SECTION 03300
CAST-IN-PLACE CONCRETE

PART 1 - GENERAL

1.01 SUMMARY

A. Provisions of the General and Supplementary Conditions and Division 01 apply to this section.

B. Section Includes:


C. Related Sections:

1. Section 01300: Submittals
2. Section 01420: Testing and Inspection.
3. Section 03100: Concrete Forms and Accessories.
4. Section 03200: Concrete Reinforcement.
5. Section 03331: Lightweight Concrete Floor Topping.
6. Section 03360: Integral Color Concrete
7. Section 07900: Caulking and Sealants
8. Section 07920: Joint Sealants

1.02 SUBMITTALS

A. Shop Drawings: Submit Shop Drawings indicating locations of cast-in-place concrete Work and accessory items such as vapor barriers. Include details and locations of reinforcing, embedded items, and interfacing with other Work.

B. Product Data:

1. Mix Design: Submit a concrete mix design for each mix that will be provided for the Work. Include water/ cement ratio, size of coarse aggregate and amount of any admixture. Predict minimum compressive strength, maximum slump and air content percentage.

2. Manufacturer of ready-mixed concrete shall deliver to the CM a certificate with each mixer truck. Certificate shall bear the signature of representative of the
testing laboratory, and shall state quantity of cement, water, fine and coarse aggregate and admixtures.

C. Material Samples: Submit Samples illustrating concrete finishes, reveals, and tie-holes, minimum 12 inches x 12 inches in size.

D. Certificates: Submit a notarized certificate that each of following conforms to standards indicated:

1. Aggregates – ASTM Standards

1.03 QUALITY ASSURANCE

A. Comply with the following as a minimum requirement.

B. American Concrete Institute (ACI) Publication:

1. ACI 211 - Recommended Practice for Selecting Proportions of Concrete.
2. ACI 304 - Recommended Practice for Measuring, Mixing, Transporting and Placing Concrete.
3. ACI 305 - Recommended Practice for Hot Weather Concreting.
4. ACI 306 - Recommended Practice for Cold Weather Concreting.
5. ACI 308 - Recommended Practice for Curing Concrete.
6. ACI 309 - Recommended Practice for Consolidation of Concrete.

C. American Society for Testing and Materials (ASTM) Standards:

1. ASTM A 185 - Welded Steel Wire Fabric For Concrete Reinforcement.
2. ASTM C 31 - Making and Curing Concrete Test Specimens in the Field.
3. ASTM C 33 - Concrete Aggregates.
4. ASTM C 39 - Compressive Strength of Cylindrical Concrete Specimens.
5. ASTM C 88 - Soundness of Aggregates by use of Sulphate or Magnesium Sulphate.
6. ASTM C 94 - Ready-Mixed Concrete.
7. ASTM C 143 - Slump of Hydraulic Cement Concrete.
8. ASTM C 150 - Portland Cement.
9. ASTM C 171 - Sheet Materials for Curing Concrete.
10. ASTM C 172 - Sampling Freshly Mixed Concrete.
11. ASTM C 173 - Air Content of Freshly Mixed Concrete by the Volumetric Method.
13. ASTM C 231 - Air Content of Freshly Mixed Concrete by the Pressure Method.
15. ASTM C 289 - Potential Reactivity of Aggregates (Chemical Method).
16. ASTM D 1751 - Preformed Expansion Joint Fillers for Concrete Paving and Structural Construction (Non-extruding and Resilient Bituminous Types).

D. Continuous inspection shall be provided at the batch plant and for transit-mixed concrete to run check sieve analysis of aggregate, check moisture content of fine aggregate, check design of mix, check cement being used with test reports, check loading of mixer trucks, and certify to quantities of materials placed in each mixer truck.

E. Inspection shall be performed by a representative of a testing laboratory selected by the Owner. Owner will pay for inspection costs. Notify the laboratory 24 hours in advance of time concrete is to be mixed. Notify the laboratory of postponement or cancellation of mixing within at least 24 hours of scheduling time.

