Contract Documents by mention or inference otherwise in any reference document.

1.05  TESTING AND INSPECTION AGENCIES AND SERVICES
A. Owner will employ and pay for services of an independent testing agency to perform specified testing and inspections.
1. Owner will furnish Contractor with names, addresses, and telephone numbers of testing agencies engaged and a description of types of testing and inspecting they are engaged to perform.
2. Costs for retesting and reinspecting construction that replaces or is necessitated by work that failed to comply with the Contract Documents will be charged to Contractor, and the Contract Sum will be adjusted by Change Order.

B. Employment of agency in no way relieves Contractor of obligation to perform Work in accordance with requirements of Contract Documents.

PART 2 PRODUCTS - NOT USED

PART 3 EXECUTION

3.01 CONTROL OF INSTALLATION
A. Monitor quality control over suppliers, manufacturers, products, services, site conditions, and workmanship, to produce Work of specified quality.
B. Comply with manufacturers' instructions, including each step in sequence.
C. Should manufacturers' instructions conflict with Contract Documents, request clarification from Architect before proceeding.
D. Comply with specified standards as minimum quality for the Work except where more stringent tolerances, codes, or specified requirements indicate higher standards or more precise workmanship.
E. Have Work performed by persons qualified to produce required and specified quality.
F. Verify that field measurements are as indicated on shop drawings or as instructed by the manufacturer.
G. Secure products in place with positive anchorage devices designed and sized to withstand stresses, vibration, physical distortion, and disfigurement.

3.02 TOLERANCES
A. Monitor fabrication and installation tolerance control of products to produce acceptable Work. Do not permit tolerances to accumulate.
B. Comply with manufacturers' tolerances. Should manufacturers' tolerances conflict with Contract Documents, request clarification from Architect before proceeding.
C. Adjust products to appropriate dimensions; position before securing products in place.

3.03 TESTING AND INSPECTION
A. See individual specification sections for testing required.
B. Testing Agency Duties:
   2. Perform specified sampling and testing of products in accordance with specified standards.
   3. Ascertain compliance of materials and mixes with requirements of Contract Documents.
   4. Promptly notify Architect and Contractor of observed irregularities or non-conformance of Work or products.
   5. Perform additional tests and inspections required by Architect.
   6. Submit reports of all tests/inspections specified.
C. Limits on Testing/Inspection Agency Authority:
   1. Agency may not release, revoke, alter, or enlarge on requirements of Contract Documents.
   2. Agency may not approve or accept any portion of the Work.
   3. Agency may not assume any duties of Contractor.
   4. Agency has no authority to stop the Work.
D. Contractor Responsibilities:
1. Cooperate with laboratory personnel, and provide access to the Work.
2. Provide incidental labor and facilities:
   a. To provide access to Work to be tested/inspected.
   b. To obtain and handle samples at the site or at source of Products to be tested/inspected.
   c. To facilitate tests/inspections.
   d. To provide storage and curing of test samples.
3. Notify Architect, Owner and laboratory 24 hours prior to expected time for operations requiring testing/inspection services.
4. Employ services of an independent qualified testing laboratory and pay for additional samples, tests, and inspections required by Contractor beyond specified requirements.
5. Arrange with Owner's agency and pay for additional samples, tests, and inspections required by Contractor beyond specified requirements.

E. Re-testing required because of non-conformance to specified requirements shall be performed by the same agency on instructions by Architect.

F. Re-testing required because of non-conformance to specified requirements shall be paid for by Contractor.

3.04 DEFECT ASSESSMENT
A. Replace Work or portions of the Work not conforming to specified requirements.

3.05 REPAIR AND PROTECTION
A. General: On completion of testing, inspecting, sample taking, and similar services, repair damaged construction and restore substrates and finishes.
   1. Provide materials and comply with installation requirements specified in other Specification Sections. Restore patched areas and extend restoration into adjoining areas with durable seams that are as invisible as possible.
B. Protect construction exposed by or for quality-control service activities.
C. Repair and protection are Contractor's responsibility, regardless of the assignment of responsibility for quality-control services.

END OF SECTION
SECTION 01 42 16 - DEFINITIONS

PART 1 GENERAL

1.01 SUMMARY

A. This section supplements the definitions contained in the General Conditions.
B. Other definitions are included in individual specification sections.

1.02 DEFINITIONS

A. Approved: When used to convey Architect's action on Contractor's submittals, applications, and requests, "approved" is limited to Architect's duties and responsibilities as stated in the Conditions of the Contract.
B. Directed: A command or instruction by Architect. Other terms including "requested," "authorized," "selected," "required," and "permitted" have the same meaning as "directed".
C. Furnish: To supply, deliver to Project site, ready for unloading, unpacking, assembly, installation, and similar operation.
D. Indicated: Requirements expressed by graphic representations or in written form on Drawings, in Specifications, and in other Contract Documents. Other terms including "shown," "noted," "scheduled," and "specified" have the same meaning as "indicated."
E. Install: To unload, temporarily store, unpack, assemble, erect, apply, place, anchor, work to dimensions, finish, cure, protect, clean, start up, and make ready for use.
F. Product: Material, machinery, components, equipment, fixtures, and systems forming the work result. Not materials or equipment used for preparation, fabrication, conveying, or erection and not incorporated into the work result. Products may be new, never before used equipment.
G. Project Site: Space available for performing construction activities. The extent of Project site is shown on Drawings and may or may not be identical with the description of the land on which Project is to be built.
H. Provide: To furnish and install, complete and ready for the intended use.
I. Regulations: Laws, ordinances, statutes, and lawful orders issued by authorities having jurisdiction, and rules, conventions, and agreements within the construction industry that control performance of the Work.
J. Supply: Same as Furnish.

PART 2 PRODUCTS - NOT USED

PART 3 EXECUTION - NOT USED

END OF SECTION
SECTION 01 45 40 - MOCK-UP REQUIREMENTS

PART 1 - GENERAL

1.01 SECTION INCLUDES

A. Mock-up requirements for the following field fabricated assemblies:
   1. Metal Stud Assembly and Siding.
   2. Additional mockups as specified in individual specification sections or where indicated on drawings.

1.02 RELATED SECTIONS

A. Section 03 30 00 – Cast-in-Place Concrete.
B. Section 04 20 00 – Unit Masonry
C. Section 06 10 00 – Rough Carpentry.
D. Section 07 21 00 - Thermal Insulation.
E. Section 07 25 00 - Weather Barriers.
F. Section 07 27 13 - Water Barrier Membrane System.
G. Section 07 42 33 - Exterior Solid Phenolic Rainscreen Panel System
H. Section 07 46 46 - Fiber Cement Siding
I. Section 07 53 00 - Elastomeric Membrane Roofing.
J. Section 07 62 00 - Sheet Metal Flashing and Trim
K. Section 07 90 05 – Joint Sealants.
L. Section 08 55 00 – Aluminum Clad Wood Windows
M. Section 08 55 10 – Reinforced Aluminum Windows with Impact Glazing
N. Section 08 80 00 – Glazing.

1.03 GENERAL MOCK-UP PROVISIONS

A. Mock-ups, when approved by the Architect, will be used as datum for comparison with the remainder of the Work for the purposes of acceptance or rejection. Maintain mock-up throughout construction period until Substantial Completion or as otherwise directed by Architect.
   1. All Mock-ups are to be constructed and approved by Architect prior to shop drawing approval of related materials. General Contractor shall make it a priority to have all mock-ups constructed concurrently for review by the Architect. Mock-ups will be made of the exact materials specified with the selected colors and finishes. Mock-up assemblies shall be built of the appropriate back-up material framing as indicated in typical wall assemblies in the construction documents (no substitutions are allowed). Provide appropriate flashings, sheathing materials, membrane materials, sealants, etc.
   2. Approved mock-ups may become part of the completed work if undisturbed at the time of substantial completion. Only mock-ups as identified to be built in-place shall remain a part of the final construction. Mock-ups identified to be built on-site or on ground shall be removed per the direction of the Owner/Consultant.

B. Regarding mock-ups specified in individual specification sections:
   1. Where requested by Consultant, or as specified in individual specification sections, assemble and erect specified items, with specified attachment and anchorage devices, flashings, seals, and finishes.
   2. Demolish and remove from site prior to requesting inspection for certification of Substantial Completion, all mock-ups which are not permitted to remain as part of the finished work.
PART 2 – PRODUCTS

2.01 SIDING / METAL FRAMING / CMU / WINDOW

A. Mock-Up Unit: Shall consist of three exterior wall section, as indicated on Drawings, using specified products as noted below.
   1. General Description: Mock-up exterior construction, which include all components specified and indicated which are typical to the exterior wall construction and additional components specified herein.
      a. Include into mock-up assembly all flashing, joint sealers and all finish trim and accessories necessary to show typical completed construction.
      b. Include one half sized window unit complete with glazing, panning, and trim.
      c. Provide concealed various wood blocking, edgings, nailers, curbs, and cants required for receipt of various finishes and surfacing materials.
      d. Provide additional framing and cross-bracing required for construction of various components of the mock-up panel.
   2. Mock-up shall be divided vertically with a control joint for construction reference only. Construct using steel stud framing backup and sheathing for veneer masonry.

B. Components in the mock-up include, but are not limited to:
   1. Division 3 – Concrete:
      a. Provide a concrete foundation wall to a depth required to support wall mock-up.
   2. Section 04 20 00 – Unit Masonry Assemblies:
      a. Provide concrete masonry backup support.
   3. Section 06 10 00 – Rough Carpentry:
      a. Provide wood blocking and wood panels as required for mock-up assembly.
   4. Section 07 21 00 - Thermal Insulation
      a. Provide wall cavity insulation.
   5. Section 07 27 13 – Water Barrier Membrane System
      a. Install water barrier membrane and associated flashings over masonry backup.
   6. Section 07 42 33 – Exterior Solid Phenolic Rainscreen Panel System
      a. Install composite wall panels, mounting system, copings, trims, flashings, gaskets and sealants.
   7. Section 07 46 46 – Fiber Cement Siding
      a. Install siding panels, mounting system, copings, trims, flashings, gaskets and sealants.
   8. Section 08 55 10 – Reinforced Aluminum Windows with Impact Glazing
      a. Install system in accordance to the ICC-500 requirements. Provide joint sealant at perimeter of all components. Colors shall be selected by the Architect.
   9. Section 08 55 00 – Aluminum Clad Wood Windows
      a. Provide window framing as required for mockup assembly.
   10. Section 08 80 00 - Glazing
        a. Provide glazing as required for mockup assembly.

PART THREE – EXECUTION

3.01 PREPARATION

A. Construct mock-up on the site, in location approved by Architect.
B. Construct mock-up in time to make product and/or assembly modifications without delaying production work.

3.02 INSTALLATION

A. Construct mock-up to duplicate actual job conditions.
B. Locate at an area on-site as directed by Architect.
C. Provide foundations, bases, supports, and braces adequate to make mock-up stable and safe.
D. Provide weather protection for materials in mock-ups that are not exposed to weather in intended service.

3.03 REMOVAL
A. Completely demolish and remove stand-alone mock-ups from the job site at a time designated by the Consultant and the Owner, prior to date of Final Inspection.

END OF SECTION
SECTION 01 50 00 - TEMPORARY FACILITIES AND CONTROLS

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Temporary utilities.
B. Temporary telecommunications services.
C. Temporary sanitary facilities.
D. Vehicular access and parking.
E. Project identification sign.
F. Field offices.

1.02 INFORMATIONAL SUBMITTALS

A. Site Plan: Show temporary facilities, utility hookups, staging areas, and parking areas for construction personnel.
B. Erosion- and Sedimentation-Control Plan: Show compliance with requirements of EPA Construction General Permit or authorities having jurisdiction, whichever is more stringent.
C. Fire-Safety Program: Show compliance with requirements of NFPA 241 and authorities having jurisdiction. Indicate Contractor personnel responsible for management of fire-prevention program.
D. Moisture Protection Plan: Describe procedures and controls for protecting materials and construction from water absorption and damage.
   1. Describe delivery, handling and storage provisions for materials subject to water absorption or water damage.
   2. Indicate procedures for discarding water-damaged materials, protocols for mitigating water intrusion into completed Work, and replacing water-damaged Work.
   3. Indicate sequencing of work that requires water, such as sprayed fire-resistive materials, plastering, and terrazzo grinding, and describe plans for dealing with water from these operations. Show procedures for verifying that wet construction has dried sufficiently to permit installation of finish materials.
E. Dust- and HVAC-Control Plan: Submit coordination drawing and narrative that indicates the dust- and HVAC-control measures proposed for use, proposed locations, and proposed time frame for their operation. Identify further options if proposed measures are later determined to be inadequate. Include the following:
   1. Locations of dust-control partitions at each phase of work.
   2. HVAC system isolation schematic drawing.
   3. Location of proposed air-filtration system discharge.
   5. Other dust-control measures.

1.03 TEMPORARY UTILITIES

A. Locate job trailer, dumpster and associated temporary facilities within construction site boundaries. Upon completion of work, remove temporary facilities and restore site areas to original condition.
B. Utilities: Contractor shall provide and pay for the following utilities:
   1. Electrical.
   2. Water.
C. General Contractor will provide all connections to utilities.
D. General Contractor will provide and pay for all heating and cooling and ventilation required for construction purposes. Permanent HVAC equipment is not to be used for heating or cooling the building during construction. The Contractor may ask the owner if they can use the permanent...
equipment for heating and cooling of the space once the majority of the dust producing construction is complete (i.e. after drywall).

E. Existing facilities may be used.
F. New permanent facilities may be used.
G. Use trigger-operated nozzles for water hoses, to avoid waste of water.

1.04 TELECOMMUNICATIONS SERVICES

A. Provide, maintain, and pay for telecommunications services to field office at time of project mobilization.
B. Telecommunications services shall include:
   1. Windows-based personal computer dedicated to project telecommunications, with necessary software and laser printer.
   2. Internet Connections: Minimum of one; DSL modem or faster.
   3. Email: Account/address reserved for project use.

1.05 TEMPORARY SANITARY FACILITIES

A. Provide and maintain required facilities and enclosures. Provide at time of project mobilization.
B. Maintain daily in clean and sanitary condition.

1.06 FENCING

A. Provide 6 foot high fence around construction site; equip with vehicular gates with locks.

1.07 EXTERIOR ENCLOSURES

A. Provide temporary insulated weather tight closure of exterior openings to accommodate acceptable working conditions and protection for Products, to allow for temporary heating and maintenance of required ambient temperatures identified in individual specification sections, and to prevent entry of unauthorized persons. Provide access doors with self-closing hardware and locks.

1.08 INTERIOR ENCLOSURES

A. Provide temporary partitions and ceilings as indicated to separate work areas from Owner-occupied areas, to prevent penetration of dust and moisture into Owner-occupied areas, and to prevent damage to existing materials and equipment.

1.09 VEHICULAR ACCESS AND PARKING

A. Coordinate access and haul routes with governing authorities and Owner. Loaded trucks will be required to access the site on the East/West access drive connecting to Kirkwood Blvd. Deliveries to the site should be scheduled to miss the peak campus traffic, which occur from 8:15 am to 9:15 am and 2:30pm to 4:15pm. Please notify Owner of all major deliveries to coordinate any potential campus traffic issues.
B. Provide and maintain access to fire hydrants, free of obstructions.
C. Provide means of removing mud from vehicle wheels before entering streets.
D. Provide temporary parking areas to accommodate construction personnel. When site space is not adequate, provide additional off-site parking.

1.10 WASTE REMOVAL

A. Provide waste removal facilities and services as required to maintain the site in clean and orderly condition.
B. Provide containers with lids. Remove trash from site periodically.
C. If materials to be recycled or re-used on the project must be stored on-site, provide suitable non-combustible containers; locate containers holding flammable material outside the structure unless otherwise approved by the authorities having jurisdiction.
D. Open free-fall chutes are not permitted. Terminate closed chutes into appropriate containers with lids.
1.11 PROJECT IDENTIFICATION
   A. Provide project identification sign of design and construction indicated on Drawings.
   B. Erect on site at location indicated.
   C. No other signs are allowed without Owner permission except those required by law.

1.12 FIELD OFFICES
   A. Field Office: Prefabricated or mobile units, weathertight, with lighting, electrical outlets, heating, cooling equipment, and equipped with sturdy furniture, drawing rack and drawing display table.
   B. Provide space for Project meetings, with table and chairs to accommodate 16 persons.
   C. Locate offices a minimum distance of 30 feet from existing and new structures.

1.13 REMOVAL OF UTILITIES, FACILITIES, AND CONTROLS
   A. Remove temporary utilities, equipment, facilities, materials, prior to Date of Substantial Completion inspection.
   B. Remove underground installations to a minimum depth of 2 feet. Grade site as indicated.
   C. Clean and repair damage caused by installation or use of temporary work.
   D. Restore existing facilities used during construction to original condition.
   E. Restore new permanent facilities used during construction to specified condition.

PART 2 PRODUCTS
2.01 SITE ENCLOSURE FENCING
   A. Chain Link Fencing: Minimum 2 inch, 0.148 inch thick, galvanized steel, chain link fabric fencing, minimum 6 feet high with galvanized steel pipe posts; minimum 2-3/8 inch OD line posts and 2-7/8 inch OD corner and pull posts.

2.02 EQUIPMENT
   A. Fire Extinguishers: Portable, UL rated; with class and extinguishing agent as required by locations and classes of fire exposure.

PART 3 EXECUTION - NOT USED
3.01 INSTALLATION, GENERAL
   A. Locate facilities where they will serve Project adequately and result in minimum interference with performance of the Work. Relocate and modify facilities as required by progress of the Work.
   B. Provide each facility ready for use when needed to avoid delay. Do not remove until facilities are no longer needed or are replaced by authorized use of permanent facilities.

3.02 TEMPORARY UTILITY INSTALLATION
   A. General: Install temporary service.
      1. Arrange with utility company, To make connections for temporary services.
   B. Water Service: Install water service and distribution piping in sizes and pressures adequate for construction.
   C. Sanitary Facilities: Provide temporary toilets, wash facilities, and drinking water for use of construction personnel. Comply with requirements of authorities having jurisdiction for type, number, location, operation, and maintenance of fixtures and facilities.
   D. Heating: Provide temporary heating required by construction activities for curing or drying of completed installations or for protecting installed construction from adverse effects of low temperatures or high humidity. Select equipment that will not have a harmful effect on completed installations or elements being installed.
   E. Isolation of Work Areas in Occupied Facilities: Prevent dust, fumes, and odors from entering occupied areas.
F. Ventilation and Humidity Control: Provide temporary ventilation required by construction activities for curing or drying of completed installations or for protecting installed construction from adverse effects of high humidity. Select equipment that will not have a harmful effect on completed installations or elements being installed. Coordinate ventilation requirements to produce ambient condition required and minimize energy consumption.

G. Electric Power Service: Provide electric power service and distribution system of sufficient size, capacity, and power characteristics required for construction operations.
   1. Connect temporary service to Utility.

H. Lighting: Provide temporary lighting with local switching that provides adequate illumination for construction operations, observations, inspections, and traffic conditions.

I. Telephone Service: Provide temporary telephone service in common-use facilities for use by all construction personnel. Install one telephone line for each field office.
   1. At each telephone, post a list of important telephone numbers:
      a. Police and fire departments.
      b. Ambulance service.
      c. Contractor's home office.
      d. Contractor's emergency after-hours telephone number.
      e. Architect's office.
      f. Engineer's office.
      g. Owner's office.
      h. Principal subcontractors' field and home offices.
   2. Provide superintendent with cellular telephone when away from field office.

3.03 SUPPORT FACILITIES INSTALLATION

A. Temporary Use of Permanent Roads and Paved Areas: Locate temporary roads and paved areas in same location as permanent roads and paved areas. Construct and maintain temporary roads and paved areas adequate for construction operations. Extend temporary roads and paved areas, within construction limits indicated, as necessary for construction operations.

B. Traffic Controls: Comply with requirements of authorities having jurisdiction.

C. Dewatering Facilities and Drains: Comply with requirements of authorities having jurisdiction. Maintain Project site, excavations, and construction free of water.
   1. Dispose of rainwater in lawful manner that will not result in flooding Project or adjoining properties or endanger permanent Work or temporary facilities.
   2. Remove snow and ice as required to minimize accumulations.

D. Lifts and Hoists: Provide facilities necessary for hoisting materials and personnel.
   1. Truck cranes and similar devices used for hoisting materials are considered "tools and equipment" and not temporary facilities.

3.04 SECURITY AND PROTECTION OF FACILITIES INSTALLATION

A. Protection of Existing Facilities: Protect existing vegetation, equipment, structures, utilities, and other improvements at Project site and on adjacent properties, except those indicated to be removed or altered. Repair damage to existing facilities.

B. Environmental Protection: Provide protection, operate temporary facilities, and conduct construction as required to comply with environmental regulations and that minimize possible air, waterway, and subsoil contamination or pollution or other undesirable effects.

C. Temporary Erosion and Sedimentation Control: Comply with requirements specified.

D. Tree and Plant Protection: Install temporary fencing located as indicated or outside the drip line of trees to protect vegetation from damage from construction operations. Protect tree root systems from damage, flooding, and erosion.
E. Site Enclosure Fence: Before construction operations begin, furnish and install site enclosure fence in a manner that will prevent people and animals from easily entering site except by entrance gates.

F. Barricades, Warning Signs, and Lights: Comply with requirements of authorities having jurisdiction for erecting structurally adequate barricades, including warning signs and lighting.

G. Temporary Egress: Maintain temporary egress from existing occupied facilities as indicated and as required by authorities having jurisdiction.

H. Temporary Partitions: Provide floor-to-ceiling dustproof partitions to limit dust and dirt migration and to separate occupied areas from fumes and noise.

I. Temporary Fire Protection: Install and maintain temporary fire-protection facilities of types needed to protect against reasonably predictable and controllable fire losses. Comply with NFPA 241; manage fire-prevention program.


END OF SECTION
SECTION 01 60 00 - PRODUCT REQUIREMENTS

PART 1 GENERAL

1.01 SECTION INCLUDES

A. General product requirements.
B. Transportation, handling, storage and protection.
C. Product option requirements.
D. Substitution limitations.
E. Maintenance materials, including extra materials, spare parts, tools, and software.

1.02 DEFINITIONS

A. Products: Items obtained for incorporating into the Work, whether purchases for Project or taken from previously purchased stock. The term "product" includes the terms "material," "equipment," "system," and terms of similar intent.
   1. Named Products: Items identified by manufacturer's product name, including make or model number or other designation shown or listed in manufacturer's published product literature, that is current as of date of the Contract Documents.
   2. New Products: Items that have not previously been incorporated into another project or facility. Products salvaged or recycled from other projects are not considered new products.
   3. Comparable Products: Product that is demonstrated and approved, prior to bid, through substitution process, to have the indicated qualities related to type, function, dimension, in-service performance, physical properties, appearance, and other characteristics that equal or exceed those specified products.

B. Basis-of-Design Product Specification: A specification in which a specific manufacturer's product is named and accompanied by the words "basis-of-design product," including make or model number or other designation, to establish the significant qualities related to type, function, dimension, in-service performance, physical properties, appearance, and other characteristics for purposes of evaluating comparable products of additional manufacturers named in the specification.

1.03 SUBMITTALS

A. Product Data Submittals: Submit manufacturer's standard published data. Mark each copy to identify applicable products, models, options, and other data. Supplement manufacturers' standard data to provide information specific to this Project.

B. Shop Drawing Submittals: Prepared specifically for this Project; indicate utility and electrical characteristics, utility connection requirements, and location of utility outlets for service for functional equipment and appliances.

C. Sample Submittals: Illustrate functional and aesthetic characteristics of the product, with integral parts and attachment devices. Coordinate sample submittals for interfacing work.
   1. For selection from standard finishes, submit samples of the full range of the manufacturer's standard colors, textures, and patterns.

PART 2 PRODUCTS

2.01 NEW PRODUCTS

A. Provide new products unless specifically required or permitted by the Contract Documents.

2.02 MAINTENANCE MATERIALS

A. Furnish extra materials, spare parts, tools, and software of types and in quantities specified in individual specification sections.

B. Deliver to Project site; obtain receipt prior to final payment.
2.03 PRODUCT WARRANTIES

A. Warranties specified in other Sections shall be in addition to, and run concurrent with, other warranties required by the Contract Documents. Manufacturer's disclaimers and limitations on product warranties do not relieve Contractor of obligations under requirements of the Contract Documents.

1. Manufacturer's Warranty: Written warranty furnished by individual manufacturer for a particular product and specifically endorsed by manufacturer to Owner.
2. Special Warranty: Written warranty required by the Contract Documents to provide specific rights for Owner.

B. Special Warranties: Prepare a written document that contains appropriate terms and identification, ready for execution.

1. Manufacturer's Standard Form: Modified to include Project-specific information and properly executed.
2. Specified Form: When specified forms are included with the Specifications, prepare a written document using indicated from properly executed.
3. Refer to Divisions 02 through 49 Sections for specific content requirements and particular requirements for submitting special warranties.

PART 3 EXECUTION

3.01 PRODUCT SELECTION PROCEDURES

A. General Product Requirements: Provide products that comply with the Contract Documents, are undamaged and, unless otherwise indicated, are new at time of installation.

1. Provide products complete with accessories, trim, finish, fasteners, and other items needed for a complete installation and indicated use and effect.
2. Standard Products: If available, and unless custom products or nonstandard options are specified, provide standard products of types that have been produced and used successfully in similar situations on other projects.
3. Where products are accompanied by the term "as selected," Architect will make selection.

B. Product Selection Procedures:

1. Comparable products, or substitutions for Contractor's convenience, will not be considered unless approved by the Architect prior to bid.
2. Product: Where Specifications name a single manufacturer and product, provide the named product that complies with requirements.
3. Manufacturer/Source: Where Specifications name a single manufacturer or source, provide a product by the named manufacturer or source that complies with requirements. Comparable products or substitutions for Contractor's convenience will not be considered.
4. Basis-of Design Product: Where Specifications name a product, or refer to a product indicated on Drawings, and include a list of manufacturers, provide the specified or indicated product or a comparable product, that meets or exceeds the characteristics of the basis-of-design product, by one of the other named manufacturers. Drawings and specifications indicate sizes, profiles, dimensions, and other characteristics that are based on the product named. Designation as an acceptable comparable manufacturer does not signify acceptance of a specific product by that manufacturer unless it is deemed, by the Architect, as meeting or exceeding the characteristics of the basis-of-design product.
   a. Construction Document design is based on the basis-of-design product listed, if a comparable product from another named manufacturer is proposed, the Architect shall consider the Contractor's selection of a comparable product when the following conditions are satisfied. If all of the following conditions are not satisfied, Architect will return requests without action, except to record non-compliance with these requirements:
1) Selected comparable product must be from one of the manufacturers listed as an acceptable manufacturer in the specifications and must meet or exceed performance and characteristics of basis-of-design product.

2) Evidence that the selected comparable product does not require extensive revisions to the Contract Documents and will produce the indicated results, and that it is compatible with other portions of work.

3) Detailed comparison of significant qualities of proposed comparable product with the basis-of-design product named in the Specifications. Significant qualities include attributes such as performance, weight, size, durability, visual effect, and specific features and requirements indicated.

4) Evidence that comparable product provides warranty which meets or exceeds that specified.

5) List of similar installations for completed projects with project names and addresses and names and addresses of architects and owners, if requested.

6) Samples, if requested.

b. Products by unnamed manufacturers will only be considered prior to bid. Comply with "Comparable Product Requests" paragraphs for consideration of comparable products.

c. Where a list of manufacturers is not provided, comply with "Comparable Product Requests" paragraphs for consideration of comparable products. Comparable product request will ony be considered prior to bid.

C. Visual Matching Specification: Where Specifications require "match Architect's sample" provide a product that complies with requirements and matches Architect's sample. Architect's decision will be final on whether a proposed product matches.

D. Visual Selection Specification: Where Specifications include the phrase "as selected by Architect from manufacturer's full range" or similar phrase, select a product that complies with requirements. Architect will select color, gloss, pattern, density, or texture from manufacturer's product line that includes both standard and premium items.

3.02 SUBSTITUTION LIMITATIONS

A. See Section 01 25 00 - Substitution Procedures.

B. Submit substitution request on Substitution Request Form provided in the Specification Manual.
   1. Notification of approved substitutions shall be provided by Addendum.
   2. Use product specified if Architect does not issue a decision on use of a substitution request within time allocated.

3.03 COMPARABLE PRODUCT REQUESTS

A. Submit request for consideration of each comparable product during the bidding period complying with same time restriction as substitutions, using same form as substitution requests. Identify product or fabrication or installation method to be replaced. Include Specification Section number and title and Drawing numbers and titles.
   1. Architect's Action: If necessary, Architect will request additional information or documentation for evaluation within three days of receipt of request.
   2. Notification of approved substitutions shall be provided by Addendum.
   3. Use product specified if Architect does not issue a decision on use of a comparable product request within time allocated.

3.04 TRANSPORTATION AND HANDLING

A. Package products for shipment in manner to prevent damage; for equipment, package to avoid loss of factory calibration.

B. If special precautions are required, attach instructions prominently and legibly on outside of packaging.

C. Coordinate schedule of product delivery to designated prepared areas in order to minimize site storage time and potential damage, deterioration, and loss, including theft and vandalism to stored materials.
D. Transport and handle products in accordance with manufacturer's instructions.
E. Transport materials in covered trucks to prevent contamination of product and littering of surrounding areas.
F. Promptly inspect shipments to ensure that products comply with requirements, quantities are correct, and products are undamaged.
G. Provide equipment and personnel to handle products by methods to prevent soiling, disfigurement, or damage, and to minimize handling.
H. Arrange for the return of packing materials, such as wood pallets, where economically feasible.

3.05 STORAGE AND PROTECTION

A. Designate receiving/storage areas for incoming products so that they are delivered according to installation schedule and placed convenient to work area in order to minimize waste due to excessive materials handling and misapplication.
B. Store and protect products in accordance with manufacturers' instructions.
C. Store with seals and labels intact and legible.
D. Store sensitive products in weather tight, climate controlled, enclosures in an environment favorable to product.
E. For exterior storage of fabricated products, place on sloped supports above ground.
F. Protect products from damage or deterioration due to construction operations, weather, precipitation, humidity, temperature, sunlight and ultraviolet light, dirt, dust, and other contaminants.
G. Comply with manufacturer's warranty conditions, if any.
H. Cover products subject to deterioration with impervious sheet covering. Provide ventilation to prevent condensation and degradation of products.
I. Prevent contact with material that may cause corrosion, discoloration, or staining.
J. Provide equipment and personnel to store products by methods to prevent soiling, disfigurement, or damage.
K. Arrange storage of products to permit access for inspection. Periodically inspect to verify products are undamaged and are maintained in acceptable condition.

END OF SECTION
SECTION 01 70 00 - EXECUTION AND CLOSEOUT REQUIREMENTS

PART 1  GENERAL

1.01  SECTION INCLUDES

A. Examination, preparation, and general installation procedures.
B. Requirements for alterations work, including selective demolition, except removal, disposal, and/or remediation of hazardous materials and toxic substances.
C. Cutting and patching.
D. Laying out the Work.
E. Cleaning and protection.
F. Starting of systems and equipment.
G. Demonstration and instruction of Owner personnel.
H. Closeout procedures, including Contractor's Correction Punch List, except payment procedures.
I. General requirements for maintenance service.

1.02  RELATED REQUIREMENTS

A. Section 01 79 00 - Demonstration and Training: Demonstration of products and systems to be commissioned and where indicated in specific specification sections
B. Section 07 84 00 - Firestopping.

1.03  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.

1.04  SUBMITTALS

A. See Section 01 30 00 - Administrative Requirements, for submittal procedures.
B. Cutting and Patching: Submit written request in advance of cutting or alteration that affects:
   1. Structural integrity of any element of Project.
   2. Integrity of weather exposed or moisture resistant element.
   3. Efficiency, maintenance, or safety of any operational element.
   5. Work of Owner or separate Contractor.
   6. Include in request:
      a. Extent: Describe reason for and extent of each occurrence of cutting and patching.
      b. Changes to In-Place Construction: Describe anticipated results. Include changes to structural elements and operating components as well as changes in building appearance and other significant visual elements.
      c. Products: List products to be used for patching and firms or entities that will perform patching work.
      d. Dates: Indicate when cutting and patching will be performed.
      e. Utilities and Mechanical and Electrical Systems: List services and systems that cutting and patching procedures will disturb or affect. List services and systems that will be relocated and those that will be temporarily out of service. Indicate length of time permanent services and systems will be disrupted.
         1) Include description of provisions for temporary services and systems during interruption of permanent services and systems.

1.05  QUALITY ASSURANCE

A. Cutting and Patching: Comply with requirements for and limitations on cutting and patching of construction elements.
1. Structural Elements: When cutting and patching structural elements, notify Architect of locations and details of cutting and await directions from Architect before proceeding. Shore, brace, and support structural elements during cutting and patching. Do not cut and patch structural elements in a manner that could change their load-carrying capacity or increase deflection.

2. Operational Elements: Do not cut and patch operating elements and related components in a manner that results in reducing their capacity to perform as intended or that results in increased maintenance or decreased operational life or safety. Operational elements include the following:
   a. Primary operational systems and equipment.
   b. Fire separation assemblies.
   c. Air or smoke barriers.
   d. Fire-suppression systems.
   e. Mechanical systems piping and ducts.
   f. Control systems.
   g. Communication systems.
   h. Fire-detection and -alarm systems.
   i. Conveying systems.
   j. Electrical wiring systems.
   k. Operating systems of special construction.

3. Other Construction Elements: Do not cut and patch other construction elements or components in a manner that could change their load-carrying capacity, that results in reducing their capacity to perform as intended, or that results in increased maintenance or decreased operational life or safety. Other construction elements include but are not limited to the following:
   a. Water, moisture, or vapor barriers.
   b. Membranes and flashings.
   c. Exterior curtain-wall construction.
   d. Sprayed fire-resistant material.
   e. Equipment supports.
   f. Piping, ductwork, vessels, and equipment.
   g. Noise- and vibration-control elements and systems.

4. 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, in Architect's opinion, reduce the building's aesthetic qualities. Remove and replace construction that has been cut and patched in a visually unsatisfactory manner.

B. Manufacturer's Installation Instructions: Obtain and maintain on-site manufacturer's written recommendations and instructions for installation of products and equipment.

1.06 PROJECT CONDITIONS

A. Use of explosives is not permitted.

B. Ventilate enclosed areas to assist cure of materials, to dissipate humidity, and to prevent accumulation of dust, fumes, vapors, or gases.

C. Dust Control: Execute work by methods to minimize raising dust from construction operations. Provide positive means to prevent airborne dust from dispersing into atmosphere and over adjacent property.
   1. Provide dust-proof barriers between construction areas and areas continuing to be occupied by Owner.

D. Pest and Rodent Control: Provide methods, means, and facilities to prevent pests and insects from damaging the work.

E. Pollution Control: Provide methods, means, and facilities to prevent contamination of soil, water, and atmosphere from discharge of noxious, toxic substances, and pollutants produced by construction operations. Comply with federal, state, and local regulations.
1.07 COORDINATION

A. Coordinate scheduling, submittals, and work of the various sections of the Project Manual to ensure efficient and orderly sequence of installation of interdependent construction elements, with provisions for accommodating items installed later.

B. Notify affected utility companies and comply with their requirements.

C. Coordinate space requirements, supports, and installation of mechanical and electrical work that are indicated diagrammatically on drawings. Follow routing indicated for pipes, ducts, and conduit, as closely as practicable; place runs parallel with lines of building. Utilize spaces efficiently to maximize accessibility for other installations, for maintenance, and for repairs.

D. In finished areas, conceal pipes, ducts, and wiring within the construction. Coordinate locations of fixtures and outlets with finish elements.

E. Coordinate completion and clean-up of work of separate sections.

F. After Owner occupancy of premises, coordinate access to site for correction of defective work and work not in accordance with Contract Documents, to minimize disruption of Owner's activities.

PART 2 PRODUCTS

2.01 PATCHING MATERIALS

A. New Materials: As specified in product sections; match existing products and work for patching and extending work.

B. Type and Quality of Existing Products: Determine by inspecting and testing products where necessary, referring to existing work as a standard.

C. In-Place Materials: Use materials for patching identical to in-place materials. For exposed surfaces, use materials that visually match in-place adjacent surfaces to the fullest extent possible.
   1. If identical materials are unavailable or cannot be used, use materials that, when installed, will provide a match acceptable to Architect for the visual and functional performance of in-place materials.

PART 3 EXECUTION

3.01 EXAMINATION

A. Verify that existing site conditions and substrate surfaces are acceptable for subsequent work. Start of work means acceptance of existing conditions.

B. Verify that existing substrate is capable of structural support or attachment of new work being applied or attached.

C. Examine and verify specific conditions described in individual specification sections.

D. Take field measurements before confirming product orders or beginning fabrication, to minimize waste due to over-ordering or misfabrication.

E. Verify that utility services are available, of the correct characteristics, and in the correct locations.

F. Prior to Cutting: Examine existing conditions prior to commencing work, including elements subject to damage or movement during cutting and patching. After uncovering existing work, assess conditions affecting performance of work. Beginning of cutting or patching means acceptance of existing conditions.

G. Written Report: Where a written report listing conditions detrimental to performance of the Work is required by other Sections, include the following:
   1. Description of the Work.
   2. List of detrimental conditions, including substrates.
   3. List of unacceptable installation tolerances.
   4. Recommended corrections.
H. Proceed with installation only after unsatisfactory conditions have been corrected. Proceeding with the Work indicates acceptance of surfaces and conditions.

3.02 PREPARATION

A. Existing Utility Information: Furnish information to [local utility] [Owner] that is necessary to adjust, move, or relocate existing utility structures, utility poles, lines, services, or other utility appurtenances located in or affected by construction. Coordinate with authorities having jurisdiction.

B. 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.

C. Space Requirements: Verify space requirements and dimensions of items shown diagrammatically on Drawings.

D. Clean substrate surfaces prior to applying next material or substance.

E. Seal cracks or openings of substrate prior to applying next material or substance.

F. Apply manufacturer required or recommended substrate primer, sealer, or conditioner prior to applying any new material or substance in contact or bond.

3.03 GENERAL INSTALLATION REQUIREMENTS

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.

B. Install products as specified in individual sections, in accordance with manufacturer’s instructions and recommendations, and so as to avoid waste due to necessity for replacement.

C. 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.

D. Attachment: Provide blocking and attachment plates and anchors and fasteners of adequate size and number to securely anchor each component in place, accurately located and aligned with other portions of the Work. Where size and type of attachments are not indicated, verify size and type required for load conditions.
   1. Mounting Heights: Where mounting heights are not indicated, mount components at heights directed by Architect.
   2. Allow for building movement, including thermal expansion and contraction.
   3. Coordinate installation of anchorages. Furnish setting drawings, templates, and directions for installing anchorages, including sleeves, concrete inserts, anchor bolts, and items with integral anchors, that are to be embedded in concrete or masonry. Deliver such items to Project site in time for installation.

E. Make vertical elements plumb and horizontal elements level, unless otherwise indicated.

F. Install equipment and fittings plumb and level, neatly aligned with adjacent vertical and horizontal lines, unless otherwise indicated.

G. Make consistent texture on surfaces, with seamless transitions, unless otherwise indicated.

H. Make neat transitions between different surfaces, maintaining texture and appearance.

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.

3.04 ALTERATIONS

A. Drawings showing existing construction and utilities are based on casual field observation and existing record documents only.
   1. Verify that construction and utility arrangements are as indicated.
   2. Report discrepancies to Architect before disturbing existing installation.
   3. Beginning of alterations work constitutes acceptance of existing conditions.

B. Services (Including but not limited to HVAC, Plumbing, Fire Protection, Electrical, and Telecommunications): Remove, relocate, and extend existing systems to accommodate new construction.
   1. Maintain existing active systems that are to remain in operation; maintain access to equipment and operational components; if necessary, modify installation to allow access or provide access panel.
   2. Where existing systems or equipment are not active and Contract Documents require reactivation, put back into operational condition; repair supply, distribution, and equipment as required.
   3. Where existing active systems serve occupied facilities but are to be replaced with new services, maintain existing systems in service until new systems are complete and ready for service.
      a. Disable existing systems only to make switchovers and connections; minimize duration of outages.
      b. Provide temporary connections as required to maintain existing systems in service.
   4. Verify that abandoned services serve only abandoned facilities.
   5. Remove abandoned pipe, ducts, conduits, and equipment, including those above accessible ceilings; remove back to source of supply where possible, otherwise cap stub and tag with identification; patch holes left by removal using materials specified for new construction.

C. Protect existing work to remain.
   1. Prevent movement of structure; provide shoring and bracing if necessary.
   2. Perform cutting to accomplish removals neatly and as specified for cutting new work.
   3. Repair adjacent construction and finishes damaged during removal work.

D. Patching: Where the existing surface is not indicated to be refinished, patch to match the surface finish that existed prior to cutting. Where the surface is indicated to be refinished, patch so that the substrate is ready for the new finish.

E. Remove demolition debris and abandoned items from alterations areas and dispose of off-site; do not burn or bury.

3.05 CUTTING AND PATCHING

A. Whenever possible, execute the work by methods that avoid cutting or patching.

B. See Alterations article above for additional requirements.

C. Perform whatever cutting and patching is necessary to:
   1. Complete the work.
   2. Fit products together to integrate with other work.
   3. Provide openings for penetration of mechanical, electrical, and other services.
   4. Match work that has been cut to adjacent work.
   5. Repair areas adjacent to cuts to required condition.
   6. Repair new work damaged by subsequent work.
   7. Remove samples of installed work for testing when requested.
   8. Remove and replace defective and non-conforming work.
D. Execute work by methods that avoid damage to other work and that will provide appropriate surfaces to receive patching and finishing. In existing work, minimize damage and restore to original condition.

E. 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.

F. Employ original installer to perform cutting for weather exposed and moisture resistant elements, and sight exposed surfaces.

G. Temporary Support: Provide temporary support of work to be cut.

H. 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 minimize interruption to occupied areas.

I. Cut rigid materials using masonry saw or core drill. Pneumatic tools not allowed without prior approval.

J. 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 Division 31 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.

K. Restore work with new products in accordance with requirements of Contract Documents.

L. Fit work air tight to pipes, sleeves, ducts, conduit, and other penetrations through surfaces.

M. At penetrations of fire rated walls, partitions, ceiling, or floor construction, completely seal voids with fire rated material in accordance with Section 07 84 00, to full thickness of the penetrated element.

N. 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. Floors and Walls: Where walls or partitions that are removed extend one 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.
   2. Ceilings: Patch, repair, or rehang in-place ceilings as necessary to provide an even-plane surface of uniform appearance.
   3. Exterior Building Enclosure: Patch components in a manner that restores enclosure to a weathertight condition and ensures thermal and moisture integrity of building enclosure.
4. Finish patched surfaces to match finish that existed prior to patching. On continuous surfaces, refinish to nearest intersection or natural break. For an assembly, refinish entire unit.
5. Match color, texture, and appearance.
6. Repair patched surfaces that are damaged, lifted, discolored, or showing other imperfections due to patching work. If defects are due to condition of substrate, repair substrate prior to repairing finish.

3.06 PROGRESS CLEANING
A. Maintain areas free of waste materials, debris, and rubbish. Maintain site in a clean and orderly condition.
B. Remove debris and rubbish from pipe chases, plenums, attics, crawl spaces, and other closed or remote spaces, prior to enclosing the space.
C. Broom and vacuum clean interior areas prior to start of surface finishing, and continue cleaning to eliminate dust.
D. Collect and remove waste materials, debris, and trash/rubbish from site periodically and dispose off-site; do not burn or bury.

3.07 PROTECTION OF INSTALLED WORK
A. Protect installed work from damage by construction operations.
B. Provide special protection where specified in individual specification sections.
C. Provide temporary and removable protection for installed products. Control activity in immediate work area to prevent damage.
D. Provide protective coverings at walls, projections, jambs, sills, and soffits of openings.
E. Protect finished floors, stairs, and other surfaces from traffic, dirt, wear, damage, or movement of heavy objects, by protecting with durable sheet materials.
F. Prohibit traffic or storage upon waterproofed or roofed surfaces. If traffic or activity is necessary, obtain recommendations for protection from waterproofing or roofing material manufacturer.
G. Prohibit traffic from landscaped areas.
H. Remove protective coverings when no longer needed; reuse or recycle coverings if possible.

3.08 PROGRESS CLEANING
A. General: Clean Project site and work areas daily, including common areas. Enforce requirements strictly. Dispose of materials lawfully.
   2. Do not hold waste materials more than seven days during normal weather or three days if the temperature is expected to rise above 80 deg F (27 deg C).
   3. Containerize hazardous and unsanitary waste materials separately from other waste. Mark containers appropriately and dispose of legally, according to regulations.
      a. Use containers intended for holding waste materials of type to be stored.
B. Site: Maintain Project site free of waste materials and debris.
C. Work Areas: Clean areas where work is in progress to the level of cleanliness necessary for proper execution of the Work.
   1. Remove liquid spills promptly.
   2. Where dust would impair proper execution of the Work, broom-clean or vacuum the entire work area, as appropriate.
D. Installed Work: Keep installed work clean. Clean installed surfaces according to written instructions of manufacturer or fabricator of product installed, using only cleaning materials specifically recommended. If specific cleaning materials are not recommended, use cleaning
materials that are not hazardous to health or property and that will not damage exposed surfaces.

E. Concealed Spaces: Remove debris from concealed spaces before enclosing the space.

F. Exposed Surfaces in Finished Areas: Clean exposed surfaces and protect as necessary to ensure freedom from damage and deterioration at time of Substantial Completion.

G. Waste Disposal: Do not bury or burn waste materials on-site. Do not wash waste materials down sewers or into waterways.

H. During handling and installation, clean and protect construction in progress and adjoining materials already in place. Apply protective covering where required to ensure protection from damage or deterioration at Substantial Completion.

I. Clean and provide maintenance on completed construction as frequently as necessary through the remainder of the construction period. Adjust and lubricate operable components to ensure operability without damaging effects.

J. Limiting Exposures: Supervise construction operations to assure that no part of the construction, completed or in progress, is subject to harmful, dangerous, damaging, or otherwise deleterious exposure during the construction period.

3.09 SYSTEM STARTUP

A. Coordinate schedule for start-up of various equipment and systems.

B. Verify that each piece of equipment or system has been checked for proper lubrication, drive rotation, belt tension, control sequence, and for conditions that may cause damage.

C. Verify tests, meter readings, and specified electrical characteristics agree with those required by the equipment or system manufacturer.

D. Verify that wiring and support components for equipment are complete and tested.

E. Execute start-up under supervision of applicable Contractor personnel and manufacturer’s representative in accordance with manufacturers’ instructions.

F. Submit a written report that equipment or system has been properly installed and is functioning correctly.

3.10 DEMONSTRATION AND INSTRUCTION

A. See Section 01 79 00 - Demonstration and Training.

B. Demonstrate operation and maintenance of products to Owner’s personnel two weeks prior to date of Substantial Completion.

3.11 ADJUSTING

A. Adjust operating products and equipment to ensure smooth and unhindered operation.

3.12 FINAL CLEANING

A. General: Perform final cleaning. Conduct cleaning and waste-removal operations to comply with local laws and ordinances and Federal and local environmental and antipollution regulations.

B. Cleaning: Employ experienced workers or professional cleaners for final cleaning. Clean each surface or unit to condition expected in an average commercial building cleaning and maintenance program. Comply with manufacturer’s written instructions.

   1. Complete the following cleaning operations before requesting inspection for certification of Substantial Completion for entire Project or for a designated portion of Project:

      a. Clean Project site, yard, and grounds, in areas disturbed by construction activities, including landscape development areas, of rubbish, waste material, litter, and other foreign substances.

      b. Sweep paved areas broom clean. Remove petrochemical spills, stains, and other foreign deposits.

      c. Rake grounds that are neither planted nor paved to a smooth, even-textured surface.
d. Remove tools, construction equipment, machinery, and surplus material from Project site.

e. Remove snow and ice to provide safe access to building.

f. Clean exposed exterior and interior hard-surfaced finishes to a dust-free condition, free of stains, films, and similar foreign substances. Avoid disturbing natural weathering of exterior surfaces. Restore reflective surfaces to their original condition.

g. Remove debris and surface dust from limited access spaces, including roofs, plenums, shafts, trenches, equipment vaults, manholes, attics, and similar spaces.

h. Sweep concrete floors broom clean in unoccupied spaces.

i. Vacuum carpet and similar soft surfaces, removing debris and excess nap; clean according to manufacturer's recommendations if visible soil or stains remain.

j. Clean transparent materials, including mirrors and glass in doors and windows. Remove glazing compounds and other noticeable, vision-obscuring materials. Polish mirrors and glass, taking care not to scratch surfaces.

k. Remove labels that are not permanent.

l. Wipe surfaces of mechanical and electrical equipment, elevator equipment, and similar equipment. Remove excess lubrication, paint and mortar droppings, and other foreign substances.

m. Clean plumbing fixtures to a sanitary condition, free of stains, including stains resulting from water exposure.

n. Replace disposable air filters and clean permanent air filters. Clean exposed surfaces of diffusers, registers, and grills.

o. Clean light fixtures, lamps, globes, and reflectors to function with full efficiency.

p. Leave Project clean and ready for occupancy.

C. Use cleaning materials that are nonhazardous.

D. Clean interior and exterior glass, surfaces exposed to view; remove temporary labels, stains and foreign substances, polish transparent and glossy surfaces, vacuum carpeted and soft surfaces.

E. Remove all labels that are not permanent. Do not paint or otherwise cover fire test labels or nameplates on mechanical and electrical equipment.

F. Clean equipment and fixtures to a sanitary condition with cleaning materials appropriate to the surface and material being cleaned.

G. Clean filters of operating equipment.

H. Clean debris from roofs, gutters, downspouts, scuppers, overflow drains, area drains, and drainage systems.

I. Clean site; sweep paved areas, rake clean landscaped surfaces.

J. Remove waste, surplus materials, trash/rubbish, and construction facilities from the site; dispose of in legal manner; do not burn or bury.

### 3.13 CLOSEOUT PROCEDURES

A. Accompany Project Coordinator on preliminary inspection to determine items to be listed for completion or correction in the Contractor's Correction Punch List for Contractor's Notice of Substantial Completion.

B. Substantial Completion Procedures

1. Contractor's List of Incomplete Items: Prepare and submit a list of items to be completed and corrected (Contractor's punch list), indicating the value of each item on the list and reasons why the Work is incomplete.

2. Submittals Prior to Substantial Completion: Complete the following a minimum of 10 days prior to requesting inspection for determining date of Substantial Completion. List items below that are incomplete at time of request.

   a. Certificates of Release: Obtain and submit releases from authorities having jurisdiction permitting Owner unrestricted use of the Work and access to services and utilities. Include occupancy permits, operating certificates, and similar releases.
b. Submit closeout submittals specified in other Division 01 Sections, including project record documents, operation and maintenance manuals, final completion construction photographic documentation, damage or settlement surveys, property surveys, and similar final record information.

c. Submit closeout submittals specified in individual Divisions 02 through 33 Sections, including specific warranties, workmanship bonds, maintenance service agreements, final certifications, and similar documents.

d. Submit maintenance material submittals specified in individual Divisions 02 through 33 Sections, including tools, spare parts, extra materials, and similar items, and deliver to location designated by Architect. Label with manufacturer's name and model number where applicable.

1) Schedule of Maintenance Material Items: Prepare and submit schedule of maintenance material submittal items, including name and quantity of each item and name and number of related Specification Section.

e. Submit test/adjust/balance records.

f. Submit sustainable design submittals required in Division 01 sustainable design requirements Section and in individual Division 02 through 33 Sections.

g. Submit changeover information related to Owner's occupancy, use, operation, and maintenance.

3. Procedures Prior to Substantial Completion: Complete the following a minimum of 10 days prior to requesting inspection for determining date of Substantial Completion. List items below that are incomplete at time of request.

a. Advise Owner of pending insurance changeover requirements.

b. Make final changeover of permanent locks and deliver keys to Owner. Advise Owner's personnel of changeover in security provisions.

c. Complete startup and testing of systems and equipment.

d. Perform preventive maintenance on equipment used prior to Substantial Completion.

e. Instruct Owner's personnel in operation, adjustment, and maintenance of products, equipment, and systems. Submit demonstration and training video recordings specified in Division 01 Section "Demonstration and Training."

f. Advise Owner of changeover in heat and other utilities.

g. Participate with Owner in conducting inspection and walkthrough with local emergency responders.

h. Terminate and remove temporary facilities from Project site, along with mockups, construction tools, and similar elements.

i. Complete final cleaning requirements, including touchup painting.

j. Touch up and otherwise repair and restore marred exposed finishes to eliminate visual defects.

4. Inspection: Submit a written request for inspection to determine Substantial Completion a minimum of 10 days prior to the work being completed and ready for final inspection and tests. On receipt of request, Architect will either proceed with inspection or notify Contractor of unfulfilled requirements. Architect 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's punch list, that must be completed or corrected before certificate will be issued.

a. Reinspection: Request reinspection when the Work identified in previous inspections as incomplete is completed or corrected.

b. Results of completed inspection will form the basis of requirements for final completion.

C. Conduct Substantial Completion inspection and create Final Correction Punch List containing Architect's and Contractor's comprehensive list of items identified to be completed or corrected and submit to Architect.

D. Final Completion Procedures:

1. Preliminary Procedures: Before requesting final inspection for determining final completion, complete the following:
a. Submit a final Application for Payment according to Division 01 Section "Price and Payment Procedures."
b. Certified List of Incomplete Items: Submit certified copy of Architect's Substantial Completion inspection list of items to be completed or corrected (punch list), endorsed and dated by Architect. Certified copy of the list shall state that each item has been completed or otherwise resolved for acceptance.
c. Certificate of Insurance: Submit evidence of final, continuing insurance coverage complying with insurance requirements.
d. Submit pest-control final inspection report and warranty.
e. Instruct Owner's personnel in operation, adjustment, and maintenance of products, equipment, and systems.

2. Inspection: Submit a written request for final inspection to determine acceptance. On receipt of request, Architect will either proceed with inspection or notify Contractor of unfulfilled requirements. Architect will prepare a final Certificate for Payment after inspection or will notify Contractor of construction that must be completed or corrected before certificate will be issued.
a. Reinspection: Request reinspection when the Work identified in previous inspections as incomplete is completed or corrected.

E. List of Incomplete Items (Punch List)
1. Organization of List: Include name and identification of each space and area affected by construction operations for incomplete items and items needing correction including, if necessary, areas disturbed by Contractor that are outside the limits of construction.
   a. Organize list of spaces in sequential order.
   b. Organize items applying to each space by major element, including categories for ceiling, individual walls, floors, equipment, and building systems.

3.14 REPAIR OF THE WORK
A. Complete repair and restoration operations before requesting inspection for determination of Substantial Completion.
B. Repair or remove and replace defective construction. Repairing includes replacing defective parts, refinishing damaged surfaces, touching up with matching materials, and properly adjusting operating equipment. Where damaged or worn items cannot be repaired or restored, provide replacements. Remove and replace operating components that cannot be repaired. Restore damaged construction and permanent facilities used during construction to specified condition.
   1. Remove and replace chipped, scratched, and broken glass, reflective surfaces, and other damaged transparent materials.
   2. Touch up and otherwise repair and restore marred or exposed finishes and surfaces. Replace finishes and surfaces that already show evidence of repair or restoration.
      a. Do not paint over "UL" and other required labels and identification, including mechanical and electrical nameplates. Remove paint applied to required labels and identification.
   3. Replace parts subject to operating conditions during construction that may impede operation or reduce longevity.
   4. Replace burned-out bulbs, bulbs noticeably dimmed by hours of use, and defective and noisy starters in fluorescent and mercury vapor fixtures to comply with requirements for new fixtures.

3.15 MAINTENANCE
A. Provide service and maintenance of components indicated in specification sections.
B. Maintenance Period: As indicated in specification sections or, if not indicated, not less than two years from the Date of Substantial Completion or the length of the specified warranty, whichever is longer.
C. Examine system components at a frequency consistent with reliable operation. Clean, adjust, and lubricate as required.
D. Include systematic examination, adjustment, and lubrication of components. Repair or replace parts whenever required. Use parts produced by the manufacturer of the original component.

E. Maintenance service shall not be assigned or transferred to any agent or subcontractor without prior written consent of the Owner.

END OF SECTION
SECTION 01 78 00 - CLOSEOUT SUBMITTALS

PART 1 GENERAL

1.01 SECTION INCLUDES
A. Project Record Documents.
B. Operation and Maintenance Data.
C. Warranties and bonds.

1.02 RELATED REQUIREMENTS
A. Section 01 30 00 - Administrative Requirements: Submittals procedures, shop drawings, product data, and samples.
B. Individual Product Sections: Specific requirements for operation and maintenance data.
C. Individual Product Sections: Warranties required for specific products or Work.

1.03 SUBMITTALS
A. Project Record Documents: Submit documents to Architect with claim for final Application for Payment.
B. Operation and Maintenance Data:
   1. Submit electronic copy of preliminary draft or proposed formats and outlines of contents before start of Work. Architect will review draft and return one copy with comments.
   2. For equipment, or component parts of equipment put into service during construction and operated by Owner, submit completed documents within ten days after acceptance.
   3. Submit one electronic copy of completed documents 15 days prior to final inspection. This copy will be reviewed and returned after final inspection, with Architect comments. Revise content of all document sets as required prior to final submission.
   4. Submit one written set and one electronic set, posted on electronic submittal website, of revised final documents in final form within 10 days after final inspection.
C. Warranties and Bonds:
   1. For equipment or component parts of equipment put into service during construction with Owner's permission, submit documents within 10 days after acceptance.
   2. Make other submittals within 10 days after Date of Substantial Completion, prior to final Application for Payment.
   3. For items of Work for which acceptance is delayed beyond Date of Substantial Completion, submit within 10 days after acceptance, listing the date of acceptance as the beginning of the warranty period.

PART 2 PRODUCTS - NOT USED

PART 3 EXECUTION

3.01 PROJECT RECORD DOCUMENTS
A. Maintain on site one set of the following record documents; record actual revisions to the Work:
   1. Drawings.
   2. Specifications.
   3. Addenda.
   4. Change Orders and other modifications to the Contract.
B. Record Prints:
   1. Preparation: Mark record prints to show the actual installation where installation varies from that shown originally. Require individual or entity who obtained record data, whether individual or entity is Installer, subcontractor, or similar entity, to provide information for preparation of corresponding marked-up record prints.
      a. Give particular attention to information on concealed elements that would be difficult to identify or measure and record later.
      b. Accurately record information in an acceptable drawing technique.
      c. Record data as soon as possible after obtaining it.
d. Record and check the markup before enclosing concealed installations.
e. Cross-reference record prints to corresponding archive photographic documentation.

2. Content: Types of items requiring marking include, but are not limited to, the following:
   a. Dimensional changes to Drawings.
   b. Revisions to details shown on Drawings.
   c. Depths of foundations below first floor.
   d. Locations and depths of underground utilities.
   e. Revisions to routing of piping and conduits.
   f. Revisions to electrical circuitry.
   g. Actual equipment locations.
   h. Duct size and routing.
   i. Locations of concealed internal utilities.
   j. Changes made by Change Order or Construction Change Directive.
   k. Changes made following Architect's written orders.
   l. Details not on the original Contract Drawings.
   m. Field records for variable and concealed conditions.
   n. Record information on the Work that is shown only schematically.

3. Mark the Contract Drawings and Shop Drawings completely and accurately. Use personnel proficient at recording graphic information in production of marked-up record prints.

4. Mark record sets with erasable, red-colored pencil. Use other colors to distinguish between changes for different categories of the Work at same location.

5. Mark important additional information that was either shown schematically or omitted from original Drawings.

6. Note Construction Change Directive numbers, alternate numbers, Change Order numbers, and similar identification, where applicable.

C. Ensure entries are complete and accurate, enabling future reference by Owner.

D. Store record documents separate from documents used for construction.

E. Record information concurrent with construction progress.

F. Specifications: Legibly mark and record at each product section description of actual products installed, including the following:
   1. Manufacturer's name and product model and number.
   2. Product substitutions or alternates utilized.
   3. Changes made by Addenda and modifications.

3.02 OPERATION AND MAINTENANCE DATA

A. Source Data: For each product or system, list names, addresses and telephone numbers of Subcontractors and suppliers, including local source of supplies and replacement parts.

B. Product Data: Mark each sheet to clearly identify specific products and component parts, and data applicable to installation. Delete inapplicable information.

C. Drawings: Supplement product data to illustrate relations of component parts of equipment and systems, to show control and flow diagrams. Do not use Project Record Documents as maintenance drawings.

D. Typed Text: As required to supplement product data. Provide logical sequence of instructions for each procedure, incorporating manufacturer's instructions.

3.03 OPERATION AND MAINTENANCE DATA FOR MATERIALS AND FINISHES

A. For Each Product, Applied Material, and Finish:
   1. Product data, with catalog number, size, composition, and color and texture designations.

B. Instructions for Care and Maintenance: Manufacturer's recommendations for cleaning agents and methods, precautions against detrimental cleaning agents and methods, and recommended schedule for cleaning and maintenance.
C. Where additional instructions are required, beyond the manufacturer's standard printed instructions, have instructions prepared by personnel experienced in the operation and maintenance of the specific products.

3.04 OPERATION AND MAINTENANCE DATA FOR EQUIPMENT AND SYSTEMS

A. For Each Item of Equipment and Each System:
   1. Description of unit or system, and component parts.
   2. Identify function, normal operating characteristics, and limiting conditions.
   3. Include performance curves, with engineering data and tests.
   4. Complete nomenclature and model number of replaceable parts.

B. Where additional instructions are required, beyond the manufacturer's standard printed instructions, have instructions prepared by personnel experienced in the operation and maintenance of the specific products.

C. Operating Procedures: Include start-up, break-in, and routine normal operating instructions and sequences. Include regulation, control, stopping, shut-down, and emergency instructions. Include summer, winter, and any special operating instructions.

D. Maintenance Requirements: Include routine procedures and guide for preventative maintenance and trouble shooting; disassembly, repair, and reassembly instructions; and alignment, adjusting, balancing, and checking instructions.

E. Provide servicing and lubrication schedule, and list of lubricants required.

F. Include manufacturer's printed operation and maintenance instructions.

G. Include sequence of operation by controls manufacturer.

H. Provide original manufacturer's parts list, illustrations, assembly drawings, and diagrams required for maintenance.

I. Additional Requirements: As specified in individual product specification sections.

3.05 ASSEMBLY OF OPERATION AND MAINTENANCE MANUALS

A. Assemble operation and maintenance data into durable manuals for Owner's personnel use, with data arranged in the same sequence as, and identified by, the specification sections.

B. Where systems involve more than one specification section, provide separate tabbed divider for each system.

C. Prepare instructions and data by personnel experienced in maintenance and operation of described products.

D. Prepare data in the form of an instructional manual.

E. Binders: Commercial quality, 8-1/2 by 11 inch three D side ring binders with durable plastic covers; 2 inch maximum ring size. When multiple binders are used, correlate data into related consistent groupings.

F. Cover: Identify each binder with typed or printed title OPERATION AND MAINTENANCE INSTRUCTIONS; identify title of Project; identify subject matter of contents.

G. Project Directory: Title and address of Project; names, addresses, and telephone numbers of Architect, Consultants, Contractor and subcontractors, with names of responsible parties.

H. Tables of Contents: List every item separated by a divider, using the same identification as on the divider tab; where multiple volumes are required, include all volumes Tables of Contents in each volume, with the current volume clearly identified.

I. Dividers: Provide tabbed dividers for each separate product and system; identify the contents on the divider tab; immediately following the divider tab include a description of product and major component parts of equipment.

J. Text: Manufacturer's printed data, or typewritten data on 24 pound paper.

K. Drawings: Provide with reinforced punched binder tab. Bind in with text; fold larger drawings to size of text pages.
L. Contents: Prepare a Table of Contents for each volume, with each product or system description identified, in three parts as follows:

1. Part 1: Directory, listing names, addresses, and telephone numbers of Architect, Contractor, Subcontractors, and major equipment suppliers.
2. Part 2: Operation and maintenance instructions, arranged by system and subdivided by specification section. For each category, identify names, addresses, and telephone numbers of Subcontractors and suppliers. Identify the following:
   a. Significant design criteria.
   b. List of equipment.
   c. Parts list for each component.
   d. Operating instructions.
   e. Maintenance instructions for equipment and systems.
   f. Maintenance instructions for special finishes, including recommended cleaning methods and materials, and special precautions identifying detrimental agents.
3. Part 3: Project documents and certificates, including the following:
   a. Shop drawings and product data.
   b. Photocopies of warranties and bonds.

3.06 WARRANTIES AND BONDS

A. Obtain warranties and bonds, executed in duplicate by responsible Subcontractors, suppliers, and manufacturers, within 10 days after completion of the applicable item of work. Except for items put into use with Owner's permission, leave date of beginning of time of warranty until Date of Substantial completion is determined.

B. Verify that documents are in proper form, contain full information, and are notarized.

C. Co-execute submittals when required.

D. Retain warranties and bonds until time specified for submittal.

E. Manual: Bind in commercial quality 8-1/2 by 11 inch three D side ring binders with durable plastic covers.

F. Cover: Identify each binder with typed or printed title WARRANTIES AND BONDS, with title of Project; name, address and telephone number of Contractor and equipment supplier; and name of responsible company principal.

G. Table of Contents: Neatly typed, in the sequence of the Table of Contents of the Project Manual, with each item identified with the number and title of the specification section in which specified, and the name of product or work item.

H. Separate each warranty or bond with index tab sheets keyed to the Table of Contents listing. Provide full information, using separate typed sheets as necessary. List Subcontractor, supplier, and manufacturer, with name, address, and telephone number of responsible principal.

I. Warranty Electronic File: Scan warranties and bonds and assemble complete warranty and bond submittal package into a single indexed electronic PDF file with links enabling navigation to each item. Provide bookmarked table of contents at beginning of document.

END OF SECTION
PART 1 GENERAL
1.01 SUMMARY
A. Demonstration of products and systems where indicated in specific specification sections.

1.02 RELATED REQUIREMENTS
A. Section 01 78 00 - Closeout Submittals: Operation and maintenance manuals.
B. Other Specification Sections: Additional requirements for demonstration and training.

1.03 QUALITY ASSURANCE
A. Instructor Qualifications: Familiar with design, operation, maintenance and troubleshooting of the relevant products and systems.
   1. Provide as instructors the most qualified trainer of those contractors and/or installers who actually supplied and installed the systems and equipment.
   2. Where a single person is not familiar with all aspects, provide specialists with necessary qualifications.

PART 2 PRODUCTS - NOT USED

PART 3 EXECUTION
3.01 DEMONSTRATION - GENERAL
A. Demonstrations conducted during system start-up do not qualify as demonstrations for the purposes of this section, unless approved in advance by Owner.
B. Demonstration may be combined with Owner personnel training if applicable.
C. Operating Equipment and Systems: Demonstrate operation in all modes, including start-up, shut-down, seasonal changeover, emergency conditions, and troubleshooting, and maintenance procedures, including scheduled and preventive maintenance.
   1. Perform demonstrations not less than two weeks prior to Substantial Completion.
   2. For equipment or systems requiring seasonal operation, perform demonstration for other season within three months.
D. Non-Operating Products: Demonstrate cleaning, scheduled and preventive maintenance, and repair procedures.
   1. Perform demonstrations not less than two weeks prior to Substantial Completion.