F. Continuous batch plant inspection requirement may be waived. Waiver shall be in writing, including Owner approval.

G. Strength Test of Concrete: Refer to Section 01420: Testing and Inspection.

1.04 DELIVERY, STORAGE AND HANDLING

A. Mixing and Placing Concrete: Refer to Section 01420: Testing and Inspection.

B. Ready-mix concrete shall be mixed and delivered in accordance with ASTM C 94 and CBC Standard 19-3 and 19-4. Each batch of concrete delivered to the Project site shall be accompanied by a time slip bearing departure time and signature of batch plant supervisor. Concrete shall be placed within 90 minutes after start of mixing.
C. Store cement and aggregate materials so as to prevent their deterioration or intrusion by foreign matter. Deteriorated or contaminated materials shall not be furnished.

1.05 JOB CONDITIONS

A. Cold Weather Requirements:

1. Adequate equipment shall be provided for heating concrete materials and protecting concrete during freezing or near-freezing weather. Surfaces, in which concrete is to come in contact with, shall be free from frost or ice. No frozen materials or materials containing ice shall be furnished.

2. When placing concrete during freezing or near-freezing weather the mix shall have a temperature of at least 50 degrees F., but not more than 90 degrees F. when cement is added. Concrete shall be maintained at a temperature of at least 50 degrees F. for at least 72 hours after placing or until it has thoroughly hydrated. When necessary, concrete materials shall be heated before mixing. Special precautions shall be provided for protection of transit-mixed concrete.

B. Hot Weather Requirements: During hot weather, proper attention shall be provided for ingredients, production methods, handling, placing, protection and curing, to prevent excessive concrete temperatures or water evaporation which could impair required strength or durability.

PART 2 - PRODUCTS

2.01 GENERAL

A. Ready-Mixed Concrete: Mix and deliver in accordance with requirements of CBC Chapter 1905.

B. Strength of Concrete: Concrete, unless otherwise indicated or specified, shall be provided with a minimum ultimate 28-day strength of 2500 psi (f’c). For high-early-strength concrete, age for reaching the f’c shall be as indicated on Drawings.

2.02 MATERIALS

A. Cement: ASTM C 150. Furnished cement shall be as selected and reviewed for concrete proportioning.

B. Aggregates: Aggregates shall conform to ASTM C 33 and C 227 except as modified herein. Any suitable individual grading of coarse aggregate may be furnished, provided Grading of Combined Aggregate indicated in following table is obtained. Refer to Section 01420: Testing and Inspection.

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GRADING OF COMBINED AGGREGATE
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C. Water: Water shall be potable and free from deleterious matter.

D. Admixtures: CBC Chapter 19, Section 1903.6, Type A or D.

E. Expansion Joint Fillers: Preformed strips, non-extruding and resilient bituminous type, of thickness indicated, conforming to ASTM D 1751.

F. Curing Paper and Liquid Curing Compounds:
   2. Liquid Curing Compounds: A standard brand, clear liquid conforming to ASTM C 309, Master Builders, Grace, Antihydro.

G. Abrasive Aggregate: Norton Alundum, Union Carbide Carborundum, or equal, graded #12 through #30 sizes, color as selected by Architect.

H. Underlayment: Latex underlayment for filling low spots in concrete shall be Tile-Tex by Flintkote Co., Webtex #60 or Fixallatex by Dowman Products Co.

I. Vapor Barrier: ASTM D 2103, polyethylene sheeting, clear, 10 mils minimum thickness, impact strength greater than 70 grams per mil, 10 feet minimum width. Provide minimum 2-inch wide waterproof plastic self-adhering tape for sealing edges and ends of sheeting.
   1. Moisture barrier is required where an interior area is scheduled to receive moisture sensitive floor finishes.

J. Stair Strips and Nosing:
   1. Fabricated from 6063-T5 extruded aluminum, mill finish. Anti-slip filler shall contain at least 60 percent virgin grain aluminum oxide abrasive. Binder shall be fully cured resilient type epoxy, with binder-to-filler ratio of 13 percent. The epoxy-abrasive filler shall extend over the curved front edge of the nosing and shall be securely bonded to the extruded aluminum base.
3. Nosing and strips for concrete casting shall be provided with Sure-Hold anchors, chevron shaped continuous full length of nosing or strip.

4. Nosings and anchors for attachment to hydrated concrete stairs and wood stairs shall be similar to those specified below, except they shall be provided with countersunk holes for screws and fasteners.

5. Colors: As selected by Architect to contrast with stair color. Colors shall extend uniformly through the filler.

6. Strip and Nosing Types:
   a. Strips for recessing into concrete stairs: Type WP1A, except 2-1/4 inches wide, 3/8 inch thick. American Safety Tread Co., Type 24, or equal.

PART 3 - EXECUTION

3.01 GENERAL

   A. Time of Placing: Do not place concrete until reinforcement, conduits, outlet boxes, anchors, hangers, sleeves, bolts, and other embedded materials are securely fastened in place. Contact the CM at least 24 hours before placing concrete; do not place concrete until inspected by the CM.

   B. Pouring Record: A record shall be kept on the Project site of time and date of placing concrete in each portion of structure. Such record shall be maintained on the Project site until Substantial Completion and shall be available for examination by the Architect.

3.02 PREPARATION

   A. Moisture Barrier: Before placing of screeds and slab reinforcement, install a moisture barrier under slabs on grade. Place membrane in as large sheets as possible, lapped 12 inches at sides and ends, with top lap placed in the direction of the spreading of concrete. Extend membrane and lap at least 4 inches onto adjoining wall surfaces and seal with pressure-sensitive tape.

      1. Place moisture barrier on minimum 2-inch bed of sand, unless otherwise indicated, over gravel base as indicated on the Drawings.

      2. Patch punctures and tears in moisture barrier.

   C. Reglets and Rebates:

      1. Form reglets and rebates in concrete to receive flashing, frames and other equipment as detailed and required. Coordinate dimensions and locations required with other related Work.

      2. If concrete slabs on grade adjoin a wall or other perpendicular concrete surface, form a reglet in wall to receive and carry horizontal concrete Work.
Reglet shall be full thickness of the slab and shall be 3/4 inch wide, unless otherwise indicated. Requirement does not apply to exterior walks, unless specifically indicated.

D. Anchor Slots: Dove-tail anchor slots at concrete walls to receive masonry veneer shall be set vertically in forms, 24 inches maximum on centers measured horizontally. Anchor slots shall be No. 24 gage galvanized sheet steel with removable fiber filler to prevent seepage of cement in slot.

E. Screeds: Install screeds accurately and maintain at required grade or slab elevations after steel reinforcement has been placed, but before starting to place concrete. Install screeds adjacent to walls and in parallel rows not to exceed 8 feet on centers.

3.03 INSTALLATION

A. Conveying and Placing:

1. Concrete shall be placed only under direct observation of the IOR. Do not place concrete outside of regular working hours, unless the IOR has been notified at least 48 hours in advance.

2. Concrete shall be conveyed from mixer to place of final deposit by methods, which will prevent separation or loss of materials.

3. Concrete shall be deposited as nearly as practicable to its final position to avoid segregation due to re-handling or flowing. No concrete that has partially hydrated or has been contaminated by foreign materials shall be deposited, nor shall re-tempered concrete or concrete which has been remixed after initial set be installed.

4. In depositing concrete in columns, walls or thin sections, provide openings in forms, elephant trunks, tremies or other recognized devices, to prevent segregation and accumulation of partially hydrated concrete on forms or metal reinforcement above level of concrete being placed. Such devices shall be installed so that concrete will be dropped vertically. Unconfined vertical drop of concrete from end of such devices to placement surface shall not exceed 6 feet.