3.02 TRAINING - GENERAL
A. Conduct training on-site unless otherwise indicated.
B. Training schedule will be subject to availability of Owner's personnel to be trained; re-schedule training sessions as required by Owner; once schedule has been approved by Owner failure to conduct sessions according to schedule will be cause for Owner to charge Contractor for personnel "show-up" time.
C. Product- and System-Specific Training:
   1. Review the applicable O&M manuals.
   2. For systems, provide an overview of system operation, design parameters and constraints, and operational strategies.
   3. Review instructions for proper operation in all modes, including start-up, shut-down, seasonal changeover and emergency procedures, and for maintenance, including preventative maintenance.
   4. Provide hands-on training on all operational modes possible and preventative maintenance.
   5. Emphasize safe and proper operating requirements; discuss relevant health and safety issues and emergency procedures.
   6. Discuss common troubleshooting problems and solutions.
   7. Discuss any peculiarities of equipment installation or operation.
   8. Discuss warranties and guarantees, including procedures necessary to avoid voiding coverage.
9. Review recommended tools and spare parts inventory suggestions of manufacturers.
10. Review spare parts and tools required to be furnished by Contractor.
11. Review spare parts suppliers and sources and procurement procedures.

D. Be prepared to answer questions raised by training attendees; if unable to answer during training session, provide written response within three days.

END OF SECTION
SECTION 03 30 00 - CAST-IN-PLACE CONCRETE

PART 1 - GENERAL

1.1 SUMMARY
A. Section includes cast-in-place concrete, including formwork, reinforcement, concrete materials, mixture design, placement procedures, and finishes.
B. Related Sections:
   1. Section 312000 "Earth Moving" for drainage fill under slabs-on-grade.

1.2 ACTION SUBMITTALS
A. Product Data: For each type of product indicated.
B. Design Mixtures: For each concrete mixture.
C. Steel Reinforcement Shop Drawings: Placing drawings that detail fabrication, bending, and placement.
D. Formwork Shop Drawings: Prepared by or under the supervision of a qualified professional engineer detailing fabrication, assembly, and support of formwork.

1.3 INFORMATIONAL SUBMITTALS
A. Welding certificates.
B. Material certificates.
C. Material test reports.
D. Floor surface flatness and levelness measurements.

1.4 QUALITY ASSURANCE
A. Manufacturer Qualifications: A firm experienced in manufacturing ready-mixed concrete products and that complies with ASTM C 94/C 94M requirements for production facilities and equipment.
   1. Manufacturer certified according to NRMCA's "Certification of Ready Mixed Concrete Production Facilities."
B. Testing Agency Qualifications: An independent agency, qualified according to ASTM C 1077 and ASTM E 329 for testing indicated.
C. Welding Qualifications: Qualify procedures and personnel according to AWS D1.4/D 1.4M, "Structural Welding Code - Reinforcing Steel."
D. ACI Publications: Comply with the following unless modified by requirements in the Contract Documents:
   1. ACI 301, "Specifications for Structural Concrete," Sections 1 through 5.
   2. ACI 117, "Specifications for Tolerances for Concrete Construction and Materials."
E. Concrete Testing Service: Engage a qualified independent testing agency to perform material evaluation tests and to design concrete mixtures.
F. Preinstallation Conference: Conduct conference at Project site or by telephone. Conference to include Architect, Structural Engineer, Contractor and / or Subcontractor

PART 2 - PRODUCTS

2.1 FORM-FACING MATERIALS
A. Smooth-Formed Finished Concrete: Form-facings will provide continuous, true, and smooth concrete surfaces. Furnish in largest practicable sizes to minimize number of joints.
B. Rough-Formed Finished Concrete: Plywood, lumber, metal, or another approved material. Provide lumber dressed on at least two edges and one side for tight fit.

2.2 STEEL REINFORCEMENT
A. Recycled Content of Steel Products: Postconsumer recycled content plus one-half of preconsumer recycled content not less than 25 percent.
B. Reinforcing Bars: ASTM A 615/A 615M, Grade 60 (Grade 420), deformed.
   1. Epoxy-Coated Reinforcing Bars: ASTM A 775/A 775M, epoxy coated, with less than 2 percent damaged coating in each 12-inch (300-mm) bar length.
C. Plain-Steel Welded Wire Reinforcement: ASTM A 185/A 185M, plain, fabricated from as-drawn steel wire into flat sheets.
E. Galvanized-Steel Welded Wire Reinforcement: ASTM A 185/A 185M, plain, fabricated from galvanized-steel wire into flat sheets.
F. Epoxy-Coated Welded Wire Reinforcement: ASTM A 884/A 884M, Class A coated, Type 1, plain steel.

G. Bar Supports: Bolsters, chairs, spacers, and other devices for spacing, supporting, and fastening reinforcing bars and welded wire reinforcement in place. Manufacture bar supports from steel wire, plastic, or precast concrete according to CRSI's "Manual of Standard Practice. Where bar supports are located in slabs where the surface is exposed, bar supports shall be non-corrosive.

2.3 CONCRETE MATERIALS

A. Cementitious Material: Use the following cementitious materials, of the same type, brand, and source, throughout Project:
   1. Portland Cement: ASTM C 150, Type I, gray. Supplement with the following with the approval of the Engineer:
      b. Ground Granulated Blast-Furnace Slag: ASTM C 989, Grade 100 or 120.

B. Normal-Weight Aggregates: ASTM C 33, graded.
   1. Maximum Coarse-Aggregate Size: 1-1/4 inches for interior slabs on grade, 1 inch for foundations and exterior slabs on grade.
   2. Fine Aggregate: Free of materials with deleterious reactivity to alkali in cement.
      a. Where slabs are to be polished or exposed in the final condition, the fine aggregate shall be free of material prone to pop outs or rust stains.


2.4 ADMIXTURES


B. Chemical Admixtures: Provide admixtures certified by manufacturer to be compatible with other admixtures and that will not contribute water-soluble chloride ions exceeding those permitted in hardened concrete. Do not use calcium chloride or admixtures containing calcium chloride.
   1. Water-Reducing Admixture: ASTM C 494/C 494M, Type A.
   2. Retarding Admixture: ASTM C 494/C 494M, Type B.
   3. Water-Reducing and Retarding Admixture: ASTM C 494/C 494M, Type D.
   4. High-Range, Water-Reducing Admixture: ASTM C 494/C 494M, Type F.
   5. High-Range, Water-Reducing and Retarding Admixture: ASTM C 494/C 494M, Type G.
   6. Plasticizing and Retarding Admixture: ASTM C 1017/C 1017M, Type II.

2.5 WATERSTOPS

A. Flexible Rubber Waterstops: CE CRD-C 513, with factory-installed metal eyelets, for embedding in concrete to prevent passage of fluids through joints. Factory fabricate corners, intersections, and directional changes.

B. Chemically Resistant Flexible Waterstops: Thermoplastic elastomer rubber waterstops with factory-installed metal eyelets, for embedding in concrete to prevent passage of fluids through joints; resistant to oils, solvents, and chemicals. Factory fabricate corners, intersections, and directional changes.

C. Flexible PVC Waterstops: CE CRD-C 572, with factory-installed metal eyelets, for embedding in concrete to prevent passage of fluids through joints. Factory fabricate corners, intersections, and directional changes.

D. Self-Expanding Butyl Strip Waterstops: Manufactured rectangular or trapezoidal strip, butyl rubber with sodium bentonite or other hydrophilic polymers, for adhesive bonding to concrete, 3/4 by 1 inch (19 by 25 mm).

E. Self-Expanding Rubber Strip Waterstops: Manufactured rectangular or trapezoidal strip, bentonite-free hydrophilic polymer modified chloroprene rubber, for adhesive bonding to concrete, 3/8 by 3/4 inch (10 by 19 mm).

2.6 VAPOR RETARDERS

A. Sheet Vapor Retarder: ASTM E 1745, Class A, not less than 10 mils. Include manufacturer's recommended adhesive or pressure-sensitive tape.
2.7 CURING MATERIALS
A. Evaporation Retarder: Waterborne, monomolecular film forming, manufactured for application to fresh concrete.
B. Absorptive Cover: AASHTO M 182, Class 2, burlap cloth made from jute or kenaf, weighing approximately 9 oz./sq. yd. (305 g/sq. m) when dry.
C. Moisture-Retaining Cover: ASTM C 171, polyethylene film or white burlap-polyethylene sheet.
D. Water: Potable.
E. Clear, Waterborne, Membrane-Forming Curing Compound: ASTM C 309, Type 1, Class B, dissipating.
F. Clear, Waterborne, Membrane-Forming Curing Compound: ASTM C 309, Type 1, Class B, non-dissipating, certified by curing compound manufacturer to not interfere with bonding of floor covering.
G. Clear, Solvent-Borne, Membrane-Forming Curing and Sealing Compound: ASTM C 1315, Type 1, Class A.
1. VOC Content: Curing and sealing compounds shall have a VOC content of 200 g/L or less when calculated according to 40 CFR 59, Subpart D (EPA Method 24).
H. Clear, Waterborne, Membrane-Forming Curing and Sealing Compound: ASTM C 1315, Type 1, Class A.
1. VOC Content: Curing and sealing compounds shall have a VOC content of 200 g/L or less when calculated according to 40 CFR 59, Subpart D (EPA Method 24).

2.8 RELATED MATERIALS

2.9 CONCRETE MIXTURES
A. Prepare design mixtures for each type and strength of concrete, proportioned on the basis of laboratory trial mixture or field test data, or both, according to ACI 301.
B. Cementitious Materials: Use fly ash, pozzolan, ground granulated blast-furnace slag, and silica fume as needed to reduce the total amount of portland cement, which would otherwise be used, by not more than 20 percent. Only cement shall be used in polished concrete slabs.
C. Admixtures: Use admixtures according to manufacturer's written instructions.
1. Use water-reducing high-range water-reducing or plasticizing admixture in concrete, as required, for placement and workability. All anticipated admixtures must be clearly identified in any mix design submitted for approval.
2. Use water-reducing and retarding admixture when required by high temperatures, low humidity, or other adverse placement conditions.
3. Use water-reducing admixture in pumped concrete, concrete for heavy-use industrial slabs and parking structure slabs, concrete required to be watertight, and concrete with a water-cementitious materials ratio below 0.50.
D. Proportion normal-weight concrete mixture as follows:
1. Minimum Compressive Strength:
   a. 4000 psi at 28 days for all interior slabs on grade, topping slabs and exterior slabs
   b. 3000 psi at 28 days for all foundations or as noted on drawings.
2. Typical Maximum Water-Cementitious Materials Ratio: 0.50
3. Maximum Water-Cementitious Materials Ratio for Polished Concrete Slabs: 0.45.
4. Slump Limit: 8 inches (200 mm) for concrete with verified slump of 2 to 4 inches (50 to 100 mm) before adding high-range water-reducing admixture or plasticizing admixture, plus or minus 1 inch (25 mm).
5. Air Content: 6 percent, plus or minus 1.5 percent at point of delivery for 1-inch (25-mm) nominal maximum aggregate size.
6. Air Content: Do not allow air content of trowel-finished floors to exceed 3 percent.

2.10 FABRICATING REINFORCEMENT
A. Fabricate steel reinforcement according to CRSI's "Manual of Standard Practice."

2.11 CONCRETE MIXING
A. Ready-Mixed Concrete: Measure, batch, mix, and deliver concrete according to ASTM C 94/C 94M and ASTM C 1116/C 1116M, and furnish batch ticket information.
1. When air temperature is between 85 and 90 deg F (30 and 32 deg C), reduce mixing and delivery time from 1-1/2 hours to 75 minutes; when air temperature is above 90 deg F (32 deg C), reduce mixing and delivery time to 60 minutes.

PART 3 - EXECUTION

3.1 FORMWORK
A. Design, erect, shore, brace, and maintain formwork, according to ACI 301, to support vertical, lateral, static, and dynamic loads, and construction loads that might be applied, until structure can support such loads.
B. Construct formwork so concrete members and structures are of size, shape, alignment, elevation, and position indicated, within tolerance limits of ACI 117.
C. Chamfer exterior corners and edges of permanently exposed concrete.

3.2 EMBEDDED ITEMS
A. Place and secure anchorage devices and other embedded items required for adjoining work that is attached to or supported by cast-in-place concrete. Use setting drawings, templates, diagrams, instructions, and directions furnished with items to be embedded.
1. All post installed anchors used for anchor rods supporting steel columns, as indicated, are required to be tested by the Owner's testing agency.

3.3 VAPOR RETARDERS
A. Sheet Vapor Retarders: Place, protect, and repair sheet vapor retarder according to ASTM E 1643 and manufacturer's written instructions.
1. Lap joints 6 inches (150 mm) and seal with manufacturer's recommended tape.

3.4 STEEL REINFORCEMENT
A. General: Comply with CRSI's "Manual of Standard Practice" for placing reinforcement.
1. Do not cut or puncture vapor retarder. Repair damage and reseal vapor retarder before placing concrete.

3.5 JOINTS
A. General: Construct joints true to line with faces perpendicular to surface plane of concrete.
B. Construction Joints: Install so strength and appearance of concrete are not impaired, at locations indicated or as approved by Architect. All joints in exposed slabs must be approved by the Architect and Engineer.
C. Contraction Joints in Slabs-on-Grade: Form weakened-plane contraction joints, sectioning concrete into areas as indicated. Construct contraction joints for a depth equal to at least one-fourth of concrete thickness as follows. Type of joint must be approved by the Architect and Engineer.
1. Grooved Joints: Form contraction joints after initial floating by grooving and finishing each edge of joint to a radius of 1/8 inch (3.2 mm). Repeat grooving of contraction joints after applying surface finishes. Eliminate groover tool marks on concrete surfaces.
2. Sawed Joints: Form contraction joints with power saws equipped with shatterproof abrasive or diamond-rimmed blades. Cut 1/8-inch- (3.2-mm-) wide joints into concrete when cutting action will not tear, abrade, or otherwise damage surface and before concrete develops random contraction cracks.
D. Isolation Joints in Slabs-on-Grade: After removing formwork, install joint-filler strips at slab junctions with vertical surfaces, such as column pedestals, foundation walls, grade beams, and other locations, as indicated.
E. Maximum spacing of contraction joints:
1. Slab on Grade: 30 times the thickness of the slab or as indicated.
2. Exposed basement walls: 30 feet
3. Exposed non-basement walls or exposed curbs: 12 feet
F. Waterstops: Install in construction joints and at other joints indicated according to manufacturer’s written instructions.

3.6 CONCRETE PLACEMENT
A. Before placing concrete, verify that installation of formwork, reinforcement, and embedded items is complete and that required inspections have been performed.
B. Deposit concrete continuously in one layer or in horizontal layers of such thickness that no new concrete will be placed on concrete that has hardened enough to cause seams or planes of
weakness. If a section cannot be placed continuously, provide construction joints as indicated. Deposit concrete to avoid segregation.

1. Consolidate placed concrete with mechanical vibrating equipment according to ACI 301.

C. Cold-Weather Placement: Comply with ACI 306.1.

D. Hot-Weather Placement: Comply with ACI 301.

3.7 FINISHING FORMED SURFACES

A. Rough-Formed Finish: As-cast concrete texture imparted by form-facing material with tie holes and defects repaired and patched. Remove fins and other projections that exceed specified limits on formed-surface irregularities.

1. Apply to concrete surfaces not exposed to public view.

B. Smooth-Formed Finish: As-cast concrete texture imparted by form-facing material, arranged in an orderly and symmetrical manner with a minimum of seams. Repair and patch tie holes and defects. Remove fins and other projections that exceed specified limits on formed-surface irregularities.

1. Apply to concrete surfaces exposed to public view, or as indicated on Architectural drawings.

C. Rubbed Finish: Apply the following to smooth-formed finished as-cast concrete where indicated:

1. Smooth-Rubbed Finish: Not later than one day after form removal, moisten concrete surfaces and rub with carborundum brick or another abrasive until producing a uniform color and texture. Do not apply cement grout other than that created by the rubbing process.

2. Grout-Cleaned Finish: Wet concrete surfaces and apply grout of a consistency of thick paint to coat surfaces and fill small holes. Mix one part portland cement to one and one-half parts fine sand with a 1:1 mixture of bonding admixture and water. Add white portland cement in amounts determined by trial patches so color of dry grout will match adjacent surfaces. Scrub grout into voids and remove excess grout. When grout whitens, rub surface with clean burlap and keep surface damp by fog spray for at least 36 hours.

3. Cork-Floated Finish: Wet concrete surfaces and apply a stiff grout. Mix one part portland cement and one part fine sand with a 1:1 mixture of bonding agent and water. Add white portland cement in amounts determined by trial patches so color of dry grout will match adjacent surfaces. Compress grout into voids by grinding surface. In a swirling motion, finish surface with a cork float.

D. Related Unformed Surfaces: At tops of walls, horizontal offsets, and similar unformed surfaces adjacent to formed surfaces, strike off smooth and finish with a texture matching adjacent formed surfaces. Continue final surface treatment of formed surfaces uniformly across adjacent unformed surfaces unless otherwise indicated.

3.8 FINISHING FLOORS AND SLABS

A. General: Comply with ACI 302.1R recommendations for screeding, restraightening, and finishing operations for concrete surfaces. Do not wet concrete surfaces.

B. Scratch Finish: While still plastic, texture concrete surface that has been screeded and bullfloated or darbied. Use stiff brushes, brooms, or rakes to produce a profile amplitude of 1/4 inch (6 mm) in one direction.

1. Apply scratch finish to surfaces indicated.

C. Float Finish: Consolidate surface with power-driven floats or by hand floating if area is small or inaccessible to power driven floats. Restraighten, cut down high spots, and fill low spots. Repeat float passes and restraightening until surface is left with a uniform, smooth, granular texture.

1. Apply float finish to surfaces indicated or to be covered with fluid-applied or sheet waterproofing, built-up or membrane roofing, or sand-bed terrazzo.

D. Trowel Finish: After applying float finish, apply first troweling and consolidate concrete by hand or power-driven trowel. Continue troweling passes and restraighten until surface is free of trowel marks and uniform in texture and appearance. Grind smooth any surface defects that would telegraph through applied coatings or floor coverings.
1. Apply a trowel finish to surfaces indicated, exposed to view or to be covered with resilient flooring, carpet, ceramic or quarry tile set over a cleavage membrane, paint, or another thin-film-finish coating system.

2. Finish to the following tolerances:
   a. Polished slabs: Ff 38, Fl 25
   b. All other slabs: Ff 25, Fl 17

3. Floors shall be tested for flatness per ASTM E1155 within 48 hours of placement by the Owner’s testing agency.

E. Trowel and Fine-Broom Finish: Apply a first trowel finish to surfaces indicated and where ceramic or quarry tile is to be installed by either thickset or thin-set method. While concrete is still plastic, slightly scarify surface with a fine broom.

1. Comply with flatness and levelness tolerances for trowel-finished floor surfaces.

F. Broom Finish: Apply a broom finish to exterior concrete platforms, steps, ramps, and elsewhere as indicated.

3.9 CONCRETE PROTECTING AND CURING

A. General: Protect freshly placed concrete from premature drying and excessive cold or hot temperatures. Comply with ACI 306.1 for cold-weather protection and ACI 301 for hot-weather protection during curing.

B. Evaporation Retarder: Apply evaporation retarder to unformed concrete surfaces if hot, dry, or windy conditions cause moisture loss approaching 0.2 lb/sq. ft. x h (1 kg/sq. m x h) before and during finishing operations. Apply according to manufacturer's written instructions after placing, screeding, and bull floating or darbying concrete, but before float finishing.

C. Cure concrete according to ACI 308.1, by one or a combination of the following methods:
   1. Moisture Curing: Keep surfaces continuously moist for not less than seven days.
   2. Moisture-Retaining-Cover Curing: Cover concrete surfaces with moisture-retaining cover for curing concrete, placed in widest practicable width, with sides and ends lapped at least 12 inches (300 mm), and sealed by waterproof tape or adhesive. Cure for not less than seven days. Immediately repair any holes or tears during curing period using cover material and waterproof tape.
   3. Curing Compound: Apply uniformly in continuous operation by power spray or roller according to manufacturer's written instructions. Recoat areas subjected to heavy rainfall within three hours after initial application. Maintain continuity of coating and repair damage during curing period.

   a. Removal: After curing period has elapsed, remove curing compound without damaging concrete surfaces by method recommended by curing compound manufacturer unless manufacturer certifies curing compound will not interfere with bonding of floor covering used on Project.

   4. Curing and Sealing Compound: Apply uniformly to floors and slabs indicated in a continuous operation by power spray or roller according to manufacturer's written instructions. Recoat areas subjected to heavy rainfall within three hours after initial application. Repeat process 24 hours later and apply a second coat. Maintain continuity of coating and repair damage during curing period.

3.10 CONCRETE SURFACE REPAIRS

A. Defective Concrete: Repair and patch defective areas when approved by Architect. Remove and replace concrete that cannot be repaired and patched to Architect's approval.

1. Defective concrete shall be repaired, removed or patched at no additional cost to the Owner.

3.11 FIELD QUALITY CONTROL

A. Testing and Inspecting: Owner will engage a qualified testing and inspecting agency to perform field tests and inspections and prepare test reports. UNO, tests shall include the following for every 100 CY and fractions thereof of concrete placed:

   1. Slump, Air Content, Temperature (concrete and air), air entrainment and 1 set of 3 test cylinders. Break 1 cylinder at 7 days, 1 cylinder at 28 days and hold 1 cylinder in reserve.
2. The cost to perform additional tests due to defective concrete or deficient test results shall be paid by the Contractor. The cost to repair, remove or patch defective concrete shall be paid by the Contractor.

END OF SECTION 03 30 00
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 unit masonry assemblies consisting of the following:
   1. Concrete masonry units (CMUs).
   2. Mortar and grout.
   3. Reinforcing steel.
   4. Masonry joint reinforcement.
   5. Ties and anchors.
   6. Miscellaneous masonry accessories.
B. Products installed, but not furnished, under this Section include the following:
   1. Steel lintels and shelf angles for unit masonry, furnished under Division 5 Section "Metal Fabrications."
   2. Manufactured reglets in masonry joints for metal flashing, furnished under Division 7 Section "Sheet Metal Flashing and Trim."

1.03 DEFINITIONS
A. Reinforced Masonry: Masonry containing reinforcing steel in grouted cells.

1.04 PERFORMANCE REQUIREMENTS
A. Provide structural unit masonry that develops indicated net-area compressive strengths (f'm) at 28 days.
B. Determine net-area compressive strength (f'm) of masonry from average net-area compressive strengths of masonry units and mortar types (unit-strength method) according to Tables 1 and 2 in ACI 530.1/ASCE 6/TMS 602.

1.05 ACTION SUBMITTALS
A. Product Data: For each type of product indicated.
B. Shop Drawings: For the following:
   1. Masonry Units: Show sizes, profiles, of special shapes.

1.06 INFORMATIONAL SUBMITTALS
A. Material Certificates: Include statements of material properties indicating compliance with requirements including compliance with standards and type designations within standards. Provide for each type and size of the following:
   1. Masonry units.
      a. Include material test reports substantiating compliance with requirements.
      b. For masonry units used in structural masonry, include data and calculations establishing average net-area compressive strength of units.
   2. Cementitious materials. Include brand, type, and name of manufacturer.
   3. Preblended, dry mortar mixes. Include description of type and proportions of ingredients.
   4. Grout mixes. Include description of type and proportions of ingredients.
B. Mix Designs: For each type of mortar and grout. Include description of type and proportions of ingredients.
   1. Include test reports, per ASTM C 780, for mortar mixes required to comply with property specification.
   2. Include test reports, per ASTM C 1019, for grout mixes required to comply with compressive strength requirement.
C. Cold-Weather Procedures: Detailed description of methods, materials, and equipment to be used to comply with cold-weather requirements.
1.07 QUALITY ASSURANCE
   A. Testing Agency Qualifications: An independent agency qualified according to ASTM C 1093 for testing indicated, as documented according to ASTM E 548.
   B. Source Limitations for Masonry Units: Obtain exposed masonry units of a uniform texture and color, or a uniform blend within the ranges accepted for these characteristics, through one source from a single manufacturer for each product required.
   C. Source Limitations for Mortar Materials: Obtain mortar ingredients of a uniform quality, including color for exposed masonry, from a single manufacturer for each cementitious component and from one source or producer for each aggregate.
   D. Masonry Contractors Qualifications: The Masonry company may be required to provide recorded experience with a minimum record of five (5) years in service at the time of bidding.

1.08 DELIVERY, STORAGE, AND HANDLING
   A. Store masonry units on elevated platforms 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 dry.
   B. Store cementitious materials on elevated platforms, under cover, and in a dry location. Do not use cementitious materials that have become damp.
   C. Store aggregates where grading and other required characteristics can be maintained and contamination avoided.
   D. Deliver preblended, dry mortar mix in moisture-resistant containers designed for lifting and emptying into dispensing silo. Store preblended, dry mortar mix in delivery containers on elevated platforms, under cover, and in a dry location or in a metal dispensing silo with weatherproof cover.
   E. Store masonry accessories, including metal items, to prevent corrosion and accumulation of dirt and oil.

1.09 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 and hold cover securely in place.
   B. Do not apply uniform floor or roof loads for at least 12 hours and concentrated loads for at least 3 days after building masonry walls or columns.
   C. Stain Prevention: Prevent grout, mortar, and soil from staining the face of masonry to be left exposed or painted. Immediately remove grout, mortar, and soil that come in contact with such masonry.
      1. Protect sills, ledges, and projections from mortar droppings.
      2. Protect surfaces of window and door frames, as well as similar products with painted and integral finishes, from mortar droppings.
      3. 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.
   D. Cold-Weather Requirements: Do not use frozen materials or materials mixed or coated with ice or frost. Do not build on frozen substrates. Remove and replace unit masonry damaged by frost or by freezing conditions. Comply with cold-weather construction requirements contained in ACI 530.1/ASCE 6/TMS 602.
      1. Cold-Weather Cleaning: Use liquid cleaning methods only when air temperature is 40 deg F and above and will remain so until masonry has dried, but not less than 7 days after completing cleaning.
PART 2 - PRODUCTS
2.01 MANUFACTURERS
   A. In other Part 2 articles where titles below introduce lists, the following requirements apply to product selection:
      1. Available Products: Subject to compliance with requirements, products that may be incorporated into the Work include, but are not limited to, products specified.
      2. Products: Subject to compliance with requirements, provide one of the products specified.
      3. Available Manufacturers: Subject to compliance with requirements, manufacturers offering products that may be incorporated into the Work include, but are not limited to, manufacturers specified.
      4. Manufacturers: Subject to compliance with requirements, provide products by one of the manufacturers specified.

2.02 MASONRY UNITS, GENERAL
   A. Defective Units: Referenced masonry unit standards may allow a certain percentage of units to exceed tolerances and to contain chips, cracks, or other defects exceeding limits stated in the standard. Do not use units where such defects, including dimensions that vary from specified dimensions by more than stated tolerances, will be exposed in the completed Work or will impair the quality of completed masonry.

2.03 CONCRETE MASONRY UNITS (CMUs)
   A. Shapes: Provide shapes indicated and as follows:
      1. Provide special shapes for lintels, corners, jambs, sashes, movement joints, headers, bonding, and other special conditions.
      2. Provide bullnose units for outside corners, unless otherwise indicated. Do not provide bullnose units at door frames.
   B. Concrete Masonry Units: ASTM C 90
      1. Unit Compressive Strength: Provide units with minimum average net-area minimum compressive strength of 1900 psi.
      2. Weight Classification: Normal weight.
      3. Size (Width): Manufactured to dimensions 3/8 inch less than nominal dimensions.
      4. Exposed Faces: Provide color and texture matching the range represented by Architect's sample.
      5. Grade: For above grade interior units, use Grade N, Type I, complying to ASTM C-90 for load bearing concrete masonry. For below grade units, use Grade M, Type I. Architectural concrete exterior masonry units shall comply with ASTM C-55, Grade N. Masonry shall comply with UBC Standard 21-4 for load bearing units, and 21-5 for non-load bearing units.

2.04 MORTAR AND GROUT MATERIALS
   A. Portland Cement: ASTM C 150, Type I or II, except Type III may be used for cold-weather construction. Provide natural color or white cement as required to produce mortar color indicated.
   B. Masonry Cement: Shall comply with ASTM C-91 for Type N or M masonry.
   C. Hydrated Lime: ASTM C 207, Type S.
   D. Portland Cement-Lime Mix: Packaged blend of portland cement complying with ASTM C 150, Type I or Type III, and hydrated lime complying with ASTM C 207, Type S.
   E. Aggregate for Mortar: ASTM C 144.
      1. For mortar that is exposed to view, use washed aggregate consisting of natural sand or crushed stone.
      2. Colored-Mortar Aggregates: Natural sand
   F. Aggregate for Grout: ASTM C 404.
G. Water: Potable.

H. Mortar for Exterior Block: When exterior concrete masonry is to be used a water repellant mortar will be used which is of the same manufacturer as that of the masonry block water repellant admixture. Color shall match the block color, unless otherwise noted.

2.05 REINFORCEMENT

A. Masonry Joint Reinforcement, General: ASTM A 951.
   1. Interior Walls: Hot-dip galvanized, carbon steel.
   2. Exterior Walls: Hot-dip galvanized, steel.
   6. Spacing of Cross Rods, Tabs, and Cross Ties: Not more than 16 inches o.c.
   7. Provide in lengths of not less than 10 feet.
   8. At corners, use 16 gauge, hot dipped wire push ties, 16” from corner.

2.06 TIES AND ANCHORS

A. Materials: Provide ties and anchors as specified:
   2. Stainless-Steel Wire: ASTM A 580, Type 304.

2.07 MORTAR AND GROUT MIXES

A. General: Do not use admixtures, including pigments, air-entraining agents, accelerators, retarders, water-repellent agents, antifreeze compounds, or other admixtures, unless otherwise indicated.
   1. Do not use calcium chloride in mortar or grout.
   2. Limit cementitious materials in mortar to portland cement and lime.

B. Preblended, Dry Mortar Mix: Furnish dry mortar ingredients in form of a preblended mix. Measure quantities by weight to ensure accurate proportions, and thoroughly blend ingredients before delivering to Project site.

C. Mortar for Unit Masonry: Comply with ASTM C 270 Property Specification. Provide the following types of mortar for applications stated unless another type is indicated or needed to provide required compressive strength of masonry.
   1. For masonry below grade or in contact with earth, use Type S.
   2. For reinforced masonry, use Type S.
   3. For exterior, above-grade, load-bearing and non-load-bearing walls and parapet walls; for interior load-bearing walls; for interior non-load-bearing partitions; and for other applications where another type is not indicated, use Type S.
   4. For interior non-load-bearing partitions Type N.

D. Grout for Unit Masonry: Comply with ASTM C 476
   1. Use grout of type indicated or, if not otherwise indicated, of type (fine or coarse) that will comply with Table 1.15.1 in ACI 530.1/ASCE 6/TMS 602 for dimensions of grout spaces and pour height.
   2. Provide grout with a slump of 8 to 11 inches as measured according to ASTM C 143.

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 work.
   1. Verify that foundations are within tolerances specified.
   2. Verify that reinforcing dowels are properly placed.

B. Before installation, examine rough-in and built-in construction for piping systems to verify actual locations of piping connections.

C. Proceed with installation only after unsatisfactory conditions have been corrected.
3.02 INSTALLATION, GENERAL
   A. Thickness: Build cavity and composite walls and other masonry construction to full thickness shown. Build single-wythe walls to actual widths of masonry units, using units of widths indicated.
   B. Build chases and recesses to accommodate items specified in this and other Sections.
   C. Leave openings for equipment to be installed before completing masonry. After installing equipment, complete masonry to match the construction immediately adjacent to opening.
   D. Use full-size units without cutting if possible. If cutting is required to provide a continuous pattern or to fit adjoining construction, cut units with motor-driven saws; provide clean, sharp, unchipped edges. Allow units to dry before laying unless wetting of units is specified. Install cut units with cut surfaces and, where possible, cut edges concealed.
   E. Select and arrange units for exposed unit masonry to produce a uniform blend of colors and textures.
      1. Mix units from several pallets or cubes as they are placed.
   F. Wetting of Brick: Wet brick before laying if initial rate of absorption exceeds 30 g/30 sq. in. per minute when tested per ASTM C 67. Allow units to absorb water so they are damp but not wet at time of laying.

3.03 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. Stopping and Resuming Work: Stop work by raking 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.
   C. Built-in Work: As construction progresses, build in items specified in this and other Sections shall be installed by Trades furnishing materials. Fill in solidly with masonry around built-in items.
   D. Fill space between steel frames and masonry solidly with mortar, unless otherwise indicated.
   E. 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.
   F. Fill cores in hollow concrete masonry units with grout 24 inches under bearing plates, beams, lintels, posts, and similar items, unless otherwise indicated.
   G. Build non-load-bearing interior partitions full height of story to underside of solid floor or roof structure above, unless otherwise indicated.
      1. Install compressible filler in joint between top of partition and underside of structure above.
      2. Wedge non-load-bearing partitions against structure above with small pieces of tile, slate, or metal. Fill joint with mortar after dead-load deflection of structure above approaches final position.
      3. At fire-rated partitions, treat joint between top of partition and underside of structure above to comply with Division 7 Section "Fire-Resistive Joint Systems." To be installed by trade providing material.
   H. Bond breakers: Locate where masonry wall meets concrete floor or roof construction. Note where fire separation is required.

3.04 MORTAR BEDDING AND JOINTING
   A. Lay hollow brick and concrete masonry units as follows:
      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.
3. With webs fully bedded in mortar in grouted masonry, including starting course on footings.
4. With entire units, including areas under cells, fully bedded in mortar at starting course on footings where cells are not grouted.

B. Lay solid masonry units with completely filled bed and head joints; butter ends with sufficient mortar to fill head joints and shove into place. Do not deeply furrow bed joints or slush head joints.

3.05 LINTELS
A. Install steel lintels where indicated.
B. Provide 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. Provide minimum bearing of 8 inches at each jamb, unless otherwise indicated.
D. Inset leg of steel lintel to allow for tool joint at bearing location.

3.06 REINFORCED UNIT MASONRY INSTALLATION
A. Temporary Formwork and Shores: Construct formwork and shores as needed to support reinforced masonry elements during construction.
   1. Construct formwork to provide shape, line, and dimensions of completed masonry as indicated. Make forms sufficiently tight to prevent leakage of mortar and grout. Brace, tie, and support forms to maintain position and shape during construction and curing of reinforced masonry.
   2. Do not remove forms and shores until reinforced masonry members have hardened sufficiently to carry their own weight and other temporary loads that may be placed on them during construction.
B. Placing Reinforcement: Comply with requirements in ACI 530.1/ASCE 6/TMS 602.
C. Grouting: Do not place grout until entire height of masonry to be grouted has attained enough strength to resist grout pressure.
   1. Comply with requirements in ACI 530.1/ASCE 6/TMS 602 for cleanouts and for grout placement, including minimum grout space and maximum pour height.
   2. Limit height of vertical grout pours to not more than 60 inches.

3.07 REPAIRING, POINTING, AND CLEANING
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, pointed to eliminate evidence of replacement.

END OF SECTION 04 20 00
SECTION 051200 - STRUCTURAL STEEL FRAMING

PART 1 - GENERAL
1.1 SUMMARY
   A. Section Includes:
      1. Structural steel.
      2. Grout.
1.2 DEFINITIONS
   A. Structural Steel: Elements of the structural frame indicated on Drawings and as described in
      AISC 303, "Code of Standard Practice for Steel Buildings and Bridges."
1.3 PREINSTALLATION MEETINGS
   A. Preinstallation Conference: Conduct conference at Project site
1.4 ACTION SUBMITTALS
   A. Product Data: For each type of product.
   B. Shop Drawings: Show fabrication of structural-steel components.
1.5 INFORMATIONAL SUBMITTALS
   A. Qualification Data: For Installer and fabricator.
   B. Welding certificates.
   C. Mill test reports for structural steel, including chemical and physical properties.
   D. Source quality-control reports.
   E. Field quality-control and special inspection reports.
1.6 QUALITY ASSURANCE
   A. Fabricator Qualifications: A qualified fabricator that participates in the AISC Quality Certification
      Program and is designated an AISC-Certified Plant, Category STD.
   B. Installer Qualifications: A qualified installer who participates in the AISC Quality Certification
      Program and is designated an AISC-Certified Erector, Category CSE.
   C. Welding Qualifications: Qualify procedures and personnel according to AWS D1.1/D1.1M,
      "Structural Welding Code - Steel."
   D. Comply with applicable provisions of the following specifications and documents:
      1. AISC 303.
      2. AISC 360.
      3. RCSC's "Specification for Structural Joints Using ASTM A 325 or A 490 Bolts."

PART 2 - PRODUCTS
2.1 PERFORMANCE REQUIREMENTS
   A. Connections: Provide details of simple shear connections required by the Contract Documents
      to be selected or completed by structural-steel fabricator to withstand loads indicated and
      comply with other information and restrictions indicated.
      1. Select and complete connections using schematic details indicated and AISC 360.
      2. Use Allowable Stress Design; data are given at service-load level.
   B. Moment Connections: Type FR, fully restrained, UNO.
   C. Construction: Combined system of moment frame, braced frame, and shear walls.
2.2 STRUCTURAL-STEEL MATERIALS
   A. Recycled Content of Steel Products: Postconsumer recycled content plus one-half of
      preconsumer recycled content not less than 25 percent.
   B. W-Shapes: ASTM A 992/A 992M.
   C. Channels, Angles, M, S-Shapes: ASTM A 36/A 36M.
   D. Plate and Bar: ASTM A 36/A 36M, UNO.
   E. Cold-Formed Hollow Structural Sections: ASTM A 500/A 500M, Grade B, structural tubing.
   F. Steel Pipe: ASTM A 53/A 53M, Type E or Type S, Grade B.
   G. Welding Electrodes: Comply with AWS requirements.
2.3 BOLTS, CONNECTORS, AND ANCHORS
   A. High-Strength Bolts, Nuts, and Washers: ASTM A 325 (ASTM A 325M), Type 1, heavy-hex
      steel structural bolts; ASTM A 563, Grade C, (ASTM A 563M, Class 8S) heavy-hex carbon-steel
      nuts; and ASTM F 436 (ASTM F 436M), Type 1, hardened carbon-steel washers; all with plain
      finish.
      1. Direct-Tension Indicators: ASTM F 959, Type 325 (ASTM F 959M, Type 8.8),
         compressible-washer type with plain finish.
B. High-Strength Bolts, Nuts, and Washers: ASTM A 490 (ASTM A 490M), Type 1, heavy-hex steel structural bolts; ASTM A 563, Grade DH, (ASTM A 563M, Class 10S) heavy-hex carbon-steel nuts; and ASTM F 436 (ASTM F 436M), Type 1, hardened carbon-steel washers with plain finish.
   1. Direct-Tension Indicators: ASTM F 959, Type 490 (ASTM F 959M, Type 10.9), compressible-washer type with plain finish.

C. Zinc-Coated High-Strength Bolts, Nuts, and Washers: ASTM A 325 (ASTM A 325M), Type 1, heavy-hex steel structural bolts; ASTM A 563, Grade DH (ASTM A 563M, Class 10S) heavy-hex carbon-steel nuts; and ASTM F 436 (ASTM F 436M), Type 1, hardened carbon-steel washers.
   1. Finish: Hot-dip or mechanically deposited zinc coating.
   2. Direct-Tension Indicators: ASTM F 959, Type 325 (ASTM F 959M, Type 8.8), compressible-washer type with mechanically deposited zinc coating, baked epoxy-coated finish.

D. Tension-Control, High-Strength Bolt-Nut-Washer Assemblies: ASTM F 1852, Type 1, heavy-hex head assemblies consisting of steel structural bolts with splined ends, heavy-hex carbon-steel nuts, and hardened carbon-steel washers.
   1. Finish: Plain, UNO.

E. Shear Connectors: ASTM A 108, Grades 1015 through 1020, headed-stud type, cold-finished carbon steel; AWS D1.1/D1.1M, Type B.

F. Unheaded Anchor Rods: ASTM F 1554, Grade 36, UNO.

G. Threaded Rods: ASTM A 36/A 36M, UNO.


2.4 PRIMER
A. Low-Emitting Materials: Paints and coatings shall comply with the testing and product requirements of the California Department of Public Health's (formerly, the California Department of Health Services') "Standard Method for the Testing and Evaluation of Volatile Organic Chemical Emissions from Indoor Sources Using Environmental Chambers."

B. Primer: Comply with [Section 099113 "Exterior Painting" and Section 099123 "Interior Painting." ] [Section 099600 "High-Performance Coatings." ] [Section 099113 "Exterior Painting," Section 099123 "Interior Painting," and Section 099600 "High-Performance Coatings." ]

C. Primer: SSPC-Paint 25, [Type I] [Type II], zinc oxide, alkyd, linseed oil primer.

D. Primer: Fabricator's standard lead- and chromate-free, nonasphaltic, rust-inhibiting primer complying with MPI#79 and compatible with topcoat.

2.5 GROUT
A. Metallic, Shrinkage-Resistant Grout: ASTM C 1107/C 1107M, factory-packaged, metallic aggregate grout, mixed with water to consistency suitable for application and a 30-minute working time.

B. Nonmetallic, Shrinkage-Resistant Grout: ASTM C 1107/C 1107M, factory-packaged, nonmetallic aggregate grout, noncorrosive and nonstaining, mixed with water to consistency suitable for application and a 30-minute working time.

2.6 FABRICATION

B. Shear Connectors: Prepare steel surfaces as recommended by manufacturer of shear connectors. Use automatic end welding of headed-stud shear connectors according to AWS D1.1/D1.1M and manufacturer's written instructions.

2.7 SHOP CONNECTIONS
A. High-Strength Bolts: Shop install high-strength bolts according to RCSC’s "Specification for Structural Joints Using ASTM A 325 or A 490 Bolts" for type of bolt and type of joint specified.
   1. Joint Type: Snug tightened, UNO.
B. Weld Connections: Comply with AWS D1.1/D1.1M and AWS D1.8/D1.8M for tolerances, appearances, welding procedure specifications, weld quality, and methods used in correcting welding work.

2.8 SHOP PRIMING
A. Shop prime steel surfaces except the following:
   1. Surfaces embedded in concrete or mortar. Extend priming of partially embedded members to a depth of 2 inches (50 mm).
   2. Surfaces to be field welded.
   4. Surfaces to receive sprayed fire-resistive materials (applied fireproofing).
   5. Galvanized surfaces.

B. Surface Preparation: Clean surfaces to be painted. Remove loose rust and mill scale and spatter, slag, or flux deposits. Prepare surfaces according to the following specifications and standards:
   1. SSPC-SP 2, "Hand Tool Cleaning."
   2. SSPC-SP 3, "Power Tool Cleaning."
   3. SSPC-SP 7/NACE No. 4, "Brush-off Blast Cleaning."

C. Priming: Immediately after surface preparation, apply primer according to manufacturer's written instructions and at rate recommended by SSPC to provide a minimum dry film thickness of 1.5 mils (0.038 mm). Use priming methods that result in full coverage of joints, corners, edges, and exposed surfaces.

2.9 SOURCE QUALITY CONTROL
A. Testing Agency: Owner will engage a qualified testing agency to perform shop tests and inspections.
   1. Provide testing agency with access to places where structural-steel work is being fabricated or produced to perform tests and inspections.

B. Bolted Connections: Inspect and test shop-bolted connections according to RCSC's "Specification for Structural Joints Using ASTM A 325 or A 490 Bolts."

C. Welded Connections: Visually inspect shop-welded connections according to AWS D1.1/D1.1M and the following inspection procedures, at testing agency's option:
   1. Liquid Penetrant Inspection: ASTM E 165.
   2. Magnetic Particle Inspection: ASTM E 709; performed on root pass and on finished weld. Cracks or zones of incomplete fusion or penetration are not accepted.
   4. Radiographic Inspection: ASTM E 94.

D. Prepare test and inspection reports.

PART 3 - EXECUTION
3.1 EXAMINATION
A. Verify, with certified steel erector present, elevations of concrete- and masonry-bearing surfaces and locations of anchor rods, bearing plates, and other embedments for compliance with requirements.

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

3.2 ERECTION
A. Set structural steel accurately in locations and to elevations indicated and according to AISC 303 and AISC 360.

B. Baseplates Bearing Plates and Leveling Plates (as required by contractor or shown):
   1. Set plates for structural members on wedges, shims, or setting nuts as required.
   2. Weld plate washers to top of baseplate.
   3. Snug-tighten anchor rods after supported members have been positioned and plumbed. Do not remove wedges or shims but, if protruding, cut off flush with edge of plate before packing with grout.
4. Promptly pack grout solidly between bearing surfaces and plates so no voids remain. Neatly finish exposed surfaces; protect grout and allow to cure. Comply with manufacturer's written installation instructions for shrinkage-resistant grouts.

C. Maintain erection tolerances of structural steel within AISC 303, "Code of Standard Practice for Steel Buildings and Bridges."

3.3 FIELD CONNECTIONS

A. High-Strength Bolts: Install high-strength bolts according to RCSC's "Specification for Structural Joints Using ASTM A 325 or A 490 Bolts" for type of bolt and type of joint specified.
   1. Joint Type: Snug tightened, UNO.

B. Weld Connections: Comply with AWS D1.1/D1.1M and AWS D1.8/D1.8M for tolerances, appearances, welding procedure specifications, weld quality, and methods used in correcting welding work.
   1. Comply with AISC 303 and AISC 360 for bearing, alignment, adequacy of temporary connections, and removal of paint on surfaces adjacent to field welds.
   2. Remove backing bars or runoff tabs where indicated, back gouge, and grind steel smooth.

3.4 FIELD QUALITY CONTROL

A. Special Inspections: Owner will engage a qualified special inspector to perform the following special inspections:
   1. Verify structural-steel materials and inspect steel frame joint details.
   2. Verify weld materials and inspect welds.
   3. Verify connection materials and inspect high-strength bolted connections.

B. Testing Agency: Owner will engage a qualified testing agency to perform tests and inspections.

C. Bolted Connections: Inspect and test bolted connections according to RCSC's "Specification for Structural Joints Using ASTM A 325 or A 490 Bolts."

D. Welded Connections: Visually inspect field welds according to AWS D1.1/D1.1M.
   1. In addition to visual inspection, test and inspect field welds according to AWS D1.1/D1.1M and the following inspection procedures, at testing agency's option:
      a. Liquid Penetrant Inspection: ASTM E 165.
      b. Magnetic Particle Inspection: ASTM E 709; performed on root pass and on finished weld. Cracks or zones of incomplete fusion or penetration are not accepted.
      c. Ultrasonic Inspection: ASTM E 164.
      d. Radiographic Inspection: ASTM E 94.

END OF SECTION 05 12 00
SECTION 05 31 00 - STEEL DECKING

PART 1 - GENERAL

1.1 SUMMARY
A. Section Includes:
   1. Roof deck.
   2. Composite floor deck.

1.2 ACTION SUBMITTALS
A. Product Data: For each type of deck, accessory, and product indicated.
B. Shop Drawings:
   1. Include layout and types of deck panels, anchorage details, reinforcing channels, pans, cut deck openings, special jointing, accessories, and attachments to other construction.

1.3 INFORMATIONAL SUBMITTALS
A. Welding certificates.
B. Product certificates.
C. Evaluation reports.
D. Field quality-control reports.

1.4 QUALITY ASSURANCE
A. Testing Agency Qualifications: Qualified according to ASTM E 329 for testing indicated.
B. Welding Qualifications: Qualify procedures and personnel according to AWS D1.3, "Structural Welding Code - Sheet Steel."

1.5 DELIVERY, STORAGE, AND HANDLING
A. Protect steel deck from corrosion, deformation, and other damage during delivery, storage, and handling.
B. Stack steel deck on platforms or pallets and slope to provide drainage. Protect with a waterproof covering and ventilate to avoid condensation.

PART 2 - PRODUCTS

2.1 PERFORMANCE REQUIREMENTS
A. AISI Specifications: Comply with calculated structural characteristics of steel deck according to AISI's "North American Specification for the Design of Cold-Formed Steel Structural Members."
B. Recycled Content of Steel Products: Postconsumer recycled content plus one-half of preconsumer recycled content not less than 25 percent.
C. Low-Emitting Materials: Paints and coatings shall comply with the testing and product requirements of the California Department of Health Services' "Standard Practice for the Testing of Volatile Organic Emissions from Various Sources Using Small-Scale Environmental Chambers."

2.2 ROOF DECK
A. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following:
   1. ASC Profiles, Inc.; a Blue Scope Steel company.
   2. Canam United States; Canam Group Inc.
   3. CMC Joist & Deck.
   5. Epic Metals Corporation.
   6. Marlyn Steel Decks, Inc.
   7. New Millennium Building Systems, LLC.
   9. Roof Deck, Inc.
   10. Valley Joist; Subsidiary of EBSCO Industries, Inc.
   11. Verco Manufacturing Co.
   12. Wheeling Corrugating Company; Div. of Wheeling-Pittsburgh Steel Corporation.

B. Roof Deck: Fabricate panels, without top-flange stiffening grooves, to comply with "SDI Specifications and Commentary for Steel Roof Deck," in SDI Publication No. 31, and with the following:
1. Prime-Painted Steel Sheet: ASTM A 1008/A 1008M, Structural Steel (SS), Grade 33 (230) minimum, shop primed with manufacturer's standard baked-on, rust-inhibitive primer.
   a. Color: gray or as indicated
2. Galvanized-Steel Sheet: ASTM A 653/A 653M, Structural Steel (SS), Grade 33 (230) G60 (Z180) zinc coating, UNO.
3. Galvanized and Shop-Primed Steel Sheet: ASTM A 653/A 653M, Structural Steel (SS), Grade 33 (230) G60 (Z180) zinc coating; cleaned, pretreated, and primed with manufacturer's standard baked-on, rust-inhibitive primer.
   a. Color: Gray or as indicated.
4. Deck Profile: As indicated.
5. Profile Depth: As indicated
6. Design Uncoated-Steel Thickness: As indicated, 22 gauge minimum.

2.3 COMPOSITE FLOOR DECK
A. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following:
   1. ASC Profiles, Inc.; a Blue Scope Steel company.
   2. Canam United States; Canam Group Inc.
   3. CMC Joist & Deck.
   5. Epic Metals Corporation.
   6. Marlyn Steel Decks, Inc.
   7. New Millennium Building Systems, LLC.
   9. Roof Deck, Inc.
   10. Verco Manufacturing Co.
   11. Wheeling Corrugating Company; Div. of Wheeling-Pittsburgh Steel Corporation.
B. Composite Floor Deck: Fabricate panels, with integrally embossed or raised pattern ribs and interlocking side laps, to comply with "SDI Specifications and Commentary for Composite Steel Floor Deck," in SDI Publication No. 31, with the minimum section properties indicated, and with the following:
   1. Prime-Painted Steel Sheet: ASTM A 1008/A 1008M, Structural Steel (SS), Grade 33 (230) minimum, with top surface phosphatized and unpainted and underside surface shop primed with manufacturers' standard gray baked-on, rust-inhibitive primer.
   2. Galvanized-Steel Sheet: ASTM A 653/A 653M, Structural Steel (SS), Grade 33 (230), G60 (Z180) zinc coating.
   3. Galvanized and Shop-Primed Steel Sheet: ASTM A 653/A 653M, Structural Steel (SS), Grade 33 (230), G60 (Z180) zinc coating; with unpainted top surface and cleaned and pretreated bottom surface primed with manufacturer's standard gray baked-on, rust-inhibitive primer.
   4. Profile Depth: As indicated.
   5. Design Uncoated-Steel Thickness: 22 gauge minimum.

2.4 ACCESSORIES
A. General: Provide manufacturer's standard accessory materials for deck that comply with requirements indicated.
B. Mechanical Fasteners: Corrosion-resistant, low-velocity, power-actuated or pneumatically driven carbon-steel fasteners; or self-drilling, self-threading screws.
C. Side-Lap Fasteners: Corrosion-resistant, hexagonal washer head; self-drilling, carbon-steel screws, No. 10 (4.8-mm) minimum diameter.
D. Flexible Closure Strips: Vulcanized, closed-cell, synthetic rubber.
E. Miscellaneous Sheet Metal Deck Accessories: Steel sheet; minimum yield strength of 33,000 psi (230 MPa), not less than 0.0359-inch (0.91-mm) design uncoated thickness, of same material and finish as deck; of profile indicated or required for application.
F. Flat Sump Plates: Single-piece steel sheet, 0.0747 inch (1.90 mm) thick, of same material and finish as deck. For drains, cut holes in the field.
G. Galvanizing Repair Paint: [ASTM A 780] [SSPC-Paint 20 or MIL-P-21035B, with dry film containing a minimum of 94 percent zinc dust by weight].
H. Repair Paint: Manufacturer's standard rust-inhibitive primer of same color as primer.

PART 3 - EXECUTION

3.1 INSTALLATION, GENERAL
A. Install deck panels and accessories according to applicable specifications and commentary in SDI Publication No. 31, manufacturer's written instructions, and requirements in this Section.
B. Place deck panels on supporting frame and adjust to final position with ends accurately aligned and bearing on supporting frame before being permanently fastened. Do not stretch or contract side-lap interlocks.
C. Place deck panels flat and square and fasten to supporting frame without warp or deflection.
D. Cut and neatly fit deck panels and accessories around openings and other work projecting through or adjacent to deck.
E. Provide additional reinforcement and closure pieces at openings as required for strength, continuity of deck, and support of other work.
F. Comply with AWS requirements and procedures for manual shielded metal arc welding, appearance and quality of welds, and methods used for correcting welding work.
G. Mechanical fasteners may be used in lieu of welding to fasten deck. Locate mechanical fasteners and install according to deck manufacturer's written instructions.
H. Roof Sump Pans and Sump Plates: Install over openings provided in roof deck and weld or mechanically fasten flanges to top of deck. Space welds or mechanical fasteners not more than 12 inches (305 mm) apart with at least one weld or fastener at each corner.
  1. Install reinforcing channels or zees in ribs to span between supports and weld or mechanically fasten.
I. Miscellaneous Roof-Deck Accessories: Install ridge and valley plates, finish strips, end closures, and reinforcing channels according to deck manufacturer's written instructions. Weld or mechanically fasten to substrate to provide a complete deck installation.
  1. Weld cover plates at changes in direction of roof-deck panels unless otherwise indicated.
J. Pour Stops and Girder Fillers: Weld steel-sheet pour stops and girder fillers to supporting structure according to SDI recommendations unless otherwise indicated.
K. Floor-Deck Closures: Weld steel-sheet column closures, cell closures, and Z-closures to deck, according to SDI recommendations, to provide tight-fitting closures at open ends of ribs and sides of deck.

3.2 FIELD QUALITY CONTROL
A. Testing Agency: Owner will engage a qualified testing agency to perform tests and inspections.
B. Testing agency will report inspection results promptly and in writing to Contractor and Architect.
C. Remove and replace work that does not comply with specified requirements.
D. Additional inspecting, at Contractor's expense, will be performed to determine compliance of corrected work with specified requirements.

3.3 PROTECTION
A. Galvanizing Repairs: Prepare and repair damaged galvanized coatings on both surfaces of deck with galvanized repair paint according to ASTM A 780 and manufacturer's written instructions.
B. Repair Painting: Wire brush and clean rust spots, welds, and abraded areas on both surfaces of prime-painted deck immediately after installation, and apply repair paint.

END OF SECTION 05 31 00
PART 1 - GENERAL

1.1 SUMMARY
A. Section Includes:
   1. Load-bearing wall framing.
   2. Exterior non-load-bearing wall framing.

1.2 ACTION SUBMITTALS
A. Product Data: For each type of cold-formed steel framing product and accessory.
B. Shop Drawings:
   1. Include layout, spacings, sizes, thicknesses, and types of cold-formed steel framing; fabrication; and fastening and anchorage details, including mechanical fasteners.
   2. Indicate reinforcing channels, opening framing, supplemental framing, strapping, bracing, bridging, splices, accessories, connection details, and attachment to adjoining work.

1.3 INFORMATIONAL SUBMITTALS
A. Qualification Data: For testing agency.
B. Welding certificates.
C. Product test reports.
D. Research reports.

1.4 QUALITY ASSURANCE
A. Product Tests: Mill certificates or data from a qualified independent testing agency.
C. Comply with AISI S230 "Standard for Cold-Formed Steel Framing - Prescriptive Method for One and Two Family Dwellings."

PART 2 - PRODUCTS

2.1 MANUFACTURERS
A. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following:
   1. AllSteel & Gypsum Products, Inc.
   2. California Expanded Metal Products Company.
   3. ClarkWestern Building Systems, Inc.
   4. Consolidated Fabricators Corp.; Building Products Division.
   5. Craco Mfg., Inc.
   6. Custom Stud Inc.
   7. Dietrich Metal Framing; a Worthington Industries company.
   8. Formetal Co. Inc. (The).
   9. MarinoWARE.
   10. MBA Building Supplies, Inc.
   11. Nuconsteel; a Nucor Company.
   12. Olmar Supply, Inc.
   13. Quail Run Building Materials, Inc.
   14. SCAFCO Corporation.
   15. Southeastern Stud & Components, Inc.
   16. State Building Products, Inc.
   19. Steel Structural Systems.
   20. Steeler, Inc.
   22. Telling Industries, LLC.
   23. United Metal Products, Inc.
   24. United Steel Manufacturing.

2.2 PERFORMANCE REQUIREMENTS
A. AISI Specifications and Standards: Unless more stringent requirements are indicated, comply with AISI S100 and AISI S200.
B. Fire-Resistance Ratings: Comply with ASTM E 119; testing by a qualified testing agency.
1. Indicate design designations from UL’s “Fire Resistance Directory” or from the listings of another qualified testing agency.

2.3 COLD-FORMED STEEL FRAMING, GENERAL
A. Recycled Content of Steel Products: Postconsumer recycled content plus one-half of preconsumer recycled content not less than 25 percent.
B. Steel Sheet: ASTM A 1003/A 1003M, Structural Grade, Type H, metallic coated, of grade and coating weight as follows:
   1. Grade: 33 ksi, UNO
   2. Coating: G60 (Z180), A60 (ZF180), AZ50 (AZ150), or GF30 (ZGF90).
C. Steel Sheet for Vertical Deflection Clips: ASTM A 653/A 653M, structural steel, zinc coated, of grade and coating as follows:
   1. Grade: 33 (230), minimum.
   2. Coating: G60 (Z180).

2.4 LOAD-BEARING WALL FRAMING
A. Steel Studs: Manufacturer's standard C-shaped steel studs, of web depths indicated, punched, with stiffened flanges, and as follows:
   1. Minimum Base-Metal Thickness: 18 gauge, UNO
   2. Flange Width: 1.625 in, UNO
   3. Section Properties: as indicated
B. Steel Track: Manufacturer's standard U-shaped steel track, of web depths indicated, unpunched, with straight flanges, and matching minimum base-metal thickness of steel studs.
C. Steel Box or Back-to-Back Headers: Manufacturer's standard C-shapes used to form header beams, of web depths indicated, unpunched, with stiffened flanges, and as follows:
   1. Minimum Base-Metal Thickness: 18 gauge, UNO
   2. Flange Width: 1.625 in, UNO
   3. Section Properties: as indicated

2.5 EXTERIOR NON-LOAD-BEARING WALL FRAMING
A. Steel Studs: Manufacturer's standard C-shaped steel studs, of web depths indicated, punched, with stiffened flanges, and as follows:
   1. Minimum Base-Metal Thickness: 18 gauge, UNO
   2. Flange Width: 1.625 in, UNO
   3. Section Properties: as indicated
B. Steel Track: Manufacturer's standard U-shaped steel track, of web depths indicated, unpunched, with unstiffened flanges, and matching minimum base-metal thickness of steel studs.
C. Vertical Deflection Clips: Manufacturer's standard bypass clips, capable of accommodating upward and downward vertical displacement of primary structure through positive mechanical attachment to stud web.
   1. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following:
      a. AllSteel & Gypsum Products, Inc.
      b. ClarkWestern Building Systems, Inc.
      c. Dietrich Metal Framing; a Worthington Industries company.
      d. MarinoWARE.
      e. SCAFCO Corporation.
      f. Steel Network, Inc. (The).
      g. Steeler, Inc.
D. Single Deflection Track: Manufacturer's single, deep-leg, U-shaped steel track; unpunched, with unstiffened flanges, of web depth to contain studs while allowing free vertical movement, with flanges designed to support horizontal loads and transfer them to the primary structure.
E. Double Deflection Tracks: Manufacturer's double, deep-leg, U-shaped steel tracks, consisting of nested inner and outer tracks; unpunched, with unstiffened flanges.
F. Drift Clips: Manufacturer's standard bypass or head clips, capable of isolating wall stud from upward and downward vertical displacement and lateral drift of primary structure through positive mechanical attachment to stud web and structure.
2.6 **FRAMING ACCESSORIES**  
A. Fabricate steel-framing accessories from steel sheet, ASTM A 1003/A 1003M, Structural Grade, Type H, metallic coated, of same grade and coating weight used for framing members.  
B. Provide accessories of manufacturer's standard thickness and configuration.  

2.7 **ANCHORS, CLIPS, AND FASTENERS**  
A. Steel Shapes and Clips: ASTM A 36/A 36M, zinc coated by hot-dip process according to ASTM A 123/A 123M.  
B. Anchor Bolts: ASTM F 1554, Grade 36, threaded carbon-steel hex-headed bolts and carbon-steel nuts; and flat, hardened-steel washers; zinc coated by hot-dip process according to ASTM A 153/A 153M, Class C  
C. Retain "Expansion Anchors" Paragraph below if expansion anchors are acceptable. Verify safety factor with Project's structural engineer. Revise as required or insert specific load requirements and names of acceptable products.  
D. Expansion Anchors: Fabricated from corrosion-resistant materials, with allowable load or strength design capacities calculated according to ICC-ES AC193 and ACI 318 greater than or equal to the design load, as determined by testing per ASTM E 488 conducted by a qualified testing agency.  
E. Power-Actuated Anchors: Fastener system of type suitable for application indicated, fabricated from corrosion-resistant materials, with allowable load capacities calculated according to ICC-ES AC70, greater than or equal to the design load, as determined by testing per ASTM E 1190 conducted by a qualified testing agency.  
F. Mechanical Fasteners: ASTM C 1513, corrosion-resistant-coated, self-drilling, self-tapping, steel drill screws.  

1. **Head Type**: Low-profile head beneath sheathing, manufacturer's standard elsewhere.  

2.8 **MISCELLANEOUS MATERIALS**  
A. Galvanizing Repair Paint: ASTM A 780.  
B. Cement Grout: Portland cement, ASTM C 150, Type I; and clean, natural sand, ASTM C 404. Mix at ratio of 1 part cement to 2-1/2 parts sand, by volume, with minimum water required for placement and hydration.  
C. Nonmetallic, Nonshrink Grout: Premixed, nonmetallic, noncorrosive, nonstaining grout containing selected silica sands, portland cement, shrinkage-compensating agents, and plasticizing and water-reducing agents, complying with ASTM C 1107/C 1107M, with fluid consistency and 30-minute working time.  
D. Shims: Load bearing, high-density multimonomer plastic, and nonleaching; or of cold-formed steel of same grade and coating as framing members supported by shims.  
E. Sealer Gaskets: Closed-cell neoprene foam, 1/4 inch (6.4 mm) thick, selected from manufacturer's standard widths to match width of bottom track or rim track members.  

**PART 3 - EXECUTION**  

3.1 **PREPARATION**  
A. Install load bearing shims or grout between the underside of load-bearing wall bottom track and the top of foundation wall or slab at locations with a gap larger than 1/4 inch (6 mm) to ensure a uniform bearing surface on supporting concrete or masonry construction.  
B. Install sealer gaskets at the underside of wall bottom track or rim track and at the top of foundation wall or slab at stud or joist locations.  

3.2 **INSTALLATION, GENERAL**  
A. Cold-formed steel framing may be shop or field fabricated for installation, or it may be field assembled.  
B. Install cold-formed steel framing according to AISI S200 and to manufacturer's written instructions unless more stringent requirements are indicated.  
C. Install cold-formed steel framing and accessories plumb, square, and true to line, and with connections securely fastened.  
D. Install framing members in one-piece lengths.  
E. Install temporary bracing and supports to secure framing and support loads comparable in intensity to those for which structure was designed. Maintain braces and supports in place, undisturbed, until entire integrated supporting structure has been completed and permanent connections to framing are secured.
F. Do not bridge building expansion joints with cold-formed steel framing. Independently frame both sides of joints.

G. Install insulation, specified in Section 072100 "Thermal Insulation," in built-up exterior framing members, such as headers, sills, boxed joists, and multiple studs at openings, that are inaccessible on completion of framing work.

H. Fasten hole reinforcing plate over web penetrations that exceed size of manufacturer's approved or standard punched openings.

I. Erection Tolerances: Install cold-formed steel framing level, plumb, and true to line to a maximum allowable tolerance variation of 1/8 inch in 10 feet (1:960) and as follows:
   1. Space individual framing members no more than plus or minus 1/8 inch (3 mm) from plan location. Cumulative error shall not exceed minimum fastening requirements of sheathing or other finishing materials.

3.3 LOAD-BEARING WALL INSTALLATION

A. Install continuous top and bottom tracks sized to match studs. Align tracks accurately and securely anchor at corners and ends, and at spacings as follows:
   1. Anchor Spacing: as indicated, 32” maximum

B. Squarely seat studs against top and bottom tracks with gap not exceeding of 1/8 inch (3 mm) between the end of wall framing member and the web of track. Fasten both flanges of studs to top and bottom tracks. Space studs as follows:
   1. Stud Spacing: As indicated.

C. Set studs plumb, except as needed for diagonal bracing or required for non-plumb walls or warped surfaces and similar configurations.

D. Align studs vertically where floor framing interrupts wall-framing continuity. Where studs cannot be aligned, continuously reinforce track to transfer loads.

E. Align floor and roof framing over studs. Where framing cannot be aligned, continuously reinforce track to transfer loads.

F. Anchor studs abutting structural columns or walls, including masonry walls, to supporting structure as indicated.

G. Install headers over wall openings wider than stud spacing. Locate headers above openings as indicated. Fabricate headers of compound shapes indicated or required to transfer load to supporting studs, complete with clip-angle connectors, web stiffeners, or gusset plates.
   1. Frame wall openings with not less than a double stud at each jamb of frame as indicated on Shop Drawings. Fasten jamb members together to uniformly distribute loads.
   2. Install runner tracks and jack studs above and below wall openings. Anchor tracks to jamb studs with clip angles or by welding, and space jack studs same as full-height wall studs.

H. Install supplementary framing, blocking, and bracing in stud framing indicated to support fixtures, equipment, services, casework, heavy trim, furnishings, and similar work requiring attachment to framing.
   1. If type of supplementary support is not indicated, comply with stud manufacturer's written recommendations and industry standards in each case, considering weight or load resulting from item supported.