5. Concrete shall be placed as a continuous operation until placing of panel or section is completed. Top surfaces of vertically formed lifts shall be level.

6. Concrete shall be thoroughly consolidated during placement, and shall be worked around reinforcement and embedded fixtures with mechanical vibrators.

7. Where conditions make consolidation difficult, or where reinforcement is congested, batches of mortar containing same proportions of cement, sand, and water as provided in the concrete, shall first be deposited in the forms to a depth of at least one inch.
B. Compaction and Screeding:

1. Tamp freshly placed concrete with a heavy tamper until at least 3/8 inch of mortar is brought to surface. Concrete shall then be tamped with a light tamper and screeded with a heavy straightedge until depressions and irregularities are eliminated, and surface is true to finish grades or elevations. Remove excess water and debris.

2. Where slabs are to receive separate cement finish or mortar setting bed, continued tamping to raise mortar to surface is not performed. Laitance shall be removed by brushing with a stiff brush or by light sandblasting to expose clean top surface of coarse aggregate.

C. Floating and Troweling:

1. When concrete has hydrated sufficiently, it shall be floated to a compact and smooth surface. After floating, wait until concrete has reached proper consistency before troweling. Top surfaces shall receive at least 2 troweling operations with steel hand trowel. Prior to and during final troweling, apply a fine mist of water frequently with an atomizing type fog sprayer. Omit troweling for slabs to receive a separate cement finish.

2. For interior finish slabs, final troweling shall provide a hard, impervious, and non-slip surfaces, free from defects and blemishes. Finished surface shall be within a tolerance of 1/8 inch in 10 feet. Avoid burnishing. Do not add cement or sand to absorb excess moisture.
   a. At gymnasium locker room floors finish as specified above, except surface shall be given a non-slip rotary finish.

3. Exterior Paving and Cement Walks: Finish as specified above, except surface shall be given a non-slip broom finish to match Sample reviewed by the Architect.

4. Vertical concrete surfaces shall be finished smooth and free from marks.

D. Curing:

1. Concrete shall be maintained above 50 degrees F., and in a moist condition for 7 days after placing, except that high early strength concrete shall be maintained in a moist condition for 3 days.

2. Before applying curing paper, interior floor treated with colored hardener shall be given a heavy protective coat of colored wax left unpolished, and then immediately covered with paper. If wax is not applied within two hours after final troweling, concrete shall be sprayed with a fine water mist and maintained continuously moist until wax is applied, unless spraying is not recommended by hardener manufacturer. After other Work such as plastering and painting has been completed, curing paper shall be removed and waxed floors cleaned of protective wax coating.
3. Forms containing concrete, top of concrete between forms, and exposed concrete surfaces after removal of forms shall be maintained in a thoroughly wet condition for at least 7 consecutive days after placing.

4. If weather is hot or surface has dried out, spray surface of concrete slabs and paving with fine mist of water, starting not later than 2 hours after final troweling and continuing until sunset. Surface of finish shall be kept continuously wet until curing medium has been installed.

5. Immediately after finishing, roof slabs and monolithic floor finish to receive resilient floor covering shall be uniformly and completely coated with liquid curing compound.
   a. Install compound in a manner and quantity sufficient to produce a uniform continuous thin film of water-impervious membrane. Compound shall be installed in accordance with manufacturer's directions.
   b. Protect adjoining surfaces from damage during installation. If curing compound is not applied immediately, cover finished concrete with wet burlap or curing paper and keep concrete surface wet for a period not to exceed thirty hours following finishing of concrete. At end of that time, burlap or paper shall be removed and curing compound installed as specified above.

6. Immediately after finishing, monolithic floor slabs not scheduled to receive resilient floor covering shall be covered with curing paper. Paper shall be lapped 3 inches at joints and sealed with waterproof sealer. Edges shall be cemented to finish. Repair or replace paper damaged during construction operations.