I. Install horizontal bridging in stud system, spaced vertically as indicated on shop drawings (6'-0" maximum). Fasten at each stud intersection.
   1. Bridging: Cold-rolled steel channel, welded or mechanically fastened to webs of punched studs with a minimum of two screws into each flange of the clip angle for framing members up to 6 inches (150 mm) deep.
   2. Bridging: Combination of flat, taut, steel sheet straps of width and thickness indicated and stud-track solid blocking of width and thickness to match studs. Fasten flat straps to stud flanges and secure solid blocking to stud webs or flanges.
   3. Bridging: Proprietary bridging bars installed according to manufacturer's written instructions.

J. Install steel sheet diagonal bracing straps to both stud flanges, terminate at and fasten to reinforced top and bottom tracks. Fasten clip-angle connectors to multiple studs at ends of bracing and anchor to structure.
K. Install miscellaneous framing and connections, including supplementary framing, web stiffeners, clip angles, continuous angles, anchors, and fasteners, to provide a complete and stable wall-framing system.

3.4 EXTERIOR NON-LOAD-BEARING WALL INSTALLATION

A. Install continuous tracks sized to match studs. Align tracks accurately and securely anchor to supporting structure as indicated.
B. Fasten both flanges of studs to top and bottom track unless otherwise indicated. Space studs as follows:
   1. Stud Spacing: as indicated, 16” maximum
C. Set studs plumb, except as needed for diagonal bracing or required for non-plumb walls or warped surfaces and similar requirements.
D. Isolate non-load-bearing steel framing from building structure to prevent transfer of vertical loads while providing lateral support.
   1. Install single deep-leg deflection tracks and anchor to building structure.
   2. Install double deep-leg deflection tracks and anchor outer track to building structure.
   3. Connect vertical deflection clips to bypassing studs and anchor to building structure.
   4. Connect drift clips to cold-formed metal framing and anchor to building structure.
E. Install horizontal bridging in wall studs, spaced vertically in rows indicated on Shop Drawings but not more than 48 inches (1220 mm) apart. Fasten at each stud intersection.
   1. Top Bridging for Single Deflection Track: Install row of horizontal bridging within 12 inches of single deflection track. Install a combination of bridging and stud or stud-track solid blocking of width and thickness matching studs, secured to stud webs or flanges.
      a. Install solid blocking at centers indicated on Shop Drawings.
   2. Bridging: Cold-rolled steel channel, welded or mechanically fastened to webs of punched studs.
   3. Bridging: Combination of flat, taut, steel sheet straps of width and thickness indicated and stud-track solid blocking of width and thickness to match studs. Fasten flat straps to stud flanges and secure solid blocking to stud webs or flanges.
   4. Bridging: Proprietary bridging bars installed according to manufacturer’s written instructions.
F. Install miscellaneous framing and connections, including stud kickers, web stiffeners, clip angles, continuous angles, anchors, and fasteners, to provide a complete and stable wall-framing system.

3.5 FIELD QUALITY CONTROL

A. Testing: Owner will engage a qualified independent testing and inspecting agency to perform field tests and inspections and prepare test reports.
B. Field and shop welds will be subject to testing and inspecting.
C. Testing agency will report test results promptly and in writing to Contractor and Architect.
D. Remove and replace work where test results indicate that it does not comply with specified requirements.
E. Additional testing and inspecting, at Contractor’s expense, will be performed to determine compliance of replaced or additional work with specified requirements.

3.6 REPAIRS AND PROTECTION

A. Galvanizing Repairs: Prepare and repair damaged galvanized coatings on fabricated and installed cold-formed steel framing with galvanized repair paint according to ASTM A 780 and manufacturer’s written instructions.
B. Provide final protection and maintain conditions, in a manner acceptable to manufacturer and Installer that ensure that cold-formed steel framing is without damage or deterioration at time of Substantial Completion.

END OF SECTION 05 40 00
SECTION 054400 - COLD-FORMED METAL TRUSSES

PART 1 - GENERAL

1.1 SUMMARY
   A. Section includes cold-formed steel framing in the form of the following:
      1. Cold-formed steel trusses for roofs.
      2. Cold-formed steel trusses for floors.

1.2 PREINSTALLATION MEETINGS
   A. Preinstallation Conference: Conduct conference at project site.

1.3 ACTION SUBMITTALS
   A. Product Data: For each type of product.
   B. Shop Drawings:
      1. Include layout, spacings, sizes, thicknesses, and types of cold-formed steel trusses;
         fabrication; and fastening and anchorage details, including mechanical fasteners.
      2. Indicate reinforcing channels, opening framing, supplemental framing, strapping, bracing,
         bridging, splices, accessories, connection details, and attachment to adjoining work.
   C. Delegated-Design Submittal: For cold-formed steel trusses.

1.4 INFORMATIONAL SUBMITTALS
   A. Welding certificates.
   B. Product test reports.
   C. Evaluation Reports: For post-installed anchors and power-actuated fasteners, from ICC-ES or
      other qualified testing agency acceptable to authorities having jurisdiction.
   D. Field quality-control reports.

1.5 QUALITY ASSURANCE
   A. Testing Agency Qualifications: Qualified according to ASTM E 329 for testing indicated.
   B. Product Tests: Mill certificates or data from a qualified independent testing agency.
   C. Welding Qualifications: Qualify procedures and personnel according to the following:
      1. AWS D1.1/D1.1M, "Structural Welding Code - Steel."

PART 2 - PRODUCTS

2.1 MANUFACTURERS
   A. Manufacturer with a minimum of 7 years of similar experience.

2.2 PERFORMANCE REQUIREMENTS
   A. Delegated Design: Engage a qualified professional engineer, as defined in Section 014000
      "Quality Requirements," to design cold-formed steel trusses.
   B. Structural Performance: Provide cold-formed steel trusses capable of withstanding design loads
      within limits and under conditions indicated:
      1. Design Loads: As indicated on Drawings.
      2. Deflection Limits: Design trusses to withstand design loads without deflections greater
         than the following:
         a. Roof Trusses: Vertical deflection of 1/360 of the span.
      3. Design trusses to provide for movement of truss members located outside the insulated
         building envelope without damage or overstressing, sheathing failure, connection failure,
         undue strain on fasteners and anchors, or other detrimental effects when subject to a
         maximum ambient temperature change of 120 deg F.
   C. Cold-Formed Steel Truss Standards: Unless more stringent requirements are indicated, trusses
      shall comply with the following:
      2. Lateral Design: AISI S213.
   D. Fire-Resistance Ratings: Comply with ASTM E 119; testing by a qualified testing agency.
      Identify products with appropriate markings of applicable testing agency.

2.3 COLD-FORMED STEEL TRUSS MATERIALS
   A. Steel Sheet: ASTM A 1003/A 1003M, Structural Grade, Type H, metallic coated, of grade and
      coating designation as follows:
      1. Grade: As required by structural performance.
      2. Coating: G60.
2.4 ROOF TRUSSES
   A. Roof Truss Members: Manufacturer’s standard C-shaped steel sections.
      1. Connecting Flange Width: 1-5/8 inches, minimum at top and bottom chords connecting to sheathing or other directly fastened construction.

2.5 TRUSS ACCESSORIES
   A. Fabricate steel-truss accessories from steel sheet, ASTM A 1003/A 1003M, Structural Grade, Type H, metallic coated steel sheet, of same grade and coating designation used for truss members.
   B. Provide accessories of manufacturer's standard thickness and configuration unless otherwise indicated.

2.6 ANCHORS, CLIPS, AND FASTENERS
   A. Steel Shapes and Clips: ASTM A 36, zinc coated by hot-dip process according to ASTM A 123.
   B. Anchor Bolts: ASTM F 1554, Grade 36, threaded carbon-steel hex-headed bolts, carbon-steel nuts, and flat, hardened-steel washers; zinc coated by hot-dip process according to ASTM A 153, Class C.
   C. Post-Installed Anchors: Fastener systems with bolts of same basic metal as fastened metal, if visible, unless otherwise indicated; with working capacity greater than or equal to the design load, according to an evaluation report acceptable to authorities having jurisdiction.
      1. Uses: Securing cold-formed steel trusses to structure.
      2. Type: Torque-controlled expansion anchor or adhesive anchor.
      3. Material for Interior Locations: Carbon-steel components zinc plated to comply with ASTM B 633 or ASTM F 1941 unless otherwise indicated.
   D. Power-Actuated Fasteners: Fastener systems with working capacity greater than or equal to the design load, according to an evaluation report acceptable to authorities having jurisdiction.
   E. Mechanical Fasteners: ASTM C 1513, corrosion-resistant-coated, self-drilling, self-tapping steel drill screws.
      1. Head Type: Low-profile head beneath sheathing; manufacturer's standard elsewhere.

2.7 MISCELLANEOUS MATERIALS
   A. Galvanizing Repair Paint: ASTM A 780.
   B. Shims: Load-bearing, high-density multimonomer, non-leaching plastic; or cold-formed steel of same grade and metallic coating as truss members supported by shims.

PART 3 - EXECUTION

3.1 INSTALLATION
   A. Install bridging and brace cold-formed steel trusses according to AISI S200, AISI S202, AISI S214, and manufacturer's written instructions unless more stringent requirements are indicated.
      1. Coordinate with wall framing to align webs of bottom chords and load-bearing studs or continuously reinforce track to transfer loads to structure.
      2. Install continuous bridging and permanently brace trusses as indicated on Shop Drawings and designed according to CFSEI's Technical Note 551e, "Design Guide: Permanent Bracing of Cold-Formed Steel Trusses."
   B. Install cold-formed steel trusses and accessories true to line and location, and with connections securely fastened.
   C. Install temporary bracing and supports to secure trusses and support loads equal to those for which structure was designed. Maintain braces and supports in place, undisturbed, until entire integrated supporting structure has been completed and permanent connections to trusses are secured.
   D. Truss Spacing: As indicated on Drawings.

3.2 ERECTION TOLERANCES
   A. Install cold-formed steel trusses level, plumb, and true to line to a maximum allowable tolerance variation of 1/8 inch in 10 feet and as follows:
      1. Space individual trusses no more than plus or minus 1/8 inch from plan location.
      2. Cumulative error shall not exceed minimum fastening requirements of sheathing or other finishing materials.

3.3 FIELD QUALITY CONTROL
   A. Special Inspections: Owner will engage a qualified special inspector to perform inspections.
B. Testing Agency: Owner will engage a qualified testing agency to perform tests and inspections.
C. Cold-formed metal trusses will be considered defective if they do not pass tests and inspections.
D. Prepare test and inspection reports.

3.4 REPAIRS AND PROTECTION
A. Galvanizing Repairs: Prepare and repair damaged galvanized coatings on fabricated and installed cold-formed steel trusses with galvanized repair paint according to ASTM A 780 and manufacturer's written instructions.

END OF SECTION 054400
SECTION 05 50 00 - METAL FABRICATIONS

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Shop fabricated steel items.
   1. Fabricated items include the following:
      a. Metal ladders.
      b. Steel lintels.
      c. Bollards.
      d. Trash enclosure gates.
      e. Steel framing and supports for applications where framing and supports are not specified in other Sections.

1.02 REFERENCE STANDARDS

G. ASTM F3125/F3125M - Standard Specification for High Strength Structural Bolts, Steel and Alloy Steel, Heat Treated, 120 ksi (830 MPa) and 150 ksi (1040 MPa) Minimum Tensile Strength, Inch and Metric Dimensions; 2015a.
H. AWS A2.4 - Standard Symbols for Welding, Brazing, and Nondestructive Examination; 2012.

1.03 PERFORMANCE REQUIREMENTS

A. Design ladders, including comprehensive engineering analysis by a qualified professional engineer, using performance requirements and design criteria indicated.

1.04 SUBMITTALS

A. Shop Drawings: Indicate profiles, sizes, connection attachments, reinforcing, anchorage, size and type of fasteners, and accessories. Include erection drawings, elevations, and details where applicable.
   1. Indicate welded connections using standard AWS A2.4 welding symbols. Indicate net weld lengths.
B. Delegated-Design Submittal: For installed products indicated to comply with performance requirements and design criteria, including analysis data signed and sealed by the qualified professional engineer responsible for their preparation.
C. Welders’ Certificates: Submit certification for welders employed on the project, verifying AWS qualification within the previous 12 months.

1.05 COORDINATION

A. 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.

PART 2 PRODUCTS

2.01 MATERIALS - STEEL

A. Steel Sections: ASTM A 36/A 36M.
B. Steel Tubing: ASTM A501/A501M hot-formed structural tubing.
C. Plates: ASTM A283/A283M.
   1. Perforated plates shall have evenly spaced, clean perforations with smooth edges.
E. Bolts, Nuts, and Washers: ASTM F3125/F3125M, Type 1, plain.
F. Welding Materials: AWS D1.1/D1.1M; type required for materials being welded.
G. Touch-Up Primer for Galvanized Surfaces: SSPC-Paint 20, Type I - Inorganic, complying with VOC limitations of authorities having jurisdiction.

2.02 FABRICATION

A. Fit and shop assemble items in largest practical sections, for delivery to site.
B. Fabricate items with joints tightly fitted and secured.
C. Grind exposed joints flush and smooth with adjacent finish surface. Make exposed joints butt tight, flush, and hairline. Ease exposed edges to small uniform radius.
D. Supply components required for anchorage of fabrications. Fabricate anchors and related components of same material and finish as fabrication, except where specifically noted otherwise.

2.03 FABRICATED ITEMS

A. Ladders: Premanufactured Steel Ladders; in compliance with ANSI A14.3; with mounting brackets and attachments; powder coat finish.
   1. Side Rails: 1/4 x 2 x 2 inches members spaced at 16 inches unless otherwise indicated on drawings.
   2. Rungs: 3/4 inch corrugated steel round rungs spaced 12 inches on center.
   3. Space rungs 7 inches from wall surface.
   4. Provide nonslip surfaces on top of each rung by coating with abrasive material metallically bonded to rung.
   5. Provide mounting for wall mounting and floor mounting.
   6. Color: To be selected by Architect from manufacturer's full range of standard colors.
B. Bollards: Steel tube or pipe, concrete filled, crowned cap, or as otherwise detailed; galvanized finish.
   1. Bollard for mounting of ADA operator shall have welded steel plate cap.
C. Lintels: As detailed; galvanized finish.
D. Trash Enclosure Gates: As detailed; galvanized finish.
   1. Fabricate units from steel shapes, plates and bars of profiles shown with continuously welded joints and smooth exposed edges. Miter corners and use concealed field splices where possible. Provide pre-finished aluminum louver infill attached to gate frame with stainless steel fasteners.
   2. Provide weep holes where water may accumulate.
   3. Finish welded joints to comply with NOMMA's "Voluntary Joint Finish Standards" for Type 1 Welds: no evidence of welded joint.
   4. Hardware: As indicated on drawings.
   5. Louver Infill Panels: Pre-finished aluminum louver with flange frames, 0.063" thick type 6063-T5 extruded aluminum blades and frames.

E. Miscellaneous Steel Trim
   1. Unless otherwise indicated, fabricate units from steel shapes, plates, and bars of profiles shown with continuously welded joints and smooth exposed edges. Miter corners and use concealed field splices where possible.
   2. Galvanize miscellaneous steel trim.

F. Slotted Channel Framing: Fabricate channels and fittings from structural steel complying with the referenced standards; factory-applied, rust-inhibiting thermoset acrylic enamel finish.

2.04 FINISHES - STEEL
   A. Galvanize all steel items unless indicated to be prime painted.
   B. Prepare surfaces to be primed in accordance with SSPC-SP2.
   C. Clean surfaces of rust, scale, grease, and foreign matter prior to finishing.
   D. Prime Painting: One coat.
   E. Galvanizing: Galvanize after fabrication to ASTM A 123/A 123M requirements.

2.05 FABRICATION TOLERANCES
   A. Squareness: 1/8 inch maximum difference in diagonal measurements.
   B. Maximum Offset Between Faces: 1/16 inch.
   C. Maximum Misalignment of Adjacent Members: 1/16 inch.
   D. Maximum Bow: 1/8 inch in 48 inches.
   E. Maximum Deviation From Plane: 1/16 inch in 48 inches.

PART 3 EXECUTION

3.01 EXAMINATION
   A. Verify that field conditions are acceptable and are ready to receive work.

3.02 PREPARATION
   A. Clean and strip primed steel items to bare metal where site welding is required.

3.03 INSTALLATION
   A. Install items plumb and level, accurately fitted, free from distortion or defects.
   B. Provide for erection loads, and for sufficient temporary bracing to maintain true alignment until completion of erection and installation of permanent attachments.
   C. Anchor bollards in place with concrete footings, unless otherwise indicated. Center and align bollards in holes 3 inches above bottom of excavation. Place concrete and vibrate or tamp for consolidation. Support and brace bollards in position until concrete has cured.
   D. Perform field welding in accordance with AWS D1.1/D1.1M.
   E. Obtain approval prior to site cutting or making adjustments not scheduled.

3.04 TOLERANCES
   A. Maximum Variation From Plumb: 1/4 inch per story, non-cumulative.
   B. Maximum Offset From True Alignment: 1/4 inch.

END OF SECTION
SECTION 06 10 00 - ROUGH CARPENTRY

PART 1 GENERAL

1.01 SECTION INCLUDES
A. Sheathing.
B. Roofing nailers.
C. Fire retardant treated wood materials.
D. Communications and electrical room mounting boards.
E. Concealed wood blocking, nailers, and supports.
F. Miscellaneous wood nailers, furring, and grounds.

1.02 REFERENCE STANDARDS

1.03 SUBMITTALS
A. Product Data: Provide technical data on wood preservative materials and application instructions.
B. Manufacturer's Certificate: Certify that wood products supplied for rough carpentry meet or exceed specified requirements.

1.04 DELIVERY, STORAGE, AND HANDLING
A. General: Cover wood products to protect against moisture. Support stacked products to prevent deformation and to allow air circulation.
B. Fire Retardant Treated Wood: Prevent exposure to precipitation during shipping, storage, or installation.

1.05 MOCK-UP
A. Mockups: Provide materials and construct applicable portions of mockup as indicated on Section 01 45 40 Mock-Up Requirements.

PART 2 PRODUCTS

2.01 GENERAL REQUIREMENTS
A. Dimension Lumber: Comply with PS 20 and requirements of specified grading agencies.
   1. If no species is specified, provide any species graded by the agency specified; if no grading agency is specified, provide lumber graded by any grading agency meeting the specified requirements.
   2. Grading Agency: Any grading agency whose rules are approved by the Board of Review, American Lumber Standard Committee (www.alsc.org) and who provides grading service for the species and grade specified; provide lumber stamped with grade mark unless otherwise indicated.
B. Lumber fabricated from old growth timber is not permitted.

2.02 DIMENSION LUMBER FOR CONCEALED APPLICATIONS
A. Sizes: Nominal sizes as indicated on drawings, S4S.
B. Moisture Content: S-dry or MC19.

C. Miscellaneous Framing, Blocking, Nailers, Grounds, and Furring:
   1. Lumber: S4S, No. 2 or Standard Grade.
   2. Boards: Standard or No. 3.

2.03 CONSTRUCTION PANELS

A. Roof Sheathing, Nailable Insulation: Wood construction panel laminated to rigid insulation board.
   1. Construction Panel: 7/16 inch (11 mm) oriented strand board (OSB).
   2. Insulation Board: Polysiocyanurate foam plastic with cellulosic felt facer or glass fiber mat facer on major surface opposite construction panel. Provide additional layers of matching insulation board as required to meet thicknesses indicated on drawings.
   3. Finished Panel: Comply with ASTM C1289, Type V.
   4. Insulation Thickness: As indicated on drawings.
   5. Fasteners: Provide manufacturer's nailable insulation fasteners.
   6. Products:

B. Wall Sheathing: Oriented strand board wood structural panel; PS 2.
   1. Grade: Sheathing.
   2. Bond Classification: Exposure 1.
   3. Edges: Square.
   4. Exposure Time: Sheathing will not delaminate or require sanding due to moisture absorption from exposure to weather for up to 500 days.
   5. Provide fastening guide on top panel surface with separate markings indicating fastener spacing for 16 inches and 24 inches on center, respectively.

C. Telecom Backing Board:
   1. Line all walls from floor to 8' AFF (+96") with 0.75" fire retardant 3/4" AC plywood (A side visible after installation).
   2. Paint all walls with three coats of bright white paint from floor to ceiling. Each sheet of plywood will need one fire rating stamp masked off such that after painting this stamp is visible to the Authority Having Jurisdiction (AHJ).

2.04 ACCESSORIES

A. Fasteners and Anchors:

2.05 FACTORY WOOD TREATMENT

A. Treated Lumber and Plywood: Comply with requirements of AWPA U1 - Use Category System for wood treatments determined by use categories, expected service conditions, and specific applications.
   1. Fire-Retardant Treated Wood: Mark each piece of wood with producer's stamp indicating compliance with specified requirements.

B. Fire Retardant Treatment:
   1. Exterior Type: AWPA U1, Category UCFB, Commodity Specification H, chemically treated and pressure impregnated; capable of providing a maximum flame spread index of 25 when tested in accordance with ASTM E84, with no evidence of significant combustion when test is extended for an additional 20 minutes both before and after accelerated weathering test performed in accordance with ASTM D2898.
      a. Kiln dry wood after treatment to a maximum moisture content of 19 percent for lumber and 15 percent for plywood.
      b. Treat all exterior rough carpentry items.
      c. Do not use treated wood in direct contact with the ground.
2. Interior Type A: AWPA U1, Use Category UCFA, Commodity Specification H, low temperature (low hygroscopic) type, chemically treated and pressure impregnated; capable of providing a maximum flame spread index of 25 when tested in accordance with ASTM E84, with no evidence of significant combustion when test is extended for an additional 20 minutes.
   a. Kiln dry wood after treatment to a maximum moisture content of 19 percent for lumber and 15 percent for plywood.
   b. All interior rough carpentry items are to be fire retardant treated.
   c. Do not use treated wood in applications exposed to weather or where the wood may become wet.

PART 3 EXECUTION

3.01 PREPARATION
   A. Coordinate installation of rough carpentry members specified in other sections.

3.02 INSTALLATION - GENERAL
   A. Select material sizes to minimize waste.
   B. Reuse scrap to the greatest extent possible; clearly separate scrap for use on site as accessory components, including: shims, bracing, and blocking.
   C. Where treated wood is used on interior, provide temporary ventilation during and immediately after installation sufficient to remove indoor air contaminants.

3.03 BLOCKING, NAILERS, AND SUPPORTS
   A. Provide framing and blocking members as indicated or as required to support finishes, fixtures, specialty items, and trim.
   B. In walls, provide blocking attached to studs as backing and support for wall-mounted items, unless item can be securely fastened to two or more studs or other method of support is explicitly indicated.
   C. Provide the following specific non-structural framing and blocking:
      1. Cabinets and shelf supports.
      2. Wall brackets.
      3. Grab bars.
      5. Chalkboards and marker boards.
      6. Fire protection cabinets and extinguishers.

3.04 INSTALLATION OF CONSTRUCTION PANELS
   A. Subflooring/Underlayment Combination: Glue and nail to framing; staples are not permitted.
   B. Roof Sheathing: Secure panels with long dimension perpendicular to framing members, with ends staggered and over firm bearing.
      1. At long edges use sheathing clips where joints occur between roof framing members.
      2. Screw panels to framing; staples are not permitted.

3.05 TOLERANCES
   A. Framing Members: 1/4 inch from true position, maximum.
   B. Variation from Plane (Other than Floors): 1/4 inch in 10 feet maximum, and 1/4 inch in 30 feet maximum.

END OF SECTION
SECTION 06 20 00 - FINISH CARPENTRY

PART 1 GENERAL

1.01 SECTION INCLUDES
   A. Finish carpentry items.

1.02 REFERENCE STANDARDS
   A. AWI/AWMAC/WI (AWS) - Architectural Woodwork Standards; 2014.
   D. PS 1 - Structural Plywood; 2009.

1.03 QUALITY ASSURANCE
   A. Fabricator Qualifications: Company specializing in fabricating the products specified in this section with minimum five years of documented experience.

1.04 DELIVERY, STORAGE, AND HANDLING
   A. Protect work from moisture damage.

PART 2 PRODUCTS

2.01 FINISH CARPENTRY ITEMS
   A. Quality Standard: Custom Grade, in accordance with AWI/AWMAC/WI (AWS) or AWMAC/WI (NAAWS), unless noted otherwise.
   B. Interior Woodwork Items:
      1. Moldings, Bases, Casings, and Miscellaneous Trim: Species and cut as indicated on Drawing Sheet A601; prepare for transparent finish.
      2. Solid Wood Bench: Species and cut as indicated on Drawing Sheet A601; prepare for transparent finish.

2.02 WOOD-BASED COMPONENTS
   A. Wood fabricated from old growth timber is not permitted.

2.03 SHEET MATERIALS
   A. Softwood Plywood, Exposed to View: Face species and cuts as indicated, medium density fiberboard core; PS 1 Grade A-B, glue type as recommended for application.
   B. Hardwood Plywood: Face species and cut as indicated, medium density fiberboard core; HPVA HP-1, Front Face Grade AA, Back Face Grade 1, glue type as recommended for application.

2.04 FASTENINGS
   A. Fasteners: Of size and type to suit application.
   B. Adhesive for Wood Wall Panels: 100% polyurethane construction glue as recommended by panel manufacturer.

2.05 FABRICATION
   A. Shop assemble work for delivery to site, permitting passage through building openings.
   B. When necessary to cut and fit on site, provide materials with ample allowance for cutting. Provide trim for scribing and site cutting.

2.06 SHOP FINISHING
   A. Finish work in accordance with AWI/AWMAC/WI (AWS), Section 5 - Finishing for grade specified and as follows:
      1. Transparent:
         a. System - 5, Varnish, Conversion.
         b. Stain: As selected by Architect.
PART 3  EXECUTION

3.01  EXAMINATION
   A.  Verify adequacy of backing and support framing.

3.02  INSTALLATION
   A.  Install work in accordance with AWI/AWMAC/WI (AWS) requirements for grade indicated.
   B.  Install reclaimed stacked wood panels in accordance with manufacturer's installation instructions.
   C.  Set and secure materials and components in place, plumb and level.
   D.  Carefully scribe work abutting other components, with maximum gaps of 1/32 inch. Do not use additional overlay trim to conceal larger gaps.

3.03  TOLERANCES
   A.  Maximum Variation from True Position:  1/16 inch.
   B.  Maximum Offset from True Alignment with Abutting Materials:  1/32 inch.

END OF SECTION
SECTION 06 41 00 - ARCHITECTURAL WOOD CASEWORK

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Specially fabricated cabinets and casework.
B. Cabinet hardware.
C. Preparation for installing utilities.

1.02 RELATED REQUIREMENTS

A. Section 08 80 00 - Glazing: Glass for casework.
B. Section 12 36 00 - Countertops.

1.03 REFERENCE STANDARDS

A. AWI/AWMAC/WI (AWS) - Architectural Woodwork Standards; 2014.
B. BHMA A156.9 - American National Standard for Cabinet Hardware; 2010.
C. NEMA LD 3 - High-Pressure Decorative Laminates; 2005.

1.04 SUBMITTALS

A. Shop Drawings: Indicate materials, component profiles, fastening methods, jointing details, and accessories.
B. Product Data: Provide data for hardware accessories.
C. Samples: Submit actual samples of architectural cabinet construction, minimum 12 inches square, illustrating proposed cabinet, countertop, and shelf unit substrate and finish.
D. Samples: Submit actual sample items of proposed pulls, hinges, shelf standards, and locksets, demonstrating hardware design, quality, and finish.

1.05 QUALITY ASSURANCE

A. Quality Standards: Unless otherwise indicated, comply with AWI's "Architectural Woodwork Quality Standards."

1.06 MOCK-UP

A. Provide mock-up of typical base cabinet, wall cabinet, and countertop, including hardware, finishes, and plumbing accessories.
B. Mock-up may remain as part of the Work.

1.07 DELIVERY, STORAGE, AND HANDLING

A. Protect units from moisture damage.

1.08 FIELD CONDITIONS

A. During and after installation of custom cabinets, maintain temperature and humidity conditions in building spaces at same levels planned for occupancy.
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.

1.09 COORDINATION

A. Coordinate sizes and locations of framing, blocking, furring, reinforcements, and other related units of Work specified in other Sections to ensure that wood-veneer-faced architectural cabinets can be supported and installed as indicated.
PART 2 PRODUCTS

2.01 CASEWORK

A. Quality Standard: Custom Grade, in accordance with AWI/AWMAC/WI (AWS), unless noted otherwise.

B. Plastic Laminate Faced Cabinets: Custom grade.

C. Plastic Laminate Cabinets and Casework:
   2. Laminate Cladding for Exposed Surfaces: High-pressure decorative laminate as follows:
      a. Laminate Grade: HGS.
   3. Edge Treatment for doors and drawers: PVC edge banding, 3 mm thickness, matching laminate in color, pattern, and finish.
   5. Drawer Sides and Backs: Thermoset decorative panels.
   7. Laminate Colors, Patterns, and Finishes: Refer to sheet A601 for finish specifications.
   8. Core Material: Particleboard or Medium Density Fiberboard. Use exterior grade plywood for core material at sinks.
   9. Drawer Construction: Fabricate with exposed fronts fastened to subfront with mounting screws from interior of body.
      a. Join subfronts, backs, and sides with glued dovetail joints.
   10. Provide dust panels of 1/4-inch plywood or tempered hardboard above compartments and drawers, unless located directly under tops.

2.02 WOOD-BASED COMPONENTS

A. Wood fabricated from old growth timber is not permitted.

B. Composite Wood Products: Provide materials that comply with requirements of referenced quality standard for each type of woodwork and quality grade specified unless otherwise indicated.
   1. Medium-Density Fiberboard: ANSI A208.2, Grade 130, made with binder containing no urea formaldehyde.
   2. Particleboard: ANSI A208.1, Grade M-2, made with binder containing no added urea formaldehyde.
   3. Veneer-Faced Panel Products: HPVA HP-1, with wood veneer and medium density fiberboard cores, made with adhesive containing no urea formaldehyde.
   4. Particleboard is not allowed.
      a. Color: White or black, as selected by Architect.

C. Hardwood Edgebanding: Use solid hardwood edgebanding matching species, color, grain, and grade for exposed portions of cabinetry.

2.03 MATERIALS

A. High Pressure Decorative Laminate (HPDL): NEMA LD 3, types as recommended for specific applications.

B. Laminate Backer: 0.020 inch nominal thickness, undecorated; for application to concealed backside of panels faced with high pressure decorative laminate.

2.04 COUNTERTOPS

A. Refer to Section 12 36 00 Countertops.

2.05 ACCESSORIES

A. Adhesive: Type recommended by fabricator to suit application.

B. Recycling Grommets: Mockett, TMLID1, 6” Stainless Steel Metal Trash Management Grommet.

C. Grommets: Standard plastic grommets for cut-outs, in color to match adjacent surface.
2.06 HARDWARE

A. Hardware: BHMA A156.9, types as recommended by fabricator for quality grade specified.

B. Drawer and Door Pulls: Stainless steel, back mounted, solid metal, 5 inches long, 1-1/2 inches deep, and 5/16 inch in diameter, unless otherwise indicated.

C. Cabinet Locks: Keyed cylinder, two keys per lock, master keyed, steel with satin finish.

D. Catches: Magnetic.

E. Drawer Slides:
   1. Type: Full extension.
   2. Static Load Capacity: Commercial grade.
   4. Products:

F. Hinges: European style concealed self-closing type, stainless steel with satin finish.
   1. Basis-of-Design:

G. Sliding Door Track Assemblies: Upper and lower track of satin anodized aluminum, with matching shoe equipped with nylon rollers.

H. Flipper Door Hardware: Basis of Design: Hafele, PR60 Pocket Door Hardware, Complete Set, 408.20.2##, sized per door size.

I. Glass Door Slides: Basis-of-Design: Hafele, EKU Clipo GPPK, 16 (for glass weights for 35 lbs. or less), 36 (for glass weights between 35 and 79 lbs). Provide soft close mechanism.

J. Sliding Glass Door Locks: Hafele, 233.44.600 Sliding Glass Door Lock. Provide two keys per lock, key all locks alike.

K. Decorative Glass Shelving: Rakks; model SC ‘C’ style wall standards and BR2 heavy duty Rakks Shelf Support Brackets.
   1. Provide brackets for shelf depths and spacing as indicated on drawings, if spacing is not indicated, provide the following:
      a. Standards: 2 standards for shelves 2 feet long or less, 1 additional standard for each additional 2 foot of shelf length.
      b. Brackets: Provide one bracket at each standard at each shelf. Provide two Rakks Bumpon shelf rests per bracket.
      c. Finish: Clear anodized.

L. Utility Shelving:
   1. Grade: Custom.
   2. Shelf Material: 3/4 inch melamine faced panel product with matching melamine edge.
      a. Finish: White (powdercoat paint) or Anochrome (electrozinc-plated and clear lacquered cold rolled steel) as selected by the Architect.
      b. Size: Provide brackets for shelf depths and spacing as indicated on drawings, if spacing is not indicated, provide the following:
         1) Standards: 2 standards for shelves 3 feet or less, 1 additional standard for each additional 3 foot shelf length.
         2) Brackets: Provide 1 bracket at every shelf.
   4. Color: To be selected by Architect from manufacturer’s full range.


N. Rod Flanges: Aluminum.
O. Bumper Pads: ¼” diameter neoprene, adhesively applied to cabinet body at contact points for doors and drawers.

P. Counter Supports: Doug Mockett, 18 1/8” Inter-Arc Work Support SWS2. Color: Black or silver as selected by Architect.

2.07 FABRICATION

A. Assembly: Shop assemble cabinets for delivery to site in units easily handled and to permit passage through building openings.

B. Fitting: When necessary to cut and fit on site, provide materials with ample allowance for cutting. Provide matching trim for scribing and site cutting.

C. Plastic Laminate: Apply plastic laminate finish in full uninterrupted sheets consistent with manufactured sizes. Fit corners and joints hairline; secure with concealed fasteners. Slightly bevel arises.
   1. Apply laminate backing sheet to reverse side of plastic laminate finished surfaces.

D. Matching Wood Grain: Comply with requirements of quality standard for specified Grade and as follows:
   1. Provide balance matched panels at each elevation.

E. Provide cutouts for plumbing fixtures. Verify locations of cutouts from on-site dimensions. Prime paint cut edges.

PART 3 EXECUTION

3.01 EXAMINATION

A. Verify adequacy of backing and support framing.

B. Verify location and sizes of utility rough-in associated with work of this section.

3.02 INSTALLATION

A. Before installation, condition woodwork to average prevailing humidity conditions in installation areas. Examine shop-fabricated work for completion and complete work as required, including removal of packing and backpriming.

B. Set and secure custom cabinets in place, assuring that they are rigid, plumb, and level.

C. Grade: Install woodwork to comply with requirements for the same grade specified in Part 2 for fabrication of type of woodwork involved.

D. Install woodwork level, plumb, true, and straight to a tolerance of 1/8 inch in 96 inches. Shim as required with concealed shims.

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

F. Anchor woodwork to anchors or blocking built in or directly attached to substrates. Secure with countersunk, concealed fasteners and blind nailing as required for complete installation. Use fine finishing nails for exposed fastening, countersunk and filled flush with woodwork and matching final finish if transparent finish is indicated.

G. 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.
   1. Fasten wall cabinets through back, near top and bottom, at ends and not more than 16 inches o.c. with No. 10 wafer-head screws sized for 1-inch penetration into wood framing, blocking, or hanging strips.

3.03 ADJUSTING

A. Adjust moving or operating parts to function smoothly and correctly.
3.04 CLEANING
   A. Clean casework, counters, shelves, hardware, fittings, and fixtures.

END OF SECTION
SECTION 06 64 01 - FIBER-REINFORCED LAMINATES

PART 1 - GENERAL

1.01 SUMMARY

A. Provide fiber-reinforced laminates for wall protection applications (WP-1 & WP-3).

B. Related Sections:
   1. Section 092900 - Gypsum Board.
   2. Section 096513 - Resilient Base.

1.02 SUBMITTALS

A. Product Data: Submit manufacturer’s literature including product characteristics, accessories and limitations.

B. Selection Samples: Submit samples of colors and finishes if requested by Architect.

C. Verification Samples: Submit samples of materials selected specified to verify color and finish.

D. Industry Certifications and Standards: Submit copy of documentation indicating compliance.

1.03 QUALITY ASSURANCE

A. Manufacturer: Minimum of 5 years experience manufacturing similar products.

1.04 DELIVERY, STORAGE AND HANDLING

A. Deliver materials and products in unopened factory labeled packages. Store and handle in strict compliance with manufacturer’s instructions and recommendations.

1.05 WARRANTY

A. Manufacturer’s Warranty: Provide manufacturer’s standard warranty against defects in manufacturing.

PART 2 - PRODUCTS

2.01 FIBER-REINFORCED LAMINATES


B. Panels shall comply with the following:
   1. Thickness: 0.075 inches.
   5. IMO Certified for marine use.
   8. Molding Profiles: Outside corners flat, outside corners round, division bars, inside corners, standard end caps.
   9. Adhesive: Construction Adhesive #4319 by Franklin Adhesives and Polymers or equal approved by panel manufacturer.
   10. Joint Caulking: Color Sil by Color Rite or equal approved by panel manufacturer; 100 percent silicone based colored caulking.

PART 3 - EXECUTION

3.01 EXAMINATION

A. Examine substrates for compliance with requirements for installation tolerances and other conditions affecting performance. Proceed with installation only after unsatisfactory conditions have been corrected.

3.02 INSTALLATION

A. Install products in strict accordance with manufacturer’s instructions and approved submittals.
1. Clean substrate of dirt, dust, waxes, and other bond breaking substances prior to beginning installation.
2. Install panels with bottom edge located to clear top of any rigid wall base. Rubber wall bases may be bonded over the fiber reinforced laminate panels using a polymer or urethane based adhesive.
3. Apply adhesive uniformly using adhesive manufacturer’s recommended notched trowel to the entire back of panels completely to the edge.
4. Lay fiber reinforced laminate panels in place leaving approximately 1/8 inch vertical installations 3/16 inch for horizontal installation between panel joints.
5. Follow adhesive manufacturer’s recommendations for set and application times.
6. Apply pressure to entire panel face with laminate type roller, removing trapped air and ensure proper adhesion between surfaces.
7. If no trim is used, seal panel joints and top, side, and bottom edges with colored sealant to match panel color. Wipe smooth and remove excess caulk from fiber reinforced laminate panels panel face.

3.03 ADJUSTING AND CLEANING

A. Replace installations out of plumb and not aligned with adjacent panels and construction.
B. Clean panel face to remove soiling, stains, dust, and dirt using clean rags, and cleaning agents as instructed by manufacturer.
C. Leave installation clean, free of residue and debris resulting from work of this Section.

END OF SECTION
SECTION 07 05 33 - FIRE AND SMOKE ASSEMBLY IDENTIFICATION

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Identification markings for fire and smoke rated partitions, and fire rated walls.

1.02 REFERENCE STANDARDS


1.03 SUBMITTALS

A. Product Data: Manufacturer's printed product literature for each type of marking, indicating font, foreground and background colors, wording, and overall dimensions.

B. Schedule: Completely define scope of proposed marking. Indicate location of affected walls and partitions, and number of markings.

C. Samples: Submit two samples of each type of marking proposed for use, of size similar to that required for project, illustrating font, wording, and method of application.

1.04 FIELD CONDITIONS

A. Do not install painted markings when ambient temperature is lower than recommended by coating manufacturer.

PART 2 PRODUCTS

2.01 MANUFACTURERS

A. Partition Identification Labels:

2.02 FIRE AND SMOKE ASSEMBLY IDENTIFICATION


B. Adhered Fire and Smoke Assembly Identification Signs: Printed vinyl sign with factory applied adhesive backing.

C. Languages: Provide all markings in English.

PART 3 EXECUTION

3.01 EXAMINATION

A. Verify that substrate surfaces are ready to receive work.

3.02 INSTALLATION

A. Locate markings as required by ICC (IBC).

B. Install adhered markings in accordance with manufacturer's instructions.

C. Install neatly, with horizontal edges level.

D. Protect from damage until Substantial Completion; repair or replace damaged markings.

END OF SECTION
SECTION 07 14 00 - FLUID-APPLIED WATERPROOFING

PART 1 GENERAL

1.01 SECTION INCLUDES
   A. Fluid- Applied Waterproofing:
      1. Synthetic rubber waterproofing.

1.02 RELATED REQUIREMENTS
   A. Section 03 30 00 - Cast-in-Place Concrete: Concrete substrate.
   B. Section 04 20 00 - Unit Masonry: Masonry joints prepared to receive flashings.
   C. Section 07 25 00 - Weather Barriers.

1.03 REFERENCE STANDARDS

1.04 SUBMITTALS
   A. Product Data: Provide data for membrane, surface conditioner, flexible flashings, joint cover sheet, and joint and crack sealants.
   B. Shop Drawings: Indicate special joint or termination conditions and conditions of interface with other materials.
   C. Manufacturer's Installation Instructions: Indicate special procedures, perimeter conditions requiring special attention, and acceptable installation temperatures.
   D. Warranty:
      1. Submit manufacturer warranty and ensure that forms have been completed in Owner's name and registered with manufacturer.
      2. Submit installer's certification that installation complies with warranty conditions for the waterproofing membrane.

1.05 WARRANTY
   A. Contractor shall correct defective Work within a five year period after Date of Substantial Completion; remove and replace materials concealing waterproofing at no cost to Owner.
   B. Provide five year manufacturer warranty for waterproofing failing to resist penetration of water.

PART 2 PRODUCTS

2.01 MATERIALS
   A. Fluid applied membrane, two-part, self-curing, synthetic rubber based material:
      2. Other Acceptable Products:
         b. Carlisle, CCW-703 Liquiseal.
      3. Note that the same manufacturer of material used for Section 07 25 00 Weather Barriers of this project, shall be the same manufacturer of material used for this section. Written manufacturer compatibility and adhesion certification shall be required.

2.02 MEMBRANE AND FLASHING MATERIALS
   A. Synthetic Rubber Waterproofing: Cold-applied neoprene or CSPE complying with ASTM D3468; two component, quick setting.
      1. Cured Film Thickness: 1.5 mm (0.060 inch) nominal, measured in accordance with ASTM D 3767 Method A.
      2. Suitable for installation over concrete substrates.
      3. Volatile Organic Compound content: < 75 g/L.
4. Elongation:  500 percent, measured in accordance with ASTM D412.
5. Water Vapor Permeance: 0.08 perm inch max., ASTM E96, Method B.
6. Peel Adhesion to Concrete: 5 lb./inch, according to ASTM D 903 Modified.
7. Minimum Application Temperature: 20 deg. F.
8. Brittleness Temperature: -40 F, measured in accordance with ASTM D746.

B. Flexible Flashings: Type recommended by membrane manufacturer.

2.03 ACCESSORIES

A. Drainage Panel: Drainage layer with geotextile filter fabric on earth side.
   1. Composition: Dimpled polystyrene core; polypropylene or polyester filter fabric.
   2. Horizontal Application Products:
      a. Grace, Hydrotect 660 Drainage Composite.
      b. Henry DB 650
      c. Carlisle MiraDrain 9800
   3. Vertical Application Products:
      a. Grace, Hydrotect 220 Drainage Composite
      b. Henry DB 250
      c. Carlisle MiraDrain 6200

B. Protection Board (use where drainage panels are not used): Extruded polystyrene rigid board insulation; for vertical applications with the following minimum characteristics:
   1. Normal Density: 1.6 lb/ft³.
   3. Thermal Conductivity, K factor: 0.24 at 40° F, 0.26 at 75° F.
   4. Thermal Resistance, R-Value: 4.0° F.ft².h/Btu/in per 1 inch of thickness.
   5. Manufacturers:
      a. Dow Chemical Co; Product STYROFOAM PERIMATE
      b. Owens Corning Corp; Product FOAMULAR INSUL-DRAIN
      c. Kingspan Insulation; Product GreenGuard PB4

C. Miscellaneous Materials: Tape and other accessories specified or acceptable to manufacturer of fluid-applied waterproofing membrane.

PART 3 EXECUTION

3.01 EXAMINATION

A. The installer shall examine conditions of substrates and other conditions under which this work is to be performed and notify the Contractor, in writing, of circumstances detrimental to the proper completion of the work. Do not proceed with work until unsatisfactory conditions are corrected.

B. Verify that items built-in under other sections are properly located, sized, and securely installed.

3.02 PREPARATION

A. Tie-holes and “bug holes” larger in diameter than 1/2 inch or deeper than 1/8 inch, or both, should be either pre-treated per manufacturer’s installation instructions, or repaired with a lean concrete mix or grout. See ASTM D 5295 for further details on substrate preparation.

B. Cracked, pitted, honeycombed or heavily bug holed surfaces can be filled by spraying from close distance, 10 to 12 inches. High material usage will result. Under these circumstances it may be more efficient to fill the surface with a parget coat of lean mortar mix before application of the waterproofing. It is also acceptable to fill in gaps with a compatible sealant or caulk.

C. Cast-In-Place Concrete Substrates:
   1. Surface shall be free of any visible water, frost, or ice.
   2. Fill form tie rod holes with concrete and finish flush with surrounding surface.
   3. Repair bug holes greater than 1/2 inch in diameter and 1/8 inch in depth, and finish flush with surrounding surface.
   4. Remove scaling to sound, unaffected concrete, and repair exposed area.
5. Grind irregular construction joints, and protrusions taller than 1/8 inch, to suitable flush surface.


E. Related Materials: Treat joints and install flashing as recommended by waterproofing manufacturer.

3.03 INSTALLATION

A. Refer to manufacturer’s literature for recommendations on installation, including but not limited to, the following:
   1. Apply minimum 0.060-inch thickness in all areas to be waterproofed. Apply minimum 0.120-inch thickness in all detail areas.
   2. If area to be waterproofed is in direct sunlight and temperature is rising, apply “scratch coat” (a thin application of fluid-applied waterproofing) prior to the full application of the waterproofing membrane.
   3. In applications where a minimum slope of 0.13 in/ft cannot be achieved, a two-coat application of membrane is recommended to achieve the total thickness.
   4. Apply prefabricated drainage composite or protection board, and related materials, in accordance with manufacturer’s recommendations.

B. At all inside and outside corners, fenestration rough openings and penetrations install initial application of detail membrane prior to installation of the primary membrane.

C. Seal membrane and flashings to adjoining surfaces.

3.04 INSTALLATION - DRAINAGE PANEL AND PROTECTION BOARD

A. Place drainage panel directly against membrane where indicated, butt joints, place to encourage drainage downward, and scribe and cut boards around projections, penetrations, and interruptions.

B. Place protection board directly against drainage panel where indicated; butt joints, and scribe and cut boards around projections, penetrations, and interruptions.

3.05 CLEANING AND PROTECTION

A. Remove any masking materials after installation. Clean any stains on materials which would be exposed in the completed work using procedures as recommended by manufacturer.

B. Protect completed membrane waterproofing from subsequent construction activities as recommended by manufacturer.

C. Do not leave installed materials exposed to weather for longer than 30 days.

3.06 FIELD QUALITY CONTROL

A. Do not cover waterproofing until required inspections have been completed by the BECx A and/or testing agency.

B. The Contractor’s BECx C shall contact the BECx A when an agreed upon amount of area has been installed and is ready for inspection, providing adequate time for scheduling the inspection without adversely affecting the project timeline.

C. Contractor’s BECx C and/or the testing agency shall verify proper application thickness via a wet mil gauge during the application process.

3.07 PROTECTION

A. Do not permit traffic over unprotected or uncovered membrane.

END OF SECTION
SECTION 07 21 00 - THERMAL INSULATION

PART 1 GENERAL

1.01 SECTION INCLUDES
   A. Board insulation at cavity wall construction, perimeter foundation wall, underside of floor slabs, and exterior wall behind exterior wall finish.

1.02 RELATED REQUIREMENTS
   A. Section 07 53 00 - Elastomeric Membrane Roofing: Insulation specified as part of roofing system.
   B. Section 09 21 16 - Gypsum Board Assemblies: Acoustic insulation inside walls and partitions.

1.03 REFERENCE STANDARDS

1.04 SUBMITTALS
   A. Product Data: Provide data on product characteristics, performance criteria, and product limitations.
   B. Manufacturer's Installation Instructions: Include information on special environmental conditions required for installation and installation techniques.
   C. Manufacturer's Certificate: Certify that products meet or exceed specified requirements.

1.05 MOCK-UP
   A. Mockups: Provide materials and construct applicable portions of mockup as indicated on Section 01 45 40 Mock-Up Requirements.

1.06 FIELD CONDITIONS
   A. Do not install insulation adhesives when temperature or weather conditions are detrimental to successful installation.

PART 2 PRODUCTS

2.01 APPLICATIONS
   A. Insulation Under Concrete Slabs: Extruded polystyrene board.
   B. Insulation at Perimeter of Foundation: Extruded polystyrene board.
   C. Insulation Inside Masonry Cavity Walls: Polyisocyanurate board.
   D. Batt insulation where indicated on drawings.
   E. Insulation in Metal Framed Walls: Batt insulation.

2.02 FOAM BOARD INSULATION MATERIALS (RIGID INSULATION)
   A. Extruded Polystyrene Board Insulation: ASTM C578, Type IV; Extruded polystyrene board with either natural skin or cut cell surfaces; with the following characteristics:
      1. Flame Spread Index (FSI): Class A - 0 to 25, when tested in accordance with ASTM E84.
      2. Smoke Developed Index (SDI): 450 or less, when tested in accordance with ASTM E84.
      4. Board Thickness: As indicated on drawings.
      7. Manufacturers:
B. Polyisocyanurate Board Insulation with Facers Both Sides: Rigid cellular foam, complying with ASTM C1289; Type I, aluminum foil both faces; Class 1, non-reinforced foam core.
   1. Flame Spread Index (FSI): Class A - 0 to 25, when tested in accordance with ASTM E84.
   2. Smoke Developed Index (SDI): 450 or less, when tested in accordance with ASTM E84.
   4. Board Thickness: As indicated on drawings.
   6. Manufacturers:
      c. GAF: www.gaf.com/sle.

2.03 ACCESSORIES
A. Adhesive: Type recommended by insulation manufacturer for application.

PART 3 EXECUTION
3.01 EXAMINATION
A. Verify that substrate, adjacent materials, and insulation materials are dry and that substrates are ready to receive insulation.
B. Verify substrate surfaces are flat, free of honeycomb, fins, irregularities, or materials or substances that may impede adhesive bond.

3.02 BOARD INSTALLATION AT FOUNDATION PERIMETER
A. Apply adhesive to back of boards:
   1. Three continuous beads per board length.
B. Install boards horizontally on foundation perimeter.
   1. Place boards to maximize adhesive contact.
   2. Install in running bond pattern.
   3. Butt edges and ends tightly to adjacent boards and to protrusions.
C. Cut and fit insulation tightly to protrusions or interruptions to the insulation plane.

3.03 BOARD INSTALLATION AT EXTERIOR WALLS
A. Install boards horizontally on walls.
   1. Install by friction fit or adhesively attach when friction will not hold boards.
   2. Install in running bond pattern.
   3. Butt edges and ends to adjacent boards and to protrusions.
B. Cut and fit insulation tightly to protrusions or interruptions to the insulation plane.
C. Tape insulation board joints.

3.04 BOARD INSTALLATION UNDER CONCRETE SLABS
A. Place insulation under slabs on grade after base for slab has been compacted.
B. Cut and fit insulation tightly to protrusions or interruptions to the insulation plane.
C. Prevent insulation from being displaced or damaged while placing slab.

3.05 PROTECTION
A. Do not permit installed insulation to be damaged prior to its concealment.

END OF SECTION
SECTION 07 25 00 - WEATHER BARRIERS

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Fluid-applied air and vapor barrier membrane system.
B. Materials and installation methods to bridge and seal air leakage pathways in wall junctions with roofs and foundations, and at window and door openings, control and expansion joints, masonry ties, piping and other penetrations through the wall assembly.
C. Accessories and miscellaneous materials as required for complete membrane application.

1.02 RELATED REQUIREMENTS

A. Section 03 30 00 - Cast-in-Place Concrete: Vapor retarder under concrete slabs on grade.
B. Section 04 42 00 - Unit Masonry.

1.03 REFERENCE STANDARDS


1.04 SUBMITTALS

A. Product Data: Submit manufacturer's product data, shop drawings as indicated, installation instructions, supplemental installation details, use limitations and recommendations, test data, and compatibility test results.
B. Shop Drawings: Provide drawings of special joint conditions.
C. Compatibility: Submit letter from manufacturer stating that materials proposed for use are permanently chemically compatible and adhesively compatible with adjacent materials proposed for use. Submit letter from manufacturer stating that cleaning materials used during installation are chemically compatible with each of the adjacent materials proposed for use.
D. Warranty: Submit manufacturer warranty and ensure forms have been completed in the Owner's name and registered with the manufacturer.

1.05 QUALITY ASSURANCE

A. Installer Qualifications:
   1. Installer must show evidence of adequate equipment and trained field personnel to successfully complete the project in a timely manner.
B. Materials: Fluid-applied air and vapor barrier system. For each type of material required for the work of this section and related sections of performance, provide primary materials, associated materials, and material assemblies which are the products of one manufacturer. All accessory materials (self-adhered transition membranes, termination bars, compatible sealants/mastics, etc.) will be provided by, or approved by, the membrane system manufacturer to ensure compatibility and single-source responsibility.

1.06 MOCK-UP

A. Mockups: Provide materials and construct applicable portions of mockup as indicated on Section 01 45 40 Mock-Up Requirements.

PART 2 PRODUCTS

2.01 AIR AND WATER BARRIER (WATER BARRIER MEMBRANE)

A. Air and Water Barrier: Liquid applied, resilient, UV-resistant coating and associated joint treatment.
   1. Suitable for use on concrete, masonry, plywood and gypsum sheathing.
   2. Joint Preparation Treatment: Coating manufacturer's recommended method, either tape or reinforcing mesh saturated with coating material.
   4. Other Acceptable Products:

5. Performance Requirements:

<table>
<thead>
<tr>
<th>Property</th>
<th>Test Method</th>
<th>BOD Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cured Film Thickness</td>
<td>ASTM D 3767, Method A</td>
<td>60 mils (1.5 mm) nominal</td>
</tr>
<tr>
<td>Volatile Organic Compound (VOC) content, maximum</td>
<td></td>
<td>&lt; 0.63 lb/gal (&lt; 75g/L)</td>
</tr>
<tr>
<td>Air Permeance at 75 Pa (0.3 in. water) Differential Pressure</td>
<td>ASTM C 2178</td>
<td>&lt;0.0002 cfm/ft² (&lt;0.001 L/s.m²)</td>
</tr>
<tr>
<td>Assembly Air Permeance at 75 Pa (0.3 in. water) Differential Pressure</td>
<td>ASTM C 2357</td>
<td>&lt;0.0008 cfm/ft² (&lt;0.004 L/s.m²)</td>
</tr>
<tr>
<td>Water Vapor Permeance</td>
<td>ASTM E 96, Method BW</td>
<td>0.08 perms (&lt;4.6 ng/Pa.s.m²)</td>
</tr>
<tr>
<td>Pull Adhesion to Concrete Block (CMU)</td>
<td>ASTM D 4541-02</td>
<td>35 psi (0.24 N/mm²)</td>
</tr>
<tr>
<td>Pull Adhesion to Glass-Faced Gypsum Board</td>
<td>ASTM D 4541-02</td>
<td>18 psi (0.12 N/mm²)</td>
</tr>
<tr>
<td>Peel Adhesion to Concrete</td>
<td>ASTM D 903 Modified 1</td>
<td>5 lbs/in (880 N/m)</td>
</tr>
<tr>
<td>Elongation</td>
<td>ASTM D 412</td>
<td>500% minimum</td>
</tr>
<tr>
<td>Pliability; 180° bend over 1 inch mandrel at -23°F</td>
<td>ASTM D 1970</td>
<td>Unaffected</td>
</tr>
<tr>
<td>Low Temperature Flexibility and Crack Bridging; 1/8 inch crack cycling at -15°F</td>
<td>ASTM C 836</td>
<td>Pass</td>
</tr>
<tr>
<td>Extensibility over 1/4 crack after heat aging</td>
<td>ASTM C 836</td>
<td>Pass</td>
</tr>
<tr>
<td>Application Temperature, minimum</td>
<td></td>
<td>20°F (-7°C)</td>
</tr>
<tr>
<td>Peak Heat Release</td>
<td>ASTM E 1354</td>
<td>&lt; 150 KW/M²</td>
</tr>
<tr>
<td>Total Heat Release</td>
<td>ASTM E 1354</td>
<td>&lt; 20 MJ/M²</td>
</tr>
<tr>
<td>Effective Heat of Combustion</td>
<td>ASTM E 1354</td>
<td>&lt; 18 MJ/kg</td>
</tr>
<tr>
<td>Flame Spread Index</td>
<td>ASTM E 84 or UL 723</td>
<td>&lt; 25</td>
</tr>
<tr>
<td>Smoke-Developed Index</td>
<td>ASTM E 84 or UL 723</td>
<td>&lt; 450</td>
</tr>
</tbody>
</table>

Footnote 1: Waterproofing membrane is applied to concrete and allowed to cure. Peel adhesion of the membrane is measured at a rate of 2 inches per minute with a peel angle of 90 degrees at room temperature.

6. Joint Filler: As recommended by coating manufacturer and suitable to the substrate.

2.02 ACCESSORIES

A. Transition Membrane: A 40 mil self-adhering waterproofing used for flashing around beams, columns, and wall openings (including window, door and curtain wall frames, louvers, etc.); consisting of 36 mils of rubberized asphalt, integrally bonded to a 4 mil high-density cross-laminated polyethylene film. Membrane shall be interleaved with disposable silicone-coated release paper until installed. Fully-supported self-adhered membranes must be provided at all corners, (inside and outside), transitions, and changes in substrate. Liquid applied membranes that utilize mesh reinforcements will not be allowed.
2. Other Acceptable Manufacturers:
   a. Henry Corporation
   b. Carlisle Coatings & Waterproofing
3. Performance Requirements:

2. Other Acceptable Manufacturers:
   a. Henry Corporation.
   b. Carlisle Coatings & Waterproofing.
3. Performance Requirements:

<table>
<thead>
<tr>
<th>Property</th>
<th>Test Method</th>
<th>BOD Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Water Vapor Transmission, max.</td>
<td>ASTM E 96, Method B</td>
<td>0.05 perms (2.9 ng/Pa.s.m^2)</td>
</tr>
<tr>
<td>Water Absorption, maximum</td>
<td>ASTM D 570</td>
<td>0.1% by weight</td>
</tr>
<tr>
<td>Puncture Resistance, minimum</td>
<td>ASTM E 154</td>
<td>80 lbs (356 N)</td>
</tr>
<tr>
<td>Tear Resistance, Initiation, min.</td>
<td>ASTM D 1004</td>
<td>13 lbs (58 N) M.D.</td>
</tr>
<tr>
<td>Tear Resistance, Propagation, min</td>
<td>ASTM D 1938</td>
<td>9 lbs (40 N) M.D.</td>
</tr>
<tr>
<td>Lap Adhesion, min; at -25°F</td>
<td>ASTM E 1876</td>
<td>5 lbs/in (880 N/m)</td>
</tr>
<tr>
<td>Low Temperature Flexibility</td>
<td>ASTM D 1970</td>
<td>Unaffected at -45°F</td>
</tr>
<tr>
<td>Tensile Strength, Film, minimum</td>
<td>ASTM D 412, Die C Modified</td>
<td>800 lbs/in2 (5.5 MPa)</td>
</tr>
<tr>
<td>Elongation, min; ultimate failure of rubberized asphalt</td>
<td>ASTM D 412, Die C</td>
<td>200%</td>
</tr>
</tbody>
</table>

C. Metal Drip Edge: Provide metal drip edge where flashing is exposed or partially exposed and where indicated, complying with Division 7 Section "Sheet Metal Flashing and Trim" and as follows:
1. Stainless Steel: ASTM A 240/A 240M, Type 304, 0.016 inch thick.
   a. Metal Drip Edges: Fabricate from stainless steel. Extend into wall and 1/2 inch out from wall, with outer edge bent down 30 degrees and hemmed.

D. Detailing Compound: Two-part, elastomeric, trowel grade material for use with self-adhered membranes and tapes.
2. Other Acceptable Manufacturers:
   a. Henry Corporation.
b. Carlisle Coatings & Waterproofings.

E. Miscellaneous Materials: Tape and other accessories specified or acceptable to manufacturer of fluid-applied air and vapor barrier membrane.

F. Miscellaneous Materials: Tape and other accessories specified or acceptable to manufacturer of fluid-applied air and vapor barrier membrane.

PART 3 EXECUTION

3.01 EXAMINATION

A. Verify that surfaces and conditions are ready to accept the work of this section.

B. The installer shall examine conditions of substrates and other conditions under which this work is to be performed and notify the Contractor, in writing, of circumstances detrimental to the proper completion of the work. Do not proceed with work until unsatisfactory conditions are corrected.

C. Verify that items built-in under other sections are properly located, sized, and securely installed.

3.02 PREPARATION

A. Protect adjacent work areas and finish surfaces from damage during installation.

B. Refer to manufacturer’s literature for requirements for preparation of substrates. Surfaces shall be structurally sound and free of voids, spalled areas, loose aggregate and sharp protrusions. Remove contaminants such as grease, oil and wax from exposed surfaces. Remove dust, dirt, loose stone and debris. Use repair materials and methods which are acceptable to manufacturer of fluid-applied air and vapor barrier.

C. Cast-In-Place Concrete Substrates:
   1. Surface shall be free of any visible water, frost, or ice.
   2. Fill form tie rod holes with concrete and finish flush with surrounding surface.
   3. Repair bug holes greater than 1/2 inch in diameter and 1/4 inch deep, and finish flush with surrounding surface.
   4. Remove scaling to sound, unaffected concrete, and repair exposed area.
   5. Grind irregular construction joints and protrusions taller than 1/8” to suitable flush surface.

D. Exterior Sheathing Panels: Ensure that the boards are sufficiently stabilized with corners and edges fastened with appropriate screws. Pre-treat all board joints with 2 to 3 inch wide, reinforced self-adhesive tape, or fiberglass mesh-style gypsum board tape. Fill gaps greater than 1/4 inch with mastic or caulk, allowing sufficient time for full curing before application of tape and fluid-applied membrane.

E. Masonry Substrates: Apply air and vapor barrier over concrete block with smooth flush mortar joints. Fill all voids and holes, particularly in the mortar joints, with a lean mortar mix, non-shrinking grout or parge coat.

F. Related Materials: Treat joints and install flashing as recommended by membrane manufacturer.

3.03 INSTALLATION

A. Install materials in accordance with manufacturer’s instructions.

B. Application of Fluid-Applied Membrane:
   1. Spray- or trowel-apply a continuous uniform film at minimum 60 mils dry film thickness using multiple, overlapping passes.
   2. When spraying, use a cross-hatching technique (alternating horizontal and vertical passes) to ensure even thickness and coverage.
   3. When spraying, use high pressure, multi-component, airless spray equipment approved by material manufacturer.
   4. Carry membrane into any openings a minimum of 2 inches.
   5. Seal all brick-ties and other penetrations as work progresses.

C. Application of Transition Membrane:
1. After allowing the fluid-applied membrane to cure to tack-free finish, apply transition membrane with a minimum overlap of 3 inches onto each surface at all beams, columns and joints as indicated on Drawings.
2. Tie-in to window and door frames, spandrel panels, roof and floor intersections and changes in substrate.
   a. Install products in accordance to manufacturer’s installation instructions, necessary to provide a continuous weather barrier for all transitions in plane.
3. Use pre-cut, easily-handled lengths for each location.
4. Remove silicone-coated release paper and position membrane flashing carefully before placing it against the surface.
5. When properly positioned, place against surface by pressing firmly into place using hand roller.
6. Overlap adjacent pieces 2 inches, and roll all seams with a hand roller.
7. Seal top edge of flashing with sealant compatible with all surrounding materials.
8. Transition flashing is not to be pre-installed prior to application of fluid-applied membrane, apply transition flashing as above. Spray or trowel a continuous uniform film of Fluid-Applied Membrane at minimum 60 mils dry film thickness using multiple, overlapping passes, with a minimum overlap of 3 inches between the fluid applied and the transition flashing

D. Application of Flexible Membrane Wall Flashing:
   1. Precut pieces of flashing to easily handled lengths for each location.
   2. Remove silicone-coated release paper and position flashing carefully before placing it against the surface.
   3. When properly positioned, place against surface by pressing firmly into place using hand roller. Fully-adhere flashing to substrate to prevent water from migrating under flashing.
   4. Overlap adjacent pieces 2 inches and roll all seams with a hand roller.
   5. Trim bottom edge 1/2 inch back from exposed face of the wall. Flashing shall not be permanently exposed to sunlight.
   6. At heads, sills and all flashing terminations, turn up flashing ends a minimum of 2 inches, and make careful folds to form an end dam, with the seams sealed.
   7. Seal top edge of flashing with sealant compatible with all surrounding materials.
   8. Do not allow the rubberized-asphalt surface of the flashing membrane to come in contact with poly-sulfide sealants, creosote, uncured coal tar products, or ethylene-propylene-diene-terpolymer products (EPDM).

E. Installation of the primary membrane is to occur prior to all inside and outside corners, fenestration rough openings and penetrations, then install the initial application of detail membrane.

3.04 TOLERANCES
   A. System to be installed to accommodate the following maximum live load deflection in the plane of the exterior wall:
      1. Verify maximum live load deflection with structural requirements or 3/8 inch, whichever is greater.

3.05 CLEANING AND PROTECTION
   A. Remove any masking materials after installation. Clean any stains on materials which would be exposed in the completed work using procedures as recommended by manufacturer.
   B. Fluid-applied air and vapor barrier membrane is not suitable for permanent exposure and should be protected from the effects of sunlight.
   C. Schedule work to ensure that the membrane system is covered as soon as possible after installation. Protect membrane system from damage during subsequent operations. If the air and vapor barrier membrane system cannot be covered within sixty (60) days after installation, apply temporary UV protection such as dark plastic sheet or tarpaulins.
3.06 FIELD QUALITY CONTROL

A. Do not cover installed fluid-applied air and vapor barrier until required inspections have been completed by testing agency.

B. The testing agency shall verify proper application thickness via a wet mil gauge during the application process.

C. Hose tests will be performed for areas clad with composite wood panels, aluminum composite panels, fiber reinforced cementitious panels, and thin limestone adhered panel. Refer to those sections for testing requirements. Replace and/or repair components that have failed field testing and retest until performance is satisfactory.

END OF SECTION
PART 1 GENERAL

1.01 SECTION INCLUDES

A. Asphalt shingle roofing.
B. Flexible sheet membranes for underlayment.
C. Associated metal flashings and accessories.

1.02 RELATED REQUIREMENTS

A. Section 07 62 00 - Sheet Metal Flashing and Trim: Edge and cap flashings.

1.03 REFERENCE STANDARDS

F. UL (DIR) - Online Certifications Directory; current listings at database.ul.com.

1.04 SUBMITTALS

A. Product Data: Provide data indicating material characteristics.
B. Shop Drawings: For metal flashings, indicate specially configured metal flashings.
C. Samples: Submit two samples of each shingle color indicating color range and finish texture/pattern; for color selection.
D. Manufacturer's Installation Instructions: Indicate installation criteria and procedures.

1.05 QUALITY ASSURANCE

A. Products are Required to Comply with Wind Resistance Criteria: UL (DIR) listed and labeled.

1.06 FIELD CONDITIONS

A. Do not install shingles or eave protection membrane when surface temperatures are below 45 degrees F.

1.07 WARRANTY

A. Special Warranty: Standard form in which manufacturer agrees to repair or replace asphalt shingles that fail in materials or workmanship within specified warranty period.
   1. Failures include, but are not limited to, the following:
      a. Manufacturing defects.
      b. Structural failures including failure of asphalt shingles to self-seal after a reasonable time.
   2. Material Warranty Period: 30 years from date of Substantial Completion, years nonprorated.
   3. Wind-Speed Warranty Period: Asphalt shingles will resist blow-off or damage caused by wind speeds up to 100 mph for 15 years from date of Substantial Completion.
   4. Algae-Discoloration Warranty Period: Asphalt shingles will not discolor 10 years from date of Substantial Completion.
PART 2 PRODUCTS

2.01 ASPHALT SHINGLES

A. Asphalt Shingles: Asphalt-coated glass felt, mineral granule surfaced, complying with ASTM D3462/D3462M.
   1. Fire Resistance: Class A.
   2. Wind Resistance: Class F, when tested in accordance with ASTM D3161/D3161M.
   3. Warranted Wind Speed: Not less than tested wind resistance.
   4. Algae Resistant.
   6. Color: As selected by Architect from manufacturer's full range.

2.02 SHEET MATERIALS

   2. Provide products approved by shingle manufacturer for use in warranted system.
   3. High temperature resistance up to 250°F.
   4. Provide products approved by shingle manufacturer for use in warranted system.

2.03 ACCESSORIES

A. Nails: Standard round wire shingle type, of hot-dipped zinc coated steel, 10 wire gage, 0.1019 inch shank diameter, 3/8 inch head diameter, of sufficient length to penetrate through roof sheathing or 3/4 inch into roof sheathing or decking.


C. Ridge Vents: Plastic, extruded with vent openings that do not permit direct water or weather entry; flanged to receive shingles.
   1. Provide products approved by shingle manufacturer for use in warranted system.

2.04 METAL FLASHINGS

A. General: Comply with requirements in Division 07 Section "Sheet Metal Flashing and Trim."

B. Fabricate sheet metal flashing and trim to comply with recommendations in SMACNA's "Architectural Sheet Metal Manual" that apply to design, dimensions, metal, and other characteristics of the item and as required to comply with roofing manufacturer warranty.

PART 3 EXECUTION

3.01 EXAMINATION

A. Verify existing conditions prior to beginning work.

B. Verify that roof penetrations and plumbing stacks are in place and flashed to deck surface.

C. Verify roof openings are correctly framed.

D. Verify deck surfaces are dry, free of ridges, warps, or voids.

E. Prepare written report, endorsed by Installer, listing conditions detrimental to performance of the Work.

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

3.02 PREPARATION

A. Seal roof deck joints wider than 1/16 inch as recommended by shingle manufacturer.

3.03 INSTALLATION - UNDERLAYMENT

A. Self-Adhering Sheet Underlayment: Install, wrinkle free, on roof deck. Comply with low-temperature installation restrictions of underlayment manufacturer if applicable. Install at
locations indicated on Drawings, lapped in direction to shed water. Lap sides not less than 3-1/2 inches. Lap ends not less than 6 inches staggered 24 inches between courses. Roll laps with roller. Cover underlayment within seven days. Provide additional coverage as required by roof manufacturer's warranty.  
1. Sidewalls: Return vertically against sidewall not less than 6 inches.  
2. Dormers, Chimneys, Skylights, and Other Roof-Penetrating Elements: Return vertically against penetrating element not less than 6 inches.  
3. Vent pipes: Install a 24 inch square piece of eaves protection membrane lapping over roof deck underlayment; seal tightly to pipe.  
4. Cover all shingled roof areas.  
B. Items projecting through or mounted on roof: Weather lap and seal watertight with plastic cement.  

3.04 INSTALLATION - METAL FLASHING AND ACCESSORIES  
A. General: Install metal flashings and other sheet metal to comply with requirements in Division 07 Section "Sheet Metal Flashing and Trim."  
1. Install metal flashings according to recommendations in ARMA's "Residential Asphalt Roofing Manual" and asphalt shingle recommendations in NRCA's "The NRCA Roofing and Waterproofing Manual" and as required to comply with roofing warranty.  
B. Weather lap joints minimum 2 inches and seal weather tight with plastic cement.  
C. Items Projecting Through or Mounted on Roofing: Flash and seal weather tight with plastic cement.  

3.05 INSTALLATION - SHINGLES  
A. Install shingles in accordance with manufacturer's instructions manufacturer's instructions and recommendations in ARMA's "Residential Asphalt Roofing Manual,",.  
1. Fasten individual shingles using 2 nails per shingle, or as required by code, whichever is greater.  
2. Fasten strip shingles using 4 nails per strip, or as required by code, whichever is greater.  
B. Install starter strip containing sealant or cement shingles to underlayment and each other in a 4" width of asphalt plastic roof cement.  
1. Extend asphalt shingles over fasciae at eaves and rakes.  
C. Install first and remaining courses of asphalt shingles stair-stepping diagonally across roof deck with manufacturer's recommended offset pattern at succeeding courses, maintaining uniform exposure.  
D. Fasten asphalt shingle strips with a minimum of four roofing nails located according to manufacturer's written instructions or additional nails as required by manufacturer to meet requirement.  
1. Where roof slope is less than 4:12, seal asphalt shingles with asphalt roofing cement spots.  
2. When ambient temperature during installation is below 50 deg F, seal asphalt shingles with asphalt roofing cement spots.  
E. Ridge Vents: Install continuous ridge vents over asphalt shingles according to manufacturer's written instructions. Fasten with roofing nails of sufficient length to penetrate sheathing.  
F. Ridge Cap Shingles: Maintain same exposure of cap shingles as roofing shingle exposure. Lap cap shingles at ridges to shed water away from direction of prevailing winds. Fasten with roofing nails of sufficient length to penetrate sheathing.  
G. Complete installation to provide weather tight service.  

END OF SECTION
SECTION 07 41 13 - METAL ROOF PANELS

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Roofing system of preformed steel panels.
B. Attachment system.
C. Finishes.
D. Accessories.

1.02 RELATED REQUIREMENTS

A. Section 05 5400 - Cold-Formed Metal Framing: Sub-purlin framing system.
B. Section 07 92 00 - Joint Sealants: Sealing joints between metal roof panel system and adjacent construction.
C. Section 07 5300 - Elastomeric Roofing Membrane: Single source of responsibility.

1.03 REFERENCE STANDARDS


1.04 SUBMITTALS

A. Product Data: Manufacturer's data sheets on each product to be used, including:
   1. Summary of test results, indicating compliance with specified requirements.
   2. Storage and handling requirements and recommendations.
   3. Installation methods.
   4. Specimen warranty.
B. Shop Drawings: Include layouts of roof panels, details of edge and penetration conditions, spacing and type of connections, flashings, underlayments, and special conditions.
   1. Show work to be field-fabricated or field-assembled.
   2. Include structural analysis signed and sealed by qualified structural engineer, indicating conformance of roofing system to specified loading conditions.
C. Selection Samples: For each roofing system specified, submit color chips representing manufacturer's full range of available colors and patterns.
D. Test Reports: Indicate compliance of metal roofing system to specified requirements.
E. Warranty: Submit specified manufacturer's warranty and ensure that forms have been completed in Owner's name and are registered with manufacturer.

1.05 QUALITY ASSURANCE

A. Manufacturer Qualifications: Company specializing in the manufacture of roofing systems similar to those required for this project, with not less than 5 years of experience.
B. Installer Qualifications: Company specializing in performing work of the type specified and with at least three years of documented experience.
1.06 DELIVERY, STORAGE, AND HANDLING
   A. Store roofing panels on project site as recommended by manufacturer to minimize damage to panels prior to installation.

1.07 WARRANTY
   A. Finish Warranty: Provide manufacturer's special warranty covering failure of factory-applied exterior finish on metal roof panels and agreeing to repair or replace panels that show evidence of finish degradation, including significant fading, chalking, cracking, or peeling within specified warranty period of twenty years from Date of Substantial Completion.
   B. Waterproofing Warranty: Provide manufacturer's warranty for weathertightness of roofing system, including agreement to repair or replace roofing that fails to keep out water within specified warranty period of 20 years from date of Substantial Completion.

PART 2 PRODUCTS

2.01 MANUFACTURERS
   B. Acceptable comparable manufacturers are:

2.02 ROOF PANELS
   A. Engineering: Provide panel assemblies designed to safely support design loads at support spacing indicated, with deflection not to exceed 1/180 of the span when tested in accordance with ASTM E1592.
      1. Dead Loads: Weight of roofing system.
      2. Live Loads: As indicated on structural drawings.
   B. Metal Roofing: Provide complete roofing assemblies, including roof panels, clips, fasteners, connectors, and miscellaneous accessories, tested for conformance to the following minimum standards:
      1. Structural Design Criteria: Provide panel assemblies designed to safely support design loads at support spacing indicated, with deflection not to exceed L/180 of span length(L) when tested in accordance with ASTM E1592.
      2. Overall: Complete weathertight system tested and approved in accordance with ASTM E1592.
      3. Wind Uplift: Class 90 wind uplift resistance of UL 580.
      4. Air Infiltration: Maximum 0.06 cfm/sq ft at air pressure differential of 6.24 lbf/sq ft, when tested according to ASTM E1680.
      5. Water Penetration: No water penetration when tested according to procedures and recommended test pressures of ASTM E1646. Perform test immediately following air infiltration test.
      6. Thermal Movement: Design system to accommodate without deformation anticipated thermal movement over ambient temperature range of 100 degrees F.
   C. Metal Panels: Factory-formed panels with factory-applied finish.
      1. Type: Single skin, uninsulated. Vertical rib, double seamed joint.
      2. Steel Panels:
         b. Steel Thickness: 24 gauge, min. 0.0209 inch thick.
         c. PVDF (Polyvinylidene Fluoride) Coating: Superior Performance Organic Finish, AAMA 2605; multiple coat, thermally cured fluoropolymer finish system.
         d. Color: To be selected by Architect from manufacturer's full range.
      3. Profile: Standing seam, with minimum 1.5 inch seam height; concealed fastener system for field seaming with special tool.
5. Width: Maximum panel coverage of 16 inches.

2.03 ATTACHMENT SYSTEM
A. Concealed System: Provide manufacturer's standard stainless steel or nylon-coated aluminum concealed anchor clips designed for specific roofing system and engineered to meet performance requirements, including anticipated thermal movement.

2.04 UNDERLAYMENT

2.05 FINISHES
A. Fluoropolymer Coating System: Manufacturer’s standard multi-coat thermocured coating system, including minimum 70 percent fluoropolymer color topcoat with minimum total dry film thickness of 0.9 mil.

2.06 SNOW GUARDS
A. Snow Guards: Prefabricated system designed to withstand exposure to environmental elements and resist design forces without failure.
1. Attachment System to provide attachment to standing seam roofs without penetration through roof seams or panels without voiding roof warranty.
2. Components:
   a. Clamps:
      1) Manufactured from 6061-T6 aluminum extrusions conforming to ASTM B221 or aluminum castings conforming to ASTM B85 and to AA Aluminum Standards and Data.
      2) Set screws: 300 Series stainless steel, 18-8 alloy, 3/8 inch diameter, with round nose point.
      3) Attachment bolts: 300 Series stainless steel, 18-8 alloy, 8 mm or 10 mm diameter, hex flange bolt.
   b. Brackets:
      1) Manufactured from 6061-T6 or 6005-T5 alloy and temper aluminum extrusions conforming to ASTM B221 and AA Aluminum Standards and Data or cast aluminum.
      2) Screws for attachment of brackets to roof: Type best suited to application: Metal to metal applications: ¼-14 self drilling point, 2 inch length, 3/8 inch hex washer head, Zinc/Aluminum cap. Metal to wood applications: ¼-14 type 17 AB milled point, 2 inch length, 3/8 inch hex washer head, Zinc/Aluminum cap.
   c. Cross Members:
      1) Manufactured from 6061-T6 or 6005-T5 alloy and temper aluminum extrusions conforming to ASTM B221 and AA Aluminum Standards and Data.
   d. Color Strips: Same material and finish as roof panels; obtained from roof panel manufacturer.
   e. Snow and Ice Clips:
      1) Aluminum, with rubber foot, minimum 3 inches wide.

2.07 ACCESSORIES
A. Miscellaneous Sheet Metal Items: Provide flashings, gutters, downspouts, trim, moldings, closure strips, and caps of the same material, thickness, and finish as used for the roofing panels. Items completely concealed after installation may optionally be made of stainless steel.
1. Gutters: Formed from same material as roof panels, complete with end pieces, outlet tubes, and other special pieces as required. Fabricate in minimum 96-inch-long sections, of size and metal thickness according to SMACNA's "Architectural Sheet Metal Manual."
   Furnish gutter supports spaced a maximum of 36 inches o.c., fabricated from same metal
as gutters. Provide wire ball strainers of compatible metal at outlets. Finish gutters to match metal roof panels.


B. Rib and Ridge Closures: Provide prefabricated, close-fitting components of steel with corrosion resistant finish or combination steel and closed-cell foam.

C. Sealants:
   1. Exposed Sealant: Elastomeric; silicone, polyurethane, or silyl-terminated polyether/polyurethane.
   2. Concealed Sealant: Non-curing butyl sealant or tape sealant.
   3. Seam sealant shall be factory-applied, hot-melt mastic.

D. Thermal Insulation: Roofing manufacturer's approved polyisocyanurate insulation. Thickness as indicated on drawings.

PART 3 EXECUTION

3.01 EXAMINATION
   A. Do not begin installation of preformed metal roof panels until substrates have been properly prepared.
   B. If substrate preparation is the responsibility of another installer, notify Architect of unsatisfactory preparation before proceeding.

3.02 PREPARATION
   A. Coordinate roofing work with provisions for roof drainage, flashing, trim, penetrations, and other adjoining work to assure that the completed roof will be free of leaks.
   B. Do not expose materials vulnerable to water or sun damage in quantities greater than can be weatherproofed the same day.
   C. Separate dissimilar metals by applying a bituminous coating, self-adhering rubberized asphalt sheet, or other permanent method approved by roof panel manufacturer.
   D. Where metal will be in contact with wood or other absorbent material subject to wetting, seal joints with sealing compound and apply one coat of heavy-bodied bituminous paint.
   E. A. Board Insulation: Extend insulation in thickness indicated to cover entire roof. Comply with installation requirements in Division 7 Section "Building Insulation" And to comply with specified uplift resistance.

3.03 INSTALLATION
   A. Install roofing system in accordance with approved shop drawings and panel manufacturer's instructions and recommendations, as applicable to specific project conditions. Anchor all components of roofing system securely in place while allowing for thermal and structural movement.
      1. Install roofing system with concealed clips and fasteners, except as otherwise recommended by manufacturer for specific circumstances.
      2. Minimize field cutting of panels. Where field cutting is absolutely required, use methods that will not distort panel profiles. Use of torches for field cutting is absolutely prohibited.
   B. Accessories: Install all components required for a complete roofing assembly, including flashings, gutters, downspouts, trim, moldings, closure strips, preformed crickets, caps, equipment curbs, rib closures, ridge closures, and similar roof accessory items.
   C. Ice and Water Shield: Install under all metal roofing areas.
      1. Ice and water shield shall be laid in horizontal layers with joints lapped toward the eaves a minimum of 6", and well secured along laps and at ends as necessary to properly hold the felt in place. All underlayment shall be preserved unbroken and whole.
2. Ice and water shield shall lap all hips and ridges at least 12" to form double thickness and shall be lapped 6" over the metal of any valley or built-in gutters and shall be installed as required by the Standing Seam Panel Manufacturer to attain the desired 20 Year Weathertightness Warranty.

D. Roof Panels: Install panels in strict accordance with manufacturer's instructions, minimizing transverse joints except at junction with penetrations.
   1. Form weathertight standing seams incorporating concealed clips, using an automatic mechanical seaming device approved by the panel manufacturer.

E. Snow Guards:
   1. Place clamps at maximum 32 inches on center or as required by in-service loads.
   2. Place clamps in straight, aligned rows.
   3. Place both set screws on same side of clamp.
   4. Tighten set screws to manufacturer's recommended torque. Randomly test set screw torque using calibrated torque wrench.
   5. Insert color-matched metal strips into cross members, staggering strips to cover cross member joints.
   6. Attach cross members to clamps; tighten bolts to manufacturer's recommended torque.
   7. Install splice connectors at cross member end joints.
   8. Do not cantilever cross members more than 4 inches beyond last clamp at ends.
   9. Install two snow and ice clips per panel between panel seams.

F. Provide elbows at base of downspouts to direct water away from building.

3.04 CLEANING
   A. Clean exposed sheet metal work at completion of installation. Remove grease and oil films, excess joint sealer, handling marks, and debris from installation, leaving the work clean and unmarked, free from dents, creases, waves, scratch marks, or other damage to the finish.

3.05 PROTECTION
   A. Do not permit storage of materials or roof traffic on installed roof panels. Provide temporary walkways or planks as necessary to avoid damage to completed work. Protect roofing until completion of project.
   B. Touch-up, repair, or replace damaged roof panels or accessories before Date of Substantial Completion.

END OF SECTION
SECTION 07 42 33 - EXTERIOR SOLID PHENOLIC RAINSCREEN PANEL SYSTEM

PART 1 - GENERAL

1.01 SUMMARY

A. Section Includes:
   1. Exterior solid phenolic rainscreen wall panels and supporting substructure.

B. Related Sections:
   1. Division 06 "Rough Carpentry" for exterior rainscreen wall system substrate materials and installation.
   2. Division 07 "Weather Barriers" for rain and air resistant barrier, which is an integral part of rainscreen design.
   3. Division 07 - "Thermal Insulation"

1.02 SYSTEM DESCRIPTION

A. Exterior Rainscreen Assembly: Solid phenolic core, fire-retardant, exterior grade rainscreen wall panels, substructure, attachment system components, air/vapor barrier membrane, continuous exterior insulation, and all accessories necessary for a complete rear-ventilated, weathertight exterior rainscreen wall system. Furnish fastenings and flashings as required to complete rainscreen system.

1.03 PERFORMANCE REQUIREMENTS

A. General Performance: Solid phenolic exterior rainscreen wall panel system, aluminum substructure, and attachment accessories shall comply with performance requirements without failure due to defective manufacture, fabrication, installation, or other defects in construction.

B. Delegated Design Engineering: Design solid phenolic exterior rainscreen wall panel system, including comprehensive engineering analysis by a qualified professional engineer, using performance requirements and design criteria indicated.
   1. Design shall be inclusive of support structure system and all attachment accessories.
   2. Design shall be inclusive of solid phenolic exterior rainscreen wall panel manufacturing and shall conform to Manufacturer’s recommended installation procedures.

C. Structural Performance: Provide solid phenolic exterior wall panel system capable of withstanding the effects of the following loads and stresses within limits and under conditions indicated based on Manufacturer’s most current testing standards:
   1. Wind Loads: Provide exterior rainscreen wall panel system, including aluminum support structure, capable of withstanding wind loads calculated according to requirements of authorities having jurisdiction or as determined based on the following minimum design wind pressures, whichever are more stringent:
      a. Uniform pressure as indicated on Drawings.
      b. As determined by the American Society of Civil Engineers’ ASCE 7, “Minimum Design Loads for Buildings and Other Structures,” “Analytical Procedure”.

D. Deflection Limits: support structure and exterior phenolic rainscreen panel system shall be designed in accordance with the Manufacturer’s recommended maximum deflection when tested under positive and negative design wind gust loads and shall withstand wind gust loads with horizontal deflections no greater than the Manufacturer’s allowable span.

E. Thermal Movements: Exterior solid phenolic rainscreen panel system shall allow for thermal movements from ambient air and surface temperature changes by preventing buckling, opening of joints, over-stressing of components, failure of connections and other detrimental effects. Base calculations on surface temperature changes of materials due to both solar heat gain and nighttime-sky heat loss.

F. Support System: Provide support system capable of the following:
   1. Design and install support structure to accommodate expected construction tolerances and misalignment, deflection of building structural components, and openings in the building enclosure as designed.
1.04 SUBMITTALS

A. Product Data: For each type of product indicated. Include Manufacturer's written installation instructions, including recommendations for evaluating, preparing, and treating substrate, rainscreen panel technical data, material descriptions, and finishes and tested physical and performance properties.

B. Shop Drawings: Show fabrication and installation layouts of solid phenolic exterior rainscreen panel, details of support structure conditions, anchorages for support structure, attachmentsystem for panels, allowances for thermal expansion, trim, flashings, closures, corners, and accessories as required, and all special job specific details.

C. Samples: For each type of exposed finish required, prepared on samples of size and type indicated below for approval:
   1. Rainscreen Wall Panels: Minimum 4” x 4” including fasteners and other wall panel accessories as required.
   2. Support Structure: 12” long including fasteners and other accessories. Submit samples demonstrating materials, colors, and fastener attachment type.

D. Installer Qualification Data: For Installer, provide certification signed by solid phenolic rainscreen panel Manufacturer certifying that Installer complies with requirements to perform the work specified in this Section.

E. Qualification Data: For professional engineer.

F. Engineering Design Certification: From solid phenolic rainscreen panel Manufacturer, provide certification of acceptance of final shop drawings and acceptance of qualifications for installer. Certification must be provided before the start of the Work.

G. Closeout Submittals: From solid phenolic panel rainscreen panel Manufacturer, provide the following:
   1. Operation and Maintenance Data: Operation and maintenance manuals including methods for maintaining installed products, replacing damaged panels, and precautions against cleaning materials and methods detrimental to finishes and performance.
   2. FSC Chain of Custody Certificate.

H. Warranty: Sample of Manufacturer’s standard 10 year material and labor warranty for solid phenolic exterior rainscreen wall panel system.

1.05 QUALITY ASSURANCE

A. Installer Qualifications: A firm experienced in the installation of exterior rainscreen wall panel systems who has a minimum of 3 years installing products indicated for this Project, whose work has resulted in applications with a record of successful in-service performance, and who is recognized and approved by the manufacturer as suitable for the execution of the Work.

B. Fabricator Qualifications: A shop that employs skilled workers who custom fabricate solid phenolic or similar exterior rainscreen wall panel systems to those required for this Project and whose finished products have a record of successful in service performance and who is certified by the Manufacturer.

C. Source Limitations: Obtain solid phenolic rainscreen panels and all auxiliary materials from a single-source Manufacturer who has a minimum of 25 years experience in the manufacture of exterior rainscreen wall systems or an accessory Manufacturer who is certified by the solidphenolic rainscreen panel Manufacturer. Panels shall be manufactured in accordance with ISO9001 and ISO14001.

D. Mock Ups: Before construction of exterior rainscreen envelope, construct mock-up to verify selections made under approved submittals and to demonstrate typical joints, surface finish, texture, tolerances, attachments to building structure, methods of installation, connections to adjacent building enclosure materials, and standard and quality or workmanship. Build mockups to comply with the following requirements using materials indicated for completion of the Work:
1. Mock-up shall be a minimum of 100 sq./ft. and shall demonstrate substrate surface preparation, air barrier membrane joint and crack treatment, solid phenolic rainscreen panel attachment, penetration sealing, connection to window and other adjacent building envelope materials, and standard of workmanship.

2. Demonstrate continuity, air, and watertightness of air and water barrier and installation and attachment of continuous exterior insulation.

3. Provide in-situ mock-up testing according to the Project requirements as specified herein by an independent testing agency approved and certified to perform such testing.

4. If Architect determines that field constructed mock-up does not meet Project requirements, reinstall mock-up until approved.

5. Retain and maintain approved field sample during construction in an undisturbed condition as a standard for judging the completed exterior solid phenolic rainscreen panel system. An undamaged field sample may become part of the completed Work.

6. At the architects' discretion, the mock up may be part of the finished work.

E. Pre-Installation Conference: Conduct pre-installation conference at Project site prior to commencing construction of mock-up specified herein to verify Project requirements.

1. Review solid phenolic rainscreen panel installation requirements including substrate surface preparation, environmental limitations, typical details and flashings, Manufacturer's recommended installation procedures, coordination with adjacent trades, testing and inspection procedures, protection and repair procedures.

2. Ensure all sub-trades interfacing with or affected by the construction of the solid phenolic rainscreen panel system are present, including Architect, General Contractor, solid phenolic rainscreen panel Manufacturer, mock up and commissioning testing agencies, air barrier installer, exterior insulation installer, structural substrate installer, plumbing installer, window installer, electrical installer and any other installer whose work interfaces with or affects the solid phenolic rainscreen wall panels.

1.06 MOCKUP

A. Mockups: Provide materials and construct applicable portions of mockup as indicated on Section 01 45 40 Mock-Up Requirements.

1.07 PROJECT CONDITIONS, STORAGE, AND HANDLING

A. Environmental Limitations: Proceed with installation only when existing and forecasted weather conditions permit assembly of solid phenolic rainscreen wall panels to be performed according to Manufacturer’s written installation instructions and warranty requirements.

B. Field Measurements: Verify actual panel measurements/openings by field measurement before fabrication to accommodate site tolerances and changes in construction.

C. Comply with Manufacturer’s stated ordering, lead-time, and manufacturing requirements to avoid construction delays.

D. Deliver solid phenolic panel materials, support structure, and other manufactured accessory materials in Manufacturer’s original, unopened, and undamaged containers with identification labels intact and visible. Package solid phenolic rainscreen panels for protection during transportation and handling. Comply with Manufacturer’s and Distributor’s written delivery and handling guidelines.

E. Store solid phenolic rainscreen panels horizontally, covered with suitable weathertight and ventilated covering to prevent exposure to UV light and to ensure dryness with positive slope for drainage. Do not store panels in contact with ground or with materials that might cause staining, damage, scratching, or other surface damage.

F. Phenolic panel installer shall notify the General Contractor or Construction Manager immediately upon discovery of any issues with the substrate. i.e improper framing, walls out of plumb, windows not properly aligned, etc. These issues shall be appropriately addressed prior to continuation of panel system installation.

G. Remove damage and waste panel material from site and legally dispose of according to authorities having jurisdiction.
1.08 WARRANTY
   A. Submit Manufacturer's standard limited 10 year warranty covering material and labor.
   B. Warranty only available when panels are installed and fabricated by an installation contractor that has been approved and trained by the manufacturer's representative to follow the recommended guidelines.

PART 2 - PRODUCTS

2.01 SOLID PHENOLIC EXTERIOR RAINSCREEN WALL PANELS
   A. General: Subject to compliance requirements, provide solid phenolic rainscreen wall panels for exterior façade applications:
      1. Basis of Design: Fundermax Modulo as imported by Architects Surfaces LLC. www.architectssurfaces.com
   B. Product Description:
      1. Rainscreen Material: Solid phenolic resin, fire-retardant exterior grade rainscreen panel.
      2. Surface: Double Hardened Acrylic "NT" Surface
      3. Rainscreen Panel Finish: Refer to Drawing Sheets AG003 & AG004.
      4. Rainscreen Panel Core: Standard brown core.
      5. Rainscreen Panel Thickness: 8mm.
      6. Rainscreen Panel Standard Sizes: As indicated on drawings. Provide European sizes, not US.
      7. Substructure: Profiles, clips, closures, and tees and indicated on the project drawings.
   C. Physical Properties:
      1. Smoke Development Index: Less than 450 per ASTM E-84.
      2. Flame Spread Index: Less than 25 per ASTM E-84.
      3. NFPA268 Surface Ignition test, pass.
      4. Panels shall have UV and weather resistance performance with a grey scale rating minimum of 4-5 per ISO 4892-2, 4892-3.
      5. Panels shall be impact resistant per EN-ISO 178
      6. Panels shall be hail impact resistant, 2 3/4" ice ball at a velocity of approx. 67 mph with no breakage, discoloration or tearing. Tested per Austrian APBIC Standard, Association of Public Building Insurance Companies.
      7. Panels shall be scratch resistant per EN-438-6

2.02 AUXILIARY MATERIALS
   A. Trim Accessories: Provide manufacturer's extruded aluminum trim units for interior and exterior corners, perimeter trim and miscellaneous trim in profiles indicated on drawings. Additionally, provide extruded aluminum inside corner trim, outside corner trim and perimeter trim matching solid phenolic panel trim for all trim pieces at fiber cement siding specified in Section 07 46 46 0 Fiber Cement Siding.
      1. Trim Finish: Manufacturer's fluoropolymer painted finish. Trim color to match aluminum clad wood windows specified in Section 08 55 00.
   B. Aluminum Support Structure: Extruded, finished, and color-matched for the type of use indicated on project Drawings.
   C. Attachment Accessories: Of type, size, corrosion-resistance, holding-power and color-matched as required to suit attachment to aluminum support structure.

2.03 FABRICATION
   A. General: Fabricate solid phenolic rainscreen wall panels and accessory materials in accordance with Manufacturer’s written instructions and approved submittals, and at a fabrication facility trained and approved by Manufacturer. Comply with indicated profiles and within dimensional and structural requirements.
PART 3 - EXECUTION

3.01 EXAMINATION

A. Examine substrates, areas, and conditions, with Installer present, for compliance with requirements for installation tolerances of structural substrate, support structure, solid phenolic rainscreen panel, and other conditions affecting performance.

1. Verify that substrate conditions, wall framing, and other structural panel support members and anchorages installed under other sections are acceptable for product installation and have been installed within acceptable tolerances in accordance with Manufacturer’s written instructions.

2. Verify that air and weather resistant barrier has been installed over structural sheathing in accordance with air barrier Manufacturer’s recommend installation instructions and terminated properly at openings to prevent air infiltration or water penetration.

3. Examine rough-in installation for components and systems adjacent to and penetrating into solid phenolic rainscreen panels to verify actual locations of penetrations relative to joint locations of panels prior to panel installation.

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

3.02 PREPARATION

A. Support Structure: Install clips, channels, fillers, and other components in accordance with approved Shop Drawings and Manufacturer's recommended installation instructions.

B. Install support structure framing level and plumb and within tolerances of the completed system as approved and recommend by Manufacturer and in accordance with approved Shop Drawings.

C. Ensure air and water barrier is properly installed per air and water barrier Manufacturer’s approved rainscreen wall panel installation instructions and is protected from UV light deterioration at panel open joint locations or is otherwise UV stable. Pay close attention to manufacturer’s recommendations for treating penetrations in the membrane.

D. Notify General Contractor or Construction Manager immediately upon discovery of any tears, holes, or other damages to the membrane or barrier.

3.03 SOLID PHENOLIC RAINSCREEN PANEL INSTALLATION

A. Install solid phenolic rainscreen panels plumb and level and accurately spaced per Manufacturer's written installation instructions and in accordance with approved Shop Drawings.

B. Install vertical framing members at 495 mm on center for support of the system.

C. Fasten solid phenolic rainscreen wall panels to aluminum support structure with fasteners approved for use with adjoining construction and in accordance with approved Shop Drawings for color matching and to confirm compliance with wind load and engineering design requirements.

D. Accessory Rainscreen System Materials: Install corner profiles, gaskets, trim, and joint closure strips as required with fasteners appropriate for use with adjoining construction as indicated on drawings and as recommended by Manufacturer.

E. Erection Tolerances: Install aluminum support structure within the required installation tolerances as recommended by Manufacturer and in accordance with approved Shop Drawings.

F. Do not apply sealant to solid phenolic rainscreen panel joinery unless otherwise indicated on Drawings or in accordance with Manufacturer’s recommended installation instructions.

3.04 CLEANING

A. Upon completion of solid phenolic rainscreen wall panel installation clean finished surfaces as recommended by panel Manufacturer prior to Owners’ acceptance.

B. Legally dispose of all surplus materials off site.

END OF SECTION
SECTION 07 46 46 - FIBER CEMENT SIDING

PART 1 GENERAL

1.01 SECTION INCLUDES
A. Wood-fiber cement siding.

1.02 RELATED REQUIREMENTS
A. Section 07 42 33 - Exterior Phenolic Rainscreen Panel System: For corner and perimeter extruded aluminum trims.

1.03 REFERENCE STANDARDS

1.04 SUBMITTALS
A. Product Data: Manufacturer's data sheets on each product to be used, including:
   1. Manufacturer's requirements for related materials to be installed by others.
   2. Preparation instructions and recommendations.
   3. Storage and handling requirements and recommendations.
   4. Installation methods, including nail patterns.
B. Shop Drawings: Showing attachments, details and loads for backup support system, signed and sealed by structural engineer licensed in the state the project is located.

1.05 QUALITY ASSURANCE
A. Mockups: Provide materials and construct applicable portions of mockup as indicated on Section 01 45 40 Mock-Up Requirements.

1.06 DELIVERY, STORAGE, AND HANDLING

PART 2 PRODUCTS

2.01 MANUFACTURERS
A. Basis-of-Design:

2.02 SIDING
A. Lap Siding: Individual horizontal boards made of cement and cellulose fiber formed under high pressure with integral surface texture, complying with ASTM C1186 Type A Grade II; with machined edges, for nail attachment.
   2. Texture: Smooth.
   3. Length: 12 ft, nominal.
   4. Width (Height): 5-1/4 inches.
   5. Thickness: 5/16 inch, nominal.
   7. Color: Refer to Drawing Sheets AG003 & AG004.
   8. Warranty: 50 year limited; transferable.
B. Panel Siding: Vertically oriented panels made of cement and cellulose fiber formed under high pressure with integral surface texture, complying with ASTM C1186 Type A Grade II; with machined edges, for nail attachment.
   1. Texture: Smooth.
   2. Length (Height): 96 inches, nominal.
   5. Finish: Factory applied topcoat.
   6. Color: Refer to Drawing Sheets AG003 & AG004.
7. Warranty: 50 year limited; transferable.

C. Trim: Individual board trim units made of cement and cellulose fiber formed under high pressure with integral surface texture, complying with ASTM C1186 Type A Grade II; with machined edges, for nail attachment.

1. Texture: Smooth.
2. Widths: 3-1/2 & 5-1/2 inches as detailed on drawings.
3. Thickness: 3/4 inches.
5. Color: Refer to Drawing Sheets AG003 & AG004.
6. Warranty: 50 year limited; transferable.

2.03 ACCESSORIES

A. Furring Strips: Wood furring strips.
B. Fiber Cement Trim: Same material and texture as siding.
C. Extruded Aluminum Trim: Refer to Section 07 42 33 - Exterior Solid Phenolic Rainscreen Panel System.
D. Concealed Flashings: Provide stainless steel flashings in accordance with Section 07 62 00 - Sheet Metal Flashings and Trim.
E. Fasteners: Galvanized or corrosion resistant; length as required to penetrate minimum 1-1/4 inch.

PART 3 EXECUTION

3.01 EXAMINATION

A. Examine substrate and clean and repair as required to eliminate conditions that would be detrimental to proper installation.
B. Verify that water-resistant barrier has been installed over substrate completely and correctly.
C. Do not begin until unacceptable conditions have been corrected.
D. If substrate preparation is the responsibility of another installer, notify Architect of unsatisfactory preparation before proceeding.

3.02 PREPARATION

A. Install stainless steel flashing:
   1. Above door and window trim and casings.
   2. Above horizontal trim in field of siding.

3.03 INSTALLATION

A. Install in accordance with manufacturer's instructions and recommendations.
   1. Read warranty and comply with all terms necessary to maintain warranty coverage.
   2. Use trim details indicated on drawings.
   3. Touch up all field cut edges before installing.
   4. Pre-drill nail holes if necessary to prevent breakage.
B. Over Wood and Wood-Composite Sheathing: Fasten siding to wood furring strips as detailed on drawings.
C. Joints in Horizontal Siding: Avoid joints in lap siding except at corners; where joints are inevitable stagger joints between successive courses.
D. After installation, seal all joints except lap joints of lap siding. Seal around all penetrations. Paint all exposed cut edges.

3.04 PROTECTION

A. Protect installed products until completion of project.
B. Touch-up, repair or replace damaged products before Substantial Completion.

END OF SECTION
SECTION 07 46 49 - POLY-ASH TRIM

PART 1 GENERAL

1.01 SECTION INCLUDES
   A. Poly-Ash Trim.

1.02 RELATED REQUIREMENTS
   A. Section 09 91 13 – Exterior Painting: Painting exterior synthetic trim.

1.03 REFERENCE STANDARDS
   G. AWPA E10 – Standard Method of Testing Wood Preservatives by Laboratory Soil-Block Cultures.

1.04 SUBMITTALS
   A. Product Data: Submit manufacturer’s product data, including installation instructions.
   B. Samples: Submit manufacturer’s sample of exterior synthetic trim, minimum 12 inches long of dimensions specified for project.
   C. Manufacturer’s Certification: Submit manufacturer’s certification that materials comply with specified requirements and are suitable for intended application.
   D. Warranty Documentation: Submit manufacturer’s standard warranty.

1.05 QUALITY ASSURANCE
   A. Mock-up: Provide materials and installation of poly-ash trim, components and accessories installed as part of exterior wall mock-ups detailed on drawings.

1.06 DELIVERY, STORAGE, AND HANDLING
   A. Storage and Handling Requirements:
      1. Store and handle materials in accordance with manufacturer’s instructions.
      2. Keep materials in protective covering until installation.
      3. Store materials in clean, dry area.
      4. Store exterior synthetic trim on flat, level surface.
      5. Keep exterior synthetic trim covered and free of dirt and debris.
      6. Protect materials and finish during storage, handling, and installation to prevent damage.

1.07 WARRANTY
   A. Warranty Period for Exterior Synthetic Trim: 20-year limited warranty.
      1. No decay due to rot.
      2. No excess swelling from moisture.
      3. Resist termite damage.

PART 2 PRODUCTS

2.01 MANUFACTURER
   A. Boral Composites Inc., Boral TruExterior Trim.
2.02 EXTERIOR POLY-ASH TRIM

A. Composition:
   1. Post-Industrial Recycled Content: Minimum 70 percent, by weight.
   2. Post-Consumer Recycled Content: Minimum 2 percent, by weight
   3. Pigments and dyes.

B. Physical Properties:
   1. Density, ASTM C 1185: 40 to 50 pcf.
   2. Water Absorption, ASTM D 570: Less than 1.5 percent.
   3. Fungi Rot, AWPA E10:
   4. Termite Resistance, AWPA E1: Greater than 9.0, with 10 being impervious.

C. Mechanical Properties:
   1. Flexural Strength, ASTM C 1185: Greater than 1,600 psi.

D. Thermal Properties:
   1. Coefficient of Linear Expansion, ASTM D 6341, Typical: 1.40E-05 in/in/degree F, tested at
      minus 30 to 140 degrees F.
   2. Flame Spread, ASTM E 84: Between 25 and 29

E. Trim Sizes: As indicated on drawings.
   1. Manufacturing Tolerances:
      a. Width: Plus or minus 1/16 inch.
      b. Thickness: Plus or minus 1/16 inch.
      c. Length: Plus 2 inches, minus 0 inch.
      d. Edge Cut: Plus or minus 2 degrees.
   2. Exposed Texture: Woodgrain.

2.03 FINISHES

A. Factory Applied Primer:
   1. Acrylic based.
   2. Low VOC.
   3. Factory applied on all sides.

2.04 FASTENERS

A. Type: Nails.
   1. Finish: Stainless steel.

PART 3 EXECUTION

3.01 EXAMINATION

A. Examine surfaces to receive exterior synthetic trim.
B. Notify Architect of conditions that would adversely affect installation or subsequent use.
C. Do not begin installation until unacceptable conditions are corrected.

3.02 INSTALLATION

A. Install trim in accordance with manufacturer’s instructions at locations indicated on the
   Drawings.
B. Do not install trim in structural or load-bearing applications.
C. Install trim plumb, level, and square.
D. Install trim with flush, tight joints.
E. Install Fasteners:
   1. Maximum of 24 inches on center.
2. Within 2 inches of end of boards.

F. Fill nail and screw holes with acrylic caulk, wood filler, or auto body filler.

G. Repair minor damages to trim in accordance with manufacturer's instructions and as approved by Architect.

H. Remove and replace damaged trim that cannot be successfully repaired as determined by Architect.

I. Painting:
   1. Apply top coat to trim over factory-applied primer.
      a. Within 150 days of installing trim.
      b. As specified in Section 09 91 13 - Exterior Painting.

3.03 PROTECTION

A. Protect installed trim to ensure that, except for normal weathering, trim will be without damage or deterioration at time of Substantial Completion.

END OF SECTION
SECTION 07 53 00 - ELASTOMERIC MEMBRANE ROOFING

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Elastomeric roofing membrane, adhered conventional application.
B. Insulation, flat and tapered.
C. Flashings.
D. Roofing cant strips, stack boots, roofing expansion joints, and walkway pads.

1.02 RELATED REQUIREMENTS

A. Section 06 10 00 - Rough Carpentry: Wood nailers and curbs.
B. Section 07 62 00 - Sheet Metal Flashing and Trim: Counterflashings and copings.
C. Section 07 90 05 - Sealants.

1.03 REFERENCE STANDARDS


1.04 PERFORMANCE REQUIREMENTS

A. All components of the roofing system shall be manufactured, supplied, or accepted by the manufacturer/supplier and be a part of an accepted or approved FM Global RoofNav Assembly.
   1. Roof system must meet the minimum rating requirements of FM Global Class 1-A-60-SH.
B. General Performance: Installed membrane roofing and base flashings shall withstand specified uplift pressures, thermally induced movement, and exposure to weather without failure due to defective manufacture, fabrication, installation, or other defects in construction. Membrane roofing and base flashings shall remain watertight.
C. Material Compatibility: Provide roofing materials that are compatible with one another under conditions of service and application required, as demonstrated by membrane roofing manufacturer based on testing and field experience. Additionally, provide surety that roofing materials are compatible with adjacent weather and water barrier membrane systems.
D. Comply with all local code requirements.
E. Prevent chemical contaminants from coming into direct contact with the roofing membrane. If resistance to specific chemicals is required, contact the manufacturer/supplier for recommendations.

1.05 SUBMITTALS

A. Product Data: Provide data indicating membrane materials, flashing materials, insulation, fasteners, and sealants.
B. Shop Drawings: Include plans, elevations, sections and details which indicate joint or termination detail conditions, setting plan for tapered insulation, mechanical fastener layout, and conditions of interface with other materials adjacent to the roofing system. Shop drawings must be signed and certified as meeting requirements of roofing warranty indicated, prior to beginning installation.
C. Submit a letter of certification from the manufacturer which certifies the roofing contractor is authorized to install the manufacturer's roofing system and lists foremen who have received training from the manufacturer along with the dates training was received.
D. Manufacturer's Installation Instructions: Indicate membrane seaming precautions and perimeter conditions requiring special attention.

E. Manufacturer's Certification: Certify that project has been reviewed by roofing system manufacturer prior to installation and installation detailed in shop drawings is approved by manufacturer as meeting warranty requirements indicated.

F. Warranty: Submit manufacturer warranty and ensure forms have been completed in Owner's name and registered with manufacturer.

1.06 QUALITY ASSURANCE

A. Installer Qualifications: A qualified firm that is approved, authorized, or licensed by membrane roofing system manufacturer to install manufacturer's product and that is eligible to receive manufacturer's special warranty.

B. Source Limitations: Products used in the work included in this section shall be produced or supplied by the manufacturer and must have a history of successful production acceptable to the Owner.

C. All products (including insulation, fasteners, fastening plates and edgings) must be manufactured and/or supplied by the roofing system manufacturer and covered by the warranty.

D. Exterior Fire-Test Exposure: ASTM E 108, Class A; for application and roof slopes indicated, as determined by testing identical membrane roofing materials by a qualified testing agency. Materials shall be identified with appropriate markings of applicable testing agency.

E. Preinstallation Roofing Conference: A pre-installation conference shall be held two weeks prior to commencement of field operations to establish procedures to maintain optimum working conditions and to coordinate this work with related and adjacent work. Attendance shall include the contractors of adjacent systems and substrates, and the roofing system manufacturer representative. Agenda for meeting shall include but not be limited to the following:
   1. Review of approved submittals.
   2. Review of surface preparation, minimum curing period and installation procedures.
   3. Review of special details and flashings.
   4. Sequence of construction, responsibilities and schedule for subsequent operations.
   5. Review of mock-up requirements.
   6. Review of inspection, testing, protection and repair procedures.

1.07 DELIVERY, STORAGE, AND HANDLING

A. Deliver products in manufacturer's original containers, dry, undamaged, with seals and labels intact. Store in a dry location. Comply with insulation manufacturer's written instructions for handling, storing, and protecting during installation.

B. Store products in weather protected environment, clear of ground and moisture, moisture, soiling, and other sources.

C. Protect foam insulation from direct exposure to sunlight.

D. Handle and store roofing materials and place equipment in a manner to avoid overloading and/or permanent deflection of deck.

1.08 FIELD CONDITIONS

A. Do not apply roofing membrane during unsuitable weather.

B. Do not apply roofing membrane when ambient temperature is below 40 degrees F without manufacturer's approval specific to this project.

C. Do not apply roofing membrane to damp or frozen deck surface or when precipitation is expected or occurring.

D. Only as much of the new roofing as can be made weather-tight each day including all flashings and detail work, shall be installed.
1.09 WARRANTY

A. Warranty: Total System Warranty, no dollar limit, in which manufacturer agrees to repair or replace components of membrane roofing system that fail in materials or workmanship within specified warranty period. Failure includes roof leaks from incidental membrane punctures.
   1. Warranty includes roofing membrane, base flashings, roofing membrane accessories, roof insulation, fasteners, and other components of membrane roofing system.
   2. Warranty shall include peak wind speed of 72 mph and 1” hail coverage.
   3. Warranty Period: 20 years from date of Substantial Completion.
   4. Warranty shall include labor and materials.

B. Pro-rated System Warranties shall not be accepted.

C. Upon completion of the installation, the applicator shall arrange for an inspection to be made by a non-sales technical representative of the membrane manufacturer in order to determine whether or not corrective work will be required before the warranty will be issued. Notify the Architect and building owner seventy-two (72) hours prior to the manufacturer’s final inspection.

PART 2 PRODUCTS

2.01 MANUFACTURERS

A. EPDM Membrane Systems: Provide one of the following:
   2. Firestone.

2.02 ROOFING

A. Elastomeric Membrane Roofing: One ply membrane, fully adhered, over insulation.

B. Acceptable Insulation Types - Constant Thickness Application: Any of the types specified.
   1. Minimum 2 layers of polyisocyanurate board.
   2. Provided by membrane manufacturer.

C. Acceptable Insulation Types - Tapered Application: Any of the types specified.
   1. Provide factory-tapered polyisocyanurate insulation boards fabricated to slope of 1/2 inch per 12 inches unless otherwise indicated.
   2. Provided by membrane manufacturer.

2.03 ROOFING MEMBRANE AND ASSOCIATED MATERIALS

A. Membrane: Ethylene-propylene-diene-terpolymer (EPDM); externally reinforced with fabric; complying with minimum properties of ASTM D4637/D4637M.
   1. Thickness: 0.060 inch.
   2. Color: Black.
   3. Tensile Strength: 1300 psi, measured in accordance with ASTM D412.
   4. Ultimate Elongation: 300 percent, measured in accordance with ASTM D412.
   5. Tear Strength: 150 lbf/inch, measured in accordance with ASTM D624.

B. Seaming Materials: Manufacturer’s standard pre-manufactured synthetic-rubber polymer primer and butyl splice tape with release film.

C. Base Flashings: 60 mil EPDM.

D. Flexible Flashing Material: Same material as membrane.

2.04 INSULATION

A. Polyisocyanurate Board Insulation: Rigid cellular foam, complying with ASTM C1289, Type II, Class 1, cellulose felt or glass fiber mat both faces; Grade 2 and with the following characteristics:
   1. Compressive Strength: 20 psi nominal.
   2. Board Thickness: As indicated on drawings, installed in layers with staggered joints.
4. Tapered Units: Provide factory-tapered insulation boards fabricated to slope of 1/4 inch per 12 inches unless otherwise indicated.

2.05 ACCESSORIES
A. Substrate Board: ASTM C 1177/C 1177M, glass-mat, water-resistant gypsum substrate, thickness as required by manufacturer's warranty but not less than 1/2 inch, factory primed.
B. Cover Board: ASTM C 1177/C 1177M, glass-mat, water-resistant gypsum substrate, thickness as required by manufacturer's warranty and per FM Global RoofNav approved assembly, but not less than 1/2 inch, factory primed.
C. Stack Boots: Prefabricated flexible boot and collar for pipe stacks through membrane; same material as membrane.
D. Insulation Joint Tape: Glass fiber reinforced type as recommended by insulation manufacturer, compatible with roofing materials; 6 inches wide; self adhering.
E. Membrane Adhesive: As recommended by membrane manufacturer for conditions at time of installation.
F. Metal Termination Bars: Manufacturer's standard, predrilled stainless-steel or aluminum bars, approximately 1 by 1/8 inch thick; with anchors.
G. Metal Battens: Manufacturer's standard, aluminum-zinc-alloy-coated or zinc-coated steel sheet, approximately 1 inch wide by 0.05 inch thick, prepunched.
H. Fasteners: Factory-coated steel fasteners and 18-20 ga. metal plates complying with corrosion-resistance provisions in FM Approvals 4470, designed for fastening membrane to substrate, and acceptable to roofing system manufacturer to obtain specified warranty.
I. Expansion Joints: Provide roofing manufacturer’s standard expansion joint assemblies with prefabricated units for corner and joint intersections and horizontal and vertical transitions including those to other building expansion joints, splicing units, adhesives, coatings and other components as recommended by roofing manufacturer for a complete installation covered under the specified warranty.
J. Miscellaneous Accessories: Provide pourable sealers, preformed cone and vent sheet flashings, preformed inside and outside corner sheet flashings, reinforced EPDM securement strips, T-joint covers, in-seam sealants, termination reglets, cover strips, and other accessories.
K. Insulation Adhesive: As recommended by insulation manufacturer for conditions at time of installation.
L. Sealants: As recommended by membrane manufacturer.
M. Minimize roof penetrations. If structural penetrations are unavoidable, use round structural steel shapes to facilitate flashing. Means of thermal break shall be accounted for. Equipment supports for rooftop mounted equipment shall be a minimum 18 inches height. Use prefabricated equipment supports where possible. Equipment support frames or stands shall provide following working clearances:

<table>
<thead>
<tr>
<th>Width of Equipment</th>
<th>Height of Legs (above Finished Roof)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Up to 37”</td>
<td>18”</td>
</tr>
<tr>
<td>2. 37 - 49”</td>
<td>24”</td>
</tr>
<tr>
<td>3. 49 - 61”</td>
<td>30”</td>
</tr>
<tr>
<td>4. Over 60”</td>
<td>48”</td>
</tr>
</tbody>
</table>
N. Walkway Pads: Factory-formed, nonporous, heavy-duty, solid-rubber, slip-resisting, surface-textured walkway pads or rolls, approximately 3/16 inch thick, and acceptable to membrane roofing system manufacturer.

PART 3 EXECUTION
3.01 EXAMINATION
A. Verify that surfaces and site conditions are ready to receive work.
B. Verify deck is supported and secure.
C. Verify deck is clean and smooth, flat, free of depressions, waves, or projections, properly sloped and suitable for installation of roof system.

D. Verify deck surfaces are dry and free of snow or ice.

E. Verify that roof openings, curbs, and penetrations through roof are solidly set, and cant strips are in place.

F. Verify that wood blocking, curbs, and nailers are securely anchored to roof deck at penetrations and terminations and that nailers match thicknesses of insulation.

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

3.02 PREPARATION

A. Clean substrate of dust, debris, moisture, and other substances detrimental to roofing installation according to roofing system manufacturer's written instructions. Remove sharp projections.

B. Prevent materials from entering and clogging roof drains and conductors and from spilling or migrating onto surfaces of other construction. Remove roof-drain plugs when no work is taking place or when rain is forecast. Place temporary roof drain grates when roof drain plugs are not in place.

C. Complete terminations and base flashings and provide temporary seals to prevent water from entering completed sections of roofing system at the end of the workday or when rain is forecast. Remove and discard temporary seals before beginning work on adjoining roofing.

D. Install nailers as specified in Section 06 10 00 - Rough Carpentry and as required by manufacturer's approved shop drawings.

E. Handle and store roofing materials and place equipment in a manner to avoid overloading and/or permanent deflection of deck.

3.03 SLOPE AND DRAINAGE

A. The roof shall have a minimum design slope of 1/4 inch per foot. Provide tapered insulation as required to achieve required slope. Use crickets, saddles and edge strips (tapered at 2 times slope) to direct water from penetrations and parapet walls.

B. Locate roof drains at projected low points. All roofs shall have overflow systems.

3.04 INSULATION - UNDER MEMBRANE

A. Coordinate installing membrane roofing system components so insulation is not exposed to precipitation or left exposed at the end of the workday.

B. Comply with membrane roofing system and insulation manufacturer's written instructions for installing roof insulation.

C. Tapered Insulation:
   1. Install tapered insulation with slope direction as indicated on the approved shop drawings. Miter cut all panels at valleys for tight fit and alignment throughout valley length.
   2. Install tapered saddles in valleys, where indicated on the approved drawings in the sizes shown. End of saddle shall provide or slope into the sump at the drainage device. End of saddle shall be of sufficient width at sump such that flat spots do not occur in valley. Saddle slope shall be twice the field slope, unless otherwise noted on the drawings.
   3. Utilize tapered insulation panels and tapered edge strips to construct sumps at roof drains and scuppers, where detailed. Size shall be as shown in approved shop drawings. Delete thermal insulation within sumps, as required, for installation of tapered panels, so as to provide continuous slope to drainage device, without creating a sharp/steep sloped transition. At no time shall slope within drain sump exceed 1:12, unless otherwise noted in drawings.
   4. Install tapered crickets on the upslope sides of all rectangular penetrations with a dimension greater than 18" perpendicular to slope. Cricket slope shall be twice the field's slope, unless otherwise noted on drawings.
5. Utilize tapered edge strip at transitions in construction of more than 1/4 inch, and in other specified locations, to provide a smooth transition and proper support for the membrane system or subsequent insulation layer. Field cut and shape edge strip as required. Direct slope of edge strip so as to provide for proper drainage.

6. Verify that tapered insulation is properly installed according to the approve shop drawings and that no irregularities exist that will result in ponding water in the finished roof system.

D. Attachment of Insulation:
1. Mechanically fasten insulation to deck in accordance with roofing manufacturer's instructions. Install each layer of insulation and secure to deck using mechanical fasteners specifically designed and sized for fastening specified board-type roof insulation to deck type.
   a. Fasten insulation to resist uplift pressure at corners, perimeter, and field of roof.
   b. Install cover boards over insulation with long joints in continuous straight lines with end joints staggered between rows. Offset joints of insulation below a minimum of 6 inches in each direction. Loosely butt cover boards together and fasten to roof deck to resist uplift pressure at corners, perimeter, and field of roof.
   c. Install fasteners in upper flutes of metal deck.
      1) Where it is not possible to install fasteners in upper flutes of deck, trim fastener 3/8" from surface of deck flute.

E. Lay subsequent layers of insulation with joints staggered minimum 6 inch from joints of preceding layer.

F. Place tapered insulation to the required slope pattern in accordance with manufacturer's instructions.

G. On metal deck, place boards parallel to flutes with insulation board edges bearing on deck flutes.

H. Lay boards with edges in moderate contact without forcing. Cut insulation to fit neatly to perimeter blocking and around penetrations through roof.

I. Tape joints of insulation in accordance with roofing and insulation manufacturers' instructions.

J. At roof drains, use boards cut to slope to slope down to roof drains over a distance of not less than 18 inches.

K. Install cover boards over insulation with long joints in continuous straight lines with end joints staggered between rows. Offset joints of insulation below a minimum of 6 inches in each direction. Loosely butt cover boards together and fasten to roof deck.
   1. Fasten cover boards to resist uplift pressure at corners, perimeter, and field of roof.
   2. Provide supplemental fasteners as required by manufacturer's warranty.

L. Do not apply more insulation than can be covered with membrane in same day.

3.05 MEMBRANE APPLICATION

A. Roll out membrane, free from wrinkles or tears. Place sheet into place without stretching.

B. Shingle joints on sloped substrate in direction of drainage.

C. Fully Adhered Application: Apply adhesive to substrate at rate required by manufacturer. Fully embed membrane in adhesive except in areas directly over or within 3 inches of expansion joints. Fully adhere one roll before proceeding to adjacent rolls.

D. In addition to adhering, mechanically fasten membrane roofing securely at terminations, penetrations, and perimeters.
   1. Provide supplemental membrane securement as required by manufacturer's warranty.

E. Overlap edges and ends and seal seams by contact adhesive, minimum 3 inches. Seal permanently waterproof. Apply uniform bead of sealant to joint edge.

F. Base Flashing Installation:
   1. Install sheet flashings and preformed flashing accessories and adhere to substrates according to membrane roofing system manufacturer's written instructions.
2. Apply bonding adhesive to substrate and underside of sheet flashing at required rate and allow to partially dry. Do not apply bonding adhesive to seam area of flashing.

3. Flash penetrations and field-formed inside and outside corners with cured or uncured sheet flashing.

4. Clean splice areas, apply splicing cement, and firmly roll side and end laps of overlapping sheets to ensure a watertight seam installation. Apply lap sealant and seal exposed edges of sheet flashing terminations.

5. Terminate and seal top of sheet flashings and mechanically anchor to substrate through termination bars.

6. Termination bars to be covered with a reglet and counterflashing even if not required by manufacturer's warranty.

G. At intersections with vertical surfaces:
   1. Extend membrane over cant strips and up a minimum of 6 inches onto vertical surfaces.
   2. Fully adhere flexible flashing over membrane and up to nailing strips.
   3. Install in accordance with manufacturer's warranty requirements.

H. Around roof penetrations, seal flanges and flashings with flexible flashing.
   1. Install in accordance with manufacturer's warranty requirements.

I. Install roofing expansion joints where indicated. Make joints watertight.
   1. Install in accordance with manufacturer's warranty requirements.

J. Coordinate installation of roof drains and related flashings.
   1. Install in accordance with manufacturer's warranty requirements.

K. Install walkway pads in accordance with manufacturer's instructions.

3.06 FIELD QUALITY CONTROL

A. Pre-Installation Inspection: Arrange for roofing system manufacturer's technical personnel to inspect roof deck prior to installation and submit report to Architect.
   1. Notify Architect or Contracting Officer one week in advance of date and time of inspection.

B. Final Roof Inspection: Arrange for roofing system manufacturer's technical personnel to inspect roofing installation on completion.
   1. Notify Architect or Owner a week in advance of date and time of inspection.

C. Repair or remove and replace components of membrane roofing system where inspections indicate that they do not comply with specified requirements.

D. Additional inspections, at Contractor's expense, will be performed to determine compliance of replaced or additional work with specified requirements.

3.07 CLEANING

A. Remove bituminous markings from finished surfaces.

B. In areas where finished surfaces are soiled by work of this section, consult manufacturer of surfaces for cleaning advice and conform to their documented instructions.

C. Repair or replace defaced or damaged finishes caused by work of this section.

3.08 PROTECTION

A. Protect installed roofing and flashings from construction operations.

B. Where traffic must continue over finished roof membrane, protect surfaces using durable materials.

END OF SECTION
SECTION 07 62 00 - SHEET METAL FLASHING AND TRIM

PART 1 GENERAL

1.01 SECTION INCLUDES
   A. Fabricated sheet metal items, including flashings, counterflashings, gutters, downspouts, and copings.
   B. Sealants for joints within sheet metal fabrications.
   C. Precast concrete splash pads.

1.02 RELATED REQUIREMENTS
   A. Section 06 10 00 - Rough Carpentry: Wood blocking for batten seams.
   B. Section 07 92 00 - Joint Sealants: Sealing non-lap joints between sheet metal fabrications and adjacent construction.

1.03 REFERENCE STANDARDS

1.04 SUBMITTALS
   A. See Section 01 30 00 - Administrative Requirements, for submittal procedures.
   B. Shop Drawings: Indicate material profile, jointing pattern, jointing details, fastening methods, flashings, terminations, and installation details.
   C. Samples for Verification: For each type of exposed finish required, prepared on samples of size below:
      1. Sheet Metal Flashing: 12 inches long. Include fasteners, closures, and other attachments.
      2. Trim: 12 inches long. Including fasteners and other exposed accessories.

1.05 QUALITY ASSURANCE
   A. Perform work in accordance with SMACNA (ASMM) and CDA A4050 requirements and standard details, except as otherwise indicated.

1.06 MOCK-UP
   A. Mockups: Provide materials and construct applicable portions of mockup as indicated on Section 01 45 40 Mock-Up Requirements.

1.07 DELIVERY, STORAGE, AND HANDLING
   A. Stack material to prevent twisting, bending, and abrasion, and to provide ventilation. Slope metal sheets to ensure drainage.
   B. Prevent contact with materials that could cause discoloration or staining.
PART 2 PRODUCTS

2.01 SHEET MATERIALS

A. Pre-Finished Aluminum: ASTM B209 (ASTM B209M); 20 gage (0.032 inch) thick; plain finish shop pre-coated with fluoropolymer coating.
   1. Fluoropolymer Coating: High Performance Organic Finish, AAMA 2604; multiple coat, thermally cured fluoropolymer finish system.
   2. Color: Refer to drawing sheets AG003 and AG004 for color selections.
B. Lead Sheet: ASTM B749, 3/64 (0.047) inch minimum thickness.

2.02 FABRICATION, GENERAL

A. Form sections true to shape, accurate in size, square, and free from distortion or defects.
B. Form pieces in longest possible lengths.
C. Hem exposed edges on underside 1/2 inch; miter and seam corners.
D. Form material with flat lock seams, except where otherwise indicated; at moving joints, use sealed lapped, bayonet-type or interlocking hooked seams.
E. Fabricate corners from one piece with minimum 18 inch long legs; seam for rigidity, seal with sealant.

2.03 SHEET METAL FABRICATIONS

A. Aluminum Composite Panel Copings: Refer to Division 7 Section "Aluminum Composite Panel Copings".
B. Copings and Gravel Stops: Fabricate in minimum 96 inch long, but not exceeding 10 foot long sections. Fabricate joint plates of same thickness as copings. Furnish with continuous cleats to support edge of external leg. Miter corners, seal watertight. Fabricate from the following material:
   1. Pre-finished Aluminum: 0.050 inch thick minimum.
C. Parapet Scuppers: Fabricate scuppers to dimensions required, with closure flange trim to exterior, 4-inch-wide wall flanges to interior, and base extending 4 inches beyond cant or tapered strip into field of roof. Fabricate from the following materials:
   1. Pre-finished Aluminum: 0.032 inch thick minimum.
D. Roof-Penetration Flashing: Fabricate from the following material:
   1. Stainless Steel: 0.0187 inch.
E. Roof-Drain Flashing: Fabricate from the following material:
   1. Stainless Steel: 0.0156 inch.

2.04 GUTTER AND DOWNSPOUT FABRICATION

A. Gutters: SMACNA (ASMM), Rectangular profile.
B. Downspouts: Rectangular profile.
C. Gutters and Downspouts: Size for rainfall intensity determined by a storm occurrence of 1 in 10 years in accordance with SMACNA (ASMM).
   1. Prefinished Aluminum: 0.032 inch thick minimum.
D. Accessories: Profiled to suit gutters and downspouts.
   1. Anchorage Devices: In accordance with SMACNA (ASMM) requirements.
   2. Gutter Supports: Brackets.
   3. Downspout Supports: Brackets.
E. Splash Pads: Precast concrete type, of size and profiles indicated; minimum 3000 psi at 28 days, with minimum 5 percent air entrainment.
F. Seal metal joints.
2.05 ACCESSORIES

A. General: Provide materials and types of fasteners, solder, welding rods, protective coatings, separators, sealants, and other miscellaneous items as required for complete sheet metal flashing and trim installation.

B. Fasteners: Wood screws, annular threaded nails, self-tapping screws, self-locking rivets and bolt, and other suitable fasteners designed to withstand design loads.
   1. Exposed Fasteners: Heads matching color of sheet metal by means of plastic caps or factory-applied coating.
   2. Fasteners for Flashing and Trim: Blind fasteners or self-drilling screws, gasketed with hex washer heads.
   4. Use fasteners of sizes that will penetrate substrate not less than 1-1/4 inches for nails and not less than 3/4 inch for wood screws. Use stainless steel fasteners.

C. Underlayment: ASTM D226/D226M, organic roofing felt, Type I (No. 15).

D. Slip Sheet: Rosin sized building paper.

E. Primer: Zinc chromate type.

F. Concealed Sealants: Non-curing butyl sealant.

G. Exposed Sealants: ASTM C920; elastomeric sealant, with minimum movement capability as recommended by manufacturer for substrates to be sealed; color to match adjacent material.

H. Plastic Cement: ASTM D4586/D4586M, Type I.

PART 3 EXECUTION

3.01 EXAMINATION

A. Verify roof openings, curbs, pipes, sleeves, ducts, and vents through roof are solidly set, reglets in place, and nailing strips located.

B. Verify roofing termination and base flashings are in place, sealed, and secure.

3.02 PREPARATION

A. Install starter and edge strips, and cleats before starting installation.

B. Back paint concealed metal surfaces with protective backing paint to a minimum dry film thickness of 15 mil.

3.03 INSTALLATION

A. General: Anchor sheet metal flashing and trim and other components of the Work securely in place, with provisions for thermal and structural movement and to comply with SMACNA's "Architectural Sheet Metal Manual". Use fasteners, protective coatings, separators, sealants, and other miscellaneous items as required to complete sheet metal flashing and trim system.

B. Secure flashings in place using concealed fasteners, and use exposed fasteners only where permitted.

C. Apply plastic cement compound between metal flashings and felt flashings.

D. Metal Protection: Where dissimilar metals will contact each other or corrosive substrates, protect against galvanic action by painting contract surfaces with bituminous coating or by other permanent separation as recommended by fabricator or manufacturers of dissimilar materials.

E. Install exposed sheet metal flashing and trim without excessive oil canning, buckling and tool marks.

F. Install sheet metal flashing and trim true to line and levels indicated. Provide uniform, neat seams with minimum exposure of solder, welds and elastomeric sealant.

G. Expansion Provisions: Provide for thermal expansion of exposed flashing and trim. Space movement joints at a maximum of 10 feet with no joints allowed within 24 inches of corner or intersection. Where lapped or bayonet-type expansion provisions cannot be used or would not
be sufficiently watertight, form expansion joints of intermeshing hooked flanges, not less than 1 inch deep, filled with elastomeric sealant concealed within joints.

H. Copings: Anchor to resist uplift and outward forces according to recommendations in FMG Loss Prevention Data Sheet 1-49.
   1. Interlock exterior bottom edge of coping with continuous cleats anchored to substrate at 16 inch centers.
   2. Anchor interior leg of coping with screw fasteners at washers at 18 inch centers.

I. Roof-Penetration Flashing: Coordinate installation of roof-penetration flashing with installation of roofing and other items penetrating roof.

J. Miscellaneous Trims: Install with concealed fastener. Install work with laps, joints and seams that will be permanently watertight.

K. Fit flashings tight in place; make corners square, surfaces true and straight in planes, and lines accurate to profiles.