7. Within 24 hours after finishing, exterior slabs and paving, and interior slabs to receive cement topping or mortar setting beds, shall be covered with sand to a depth of 2 inches and kept thoroughly wet for 7 days.
   a. Instead of sand covering, exterior walks and paving where no other surface treatment is specified, may be cured with clear liquid curing compound immediately installed in accordance with manufacturer's directions.

E. Filling, Leveling and Patching:

1. Concrete slabs exhibiting high or low spots and indicated to receive resilient floor covering or soft floor covering, shall have surfaces repaired. High spots shall be honed, or ground with power-driven machines to required tolerances. Low spots shall be filled with latex underlayment, installed in strict accordance with manufacturer's written recommendations.

2. Holes resulting from form ties or sleeve nuts shall be solidly packed, through exterior walls, by pressure grouting with cement grout, as specified.
Grouted holes on exposed surfaces shall be screeded flush and finished to match adjoining surfaces.

F. Cement Base: Cement base shall be of the height, thickness, and shape detailed. Base shall be reinforced with one inch mesh, 18 gage, zinc-coated wire fabric. Base finish mixture shall be one part Portland cement, 2 parts of fine aggregate and one part pea gravel. Colored cement base shall include a chemically inert mineral oxide pigment in the mix.

3.04 FINISHING

A. Soda and Acid Wash: Concrete surfaces to receive plaster, paint or other finish, and which have been formed by oil coated forms, shall be scrubbed with a solution of 1-1/2 pounds of caustic soda to one gallon of water. Surfaces where smooth wood or waste molds have been furnished shall be scrubbed with a solution of 20 percent muriatic acid. Wash with clean water after scrubbing.

B. Formed Surface Finishes: Exposed concrete curbs, walls, and other surfaces; remove fins, patch tie holes, unless shown expressed in the drawings, stone joint marks and out-of-plane surfaces to within 1/16 inch of flush, to produce uniformity. Provide light sandblast finish throughout per Architect approved sample. Such surfaces shall be thoroughly washed with clean water after sandblasting.

C. Abrasive: Concrete stair treads, landings, ramps and steps on interior and exterior of buildings, and interior exposed concrete floors in shop buildings shall receive an abrasive finish. Abrasive grains in amount of 30 pounds per 100 square feet shall be evenly installed by dust-on method and embedded into surface during first troweling operation. Additional abrasive grains, in amount of 30 pounds per 100 square feet, shall then be evenly installed and embedded into surface during final troweling operation.

D. Floor Hardener: Exposed interior concrete floors throughout shall be treated with floor hardener, as specified. Install hardener after surface of concrete has reached the point where no excess moisture is present, but while it is still plastic. Hardener shall be installed as follows:

1. Colored Hardener: Install at rate of 40 pounds per 100 square feet of surface for initial application.

2. Gray (natural) Hardener: Install at rate of 20 pounds per 100 square feet of surface for initial application.

3. Hardener shall be evenly distributed and thoroughly floated into surface mortar with a wood float. An additional 20 pounds of hardener, colored or gray, specified as above, shall be installed over each 100 square feet, and troweled to an even surface having uniform color and texture.

E. Cement Grout and Dry-Pack Concrete: Cement grout shall be mixed at the Project site and shall be composed of one volume of portland cement and 2-1/2 volumes of fine aggregate. Materials shall be mixed dry with sufficient water added to make
mixture flow under its own weight. When grout is used as a dry pack concrete, add sufficient water to provide a stiff mixture, which can be molded into a sphere.

F. Broom Finish: Exterior stair treads and landings shall be provided with a non-slip broom finish in addition to abrasive finish specified.

G. Abrasive Stair Nosing: Nosing shall be installed according to manufacturers written recommendations.

3.05 EXPANSION AND CONSTRUCTION JOINTS

A. Construction Joints: Details and proposed location of construction joints shall be as indicated on the Drawings, located to least impair strength of structure, in accordance with the following:

1. Thoroughly clean contact surface by sand blasting entire surface not earlier than 5 days after initial placement.

2. A mix containing same proportion of sand and cement provided in concrete plus a maximum of 50 percent of coarse aggregate shall be placed to a depth of at least one inch on horizontal joints. Vertical joints shall be wetted and coated with a neat cement grout immediately before placing of new concrete.