L. Secure gutters and downspouts in place with concealed fasteners.

M. Set splash pads under downspouts.

END OF SECTION
PART 1 GENERAL

1.01 REFERENCE STANDARDS
D. ITS (DIR) - Directory of Listed Products; current edition.

1.02 SUBMITTALS
A. Schedule of Firestopping: List each type of penetration, fire rating of the penetrated assembly, and firestopping test or design number.
B. Product Data: Provide data on product characteristics, performance ratings, and limitations.
C. Manufacturer's Installation Instructions: Indicate preparation and installation instructions.
D. Manufacturer's Certificate: Certify that products meet or exceed specified requirements.
E. Certificate from authority having jurisdiction indicating approval of materials used.
F. Installer Qualification: Submit qualification statements for installing mechanics.

1.03 QUALITY ASSURANCE
A. Fire Testing: Provide firestopping assemblies of designs that provide the scheduled fire ratings when tested in accordance with methods indicated.
   1. Listing in UL (FRD), FM (AG), or ITS (DIR) will be considered as constituting an acceptable test report.
   2. Valid evaluation report published by ICC Evaluation Service, Inc. (ICC-ES) at www.icc-es.org will be considered as constituting an acceptable test report.
   3. Submission of actual test reports is required for assemblies for which none of the above substantiation exists.
B. Manufacturer Qualifications: Company specializing in manufacturing the products specified in this section with minimum three years documented experience.

1.04 PERFORMANCE REQUIREMENTS
A. General: For penetrations through fire-resistance-rated constructions, including both empty openings and openings containing penetration items, provide through-penetration firestop systems that are produced and installed to resist spread of fire according to requirements indicated, resist passage of smoke and other gases, and maintain original fire-resistance rating of construction penetrated.
B. Rated Systems: Provide through-penetration firestop systems with the following ratings determined per ASTM E 814 or UL 1479, with a minimum positive pressure differential of 0.01 inch of water:
1. F-Rated Systems: Provide through-penetration firestop systems with F-ratings indicated, but not less than that equaling or exceeding fire-resistance rating of constructions penetrated.

2. T-Rated Systems: For the following conditions, provide through-penetration firestop systems with T-ratings indicated, as well as F-ratings, where systems protect penetrating items exposed to potential contact with adjacent materials in occupiable floor areas:
   a. Penetrations located outside wall cavities.
   b. Penetrations located outside fire-resistance-rated shaft enclosures.

C. For through-penetration firestop systems exposed to view, traffic, moisture, and physical damage, provide products that, after curing, do not deteriorate when exposed to these conditions both during and after construction.
   1. For piping penetrations for plumbing and wet-pipe sprinkler systems, provide moisture-resistant through-penetration firestop systems.
   2. For floor penetrations with annular spaces exceeding 4 inches in width and exposed to possible loading and traffic, provide firestop systems capable of supporting floor loads involved, either by installing floor plates or by other means.
   3. For penetrations involving insulated piping, provide through-penetration firestop systems not requiring removal of insulation.

D. For through-penetration firestop systems exposed to view, provide products with flame-spread and smoke-developed indexes of less than 25 and 450, respectively, as determined by ASTM E84.

1.05 FIELD CONDITIONS
   A. Comply with firestopping manufacturer's recommendations for temperature and conditions during and after installation. Maintain minimum temperature before, during, and for 3 days after installation of materials.

PART 2 PRODUCTS
2.01 MATERIALS
   A. Firestopping Materials: Any materials meeting requirements.
   B. Primers, Sleeves, Forms, Insulation, Packing, Stuffing, and Accessories: Provide type of materials as required for tested firestopping assembly.
   C. Fire Ratings: Refer to drawings for required systems and ratings.

2.02 FIRESTOPPING ASSEMBLY REQUIREMENTS
   A. Perimeter Fire Containment Firestopping: Use any system that has been tested according to ASTM E2307 to have fire resistance F Rating equal to required fire rating of the floor assembly.
      1. Movement: In addition, provide systems that have been tested to show movement capability as required.
      2. Temperature Rise: In addition, provide systems that have been tested to show T Rating as required.
   B. Head-of-Wall Joint System Firestopping at Joints Between Fire-Rated Wall Assemblies and Non-Rated Horizontal Assemblies: Use any system that has been tested according to ASTM E2837 to have fire resistance F Rating equal to required fire rating of floor or wall, whichever is greater.
      1. Movement: In addition, provide systems that have been tested to show movement capability as required.
   C. Floor-to-Floor, Wall-to-Wall, and Wall-to-Floor Joints, Except Perimeter, Where Both Are Fire-Rated: Use any system that has been tested according to ASTM E1966 or UL 2079 to have fire resistance F Rating equal to required fire rating of the assembly in which the joint occurs.
      1. Movement: In addition, provide systems that have been tested to show movement capability as required.
2. Listing by FM (AG), ITS (DIR), UL (DIR), or UL (FRD) in their certification directories will be considered evidence of successful testing.

2.03 FIRESTOPPING SYSTEMS

A. Firestopping: Any material meeting requirements.
   1. Fire Ratings: Penetrations through fire-rated assemblies shall be protected by an approved penetration firestop system installed as tested in accordance with ASTM E 814 or UL 1479, with a minimum positive pressure differential of 0.01 inch of water, and as follows:
      a. Wall Penetrations: Shall have an F rating of not less than the required fire-resistance rating of the wall penetrated.
      b. Horizontal Assembly Penetrations: Shall have an F Rating/T Rating not less than 1 hour but not less than the required rating of the floor penetrated.
         1) Exceptions:
            (a) Floor penetrations contained and located within the cavity of a wall above the floor or below the floor do not require a T rating.
            (b) Floor penetrations by floor drains, tub drains, or shower drains contained and located within the concealed space of a horizontal assembly do not require a T rating.
      c. Membrane Penetrations: Membrane penetrations by boxes other than electrical boxes, provided such penetrating items and the annular space between the wall membrane and the box, are protected by an approved membrane penetration firestopping shall have an F and T rating of not less than the required fire-resistance rating of the wall penetrated and shall be installed in accordance with their listing.

2.04 MATERIALS

A. Provide all materials required to comply with approved firestopping systems.

PART 3 EXECUTION

3.01 EXAMINATION

A. Verify openings are ready to receive the work of this section.

3.02 PREPARATION

A. Clean substrate surfaces of dirt, dust, grease, oil, loose material, or other matter that could adversely affect bond of firestopping material.

B. Remove incompatible materials that could adversely affect bond.

3.03 INSTALLATION

A. Install materials in manner described in fire test report and in accordance with manufacturer's instructions, completely closing openings.

B. Install forming/damming/backing materials and other accessories of types required to support fill materials during their application and in the position needed to produce cross-sectional shapes and depths required to achieve fire ratings indicated.
   1. After installing fill materials and allowing them to fully cure, remove combustible forming materials and other accessories not indicated as permanent components of firestop systems.

C. Install fill materials for firestop systems by proven techniques to produce the following results:
   1. Fill voids and cavities formed by openings, forming materials, accessories, and penetrating items as required to achieve fire-resistance ratings indicated.
   2. Apply materials so they contact and adhere to substrates formed by openings and penetrating items.
   3. For fill materials that will remain exposed after completing Work, finish to produce smooth, uniform surfaces that are flush with adjoining finishes.

D. Identification: Identify through-penetration firestop systems with preprinted metal or plastic labels. Attach labels permanently to surfaces adjacent to and within 6 inches of edge of the firestop systems so that labels will be visible to anyone seeking to remove penetrating items or...
firestop systems. Use mechanical fasteners for metal labels. Include the following information on labels:
1. The words "Warning - Through-Penetration Firestop System- Do Not Disturb. Notify Building Management of Any Damage."
2. Through-penetration firestop system designation of applicable testing and inspecting agency.
3. Date of installation.
4. Through-penetration firestop system manufacturer’s name.
5. Installer’s name.

3.04 CLEANING
   A. Clean adjacent surfaces of firestopping materials.

3.05 PROTECTION
   A. Protect adjacent surfaces from damage by material installation.

END OF SECTION
SECTION 07 92 00 - JOINT SEALANTS

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Nonsag gunnable joint sealants.
B. Self-leveling pourable joint sealants.
C. Joint backings and accessories.

1.02 RELATED REQUIREMENTS

A. Section 07 25 00 - Weather Barriers: Sealants required in conjunction with air barriers and vapor retarders.
B. Section 07 84 00 - Firestopping: Firestopping sealants.
C. Section 08 80 00 - Glazing: Glazing sealants and accessories.
D. Section 09 21 16 - Gypsum Board Assemblies: Sealing acoustical and sound-rated walls and ceilings.

1.03 REFERENCE STANDARDS


1.04 SUBMITTALS

A. Product Data for Sealants: Submit manufacturer's technical data sheets for each product to be used, that includes the following.
   1. Physical characteristics, including movement capability, VOC content, hardness, cure time, and color availability.
   2. List of backing materials approved for use with the specific product.
   3. Substrates that product is known to satisfactorily adhere to and with which it is compatible.
   4. Substrates the product should not be used on.
   5. Substrates for which use of primer is required.
   6. Sample product warranty.
B. Color Cards for Selection: Where sealant color is not specified, submit manufacturer's color cards showing standard colors available for selection.
C. Preconstruction Laboratory Test Reports: Submit at least four weeks prior to start of installation.
D. Preinstallation Field Adhesion Test Reports: Submit filled out Preinstallation Field Adhesion Test Reports log within 10 days after completion of tests; include bagged test samples and photographic records.

1.05 QUALITY ASSURANCE

A. Preconstruction Field-Adhesion Testing: Before installing sealants, field test their adhesion to Project joint substrates as follows:
   1. Locate test joints where indicated on Project or, if not indicated, as directed by Architect.
   2. Conduct field tests for each kind of sealant and joint substrate.
   3. Notify Architect seven days in advance of dates and times when test joints will be erected.
   4. Report whether sealant failed to adhere to joint substrates or tore cohesively. Include data on pull distance used to test each kind of product and joint substrate. For sealants that fail adhesively, retest until satisfactory adhesion is obtained.
5. Evaluation of Preconstruction Field-Adhesion-Test Results: Sealants not evidencing adhesive failure from testing, in absence of other indications of noncompliance with requirements, will be considered satisfactory. Do not use sealants that fail to adhere to joint substrates during testing.

6. Confirm that sealants are non-bleeding at masonry/cast stone/stone units.

7. Provide samples of materials are required by manufacturer for testing to provide warranty, provide required material samples to sealant manufacturer.

8. Schedule sufficient time for testing and analyzing results to prevent delaying the Work.

1.06 MOCK-UP

A. Mockups: Provide materials and construct applicable portions of mockup as indicated on Section 01 45 40 Mock-Up Requirements.

1.07 WARRANTY

A. Special Installer's Warranty: Contractor's standard letterhead form in which Installer agrees to repair or replace joint sealants and accessories that do not comply with performance and other requirements specified in this Section within specified warranty period.
   1. Warranty Period: Five years from date of Substantial Completion.

B. Special Manufacturer's Warranty: Manufacturer's standard form in which joint-sealant manufacturer agrees to furnish joint sealants to repair or replace those that do not comply with performance, fail to achieve watertight seal and other requirements specified in this Section within specified warranty period.
   1. Warranty Period: Five years from date of Substantial Completion.
   2. Include coverage for installed sealants and accessories which fail to achieve airtight seal, exhibit loss of adhesion or cohesion, or do not cure.

PART 2 PRODUCTS

2.01 JOINT SEALANT APPLICATIONS

A. Scope:
   1. Exterior Joints: Seal open joints, whether or not the joint is indicated on the drawings, unless specifically indicated not to be sealed. Exterior joints to be sealed include, but are not limited to, the following items.
      a. Wall expansion and control joints.
      b. Expansion joints between matching materials.
      c. Joints between door, window, and other frames and adjacent construction.
      d. Joints between different exposed materials.
      e. Openings below ledge angles in masonry.
   2. Interior Joints: Do not seal interior joints unless specifically indicated to be sealed. Interior joints to be sealed include, but are not limited to, the following items.
      a. Joints between door, window, and other frames and adjacent construction.
      b. Joints in concrete floors.
      c. Expansion joints in finish flooring.
   3. Do not seal the following types of joints.
      a. Intentional weepholes in masonry.
      b. Joints within rainscreen systems.
      c. Joints indicated to be treated with manufactured expansion joint cover or some other type of sealing device.
      d. Joints where sealant is specified to be provided by manufacturer of product to be sealed.
      e. Joints where installation of sealant is specified in another section.
      f. Joints between suspended panel ceilings/grid and walls.

B. Exterior Joints: Use non-sag non-staining silicone sealant, unless otherwise indicated.
   1. Lap Joints in Sheet Metal Fabrications: Butyl rubber, non-curing; includes the following:
      a. Thresholds.
      b. Sheet metal flashings and trim joints, including scuppers and gutters.
2. Control and Expansion Joints in Concrete Paving: Self-leveling polyurethane "traffic-grade" sealant.

C. Interior Joints: Use nonsag polyurethane sealant, unless otherwise indicated.
   2. Joints between Fixtures in Wet Areas and Floors, Walls, and Ceilings: Mildew-resistant silicone sealant; white.
   3. In Sound-Rated Assemblies: Acrylic emulsion latex sealant.
   4. Floor Joints: Self-leveling polyurethane "traffic-grade" sealant.

D. Interior Wet Areas: Bathrooms, restrooms, kitchens, food service areas, and food processing areas; fixtures in wet areas include plumbing fixtures, food service equipment, countertops, cabinets, and other similar items.

E. Sound-Rated Assemblies: Walls and ceilings identified as "STC-rated", "sound-rated", or "acoustical".

2.02 NONSAG JOINT SEALANTS

A. Non-Staining Silicone Sealant: ASTM C920, Grade NS, Uses M and A; not expected to withstand continuous water immersion or traffic.
   1. Movement Capability: Plus and minus 50 percent, minimum.
   2. Non-Staining To Porous Stone: Non-staining to light-colored natural stone when tested in accordance with ASTM C1248.
   3. Color: To be selected by Architect from manufacturer's full range.
   4. Manufacturers:
   5. Applications:
      a. Exterior joints unless otherwise indicated, including, but not limited to, the following:
         1) Exterior vertical and horizontal nontraffic joints in cast-in-place concrete.
         2) Exterior vertical and horizontal nontraffic joints between plant-precast architectural concrete units.
         3) Exterior vertical control and expansion joints in unit masonry.
         4) Exterior horizontal pressure-relieving joints in unit masonry.
         5) Exterior joints between flashing materials and unit masonry.
         6) Exterior butt joints between metal panels.
         7) Exterior perimeter joints between different materials listed above.

B. Mildew-Resistant Silicone Sealant: ASTM C920, Grade NS, Uses M and A; single component, mildew resistant; not expected to withstand continuous water immersion or traffic.
   2. Products:
      a. Dow Corning Corporation, 786 Mildew Resistant.
   3. Applications:
      a. Interior joints between plumbing fixtures and adjoining walls, floors, and counters.
      b. Joints between counters and adjoining walls and floors at bathrooms, kitchens and other wet areas.

C. Polyurethane Sealant: 1, Grade NS, Uses M and A; single or multi-component; not expected to withstand continuous water immersion or traffic.
   1. Color: Match adjacent finished surfaces.
   2. Manufacturers:
a. BASF; MasterSeal NP1/NP2.
b. Pecora Corporation; DynaTrol I-XL/DynaTrol II.

3. Applications:
   a. Vertical joints on exposed surfaces of interior unit masonry and concrete walls and partitions.
   b. Interior perimeter joints of exterior openings.
   c. Joints between top of non-load bearing unit masonry walls and underside of cast-in-place concrete slabs and beams.

D. Acrylic Emulsion Latex: Water-based; ASTM C834, single component, non-staining, non-bleeding, non-sagging; not intended for exterior use.
   1. Color: To be selected by Architect from manufacturer's standard range.
   2. Manufacturers:
      b. Sonneborn; Sonolac.
   3. Applications:
      a. Perimeter joints between interior wall surfaces and frames of interior doors, windows and elevator entrances.

E. Acoustical Sealant: ASTM C 920, Grade NS, Class 12-1/2, Uses M and A; single component.
   1. Acceptable Products:
      a. Pecora Corporation; AC-20 FTR Acoustical and Insulation Sealant.
   2. Applications:
      a. Both faces of interior gypsum board partitions at perimeter relief joints and through penetrations.
      b. As required for acoustical-rated constructions.
      c. As required for gypsum board shaft-wall assemblies.

F. Non-Curing Butyl Sealant: Solvent-based; ASTM C1311; single component, nonsag, non-skinning, non-hardening, non-bleeding; vapor-impermeable; intended for fully concealed applications.
   1. Applications:
      a. Thresholds.
      b. Sheet metal flashings and trim joints, including scuppers and gutters.

2.03 SELF-LEVELING SEALANTS

A. Self-Leveling Polyurethane Sealant: ASTM C920, Grade P, Uses M and A; single or multicomponent; explicitly approved by manufacturer for traffic exposure; not expected to withstand continuous water immersion.
   2. Manufacturers:
   3. Applications:
      a. Exterior horizontal nontraffic and traffic isolation and contraction joints in cast-in-place concrete slabs.
      b. Exterior control and expansion joints in horizontal traffic surfaces of brick pavers, ceramic tile, stone paving units and similar materials unless otherwise specified in individual specification sections.
c. Interior expansion, control, contraction, and isolation joints in horizontal traffic surfaces in concrete, ceramic tile, dimension stone, dimension stone tile and brick, unless otherwise specified in individual specification sections.

B. Polyurethane Sealant for Continuous Water Immersion: Polyurethane; ASTM C920, Grade P, Uses M and A; single or multicomponent; explicitly approved by manufacturer for traffic exposure and continuous water immersion.
   2. Color: To be selected by Architect from manufacturer's standard range.
   3. Manufacturers:
      a. Pecora, DynaTread: www.pecora.com
      d. Tremco Sealants; Vulkem 445SSL: www.tremcosealants.com
4. Applications:
   a. Submerged locations.

2.04 ACCESSORIES

A. Backer Rod: Cylindrical cellular foam rod with surface that sealant will not adhere to, compatible with specific sealant used, and recommended by backing and sealant manufacturers for specific application.

B. Backing Tape: Self-adhesive polyethylene tape with surface that sealant will not adhere to and recommended by tape and sealant manufacturers for specific application.

C. Primers: Type recommended by sealant manufacturer to suit application; non-staining.

PART 3 EXECUTION

3.01 EXAMINATION

A. Verify that joints are ready to receive work.

B. Verify that backing materials are compatible with sealants.

C. Verify that backer rods are of the correct size.

3.02 PREPARATION

A. Remove loose materials and foreign matter that could impair adhesion of sealant.
   1. Clean porous joint substrate surfaces by brushing, grinding, blast cleaning, mechanical abrading, or a combination of these methods to produce a clean, sound substrate capable of developing optimum bond with joint sealants. Remove loose particles remaining after cleaning operations above by vacuuming or blowing out joints with oil-free compressed air.
      Porous joint substrates include, but are not limited to, the following:
      a. Concrete.
      b. Masonry.
      c. Unglazed surfaces of ceramic tile.
   2. Clean nonporous surfaces 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, but are not limited to, the following:
      a. Metal.
      b. Porcelain enamel.
      c. Glazed surfaces of ceramic tile.

B. Clean joints, and prime as necessary, in accordance with manufacturer's instructions.

C. Perform preparation in accordance with manufacturer's instructions and ASTM C1193.

D. Mask elements and surfaces adjacent to joints from damage and disfigurement due to sealant work; be aware that sealant drips and smears may not be completely removable.
3.03 INSTALLATION
   A. Perform work in accordance with sealant manufacturer's requirements for preparation of surfaces and material installation instructions.
   B. Perform installation in accordance with ASTM C1193.
   C. Perform acoustical sealant application work in accordance with ASTM C919.
   D. Precast Architectural Concrete Panel Joints: Install two-stage sealant joints and expansion joints in accordance with PCI Architectural Precast Concrete Design Manual, Section 4.7 and as detailed on drawings.
   E. Measure joint dimensions and size joint backers to achieve width-to-depth ratio, neck dimension, and surface bond area as recommended by manufacturer, except where specific dimensions are indicated.
   F. Install bond breaker backing tape where backer rod cannot be used.
   G. Install sealant free of air pockets, foreign embedded matter, ridges, and sags, and without getting sealant on adjacent surfaces.
   H. Do not install sealant when ambient temperature is outside manufacturer's recommended temperature range, or will be outside that range during the entire curing period, unless manufacturer's approval is obtained and instructions are followed.
   I. Nonsag Sealants: Tool surface concave, unless otherwise indicated; remove masking tape immediately after tooling sealant surface.
   J. Concrete Floor Joint Filler: After full cure, shave joint filler flush with top of concrete slab.

3.04 CLEANING
   A. Clean adjacent soiled surfaces jints 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 contract 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.

END OF SECTION
SECTION 08 11 13 - HOLLOW METAL DOORS AND FRAMES

PART 1 GENERAL

1.01 SECTION INCLUDES
   A. Non-fire-rated hollow metal doors and frames.
   B. Hollow metal frames for wood doors.
   C. Fire-rated hollow metal doors and frames.
   D. Thermally insulated hollow metal doors with frames.
   E. Storm shelter hollow metal doors and frames.
   F. Hollow metal borrowed lites glazing frames.

1.02 RELATED REQUIREMENTS
   A. Section 08 71 00 - Door Hardware.
   B. Section 08 80 00 - Glazing: Glass for doors and borrowed lites.

1.03 REFERENCE STANDARDS
   C. ANSI/SDI A250.6 - Recommended Practice for Hardware Reinforcing on Standard Steel Doors and Frames; 2003 (R2009).
   D. ANSI/SDI A250.8 - Specifications for Standard Steel Doors and Frames (SDI-100); 2014.
   J. ITS (DIR) - Directory of Listed Products; current edition.
   O. UL (DIR) - Online Certifications Directory; current listings at database.ul.com.
   P. UL 10C - Standard for Positive Pressure Fire Tests of Door Assemblies; Current Edition, Including All Revisions.

1.04 SUBMITTALS
   A. Product Data: Materials and details of design and construction, hardware locations, reinforcement type and locations, anchorage and fastening methods, and finishes; and one copy of referenced standards/guidelines.
B. Shop Drawings: Details of each opening, showing elevations, glazing, frame profiles, and any indicated finish requirements.

C. Installation Instructions: Manufacturer’s published instructions, including any special installation instructions relating to this project.

1.05 QUALITY ASSURANCE

A. 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 UL 10C.

B. Fire-Rated, Borrowed-Light Frame Assemblies: Assemblies complying with NFPA 80 that are listed and labeled, by a testing and inspecting agency acceptance to authorities having jurisdiction, for fire-protection ratings indicated, based on testing according to NFPA 257 or UL 9. Label each individual glazed lite.

C. Smoke-Control Door Assemblies: Comply with NFPA 105 or UL 1784.

D. Severe Storm Shelter Openings: Provide complete door systems for hurricane or tornado storm shelters, and other areas of refuge, complying and tested according to FEMA 361, Second Edition (2008), Design and Construction Guidance for Community Safe Rooms; and ICC 500 (2008), ICC/NSSA Standard for the Design and Construction of Storm Shelters.
   1. Each unit to bear third party permanent label indicating compliance with the referenced testing standards.

1.06 DELIVERY, STORAGE, AND HANDLING

A. Comply with NAAMM HMMA 840 or ANSI/SDI A250.8 (SDI-100) in accordance with specified requirements.

B. Protect with resilient packaging; avoid humidity build-up under coverings; prevent corrosion and adverse effects on factory applied painted finish.

PART 2 PRODUCTS

2.01 MANUFACTURERS

A. Hollow Metal Doors and Frames:
   1. Ceco Door Products; an Assa Abloy Group company.
   2. Curries Company; an Assa Abloy Group company.
   4. Pioneer Industries, Inc.
   5. Steelcraft; an Ingersoll-Rand company.

2.02 DESIGN CRITERIA

A. Requirements for Hollow Metal Doors and Frames:
   1. Steel used for fabrication of doors and frames shall comply with one or more of the following requirements; Galvannealed steel conforming to ASTM A653/A653M, cold-rolled steel conforming to ASTM A1008/A1008M, or hot-rolled pickled and oiled (HRPO) steel conforming to ASTM A1011/A1011M, Commercial Steel (CS) Type B for each.
   2. Accessibility: Comply with ICC A117.1 and ADA Standards.
   3. Door Top Closures: Flush end closure channel, with top and door faces aligned.
   5. Zinc Coating for Typical Interior and/or Exterior Locations: Provide metal components zinc-coated (galvanized) and/or zinc-iron alloy-coated (galvannealed) by the hot-dip process in accordance with ASTM A653/A653M, with manufacturer’s standard coating thickness, unless noted otherwise for specific hollow metal doors and frames.
      a. Based on SDI Standards: Provide at least A40/ZF120 (galvannealed) when necessary, coating not required for typical interior door applications, and at least A60/ZF180 (galvannealed) for corrosive locations.

B. Combined Requirements: If a particular door and frame unit is indicated to comply with more than one type of requirement, comply with the specified requirements for each type; for
instance, an exterior door that is also indicated as being sound-rated must comply with the requirements specified for exterior doors and for sound-rated doors; where two requirements conflict, comply with the most stringent.

2.03 HOLLOW METAL DOORS

A. Door Finish: Factory primed and field finished.

B. Exterior Doors: Thermally insulated.
   1. Core Material: Vertical steel stiffeners with fiberglass batts.
   4. Weatherstripping: Refer to Section 08 71 00.

C. Interior Doors, Non-Fire Rated:
   1. Core Material: Manufacturer's standard kraft-paper honeycomb, polystyrene, polyurethane, polyisocyanurate, mineral-board or vertical steel-stiffener core.
   3. Texture: Smooth faces.
   4. Finish: Factory primed, for field finishing.

D. Interior Doors, Fire-Rated Doors:
   1. Fire Rating: As indicated on Door Schedule, tested in accordance with UL 10C and NFPA 252 ("positive pressure fire tests").
      a. Provide units listed and labeled by UL (DIR) or ITS (DIR).
      b. Attach fire rating label to each fire rated unit.
   2. Core Material: Mineral board.
   5. Texture: Smooth faces.
   6. Finish: Factory primed, for field finishing.

2.04 HOLLOW METAL DOORS FOR SEVERE STORM SHELTERS

A. General: Provide complete tornado or hurricane resistant door and frame shelter assemblies constructed to resist the design wind pressures for components and cladding and missile impact loads as described in ICC 500 - 2008, ICC/NSSA Standard for the Design and Construction of Storm Shelters. Only single opening and paired opening doors and their frames constructed to resist calculated design wind pressures and laboratory tested missile impacts are acceptable.
   1. Door systems, both single doors and paired openings, tested and complying with ICC 500 and FEMA 361 (2008), Design and Construction Guidance for Community Safe Rooms and supported by third party test results.
   2. Sheets fabricated on exterior openings from commercial quality hot dipped zinc coated steel complying with ASTM A924 A60. Gauges to be in accordance with manufacturers tested assemblies.
   3. Vertical Edges: Vertical edges to have the face sheets joined by a continuous weld extending the full height of the door. Welds are to be ground, filled and dressed smooth. Beveled Lock Edge, 1/8 inch in 2 inches.
   4. Top Edge: Reinforce top of doors with a continuous steel channel extending the full width of the door and welded to the face sheet. Doors with an inverted top channel to include a steel closure channel, screw attached and welded in place with the web of the channel flush with the face sheets of the door. Plastic or composite channel fillers are not acceptable.
   5. Hinge Reinforcement: Minimum 7 gauge (3/16") plate 1-1/4" x 9".

B. Manufacturers Basis of Design:
   1. CECO Door Products StormPro Series.
   2. Curries Company StormPro Series.
2.05 HOLLOW METAL FRAMES

A. Comply with standards and/or custom guidelines as indicated for corresponding door in accordance with applicable door frame requirements.

B. General:
   1. Provide mortar guard boxes for hardware cut-outs in frames to be installed in masonry or to be grouted.

C. Exterior Door Frames: Full profile/continuously welded type.
   1. Galvanizing: Components hot-dipped zinc-iron alloy-coated (galvannealed) in accordance with ASTM A653/A653M, with A40/ZF120 coating.
   2. Frame Metal Thickness: 14 gage, 0.067 inch, minimum.
   3. Weatherstripping: Separate, see Section 08 71 00.

D. Interior Door Frames, Non-Fire Rated: Full profile/continuously welded type.
   1. Frame Metal Thickness: 14 gage, 0.067 inch, minimum.

E. Door Frames, Fire-Rated: Full profile/continuously welded type.
   1. Fire Rating: Same as door, labeled.
   2. Frame Metal Thickness: 14 gage, 0.067 inch, minimum.
   3. Frame Finish: Factory primed and field finished.

F. Frames for Wood Doors: Comply with frame requirements in accordance with corresponding door.

G. Borrowed Lites Glazing Frames: Construction and face dimensions to match door frames, and as indicated on drawings.

H. Provide mortar guard boxes for hardware cut-outs in frames to be installed in masonry or to be grouted.

I. Frames in Masonry Walls: Size to suit masonry coursing with head member 4 inch high to fill opening without cutting masonry units.

2.06 FINISHES

A. Primer: Rust-inhibiting, complying with ANSI/SDI A250.10, door manufacturer's standard.

B. Bituminous Coating: Asphalt emulsion or other high-build, water-resistant, resilient coating.

2.07 FRAMES FOR SEVERE STORM SHELTERS

A. General: Subject to the same compliance standards and requirements as standard hollow metal frames, provide complete tornado or hurricane resistant door and frame assemblies, for both single doors and paired openings, tested and labeled as complying with ICC 500 and FEMA 361 and supported by third party test results.
   1. Fabricate exterior frames from 14 gauge hot dipped zinc coated steel that complying with ASTM designations A924 A60.
   2. Manufacturers Basis of Design:
      a. CECO Door Products - StormPro Series.
      b. Curries Company - StormPro Series.

2.08 ACCESSORIES

A. Glazing: As specified in Section 08 80 00, factory installed.

B. Grout for Frames: Portland cement grout with maximum 4 inch slump for hand troweling; thinner pumpable grout is prohibited.

C. Silencers: Resilient rubber, fitted into drilled hole; provide three on strike side of single door, three on center mullion of pairs, and two on head of pairs without center mullions.

D. Ceiling Struts: Minimum 1/4 inch thick by 1 inch wide steel.

E. Temporary Frame Spreaders: Provide for factory- or shop-assembled frames.

F. Jamb Anchors:
1. Masonry Type: Adjustable strap-and-stirrup or T-shaped anchors to suit frame size, 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, welded to back of frames; not less than 0.042 inch thick.
3. Postinstalled Expansion Type for In-Place Concrete or Masonry: Minimum 3/8 inch diameter bolts with expansion shields or inserts. Provide pipe spacer from frame to wall, with throat reinforcement plate, welded to frame at each anchor location.

G. Floor Anchors: Formed from same material as frames, not less than 0.042 inch thick, and as follows:
1. Monolithic Concrete Slabs: Clip-type anchors, with extension clips, allowing not less than 2-inch height adjustment. Terminate bottom of frames at finish floor surface.

2.09 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 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.

2.10 FABRICATION

A. Tolerances: Fabricate hollow metal work to tolerances indicated in SDI 117.

B. Hollow Metal Doors:
1. Exterior Doors: Provide weep-hole openings in bottom of exterior doors. Seal joints in top edges of doors against water penetration.
2. Glazed Lites: Factory cut openings in door.
3. Astragals: Provide overlapping astragal on one leaf of pairs of doors where required by NFPA 80 for fire-performance rating or where indicated.

C. Hollow Metal Frames: Where frames are fabricated in sections, provide alignment plates or angles at each joint, fabricated of same thickness metal as frames.
1. Welded Frames: Weld flush face joints continuously; grind, fill, dress and make smooth, flush, and invisible.
2. 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.
3. Provide countersunk, flat- or oval-head exposed screws and bolts for exposed fasteners unless otherwise indicated.
4. Grout Guards: Weld guards to frame at back of hardware mortises in frames to be grouted.
5. Floor Anchors: Weld anchors to bottom of jambs and mullions with at least four spot welds per anchor.
6. Jamb Anchors: Provide number and spacing of anchor as follows:
   a. 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 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.

7. Door Silencers: Except on weather-stripped doors, drill strips to receive door silencers.
   b. Double-Door Frames: Two door silencers.

D. Hardware Preparation: Factory prepare hollow metal work to receive templated mortised hardware 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 nontemplated, 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 electrical sections.

E. Stops and Moldings: Provide stops and moldings around glazed lites where indicated. Form corners of stops and moldings with butted or mitered hairline joints.
   1. Single Glazed Lites: Provide fixed stops and moldings welded on secure side of hollow metal work.
   2. Multiple Glazed Lites: Provide fixed and removable stops and moldings so that each glazed lite is capable of being removed independently.
   3. Provide fixed frame moldings on outside of exterior and on secure side of interior doors and frames.
   4. Provide loose stops and moldings on inside of hollow metal work.
   5. Coordinate rabbet width between fixed and removeable stops with type of glazing and type of installation indicated.

PART 3 EXECUTION

3.01 PREPARATION
   A. Coat inside of frames to be installed in masonry or to be grouted, with bituminous coating, prior to installation.

3.02 INSTALLATION
   A. Install doors and frames in accordance with manufacturer's instructions and related requirements of specified door and frame standards or custom guidelines indicated.
   B. Install fire rated units in accordance with NFPA 80.
   C. Install severe storme shelter doors and frame in accordance with ICC 500 and FEMA 361.
   D. Coordinate frame anchor placement with wall construction.
   E. Set frames accurately in position, plumbed, aligned, and braced securely until permanent anchors are set. After wall construction is complete, remove temporary braces, leaving surfaces smooth and undamaged.
   F. Grout frames in masonry construction, using hand trowel methods; brace frames so that pressure of grout before setting will not deform frames.
   G. Floor Anchors: Provide floor anchors for each jamb and mullion that extends to floor, and secure with postinstalled expansion anchors.
   H. Metal-Stud Partitions: Solidly pack batt insulation behind frames.
   I. Masonry Walls: Coordinate installation of frames to allow for solidly filling space between frames and masonry with grout.
J. Ceiling Struts: Extend struts vertically from top of frame at each jamb to overhead structural support at each jamb. Bend top of struts to provide flush contact for securing to supporting construction. Provide adjustable wedged or bolted anchorage to frame jamb members.

K. Hollow Metal Doors: Fit hollow metal doors accurately in frames, within clearances specified below. Shim as necessary.

L. Glazing: Comply with installation requirements in Division 08 Section "Glazing" and with hollow metal manufacturer’s written instructions.
   1. Secure stops with countersunk flat- or oval-head machine screws spaced uniformly not more than 9 inches o.c. and not more than 2 inches o.c. from each corner.

M. Install door hardware as specified in Section 08 71 00.
   1. Comply with recommended practice for hardware placement of doors and frames in accordance with ANSI/SDI A250.6 or NAAMM HMMA 861.

N. Comply with glazing installation requirements of Section 08 80 00.

O. Touch up damaged factory finishes.

3.03 TOLERANCES
   A. Maximum Diagonal Distortion: 1/16 inch measured with straight edge, corner to corner.

3.04 ADJUSTING
   A. Adjust for smooth and balanced door movement.
   B. Prime Coat Touchup: Immediately after erection, sand smooth rusted or damaged areas of prime coat and apply touchup of compatible air-drying, rust-inhibitive primer.
   C. Metallic-Coated Surfaces: Clean abraded areas and repair with glavanizing repair paint according to manufacturer's written instructions.

END OF SECTION
SECTION 08 14 16 - FLUSH WOOD DOORS

PART 1 GENERAL

1.01 SECTION INCLUDES
  A. Flush wood doors; flush configuration; fire-rated, non-rated, and acoustical.
  B. Factory finishing flush wood doors.
  C. Factory fitting flush wood doors to frames and factory machining for hardware.

1.02 RELATED REQUIREMENTS
  A. Section 08 71 00 - Door Hardware.
  B. Section 08 80 00 - Glazing.

1.03 REFERENCE STANDARDS
  A. AWI/AWMAC/WI (AWS) - Architectural Woodwork Standards; 2014.
  E. WDMA I.S. 1A - Interior Architectural Wood Flush Doors; 2013.

1.04 SUBMITTALS
  A. Product Data: Indicate door core materials and construction; veneer species, type and characteristics.
  B. Shop Drawings: Show doors and frames, elevations, sizes, types, swings, undercuts, beveling, blocking for hardware, factory machining, factory finishing, cutouts for glazing and other details.
  C. Samples: Submit two samples of door construction, 6 x 6 inch in size cut from top corner of door illustrating wood grain, stain color and sheen.
  D. Warranty, executed in Owner's name.

1.05 QUALITY ASSURANCE
  A. Quality Standard: In addition to requirements specified, comply with AWI's "Architectural Woodwork Quality Standards Illustrated."

1.06 DELIVERY, STORAGE, AND HANDLING
  A. Package, deliver and store doors in accordance with specified quality standard.
  B. Accept doors on site in manufacturer's packaging. Inspect for damage.
  C. Protect doors with resilient packaging sealed with heat shrunk plastic. Do not store in damp or wet areas; or in areas where sunlight might bleach veneer. Seal top and bottom edges with tinted sealer if stored more than one week. Break seal on site to permit ventilation.

1.07 WARRANTY
  A. Interior Doors: Provide manufacturer's warranty for the life of the installation.
  B. Include coverage for delamination of veneer, warping beyond specified installation tolerances, defective materials, and telegraphing core construction.

PART 2 PRODUCTS

2.01 MANUFACTURERS
  A. Wood Veneer Faced Doors:
     1. Algoma Hardwoods, Inc.
     4. VT Industries Inc.
2.02 DOORS

A. Doors: Refer to drawings for locations and additional requirements.
   1. Quality Standard: Custom Grade, Heavy Duty performance, in accordance with
      AWI/AWMAC/WI (AWS), AWMAC/WI (NAAWS) or WDMA I.S. 1A.
   2. Wood Veneer Faced Doors: 5-ply or 7-ply unless otherwise indicated.

B. Interior Doors: 1-3/4 inches thick unless otherwise indicated; flush construction.
   1. Provide solid core doors at each location.
   2. Fire Rated Doors: Tested to ratings indicated on drawings in accordance with ICC (IBC) - Positive Pressure; Underwriters Laboratories Inc. (UL) or Intertek/Warnock Hersey (WHI) labeled without visible seams.
   3. Wood veneer facing with factory transparent finish.

2.03 DOOR AND PANEL CORES

A. Non-Rated Solid Core and 20 Minute Rated Doors: Type structural composite lumber core (SCLC), plies and faces as indicated.

B. Fire Rated Doors: Mineral core, Type FD, plies and faces as indicated above; with core blocking as indicated below:
   1. Blocking: Provide composite blocking with improved screw-holding capability approved for use in door of fire-protection rated doors as follows:
      a. 5 inch top rail blocking.
      b. 5 inch bottom rail blocking, in doors indicated to have protection plates.
      c. 5 inch midrail blocking, in doors indicated to have armor plates or exit devices.
   2. Edge Construction: At hinge stiles, provide laminated-edge construction with improved screw-holding capability and split resistance. Comply with specified requirements for exposed edges.

2.04 DOOR FACINGS

   1. Species and Cut: Plain sliced red oak.
   2. Vertical Edges: Same species as face veneer.
   3. "Pair Match" each pair of doors; "Set Match" pairs of doors within 10 feet of each other when doors are closed.

2.05 LIGHT FRAMES AND GLAZING

A. 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, match color on existing doors; and approved for use in doors of fire protection rating indicated.

B. Glazing: Comply with installation requirements in Division 08 Section "Glazing" and with the flush wood door manufacturer's written instructions.
   1. Pre-Installed Glazing: Pre-install glazing in doors indicated to receive glazing. Pre-installed glass to include all of the required glazing material.

2.06 DOOR CONSTRUCTION

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

B. Factory machine doors for hardware other than surface-mounted hardware, in accordance with hardware requirements and dimensions.

C. Factory fit doors for frame opening dimensions identified on shop drawings, with edge clearances in accordance with specified quality standard.

D. Provide edge clearances in accordance with the quality standard specified.

2.07 FACTORY FINISHING - WOOD VENEER DOORS

A. Finish work in accordance with 1, Section 5 - Finishing for grade specified and as follows:
   1. Transparent:
a. System - 5, Varnish, Conversion.
b. Stain: As selected by Architect.
c. Stain and Sheen: Match Architect's sample.

B. Finish work in accordance with WDMA I.S. 1A for grade specified and as follows:

PART 3 EXECUTION

3.01 EXAMINATION
A. Verify existing conditions before starting work.
B. Verify that opening sizes and tolerances are acceptable.
C. Do not install doors in frame openings that are not plumb or are out-of-tolerance for size or alignment.

3.02 INSTALLATION
A. Hardware: For installation, see Division 8 Section "Door Hardware".
B. Install doors in accordance with manufacturer's instructions and specified quality standard.
   1. Install fire-rated doors in accordance with NFPA 80 requirements.
C. Factory-Finished Doors: Do not field cut or trim; if fit or clearance is not correct, replace door.
D. Use machine tools to cut or drill for hardware.
E. Restore finish before installation if fitting or machining is required.
F. Coordinate installation of doors with installation of frames and hardware.
G. Align in frames for uniform clearances at each edge.

3.03 TOLERANCES
A. Conform to specified quality standard for fit and clearance tolerances.
B. Conform to specified quality standard for telegraphing, warp, and squareness.

3.04 ADJUSTING
A. Adjust doors for smooth and balanced door movement.
B. Adjust closers for full closure.

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

PART 1 GENERAL

1.01 SECTION INCLUDES
A. Aluminum-framed storefront, with vision glass.
B. Aluminum doors and frames.
C. Weatherstripping.

1.02 RELATED REQUIREMENTS
A. Section 08 80 00 - Glazing: Glass and glazing accessories.

1.03 REFERENCE STANDARDS
A. AAMA CW-10 - Care and Handling of Architectural Aluminum From Shop to Site; 2015.

1.04 SUBMITTALS
A. Product Data: Provide component dimensions, describe components within assembly, anchorage and fasteners, glass and infill, internal drainage details.
B. Shop Drawings: Indicate system dimensions, framed opening requirements and tolerances, affected related Work, expansion and contraction joint location and details, and field welding required. Include plans, elevations, sections, details, attachments to other work, embedment type, size and layout.
   1. Provide water control diagrams for condensation and infiltration evacuation.
C. Samples: Submit two samples 2 x 3 inches in size illustrating finished aluminum surface, color matched to existing storefront framing.

1.05 QUALITY ASSURANCE
A. Designer Qualifications: Design structural support framing components under direct supervision of a Professional Structural Engineer experienced in design of this Work and licensed in the State in which the Project is located.
B. Manufacturer Qualifications: Company specializing in performing work of type specified and with at least three years of documented experience.

1.06 DELIVERY, STORAGE, AND HANDLING
A. Handle products of this section in accordance with AAMA CW-10.
B. Protect finished aluminum surfaces with wrapping. Do not use adhesive papers or sprayed coatings that bond to aluminum when exposed to sunlight or weather.

1.07 FIELD CONDITIONS

A. Do not install sealants when ambient temperature is less than 40 degrees F. Maintain this minimum temperature during and 48 hours after installation.

1.08 WARRANTY

A. Standard Warranty: 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 deteriorate as defined in this Section within specified warranty period.

1. Failures include, but are not limited to, the following:
   a. Structural failures including, but not limited to, excessive deflection.
   b. Noise or vibration caused by thermal movements.
   c. Deterioration of metals and other materials beyond normal weathering.
   d. Water leakage through fixed glazing and framing areas.
   e. Failure of operating components to function properly.

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

B. Provide ten year manufacturer warranty against excessive degradation of exterior finish. Include provision for replacement of units with excessive fading, chalking, or flaking.

PART 2 PRODUCTS

2.01 MANUFACTURERS

A. Basis of Design: See below under description of products.

1. Exterior Storefront System: Kawneer, Trifab VG 451T.

B. Other Acceptable Manufacturers:


2.02 STOREFRONT

A. Aluminum-Framed Storefront: Factory fabricated, factory finished aluminum framing members with infill, and related flashings, anchorage and attachment devices.

1. Finish: Class I color anodized.
   a. Factory finish all surfaces that will be exposed in completed assemblies.

B. Performance Requirements:

1. General: Provide aluminum-framed systems, including anchorage, capable of withstanding, without failure, the effects of the following:
   a. Structural loads.
   b. Thermal movements.
   c. Movements of supporting structure indicated on Drawings including, but not limited to, story drift and deflection from uniformly distributed and concentrated live loads.
   d. Dimensional tolerances of building frame and other adjacent construction.
   e. Failure includes the following:
      1) Deflection exceeding specified limits.
      2) Thermal stresses transferred to building structure.
      3) Framing members transferring stresses, including those caused by thermal and structural movements, to glazing.
      4) Noise or vibration created by wind and thermal and structural movements.
      5) Loosening or weakening of fasteners, attachments, and other components.
      6) Sealant failure.
      7) Failure of operating units to function properly.

2. Structural Loads:
   a. Wind Loads: As indicated on Structural Drawings.
b. Seismic Loads: As indicated on Structural Drawings.

3. Deflection of Framing Members Normal to Wall Plane: Limited to 1/175 of clear span for spans up to 13 feet 6 inches and to 1/240 of clear span plus 1/4 inch for spans greater than 13 feet 6 inches or an amount that restricts edge deflection of individual glazing lites to 3/4 inch, whichever is less.

4. Structural-Test Performance: Systems tested according to ASTM E 330 as follows:
   a. When tested at positive and negative wind-load design pressures, systems do not evidence deflection exceeding specified limits.
   b. When tested at 150 percent of positive and negative wind-load design pressures, systems, including anchorage, do not evidence material failures, structural distress, and permanent deformation of main framing members exceeding 0.2 percent of span.
   c. Test Durations: As required by design wind velocity but not less than 10 seconds.

5. Water Penetration Resistance: No uncontrolled water on interior face, when tested in accordance with ASTM E331 at pressure differential of 8 psf.

6. Air Leakage: Maximum of 0.06 cu ft/min sq ft of wall area, when tested in accordance with ASTM E283 at 6.27 psf pressure differential across assembly.

7. Movement: Accommodate movement between storefront and perimeter framing and deflection of lintel, without damage to components or deterioration of seals.

8. Air Infiltration: Limit air infiltration through assembly to 0.06 cu ft/min/sq ft of wall area, measured at minimum static-air-pressure difference of 6.24 lbf/sq. ft. across assembly in accordance with ASTM E 283.

9. Condensation Resistance Factor: Measure in accordance with AAMA 1503 with 1 inch insulating glass installed. Fixed glazing and framing areas of systems have condensation-resistance factor (CRF) of not less than 53 when tested according to AAMA 1503.

10. Water Leakage: None, when measured in accordance with ASTM E 331 at a minimum static-air-pressure difference of 20 percent of positive wind-load design pressure, but not less than 6.24 lbf/sq. ft.

11. System Internal Drainage: Drain to the exterior by means of a weep drainage network any water entering joints, condensation occurring in glazing channel, and migrating moisture occurring within system.

12. Air and Vapor Seal: Maintain continuous water barrier membrane throughout assembly, primarily in line with pane of glass and heel bead of glazing compound.

13. Expansion/Contraction: Provide for expansion and contraction within system components caused by cycling temperature range of 170 degrees F over a 12 hour period without causing detrimental effect to system components, anchorages, and other building elements.

2.03 COMPONENTS

A. Aluminum Framing Members: Tubular aluminum sections, drainage holes and internal weep drainage system.
   1. Framing members for interior applications need not be thermally broken.
   2. Cross-Section: As indicated on drawings.

B. Swing Doors: Glazed aluminum.
   2. Top Rail: 3-1/2 inches wide.
   3. Vertical Stiles: 3-1/2 inches wide.
   5. Glazing Stops: Square.
   6. Finish: Same as storefront.

2.04 MATERIALS

B. Fasteners: Stainless steel.
C. Glass: As specified in Section 08 80 00.
D. Glazing Accessories: As specified in Section 08 80 00.

2.05 FINISHES
A. Superior Performing Organic Coatings: AAMA 2605 multiple coat, thermally cured polyvinylidene fluoride (PVDF) system.
   1. Polyvinylidene fluoride (PVDF) multi-coat thermoplastic fluoropolymer coating system, including minimum 70 percent PVDF color topcoat and minimum total dry film thickness of 0.9 mil; color and gloss to match aluminum clad wood windows specified in Section 08 55 00.

2.06 HARDWARE
A. Door Hardware: As specified in Section 08 71 00 - Door Hardware.
B. Weatherstripping: Wool pile, continuous and replaceable; provide on all doors.
C. Sill Sweep Strips: Resilient seal type, retracting, of neoprene; provide on all doors.

2.07 FABRICATION
A. Fabricate components with minimum clearances and shim spacing around perimeter of assembly, yet enabling installation and dynamic movement of perimeter seal and that have the following characteristics:
   1. Profiles that are sharp, straight and free of defects or deformations.
   2. Accurately fitted and secure joints and corners. Make joints flush, hairline, and weatherproof.
   3. Means to drain water passing joints, condensation occurring within framing members, and moisture migrating within the system to exterior.
   4. Accommodations for thermal and mechanical movements of glazing and framing to maintain required glazing edge clearances.
   5. Provisions for field replacement of glazing from exterior of building.
   6. Fasteners, anchors, and connection devices that are concealed from view to greatest extend possible.
B. Door Frames: Reinforce as required to support loads imposed by door operation and for installing hardware.
   1. At exterior doors, provide compression weather stripping at fixed stops. Provide continuous aluminum drip above all doors, extend to outside of door frame.
   2. At interior doors, provide silencers at stops to prevent metal-to-metal contact. Install three silencers on strike jamb of single-door frames and two silencers on head of frames for pairs of doors.
C. Doors: Reinforce doors as required for installing hardware.
   1. At pairs of exterior doors, provide sliding weather stripping retained in adjustable strip mortised into door edge.
   2. At exterior doors, provide weather sweeps applied to door bottoms.
D. Prepare components to receive anchor devices. Fabricate anchors.
E. Coat concealed metal surfaces that will be in contact with cementitious materials or dissimilar metals with bituminous paint.
F. Arrange fasteners and attachments to conceal from view.
G. Reinforce components internally for door hardware.
H. Reinforce framing members for imposed loads.
I. Finishing: Apply factory finish to all surfaces that will be exposed in completed assemblies.
   1. Touch-up surfaces cut during fabrication so that no natural aluminum is visible in completed assemblies, including joint edges.

PART 3 EXECUTION
3.01 EXAMINATION
A. Verify dimensions, tolerances, and method of attachment with other work.
B. Verify that wall openings and adjoining air and vapor seal materials are ready to receive work of this section.

3.02 INSTALLATION
A. Install wall system in accordance with manufacturer's instructions.
B. Attach to structure to permit sufficient adjustment to accommodate construction tolerances and other irregularities.
C. Provide alignment attachments and shims to permanently fasten system to building structure.
D. Align assembly plumb and level, free of warp or twist. Maintain assembly dimensional tolerances, aligning with adjacent work.
E. Provide thermal isolation where components penetrate or disrupt building insulation.
F. Install sill flashings. Turn up ends and edges; seal to adjacent work to form water tight dam.
G. Where fasteners penetrate sill flashings, make watertight by seating and sealing fastener heads to sill flashing.
H. Install anti-walking clips in openings that are more than three frames wide per manufacturers instructions.
I. Install anchors with separators and isolators to prevent metal corrosion and electrolytic deterioration.
J. Coordinate attachment and seal of perimeter air and vapor barrier materials.
K. Pack fibrous insulation in shim spaces at perimeter of assembly to maintain continuity of thermal barrier.
L. Metal Protection:
   1. Where aluminum will contact dissimilar metals, protect against galvanic action by painting contact surfaces with primer or by applying sealant or tape or 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.
   3. If necessary protect the exterior framing during masonry wash down.
M. Install glass and infill panels in accordance with Section 08 80 00, using glazing method required to achieve performance criteria.
N. Entrances: Install to produce smooth operation and tight fit at contact points.
   1. Exterior Entrances: Install to produce tight fit at weather stripping and weathertight closure.
   2. Field-Installed Hardware: Install surface-mounted hardware according to hardware manufacturers' written instructions using concealed fasteners to greatest extent possible.
O. Door Hardware: Install door hardware specified in Division 8 Section "Door Hardware."
P. Touch-up minor damage to factory applied finish; replace components that cannot be satisfactorily repaired.

3.03 TOLERANCES
A. Maximum Variation from Plumb: 0.06 inches every 3 ft non-cumulative or 1/16 inches per 10 ft, whichever is less.
B. Maximum Misalignment of Two Adjoining Members Abutting in Plane: 1/32 inch.

3.04 ADJUSTING
A. Adjust operating hardware for smooth operation.

3.05 CLEANING
A. Remove protective material from pre-finished aluminum surfaces.
B. Upon completion of installation, thoroughly clean aluminum surfaces in accordance with AAMA 609 & 610.
C. Remove excess sealant by method acceptable to sealant manufacturer.

3.06 PROTECTION
A. Protect installed products from damage until Date of Substantial Completion.

END OF SECTION
SECTION 08 55 00 - ALUMINUM CLAD WOOD WINDOWS

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Clad wood windows.
B. Glazing and accessories.

1.02 RELATED SECTIONS

A. Section 03 30 00 - Cast-In-Place Concrete: Openings in cast-in-place concrete.
B. Section 03 45 00 - Precast Concrete Wall Panels: Openings in precast concrete wall panels.
C. Section 04 20 00 - Unit Masonry Assemblies: Openings in masonry.
D. Section 06 10 00 - Rough Carpentry: Framed openings.
E. Section 07 21 00 - Building Insulation: Batt insulation at window perimeter.
F. Section 07 92 00 - Joint Sealers: Perimeter joint sealant and backer rod.
G. Section 08 80 00 - Glazing: Translucent vinyl film.

1.03 REFERENCES

N. WDMA I.S.4-07A - Water-Repellent Preservative Treatment for Millwork.

1.04 SUBMITTALS

A. Product Data: Manufacturer's data sheets on each product to be used, including:
   1. Preparation instructions and recommendations.
   2. Storage and handling requirements and recommendations.
   3. Installation methods.
B. Certification: Evidence of certification to specified ratings.
C. Selection Samples: For each finish product specified, two complete sets of color chips representing manufacturer's full range of available colors and patterns.

D. Verification Samples: For each finish product specified, two samples, minimum size 6 inches square, representing actual product, color, and patterns.

1.05 QUALITY ASSURANCE
A. Provide windows for mock ups as shown on drawings. Include products and flashings as required for a complete installation.

1.06 DELIVERY, STORAGE, AND HANDLING
A. Do not deliver units to project site until ready to install, unless indoor storage area is available.
B. Store products in manufacturer's unopened packaging until ready for installation.

1.07 WARRANTY
A. Provide manufacturer's standard warranty for:
   1. Wood Members: 10 years.
   4. Exterior Aluminum Finish: Kynar finish 20 years.
   5. Anodized Aluminum Finish: 5 years.
   6. Insulating Glass: 20 years.
   7. Other Components: 10 years.

PART 2 PRODUCTS

2.01 MANUFACTURERS
A. Acceptable Manufacturer: Andersen Windows, E-series (Eagle), which is located at: 2045 Kerper Blvd. ; Dubuque, IA 52001; Toll Free Tel: 800-324-5354
   1. Contact Info: Nathan Treloar, Tel: 320-492-8392

2.02 WINDOWS - GENERAL
A. Windows: Complying with AAMA/WDMA/CSA 101/I.S.2/A440-08; factory assembled and glazed, complete with weatherstripping, operating hardware and specified accessories.
   1. Total Jamb Depth: As indicated on Drawings; provide factory installed jamb extensions.
   2. NFRC certified thermal performance.

2.03 CLAD WOOD WINDOWS
A. Fixed Windows:
   1. Type: Fixed picture; Rating LC-PG50.
   2. Factory applied nailing fin.

B. Wood Frame and Sash Members: Select kiln dried wood, water and insect repellent and preservative treated in accordance with WDMA I.S.4; wood members not fastened or adhered to cladding.
   1. Wood Species: Maple.
      a. Frame: Preservative treated laminated veneer lumber.
      b. Interior Exposed Frame: Preservative treated solid lumber, kiln dried and suitable for stain or painted finish.
      c. Sash: Preservative treated solid lumber, kiln dried and suitable for stain or painted finish.
   3. Frame Corners: Block mitered, stapled, and sealed with silicone.
   4. Sash Corners: Mortised and tenoned, glued, mechanically fastened, and sealed with silicone.
   5. Interior Finish: Factory applied stain and transparent finish.
      a. Finish color as selected from manufacturer's full line.
C. Aluminum Cladding: Aluminum extrusions, 0.045 inch thick minimum on both frame and sash, one piece in any one length; with mitered corners mechanically fastened with corner locks and stainless steel screws; sash cladding applied by sliding onto wood members, not fastened or adhered to wood.
   1. Painted Finish: Factory-applied baked-on silicone polyester enamel, in compliance with AAMA 2605 color as selected from manufacturer’s standard colors of no less than 50 options.

2.04 MATERIALS

A. Insulated Glazing: Sealed insulating glass; glass of thickness recommended by manufacturer for size and application; rated CBA in accordance with ASTM E 774.
   1. All windows, without Decorative glass or between-the-glass blinds, shall be covered with a protective film applied to the interior and exterior lites to protect against damage and aid in final cleaning.
   2. Windows, Unless Indicated as Tempered: Inboard and outboard lite annealed, complying with ASTM C 1036 quality Q3.
   3. Windows, Where Tempered Glass is Indicated: Inboard and outboard lites fully tempered, complying with ASTM C 1036 quality Q3 and ASTM C 1048, Kind FT.
   4. Type: LowE-366 Low SHGC, High Performance Low-E4, Titanium Dioxide and Silicone Dioxide hydrophilic low-emissivity coated, with Argon glass blend fill and a translucent protective film.
      a. Low-Emissivity Coating. Three layers of silver Magnetron sputtering vapor deposition (MSVD) type applied to No. 2 surface.
      b. Performance at Center of Glass. NFRC validated.
         1) Thermal Transmission: U-value of 0.24.
         2) Solar Heat Gain Coefficient (SHGC): 0.27.
         3) Visible Light Transmittance (Vtc): 66 percent.
         4) Ultraviolet Transmittance (Tuv): 5 percent.
         5) Krochmann Damage Weighted Fading Function (Tdw): 43 percent.
         6) ISO-CIE Damage Weighted Transmission: 43 percent.
   5. Tint: None.

B. Interior Trim and Casings: Profiles as indicated on the drawings; same species as interior frame and sash; finger jointing is acceptable for opaque finishing.

C. Structural Mullion Reinforcement: As indicated on the drawings or required to comply with local code requirements; provide drip cap at horizontal zero mullions.

D. Metal Trim Accessories: Type and configuration as required to make a complete, weatherproof installation; same finish as exterior frame.

PART 3 EXECUTION

3.01 EXAMINATION

A. Do not begin installation until substrates have been properly prepared.

B. If substrate preparation is the responsibility of another installer, notify Architect of unsatisfactory preparation before proceeding.

3.02 PREPARATION

A. Clean surfaces thoroughly prior to installation.

B. Prepare surfaces using the methods recommended by the manufacturer for achieving the best result for the substrate under the project conditions.

3.03 INSTALLATION

A. Install in accordance with manufacturer’s instructions.

B. After installation adjust units for proper operation, without binding, sticking, or racking.
3.04 PROTECTION
   A. Protect installed products until completion of project.
   B. Touch-up, repair or replace damaged products before Substantial Completion.

END OF SECTION
SECTION 08 55 10 - REINFORCED ALUMINUM WINDOWS WITH IMPACT GLAZING

PART 1 - GENERAL

1.01 SECTION INCLUDES

A. Reinforced aluminum windows with impact glazing.

1.02 RELATED SECTIONS

A. Section 07 92 00: Joint Sealers.

1.03 REFERENCES


G. AAMA 512-11 - Voluntary Specifications for Tornado Hazard Mitigation Fenestration Products.

H. FEMA 361 - Design and Construction Guidelines For Community Safe Rooms


M. ASTM E 547 - Standard Test Method for Water Penetration of Exterior Windows, Skylights, Doors, and Curtain Walls by Cyclic Static Air Pressure Difference


1.04 SUBMITTALS

A. Product Data: Manufacturer's data sheets on each product to be used, including:
   1. Preparation instructions and recommendations.
   2. Storage and handling requirements and recommendations.
   3. Installation methods.

B. Shop Drawings:
   1. Elevation for each style window specified indicating its size, glazing type, muntin type and design.
2. Manufacturer’s head, jamb and sill details and section views for each window type specified.

C. Schedules:
   1. Provide a window schedule indicating the type, size, color, and operation of each unit specified. Coordinate with window mark types found in the Contract Drawings.

D. Selection Samples: For each finish product specified, two complete sets of color chips representing manufacturer’s full range of available colors and patterns.

E. Verification Samples: For each finish product specified, two samples representing actual product, color, and patterns. Samples may be subsequently installed on the project.

F. Test Reports: Submit certified independent testing agency reports indicating window units meet or exceed specified performance requirements.

1.05 SYSTEM DESCRIPTION

A. Test Units:
   1. Air, water and structural test unit shall conform to requirements set forth in AAMA/WDMA/CSA 101/I.S.2/A440.

B. Test Procedures and Performance:
   1. Windows shall conform to AAMA/WDMA/CSA 101/I.S.2/A440 requirements for each window type.
   2. Air Infiltration Test:
      a. With window sash and ventilators closed and locked, test unit in accordance with ASTM E 283 at static air pressure of 6.24 psf.
      b. Air infiltration shall not exceed that specified for each Product.
   3. Water Resistance Test:
      a. With window sash and ventilators closed and locked, test unit in accordance with ASTM E 331 and ASTM E 547 at static air pressure difference of 12 psf.
      b. There shall be no uncontrolled water leakage.
   4. Uniform Load Deflection Test:
      a. With window sash and ventilators closed and locked, test unit in accordance with ASTM E 330 at static air pressure (positive and negative) difference of 100% design pressure.
      b. During testing, no member shall deflect more than 1/175 of its span.
   5. Uniform Load Structural Test:
      a. With window sash and ventilators closed and locked, test unit in accordance with ASTM E 330 at static air pressure (positive and negative) difference 150% of design pressure.
      b. At conclusion of test, there shall be no glass breakage; no permanent damage to fasteners, hardware parts, support arms, or actuating mechanisms; no other damage which would cause window to be inoperable.
   6. Condensation Resistance Test (CRF):
      a. With window sash closed and locked, test unit in accordance with AAMA 1503.1.
      b. Condensation Resistance Factor (CRF) shall not be less than that specified for each Product.
   7. Thermal Transmittance Test (Conductive U-Value):
      a. With window sash closed and locked, test unit in accordance with AAMA 1503.1.
      b. Conductive thermal transmittance (U-Value) shall not exceed that specified for each Product.
   8. Life Cycle Test:
      a. Test window in accordance with AAMA 910.
      b. At conclusion of test, there shall be no damage to fasteners, hardware parts, support arms, or actuating mechanisms; no other damage which would cause window to be inoperable. Subsequent air infiltration and water resistance tests shall not exceed specified requirements.
9. Forced Entry Resistance Test: ASTM F 588, Type and Grade as indicated for each Product.
10. Tornado Hazard Mitigating:
   a. Test window in accordance with FEMA 361
   b. Furnish windows capable of providing protection from winds as specified in ICC-500 Tornado Hazard Map.
   c. Furnish window that will resist 3-second 180 mph design wind speed and tornado missile speed of 100 mph (15-lb 2X4)
   d. A “Pass” test as identified in ICC-500 Chapter 8. Missile did not perforate the glazing; The glazing remained attached to the glazing frame; Glass fragments or shards remained within the glazing unit.
   e. Anchors, clips, stops and other accessories shall be provided to comply with AAMA 101.1.S.2 and AAMA 907. Provide units and anchorage mechanism with sufficient strength to withstand required design pressure and strength for specified load conditions.

1.06 QUALITY ASSURANCE
   A. Manufacturer Qualifications: All windows and window hardware specified in this section will be supplied by a single manufacturer with a minimum of ten (10) years experience.
   B. Installer Qualifications: All products listed in this section are to be installed by a single installer with a minimum of five (5) years demonstrated experience in installing windows of the same type and scope as specified.
   C. Provide test reports from AAMA accredited laboratory certifying that window units are found to be in compliance with AAMA/WDMA/CSA 101/I.S.2/A440-97 and performance standards listed above.
      1. Test reports shall be accompanied by the window manufacturer's letter of certification stating that the tested window meets or exceeds criteria for the appropriate AAMA/WDMA/CSA 101/I.S.2/A440 test.
   D. Code Compliance: Provide windows that comply with regulations of the code bodies having jurisdiction.

1.07 DELIVERY, STORAGE, AND HANDLING
   A. Store products in manufacturer's unopened packaging until ready for installation in accordance with manufacturer's recommendations.
   B. Protect units against damage from the elements, construction activities and other hazards before, during, and after installation.

1.08 PROJECT CONDITIONS
   A. Maintain environmental conditions (temperature, humidity, and ventilation) within limits recommended by manufacturer for optimum results. Do not install products under environmental conditions outside manufacturer's absolute limits.

1.09 WARRANTY
   A. At project closeout, provide to Owner or Owners Representative an executed copy of the manufacturer's standard limited warranty against manufacturing defect, outlining its terms, conditions, and exclusions from coverage.

PART 2 - PRODUCTS

2.01 MANUFACTURERS
   A. Basis-of-Design: Winco Window Co., Winco 3350 Series: 3-1/2 inch Heavy Commercial Thermally Improved Windows; www.wincowindow.com

2.02 MATERIALS
   A. Aluminum:
      1. Frame: Extruded aluminum, 6063-T6 alloy and temper, tensile strength of 25,000 psi.
2. Ventilator: Extruded tubular aluminum, 6063-T6 alloy and temper, tensile strength of 25,000 psi.

B. Thermal Barrier:
   1. Poured-in-place structural thermal barrier shall transfer shear during bending and provide composite action between frame components.
   2. Thermal barrier pocket on aluminum extrusions shall be Azo-Braded to create a mechanical lock to improve the adhesion properties between the polyurethane polymer and the surface of the thermal barrier pocket.
   3. Window manufacturer must provide a warranty from the manufacturer of the polyurethane thermal barrier that warrants against product failure as a result of thermal shrinkage beyond 1/8 inch from each end and fracturing of the polyurethane for a period not to exceed ten years from the date of window manufacture.

2.03 THERMAL FLUSH VENT PROJECTED/FIXED WINDOWS
      4. Air Infiltration, ASTM E 283 at static air pressure of 6.24 psf: 0.05 cfm/sf.
      5. Uniform Load Structural Test, ASTM E 330: 120 psf.
      7. Condensation Resistance Factor (CRF), AAMA 1503.1:
         a. Frame: 63.
      8. Thermal Performance ("U" Value), AAMA 1503.1: 0.39 BTU/Hr.F°-Ft².
      9. Blast Resistant: Provide a complete blast resistant window assembly meeting UFC 4-010-01. Reference the Project Blast Load Table for specific Charge Weights and Standoff distances per elevation.

   B. Ventilator and Access Sash:
      2. Vent and access panel shall be flush with exterior frame when closed. Overlap sash is unacceptable.
      3. Wall Thickness: 0.125 inches.
      4. Ventilator Depth: 3-5/16 inches.
      5. Corners: Mitered and mechanically fastened with screws and sealed.

2.04 HARDWARE
   A. Hinged Sash Supports: Stainless steel four bar arms.

2.05 2.5 FINISH
   A. Paint Finish: Finish all exposed areas of aluminum windows and components with the following:
      1. 70 percent Kynar in accordance with AA-M12-C42-R1X, AAMA 2605-98
      2. Color: Match color of aluminum clad wood windows specified in Section 08 55 00.

2.06 GLAZING
   A. Glass: Manufacturer’s clear, low-e coated insulated unit tested and complying with performance requirements.

PART 3 - EXECUTION

3.01 EXAMINATION
   A. Do not begin installation until substrates have been properly prepared.
   B. If substrate preparation is the responsibility of another installer, notify Architect of unsatisfactory preparation before proceeding.
3.02 PREPARATION
   A. Clean surfaces thoroughly prior to installation.
   B. Prepare surfaces using the methods recommended by the manufacturer for achieving the best result for the substrate under the project conditions.

3.03 INSTALLATION
   A. Install in accordance with manufacturer's instructions.

3.04 PROTECTION
   A. Protect installed products until completion of project.
   B. Final operating adjustment shall be made after glazing work is complete. Operating sash and ventilator shall operate smoothly and shall be weathertight when in locked position
   C. Touch-up, repair or replace damaged products before Substantial Completion.

   END OF SECTION
SECTION 08 71 00 – DOOR HARDWARE

PART 1 - GENERAL

1.1 SUMMARY

A. This Section includes commercial door hardware for the following:
   1. Swinging doors.
   2. Other doors to the extent indicated.

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

C. Related Sections:
   1. Division 08 Section “Hollow Metal Doors and Frames”.
   2. Division 08 Section “Flush Wood Doors”.
   3. Division 08 Section “Aluminum-Framed Storefronts”.

D. Codes and References: Comply with the version year adopted by the Authority Having Jurisdiction.
   6. NFPA 105 - Installation of Smoke Door Assemblies.
   7. UL/ULC and CSA C22.2 – Standards for Automatic Door Operators Used on Fire and Smoke Barrier Doors and Systems of Doors.
   8. 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. Supplier to have on staff a certified Architectural Hardware Consultant (AHC) available during the course of the Work to consult with Contractor, Architect, and Owner concerning both standard and electromechanical door hardware and keying.

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 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 as specified in the Door Hardware Sets.

1. Quantity: Provide the following hinge quantity, unless otherwise indicated:
   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. Acceptable Manufacturers:
   a. Hager Companies (HA).
   b. Ives (IV).
   c. McKinney Products; ASSA ABLOY Architectural Door Accessories (MK).

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. Acceptable Manufacturers:
a. Ives (IV).
b. McKinney Products; ASSA ABLOY Architectural Door Accessories (MK).
c. Pemko Products; ASSA ABLOY Architectural Door Accessories (PE).

2.3 POWER TRANSFER DEVICES

A. 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. Acceptable Manufacturers:
   a. Pemko Products; ASSA ABLOY Architectural Door Accessories (PE) – EL-CEPT Series.
   b. Securitron (SU) - EL-CEPT Series.

B. 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. Acceptable Manufacturers:

2.4 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. 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.

C. Patented Cylinders: ANSI/BHMA A156.5, Grade 1, certified cylinders employing a utility patented and restricted keyway requiring the use of patented controlled keys. Provide bump resistant, fixed core cylinders as standard with solid recessed cylinder collars. Cylinders are to be factory keyed where permanent keying records will be established and maintained.

1. Provide a 6 pin multi-level master key system comprised of patented controlled keys and security and high security cylinders operated by one (1) key of the highest level. Geographical exclusivity to be provided for all security and high security cylinders and UL437 certification where specified.
   a. Level 1 Cylinders: Provide utility patented controlled keyway cylinders that are furnished with patented keys available only from authorized distribution.

2. Acceptable Manufacturers:
   a. Sargent Manufacturing (SA) - Degree Series.

D. 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.

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

1. Change Keys per Cylinder: Two (2)
2. Master Keys (per Master Key Level/Group): Five (5).

F. Construction Keying: Provide construction master keyed cylinders.

G. 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.

H. Key Control Cabinet: Provide a key control system including envelopes, labels, and tags with self-locking key clips, receipt forms, 3-way visible card index, temporary markers, permanent markers, and standard metal cabinet. Key control cabinet shall have expansion capacity of 150% of the number of locks required for the project.

1. Acceptable Manufacturers:
   a. Lund Equipment (LU).
   b. MMF Industries (MM).
   c. Telkee (TK).
2.5 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. Extended cycle test: Locks to have been cycle tested in ordinance with ANSI/BHMA 156.13 requirements to 10 million cycles.
2. Acceptable Manufacturers:
   b. Sargent Manufacturing (SA) – 8200 Series.
   c. No Substitution.

B. Multi-Point Locksets: Vertical rod locking devices designed for openings requiring multiple latching points within one locking mechanism. Rods are retracted by dual mounted outside lever trim controls available in a variety of ANSI/BHMA operational functions. Option for single top latching only eliminates the need for bottom strikes.

1. Acceptable Manufacturers:
   a. Corbin Russwin Hardware (RU) – MP9800 Series.
   b. Sargent Manufacturing (SA) - 7000 Series.

2.6 ELECTROMECHANICAL LOCKING DEVICES

A. Electromechanical Mortise Locksets, Grade 1 (Heavy Duty): Subject to same compliance standards and requirements as mechanical mortise locksets, electrified locksets to be of type and design as specified below.

1. Electrified Lock Options: Where indicated in the Hardware Sets, provide electrified options including: outside door lock/unlock trim control, latchbolt and lock/unlock status monitoring, deadbolt monitoring, and request-to-exit signaling. Support end-of-line resistors contained within the lock case. Unless otherwise indicated, provide electrified locksets standard as fail secure.
2. Energy Efficient Design: Provide lock bodies which have a holding current draw of 15mA maximum, and can operate on either 12 or 24 volts. Locks are to be field configurable for fail safe or fail secure operation.
3. High Security Monitoring: Provide lock bodies which have built-in request to exit monitoring and are provided with accompanying door position switches. Provide a resistor configuration which is compatible with the access control system.
4. Acceptable Manufacturers:
   a. Corbin Russwin Hardware (RU) - ML20900 Series.
   b. Sargent Manufacturing (SA) - 8200 Series.
   c. No Substitution.
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 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. Extended cycle test: Devices to have been cycle tested in ordinance with ANSI/BHMA 156.3 requirements to 9 million cycles.

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

13. 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. Acceptable Manufacturers:
   a. Corbin Russwin Hardware (RU) - ED4000 / ED5000 Series.
   b. Sargent Manufacturing (SA) - 80 Series.
   c. No Substitution.

C. 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. Acceptable Manufacturers:
   a. Corbin Russwin Hardware (RU) - 700/900 Series.
   b. Sargent Manufacturing (SA) - 980S Series.

2.9 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 (Large Body Cast Iron): 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 body construction, with adjustable backcheck and separate non-critical valves for closing sweep and latch speed control.

1. Acceptable Manufacturers:
   a. Corbin Russwin Hardware (RU) - DC8000 Series.
   b. Norton Door Controls (NO) – 9500 Series.
   c. Sargent Manufacturing (SA) - 281 Series.

### 2.10 ELECTROHYDRAULIC DOOR OPERATORS

A. General: Provide low energy operators of size recommended by manufacturer for door size, weight, and movement; for condition of exposure; and for compliance with UL 325. Coordinate operator mechanisms with door operation, hinges, and activation devices.

1. Fire-Rated Doors: Provide door operators for fire-rated door assemblies that comply with NFPA 80 for fire-rated door components and are listed and labeled by a qualified testing agency.

B. Standard: Certified ANSI/BHMA A156.19.

C. Performance Requirements:
1. Opening Force if Power Fails: Not more than 15 lbf required to release a latch if provided, not more than 30 lbf required to manually set door in motion, and not more than 15 lbf required to fully open door.

2. Entrapment Protection: Not more than 15 lbf required to prevent stopped door from closing or opening.

D. Configuration: Surface mounted or in-ground as required. Door operators to control single swinging and pair of swinging doors.

E. Operation: Power opening and spring closing operation capable of meeting ANSI A117.1 accessibility guideline. Provide time delay for door to remain open before initiating closing cycle as required by ANSI/BHMA A156.19. When not in automatic mode, door operator to function as manual door closer with fully adjustable opening and closing forces, with or without electrical power.

F. Features: Operator units to have full feature adjustments for door opening and closing force and speed, backcheck, motor assist acceleration from 0 to 30 seconds, time delay, vestibule interface delay, obstruction recycle, and hold open time from 0 up to 30 seconds.

G. Provide outputs and relays on board the operator to allow for coordination of exit device latch retraction, electric strikes, magnetic locks, card readers, safety and motion sensors and specified auxiliary contacts.

H. Brackets and Reinforcements: Manufacturer's standard, fabricated from aluminum with nonferrous shims for aligning system components.

I. Acceptable Manufacturers: Subject to compliance with requirements, provide products by one of the following:

1. Norton Door Controls (NO) - 6000 Series.

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, 0.050-inch thick.

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

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

C. Overhead Door Stops and Holders: ANSI/BHMA A156.6, Grade 1 certified overhead stops and holders to be surface or concealed types as indicated in Hardware Sets. Track, slide, arm and jamb bracket to be constructed of extruded bronze and shock absorber spring of heavy tempered steel. Provide non-handed design with mounting brackets as required for proper operation and function.

   1. Acceptable Manufacturers:
      a. Rixson Door Controls (RF).
      b. Rockwood Products; ASSA ABLOY Architectural Door Accessories (RO).
      c. Sargent Manufacturing (SA).

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

2.14 ELECTRONIC ACCESSORIES

A. 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. Acceptable Manufacturers:
      a. Security Door Controls (SD) - DPS Series.
      b. Securitron (SU) - DPS 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.

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. Manufacturer's Abbreviations:
1. MK - McKinney
2. PE - Pemko
3. RO - Rockwood
4. SA - Sargent
5. RF - Rixson
6. NO - Norton
7. SU - Securitron

**Hardware Sets**

**Set: 1.0**

<table>
<thead>
<tr>
<th>Doors: 01</th>
</tr>
</thead>
<tbody>
<tr>
<td>2 Continuous Hinge</td>
</tr>
<tr>
<td>1 Removable Mullion</td>
</tr>
<tr>
<td>1 Exit Device</td>
</tr>
<tr>
<td>1 Exit Device</td>
</tr>
<tr>
<td>1 Mullion Cylinder</td>
</tr>
<tr>
<td>2 Pull</td>
</tr>
<tr>
<td>2 Concealed Overhead Stop</td>
</tr>
<tr>
<td>1 Door Closer</td>
</tr>
<tr>
<td>1 Drop Plate</td>
</tr>
<tr>
<td>1 Blade Stop Spacer</td>
</tr>
<tr>
<td>1 Door Operator</td>
</tr>
<tr>
<td>1 Threshold</td>
</tr>
<tr>
<td>1 Mullion Gasketing</td>
</tr>
<tr>
<td>2 Sweep</td>
</tr>
<tr>
<td>2 Electric Power Transfer</td>
</tr>
<tr>
<td>2 ElectroLynx Harness</td>
</tr>
<tr>
<td>2 ElectroLynx Harness</td>
</tr>
<tr>
<td>2 Position Switch</td>
</tr>
<tr>
<td>2 Actuator</td>
</tr>
<tr>
<td>1 Set Of Wiring Diagrams</td>
</tr>
</tbody>
</table>

Notes: Doors normally closed, latched and secure. Entry by valid prox card, as electrically dogged open or actuators as programmed by access control system.
Free egress at all times.
Card reader, AiPhone and power supply by security contractor.
Weatherstripping by aluminum door supplier.

**Set: 2.0**

<table>
<thead>
<tr>
<th>Item</th>
<th>Model/Description</th>
<th>Finish</th>
<th>Location</th>
</tr>
</thead>
<tbody>
<tr>
<td>2 Continuous Hinge</td>
<td>CFM83SLI-HD1 PT x Height Required</td>
<td>PE</td>
<td>PE</td>
</tr>
<tr>
<td>1 Removable Mullion</td>
<td>L980 x Height Required</td>
<td>PC</td>
<td>SA</td>
</tr>
<tr>
<td>1 Exit Device</td>
<td>53 55 56 8810</td>
<td>US32D</td>
<td>SA</td>
</tr>
<tr>
<td>1 Exit Device</td>
<td>DG1 53 55 6804</td>
<td>US32D</td>
<td>SA</td>
</tr>
<tr>
<td>1 Mullion Cylinder</td>
<td>DG1 980C1</td>
<td>US26D</td>
<td>SA</td>
</tr>
<tr>
<td>2 Pull</td>
<td>RM201 Mtg-Type 1XHD</td>
<td>US32D</td>
<td>RO</td>
</tr>
<tr>
<td>2 Concealed Overhead Stop</td>
<td>1-X36</td>
<td>630</td>
<td>RF</td>
</tr>
<tr>
<td>1 Door Closer</td>
<td>281 P10</td>
<td>EN</td>
<td>SA</td>
</tr>
<tr>
<td>1 Drop Plate</td>
<td>281D</td>
<td>EN</td>
<td>SA</td>
</tr>
<tr>
<td>1 Blade Stop Spacer</td>
<td>581-2</td>
<td>EN</td>
<td>SA</td>
</tr>
<tr>
<td>1 Door Operator</td>
<td>6060</td>
<td></td>
<td>NO</td>
</tr>
<tr>
<td>1 Mullion Gasketing</td>
<td>5110BL</td>
<td></td>
<td>PE</td>
</tr>
<tr>
<td>2 Electric Power Transfer</td>
<td>EL-CEPT</td>
<td></td>
<td>SU</td>
</tr>
<tr>
<td>2 ElectroLynx Harness</td>
<td>QC-C1500P (Frame - EPT to Power/Controller)</td>
<td></td>
<td>MK</td>
</tr>
<tr>
<td>2 ElectroLynx Harness</td>
<td>QC-CxxxP (Door - EPT to Elec. Exit Device)</td>
<td></td>
<td>MK</td>
</tr>
<tr>
<td>2 Position Switch</td>
<td>DPS-M / W</td>
<td></td>
<td>SU</td>
</tr>
<tr>
<td>2 Actuator</td>
<td>505</td>
<td></td>
<td>NO</td>
</tr>
<tr>
<td>1 Set Of Wiring Diagrams</td>
<td></td>
<td></td>
<td>00</td>
</tr>
</tbody>
</table>

Notes: Doors normally closed, latched and secure.
Entry by valid prox card, as electrically dogged open or actuators as programmed by access control system.
Free egress at all times.
Card reader and power supply by security contractor.

**Set: 3.0**

<table>
<thead>
<tr>
<th>Item</th>
<th>Model/Description</th>
<th>Finish</th>
<th>Location</th>
</tr>
</thead>
<tbody>
<tr>
<td>2 Continuous Hinge</td>
<td>CFM83HD1 PT x Height Required</td>
<td>PE</td>
<td>PE</td>
</tr>
<tr>
<td>1 Removable Mullion</td>
<td>L980 x Height Required</td>
<td>PC</td>
<td>SA</td>
</tr>
<tr>
<td>1 Exit Device</td>
<td>53 55 56 8810</td>
<td>US32D</td>
<td>SA</td>
</tr>
<tr>
<td>1 Rim Exit Device</td>
<td>DG1 53 55 8804 ETJ</td>
<td>US32D</td>
<td>SA</td>
</tr>
<tr>
<td>1 Mullion Cylinder</td>
<td>DG1 980C1</td>
<td>US26D</td>
<td>SA</td>
</tr>
<tr>
<td>2 Surface Overhead Stop</td>
<td>9-X36</td>
<td>630</td>
<td>RF</td>
</tr>
<tr>
<td>2 Door Closer</td>
<td>281 PD10</td>
<td>EN</td>
<td>SA</td>
</tr>
<tr>
<td>Item</td>
<td>Description</td>
<td>Code</td>
<td>Notes</td>
</tr>
<tr>
<td>-------------------------------------</td>
<td>--------------------------------------------------</td>
<td>---------</td>
<td>--------------------------------------------</td>
</tr>
<tr>
<td>Kick Plate</td>
<td>K1050 10&quot; x 2&quot; LDW 4BE CSK</td>
<td>US32D</td>
<td></td>
</tr>
<tr>
<td>Threshold</td>
<td>253x3AFG</td>
<td>PE</td>
<td></td>
</tr>
<tr>
<td>Rain Guard</td>
<td>346A TKSP8</td>
<td>PE</td>
<td></td>
</tr>
<tr>
<td>Weather Stripping</td>
<td>316APK TKSP8</td>
<td>PE</td>
<td></td>
</tr>
<tr>
<td>Mullion Gasketing</td>
<td>5110BL</td>
<td>PE</td>
<td></td>
</tr>
<tr>
<td>Sweep</td>
<td>3452CNB TKSP8</td>
<td>PE</td>
<td></td>
</tr>
<tr>
<td>Astragal</td>
<td>18041CNB TKSP8</td>
<td>PE</td>
<td></td>
</tr>
<tr>
<td>Electric Power Transfer</td>
<td>EL-CEPT</td>
<td>SU</td>
<td></td>
</tr>
<tr>
<td>ElectroLynx Harness</td>
<td>QC-C1500P (Frame - EPT to Power/Controller)</td>
<td>MK</td>
<td></td>
</tr>
<tr>
<td>ElectroLynx Harness</td>
<td>QC-CxxxP (Door - EPT to Elec. Exit Device)</td>
<td>MK</td>
<td></td>
</tr>
<tr>
<td>Position Switch</td>
<td>DPS-M / W</td>
<td>SU</td>
<td></td>
</tr>
<tr>
<td>Set Of Wiring Diagrams</td>
<td></td>
<td>00</td>
<td></td>
</tr>
</tbody>
</table>

Notes: Door normally closed, latched and secure.
Entry by key override.
Free egress at all times.
Power supply by security contractor.

Set: 4.0

Doors: 02, 03

<table>
<thead>
<tr>
<th>Item</th>
<th>Description</th>
<th>Code</th>
<th>Notes</th>
</tr>
</thead>
<tbody>
<tr>
<td>Continuous Hinge</td>
<td>CFM83HD1 PT x Height Required</td>
<td>PE</td>
<td></td>
</tr>
<tr>
<td>Rim Exit Device (local alarm)</td>
<td>AL DG1 53 55 8810</td>
<td>US32D</td>
<td></td>
</tr>
<tr>
<td>Surface Overhead Stop</td>
<td>9-X36</td>
<td>630</td>
<td></td>
</tr>
<tr>
<td>Door Closer</td>
<td>281 PD10</td>
<td>EN</td>
<td></td>
</tr>
<tr>
<td>Kick Plate</td>
<td>K1050 10&quot; x 2&quot; LDW 4BE CSK</td>
<td>US32D</td>
<td></td>
</tr>
<tr>
<td>Threshold</td>
<td>253x3AFG</td>
<td>PE</td>
<td></td>
</tr>
<tr>
<td>Rain Guard</td>
<td>346A TKSP8</td>
<td>PE</td>
<td></td>
</tr>
<tr>
<td>Weather Stripping</td>
<td>316APK TKSP8</td>
<td>PE</td>
<td></td>
</tr>
<tr>
<td>Sweep</td>
<td>3452CNB TKSP8</td>
<td>PE</td>
<td></td>
</tr>
<tr>
<td>Electric Power Transfer</td>
<td>EL-CEPT</td>
<td>SU</td>
<td></td>
</tr>
<tr>
<td>ElectroLynx Harness</td>
<td>QC-C1500P (Frame - EPT to Power/Controller)</td>
<td>MK</td>
<td></td>
</tr>
<tr>
<td>ElectroLynx Harness</td>
<td>QC-CxxxP (Door - EPT to Elec. Exit Device)</td>
<td>MK</td>
<td></td>
</tr>
<tr>
<td>Position Switch</td>
<td>DPS-M / W</td>
<td>SU</td>
<td></td>
</tr>
<tr>
<td>Set Of Wiring Diagrams</td>
<td></td>
<td>00</td>
<td></td>
</tr>
</tbody>
</table>

Notes: Door normally closed, latched and secure.
No entry - exit only door.
Free egress at all times will sound local alarm.
Alarm reset by cylinder in exit device rail.
Power supply by security contractor.
Set: 5.0

Doors: 05, 06

<table>
<thead>
<tr>
<th>Item</th>
<th>Description</th>
<th>Set</th>
<th>Finish</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 Continuous Hinge</td>
<td>CFM83HD1 PT x Height Required</td>
<td>PE</td>
<td></td>
</tr>
<tr>
<td>1 Exit Device</td>
<td>DG1 53 55 56 8804</td>
<td>US32D</td>
<td>SA</td>
</tr>
<tr>
<td>1 Pull</td>
<td>RM201 Mtg-Type 1XHD</td>
<td>US32D</td>
<td>RO</td>
</tr>
<tr>
<td>1 Surface Overhead Stop</td>
<td>9-X36</td>
<td>630</td>
<td>RF</td>
</tr>
<tr>
<td>1 Door Closer</td>
<td>281 PD10</td>
<td>EN</td>
<td>SA</td>
</tr>
<tr>
<td>1 Kick Plate</td>
<td>K1050 10&quot; x 2&quot; LDW 4BE CSK</td>
<td>US32D</td>
<td>RO</td>
</tr>
<tr>
<td>1 Threshold</td>
<td>253x3AFG</td>
<td>PE</td>
<td></td>
</tr>
<tr>
<td>1 Rain Guard</td>
<td>346A TKSP8</td>
<td>PE</td>
<td></td>
</tr>
<tr>
<td>1 Weather Stripping</td>
<td>316APK TKSP8</td>
<td>PE</td>
<td></td>
</tr>
<tr>
<td>1 Sweep</td>
<td>3452CNB TKSP8</td>
<td>PE</td>
<td></td>
</tr>
<tr>
<td>1 Electric Power Transfer</td>
<td>EL-CEPT</td>
<td>SU</td>
<td></td>
</tr>
<tr>
<td>1 ElectroLynx Harness (FEMA)</td>
<td>QC-C1500P (Frame - EPT to Power/Controller)</td>
<td>MK</td>
<td></td>
</tr>
<tr>
<td>1 ElectroLynx Harness</td>
<td>QC-CxxxP (Door - EPT to Elec. Exit Device)</td>
<td>MK</td>
<td></td>
</tr>
<tr>
<td>1 Position Switch</td>
<td>DPS-M / W</td>
<td>SU</td>
<td></td>
</tr>
<tr>
<td>1 Set Of Wiring Diagrams</td>
<td>00</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Notes: Door normally closed, latched and secure. 
Entry by valid card read or key override. 
Free egress at all times. 
Card reader, power supply and wiring by security contractor.

Set: 6.0

Doors: 08

<table>
<thead>
<tr>
<th>Item</th>
<th>Description</th>
<th>Set</th>
<th>Finish</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 Continuous Hinge</td>
<td>MCK-HG305 x Height Required</td>
<td>US32D</td>
<td>MK</td>
</tr>
<tr>
<td>1 Multipoint Exit Device (FEMA)</td>
<td>FM8710</td>
<td>US32D</td>
<td>SA</td>
</tr>
<tr>
<td>1 Door Closer</td>
<td>TB 281 CPS</td>
<td>EN</td>
<td>SA</td>
</tr>
<tr>
<td>1 Threshold</td>
<td>1715A</td>
<td>PE</td>
<td></td>
</tr>
<tr>
<td>1 Rain Guard</td>
<td>346A TKSP8</td>
<td>PE</td>
<td></td>
</tr>
<tr>
<td>1 Gasketing</td>
<td>S773D</td>
<td>PE</td>
<td></td>
</tr>
<tr>
<td>1 Sweep</td>
<td>3452CNB TKSP8</td>
<td>PE</td>
<td></td>
</tr>
<tr>
<td>1 Position Switch</td>
<td>DPS-M / W</td>
<td>SU</td>
<td></td>
</tr>
<tr>
<td>1 Set Of Wiring Diagrams</td>
<td>00</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Notes: FEMA 361 Opening. 
Door normally closed, latched and secure. 
No entry - exit only door. 
Free egress at all times. 
Wiring by security contractor.
Notch threshold so bottom strike mounts on concrete floor and not on top of threshold.

**Set: 7.0**

<table>
<thead>
<tr>
<th>Item</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Doors: 04</td>
<td></td>
</tr>
<tr>
<td>1 Continuous Hinge</td>
<td>CFM83HD1 PT x Height Required PE</td>
</tr>
<tr>
<td>1 Exit Device</td>
<td>DG1 53 55 56 8804 US32D SA</td>
</tr>
<tr>
<td>1 Pull</td>
<td>RM201 Mtg-Type 1XHD US32D RO</td>
</tr>
<tr>
<td>1 Surf Overhead Hold Open</td>
<td>9-X26 630 RF</td>
</tr>
<tr>
<td>1 Door Closer</td>
<td>281 PD10 EN SA</td>
</tr>
<tr>
<td>1 Armor Plate</td>
<td>K1050 34&quot; x 2&quot; LDW 4BE CSK US32D RO</td>
</tr>
<tr>
<td>1 Threshold</td>
<td>253x3AFG PE</td>
</tr>
<tr>
<td>1 Rain Guard</td>
<td>346A TKSP8 PE</td>
</tr>
<tr>
<td>1 Weather Striping</td>
<td>316APK TKSP8 PE</td>
</tr>
<tr>
<td>1 Sweep</td>
<td>3452CNB TKSP8 PE</td>
</tr>
<tr>
<td>1 Electric Power Transfer</td>
<td>EL-CEPT SU</td>
</tr>
<tr>
<td>1 ElectroLynx Harness</td>
<td>QC-C1500P (Frame - EPT to Power/Controller) MK</td>
</tr>
<tr>
<td>1 ElectroLynx Harness</td>
<td>QC-CxxxP (Door - EPT to Elec. Exit Device) MK</td>
</tr>
<tr>
<td>1 Position Switch</td>
<td>DPS-M / W SU</td>
</tr>
<tr>
<td>1 Set Of Wiring Diagrams</td>
<td>00</td>
</tr>
</tbody>
</table>

Notes: Door normally closed, latched and secure.
Entry by valid prox or key override.
Free egress at all times.
Power supply by security contractor.

**Set: 8.0**

<table>
<thead>
<tr>
<th>Item</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Doors: 102A</td>
<td></td>
</tr>
<tr>
<td>6 Hinge</td>
<td>TA2714 4-1/2&quot; x 4-1/2&quot; US26D MK</td>
</tr>
<tr>
<td>1 Removable Mullion</td>
<td>L980 x Height Required PC SA</td>
</tr>
<tr>
<td>2 Exit Device</td>
<td>DG1 8816 ETJ US32D SA</td>
</tr>
<tr>
<td>1 Mullion Cylinder</td>
<td>DG1 980C1 US26D SA</td>
</tr>
<tr>
<td>2 Door Closer</td>
<td>281 P10 EN SA</td>
</tr>
<tr>
<td>2 Kick Plate</td>
<td>K1050 10&quot; x 2&quot; LDW 4BE CSK US32D RO</td>
</tr>
<tr>
<td>2 Wall Stop</td>
<td>400 US26D RO</td>
</tr>
<tr>
<td>1 Mullion Gasketing</td>
<td>5110BL PE</td>
</tr>
</tbody>
</table>

**Set: 9.0**

<table>
<thead>
<tr>
<th>Item</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Doors: 102B</td>
<td></td>
</tr>
<tr>
<td>6 Hinge</td>
<td>TA2714 4-1/2&quot; x 4-1/2&quot; US26D MK</td>
</tr>
<tr>
<td>Item Description</td>
<td>Specification</td>
</tr>
<tr>
<td>---------------------------------------</td>
<td>----------------------</td>
</tr>
<tr>
<td>Removable Mullion</td>
<td>L980 x Height Required</td>
</tr>
<tr>
<td>Exit Device</td>
<td>DG1 8816 ETJ</td>
</tr>
<tr>
<td>Mullion Cylinder</td>
<td>DG1 980C1</td>
</tr>
<tr>
<td>Surface Overhead Stop</td>
<td>9-X36</td>
</tr>
<tr>
<td>Door Closer</td>
<td>281 PD10</td>
</tr>
<tr>
<td>Kick Plate</td>
<td>K1050 10&quot; x 2&quot; LDW 4BE CSK</td>
</tr>
<tr>
<td>Mullion Gasketing</td>
<td>5110BL</td>
</tr>
</tbody>
</table>

**Set: 10.0**

Doors: 102A.1

<table>
<thead>
<tr>
<th>Item Description</th>
<th>Specification</th>
<th>Quantity</th>
<th>Finish</th>
<th>Usage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Hinge (heavy weight)</td>
<td>T4A3786 5&quot; x 4-1/2&quot;</td>
<td>6</td>
<td>US26D</td>
<td>MK</td>
</tr>
<tr>
<td>Multi-Point Lock</td>
<td>DG1 NB 701315 ETJ</td>
<td>2</td>
<td>US26D</td>
<td>SA</td>
</tr>
<tr>
<td>Surface Overhead Stop</td>
<td>9-X36</td>
<td>2</td>
<td>630</td>
<td>RF</td>
</tr>
<tr>
<td>Kick Plate</td>
<td>K1050 10&quot; x 2&quot; LDW 4BE CSK</td>
<td>2</td>
<td>US32D</td>
<td>RO</td>
</tr>
</tbody>
</table>

**Set: 11.0**

Doors: 201C.1

<table>
<thead>
<tr>
<th>Item Description</th>
<th>Specification</th>
<th>Quantity</th>
<th>Finish</th>
<th>Usage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Hinge (heavy weight)</td>
<td>T4A3786 5&quot; x 4-1/2&quot;</td>
<td>6</td>
<td>US26D</td>
<td>MK</td>
</tr>
<tr>
<td>Multi-Point Lock</td>
<td>DG1 NB 700615 ETJ</td>
<td>2</td>
<td>US26D</td>
<td>SA</td>
</tr>
<tr>
<td>Surface Overhead Stop</td>
<td>9-X36</td>
<td>2</td>
<td>630</td>
<td>RF</td>
</tr>
<tr>
<td>Door Closer</td>
<td>281 PD10</td>
<td>2</td>
<td>EN</td>
<td>SA</td>
</tr>
</tbody>
</table>

**Set: 12.0**

Doors: 402A.1

<table>
<thead>
<tr>
<th>Item Description</th>
<th>Specification</th>
<th>Quantity</th>
<th>Finish</th>
<th>Usage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Hinge</td>
<td>TA2714 4-1/2&quot; x 4-1/2&quot;</td>
<td>3</td>
<td>US26D</td>
<td>MK</td>
</tr>
<tr>
<td>Storeroom Lock</td>
<td>DG1 8204 LNJ</td>
<td>1</td>
<td>US26D</td>
<td>SA</td>
</tr>
<tr>
<td>Door Closer</td>
<td>281 O</td>
<td>1</td>
<td>EN</td>
<td>SA</td>
</tr>
<tr>
<td>Kick Plate</td>
<td>K1050 10&quot; x 2&quot; LDW 4BE CSK</td>
<td>1</td>
<td>US32D</td>
<td>RO</td>
</tr>
<tr>
<td>Wall Stop</td>
<td>400</td>
<td>1</td>
<td>US26D</td>
<td>RO</td>
</tr>
</tbody>
</table>

**Set: 13.0**

Doors: 102A.2, 201A.1, 202B.1, 304B.2, 404B.2

<table>
<thead>
<tr>
<th>Item Description</th>
<th>Specification</th>
<th>Quantity</th>
<th>Finish</th>
<th>Usage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Hinge</td>
<td>TA2714 4-1/2&quot; x 4-1/2&quot;</td>
<td>3</td>
<td>US26D</td>
<td>MK</td>
</tr>
<tr>
<td>Classroom Lock</td>
<td>DG1 8237 LNJ</td>
<td>1</td>
<td>US26D</td>
<td>SA</td>
</tr>
<tr>
<td>Wall Stop</td>
<td>400</td>
<td>1</td>
<td>US26D</td>
<td>RO</td>
</tr>
</tbody>
</table>

**Set: 14.0**
## COLLEGE COMMUNITY SCHOOL DISTRICT
### PRAIRIE EARLY CHILDHOOD CENTER
#### OPN PROJECT NO. 15290000

### DOOR HARDWARE

**Set: 15.0**

<table>
<thead>
<tr>
<th>Door</th>
<th>Item Description</th>
<th>Set</th>
</tr>
</thead>
<tbody>
<tr>
<td>101B, 101G.2</td>
<td><strong>3 Hinge</strong> TA2714 4-1/2&quot; x 4-1/2&quot; US26D MK 1 Classroom Lock DG1 8237 LNJ US26D SA 1 Door Closer 281 P10 EN SA 1 Kick Plate K1050 10&quot; x 2&quot; LDW 4BE CSK US32D RO 1 Wall Stop 400 US26D RO</td>
<td></td>
</tr>
<tr>
<td>101A</td>
<td><strong>3 Hinge</strong> TA2714 4-1/2&quot; x 4-1/2&quot; US26D MK 1 Fail Secure Electric Lock DG1 LX 8271-24V LNJ US26D SA 1 Door Closer 281 O EN SA 1 Kick Plate K1050 10&quot; x 2&quot; LDW 4BE CSK US32D RO 1 Wall Stop 400 US26D RO 1 Electric Power Transfer EL-CEPT SU 1 ElectroLynx Harness QC-C1500P (Frame - EPT to Power/Controller) MK 1 ElectroLynx Harness QC-CxxxP (Door - EPT to Elec. Lock) MK 1 Set Of Wiring Diagrams 00</td>
<td></td>
</tr>
<tr>
<td>204A</td>
<td><strong>3 Hinge</strong> TA2714 4-1/2&quot; x 4-1/2&quot; US26D MK 1 Classroom Lock DG1 8237 LNJ US26D SA 1 Door Closer (hold open) 281 PH10 EN SA 1 Armor Plate K1050 34&quot; x 2&quot; LDW 4BE CSK US32D RO 1 Wall Stop 400 US26D RO</td>
<td></td>
</tr>
<tr>
<td>101F.2</td>
<td><strong>3 Hinge</strong> TA2714 4-1/2&quot; x 4-1/2&quot; US26D MK 1 Classroom Lock DG1 8237 LNJ US26D SA 1 Surface Overhead Stop 9-X36 630 RF 1 Door Closer 281 PD10 EN SA 1 Kick Plate K1050 10&quot; x 2&quot; LDW 4BE CSK US32D RO</td>
<td></td>
</tr>
</tbody>
</table>

**Notes:**
- Door normally closed, latched and secure.
- Entry by key override or remote push button.
- Free egress at all times.
- Remote push button, power supply and wiring by security contractor.

**Set: 16.0**

<table>
<thead>
<tr>
<th>Door</th>
<th>Item Description</th>
<th>Set</th>
</tr>
</thead>
<tbody>
<tr>
<td>101A</td>
<td><strong>3 Hinge</strong> TA2714 4-1/2&quot; x 4-1/2&quot; US26D MK 1 Classroom Lock DG1 8237 LNJ US26D SA 1 Door Closer (hold open) 281 PH10 EN SA 1 Armor Plate K1050 34&quot; x 2&quot; LDW 4BE CSK US32D RO 1 Wall Stop 400 US26D RO</td>
<td></td>
</tr>
</tbody>
</table>

**Set: 17.0**

<table>
<thead>
<tr>
<th>Door</th>
<th>Item Description</th>
<th>Set</th>
</tr>
</thead>
<tbody>
<tr>
<td>101F.2</td>
<td><strong>3 Hinge</strong> TA2714 4-1/2&quot; x 4-1/2&quot; US26D MK 1 Classroom Lock DG1 8237 LNJ US26D SA 1 Surface Overhead Stop 9-X36 630 RF 1 Door Closer 281 PD10 EN SA 1 Kick Plate K1050 10&quot; x 2&quot; LDW 4BE CSK US32D RO</td>
<td></td>
</tr>
<tr>
<td>Set: 18.0</td>
<td></td>
<td></td>
</tr>
<tr>
<td>---</td>
<td>---</td>
<td></td>
</tr>
<tr>
<td>Doors: 204A.1, 208B.1, 208B.2, 209B.1, 210B.1, 304B.1, 404B.1</td>
<td></td>
<td></td>
</tr>
<tr>
<td>3 Hinge</td>
<td>TA2714 4-1/2&quot; x 4-1/2&quot;</td>
<td>US26D MK</td>
</tr>
<tr>
<td>1 Classroom Lock</td>
<td>DG1 8237 LNJ</td>
<td>US26D SA</td>
</tr>
<tr>
<td>1 Surface Overhead Stop</td>
<td>9-X36</td>
<td>630 RF</td>
</tr>
</tbody>
</table>

Notes: Door # 210B.1 is part of alternate #1

<table>
<thead>
<tr>
<th>Set: 19.0</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Doors: 209A, 211A, 404A</td>
<td></td>
</tr>
<tr>
<td>3 Hinge</td>
<td>TA2714 4-1/2&quot; x 4-1/2&quot;</td>
</tr>
<tr>
<td>1 Classroom Security Lock</td>
<td>DG1 8238 LNJ</td>
</tr>
<tr>
<td>1 Door Closer</td>
<td>281 P10</td>
</tr>
<tr>
<td>1 Kick Plate</td>
<td>K1050 10&quot; x 2&quot; LDW 4BE CSK</td>
</tr>
<tr>
<td>1 Wall Stop</td>
<td>400</td>
</tr>
<tr>
<td>1 Finger Guard</td>
<td>2248A- 82&quot;</td>
</tr>
</tbody>
</table>

Notes: Door # 211A is part of alternate #1

<table>
<thead>
<tr>
<th>Set: 20.0</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Doors: 201A, 202A, 207A, 208A, 303A, 304A, 403A</td>
<td></td>
</tr>
<tr>
<td>3 Hinge</td>
<td>TA2714 4-1/2&quot; x 4-1/2&quot;</td>
</tr>
<tr>
<td>1 Classroom Security Lock</td>
<td>DG1 8238 LNJ</td>
</tr>
<tr>
<td>1 Surface Overhead Stop</td>
<td>9-X36</td>
</tr>
<tr>
<td>1 Door Closer</td>
<td>281 PD10</td>
</tr>
<tr>
<td>1 Kick Plate</td>
<td>K1050 10&quot; x 2&quot; LDW 4BE CSK</td>
</tr>
<tr>
<td>1 Finger Guard</td>
<td>2248A- 82&quot;</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Set: 21.0</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Doors: 301A, 302A</td>
<td></td>
</tr>
<tr>
<td>4 Hinge</td>
<td>SP3786 5&quot; x 4-1/2&quot;</td>
</tr>
<tr>
<td>1 Multi-Point Lock (classroom)</td>
<td>DG1 FM7318 LNJ</td>
</tr>
<tr>
<td>1 Door Closer</td>
<td>TB 281 CPS</td>
</tr>
<tr>
<td>1 Gasketing</td>
<td>S88D</td>
</tr>
</tbody>
</table>

Notes: FEMA 361 Openings.

<table>
<thead>
<tr>
<th>Set: 22.0</th>
<th></th>
</tr>
</thead>
</table>
Doors: 101D.1

3 Hinge
1 Storeroom Lock
1 Wall Stop

Set: 23.0

Doors: 203A, 302B.1

3 Hinge
1 Storeroom Lock
1 Door Closer
1 Kick Plate
1 Wall Stop

Set: 24.0

Doors: 102B.1

3 Hinge
1 Storeroom Lock
1 Door Closer
1 Wall Stop

Set: 25.0

Doors: 101H.1, 402A

3 Hinge
1 Storeroom Lock
1 Door Closer
1 Kick Plate
1 Wall Stop

Set: 26.0

Doors: 209C.1, 304C.1, 404C.1

3 Hinge (heavy weight)
1 Storeroom Lock
1 Surface Overhead Stop
1 Door Closer
1 Kick Plate

Set: 26.5
Doors: 101H.2, 208C.1, 210C.2

<table>
<thead>
<tr>
<th>Item</th>
<th>Quantity</th>
<th>Description</th>
<th>Finish</th>
</tr>
</thead>
<tbody>
<tr>
<td>3 Hinge</td>
<td></td>
<td>TA2714 4-1/2&quot; x 4-1/2&quot;</td>
<td>US26D MK</td>
</tr>
<tr>
<td>1 Storeroom Lock</td>
<td></td>
<td>DG1 8204 LNJ</td>
<td>US26D SA</td>
</tr>
<tr>
<td>1 Surface Overhead Stop</td>
<td></td>
<td>9-X36</td>
<td>630 RF</td>
</tr>
<tr>
<td>1 Door Closer</td>
<td></td>
<td>281 PD10</td>
<td>EN SA</td>
</tr>
<tr>
<td>1 Kick Plate</td>
<td></td>
<td>K1050 10&quot; x 2&quot; LDW 4BE CSK</td>
<td>US32D RO</td>
</tr>
</tbody>
</table>

Notes: Door 210C.2 is part of alternate #1.

Set: 27.0

Doors: 101A.1, 101B.1

<table>
<thead>
<tr>
<th>Item</th>
<th>Quantity</th>
<th>Description</th>
<th>Finish</th>
</tr>
</thead>
<tbody>
<tr>
<td>3 Hinge</td>
<td></td>
<td>TA2714 4-1/2&quot; x 4-1/2&quot;</td>
<td>US26D MK</td>
</tr>
<tr>
<td>1 Office Lock</td>
<td></td>
<td>DG1 8205 LNJ</td>
<td>US26D SA</td>
</tr>
<tr>
<td>1 Wall Stop</td>
<td></td>
<td>400</td>
<td>US26D RO</td>
</tr>
</tbody>
</table>

Set: 28.0

Doors: 202A.1, 208A.1, 208A.2, 209A.1, 210A.1, 302A.1, 302A.2, 304A.1, 304A.2, 404A.1, 404A.2

<table>
<thead>
<tr>
<th>Item</th>
<th>Quantity</th>
<th>Description</th>
<th>Finish</th>
</tr>
</thead>
<tbody>
<tr>
<td>4 Hinge</td>
<td></td>
<td>TA2714 4-1/2&quot; x 4-1/2&quot;</td>
<td>US26D MK</td>
</tr>
<tr>
<td>1 Dutch Door Bolt</td>
<td></td>
<td>630-4</td>
<td>US26D RO</td>
</tr>
<tr>
<td>1 Passage Set</td>
<td></td>
<td>8215 LNJ</td>
<td>US26D SA</td>
</tr>
<tr>
<td>1 Wall Stop</td>
<td></td>
<td>400</td>
<td>US26D RO</td>
</tr>
<tr>
<td>1 Finger Guard</td>
<td></td>
<td>2248A- 38&quot;</td>
<td>NG</td>
</tr>
</tbody>
</table>

Notes: Dutch Doors.
Door # 210A.1 is part of alternate #1

Set: 29.0

Doors: 101G.1

<table>
<thead>
<tr>
<th>Item</th>
<th>Quantity</th>
<th>Description</th>
<th>Finish</th>
</tr>
</thead>
<tbody>
<tr>
<td>3 Hinge</td>
<td></td>
<td>TA2714 4-1/2&quot; x 4-1/2&quot;</td>
<td>US26D MK</td>
</tr>
<tr>
<td>1 Passage Set</td>
<td></td>
<td>8215 LNJ</td>
<td>US26D SA</td>
</tr>
<tr>
<td>1 Wall Stop</td>
<td></td>
<td>400</td>
<td>US26D RO</td>
</tr>
</tbody>
</table>

Set: 30.0

Doors: 101F.1

<table>
<thead>
<tr>
<th>Item</th>
<th>Quantity</th>
<th>Description</th>
<th>Finish</th>
</tr>
</thead>
<tbody>
<tr>
<td>3 Hinge</td>
<td></td>
<td>TA2714 4-1/2&quot; x 4-1/2&quot;</td>
<td>US26D MK</td>
</tr>
<tr>
<td>1 Passage Set</td>
<td></td>
<td>8215 LNJ</td>
<td>US26D SA</td>
</tr>
<tr>
<td>1 Door Closer</td>
<td></td>
<td>281 P10</td>
<td>EN SA</td>
</tr>
<tr>
<td>1 Kick Plate</td>
<td></td>
<td>K1050 10&quot; x 2&quot; LDW 4BE CSK</td>
<td>US32D RO</td>
</tr>
</tbody>
</table>
1 Wall Stop                             400 US26D RO

Set: 31.0

Doors: 101E.1

3 Hinge                               TA2714 4-1/2" x 4-1/2" US26D MK
1 Privacy Set w/ Indicator            49 8265 LNJ US26D SA
1 Wall Stop                            400 US26D RO

Set: 32.0

Doors: 205A, 206A, 401A

3 Hinge                               TA2714 4-1/2" x 4-1/2" US26D MK
1 Privacy Set w/ Indicator            49 8265 LNJ US26D SA
1 Door Closer                          281 O EN SA
1 Kick Plate                           K1050 10" x 2" LDW 4BE CSK US32D RO
1 Wall Stop                            400 US26D RO

<table>
<thead>
<tr>
<th>Mark</th>
<th>Hardware</th>
<th>102A</th>
<th>102A.1</th>
<th>102A.2</th>
<th>102B</th>
<th>102B.1</th>
<th>201A</th>
<th>201A.1</th>
<th>201C.1</th>
<th>202A</th>
<th>202B.1</th>
<th>202A.1</th>
<th>202A.2</th>
<th>203A</th>
<th>203B</th>
<th>204A</th>
<th>204A.1</th>
<th>204A.2</th>
<th>205A</th>
<th>205B</th>
<th>206A</th>
<th>206B</th>
<th>207A</th>
<th>207B</th>
<th>208A</th>
<th>208B</th>
<th>208A.1</th>
<th>208A.2</th>
<th>208B</th>
<th>208B.1</th>
<th>208B.2</th>
</tr>
</thead>
<tbody>
<tr>
<td>01</td>
<td>1.0</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>02</td>
<td>4.0</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>03</td>
<td>4.0</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>04</td>
<td>7.0</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>05</td>
<td>5.0</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>06</td>
<td>5.0</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>07</td>
<td>3.0</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>08</td>
<td>6.0</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>100A</td>
<td>2.0</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>101A</td>
<td>15.0</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>101A.1</td>
<td>27.0</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>101B</td>
<td>14.0</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>101B.1</td>
<td>27.0</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>101D.1</td>
<td>22.0</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>101E.1</td>
<td>31.0</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>101F.1</td>
<td>30.0</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>101F.2</td>
<td>18.0</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>101G.1</td>
<td>29.0</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>101G.2</td>
<td>14.0</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>101H.1</td>
<td>25.0</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>101H.2</td>
<td>26.5</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

DOOR HARDWARE

08 71 00 - 28
<table>
<thead>
<tr>
<th>Code</th>
<th>Quantity</th>
</tr>
</thead>
<tbody>
<tr>
<td>208C.1</td>
<td>26.5</td>
</tr>
<tr>
<td>209A</td>
<td>19.0</td>
</tr>
<tr>
<td>209A.1</td>
<td>28.0</td>
</tr>
<tr>
<td>209B.1</td>
<td>18.0</td>
</tr>
<tr>
<td>209C.1</td>
<td>26.0</td>
</tr>
<tr>
<td>210A.1</td>
<td>28.0</td>
</tr>
<tr>
<td>210B.1</td>
<td>18.0</td>
</tr>
<tr>
<td>210C.2</td>
<td>26.5</td>
</tr>
<tr>
<td>211A</td>
<td>19.0</td>
</tr>
<tr>
<td>301A</td>
<td>21.0</td>
</tr>
<tr>
<td>302A</td>
<td>21.0</td>
</tr>
<tr>
<td>302A.1</td>
<td>28.0</td>
</tr>
<tr>
<td>302A.2</td>
<td>28.0</td>
</tr>
<tr>
<td>302B.1</td>
<td>23.0</td>
</tr>
<tr>
<td>303A</td>
<td>20.0</td>
</tr>
<tr>
<td>304A</td>
<td>20.0</td>
</tr>
<tr>
<td>304A.1</td>
<td>28.0</td>
</tr>
<tr>
<td>304A.2</td>
<td>28.0</td>
</tr>
<tr>
<td>304B.1</td>
<td>18.0</td>
</tr>
<tr>
<td>304B.2</td>
<td>13.0</td>
</tr>
<tr>
<td>304C.1</td>
<td>26.0</td>
</tr>
<tr>
<td>401A</td>
<td>32.0</td>
</tr>
<tr>
<td>402A</td>
<td>25.0</td>
</tr>
<tr>
<td>402A.1</td>
<td>12.0</td>
</tr>
<tr>
<td>403A</td>
<td>20.0</td>
</tr>
<tr>
<td>404A</td>
<td>19.0</td>
</tr>
<tr>
<td>404A.1</td>
<td>28.0</td>
</tr>
<tr>
<td>404A.2</td>
<td>28.0</td>
</tr>
<tr>
<td>404B.1</td>
<td>18.0</td>
</tr>
<tr>
<td>404B.2</td>
<td>13.0</td>
</tr>
<tr>
<td>404C.1</td>
<td>26.0</td>
</tr>
</tbody>
</table>

END OF SECTION
SECTION 08 80 00 - GLAZING

PART 1 GENERAL

1.01 SECTION INCLUDES
A. Insulating glass units.
B. Glazing units.
C. Glazing compounds and accessories.

1.02 RELATED REQUIREMENTS
A. Section 06 41 00 - Architectural Wood Casework: Cabinets with requirements for glass shelves.
B. Section 08 43 13 - Aluminum-Framed Storefronts: Glazing furnished as part of storefront assembly.

1.03 REFERENCE STANDARDS
J. GANA (GM) - GANA Glazing Manual; 2009.
M. ITS (DIR) - Directory of Listed Products; current edition.
N. NFRC 100 - Procedure for Determining Fenestration Product U-factors; 2014.
Q. UL (DIR) - Online Certifications Directory; current listings at database.ul.com.

1.04 SUBMITTALS
A. Product Data on Glazing Compounds and Accessories: Provide chemical, functional, and environmental characteristics, limitations, special application requirements. Identify available colors.
B. Samples: Submit two samples 12 by 12 inch in size of glass units.
C. Certificate: Certify that products of this section meet or exceed specified requirements.
D. Warranty Documentation: Submit manufacturer warranty and ensure that forms have been completed in Owner’s name and registered with manufacturer.
1.05 QUALITY ASSURANCE
   A. Perform Work in accordance with GANA (GM) for glazing installation methods.
   B. Installer Qualifications: Company specializing in performing work of the type specified and with at least three years documented experience.

1.06 MOCK-UPS
   A. Mockups: Provide materials and construct applicable portions of mockup as indicated on Section 01 45 40 Mock-Up Requirements.

1.07 FIELD CONDITIONS
   A. Do not install glazing when ambient temperature is less than 40 degrees F.
   B. Maintain minimum ambient temperature before, during and 24 hours after installation of glazing compounds.

1.08 WARRANTY
   A. Insulating Glass Units: Provide a five (5) year manufacturer warranty to include coverage for seal failure, interpane dusting or misting, including providing products to replace failed units.

PART 2 PRODUCTS

2.01 PERFORMANCE REQUIREMENTS - EXTERIOR GLAZING ASSEMBLIES
   A. Provide type and thickness of exterior glazing assemblies to support assembly dead loads, and to withstand live loads caused by positive and negative wind pressure acting normal to plane of glass.
      1. Comply with ASTM E1300 for design load resistance of glass type, thickness, dimensions, and maximum lateral deflection of supported glass.
      2. Provide glass edge support system sufficiently stiff to limit the lateral deflection of supported glass edges to less than 1/175 of their lengths under specified design load.
      3. Glass thicknesses listed are minimum.
   B. Vapor Retarder and Air Barrier Seals: Provide completed assemblies that maintain continuity of building enclosure vapor retarder and air barrier.
      1. In conjunction with vapor retarder and joint sealer materials described in other sections.
   C. Thermal and Optical Performance: Provide exterior glazing products with performance properties as indicated. Performance properties are in accordance with manufacturer's published data as determined with the following procedures and/or test methods:
      1. Center of Glass U-Value: Comply with NFRC 100 using Lawrence Berkeley National Laboratory (LBNL) WINDOW 6.3 computer program.
      2. Center of Glass Solar Heat Gain Coefficient (SHGC): Comply with NFRC 200 using Lawrence Berkeley National Laboratory (LBNL) WINDOW 6.3 computer program.

2.02 GLASS MATERIALS
   A. Float Glass: Provide float glass based glazing unless noted otherwise.
      1. Heat-Strengthened and Fully Tempered Types: ASTM C1048, Kind HS and FT.

2.03 INSULATING GLASS UNITS
   A. Insulating Glass Units: Types as indicated.
      1. Durability: Certified by an independent testing agency to comply with ASTM E2190.
      2. Coated Glass: Comply with requirements of ASTM C1376 for pyrolytic (hard-coat) or magnetic sputter vapor deposition (soft-coat) type coatings on flat glass; coated vision glass, Kind CV; coated overhead glass, Kind CO; or coated spandrel glass, Kind CS.
      4. Edge Seal:
      5. Color: Black.
      6. Purge interpane space with dry air, hermetically sealed.
B. Insulating Glass Units: Vision glazing, with Low-E coating.
   1. Applications: Exterior insulating glass glazing unless otherwise indicated.
   2. Space between lites filled with air.
   3. Total Thickness: 1 inch.
   4. Thermal Transmittance (U-Value), Winter - Center of Glass: .24, nominal.
   7. Outboard Lite: Heat-strengthened float glass unless tempered safety glass is indicated, 1/4 inch thick, minimum.
      a. Low-E Coating: Vitro Glass (formerly PPG Glass) Solarban z75 on #2 surface.
      b. Glass: Clear.
   8. Inboard Lite: Heat-strengthened float glass unless tempered safety glass is indicated, 1/4 inch thick.

2.04 GLAZING UNITS

A. Fire-Protection-Rated Glazing: Type, thickness, and configuration of glazing that contains flame, smoke, and does not block radiant heat, as required to achieve fire-doors indicated fire-rating period as indicated on drawings.
   1. Applications:
      a. Glazing in fire-rated door assembly.
      b. Glazing in fire-rated window assembly.
      c. Other locations as indicated on drawings.
   2. Glass Type: Specialty tempered float glass.
   3. Provide products listed by ITS (DIR) or UL (DIR) and approved by authorities having jurisdiction.
   4. Safety Glazing Certification: 16 CFR 1201 Category II.
   5. Fire-Rating Period: As indicated on drawings.
   7. Products:
      a. SAFTI FIRST, a division of O'Keeffe's Inc; SuperLite I-XL: www.safti.com/#sle.

B. Monolithic Safety Glazing: Non-fire-rated.
   1. Applications:
      a. Glazed lites in doors, except fire doors.
      b. Glazed sidelights to doors, except in fire-rated walls and partitions.
      c. Other locations required by applicable federal, state, and local codes and regulations.
      d. Other locations indicated on drawings.
   2. Glass Type: Fully tempered safety glass as specified.
   3. Tint: Clear.
   4. Thickness: 1/4 inch, nominal.

2.05 GLAZING COMPOUNDS

A. Type GC-2 - Butyl Sealant: Single component; ASTM C920, Grade NS, Class 12-1/2, Uses M and A, Shore A hardness of 10 to 20; black color.

B. Silicone Sealant: Single component; neutral curing; capable of water immersion without loss of properties; non-bleeding, non-staining; ASTM C920, Type S, Grade NS, Class 25, Uses M, A, and G; with cured Shore A hardness range of 15 to 25; color as selected.

2.06 ACCESSORIES

A. Setting Blocks: Silicone, with 80 to 90 Shore A durometer hardness; ASTM C864 Option II. Length of 0.1 inch for each square foot of glazing or minimum 4 inch x width of glazing rabbet space minus 1/16 inch x height to suit glazing method and pane weight and area.
B. Glazing Gaskets: Resilient silicone extruded shape to suit glazing channel retaining slot; ASTM C864 Option II; color as selected.

PART 3 EXECUTION

3.01 VERIFICATION OF CONDITIONS

A. Verify that openings for glazing are correctly sized and within tolerances, including those for size, squareness, and offsets at corners.
B. Verify that surfaces of glazing channels or recesses are clean, free of obstructions that may impede moisture movement, weeps are clear, and support framing is ready to receive glazing system.

3.02 PREPARATION

A. Clean contact surfaces with appropriate solvent and wipe dry immediately before glazing. Remove coatings that are not tightly bonded to substrates.
B. Seal porous glazing channels or recesses with substrate compatible primer or sealer.
C. Prime surfaces scheduled to receive sealant where required for proper sealant adhesion.

3.03 INSTALLATION, GENERAL

A. Install glazing in compliance with written instructions of glass, gaskets, and other glazing material manufacturers, unless more stringent requirements are indicated, including those in glazing referenced standards.
B. Install glazing sealants in accordance with ASTM C1193, GANA (SM), and manufacturer’s instructions.
C. Do not exceed edge pressures around perimeter of glass lites as stipulated by glass manufacturer.
D. Set glass lites of system with uniform pattern, draw, bow, and similar characteristics.
E. Prevent glass from contact with any contaminating substances that may be the result of construction operations such as, and not limited to the following; weld splatter, fire-saing, plastering, mortar droppings, etc.

3.04 INSTALLATION - DRY GLAZING METHOD (GASKET GLAZING)

A. Application - Exterior and/or Interior Glazed: Set glazing infills from either the exterior or the interior of the building.
B. Place setting blocks at 1/4 points with edge block no more than 6 inch from corners.
C. Rest glazing on setting blocks and push against fixed stop with sufficient pressure on gasket to attain full contact.
D. Install removable stops without displacing glazing gasket; exert pressure for full continuous contact.

3.05 INSTALLATION - DRY GLAZING METHOD (TAPE AND GASKET SPLINE GLAZING)

A. Application - Exterior Glazed: Set glazing infills from the exterior of the building.
B. Cut glazing tape to length; install on glazing pane. Seal corners by butting tape and sealing junctions with butyl sealant.
C. Place setting blocks at 1/4 points with edge block no more than 6 inch from corners.
D. Rest glazing on setting blocks and push against fixed stop with sufficient pressure to attain full contact.
E. Install removable stops without displacing glazing spline. Exert pressure for full continuous contact.
F. Carefully trim protruding tape with knife.
3.06 CLEANING
   A. Remove excess glazing materials from finish surfaces immediately after application using solvents or cleaners recommended by manufacturers.
   B. Remove non-permanent labels immediately after glazing installation is complete.
   C. Clean glass and adjacent surfaces after sealants are fully cured.
   D. Clean glass on both exposed surfaces not more than 4 days prior to Date of Substantial Completion in accordance with glass manufacturer's written recommendations.

3.07 PROTECTION
   A. After installation, mark pane with an 'X' by using removable plastic tape or paste; do not mark heat absorbing or reflective glass units.
   B. Remove and replace glass that is damaged during construction period prior to Date of Substantial Completion.

END OF SECTION
SECTION 09 21 16 - GYPSUM BOARD ASSEMBLIES

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Performance criteria for gypsum board assemblies.
B. Metal stud wall framing.
C. Metal channel ceiling framing.
D. Acoustic insulation.
E. Cementitious backing board.
F. Gypsum wallboard.
G. Joint treatment and accessories.

1.02 RELATED REQUIREMENTS

A. Section 06 10 00 - Rough Carpentry: Wood blocking product and execution requirements.
B. Section 07 92 00 - Joint Sealants: Sealing acoustical gaps in construction other than gypsum board or plaster work.

1.03 REFERENCE STANDARDS

A. AISI S100-12 - North American Specification for the Design of Cold-Formed Steel Structural Members; American Iron and Steel Institute; 2012.
H. ASTM C954 - Standard Specification for Steel Drill Screws for the Application of Gypsum Panel Products or Metal Plaster Bases to Steel Studs From 0.033 in. (0.84 mm) to 0.112 in. (2.84 mm) in Thickness; 2015.
I. ASTM C1002 - Standard Specification for Steel Self-Piercing Tapping Screws for Application of Gypsum Panel Products or Metal Plaster Bases to Wood Studs or Steel Studs; 2014.
O. ASTM E413 - Classification for Rating Sound Insulation; 2010.
1.04 SUBMITTALS
   A. Product Data: Provide data on metal framing, gypsum board, accessories, and joint finishing system.
   B. Product Data: Provide manufacturer's data on partition head to structure connectors, showing compliance with requirements.

PART 2 PRODUCTS

2.01 GYPSUM BOARD ASSEMBLIES
   A. Provide completed assemblies complying with ASTM C840 and GA-216.
   B. Interior Partitions, Indicated as Acoustic: Provide completed assemblies with the following characteristics:
      1. Acoustic Attenuation: STC of 45-49 calculated in accordance with ASTM E413, based on tests conducted in accordance with ASTM E90.
   C. Fire Rated Assemblies: Provide completed assemblies complying with applicable code.
      1. UL Assembly Numbers: Provide construction equivalent to that listed for the particular assembly in the current UL Fire Resistance Directory.

2.02 METAL FRAMING MATERIALS
   A. Non-Loadbearing Framing System Components: ASTM C645; galvanized sheet steel, of size and properties necessary to comply with ASTM C754 for the spacing indicated, with maximum deflection of wall framing of L/240 at 5 psf. All wall locations to receive tiling, maximum wall deflection shall be L/360 at 5 psf.
      1. Studs: “C” shaped with flat or formed webs.
      2. Runners: U shaped, sized to match studs.
      3. Ceiling Channels: C shaped.
   B. Grid Suspension System for Gypsum Board Ceiling: ASTM C 645, direct-hung system composed of main beams and cross-furring members that interlock.
      1. Products: Subject to compliance with requirements, provide one of the following:
         b. Chicago Metallic Corporation; Drywall Grid System.
         c. USG Corporation; Drywall Suspension System.
   C. Partition Head to Structure Connections: Provide mechanical anchorage devices that accommodate deflection using slotted holes, screws and anti-friction bushings, preventing rotation of studs while maintaining structural performance of partition.
      1. Structural Performance: Maintain lateral load resistance and vertical movement capacity required by applicable code, when evaluated in accordance with AISI S100-12.
      3. Provide components UL-listed for use in UL-listed fire-rated head of partition joint systems of fire rating and movement required.
      4. Deflection and Firestop Track:
         a. Provide mechanical anchorage devices as described above that accommodate deflection while maintaining the fire-rating of the wall assembly.
         b. Products:
            1) FireTrak Corporation; Posi Klip.
            2) Metal-Lite, Inc; The System.

2.03 BOARD MATERIALS
   A. Manufacturers - Gypsum-Based Board:
B. Gypsum Wallboard: Paper-faced gypsum panels as defined in ASTM C 1396/C 1396M; sizes to minimize joints in place; ends square cut.
   1. Application: Use for vertical surfaces and ceilings, unless otherwise indicated.
   2. Unfaced fiber-reinforced gypsum panels as defined in ASTM C1278/C1278M, suitable for paint finish, of the same core type and thickness may be substituted for paper-faced board.
   3. Mold Resistance: Score of 10, when tested in accordance with ASTM D3273.
      a. Mold resistant board is required on walls and ceilings in toilet rooms, janitor closets and other locations indicated on drawings.
   4. At Assemblies Indicated with Fire-Rating: Use type required by indicated tested assembly; if no tested assembly is indicated, use Type X board, UL or WH listed.
   5. Thickness:
      b. Multi-Layer Assemblies: Thicknesses as indicated on drawings.

C. Abuse Resistant Wallboard:
   1. Application: Gypsum board walls up to 4 feet.
   2. Surface Abrasion: Level 3, minimum, when tested in accordance with ASTM C1629/C1629M.
   3. Indentation: Level 1, minimum, when tested in accordance with ASTM C1629/C1629M.
   4. Soft Body Impact: Level 1, minimum, when tested in accordance with ASTM C1629/C1629M.
   5. Mold Resistance: Score of 10, when tested in accordance with ASTM D3273.
   6. Type: Fire resistance rated Type X, UL or WH listed.
   9. Products:
      a. Georgia-Pacific Gypsum; DensArmor Plus Abuse-Resistant.
      b. National Gypsum Company; Gold Bond Hi-Abuse XP Gypsum Board.

D. Backing Board For Tile Areas:
   1. Application: Surfaces behind tile areas.
   2. ASTM Cement-Based Board: Non-gypsum-based, cementitious board complying with ASTM C1288.
      a. Thickness: 1/2 inch.
      b. Products:
         2) National Gypsum Company; PermaBase Brand Cement Board.
         3) USG Corporation; Durock Brand Cement Board.

2.04 ACCESSORIES
A. Acoustic Insulation: Preformed glass fiber, friction fit type, unfaced. Thickness as required to fill stud space.
B. Acoustic Sealant: Acrylic emulsion latex or water-based elastomeric sealant; do not use solvent-based non-curing butyl sealant.
C. Finishing Accessories: ASTM C1047, galvanized steel or rolled zinc, unless noted otherwise.
   1. Types: As detailed or required for finished appearance.
   2. Special Shapes: In addition to conventional corner bead and control joints, provide U-bead at exposed panel edges.
D. Aluminum Reveal Trim: Extruded accessories of profiles and dimensions indicated.
   1. Acceptable Manufacturers:
      a. Fry Reglet.
      b. Gordon, Inc.
      c. Pittcon Industries.
2. Aluminum: Alloy and temper with not less than the strength and durability properties of ASTM B 221, Alloy 6063-T5.

3. Finish: Corrosion-resistant primer compatible with joint compound and finish materials specified.

E. Joint Materials: ASTM C475/C475M and as recommended by gypsum board manufacturer for project conditions.
   1. Tape: 2 inch wide, creased paper tape for joints and corners.

F. Joint Compound for Interior Gypsum Wallboard: 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 compound.
   3. Fill Coat: For second coat, use setting-type, sandable topping compound.
   4. Finish Coat: For third coat, use drying-type, all-purpose compound.

G. Screws for Fastening of Gypsum Panel Products to Cold-Formed Steel Studs Less than 0.033 inch in Thickness and Wood Members: ASTM C1002; self-piercing tapping screws, corrosion resistant.

H. Screws for Fastening of Gypsum Panel Products to Steel Members from 0.033 to 0.112 inch in Thickness: ASTM C954; steel drill screws, corrosion resistant.

PART 3 EXECUTION

3.01 EXAMINATION

A. Verify that project conditions are appropriate for work of this section to commence.

3.02 FRAMING INSTALLATION

A. Metal Framing: Install in accordance with ASTM C754 and manufacturer's instructions.

B. Suspended Ceilings and Soffits: Space framing and furring members as indicated.
   1. Level ceiling system to a tolerance of 1/1200.
   2. Laterally brace entire suspension system.

C. Studs: Space studs at 16 inches on center unless otherwise indicated.
   1. Extend partition framing to structure where indicated and to ceiling in other locations.
   2. Partitions Terminating at Ceiling: Attach ceiling runner securely to ceiling track in accordance with manufacturer's instructions.
   3. Partitions Terminating at Structure: Attach top runner to structure, maintain clearance between top of studs and structure, and connect studs to track using specified mechanical devices in accordance with manufacturer's instructions; verify free movement of top of stud connections; do not leave studs unattached to track.