3. Should contact surface become coated with earth, sawdust, or deleterious material of any kind after being cleaned, entire surface shall be re-cleaned before applying mix.

B. Expansion Joints: Provide expansion joints where indicated in walks and exterior slabs. Space approximately 20 feet apart, unless otherwise indicated. Joints shall extend entirely through slab with joint filler in one piece for width of walk or slab. Joint filler shall be 3/8 inch thick, unless otherwise indicated.

C. Tooled Joints: Slabs, walks and paving shall be marked into areas as indicated with markings made with a V-grooving tool. Marks shall be round-edged, free from burrs or obstructions, with clean cut angles and shall be straight and true. Walks, if not indicated, shall be marked off into rectangles of not more than 12 square feet and shall have a center marking where more than 5 feet wide.

3.06 TESTING

A. Molded Cylinder Tests:

1. Owner Consultant will prepare cylinders. Each cylinder shall be dated, given a number, point in structure from which sample was obtained, mix design number, mix design strength and result of accompanying slump test noted.

2. Separate tests of molded concrete cylinders obtained at same place and time shall be made at age of 3 days, 7 days, and 28 days. A strength test shall be the average of the compressive strength of 2
cylinders, obtained from the same sample of concrete and tested at 28 days or at test age designated for determination of \( f'c \).

3. Test cylinders shall be prepared at the Project site and stored in testing laboratory in accordance with ASTM C 31, and tested in accordance with ASTM C 39.

B. Core Test: At request of the Architect, cores of hardened concrete shall be cut from portions of hydrated structures for testing, in accordance with CBC and ASTM C 42.

1. Provide 4 inch diameter cores at representative places throughout the structure as designated by the Architect.

2. In general, provide sufficient cores to represent concrete placed with at least one core for each 4,000 square feet of building area, and at least 3 cores total for each Project.

3. Where cores have been removed, fill voids with drypack, and patch the finish to match the adjacent existing surfaces.

C. Concrete Consistency: Measure consistency according to ASTM C 143. Test twice each day or partial day’s run of the mixer.

D. Adjustment of Mix: If the strength of any grade of concrete for any portion of Work, as indicated by molded test cylinders, fall below minimum 28 days compressive strength specified or indicated, adjust mix design for remaining portion of construction so that resulting concrete meets minimum strength requirements.

E. Defective Concrete:

1. Should strength of any grade of concrete, for any portion of Work indicated by tests of molded cylinders and core tests, fall below minimum 28 days strength specified or indicated, concrete will be deemed defective Work and shall be replaced or adequately strengthened in a manner acceptable to the Architect.

2. Concrete Work that is not formed as indicated, is not true within 1/250 of span, not true to intended alignment, not plumb or level where so intended, not true to intended grades and levels, contains sawdust shavings, wood or embedded debris, or does not fully conform to Contract provisions, shall be deemed to be defective Work and shall be removed and replaced.

F. Concrete For Equipment Pads, Mechanical and Electrical Work: Unless otherwise indicated, strength shall be 3,000 psi concrete. Exposed concrete shall be provided with a hand trowel finish with radius corners and edges. Form and place concrete where necessary as described in Section 03100: Concrete Forms and Accessories, and reinforced as described in Section 03200: Concrete Reinforcement. Calcium chloride shall not be furnished in any concrete mix provided for the installation of underground electrical conduits. For concrete encasement of
more than one conduit, furnish 3/4 inch to 1 inch aggregate as specified for concrete mix.