D. Openings: Reinforce openings as required for weight of doors or operable panels, using not less than double studs at jambs.

E. Blocking: Install wood blocking specified in Division 6 Section "Rough Carpentry".

3.03 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. Place continuous bead at perimeter of each layer of gypsum board.

3.04 BOARD INSTALLATION

A. Comply with ASTM C840, GA-216, and manufacturer's instructions. Install to minimize butt end joints, especially in highly visible locations.

B. Single-Layer Non-Rated: Install gypsum board in most economical direction, with ends and edges occurring over firm bearing.
C. Install panels with face side out. Butt panels together for a light contract as edges and ends with not more than 1/16 inch of open space between panels. Do not force into place.

D. Cover both faces of support framing with gypsum in concealed spaces (above ceilings, etc.), except in chases braced internally.
1. Unless concealed application is indicated or required for sound, fire, air, or smoke ratings, coverage may be accomplished with scraps of not less than 8 sq. ft. in area.
2. Fit gypsum panels around ducts, pipes, and conduits.
3. Where partitions intersect structural members projecting below underside of floor/roof slabs and decks, cut gypsum panels to fit profile formed by structural members; allow 1/4- to 3/8-inch-wide joints to install sealant.

E. Attachment to Steel Framing: Attach panels so leading edge or end of each panel is attached to open (unsupported) edges of stud flanges first.

F. Form control and expansion joints with space between edges of adjoining gypsum panels.

G. Fire-Rated Construction: Install gypsum board in strict compliance with requirements of assembly listing.

H. Cementitious Backing Board: Install over steel framing members and plywood substrate where indicated, in accordance with ANSI A108.11 and manufacturer's instructions.
1. Where tile backing panels abut other types of panels in same plane, shim surface

I. Installation on Metal Framing: Use screws for attachment of all gypsum board.

3.05 INSTALLATION OF TRIM AND ACCESSORIES
A. Control Joints: Place control joints consistent with lines of building spaces and as indicated.
1. Not more than 30 feet apart on walls and ceilings over 50 feet long.

B. Corner Beads: Install at external corners, using longest practical lengths.

C. Edge Trim: Install at locations where gypsum board abuts dissimilar materials.

3.06 JOINT TREATMENT
A. Joint Compound for Interior Gypsum Wallboard: 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 compound.
3. Fill Coat: For second coat, use setting-type, sandable topping compound.
4. Finish Coat: For third coat, use drying-type, all-purpose compound.

B. Finish gypsum board in accordance with levels defined in ASTM C840, as follows:
1. Level 4: Walls and ceilings to receive paint finish unless otherwise indicated.
2. Level 1: Fire rated wall areas above finished ceilings, whether or not accessible in the completed construction.

C. Tape, fill, and sand exposed joints, edges, and corners to produce smooth surface ready to receive finishes.
1. Feather coats of joint compound so that camber is maximum 1/32 inch.

D. Fill and finish joints and corners of cementitious backing board as recommended by manufacturer.

3.07 PROTECTION
A. Protect installed products from damage from weather, condensation, direct sunlight, construction, and other causes during remainder of the construction period.

B. 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.
3.08 TOLERANCES

A. Maximum Variation of Finished Gypsum Board Surface from True Flatness: 1/8 inch in 10 feet in any direction.

END OF SECTION
SECTION 09 30 00 - TILING

PART 1 GENERAL

1.01 SECTION INCLUDES
A. Tile for floor applications.
B. Tile for wall applications.
C. Non-ceramic trim.

1.02 RELATED REQUIREMENTS
A. Section 07 92 00 - Joint Sealants: Sealing joints between tile work and adjacent construction and fixtures.
B. Section 09 21 16 - Gypsum Board Assemblies: Tile backer board.

1.03 REFERENCE STANDARDS
   4. ANSI A108.4 - American National Standard Specifications for Installation of Ceramic Tile with Organic Adhesives or Water Cleanable Tile-Setting Epoxy Adhesive; 2009 (Revised).


1.04 DEFINITIONS
A. Construction Joints: The surface where two successive placements of concrete meet, across which it may be desirable to achieve bond and through which reinforcement may be made continuous.
B. Contraction Joints/Control Joints: Formed, sawed or tooled groove in a concrete structure to create a weakened plane and regulate the location of cracking resulting from the dimensional change of different parts of the structure.
C. Expansion Joints: (1) A separation provided between adjoining parts of a structure to allow movement where expansion is likely to exceed contraction; (2) a separation between pavement slabs on grade, filled with a compressible filler material; (3) an isolation joint intended to allow independent movement between adjoining parts.
D. Isolation Joints: A separation between adjoining parts of a concrete structure, usually a vertical
plane, at a designated location such as to interfere least with performance of the structure, yet
such as to allow relative movement in three directions and avoid formation of cracks elsewhere
in the concrete and through which all or part of the bonded reinforcement is interrupted.

1.05 SUBMITTALS
A. Product Data: Provide manufacturers’ data sheets on tile, mortar, grout, and accessories.
Include instructions for using grouts and adhesives.
B. Shop Drawings: Indicate tile layout, patterns, color arrangement, perimeter conditions, junctions
with dissimilar materials, control and expansion joints, thresholds, ceramic accessories, and
setting details.
C. Samples: Mount tile and apply grout on two plywood panels, minimum 18 by 18 inches in size
illustrating pattern, color variations, and grout joint size variations.
D. Manufacturer's Certificate: Certify that products meet or exceed specified requirements.
E. Maintenance Data: Include recommended cleaning methods, cleaning materials, and stain
removal methods.
F. Maintenance Materials: Furnish the following for Owner's use in maintenance of project.
1. Extra Wall Tile: 1 box (10 pieces) of each color of wall tile.
2. Extra Floor Tile: 3 percent percent of each size, color, and surface finish combination.

1.06 QUALITY ASSURANCE
A. Maintain one copy of The Tile Council of North America Handbook and ANSI A108 Series/A118
Series on site.
B. Installer Qualifications: Company specializing in performing tile installation, with minimum of
five years of documented experience.

1.07 DELIVERY, STORAGE, AND HANDLING
A. Protect adhesives from freezing or overheating in accordance with manufacturer's instructions.

PART 2 PRODUCTS

2.01 TILE
A. Interior Wall Tile: Refer to Drawing Sheet A601 for Finish Material Specification.
B. Interior Floor Tile: Refer to Drawing Sheet A601 for Finish Material Specification.

2.02 TRIM AND ACCESSORIES
A. Non-Ceramic Trim: Brushed stainless steel, style and dimensions to suit application, for setting
using tile mortar or adhesive.
1. Applications:
   a. Refer to drawing sheet A601 for trim profiles.

2.03 MORTAR MATERIALS
A. Mortar Bond Coat Materials:
1. Complying with ANSI A118.4.
2. Provide mortars mixed with liquid latex admixture.

2.04 GROUTS
A. Grout: Specialty grout with quartz aggregate complying with ANSI A118.3.
2. Product:
   a. Mapei, Flexcolor CQ.

2.05 ACCESSORY MATERIALS
A. Crack Isolation Membrane: Comply with ANSI 118.12.
1. Products:

B. Primer for Structural Glazed Tile to Receive Ceramic/Glass Tile: Provide bond promoting primer over all existing Structural Ceramic Glazed Tile to receive new wall tile.

C. Mesh Tape: 2 inch wide self-adhesive fiberglass mesh tape.

D. Tile Cleaner: A neutral cleaner capable of removing soil and residue without harming tile and grout surfaces, specifically approved for materials and installations indicated by tile and grout manufacturers.

### 2.06 MIXING MORTARS AND GROUT

A. Mix mortars and grouts to comply with referenced standards and mortar and grout manufacturers' written instructions.

B. Add materials, water, and additives in accurate proportions.

C. Obtain and use type of mixing equipment, mixer speeds, mixing containers, mixing time, and other procedures to produce mortars and grouts of uniform quality with optimum performance characteristics for installations indicated.

### PART 3 EXECUTION

#### 3.01 EXAMINATION

A. Verify that sub-floor surfaces are smooth and flat within the tolerances specified for that type of work and are ready to receive tile.

B. Verify that sub-floor surfaces are dust-free and free of substances that could impair bonding of setting materials to sub-floor surfaces.

C. Verify that concrete sub-floor surfaces are ready for tile installation by testing for moisture emission rate and alkalinity; obtain instructions if test results are not within limits recommended by tile manufacturer and setting materials manufacturer.

D. Verify that joints and cracks in tile substrate are coordinated with tile joint locations; if not coordinated, adjust joint locations in consultation with Architect.

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

#### 3.02 PREPARATION

A. Protect surrounding work from damage.

B. Vacuum clean surfaces and damp clean.

C. Seal substrate surface cracks with filler. Level existing substrate surfaces to acceptable flatness tolerances.

#### 3.03 INSTALLATION - GENERAL

A. Install tile and grout in accordance with applicable requirements of ANSI A108.1a through ANSI A108.13, manufacturer's instructions, and TCNA (HB) recommendations.

B. Lay tile to pattern indicated. Do not interrupt tile pattern through openings.

C. Cut and fit tile to penetrations through tile, leaving sealant joint space. Form corners and bases neatly. Align floor joints.

D. Extend tile work into recesses and under or behind equipment and fixtures to form complete covering without interruptions, unless otherwise indicated. Terminate work neatly at obstructions, edges, and corners without disrupting pattern or joint alignments.

E. Place tile joints uniform in width, subject to variance in tolerance allowed in tile size. Make grout joints without voids, cracks, excess mortar or excess grout, or too little grout.

F. Form internal angles square and external angles square.

G. Install non-ceramic trim in accordance with manufacturer's instructions.

H. For installations indicated below, follow procedures in ANSI A108 Series tile installation standards for providing 95 percent mortar coverage.
1. Tile floors composed of tiles 8 by 8 inch or larger.
2. Tile floors composed of rib-backed tiles.
I. Sound tile after setting. Replace hollow sounding units.
J. Keep control and expansion joints free of mortar, grout, and adhesive.
K. Install construction joints, perimeter joints and movement joints, as detailed on drawings and as otherwise directed by Architect, in accordance with The Tile Council of North America Handbook "Movement Joint Design Essentials EJ171."
L. Expansion Joints: Locate expansion joints and other sealant-filled joints during installation of setting materials and tile. Do not saw-cut joints after installing tiles.
1. Locate joints in tile surfaces directly above joints in concrete substrates.
M. Allow tile to set for a minimum of 48 hours prior to grouting.
N. Grout tile joints to comply with requirements of ANSI A108.10, unless otherwise indicated.
O. At changes in plane and tile-to-tile control joints, use tile sealant instead of grout, with either bond breaker tape or backer rod as appropriate to prevent three-sided bonding.

3.04 INSTALLATION - FLOORS - THIN-SET METHODS
A. Over interior concrete substrate, install in accordance with TCA Handbook Method F115, latex-portland cement mortar and specified grout.
B. Where cracks occur in new or existing concrete floors, provide crack isolation in accordance with The Tile Council of North America Handbook Method F125 & F125A.

3.05 INSTALLATION - WALL TILE
A. Over cementitious backer units on studs, install in accordance with The Tile Council of North America Handbook Method W244C, with latex-portland cement mortar and specified grout.
B. Over interior concrete and masonry install in accordance with TCNA (HB) Method W202 with latex-portland cement mortar and specified grout.

3.06 CLEANING
A. Clean tile and grout surfaces.

3.07 PROTECTION
A. Do not permit traffic over finished floor surface for 4 days after installation.

END OF SECTION
SECTION 09 51 00 - ACOUSTICAL CEILINGS

PART 1 GENERAL

1.01 SECTION INCLUDES
A. Suspended metal grid ceiling system.
B. Acoustical units.

1.02 REFERENCE STANDARDS
C. ASTM E1264 - Standard Classification for Acoustical Ceiling Products; 2014.

1.03 ADMINISTRATIVE REQUIREMENTS
A. Sequence work to ensure acoustical ceilings are not installed until building is enclosed, sufficient heat is provided, dust generating activities have terminated, and overhead work is completed, tested, and approved.
B. Do not install acoustical units until after interior wet work is dry.

1.04 SUBMITTALS
A. Shop Drawings: Indicate grid layout and related dimensioning, junctions with other ceiling finishes, and mechanical and electrical items installed in the ceiling.
B. Product Data: Provide data on suspension system components and acoustical units.
C. Maintenance Materials: Furnish the following for Owner's use in maintenance of project.
   1. Extra Acoustical Units: Provide 2 boxes of each type and size panel provided on project. Provide full size panels.

1.05 FIELD CONDITIONS
A. Maintain uniform temperature of minimum 60 degrees F, and maximum humidity of 40 percent prior to, during, and after acoustical unit installation.

PART 2 PRODUCTS

2.01 ACOUSTICAL UNITS
A. Acoustical Units - General: ASTM E1264, Class A.
   1. Basis-of-Design Product: Subject to compliance with requirements, provide the product indicated on Drawings or a comparable product, approved prior to bid, by one of the following:
      a. Armstrong World Industries, Inc.
      b. Chicago Metallic Corporation.
      c. USG Interiors, Inc.

2.02 SUSPENSION SYSTEM(S)
A. Suspension Systems - General: ASTM C 635; die cut and interlocking components, with clips, splices, and perimeter moldings as required.
   1. Intermediate duty system with main and cross runners roll formed from cold-rolled steels sheet, prepainted, electrolytically zinc coated, or hot-dip galvanized.
   2. Basis-of-Design Product: Subject to compliance with requirements, provide the product indicated on Drawings or a comparable product, approved prior to bid, by one of the following:
      a. Armstrong World Industries, Inc.
      b. Chicago Metallic Corporation.
      c. USG Interiors, Inc.

2.03 ACCESSORIES

A. Support Channels and Hangers: Galvanized steel; size and type to suit application and ceiling system flatness requirement specified.
   1. Attachment Devices: Size for five times the design load indicated in ASTM C 635, Table 1, "Direct Hung," unless otherwise indicated. Comply with seismic design requirements.
   2. Wire Hangers, Braces and Ties: Zinc-coated carbon-steel wire; ASTM C641, Class 1, zinc coating, soft temper.
      a. Size: Select wire diameter so its stress at 3 times hanger design load (ASTM C 635, Table 1, "Direct Hung") will be less than yield stress of wire, but provide not less than 0.106 inch diameter wire.
   3. Provide acoustic type hangers where indicated on drawings.

B. Perimeter Moldings: Same material and finish as grid.
   1. At Exposed Grid: Provide L-shaped molding for mounting at same elevation as face of grid.

C. Perimeter Trim: Extruded aluminum trim, height as indicated on drawings, white.
   1. Color: As indicated on drawings, if not indicated selected from manufacturer's standard colors.
   2. Acceptable Products:
      b. Alpro, Aviar Perimeter Trim.

D. Touch-up Paint: Type and color to match acoustical and grid units.

PART 3 EXECUTION

3.01 EXAMINATION

A. Verify existing conditions before starting work.
B. Verify that layout of hangers will not interfere with other work.

3.02 INSTALLATION - SUSPENSION SYSTEM

A. Install suspension system in accordance with ASTM C 636/C 636M and manufacturer's instructions and as supplemented in this section.
B. Rigidly secure system, including integral mechanical and electrical components, for maximum deflection of 1:360.
C. Install after major above-ceiling work is complete. Coordinate the location of hangers with other work.
D. Hang suspension system independent of walls, columns, ducts, pipes and conduit. Where carrying members are spliced, avoid visible displacement of face plane of adjacent members.
E. Where ducts or other equipment prevent the regular spacing of hangers, reinforce the nearest affected hangers and related carrying channels to span the extra distance.
F. Do not support components on main runners or cross runners if weight causes total dead load to exceed deflection capability.
G. Support fixture loads using supplementary hangers located within 6 inches of each corner, or support components independently.
H. Do not eccentrically load system or induce rotation of runners.
I. Perimeter Molding: Install at intersection of ceiling and vertical surfaces and at junctions with other interruptions.
   1. Use longest practical lengths. Use longest practical lengths
   2. Overlap and rivet corners.

3.03 INSTALLATION - ACOUSTICAL UNITS

A. Install acoustical units in accordance with manufacturer's instructions.
B. Fit acoustical units in place, free from damaged edges or other defects detrimental to appearance and function.
C. Fit border trim neatly against abutting surfaces.
D. Install units after above-ceiling work is complete.
E. Install acoustical units level, in uniform plane, and free from twist, warp, and dents.
F. Cutting Acoustical Units:
   1. Make field cut edges of same profile as factory edges.
   2. Double cut and field paint exposed reveal edges.

3.04 TOLERANCES
A. Maximum Variation from Flat and Level Surface: 1/8 inch in 10 feet.
B. Maximum Variation from Plumb of Grid Members Caused by Eccentric Loads: 2 degrees.

END OF SECTION
SECTION 09 65 00 - RESILIENT FLOORING

PART 1  GENERAL
1.01  SECTION INCLUDES
   A. Resilient tile flooring.
   B. Resilient base.
   C. Installation accessories.

1.02  REFERENCE STANDARDS
   C. RFCI (RWP) - Recommended Work Practices for Removal of Resilient Floor Coverings; Resilient Floor Covering Institute; October 2011.

1.03  SUBMITTALS
   A. Product Data: Provide data on specified products, describing physical and performance characteristics; including sizes, patterns and colors available; and installation instructions.
   B. Verification Samples: Submit two samples, 4 by 4 inch in size illustrating color and pattern for each resilient flooring product specified.
   C. Maintenance Data: Include maintenance procedures, recommended maintenance materials, and suggested schedule for cleaning, stripping, and re-waxing.
   D. Maintenance Materials: Furnish the following for Owner's use in maintenance of project.
      1. Extra Flooring Material: Furnish 1 box for every 50 boxes or fraction thereof, of each type, color, and pattern of floor tile installed.
      2. Extra Wall Base: 10 linear feet of each type and color.

1.04  DELIVERY, STORAGE, AND HANDLING
   A. Store all materials off of the floor in an acclimatized, weather-tight space.
   B. Protect roll materials from damage by storing on end.
   C. Do not double stack pallets.

PART 2  PRODUCTS
2.01  TILE FLOORING
   A. Luxury Vinyl Tile: Printed film type, with transparent or translucent wear layer, and:
      1. Minimum Requirements: Comply with ASTM F 1700, of Class corresponding to type specified.
      2. Tile Size: As indicated on drawings.
      3. Basis-of-Design Refer to Finish Material Specification on Drawing Sheet A601. Provide the basis-of-design product or a comparable product approved prior to bid.

2.02  RESILIENT BASE
   A. Resilient Base: ASTM F1861, Type TS rubber, vulcanized thermoset; top set as indicated on drawings.
      1. Height: 4 inch.
      2. Thickness: 0.125 inch.
      3. Length: Roll.
      4. Basis-of-Design Refer to Finish Material Specification on Drawing Sheet A601. Provide the basis-of-design product or a comparable product approved prior to bid.

2.03  ACCESSORIES
   A. Primers and Adhesives, and Seaming: Waterproof; types recommended by resilient flooring manufacturer, compatible with materials being adhered; maximum VOC of 50 g/L; CRI Green Label certified.
1. Provide adhesives recommended by manufacturer for installation on cementitious sub-floor surface moisture and pH levels present at time of installation.
2. Provide floor sealers for surfaces that test over adhesive manufacturer’s maximum recommended moisture/pH levels. Follow adhesive manufacturer’s recommendations for sealer products and application as required to meet manufacturer’s warranty requirements.

B. Moldings, Transition and Edge Strips: Same material as flooring. Refer to Drawings for profiles.

PART 3 EXECUTION

3.01 EXAMINATION
A. Verify that surfaces are flat to tolerances acceptable to flooring manufacturer, free of cracks that might telegraph through flooring, clean, dry, and free of curing compounds, surface hardeners, and other chemicals that might interfere with bonding of flooring to substrate.
B. Cementitious Sub-floor Surfaces: Verify that substrates are dry enough and ready for resilient flooring installation by testing for moisture and pH.

3.02 PREPARATION
A. Remove existing resilient flooring and flooring adhesives; follow the recommendations of RFCI (RWP).
B. Prepare floor substrates as recommended by flooring and adhesive manufacturers.
C. Apply sealer as required to meet manufacturer’s installation requirements.
D. Remove sub-floor ridges and bumps. Fill minor low spots, cracks, joints, holes, and other defects with sub-floor filler to achieve smooth, flat, hard surface.
E. Prohibit traffic until filler is fully cured.

3.03 INSTALLATION - GENERAL
A. Starting installation constitutes acceptance of sub-floor conditions.
B. Install in accordance with manufacturer’s written instructions.
C. Spread only enough adhesive to permit installation of materials before initial set.
D. Fit joints and butt seams tightly.
E. Set flooring in place, press with heavy roller to attain full adhesion.
F. Match floor tiles for color and pattern by selecting tiles from cartons in the same sequence as manufactured and packaged, if so numbered. Discard broken, cracked, chipped, or deformed tiles.
G. Where type of floor finish, pattern, or color are different on opposite sides of door, terminate flooring under centerline of door.
H. Install edge strips at unprotected or exposed edges, where flooring terminates, and where indicated.
1. Metal Strips: Attach to substrate before installation of flooring using stainless steel screws.
2. Resilient Strips: Attach to substrate using adhesive.
I. Scribe flooring to walls, columns, cabinets, floor outlets, and other appurtenances to produce tight joints.
J. Extend floor tiles into toe spaces, door reveals, closets, and similar openings. Extend floor tiles to center of door openings.
K. Install flooring in recessed floor access covers, maintaining floor pattern.

3.04 INSTALLATION - TILE FLOORING
A. Mix tile from container to ensure shade variations are consistent when tile is placed, unless otherwise indicated in manufacturer’s installation instructions.

3.05 INSTALLATION - RESILIENT BASE
A. Fit joints tightly and make vertical. Maintain minimum dimension of 18 inches between joints.
B. Miter internal corners. At external corners, use premolded units. At exposed ends, use premolded units.
C. Install base on solid backing. Bond tightly to wall and floor surfaces.
D. Scribe and fit to door frames and other interruptions.

3.06 CLEANING
   A. Remove excess adhesive from floor, base, and wall surfaces without damage.
   B. Clean in accordance with manufacturer's written instructions.

3.07 PROTECTION
   A. Prohibit traffic on resilient flooring for 48 hours after installation.

END OF SECTION
SECTION 09 67 14 - FLUID APPLIED EPOXY FLOORING

PART 1 GENERAL
1.01 SECTION INCLUDES
A. Fluid-applied epoxy elastomeric flooring and integral cove base.

1.02 SUBMITTALS
A. Product Data: Provide data on specified products, describing physical and performance characteristics; sizes, patterns and colors available.
B. Samples: Submit two samples, 12 x 12 inch in size illustrating color and pattern for each color specified.

1.03 QUALITY ASSURANCE
A. Manufacturer Qualifications: Company specializing in manufacturing the Products specified in this section with minimum three years documented experience.

1.04 DELIVERY, STORAGE, AND HANDLING
A. Store materials in a dry, secure area.
B. Maintain minimum temperature of 70 degrees F.
C. Store materials in area of installation for three days prior to installation to achieve temperature stability.

1.05 FIELD CONDITIONS
A. Maintain ambient temperature required by manufacturer for minimum period of 72 hours prior to, during, and 24 hours after installation of materials.
B. Maintain relative humidity in area of installation at 70 percent, maximum, during installation and for minimum period of 72 hours after installation.

PART 2 PRODUCTS
2.01 MATERIALS
A. Fluid-Applied Flooring: Epoxy base coat(s) with embedded vinyl flakes.
   1. Basis-of-Design: Sherwin-Williams, Decorative Mosaic Coating WB.
      a. Primer: 3579 Standard Primer @ 6 mils WFT.
      b. Base Coat: 3744 High Performance CR Epoxy - Pigmented @ 6-8 mils DFT.
      c. Full Broadcast Chips: 6750 Vinyl Chip (Blend) @100#/1000sf
      d. Top Coat: 4408 Water-Based Polyurethane @ 4-5 mils DFT.
   2. Manufacturers: Provide basis of design product or comparable product selected by interior designer prior to bid from the full product line from one of the following.
      a. Dur-A-Flex
      b. Stonehard
   4. Abrasion Resistance (ASTM D 4060, CS-17 Wheel, 1,000 cycles) 63 msg lost
   5. Flexural Strength (ASTM C 580): 10,000 psi
   6. Adhesion (ACI 503A) 300 psi concrete failure
   7. Flammability: self-extinguishing over concrete
   9. Resistance to Elevated Temperatures (MIL-D-3134J) No slip or flow at required temperature of 158 F
B. Cant Strips: 1 x 1 x 45 degrees, of dense sponge rubber compatible with floor materials.
C. Sealant: Compatible with flooring materials.

2.02 ACCESSORIES
A. Subfloor Filler: White premix latex; type recommended by flooring material manufacturer.
B. Primers and Adhesives: Waterproof; types recommended by flooring manufacturer.

PART 3 EXECUTION

3.01 EXAMINATION

A. Verify that sub-floor surfaces are smooth and flat within the tolerances specified for that type of work and are ready to receive flooring.

B. Verify that wall surfaces are smooth and flat within the tolerances specified for that type of work, are dust-free, and are ready to receive flooring.

C. Verify that sub-floor surfaces are dust-free and free of substances that could impair bonding of materials to sub-floor surfaces.

D. Verify that concrete sub-floor surfaces are ready for flooring installation by testing for moisture emission rate and alkalinity; obtain instructions if test results are not within limits recommended by flooring materials manufacturer.

E. Verify that required floor-mounted utilities are in correct location.

3.02 PREPARATION

A. Remove subfloor ridges and bumps. Fill low spots, cracks, joints, holes, and other defects with subfloor filler.

B. Apply, trowel, and float filler to achieve smooth, flat, hard surface. Grind irregularities above the surface level. Prohibit traffic until filler is cured.

C. Vacuum clean substrate.

D. Apply primer to surfaces required by manufacturer.

3.03 INSTALLATION

A. Apply in accordance with manufacturer's instructions.

B. Apply each coat to minimum thickness indicated.

C. Finish to smooth level surface.

D. Extend primer, base and top coats up intersecting and perimeter vertical surfaces, 6 inches. Terminate top edge clean, straight, and level.

E. Cove at vertical surfaces.

END OF SECTION
SECTION 09 68 13 - TILE CARPETING

PART 1 GENERAL
1.01 SECTION INCLUDES
   A. Carpet tile and walk-off mat carpet tile, fully adhered.

1.02 RELATED REQUIREMENTS
   A. Section 03 30 00 - Cast-in-Place Concrete: Restrictions on curing compounds for concrete slabs and floors.

1.03 REFERENCE STANDARDS

1.04 SUBMITTALS
   A. Shop Drawings: Indicate the following:
      1. Columns, doorways, enclosing walls or partitions, built-in cabinets, and locations where cutouts are required in carpet tiles.
      2. Carpet tile type, color, and dye lot.
      3. Type of subfloor.
      4. Type of installation.
      5. Pattern of installation.
      6. Pattern type, location, and direction.
      7. Pile direction.
      8. Type, color, and location of insets and borders.
      9. Type, color, and location of edge, transition, and other accessory strips.
      10. Transition details to other flooring materials.
   B. Product Data: Provide data on specified products, describing physical and performance characteristics; sizes, patterns, colors available, and method of installation.
   C. Samples: Submit two carpet tiles illustrating color and pattern design for each carpet color selected.
   D. Manufacturer's Installation Instructions: Indicate special procedures.
   E. Maintenance Data: Include maintenance procedures, recommended maintenance materials, and suggested schedule for cleaning.
   F. Maintenance Materials: Furnish the following for Owner's use in maintenance of project.
      1. Extra Carpet Tiles: Quantity equal to 5 percent of total installed of each color and pattern installed.
      2. Self-Adhesive Spot Stickers: Provide roll of one hundred sticker spots.

1.05 PREINSTALLATION MEETINGS
   A. Preinstallation Conference: Conduct conference at Project site.
      1. Review methods and procedures related to carpet tile installation including, but not limited to, the following:
         a. Review delivery, storage, and handling procedures.
         b. Review ambient conditions and ventilation procedures.
         c. Review subfloor preparation procedures.

1.06 QUALITY ASSURANCE
   A. Installer Qualifications: Company specializing in installing carpet tile with minimum five years documented experience.
   B. Environmental Limitations: Do not deliver or install carpet tiles until spaces are enclosed and weathertight, wet work in spaces is complete and dry, and ambient temperature and humidity conditions are maintained at occupancy levels during the remainder of the construction period.
C. Do not install carpet tiles over concrete slabs until slabs have cured and are sufficiently dry to bond with adhesive and concrete slabs have pH range recommended by carpet tile manufacturer.

1.07 FIELD CONDITIONS
A. Comply with CRI 104.

1.08 WARRANTY
A. Special Warranty for Carpet Tiles: Manufacturer agrees to repair or replace components of carpet tile installation that fail in materials or workmanship within specified warranty period.
   1. Warranty does not include deterioration or failure of carpet tile due to unusual traffic, failure of substrate, vandalism, or abuse.
   2. Failures include, but are not limited to, more than 10 percent edge raveling, snags, runs, dimensional stability, loss of tuft bind strength, loss of face fiber, and delamination.
   3. Warranty Period: 10 years from date of Substantial Completion.

PART 2 PRODUCTS
2.01 MATERIALS
A. Carpet Tile: Products: Refer to Drawing Sheet A601 Finish Material Specification for carpet types and products..

2.02 ACCESSORIES
A. Sub-Floor Filler: Pre-mix latex; type recommended by flooring material manufacturer.
B. Adhesives: Acceptable to carpet tile manufacturer, compatible with materials being adhered; maximum VOC of 50 g/L; CRI Green Label certified.
   1. Provide sealers and adhesives recommended by manufacturer for installation on cementitious sub-floor surface moisture and pH levels present at time of installation.
   2. Provide floor sealers for surfaces that test over adhesive manufacturer's maximum recommended moisture/pH levels. Follow adhesive manufacturer's recommendations for sealer products and application as required to meet manufacturer's warranty requirements.
C. Metal Edge/Transition Strips: Extruded aluminum with mill finish of profile and width shown, of height required to protect exposed edge of carpet, and of maximum lengths to minimize running joints.

PART 3 EXECUTION
3.01 EXAMINATION
A. Verify that sub-floor surfaces are smooth and flat within tolerances specified for that type of work and are ready to receive carpet tile.
B. Verify that sub-floor surfaces are dust-free and free of substances that could impair bonding of adhesive materials to sub-floor surfaces.
C. Cementitious Sub-floor Surfaces: Verify that substrates are dry enough and ready for flooring installation by testing for moisture and pH.
D. Apply sealer as required to meet manufacturer's installation requirements.

3.02 PREPARATION
A. General: Comply with CRI 104, Section 6.2, "Site Conditions; Floor Preparation," and with carpet tile manufacturer's written installation instructions for preparing substrates indicated to receive carpet tile installation.
B. Prepare floor substrates as recommended by flooring and adhesive manufacturers.
C. Use trowelable leveling and patching compounds, according to manufacturer's written instructions, to fill cracks, holes, depressions, and protrusions in substrates. Fill or level cracks, holes and depressions 1/8 inch wide or wider and protrusions more than 1/32 inch unless more stringent requirements are required by manufacturer's written instructions.
D. Remove coatings, including curing compounds, and other substances that are incompatible with adhesives and that contain soap, wax, oil, or silicone, without using solvents. Use mechanical methods recommended in writing by carpet tile manufacturer.

E. Clean metal substrates of grease, oil, soil and rust, and prime if directed by adhesive manufacturer. Rough sand painted metal surfaces and remove loose paint. Sand aluminum surfaces, to remove metal oxides, immediately before applying adhesive.

F. Broom and vacuum clean substrates to be covered immediately before installing carpet tile.

3.03 INSTALLATION

A. Starting installation constitutes acceptance of sub-floor conditions.

B. Install carpet tile in accordance with manufacturer's instructions and CRI 104 Section 14 "Carpet Modules".

C. Blend carpet from different cartons to ensure minimal variation in color match.

D. Cut carpet tile clean. Fit carpet tight to intersection with vertical surfaces without gaps.

E. Lay carpet tile in square pattern, with pile direction parallel to next unit, set in directions and patterns indicated on drawings.

F. Extend carpet tile into toe spaces, door reveals, closets, open-bottomed obstructions, removable flanges, alcoves, and similar openings.

G. Fully adhere carpet tile to substrate.

H. Trim carpet tile neatly at walls and around interruptions.

I. Complete installation of edge strips, concealing exposed edges.

3.04 CLEANING AND PROTECTION

A. Remove excess adhesive without damage, from floor, base, and wall surfaces.

B. Perform the following operations immediately after installing carpet tile:
   1. Remove excess adhesive, seam sealer, and other surface blemishes using cleaner recommended by carpet tile manufacturer.
   2. Remove yarns that protrude from carpet tile surface.

C. Protect installed carpet tile to comply with CRI 104, Section 16, "Protecting Indoor Installations."

D. Protect carpet tile against damage from construction operations and placement of equipment and fixtures during the remainder of construction period. Use protection methods indicated or recommended in writing by carpet tile manufacturer.

END OF SECTION
SECTION 09 77 00 - FIBERGLASS REINFORCED PANELS

SUMMARY

1.01 SECTION INCLUDES:

1.02 SYSTEM DESCRIPTION
   A. Performance Requirements: Provide fiberglass reinforced plastic (FRP) panels which have been manufactured and installed to maintain performance criteria stated by manufacturer without defects, damage or failure.

1.03 SUBMITTALS
   A. Product Data: Submit product data, including manufacturer's product data sheet, for specified products.
   B. Shop Drawings: Submit shop drawings showing layout, profiles and product components, including anchorage, accessories, finish colors, patterns and textures. Indicate location and dimension of joints and fastener attachment.
   C. Samples: Submit selection and verification samples for finishes, colors and textures. Submit 2 samples of each type of panel, trim and fastener.

1.04 QUALITY ASSURANCE
   A. Installer Qualifications: Installer should be experienced in performing work of this section and should have specialized in installation of work similar to that required for this project.

1.05 DELIVERY, STORAGE & HANDLING
   A. Delivery: Deliver materials in manufacturer's original, unopened, undamaged containers with identification labels intact. Package sheets on skids or pallets for shipment to project site.
   B. Storage and Protection: Store materials protected from exposure to harmful weather conditions and at temperature and humidity conditions recommended by manufacturer. Store panels indoors in a dry place at the project site.
   C. Handling: Remove foreign matter from face of panel by using a soft bristle brush, avoiding abrasive action.

1.06 PROJECT CONDITIONS
   A. Environmental Requirements:
      1. Installation shall not begin until building is enclosed, permanent heating and cooling equipment is in operation, and residual moisture from concrete work has dissipated.
      2. During installation, and for not less than 48 hours before, maintain an ambient temperature and relative humidity within limits required by type of adhesive used and recommendation of adhesive manufacturer.
      3. Provide ventilation to disperse fumes during application of adhesive as recommended by adhesive manufacturer.

PART 2 - PRODUCTS

2.01 FIBERGLASS REINFORCED PLASTIC (FRP) PANELS
   A. Acceptable Products: Subject to compliance with requirements, products that may be incorporated into the Work include:
      1. Glasteel, Glasliner FRP 1600 Series.
   B. Thickness: 1/4” thick.
   C. Moldings: PVC moldings in same color as panel.
   D. Color: To be selected by Architect from manufacturer’s full range.

2.02 ACCESSORIES
   A. Adhesive: Provide panel adhesive as recommended by panel manufacturer.
2.03 RELATED MATERIALS
   A. Related Materials: Refer to other sections listed in Related Sections paragraph herein for related materials.

2.04 SOURCE QUALITY
   A. Source Quality: Obtain fiberglass reinforced plastic (FRP) panels from a single manufacturer. Provide panels and molding only from manufacturer specified to ensure warranty and color matching of accessories.

PART 3 - EXECUTION
3.01 MANUFACTURER'S INSTRUCTIONS
   A. Compliance: Comply with manufacturer's product data, including product technical bulletins, product catalog installation instructions and product carton instructions for installation.

3.02 EXAMINATION
   A. Site Verification of Conditions: Verify that substrate conditions, which have been previously installed under other sections, are acceptable for product installation in accordance with manufacturer's instructions.
      1. Examine backup surfaces to determine that corners are plumb and straight, surfaces are smooth, uniform, clean and free from foreign matter, nails are countersunk and joints and cracks are filled flush and smooth with the adjoining surface.
      2. Do not begin installation until backup surfaces are in satisfactory condition.

3.03 PREPARATION
   A. Surface Preparation: Follow manufacturer's written recommendation for surface preparation.

3.04 INSTALLATION
   A. Fiberglass Reinforced Panel (FRP) Installation:
      1. Cut and drill panels with carbide tipped saw blades or drill bits, or cut with snips.
      2. Install panels with manufacturer's recommended gap for panel field and corner joints.
      3. For trowel type and application of adhesive, follow adhesive manufacturer's recommendations.
      4. Use products acceptable to panel manufacturer and install FRP system in accordance with panel manufacturer's printed instructions.

3.05 CLEANING
   A. Cleaning: Remove temporary coverings and protection of adjacent work areas. Repair or replace products that have been installed and are damaged. Clean installed products in accordance with manufacturer's instructions prior to Owner's acceptance. Remove construction debris from project site and legally dispose of debris.
      1. Remove any adhesive or excessive sealant from panel face using solvent or cleaner recommended by panel manufacturer.

3.06 PROTECTION
   A. Protection: Protect installed product and finish surfaces from damage during construction.

END OF SECTION
SECTION 09 84 30 - SOUND-ABSORBING PANELS

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Fabric wrapped sound-absorbing panels.
B. Mounting accessories.

1.02 SUBMITTALS

A. Product Data: Manufacturer's printed data sheets for products specified.
B. Shop Drawings: Fabrication and installation details, panel layout, and fabric orientation.
C. Verification Samples: Fabricated samples of each type of panel specified; 12 by 12 inch, showing construction, edge details, and fabric covering.

1.03 DELIVERY, STORAGE, AND HANDLING

A. Protect acoustical units from moisture during shipment, storage, and handling. Deliver in factory-wrapped bundles; do not open bundles until units are needed for installation.
B. Store units flat, in dry, well-ventilated space; do not stand on end.
C. Protect edges from damage.

PART 2 PRODUCTS

2.01 FABRIC-COVERED SOUND-ABSORBING UNITS

A. Fabric Covered tackable Acoustic Panels:
   1. Basis-of-Design: Conwed, Respond IR Acoustical Panels. Subject to compliance with requirements, provide basis-of-design product or a comparable product by one of the following:
      a. Golterman & Sabo.
      b. Panel Solution, Inc.
   2. Panel Core: Manufacturer's standard rigid or semi-rigid fiberglass core.
      a. Core Density: 6 to 7 lb/cu ft.
   3. Facing: 1/8 inch impact-resistant and tackable surface laminated to core.
      a. Core Density: 16 to 20 lb/cu ft.
   4. Panel Size: As indicated on Drawings.
   5. Panel Thickness: As indicated on Drawings.
   7. Corners: Square.
      a. Fabric: Refer to Drawing Sheet A601 for Finish Material Specifications. Panel manufacturer must be able to provide panels wrapped in specified fabric.

2.02 FABRICATION

A. Fabric Wrapped, General: Fabricate panels to sizes and configurations as indicated, with fabric facing installed without sagging, wrinkles, blisters, or visible seams.
B. Tolerances: Fabricate to finished tolerance of plus or minus 1/16 inch for thickness, overall length and width, and squareness from corner to corner.

2.03 ACCESSORIES

A. Back-Mounting Accessories: Manufacturer's standard accessories for concealed support, designed to allow panel removal, and as follows:
   1. Z-clip hanger and magnet system with magnets recessed into panel frame and designed to engage steel mounting plates secured to substrate with screws.
PART 3 EXECUTION

3.01 EXAMINATION
   A. Examine substrates for conditions detrimental to installation of acoustical units. Proceed with installation only after unsatisfactory conditions have been corrected.

3.02 INSTALLATION
   A. Install acoustical units in locations as indicated, following manufacturer's installation instructions.
   B. Align panels accurately, with edges plumb and top edges level. Scribe to fit accurately at adjoining work and penetrations.
   C. Install acoustical units to construction tolerances of plus or minus 1/16 inch for the following:
      1. Plumb and level.
      2. Flatness.

3.03 CLEANING
   A. Clean fabric facing upon completion of installation from dust and other foreign materials, following manufacturer's instructions.

3.04 PROTECTION
   A. Provide protection of installed acoustical panels until Date of Substantial Completion.
   B. Replace panels that cannot be cleaned and repaired to satisfaction of the Architect.

END OF SECTION
SECTION 09 91 13 - EXTERIOR PAINTING

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Surface preparation.
B. Field application of paints.
C. Scope: Finish exterior surfaces exposed to view, unless fully factory-finished and unless otherwise indicated.
D. Do Not Paint or Finish the Following Items:
   1. Items factory-finished unless otherwise indicated; materials and products having factory-applied primers are not considered factory finished.
   2. Items indicated to receive other finishes.
   3. Items indicated to remain unfinished.
   4. Fire rating labels, equipment serial number and capacity labels, and operating parts of equipment.
   5. Floors, unless specifically indicated.
   7. Concealed pipes, ducts, and conduits.
   8. Data cable.
      a. Painter shall be aware that any amount of paint or overspray of paint on data cable will void the warranty of the data cable. Attempts to remove paint by chemical or physical means from data cable is not allowed. All data cable with paint/overspray shall be required to be fully replaced. Entire run of cable will be replaced. No splicing is allowed.

1.02 REFERENCE STANDARDS

A. SSPC-SP 3 - Power Tool Cleaning; 1982 (Ed. 2004).

1.03 SUBMITTALS

A. Product Data: Provide complete list of products to be used, with the following information for each:
   1. Manufacturer's name, product name and/or catalog number, and general product category (e.g. "alkyd enamel").
   2. Cross-reference to specified paint system(s) product is to be used in; include description of each system.
   3. Manufacturer's installation instructions.
B. Samples: Submit three paper "draw down" samples, 8-1/2 by 11 inches in size, illustrating range of colors available for each finishing product specified.
   1. Where sheen is specified, submit samples in only that sheen.
C. Maintenance Data: Submit data including care and cleaning instructions, touch-up procedures, and repair of painted and finished surfaces.
D. Maintenance Materials: Furnish the following for Owner's use in maintenance of project.
   1. Extra Paint and Coating: 1 full quart of each color and sheen.

1.04 QUALITY ASSURANCE

A. Benchmark Samples (Mockups): Provide a full-coat benchmark finish sample for each type of coating and substrate required.
   1. Wall Surfaces: Provide samples on at least 100 sq. ft.
   2. Final approval of colors will be from benchmark samples.

1.05 DELIVERY, STORAGE, AND HANDLING

A. Deliver products to site in sealed and labeled containers; inspect to verify acceptability.
B. Container Label: Include manufacturer's name, type of paint, brand name, lot number, brand code, coverage, surface preparation, drying time, cleanup requirements, color designation, and instructions for mixing and reducing.

C. Paint Materials: Store at minimum ambient temperature of 45 degrees F and a maximum of 90 degrees F, in ventilated area, and as required by manufacturer's instructions.

1.06 FIELD CONDITIONS
A. Do not apply materials when surface and ambient temperatures are outside the temperature ranges required by the paint product manufacturer.

B. Follow manufacturer's recommended procedures for producing best results, including testing of substrates, moisture in substrates, and humidity and temperature limitations.

C. Do not apply exterior paint and finishes during rain or snow, or when relative humidity is outside the humidity ranges required by the paint product manufacturer.

D. Provide lighting level of 80 ft candles measured mid-height at substrate surface.

PART 2 PRODUCTS
2.01 MANUFACTURERS
A. Provide paints and finishes from the same manufacturer to the greatest extent possible.

2.02 PAINTS AND FINISHES - GENERAL
A. Paints and Finishes: Ready mixed, unless required to be a field-catalyzed paint.
   1. Provide paints and finishes of a soft paste consistency, capable of being readily and uniformly dispersed to a homogeneous coating, with good flow and brushing properties, and capable of drying or curing free of streaks or sags.
   2. Provide materials that are compatible with one another and the substrates indicated under conditions of service and application, as demonstrated by manufacturer based on testing and field experience.
   3. For opaque finishes, tint each coat including primer coat and intermediate coats, one-half shade lighter than succeeding coat, with final finish coat as base color.
   4. Supply each paint material in quantity required to complete entire project's work from a single production run.
   5. Do not reduce, thin, or dilute paint or finishes or add materials unless such procedure is specifically described in manufacturer's product instructions.

2.03 PAINT SYSTEMS - EXTERIOR
A. Exterior Galvanized Metal Indicated to be Painted:
   1. Primer:
      a. Diamond Vogel: Mult-E-Prime 500 Hi-Build Epoxy Primer
      d. Tnemec; Series 27 WB Typoxy Polymide Epoxy.
   2. Intermediate Coat:
      c. Sherwin-Williams; Macropoxy 646.
      d. Tnemec; None required.
   3. Topcoat:
      a. Diamond Vogel; Multi-Thane 330 High Solids Acrylic Polyurethane.
      d. Tnemec; Series 1075 Endura-Shield II.

B. Exterior Poly-Ash Trim to be Painted:
   1. Two top coats over factory applied primer.
   2. Top Coat(s): Exterior Latex.
a. Products:
   1) PPG Industries, Inc., Fortis 450.
   2) Pittsburg Paints, Regency Exterior Latex.
   3) Sherwin Williams, A-100 Exterior Latex.

2.04 ACCESSORY MATERIALS
A. Accessory Materials: Provide primers, sealers, cleaning agents, cleaning cloths, sanding materials, and clean-up materials as required for final completion of painted surfaces.

PART 3 EXECUTION
3.01 EXAMINATION
A. Verify that surfaces are ready to receive work as instructed by the product manufacturer.
B. Examine surfaces scheduled to be finished prior to commencement of work. Report any condition that may potentially effect proper application.
C. Test shop-applied primer for compatibility with subsequent cover materials.

3.02 PREPARATION
A. Clean surfaces thoroughly and correct defects prior to application.
B. Prepare surfaces using the methods recommended by the manufacturer for achieving the best result for the substrate under the project conditions.
C. Remove or mask surface appurtenances, including electrical plates, hardware, light fixture trim, escutcheons, and fittings, prior to preparing surfaces for finishing.
D. Seal surfaces that might cause bleed through or staining of topcoat.
E. Remove mildew from impervious surfaces by scrubbing with solution of tetra-sodium phosphate and bleach. Rinse with clean water and allow surface to dry.
F. Galvanized Surfaces:
   1. Prepare surface according to SSPC-SP 3.

3.03 APPLICATION
A. Apply products in accordance with manufacturer's written instructions.
B. Do not apply finishes to surfaces that are not dry. Allow applied coats to dry before next coat is applied.
C. Apply each coat to uniform appearance.
D. Vacuum clean surfaces of loose particles. Use tack cloth to remove dust and particles just prior to applying next coat.
E. Reinstall electrical cover plates, hardware, light fixture trim, escutcheons, and fittings removed prior to finishing.

3.04 CLEANING
A. Collect waste material that could constitute a fire hazard, place in closed metal containers, and remove daily from site.

3.05 PROTECTION
A. Protect finishes until completion of project.
B. Touch-up damaged finishes after Substantial Completion.

END OF SECTION
SECTION 09 91 23 - INTERIOR PAINTING

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Surface preparation.
B. Field application of paints.
C. Scope: Finish interior surfaces exposed to view, unless fully factory-finished and unless otherwise indicated.
   1. Both sides and edges of plywood backboards for electrical and telecom equipment before installing equipment.
   2. Elevator pit ladders.
   3. Prime surfaces to receive wall coverings.
   4. Mechanical and Electrical:
      a. In finished areas, paint insulated and exposed pipes, conduit, boxes, insulated and exposed ducts, hangers, brackets, collars and supports, mechanical equipment, and electrical equipment, unless otherwise indicated.
   5. Stenciling at Fire/Smoke Walls and Partitions: Provide identification for all fire walls, fire barriers, fire partitions, smoke barriers and smoke partitions. Such identifications shall:
      a. Be located in accessible concealed floor, floor-ceiling or attic spaces;
      b. Be repeated at intervals not exceeding 30 feet measured horizontally along the wall or partition; and
      c. Include lettering not less than 0.5 inch in height, incorporating the suggested wording: "FIRE AND/OR SMOKE BARRIER-PROTECT ALL OPENINGS," or other wording as indicated on drawings.
D. Do Not Paint or Finish the Following Items:
   1. Items factory-finished unless otherwise indicated; materials and products having factory-applied primers are not considered factory finished.
   2. Items indicated to receive other finishes.
   3. Items indicated to remain unfinished.
   4. Fire rating labels, equipment serial number and capacity labels, bar code labels, and operating parts of equipment.
   5. Floors, unless specifically indicated.
   6. Ceramic and other tiles.
   7. Glass.
   8. Concealed pipes, ducts, and conduits.
      a. Painter shall be aware that any amount of paint or overspray of paint on data cable will void the warranty of the data cable. Attempts to remove paint by chemical or physical means from data cable is not allowed. All data cable with paint/overspray shall be required to be fully replaced. Entire run of cable will be replaced. No splicing is allowed.

1.02 REFERENCE STANDARDS

B. SSPC-SP 1 - Solvent Cleaning; 2015.
C. SSPC-SP 3 - Power Tool Cleaning; 1982 (Ed. 2004).
D. SSPC-SP 6 - Commercial Blast Cleaning; 2007.
E. SSPC-SP 13 - Surface Preparation of Concrete; (Reaffirmed 2015); 2003.

1.03 SUBMITTALS

A. Product Data: Provide complete list of products to be used, with the following information for each:
1. Manufacturer's name, product name and/or catalog number, and general product category (e.g. "alkyd enamel").
2. Cross-reference to specified paint system(s) product is to be used in; include description of each system.
3. Manufacturer's installation instructions.

B. Samples: Submit two paper "draw down" samples, 8-1/2 by 11 inches in size, illustrating range of colors available for each finishing product specified.
   1. Where sheen is specified, submit samples in only that sheen.

C. Manufacturer's Instructions: Indicate special surface preparation procedures.

D. Maintenance Data: Submit data including finish schedule showing where each product/color/finish was used, product technical data sheets, care and cleaning instructions, touch-up procedures, repair of painted and finished surfaces, and color samples of each color and finish used.

E. Maintenance Materials: Furnish the following for Owner's use in maintenance of project.
   1. Extra Paint and Finish Materials: 1 gallon of each color; from the same product run, store where directed.
   2. Label each container with color in addition to the manufacturer's label.

1.04 QUALITY ASSURANCE

A. Manufacturer Qualifications: Company specializing in manufacturing the products specified, with minimum three years documented experience.

B. Applicator Qualifications: Company specializing in performing the type of work specified with minimum five years experience.

1.05 MOCK-UP

A. Provide mockup of

1.06 DELIVERY, STORAGE, AND HANDLING

A. Deliver products to site in sealed and labeled containers; inspect to verify acceptability.

B. Container Label: Include manufacturer's name, type of paint, brand name, lot number, brand code, coverage, surface preparation, drying time, cleanup requirements, color designation, and instructions for mixing and reducing.

C. Paint Materials: Store at minimum ambient temperature of 45 degrees F and a maximum of 90 degrees F, in ventilated area, and as required by manufacturer's instructions.

1.07 FIELD CONDITIONS

A. Do not apply materials when surface and ambient temperatures are outside the temperature ranges required by the paint product manufacturer.

B. Follow manufacturer's recommended procedures for producing best results, including testing of substrates, moisture in substrates, and humidity and temperature limitations.

C. Provide lighting level of 80 ft candles measured mid-height at substrate surface.

PART 2 PRODUCTS

2.01 MANUFACTURERS

A. Provide paints and finishes used in any individual system from the same manufacturer; no exceptions.

2.02 PAINTS AND FINISHES - GENERAL

A. Paints and Finishes: Ready mixed, unless intended to be a field-catalyzed paint.
   1. Provide paints and finishes of a soft paste consistency, capable of being readily and uniformly dispersed to a homogeneous coating, with good flow and brushing properties, and capable of drying or curing free of streaks or sags.
   2. Supply each paint material in quantity required to complete entire project's work from a single production run.
3. Do not reduce, thin, or dilute paint or finishes or add materials unless such procedure is specifically described in manufacturer’s product instructions.

B. Colors: As indicated on drawings.
   1. In finished areas, finish pipes, ducts, conduit, and equipment the same color as the wall/ceiling they are mounted on/under, unless otherwise indicated on drawings.

2.03 PAINT SYSTEMS - INTERIOR

A. Interior Gypsum Board Surfaces to be Painted:
   1. Two top coats and one coat primer.
   2. Top Coats for Walls: Interior Eggshell Latex.
      a. Products:
         1) Benjamin Moore, Super Spec Interior Latex Eggshell Finish
         2) Diamond Vogel, Vantage Plus Interior Latex Eggshell Enamel
         4) Pratt & Lambert Pro-Hide Gold Ultra Interior Latex, Eggshell.
   3. Top Coats for Ceilings: Interior Flat Latex.
      a. Products:
         1) Benjamin Moore, Super Spec Interior Latex Flat Finish
         2) Diamond Vogel, Vantage Plus Interior Latex Flat Enamel.
         3) PPG Paints Ultra-Hide 150 Interior Paint, 1210-XXXXV, Flat.
         4) Pratt & Lambert Pro-Hide Gold Ultra Interior Latex, Flat.
         5) Sherwin-Williams ProMar 200 Zero VOC Interior Latex, Flat.
   4. Primer: As recommended by top coat manufacturer for specific substrate.

B. Concrete and Concrete Masonry Units: Interior Semi-Gloss Latex.
   1. Two top coats and one coat primer.
   2. Primer: As recommended by top coat manufacturer for specific substrate.
   3. Products:
      a. Benjamin Moore, Super Spec Semi-Gloss Finish

C. Ferrous and Galvanized Metal Surfaces to be Painted: For surfaces subject to frequent contact by occupants, including metals:
   1. Medium duty applications include doors, door frames, railings, handrails, guardrails, balustrades, and miscellaneous metals.
   2. Two top coats and one coat primer.
   3. Top Coat(s): Interior Light Industrial Coating, Water Based.
      a. Products:
         1) Benjamin Moore, Ultra Spec HP DTM Acrylic Semi-Gloss HP29
         5) Sherwin-Williams Pro Industrial Acrylic Coating, Semi-Gloss.

D. Interior Epoxy Coating: Including gypsum board and concrete masonry units.
   1. Primer for gypsum wallboard: As recommended by manufacturer.
   2. Primer for concrete masonry: Masonry filler.
   3. Finish Coatings: Two coats. Provide one of the following:
      b. Pittsburgh Paints; PITT-GLAZE Water Based Acrylic Epoxy Semi-Gloss.
      d. Sherwin-Williams Pro Industrial Pre-Catalyzed Waterbased Epoxy, Semi-Gloss.
E. Dry Fall: Metals; exposed structure and overhead-mounted services, including shop primed steel deck, structural steel, metal fabrications, galvanized ducts, galvanized conduit, and galvanized piping.
   1. One top coat.
   2. Top Coat: Latex Dry Fall.
      a. Products:
         1) Benjamin Moore, Latex Dry Fall Flat 395
         2) Diamond Vogel, Luminance 300 Latex Dri-Mist Flat.
         3) PPG Paints Speedhide Super Tech Water Based Interior Dry-Fog, 6-723XI, 6-725XI, Flat.
         4) Pratt & Lambert Waterborne Dry Fall, Flat.
         5) Sherwin-Williams Waterborne Acrylic Dryfall, Flat.
F. Transparent Finish on Concrete Floors.
   1. 2 coats sealer.
   2. Sealer: Water Based for Concrete Floors.
      a. Products:
         1) Tamms; Clearseal WB 300.
         2) L & M Construction Chemicals; Durathane HS/VOC.
         3) W.R. Meadows; VOCOMP - 25.

2.04 ACCESSORY MATERIALS
   A. Accessory Materials: Provide primers, sealers, cleaning agents, cleaning cloths, sanding materials, and clean-up materials as required for final completion of painted surfaces.
   B. Patching Material: Latex filler.
   C. Fastener Head Cover Material: Latex filler.

PART 3 EXECUTION
3.01 EXAMINATION
   A. Verify that surfaces are ready to receive work as instructed by the product manufacturer.
   B. Examine surfaces scheduled to be finished prior to commencement of work. Report any condition that may potentially effect proper application.
   C. Test shop-applied primer for compatibility with subsequent cover materials.
   D. Measure moisture content of surfaces using an electronic moisture meter. Do not apply finishes unless moisture content of surfaces are below the following maximums:
      1. Gypsum Wallboard: 12 percent.
      2. Concrete Floors and Traffic Surfaces: 8 percent.

3.02 PREPARATION
   A. Clean surfaces thoroughly and correct defects prior to application.
   B. Prepare surfaces using the methods recommended by the manufacturer for achieving the best result for the substrate under the project conditions.
   C. Remove or mask surface appurtenances, including electrical plates, hardware, light fixture trim, escutcheons, and fittings, prior to preparing surfaces or finishing.
   D. Seal surfaces that might cause bleed through or staining of topcoat.
   E. Concrete:
      1. Remove release agents, curing compounds, efflorescence, and chalk. Do not coat surfaces if moisture content or alkalinity of surfaces to be coated exceeds that permitted in manufacturer’s written instructions.
      2. Prepare surface as recommended by top coat manufacturer and according to SSPC-SP 13.
   F. Masonry:
1. Remove efflorescence and chalk. Do not coat surfaces if moisture content or alkalinity of surfaces or if alkalinity of mortar joints exceed that permitted in manufacturer's written instructions. Allow to dry.

2. Prepare surface as recommended by top coat manufacturer.

G. Concrete Floors and Traffic Surfaces: Remove contamination, acid etch, and rinse floors with clear water. Verify required acid-alkali balance is achieved. Allow to dry.

H. Gypsum Board: Fill minor defects with filler compound. Spot prime defects after repair.

I. Galvanized Surfaces:
   1. Prepare surface according to SSPC-SP 3.

J. Ferrous Metal:
   1. Solvent clean according to SSPC-SP 1.
   3. Remove rust, loose mill scale, and other foreign substances using methods recommended in writing by paint manufacturer and blast cleaning according to SSPC-SP 6 "Commercial Blast Cleaning". Protect from corrosion until coated.

K. Once paint schemes are masked out on wall, prior to painting, contact the Designer at OPN Architects to view and approve.

3.03 APPLICATION

A. Remove unfinished louvers, grilles, covers, and access panels on mechanical and electrical components and paint separately.

B. Apply products in accordance with manufacturer's written instructions.

C. Do not apply finishes to surfaces that are not dry. Allow applied coats to dry before next coat is applied.

D. Apply each coat to uniform appearance in thicknesses specified by manufacturer.

E. Include areas visible when permanent or built-in fixtures, grilles, convector covers, covers for finned-tube radiation, and similar components are in place. Extend coatings in these areas, as required, to maintain system integrity and provide desired protection.
   1. Paint surfaces behind movable equipment and furniture the same as similar exposed surfaces. Before final installation of equipment, paint surfaces behind permanently fixed equipment or furniture with prime coat only.
   2. Paint interior surfaces of ducts with a flat, nonspecular black paint where visible through registers or grilles.
   3. Paint back sides of access panels and removable or hinged covers to match exposed surfaces.
   4. Finish doors on tops, bottoms, and side edges the same as exterior faces.

F. Minimum Coating Thickness: Apply paint materials no thinner than manufacturer's recommended spreading rate. Provide total dry film thickness of the entire system as recommended by manufacturer.

G. Block Fillers: Apply block fillers to concrete masonry block at a rate to ensure complete coverage with pores filled.

H. Dark Colors and Deep Clear Colors: Regardless of number of coats specified, apply as many coats as necessary for complete hide.

I. Sand wood and metal surfaces lightly between coats to achieve required finish.

J. Vacuum clean surfaces of loose particles. Use tack cloth to remove dust and particles just prior to applying next coat.

K. Reinstall electrical cover plates, hardware, light fixture trim, escutcheons, and fittings removed prior to finishing.
L. Concrete Floor Sealer: Follow manufacturer's instructions for preparation and installation.

3.04 CLEANING
   A. Collect waste material that could constitute a fire hazard, place in closed metal containers, and remove daily from site.
   B. At end of each workday, remove empty cans, rags, rubbish, and other discarded paint materials from Project site.
   C. Protect work of other trades, whether being painted or not, against damage from painting.
      Correct damage by cleaning, repairing or replacing, and repainting.
   D. Provide "Wet Paint: signs to protect newly painted finishes.

3.05 PROTECTION
   A. Protect finishes until completion of project.
   B. Touch-up damaged finishes after Substantial Completion.

END OF SECTION
SECTION 10 11 01 - VISUAL DISPLAY BOARDS

PART 1 GENERAL

1.01 SECTION INCLUDES
   A. Markerboards and Tackboards.

1.02 REFERENCE STANDARDS

1.03 SUBMITTALS
   A. Product Data: Provide manufacturer's data on markerboard, tackboard, trim, and accessories.
   B. Shop Drawings: Indicate wall elevations, dimensions, joint locations, special anchor details.
   C. Maintenance Data: Include data on regular cleaning, stain removal.

1.04 QUALITY ASSURANCE
   A. Manufacturer Qualifications: Company specializing in manufacturing the products specified in this section with minimum three years documented experience.

1.05 WARRANTY
   A. Provide five year warranty for markerboard to include warranty against discoloration due to cleaning, crazing or cracking, and staining.

PART 2 PRODUCTS

2.01 FRAMED DISPLAY BOARDS
   A. Manufacturers:
      2. Claridge Products and Equipment, Inc; Series 1.
      5. W.E. Neal Slate Co.
   B. Markerboards: Porcelain enamel on steel, laminated to core.
      1. Steel Face Sheet Thickness: 24 gage, 0.0239 inch.
      2. Core: Particleboard, manufacturer's standard thickness, laminated to face sheet.
      3. Backing: Aluminum foil, laminated to core.
      4. Size: As indicated on drawings.
      5. Provide printed music staff or grid markings as indicated on drawings.
      6. Frame Profile: 1-1/2" wide, rectangular trim.
      8. Accessories: Provide chalk tray and map rail.
   C. Tackboards: Composition cork.
      2. Color: As selected from manufacturer's full range.
      3. Backing: Hardboard, 1/4 inch thick, laminated to tack surface.
      4. Size: As indicated on drawings.
      5. Frame: Same type and finish as for markerboard.
   D. Materials:
      1. Porcelain Enameled Steel Sheet: ASTM A424/A424M, Type I, Commercial Steel, with fired-on vitreous finish.
      2. Particleboard: ANSI A208.1; wood chips, set with waterproof resin binder, sanded faces.
      3. Foil Backing: Aluminum foil sheet, 0.005 inch thick.
   E. Accessories:
      1. Map Rail: Extruded aluminum, manufacturer's standard profile, with cork insert and runners for accessories; 1 inch wide overall, full width of frame.
2. Chalk Tray: Aluminum, manufacturer's standard profile, one piece full length of chalkboard, molded ends, concealed fasteners, same finish as frame.
4. Marker Sets: Provide one - 4 market set (blue, red, green, black) and one dry eraser for each room where marker boards are being installed.

PART 3 EXECUTION

3.01 EXAMINATION
   A. Verify that field measurements are as indicated.
   B. Verify that internal wall blocking is ready to receive work and positioning dimensions are as indicated on shop drawings.

3.02 INSTALLATION
   A. Install visual display surfaces in locations and at mounting heights indicated on Drawings.
   B. Visual Display Boards: Attach concealed clips, hangers, and grounds to wall surfaces and to visual display boards with fasteners at not more than 16 inches o.c. Secure both top and bottom of boards to walls.
   C. Secure units level and plumb.

3.03 CLEANING
   A. Clean board surfaces in accordance with manufacturer's instructions.

END OF SECTION
SECTION 10 14 00 - SIGNAGE

PART 1 GENERAL

1.01 SECTION INCLUDES
A. Building signage.

1.02 SUBMITTALS
A. Product Data: Manufacturer's printed product literature for each type of sign, indicating sign styles, font, foreground and background colors, locations, overall dimensions of each sign.
B. Samples: Submit one sample of one letter, of size similar to that required for project, illustrating sign style, font, and method of attachment.
C. Manufacturer's Installation Instructions: Include installation templates and attachment devices.

1.03 DELIVERY, STORAGE, AND HANDLING
A. Package signs as required to prevent damage before installation.

PART 2 PRODUCTS

2.01 SIGNAGE APPLICATIONS
A. Interior Letter Signage:
   1. Use individual cut metal letters.
B. Exterior Building Identification Signs:
   1. Use individual formed metal letters.

2.02 DIMENSIONAL LETTERS
A. Exterior Formed Metal Letters:
   1. Metal: Aluminum, formed metal.
   2. Finish: Baked enamel, black.
   4. Letter Style and Height: As indicated on drawings.
B. Interior Cut Metal Letters:
   1. Metal: Aluminum, cut sheet.
   2. Finish: Clear anodized.
   5. Letter Style and Height: As indicated on drawings.

2.03 ACCESSORIES
A. Concealed Screws: Stainless steel, galvanized steel, chrome plated, or other non-corroding metal.

2.04 FABRICATION - GENERAL
A. General: Comply with requirements indicated for materials, thicknesses, finishes, colors, designs, shapes, sizes, and details of construction.
B. Design, fabricate, and install sign assemblies to prevent buckling, opening up of joints, and over-stressing of welds and fasteners.
C. Mill joints to a tight, hairline fit. Form joints exposed to the weather to exclude water penetration.
D. Conceal fasteners if possible; otherwise, locate fasteners where they will be inconspicuous.
E. Create signage to required sizes and layout. Comply with requirements indicated for design, dimensions, finish, color, and details of construction.
PART 3  EXECUTION

3.01  EXAMINATION
   A.  Verify that substrate surfaces are ready to receive work.

3.02  INSTALLATION
   A.  Install in accordance with manufacturer's instructions.
   B.  Install neatly, with horizontal edges level.
   C.  Protect from damage until Substantial Completion; repair or replace damaged items.

END OF SECTION
SECTION 10 21 13.19 - SOLID COLOR REINFORCED TOILET SCREENS

PART 1 GENERAL

1.01 SECTION INCLUDES
A. Solid color reinforced toilet compartments.

1.02 REFERENCE STANDARDS

1.03 SUBMITTALS
A. See Section 01 30 00 - Administrative Requirements, for submittal procedures.
B. Product Data: Provide data on panel construction, hardware, and accessories.
C. Shop Drawings: Indicate partition plan, elevation views, dimensions, details of wall supports, door swings.
D. Samples: Submit two samples of partition panels, 2 by 2 inch in size illustrating panel finish, color, and sheen.

PART 2 PRODUCTS

2.01 MANUFACTURERS
A. Solid Color Reinforced Toilet Compartments:
   1. Basis-of-Design: Subject to compliance with the specifications, provide Bobrick, Sierra Series Toilet Compartments or a comparable product, approved prior to bid.

2.02 COMPONENTS
A. Screens: Solid color reinforced composite material panels.
   1. Material: Screens shall be constructed of Solid Color Reinforced Composite material, which is composed of dyes, organic fibrous material, and polycarbonate/phenolic resins. Material shall have a non-ghosting, graffiti resistant surface integrally bonded to core through a series of manufacturing steps requiring thermal and mechanical pressure. Edges of material shall be the same color as the surface.

2.03 ACCESSORIES
A. Wall Brackets: Continuous type, polished stainless steel.

PART 3 EXECUTION

3.01 EXAMINATION
A. Verify that field measurements are as indicated.
B. Verify correct spacing of and between plumbing fixtures.

3.02 INSTALLATION
A. Install partitions secure, rigid, plumb, and level in accordance with manufacturer's instructions.
B. Maintain 3/8 inch to 1/2 inch space between wall and panels.
C. Attach panel brackets securely to walls using anchor devices.
D. Attach panels to brackets.

3.03 TOLERANCES
A. Maximum Variation From True Position: 1/4 inch.
B. Maximum Variation From Plumb: 1/8 inch.

3.04 ADJUSTING
A. Adjust adjacent components for consistency of line or plane.

END OF SECTION
SECTION 10 26 01 - CORNER GUARDS

PART 1 GENERAL
1.01 SECTION INCLUDES
   A. Corner guards.

1.02 SUBMITTALS
   A. Product Data: Indicate physical dimensions.
   B. Manufacturer's installation instructions.

PART 2 PRODUCTS
2.01 COMPONENTS
   A. Corner Guards - Surface Mounted:
      1. Material: Type 304 stainless steel, No. 4 finish, 16 gage, 0.06 inch thick.
      2. Width of Wings: 1 inches.
      3. Height: Start at top of wall base to 7' A.F.F., unless otherwise indicated on drawings.
      4. Styles: Provide 90 or 135 degree corners and wall end protectors as required by wall construction. Tapered edges.
      6. Manufacturers:
         a. Arden Architectural Specialties, Inc.
         b. Balco, Inc.
         c. Construction Specialties, Inc.
         d. IPC Door and Wall Protection Systems; Division of InPro Corporation.
         e. Korogard Wall Protection Systems; a division of RJF International Corporation.
   B. Adhesive: As recommended by impact-resistant plastic wall protection manufacturer and with a VOC content of 70 g/L or less when calculated according to 40 CFR 59, Subpart D (EPA Method 24).

PART 3 EXECUTION
3.01 INSTALLATION
   A. Install components in accordance with manufacturer's instructions, level and plumb, secured rigidly in position to wall framing members only.
   B. Remove excess adhesive using methods and materials recommended in writing by manufacturer.

END OF SECTION
SECTION 10 28 00 - TOILET ACCESSORIES

PART 1  GENERAL

1.01  SECTION INCLUDES
   A.  Commercial toilet accessories.
   B.  Commercial shower and bath accessories.
   C.  Diaper changing stations.
   D.  Utility room accessories.

1.02  REFERENCE STANDARDS
   A.  ASTM A666 - Standard Specification for Annealed or Cold-Worked Austenitic Stainless Steel Sheet, Strip, Plate, and Flat Bar; 2015.

1.03  SUBMITTALS
   A.  Product Data:  Submit data on accessories describing size, finish, details of function, and attachment methods.
   B.  Samples:  Submit two samples of each accessory, illustrating color and finish.

PART 2  PRODUCTS

2.01  MATERIALS
   A.  Accessories - General:  Shop assembled, free of dents and scratches and packaged complete with anchors and fittings, steel anchor plates, adapters, and anchor components for installation.
   B.  Stainless Steel Sheet:  ASTM A666, Type 304.
   C.  Mirror Glass:  Annealed float glass, ASTM C1036 Type I, Class 1, Quality Q2, with silvering, protective and physical characteristics complying with ASTM C1503.
   D.  Fasteners, Screws, and Bolts:  Hot dip galvanized; tamper-proof; security type.

2.02  FINISHES
   A.  Stainless Steel:  Satin finish, unless otherwise noted.

2.03  COMMERCIAL TOILET ACCESSORIES
   A.  Toilet Paper Dispenser:  Owner furnished, Contractor installed.
   B.  Paper Towel Dispenser:  Owner furnished, Contractor installed.
   C.  Trash Receptacle:  Recessed, stainless steel, door for access to container, with tumbler lock, reinforced panel full height of door, continuously welded bottom pan and seamless exposed flanges.
   D.  Soap Dispenser:  Owner furnished, Contractor installed.
   E.  Mirrors:  Stainless steel framed, 1/4 inch thick annealed float glass; ASTM C1036.
      1.  Annealed Float Glass:  Silvering, protective and physical characteristics in compliance with ASTM C1503.
      2.  Size:  As indicated on drawings.
      3.  Frame:  0.05 inch angle shapes, with mitered corners, and tamperproof hanging system; satin finish.
   F.  ADA Grab Bars:  Stainless steel, nonslip grasping surface finish.
      1.  Standard Duty Grab Bars:
1.03 TOILET ACCESSORIES

2.04 DIAPER CHANGING STATIONS

A. Diaper Changing Station: Wall-mounted folding diaper changing station for use in commercial toilet facilities, meeting or exceeding ASTM F2285.

2.05 UTILITY ROOM ACCESSORIES

A. Mop Rail: 0.05 inch thick stainless steel, Type 304, hat-shaped channel.
   1. Holders: 3 spring-loaded rubber cam holders.
   2. Length: 36 inches.

PART 3 EXECUTION

3.01 EXAMINATION

A. Verify existing conditions before starting work.
B. Verify exact location of accessories for installation.

3.02 PREPARATION

A. Provide templates and rough-in measurements as required.

3.03 INSTALLATION

A. Install accessories in accordance with manufacturer's instructions in locations indicated on the drawings.
B. Install plumb and level, securely and rigidly anchored to substrate.
C. Mounting Heights: As required by accessibility regulations, unless otherwise indicated on drawings.

3.04 PROTECTION

A. Protect installed accessories from damage due to subsequent construction operations.

END OF SECTION
SECTION 10 44 00 - FIRE PROTECTION SPECIALTIES

PART 1 GENERAL

1.01 SECTION INCLUDES
A. Fire extinguishers.
B. Fire extinguisher cabinets.
C. Accessories.
D. Emergency key cabinet (Knox Box).

1.02 REFERENCE STANDARDS

1.03 QUALITY ASSURANCE
A. Confirm keying for emergency key cabinet with fire department having jurisdiction prior to final purchase of unit.

1.04 SUBMITTALS
A. Shop Drawings: Indicate locations of cabinets and cabinet physical dimensions.

PART 2 PRODUCTS

2.01 MANUFACTURERS
A. Fire Extinguishers:
   1. JL Industries, Inc.
   2. Larsen's Manufacturing Co.

2.02 FIRE EXTINGUISHERS
A. Fire Extinguishers - General: Comply with product requirements of NFPA 10 and applicable codes, whichever is more stringent.
B. Dry Chemical Type Fire Extinguishers: Stainless steel tank, with pressure gage.
   1. Class: 2A:10:B:C.
   2. Size: 5 pound.
   3. Finish: Baked enamel, color as selected.
C. Wet Chemical Type Fire Extinguishers (Kitchen): UL-rated 2-A:1-B:C:K, 2.5 gallon, nominal capacity, with potassium acetate-based chemical in stainless-steel container; with pressure-indicating gage.

2.03 FIRE EXTINGUISHER CABINETS
A. Cabinet Configuration: Semi-recessed type.
   1. Size to accommodate accessories.
   2. Trim: Rolled return with 2-1/2 inch projection.
B. Door: 0.036 inch metal thickness, reinforced for flatness and rigidity with nylon catch. Hinge doors for 180 degree opening with two butt hinge.
C. Door Glazing: Tempered glass, clear, 1/8 inch thick, and set in resilient channel glazing gasket.
D. Finish of Cabinet Exterior Trim and Door: Stainless Steel No. 4.
E. Finish of Cabinet Interior: White colored enamel.

2.04 ACCESSORIES
A. Extinguisher Brackets: Formed steel, galvanized and enamel finished.

2.05 EMERGENCY KEY CABINET
A. Fire department emergency access key cabinet ("Knox Box"): Model 3200-R, Knox Rapid Entry System Box, high security heavy duty, medium capacity (10 keys), recessed mounted with
optional recessed masonry mounting kit, as manufactured by The Knox Company, Irvine, CA, (800) 552-5669, having the following construction.
1. Housing: 1/4 inch thick plate steel with joists welded.
2. Door: 1/2 inch thick steel plate with neoprene weather seal.
3. Locking: 3 point lock with stainless steel lock cover.
5. Mounting: Height as indicated on drawings.
6. Provide mounting kit as required for installation in wall surface material.
7. Confirm keying with fire department having jurisdiction prior to purchase.

PART 3 EXECUTION

3.01 EXAMINATION
   A. Verify rough openings for cabinet are correctly sized and located.

3.02 INSTALLATION
   A. Install in accordance with manufacturer's instructions.
   B. Secure rigidly in place.
   C. Place extinguishers in cabinets.
   D. Install emergency key cabinets per manufacturer's written instructions and as approved by fire department having jurisdiction.

3.03 WASTE MANAGEMENT
   A. Separate and dispose of waste in accordance with the Project's Waste Management Plan.

END OF SECTION
SECTION 10 75 00 - FLAGPOLES

PART 1  GENERAL

1.01  SECTION INCLUDES
   A. Aluminum Flagpoles.

1.02  RELATED REQUIREMENTS
   A. Section 03 30 00 - Cast-in-Place Concrete: Concrete base and foundation construction.

1.03  REFERENCE STANDARDS

1.04  SUBMITTALS
   A. See Section 01 30 00 - Administrative Requirements, for submittal procedures.
   B. Product Data: Provide data on pole, accessories, and configurations.
   C. Shop Drawings: Indicate detailed dimensions, base details, anchor requirements, and imposed loads.
   D. Maintenance Data: Provide lubrication and periodic maintenance requirement schedules.

1.05  QUALITY ASSURANCE
   A. Designer Qualifications: Design flagpole foundation under direct supervision of a Professional Structural Engineer experienced in design of this Work and licensed the State in which the Project is located.

1.06  DELIVERY, STORAGE, AND HANDLING
   A. Spiral wrap flagpole with protective covering and pack in protective shipping tubes or containers.
   B. Protect flagpole and accessories from damage or moisture.

PART 2  PRODUCTS

2.01  MANUFACTURERS
   A. Flagpoles:
      2. Substitutions: See Section 01 60 00 - Product Requirements.

2.02  FLAGPOLES
   A. Flagpoles: Designed in accordance with NAAMM FP 1001.
      1. Material: Aluminum.
      2. Design: Step tapered.
      3. Mounting: Ground mounted type.
      5. Outside Top Diameter: 3.5 inches.
      6. Nominal Wall Thickness: .188 inches.
      7. Nominal Height: 30 ft; measured from nominal ground elevation.
9. Winch: Manually operated, removable handle
10. Access door: flush with compression lock, reinforced door frame

B. Performance Requirements:
1. Wind Pressure Loading on Flagpole with Flag: Resistant without permanent deformation to 120 miles/hr wind speed, in accordance with NAAMM FP 1001; the factor of safety used is 2.5.

2.03 POLE MATERIALS
A. Aluminum: ASTM B241/B241M, 6063 alloy, T6 temper.

2.04 ACCESSORIES
A. Finial Ball: Clear anodized, 6 inch diameter.
B. Truck Assembly: Cast aluminum; revolving, stainless steel ball bearings, non-fouling.
C. Flag: USA design, 5 ft by 8 ft size, nylon fabric, brass grommets, hemmed edges.
D. Halyard: Stainless steel wire aircraft cable

2.05 MOUNTING COMPONENTS
A. Foundation Tube Sleeve: AASHTO M 36, corrugated 16 gage, 0.0598 inch steel, galvanized, depth of 36 inches as indicated.
B. Lighting Ground Rod: 12 inch long steel rod, 3/4 inch diameter.

2.06 FINISHING
A. Metal Surfaces in Contact With Concrete: Asphaltic paint.
B. Aluminum: Satin finish.
C. Finial: Clear anodized finish.

PART 3 EXECUTION
3.01 EXAMINATION
A. Verify that concrete foundation is ready to receive work and dimensions are as indicated on shop drawings.

3.02 PREPARATION
A. Coat metal sleeve surfaces below grade and surfaces in contact with dissimilar materials with asphaltic paint.

3.03 INSTALLATION
A. Install flagpole, base assembly, and fittings in accordance with manufacturer's instructions.
B. Electrically ground flagpole installation.
C. Fill foundation tube sleeve with sand.
D. Install foundation plate and centering wedges for flagpoles base set in concrete base and fasten.

3.04 TOLERANCES
A. Maximum Variation From Plumb: 1 inch.

3.05 ADJUSTING
A. Adjust operating devices so that halyard and flag function smoothly.

END OF SECTION
SECTION 11 40 00 - FOOD SERVICE EQUIPMENT

PART 1 - GENERAL

1.1 SUMMARY

A. Section includes Foodservice Equipment as scheduled on the drawings

B. Whenever the term "KEC" or "Kitchen Equipment Contractor" is used, it shall be the company that is the successful bidder and is awarded the contract for the erection and completion of the work that is outlined herein to the complete satisfaction of the Owner’s Representative.

C. Whenever the term "FSEC" is used, it shall refer to the Food Service Equipment Consultant.

D. KEC must perform all work in a timely fashion which is aligned with the overall construction schedule for the project. KEC must communicate any delays or schedule conflicts that they foresee to architect and general contractor in a timely fashion. Failure to communicate delays will not be acceptable.

1.2 RELATED WORK[ES1]

A. Division 01 – General Requirements

B. Division 15 – Mechanical Contractor

C. Division 16 – Electrical Contractor

1.2 SUBMITTALS

A. Within (5) calendar days after award of contract, the KEC must provide an itemized list of equipment included in bid to the Owner, Architect, & FSEC for review to confirm conformity to written specifications. Failure to follow specifications as detailed in this Division 11 4000 may result in disqualification.[ES2]

B. Within thirty (30) calendar days after award of contract, the KEC is to supply (1) electronic copy and (4) printed, ¼” equals 1'-0” scale dimensioned plan drawings indicating location of all food service equipment along with its associated mechanical, electrical, plumbing, special conditions requirements.[ES3]

C. State the name of the fabricator of all custom fabricated equipment. Any change of source afterward shall be subject to approval by the FSEC and Owner’s Representative.

D. Within thirty (30) days after award of contract, the KEC is to supply, in quadruplicate, a detailed set of shop drawings of custom fabricated equipment, at a scale of no less than ¼” equals 1'-0". Submit in quadruplicate, specifications sheets with full data on all items of brand name manufacturer, catalog cuts to be bound in booklet form and clearly identified with item number to correspond with itemized specifications, hereinafter indicated.

E. Approval of detailed shop drawings and specification sheets shall not waive obligation of KEC to furnish materials and methods of construction called for in specifications, even though they may be shown incorrectly, or, not at all, in the drawings.
F. Any substitute for materials specified, or changes in methods of construction from the way specified and shown on the approved detail drawings is to be requested, in writing, from the Owner’s Representative and FSEC, before any such substitution is applicable.

G. All equipment of brand name manufacturer shall be of the latest model or succeeding model at the time of the delivery. Any price adjustment in connection with this shall be requested of the Owner’s Representative in writing.

1.4 WARRANTY

A. Submit KEC’s guarantee for all workmanship, material and equipment, for a period of one (1) year from the time the equipment is put into operation and accepted by the Owner’s Representative.

B. Guarantee and conditions of service on items of brand name manufacturer, as established by the manufacturers, shall apply where extending beyond the guarantee and service set forth in these specifications.

C. Refrigeration and Freezer Systems: Three year full system parts and labor warranty to cover installation and parts associated with the reach-in refrigeration units; five year warranty on compressor/condensing unit and coil to cover parts and materials.

1.5 QUALITY ASSURANCE

A. Installer Qualifications: Engage an experienced installer to perform work of this Section, who has specialized in installation of Food Service Equipment for a minimum of (5) years. Installer must have a successful performance record.

B. The following are basic specifications of items of custom fabricated equipment covering the type and quality of materials, the method of fabrication, assembly and design and will be referred to in the itemized specifications by the term "as specified".

C. All items of custom fabrication shall be the product of the single manufacturer of such equipment so as to insure uniformity throughout.

D. All metal gauges shall be United States Standard.

E. All workmanship shall be of the finest and all materials shall be new, of best quality and without flaws.

F. NSF Standards: Comply with Applicable NSF International standards and criteria. All equipment to have NSF mark on each equipment item, unless otherwise indicated.

G. All equipment shall comply with National Sanitation Foundation standards and all Federal, State and Local Health Codes.

H. All gas equipment to be U.L. and AGA approved.

I. All electrical equipment shall wear Underwriter’s seal of approval.

J. KEC to take part in Pre-Installation Conference and prescribed construction meeting(s). Coordinate with all trades for access, connections, disconnects and code compliance.

K. Review requirements:
1. For equipment delivery
2. Equipment storage and security requirements
3. Inspect and discuss condition of substrate and other preparatory work performed by other trades
4. Review and finalize schedule and expectations

1.6 SUBSTITUTIONS

Submit a written request to the FSEC and Architect for approval not less than ten business days prior to bid date. Include description, drawings, and equipment cut sheet, performance test data and any other pertinent information regarding the specified item. Approval is subject to FSEC and Owner review.

1.1 DELIVERY, STORAGE AND HANDLING

A. Deliver food service equipment as complete units with protective covering. If building access points restrict delivery of equipment completely assembled then FSEC and Architect must be notified in writing and delivery method must be coordinated with General Contractor.

B. Remove packaging into site construction dumpsters to be provided by others.

C. Vendor supplied equipment shall be uncrated, set in place, sealed to wall (where noted) and sealed with NSF Silver, Clear or White silicone (to be reviewed with owner)

D. Examine Electrical and plumbing rough-ins for proper drainage, correct electrical outlets or J boxes, Tell-tale waste and all listed products requirement.

1.8 SITE CONDITIONS

A. It is the responsibility of the KEC to verify dimensions of food service equipment installation areas by conducting field measurements before custom fabricated equipment is approved for production.

B. Establish rough-ins for all electrical, plumbing and mechanical connections.

C. Where field measurements cannot be made without delaying the work, establish required dimensions with architect and GC and proceed with fabricating equipment.

D. Coordinate construction dimensions and installation with other work including light fixtures, HVAC equipment and fire-suppression system components.

E. Field verification and coordination with G.C. to ensure that units can be delivered to their final destination through existing building openings. If KEC cannot build and install equipment in a fashion that utilizes existing building openings they must notify the architect and general contractor in writing to coordinate alternative delivery methods prior to bid. Failure to notify design team of delivery issues may result in additional costs that will be the responsibility of the KEC.

PART 2 – PRODUCTS

2.1 QUALIFIED FABRICATORS

A. QUALIFICATIONS: Minimum (5) years experience constructing similar equipment for food service applications.
B. Authorized Equipment Fabricators: The companies which have been listed below are approved for fabrication of stainless steel equipment detailed for this project. Substitutions are permitted per Section 1.6.

1. Eagle Group
2. Advance Tabco

2.2 GENERAL REQUIREMENTS

A. All stainless steel to be fabricated per written specification for each item provided in section 3.5 PRODUCT SPECIFICATIONS below.

B. All piecing of stainless steel, whether on cabinet surfaces or cabinet bases, shall be continuous welded joints. All welded joints shall be smooth and polished to original finish.

C. Where galvanized iron is specified, it shall be copper bearing sheets, used in largest sizes with as few joints as possible. All welded joints shall be sandblasted and finished with rustproof galvanized zinc compound. All galvanized iron is to be finished with a prime coat and two (2) finish coats of hammerloid enamel.

D. When plywood is used for backing, supports, construction of casework, it shall be no less than exterior grade plywood, manufactured per U.S. Product Standard PS-1-83, 5 or 7 ply, with waterproof glue.

E. Where marine grade plywood is specified it will be manufactured per U.S. Product Standard PS-1-83, complete with Douglas Fir 1 and Western Larch. Plywood shall be 5 or 7 ply with waterproof glue.

F. KEC is responsible for delivery assembly of all equipment in locations as they are reflected in the architectural and food service plans.

G. KEC is responsible for caulking along seams for all equipment. Silicone shall be gray or silver to match finish of equipment. All sealing of equipment must be done in a neat and workmanlike manner.

2.3 PRODUCTS

A. BASE CABINETS

To be constructed per shop drawings included in food service plans for this project. Cabinets must be constructed using methods specified in shop drawings.

B. PIPE STANDS AND OPEN BASE TABLES

All open base tables shall be constructed per description provided for each item in written specification listed below in section 3.5 PRODUCT SPECIFICATIONS.

C. FIELD JOINTS

IF NECESSARY, all field joints in both tops and cabinet bases shall be completely welded or seamed on the job and ground smooth and polished to match original finish by KEC. Tack welding or bolting in the field will not be accepted.

D. DRAIN BOARDS
All drain boards shall be constructed per description provided for each item in written specification listed below in section 3.5 PRODUCT SPECIFICATIONS.

E. DRAWERS

All drawers shall be constructed per description provided for each item in written specification listed below in section 3.5 PRODUCT SPECIFICATIONS and food service plans.

F. DOORS

All doors shall be constructed per description provided for each item in written specification listed below in section 3.5 PRODUCT SPECIFICATIONS and food service plans.

G. CLOSURE AND TRIM PANELS

Where applicable above exhaust hoods and walk-in refrigeration the KEC will be responsible to provide closure and trim panels that match the finish of the equipment that they are incorporated into.

H. ELEVATED SHELVING

Shelving to be mounted at a height of 54” AFF unless specified otherwise in an items particular written specification or food service plans.

I. WALL FLASHING

KEC will be responsible for furnishing wall flashing underneath all Type I exhaust hoods. Metal used must be 22 gauge stainless and include trim at all breaks in the flashing panels. Flashing must be provided from top of cove base to bottom side of hood and run complete length of the hood. It is the responsibility of the KEC to confirm that wall construction behind the hood is non-combustible. Should any materials be deemed to be limited combustible or combustible it will be responsibility of KEC to provide adequate clearance from materials.

PART 3 - EXECUTION

3.1 PREPARATION

A. All valves, traps, tail pieces, fittings, cut-off switches, or other materials necessary for connections are to be furnished by related contractors, except where otherwise specified.

B. All electrical equipment shall be correct for type of electric current available.

C. All items of equipment specified with cord and plug shall match receptacle at the jobsite.

3.2 INSTALLATION

A. The KEC is to deliver and set in place, ready for related contractors to make required plumbing, electrical and ventilation connections, all equipment at locations where shown on plan.
B. Install food service equipment level and plumb, according to manufacturer’s written instructions, original design and referenced standards.

C. Install equipment with access and maintenance clearances according to manufacturer’s written instructions and requirements of authorities having jurisdiction.

D. Provide cutouts in equipment, neatly formed where required to run service lines through equipment to make final connections.

E. Provide final protection and maintain conditions, in a manner acceptable to manufacturers and installer that ensure food service equipment is without damage or deterioration at the time of substantial completion.

F. KEC responsible for delivery of exhaust hood. The exhaust fan(s), MUA, curbs will be by others. Mechanical contractor responsible for hanging hoods and pulling necessary permits.

3.3 CLEANING AND PROTECTION

KEC shall remove all debris accumulated during the delivery and installation of his equipment daily and immediately upon completion of said installation. They will provide a representative, when necessary, to correlate final hook-up by related contractors, so as not to impede job progress. After final hook-up, they shall lubricate, start up and check out all equipment requiring this service, and shall clean equipment and turn over to the Owner’s Representative, for their final acceptance, in first class condition, all items in their contract.

3.4 COMMISSIONING

The KEC shall provide a capable representative or representatives, to demonstrate the proper use of the equipment, at the time selected by the Owner’s Representative. The Owner’s Representative is to give the KEC a minimum of seven (7) calendar days prior to this demonstration date.

3.5 PRODUCT SPECIFICATIONS

**NOTICE TO ALL BIDDERS**

Items included in this Section 11 40 00 specification provide for construction of equipment by several different fabricators who have been deemed to be of similar quality. It is the responsibility of the bidder to provide a bid for the equipment called for which matches all specifications laid out in the attached shop drawings. It will be the responsibility of the Kitchen Equipment Contractor to notify the FSEC and Architect of any inconsistencies that may result in decreased performance for the end user prior to bidding. Any deviations from what is called for without notification to the FSEC and Architect may result in corrective action having to be taken by KEC at their expense.[ES4]
ITEM # 1  EXHAUST HOOD
Dimensions:
Quantity:  One (1)
Manufacturer: Captive-Aire
Model:  5430ND

One (1) Model 5430ND 5430ND-2-PSP-F - 7ft  0" Long Exhaust-Only Wall Canopy Hood with Front Perforated Supply Plenum with Built-in 3" Back Standoff
1 - 430 SS Where Exposed
1 - Fire Cabinet on the Right Side 12.00" Width x 54" Length x 30.00" Height (Additional charges may apply for cabinet if not sold with fire system)
5 - FILTER - 20" tall x 16" ( 19.625" by 15.625") wide Stainless Steel Captrate Solo filter with hook, ETL Listed.  Particulate capture efficiency: 85% efficient at 9 microns, 76% efficient at 5 microns.  Used on hoods shipped AFTER 7/27/17.
2 - L55 Series E26 Canopy Light Fixture - High Temp Assembly, Includes Clear Thermal and Shock Resistant Globe (L55 Fixture), Bulbs By Others
6 - EXHAUST RISER - Factory installed  12" Diameter X 4" Height
1 - SUPPLY RISER - 12" Square to 10" Round Supply Collar with 10" Round Volume Damper. Nailor 1090 Series.
1 - 1/2 Pint Grease Cup New Style, Flanged Slotted
1 - FIELD WRAPPER  18.00" High  Front, Right
1 - Electrical Package Installation in Utility Cabinet by Plant.
1 - BACKSPLASH  128.00" High X 115.00" Long  430 SS Vertical (Includes End Caps & Divider Bars)
1 - LEFT SIDESPLASH  128.00" High X 72.00" Long  430 SS Vertical (Includes End Caps & Divider Bars)
1 - LEFT END STANDOFF (FINISHED)  1" Wide  54" Long Insulated
1 - BACKSPLASH - INSIDE CORNER  128.00" High X 2.00" Leg Length  430 SS Vertical (Includes End Caps & Divider Bars)
1 - RIGHT QUARTER END PANEL  23" Top Width, 0" Bottom Width, 23" High  430 SS
1 - Parts required to mount riser sensor 6 inches beside riser.  Typically used with installations of field supplied double wall duct.
One (1) Model FIRE SYSTEM ANSUL-3.0 Ansul 3 gallon Fire System in Utility Cabinet (includes pre-piped hood(s) with detection, tank(s), release mechanism, microswitches and pull station).
Includes piping for hood:
One (1) Model DCV-1111 Electrical System
DCV-1111 Demand Control Ventilation, w/ control for 1 Exhaust Fan, 1 Supply Fan, Exhaust on in Fire, Lights out in Fire, Fans modulate based on duct temperature. INVERTER DUTY 3 PHASE MOTOR REQUIRED FOR USE WITH VFD. Room temperature sensor shipped loose for field installation. Verify distance between VFD and Motor; additional cost could apply if distance exceeds 50 feet. Includes 1 Duct Thermostat kit.
1 - CASLink building monitoring system communications module. Requires internet & field wired ethernet connection or 3G cellular service. Includes Rev 3 Comm Module, RJ45 to modbus converter, 3 FT cat5 cable, and 1 FT of shielded twisted pair.
1 - CAT-5E CABLE - 50 Foot.
1 - PSP thermostat kit, includes 1x duct thermostat, quick seal, and j-box for monitoring of PSP discharge temperature.
1 - Digital Prewire Lighting Relay Kit. Includes hood lighting relay & terminal blocks. Allows for up to 1400W of lighting each.
75 - Thermistor CABLE - 18/2 AWG  GREEN WHITE, plenum rated. USED for thermistor duct stat. Per Foot Price.
One (1) Model FRTOOL20 Filter Removal Tool for Kitchen Hoods with 20" tall baffle filters
ITEM # 2
RANGE, 36", 6 OPEN BURNERS
Dimensions: 58(h) x 36(w) x 34(d)
Quantity: One (1)
Manufacturer: Vulcan
Model: 36S-6BN

One (1) Model 36S-6BN Endurance™ Restaurant Range, natural gas, 36", (6) 30,000 BTU burners, lift-off burner heads, standard oven, stainless steel front, sides, backriser, & lift-off high shelf, fully MIG welded chassis, 6" adjustable legs, 215,000 BTU, CSA, NSF
One (1) 1 year limited parts & labor warranty, standard
Three (3) Spark igniter with flame safety device, for open top burners, thermostat griddles & oven pilots (one required per 12" section)
One (1) Stainless steel backriser and lift-off high shelf, standard
One (1) Model CASTERS RR4 Casters (set of 4)

ITEM # 2A
SAFETY SYSTEM MOVEABLE GAS CONNECTOR
Dimensions: 30.63(h) x 30(w) x 28.25(d)
Quantity: One (1)
Manufacturer: Dormont Manufacturing
Model: 1675KIT48PS

One (1) Model 1675KIT48PS Dormont Blue Hose™ Moveable Gas Connector Kit, 3/4" inside dia., 48" long, covered with stainless steel braid, coated with blue antimicrobial PVC, 1 SnapFast® QD, 1 full port valve (2) 90° elbows, 1 pair Safety Set® with adhesive foam tape and hardware mounting options, limited lifetime warranty

ITEM # 3
CONVECTION OVEN, GAS
Dimensions: 30.63(h) x 30(w) x 28.25(d)
Quantity: One (1)
Manufacturer: Vulcan
Model: GCO2D

One (1) Model GCO2D Oven, Convection, gas, single-deck, half-size, solid state controls, electronic spark ignition, 60 minute timer, 150° to 500°F temperature range, single speed fan, (5) oven racks, door with window, porcelain interior, stainless steel door, sides, top & back enclosure panel, 1/2 HP, 25,000 BTU
One (1) 1 year limited parts & labor warranty, standard
One (1) K-12 School Nutrition extended warranty extends the warranty for 12 months beyond the 12 month Original Equipment Warranty, not to exceed 24 months from date of installation
One (1) Natural gas (add -1 suffix) (specify elevation if over 2,000 ft.)
One (1) 120v/60/1-ph, 8.0 amps, standard
One (1) Model OPNSTND-HLFCST Stainless steel Leg Stand with stainless steel shelf and adjustable rack supports with 6" casters

ITEM # 3A
SAFETY SYSTEM MOVEABLE GAS CONNECTOR
Dimensions: 30.63(h) x 30(w) x 28.25(d)
Quantity: One (1)
Manufacturer: Dormont Manufacturing
Model: 1675KIT48PS

One (1) Model 1675KIT48PS Dormont Blue Hose™ Moveable Gas Connector Kit, 3/4" inside dia., 48" long, covered with stainless steel braid, coated with blue antimicrobial PVC, 1
SnapFast® QD, 1 full port valve (2) 90° elbows, 1 pair Safety Set® with adhesive foam tape and hardware mounting options, limited lifetime warranty

<table>
<thead>
<tr>
<th>ITEM # 4</th>
<th>MICROWAVE STEAMER OVEN</th>
</tr>
</thead>
<tbody>
<tr>
<td>Dimensions:</td>
<td>18.56(h) x 25.56(w) x 20.75(d)</td>
</tr>
<tr>
<td>Quantity:</td>
<td>One (1)</td>
</tr>
<tr>
<td>Manufacturer:</td>
<td>Panasonic</td>
</tr>
<tr>
<td>Model:</td>
<td>NE-2180</td>
</tr>
</tbody>
</table>

One (1) Model NE-2180 Sonic Steamer® Microwave Oven, 2100 Watts, 1.6 cu ft. capacity, 8 programmable memory pads, dial timer, 5 power levels, digital display, connectionless, rethermalizer, removable shelf, 4 heating elements, see-thru drop down door, stainless steel cabinet & cavity, UL, NSF
One (1) 1 year parts & labor warranty and 3 year magnetron warranty (labor for magnetron replacement is not covered in years 2 and 3)
One (1) 208v/60/1-ph, 20.0 amps, NEMA 6-30P, standard

<table>
<thead>
<tr>
<th>ITEM # 5</th>
<th>WORK TABLE, STAINLESS STEEL TOP</th>
</tr>
</thead>
<tbody>
<tr>
<td>Dimensions:</td>
<td>36.63(h) x 30(w) x 24(d)</td>
</tr>
<tr>
<td>Quantity:</td>
<td>One (1)</td>
</tr>
<tr>
<td>Manufacturer:</td>
<td>Eagle Group</td>
</tr>
<tr>
<td>Model:</td>
<td>UT2430SEB</td>
</tr>
</tbody>
</table>

One (1) Model UT2430SEB Deluxe Series Work Table, 30"W x 24"D, 16/300 series stainless steel top with 1-1/2" rear upturn, rolled front edge, adjustable 430 stainless steel undershelf with marine edge, Uni-Lok® gusset system, (4) stainless steel legs & adjustable bullet feet, NSF

<table>
<thead>
<tr>
<th>ITEM # 6</th>
<th>WORK TABLE, STAINLESS STEEL TOP</th>
</tr>
</thead>
<tbody>
<tr>
<td>Dimensions:</td>
<td>39.63(h) x 48(w) x 30(d)</td>
</tr>
<tr>
<td>Quantity:</td>
<td>One (1)</td>
</tr>
<tr>
<td>Manufacturer:</td>
<td>Eagle Group</td>
</tr>
<tr>
<td>Model:</td>
<td>T3048SEB-BS</td>
</tr>
</tbody>
</table>

One (1) Model T3048SEB-BS Deluxe Series Work Table, 48"W x 30"D, 16/300 series stainless steel top with rolled front edge & 4-1/2" backsplash, adjustable 430 stainless steel undershelf with marine edge, Uni-Lok® gusset system, (4) stainless steel legs & adjustable bullet feet, NSF
One (1) Model E20 Sink, 10" x 14" x 9-1/2" bowl, for 30"W tables, complete with faucet & basket drain (locate on operators right end of table).

<table>
<thead>
<tr>
<th>ITEM # 6A</th>
<th>SHELVING, WALL-MOUNTED</th>
</tr>
</thead>
<tbody>
<tr>
<td>Dimensions:</td>
<td>48(w) x 12(d)</td>
</tr>
<tr>
<td>Quantity:</td>
<td>One (1)</td>
</tr>
<tr>
<td>Manufacturer:</td>
<td>Eagle Group</td>
</tr>
<tr>
<td>Model:</td>
<td>SWS1248-16/3</td>
</tr>
</tbody>
</table>

One (1) Model SWS1248-16/3-X Snap-n-Slide® Shelf, wall-mounted, 48"W x 12"D, rolled frontedge, 1-1/2" upturn on rear & ends, stainless steel wall brackets mount to wall studs (no wall backing required), 180 lbs. weight capacity, 16/304 stainless steel construction, NSF (F
ITEM # 7  REACH-IN REFRIGERATOR
Dimensions: 82.25(h) x 26(w) x 35.38(d)
Quantity: One (1)
Manufacturer: Continental Refrigerator
Model: 1R

One (1) Model 1R Refrigerator, reach-in, one-section, 20 cu. ft., self-contained refrigeration, stainless steel front, aluminum interior & ends, standard depth, full-height solid door, electronic controller w/ digital display, electric condensate evaporator, 5" casters, 1/4 hp, cETLus, NSF, Made in USA
One (1) Standard warranty (for the United States & Canada Only): 3 year parts and labor; 5 year compressor
One (1) 115v/60/1-ph, 5.5 amps, cord, NEMA 5-15P, standard
One (1) Door hinged on right, standard
One (1) 5" Casters, standard

ITEM # 8  REACH-IN FREEZER
Dimensions: 82.25(h) x 52(w) x 35.38(d)
Quantity: One (1)
Manufacturer: Continental Refrigerator
Model: 2F

One (1) Model 2F Freezer, reach-in, two-section, self-contained refrigeration, stainless steel front, aluminum interior & ends, standard depth, full-height solid doors, electronic controller w/ digital display, electric condensate evaporator, 5" casters, 1/2 hp, cETLus, NSF, Made in USA
One (1) Standard warranty (for the United States & Canada Only): 3 year parts and labor; 5 year compressor
One (1) 115v/60/1-ph, 9.8 amps, cord, NEMA 5-15P, standard
One (1) Left Door hinged on left & right door hinged on right, standard
One (1) 5" Casters, standard

ITEM # 9  REACH-IN REFRIGERATOR
Dimensions: 82.25(h) x 52(w) x 35.38(d)
Quantity: One (1)
Manufacturer: Continental Refrigerator
Model: 2R

One (1) Model 2R Refrigerator, reach-in, two-section, self-contained refrigeration, stainless steel front, aluminum interior & ends, standard depth, full-height solid doors, electronic controller w/ digital display, electric condensate evaporator, 5" casters, 1/3 hp, cETLus, NSF, Made in USA
One (1) Standard warranty (for the United States & Canada Only): 3 year parts and labor; 5 year compressor
One (1) 115v/60/1-ph, 6.5 amps, cord, NEMA 5-15P, standard
One (1) Left Door hinged on left & right door hinged on right, standard
One (1) 5" Casters, standard
ITEM # 10  WIRE SHELVING UNIT
Dimensions: 74(h) x 48(w) x 24(d)
Quantity: Two (2)
Manufacturer: Eagle Group
Model: S4-74-2448VG-X

Two (2) Model S4-74-2448VG-X Starter Shelving Unit, 4-tier, 48"W x 24"D x 74"H, wire shelves with patented QuadTruss® design, (4) 74"H posts, Valu-Gard® green epoxy finish, KD, NSF (FLyer)

One (1) Model A4-74-2436VG Add-On Shelving Unit, 4-tier, 36"W x 24"D x 74"H, wire shelves with patented QuadTruss® design, (2) 74"H posts, (2) "S" hooks per shelf, Valu-Gard® green epoxy finish, KD, NSF

ITEM # 11  DISHWASHER, UNDERCOUNTER
Dimensions: 32.94(h) x 23.94(w) x 25.56(d)
Quantity: One (1)
Manufacturer: Hobart
Model: LXEH-2

One (1) Model LXEH-2 LXe Dishwasher, undercounter, 23-15/16"W x 25-9/16"D x 32-15/16"H, high temperature sanitizing, (32) racks/hr, fresh water rinse, .74 gal/rack, delime notification, auto chemical priming, service diagnostics, detergent & rinse aid pump, 120/208-240(3W)/60/1-ph, 30.5 amps, cULus, NSF, ENERGY STAR®

One (1) Standard warranty - 1-Year parts, labor & travel time during normal working hours
One (1) Model DWT-LXE Drain water tempering kit for LXe
One (1) On-site DWT installation by local Hobart Service Office (this price is available only if the local Hobart Service Office completes the installation of the dishwasher within a 50 mile radius & during normal business hours). Price is available only with machine purchase (if purchased separately local installation rates will apply)

ITEM # 12  SOILED DISHTABLE
Dimensions: 43.5(h) x 60(w) x 27.5(d)
Quantity: One (1)
Manufacturer: Eagle Group
Model: UDT-5L-14/3

One (1) Model UDT-5L-14/3 Spec-Master® Soiled Dishtable, undercounter, dishwasher on left, 60"W x 27-1/2"D x 43-1/2"H, 14/304 stainless steel top, 20" x 20" x 5" pre-rinse sink includes basket drain with removable crumb cup, 8"H backsplash, single deck mount faucet hole for pre-rinse, raised rolled rims on front & sides, accommodates 24" (front-to-back) undercounter dishwasher, stainless steel legs & crossrails with adjustable metal feet, adjustable metal feet, NSF

One (1) Model 300718 Pre-Rinse Spray Unit, deck mount
One (1) Model 301190 Pre-Rinse Wall Bracket
One (1) Model 301189 Pre-Rinse Faucet, add-on 12" spout, to be used with 300719
One (1) Model E41 Disposal provision package, includes weldment only for collar which are furnished by others, control panel bracket weldment, & holes for pre-rinse & anti-siphon vacuum breaker
<table>
<thead>
<tr>
<th>Item #</th>
<th>Description</th>
<th>Dimensions</th>
<th>Quantity</th>
<th>Manufacturer</th>
<th>Model</th>
</tr>
</thead>
<tbody>
<tr>
<td>13</td>
<td>DISPOSER</td>
<td></td>
<td>One (1)</td>
<td>Salvajor</td>
<td>100-SA-3-ARSS-2</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>One (1) 100-SA-3-ARSS-2 Disposer, Sink Assembly, 3-1/2&quot; sink collar, 1 Hp motor, start/stop push button, automatic reversing ARSS-2 control, includes fixed nozzle, chrome plated vacuum breaker, solenoid valve, sink stopper &amp; flow control, heat treated aluminum alloy housing, UL, CSA, CE</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>One (1) 208v/60/1-ph, 10.2 amps</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>One (1) Model 980104 Mounting bracket for RSS, MSS, MSS-LD, MRSS, MRSS-LD</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>One (1) Model DP Stainless steel dejamming prong</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>14</td>
<td>HAND SINK</td>
<td>12.75(h) x 18.88(w) x 14.75(d)</td>
<td>One (1)</td>
<td>Eagle Group</td>
<td>HSA-10-FAW</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>One (1) Model HSA-10-FAW Hand Sink, wall mount, 13-1/2&quot; wide x 9-3/4&quot; front-to-back x 6-3/4&quot; deep bowl, 304 stainless steel construction, splash mount gooseneck faucet with wrist handles, P-trap &amp; tail piece, basket drain, deep-drawn seamless design-positive drain, inverted &quot;V&quot; edge, NSF</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>One (1) Model -LS Left side splashes for handsink</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>15</td>
<td>SPARE NO.</td>
<td></td>
<td>&lt;Spare No.&gt;</td>
<td></td>
<td></td>
</tr>
<tr>
<td>16</td>
<td>WORK TABLE, STAINLESS STEEL TOP</td>
<td>35.13(h) x 60(w) x 36(d)</td>
<td>One (1)</td>
<td>Eagle Group</td>
<td>T3660SEB</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>One (1) Model T3660SEB Deluxe Series Work Table, 60&quot;W x 36&quot;D, 16/300 series stainless steel top, rolled edge on front &amp; back, adjustable 430 stainless steel undershelf with marine edge, Uni-Lok® gusset system, (4) stainless steel legs &amp; adjustable bullet feet, NSF</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>One (1) Model CAH4-SB Table Casters, set of (4), 5&quot; diameter, (2) swivel &amp; (2) swivel/brake, 200 lbs. capacity per caster, zinc with resilient tread, NSF</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Stainless steel tables and shelves as alternate to millwork in the warewashing area</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>17</td>
<td>MILLWORK</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Millwork - By Others</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
ITEM # 18  MILLWORK
Dimensions:
Quantity:
Manufacturer:

Millwork - By Others

ITEM # 19  MILLWORK
Dimensions:
Quantity:
Manufacturer:

Millwork - By Others

ITEM # 20  MILLWORK
Dimensions:
Quantity:
Manufacturer:

Millwork - By Others

ITEM # 21  MILK COOLER
Dimensions:
Quantity:
Manufacturer:

Milk Cooler - By Others

END OF SECTION
SECTION 11 68 13 - PLAYGROUND EQUIPMENT

PART 1  GENERAL

1.01  SECTION INCLUDES
   A.  Playground layout (staking).
   B.  New play equipment.
   C.  Relocation of existing play equipment
   D.  Play area accessories

1.02  RELATED REQUIREMENTS
   A.  Section 32 18 16.13 - Playground Protective Surfacing:  Protective surfacing in playground area.
   B.  Concrete for Footings:  As specified in Structural drawings

1.03  REFERENCE STANDARDS
   C.  ASTM A500/A500M - Standard Specification for Cold-Formed Welded and Seamless Carbon Steel Structural Tubing in Rounds and Shapes; 2013.

1.04  DEFINITIONS
   A.  Play Event:  A piece of playground equipment that supports one or more play activities.
   B.  Use Zone:  The area under and around a play event within which the ground surfacing must meet fall impact attenuation requirements of ASTM F1292 when tested at the fall height specified for the play event.
C. Critical Height: Standard measure of shock attenuation. According to CPSC No. 325, this means "the fall height below which a life-threatening head injury would not be expected to occur".

D. Fall Height: The vertical distance between the finished elevation of the designated play surface and the finished elevation of the protective surfacing beneath it, as defined in ASTM F1487.

E. Protective Surfacing: Resilient ground surfacing, specified in Section 32 1816.13. The characteristics of the protective surfacing are based on the fall height of the playground equipment. Changes in either the surfacing or the fall height, particularly reducing the resilience of the protective surfacing or increasing the fall height, will reduce safety-related performance.

F. IPEMA: International Play Equipment Manufacturer’s Association

G. Play Structure: According to ASTM F 1487, this is "a free-standing structure with one or more components and their supporting members".

H. Subgrade: The surface of the ground on which the protective surfacing is installed; the subbase for the protective surfacing is installed over the subgrade.

1.05 ADMINISTRATIVE REQUIREMENTS

A. Preinstallation Meetings: Convene a meeting one week before starting earthwork for playground to discuss coordination between various installers.
   1. Require attendance by personnel responsible for grading and installers of playground equipment, protective surfacing, footings, and adjacent work.
   2. Include representatives of Contractor.
   3. Notify Architect at least 2 weeks prior to meeting.

1.06 SUBMITTALS

A. See Section 01 30 00 - Administrative Requirements, for submittal procedures.

B. Proposals for Substitutions: Substitutions that will increase the fall height, platform height, or maximum equipment height will not be considered; submit shop drawings with proposed modifications clearly identified and sufficient information to determine compliance with specified criteria.

C. Product Data: For all manufactured equipment, provide manufacturer’s product data showing materials of construction, compliance with specified standards, installation procedures, safety limitations, and the number of users permitted.

D. Product Data: For custom-fabricated items or natural material items, provide the following:
   1. Treated Wood Products: Provide information on wood treatment chemical content, toxicity level, and life-cycle durability.
   2. Wood Finishes: Provide information on wood finish chemical content and toxicity level.

E. Shop Drawings: Detailed scale drawings showing manufacturered and custom-fabricated play element layout, Use Zone perimeters, and fall height for each play event.
   1. Include materials, plans, elevations, sections, details, method of field assembly, connections, and installation details. For manufactured items, Include manufacturer’s product number, color choices for each product piece, and product mounting depth & height.
   2. Show locations and dimensions of footings and anchorage points.
   3. Clearly identify mounting elevations in relation to a fixed survey point on site and to subgrade elevation and depth of protective surfacing.
   4. Show locations of underground utilities, storm drainage system and irrigation system.
   5. Show locations of related construction such as walkways and roadways, fences, site furnishings, and plantings.

F. Coordination Drawings: Layout plans and elevations drawn to scale and coordinating playground equipment with playground surface systems. Show playground element locations,
use zones, fall heights, extent of protective surfacing, and Critical heights. Architect to finalize color selections prior to ordering of manufacturered equipment.

G. Samples for Verification: For the following products; for each type of exposed finish required, prepared on samples of size indicated below and of the same thickness and material indicated for the Work. If finishes involve normal color and texture variations, include sample sets showing the full range of variations expected. Architect reserves the right to require additional samples that show fabrication techniques, workmanship, and design of elements.

H. Product Certificates: Signed by manufacturers of playground equipment certifying that products furnished comply with requirements.

I. Installer Certificates: Signed by manufacturer certifying that installers comply with requirements.

J. Manufacturer Certificates: Signed by manufacturers certifying that they comply with requirements.

K. Product Test Reports: From a qualified testing agency indicating playground equipment complies with requirements based on comprehensive testing of current products.

L. Maintenance Data: Provide manufacturer’s or fabricator’s recommended maintenance instructions for equipment, custom fabrications, natural products, and finishes. Provide list of replaceable parts and/or finishes for each equipment item, with address and phone number of source of supply.

M. Manufacturer’s Field Report for manufacured equipment

N. Field Quality Control Report for custom fabricated items.

O. Warranty: Submit manufacturer warranty and ensure that forms have been completed in Owner's name and registered with manufacturer.

1.07 QUALITY ASSURANCE

A. Maintain one copy of the latest edition of ASTM F1487 and CPSC Pub. No. 325 at project site.

B. Manufacturer Qualifications: Company regularly engaged in manufacturing materials and products specified in this section, with not less than three years experience.
   1. Provide documentation showing that playground equipment similar to that specified has been installed in minimum 10 sites and been in successful service for minimum of 5 years; provide addresses.
   2. Provide certificate of Insurance AA rated for minimum 1,000,000 dollars covering both product and general liability.
   3. Manufacturer’s Representative: Provide name, company name and address, and playground safety training certificate.

C. Installer Qualifications: Company certified by manufacturer for training and experience installing play events and equipment.

1.08 DELIVERY, STORAGE, AND HANDLING

A. Deliver, handle, and store equipment to project site in accordance with manufacturer’s recommendations.

B. Store materials in a dry, covered area, elevated above grade.

1.09 WARRANTY

A. See Section 01 78 00 - Closeout Submittals, for additional warranty requirements.

PART 2 PRODUCTS

2.01 MANUFACTURERS

A. Manufacturered Playground Equipment (Relocated):
   1. Xccent Play; 5240 257th St. Wyoming, MN; (800)-933-4748; www.xccentplay.com

B. Manufactured Swing Set:
   1. Playcraft Systems; 123 North Valley Dr., Grants Pass, OR, 97526; (800)-333-8519; www.playcraftsystems.com
2. Substitutions: See Section 01 60 00 - Product Requirements.

C. Play Area Accessories
   1. Nature of Early Play; 170 Allens Way, Somerset, KY 42501; (800)-437-5297
      www.natureofearlyplay.com
   2. Substitutions: See Section 01 60 00 - Product Requirements.

2.02 PLAYGROUND EQUIPMENT - GENERAL

A. Design Assumptions: Because the safety of the playground depends on strict conformance to
   the design criteria, this information is provided for Contractor's information.
   1. Playground has been designed for children ages infant to 5 years.
   2. Area indicated as infant area is reserved for children ages 12 through 24 months.
   3. If deviations from specified dimensions, especially fall heights, is required, obtain approval
      prior to proceeding; follow approval request procedure as specified for substitutions.

B. Mount all equipment on concrete footings, unless otherwise indicated.
   1. The playground protective surfacing constitutes a resilient tile product adhered to a pcc
      base over compacted aggregate subbase (non-resilient) that is installed over the
      subgrade; the top of footings and anchorage devices is to be covered by full depth of the
      resilient portion of the protective surfacing.
   2. Protective Surfacing Depth: Verify with product manufacturer prior to procurement or
      installation.
      a. At Swings: 3 inches.
      b. At Relocated Structure with Slide: 2 inches.
   3. Provide supports as required to mount equipment at proper height above finish and
      sub-grades to allow installation of sufficient depth of protective surfacing; portion of
      support below top of surfacing must comply with specified requirements for equipment.
   4. Paint the portion of the support that is intended to be installed below the top surface of the
      protective surfacing a different color, or mark in other permanent way, so that installers
      and maintainers of protective surfacing can easily determine whether sufficient depth has
      been installed.

2.03 PLAYGROUND EQUIPMENT

A. Comply with ASTM F1487 and CPSC Pub. No. 325; provide equipment complying with specific
   requirements for the relevant age group(s).
   1. Provide components having factory-drilled holes. Do not use components with extra holes
      that will not be filled by hardware or covered by other components.

B. Relocated Structure with Slide
   1. Existing Location: Prairie Crest Elementary
   2. New Location: As indicated on drawings
   3. 'Go Play' Structure by Xccent Play
   4. Product Representative: Karen Sherman, National Playground, PO Box 506, Carlisle, IA
      50047, (319)-730-0923; karen@playgroundcompliance.com
   5. Provide documentation of continued warranty for relocated structure.

C. Swing Set
   1. Location: As indicated on drawings.
   2. Frame
      a. 3.5" OD steel with baked powdercoating paint finish, blue
      b. 7' height
      c. Two bays accommodating 4 total swing seats
   3. Seats
      a. Slash-proof Belt Seats (2), black
      b. Full Bucket Seat (1), black
      c. Inclusive (ADA) Seat (1), blue
   4. Swing Chain
      a. Galvanized steel

PLAYGROUND EQUIPMENT
5. Certification: Provide International Play Equipment Manufacturers Association (IPEMA) certification that product complies with ASTM F1487, excluding sections 7.1.1, 10, and 12.6.1.

2.04 PLAY AREA ACCESSORIES

A. Wood Stepping Slices
   1. 8-15" diameter x 3" height
   2. Natural, unfinished wood. Owner to seal with desired product after placement.

B. Hollow log
   1. Maximum length: 60 inches
   2. Maximum outer diameter: 32 inches
   3. Minimum inner diameter: 24 inches
   4. Maintain 6'-0" clear use zone around perimeter of log
   5. Natural, unfinished wood. Owner to seal with desired product after placement.

C. Storage Benches
   1. 16" d x 72" w x 14" h
   2. HDPE 'EcoColor' side panels, green
   3. RSP (Recycled structural plastic) seat surface/lid, tan
   4. Waterproof construction with hydraulic hinges

D. Landscape Boulders
   1. Non-porous, natural stones sourced regionally (granite glacial erratics / Iowa field stones)
   2. 18-36 inch diameter
   3. Boulders should be smooth without sharp or jagged edges
   4. Boulders shall sit stable on the ground unable to be rocked or rolled

2.05 MATERIALS

A. Steel Pipe and Tube: Conforming to ASTM A135/A135M, ASTM A500/A500M, or ASTM A513/A513M; hot-dipped galvanized and free of excess weld and spatter.
   1. Tensile Strength: 45,000 psi, minimum.
   2. Yield Point: 33,000 psi, minimum.
   3. Galvanizing: Hot-dip metal components in zinc after fabrication, in accordance with ASTM A123/A123M; remove tailings and sharp protrusions and burnish edges.

B. Extruded Aluminum: ASTM B221 or ASTM B221M, Alloy 6061, 6062, or 6063.
   1. Tensile Strength: 39,000 psi, minimum.
   2. Yield Point: 36,500 psi, minimum.


D. Chain: Corrosion resistant zinc plated steel; minimum size 5/0.

E. Hardware: Of design without hazardous protrusions, corners, or finishes, and requiring tools for removal after installation; countersunk fasteners are preferred.
   1. Use stainless steel for metal-to-metal connections; select type to minimize galvanic corrosion of materials connected by hardware.
   2. Use stainless steel for wood-to-wood and wood-to-metal connections.
   3. Use stainless steel with plastic components.
   5. Hooks, Including S-Hooks: Closed loop; maximum gap 0.04 inches, less than the thickness of a dime.
   6. Rails, Loops, and Hand Bars: Same metal as item is mounted on or aluminum; with powder coating.
   7. Anchors: In accordance with manufacturer's recommendations.

F. Opaque Plastic: Molded homogeneous plastic or wood-polymer composite lumber; do not use plastic as major load bearing members; use as deck boards, panels, and railings is acceptable.
   1. Homogeneous Plastic: Ultraviolet and color stabilized polyethylene without applied surface coating; color through entire thickness.
2. Wood-Polymer Composite Lumber: Complying with ASTM D6662; factory finished.
4. Maximum Deflection: 1/360 of span, when tested in accordance with ASTM D648, with a uniform live load of 40 pounds/ft.
5. Deck Board Span: 12 inches on center, maximum, spanning minimum of 3 joists.

G. Wood Sealer: Transparent dampproofing.
H. Powder Coating for Steel: Electrostatically applied and oven cured polyester powder over electrostatic zinc coating.
I. Polyvinyl Chloride (PVC) Coating: Ultraviolet stabilized and mold-resistant; slip-resistant finish. Prime parts to be coated with clear acrylic thermosetting solution, and preheat prior to dipping in liquid PVC.
   1. Thickness: 0.08 inch, minimum, plus/minus 0.02 inch.
   2. Hardness: 85 durometer, when tested in accordance with ASTM D3363.
J. Concrete: As specified in Structural drawings

PART 3 EXECUTION

3.01 LAYING OUT THE WORK
A. Stake the location of playground elements, including Use Zone perimeters, perimeter of protective surfacing, access and egress points, hard surfaces, walls, fences, and structures, and planting locations.
B. Stake the layout of the entire Use Zone perimeter before starting any work and before subbase under resilient surfacing is laid.
   1. Verify that Use Zone perimeters do not overlap hard surfaces, whether currently installed or not.
   2. Verify that Use Zones are free of obstructions that would extend into the resilient portion of the protective surfacing.
   3. If conflicts or obstructions exist, notify Architect.
   4. Do not proceed until revised drawings have been provided, showing corrected layout, and obstructions have been removed.

3.02 EXAMINATION
A. Verify that playground area has been graded to subgrade elevations required and that excess soil, rocks, and debris have been removed.
B. Verify that playground equipment footings have been installed in proper locations and at proper elevations.
C. Verify location of underground utilities and facilities in the playground area. Damage to underground utilities and facilities will be repaired at Contractor's expense.

3.03 INSTALLATION
A. Coordinate work with preparation for and installation of protective surfacing specified in Section 32 18 16.13. The resilient portion of the protective surfacing is to be installed after playground equipment installation.
B. Install in accordance with CPSC Pub. No. 325, ASTM F1487, manufacturer's instructions, and requirements of authorities having jurisdiction.
C. Anchor equipment securely below the bottom elevation of the resilient surfacing layer.
D. Install without sharp points, edges, or protrusions; entanglement hazards; or pinch, crush, or shear points.
E. Do not modify play events on site without written approval of manufacturer.
F. Install required signage if not factory-installed.
3.04 FIELD QUALITY CONTROL
   A. Obtain the services of the equipment manufacturer's field representative to review the finished installation for compliance with specified requirements and with design criteria to the extent known to the Contractor; submit report of field review.
   B. Owner or Owner's representative will inspect playground equipment after installation to verify that playground meets specified design safety and accessibility requirements.
   C. Repair or replace rejected work until compliance is achieved.

3.05 CLEANING
   A. Restore adjacent existing areas that have been damaged from the construction.
   B. Clean playground equipment of construction materials, dirt, stains, filings, and blemishes due to shipment or installation. Clean in accordance with manufacturer's instructions, using cleaning agents as recommended by manufacturer.
   C. Clean playground area of excess construction materials, debris, and waste.
   D. Remove excess and waste material and dispose of off-site in accordance with requirements of authorities having jurisdiction.

3.06 PROTECTION
   A. Protect installed products until Date of Substantial Completion.
   B. Replace damaged products before Date of Substantial Completion.

END OF SECTION
SECTION 12 24 13 - ROLLER WINDOW SHADES

GENERAL

1.01 SUMMARY
   A. This Section includes roller shades.

1.02 SUBMITTALS
   A. Product Data: For each type of product indicated.
   B. Shop Drawings: Include plans, elevations, sections, details, details of installation, operational clearances, and relationship to adjoining Work.
      1. Verify dimensions by field measurements before fabrication and indicate measurements on Shop Drawings.
   C. Samples: For each exposed finish and for each color and texture required.
   D. Window Treatment Schedule: Use same designations indicated on Drawings.
   E. Maintenance data.

1.03 QUALITY ASSURANCE
   A. Installer Qualifications: Fabricator of products.
   B. Fire-Test-Response Characteristics: Provide products passing flame-resistance testing according to NFPA 701 by a testing agency acceptable to authorities having jurisdiction.
   C. Comply with WCMA A 100.1.

PRODUCTS

2.01 ROLLER SHADES
   A. Acceptable Products:
      1. Manual Shades:
   B. Shade Fabric: Refer to Drawing Sheet A601 for Finish Material Specifications.
   C. Rollers: Electrogalvanized or epoxy primed steel or extruded-aluminum tube of diameter and wall thickness required to support and fit internal components of operating system and the weight and width of shade band material without sagging; designed to be easily removable from support brackets. Provide capacity for one roller shade band(s) per roller.
   D. Direction of Roll: As indicated on drawings.
   E. Mounting Brackets: Powder coated steel.
   F. Bottom Bar: Steel or extruded aluminum, with plastic or metal capped ends. Provide concealed, by pocket of shade material, internal-type.
   G. Mounting: Bracket mount as indicated on drawings, permitting easy removal and replacement without damaging roller shade or adjacent surfaces and finishes.
   H. Shade Operation:
      1. Manual; with continuous-loop bead-chain, clutch, and cord tensioner and bracket lift operator.

2.02 ROLLER SHADE FABRICATION
   A. Product Description: Roller shade consisting of roller, a means of supporting roller, flexible sheet or band of material carried by roller, a means of attaching material to roller, bottom bar and operating mechanism that lifts and lowers the shade.
   B. Unit Sizes: Obtain units fabricated in sizes to fill window and other openings as follows, measured at 74 deg F:
      1. Shade Units Installed between (Inside) Jambs: Edge of shade not more than 1/4 inch from face of jamb. Length equal to head to sill dimension of opening in which each shade is installed.
2. Shade Units Installed Outside Jambs: Width and length as indicated, with terminations between shades of end-to-end installations at centerlines of mullion or other defined vertical separations between openings.

C. Installation Brackets: Designed for easy removal and reinstallation of shade, for supporting roller, and operating hardware and for hardware position and shade mounting method indicated.

D. Installation Fasteners: No fewer than two fasteners per bracket, fabricated from metal noncorrosive to shade hardware and adjoining construction; type designed for securing to supporting substrate; and supporting shades and accessories under conditions of normal use.

EXECUTION

3.01 ROLLER SHADE INSTALLATION

A. Install roller shades level, plumb, and aligned with adjacent units according to manufacturer's written instructions. Allow clearances for window operation hardware.

B. Adjust and balance roller shades to operate smoothly, easily, safely, and free from binding or malfunction throughout entire operational range.

C. Clean roller shade surfaces after installation, according to manufacturer's written instructions.

END OF SECTION
PART 1 GENERAL

1.01 SECTION INCLUDES
   A. Countertops for architectural cabinet work.
   B. Wall-hung counters and vanity tops.
   C. Sinks molded into countertops.
   D. Window sills.

1.02 RELATED REQUIREMENTS
   A. Section 06 41 00 - Architectural Wood Casework.

1.03 REFERENCE STANDARDS
   C. AWI/AWMAC/WI (AWS) - Architectural Woodwork Standards; 2014.
   F. NEMA LD 3 - High-Pressure Decorative Laminates; 2005.
   G. PS 1 - Structural Plywood; 2009.

1.04 SUBMITTALS
   A. Product Data: Manufacturer's data sheets on each product to be used, including:
      1. Preparation instructions and recommendations.
      2. Storage and handling requirements and recommendations.
      3. Specimen warranty.
   B. Shop Drawings: Complete details of materials and installation; combine with shop drawings of cabinets and casework specified in other sections.
   C. Verification Samples: For each finish product specified, minimum size 6 inches square, representing actual product, color, and patterns.
   D. Test Reports: Chemical resistance testing, showing compliance with specified requirements.
   E. Maintenance Data: Manufacturer's instructions and recommendations for maintenance and repair of countertop surfaces.

1.05 QUALITY ASSURANCE
   A. Fabricator of this section must also provide work specified in Division 6 Section "Wood-Veneer Paneling".

1.06 DELIVERY, STORAGE, AND HANDLING
   A. Store products in manufacturer's unopened packaging until ready for installation.

1.07 FIELD CONDITIONS
   A. Maintain environmental conditions (temperature, humidity, and ventilation) within limits recommended by manufacturer for optimum results. Do not install products under environmental conditions outside manufacturer's absolute limits.

PART 2 PRODUCTS

2.01 COUNTERTOPS
   A. Quality Standard: Custom Grade, in accordance with AWI/AWMAC/WI (AWS), unless noted otherwise.
B. Plastic Laminate Countertops: High-pressure decorative laminate (HPDL) sheet bonded to substrate.
   1. Laminate Sheet: NEMA LD 3, Grade HGS, 0.048 inch nominal thickness.
      a. Laminate Core Color: Same as decorative surface.
   2. Exposed Edge Treatment: Square, substrate built up to minimum 1-1/4 inch thick; covered with matching laminate.
   3. Back and End Splashes: Same material, same construction.
   4. Fabricate in accordance with AWI/AWMAC/WI (AWS), Section 11 - Countertops, Custom Grade.
   5. Use exterior grade plywood at sink locations.

C. Solid Surfacing Countertops: Solid surfacing sheet or plastic resin casting over continuous substrate.
   1. Solid Surfacing Sheet and Plastic Resin Castings: Complying with ISFA 2-01 and NEMA LD 3; acrylic or polyester resin, mineral filler, and pigments; homogenous, non-porous and capable of being worked and repaired using standard woodworking tools; no surface coating; color and pattern consistent throughout thickness.
      a. Sinks and Bowls: Integral castings; minimum 3/4 inch wall thickness; comply with IAPMO Z124 and ADA size and clearance requirements.
      b. Finish on Exposed Surfaces: Matte, gloss rating of 5 to 20.
   2. Back and End Splashes: Same sheet material, square top; minimum 4 inches high.

2.02 MATERIALS
A. Plywood for Supporting Substrate: PS 1 Exterior Grade, A-C veneer grade with no added urea formaldehyde, minimum 5-ply; minimum 3/4 inch thick; join lengths using metal splines.
B. Particleboard for Supporting Substrate: ANSI A208.1 Grade M-2 with no added urea formaldehyde, 45 pcf minimum density; minimum 3/4 inch thick; join lengths using metal splines.
C. Medium Density Fiberboard for Supporting Substrate: ANSI A208.2, Grade 130 with no added urea formaldehyde; 3/4 inch thick; join lengths using metal splines.
D. Adhesives: Chemical resistant waterproof adhesive as recommended by manufacturer of materials being joined.

2.03 FABRICATION
A. Fabricate tops and splashes in the largest sections practicable, with top surface of joints flush.
   1. Join lengths of tops using best method recommended by manufacturer.
   2. Fabricate to overhang fronts and ends of cabinets 1 inch except where top butts against cabinet or wall.
   3. Prepare all cutouts accurately to size; replace tops having improperly dimensioned or unnecessary cutouts or fixture holes.
B. Provide back/end splash wherever counter edge abuts vertical surface unless otherwise indicated.
   1. Secure to countertop with concealed fasteners and with contact surfaces set in waterproof glue.
   2. Height: 4 inches, unless otherwise indicated.
C. Solid Surfacing: Fabricate tops up to 144 inches long in one piece; join pieces with adhesive sealant in accordance with manufacturer's recommendations and instructions.
   1. Where sinks are indicated in solid surface countertops, provide integral bowls.
D. Wall-Mounted Counters: Provide skirts, aprons, brackets, and braces as indicated on drawings.

PART 3 EXECUTION
3.01 EXAMINATION
A. Do not begin installation until substrates have been properly prepared.
B. If substrate preparation is the responsibility of another installer, notify Architect of unsatisfactory preparation before proceeding.

C. Verify that wall surfaces have been finished and mechanical and electrical services and outlets are installed in proper locations.

3.02 INSTALLATION

A. Securely attach countertops to cabinets using concealed fasteners. Make flat surfaces level; shim where required.

B. Attach plastic laminate countertops using screws with minimum penetration into substrate board of 5/8 inch.

C. Seal joint between back/end splashes and vertical surfaces.

3.03 CLEANING

A. Clean countertops surfaces thoroughly.

3.04 PROTECTION

A. Protect installed products until completion of project.

B. Touch-up, repair or replace damaged products before Date of Substantial Completion.

END OF SECTION