3.07 CLEAN UP
A. Remove rubbish, debris and waste materials and legally dispose of off the Project site.

3.08 PROTECTION
A. Protect the Work of this section until Substantial Completion.

END OF SECTION
SECTION 00001

TECHNICAL SPECIFICATIONS

ROXBURY MEMORIAL PARK IMPROVEMENTS

City of Beverly Hills
Community Services Department
Recreation and Parks Division
455 N. Rexford Drive, Room 100
Beverly Hills, CA 90210

PREPARED BY:

HAI, Hirsch & Associates, Inc.
2221 E. Winston Road, Suite A
Anaheim, CA 92806

END OF SECTION
SECTION 00002

PROJECT DIRECTORY

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CIVIL ENGINEER
ROBERT DEPRAT
BLUE PEAK ENGINEERING
646 North Sepulveda Place
Placentia, CA 92870
Tel: (714) 749-3077
Fax: (714) 996-4154
# Document 00 \- Introductory Requirements

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## Division 01 \- General Requirements

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<td>01025</td>
<td>Allowances</td>
<td>02</td>
</tr>
<tr>
<td>01030</td>
<td>Alternates</td>
<td>02</td>
</tr>
<tr>
<td>01100</td>
<td>Coordination</td>
<td>02</td>
</tr>
<tr>
<td>01120</td>
<td>Cutting and Patching</td>
<td>03</td>
</tr>
<tr>
<td>01130</td>
<td>Field Engineering</td>
<td>02</td>
</tr>
<tr>
<td>01150</td>
<td>Resource Conservation</td>
<td>04</td>
</tr>
<tr>
<td>01160</td>
<td>Request for Clarification</td>
<td>01</td>
</tr>
<tr>
<td>01200</td>
<td>Project Meetings</td>
<td>04</td>
</tr>
<tr>
<td>01300</td>
<td>Submittals</td>
<td>05</td>
</tr>
<tr>
<td>01360</td>
<td>Construction Schedule</td>
<td>12</td>
</tr>
<tr>
<td>01420</td>
<td>Testing and Inspection</td>
<td>04</td>
</tr>
<tr>
<td>01450</td>
<td>Test and Balance</td>
<td>13</td>
</tr>
<tr>
<td>01500</td>
<td>Construction Facilities and Temporary Controls</td>
<td>10</td>
</tr>
<tr>
<td>01600</td>
<td>Materials and Equipment</td>
<td>04</td>
</tr>
<tr>
<td>01640</td>
<td>Substitutions</td>
<td>02</td>
</tr>
<tr>
<td>01700</td>
<td>Contract Closeout</td>
<td>04</td>
</tr>
<tr>
<td>01740</td>
<td>Warranties</td>
<td>02</td>
</tr>
</tbody>
</table>

## Division 02 \- Site Work

<table>
<thead>
<tr>
<th>Division</th>
<th>Description</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>02110</td>
<td>Clearing and Grubbing</td>
<td>03</td>
</tr>
<tr>
<td>02200</td>
<td>Demolition</td>
<td>05</td>
</tr>
<tr>
<td>02280</td>
<td>Soil Treatment</td>
<td>03</td>
</tr>
<tr>
<td>02310</td>
<td>Grading</td>
<td>04</td>
</tr>
<tr>
<td>02315</td>
<td>Excavating, Backfilling and Compacting</td>
<td>08</td>
</tr>
<tr>
<td>02319</td>
<td>Base Course</td>
<td>02</td>
</tr>
<tr>
<td>02400</td>
<td>Shoring and Bracing</td>
<td>02</td>
</tr>
<tr>
<td>02500</td>
<td>Site Drainage System</td>
<td>02</td>
</tr>
<tr>
<td>02530</td>
<td>Sewer Lateral Line Construction</td>
<td>03</td>
</tr>
<tr>
<td>02535</td>
<td>Washed Plaster Sand</td>
<td>02</td>
</tr>
<tr>
<td>02551</td>
<td>Site Domestic Water System</td>
<td>02</td>
</tr>
<tr>
<td>02610</td>
<td>Asphalt Concrete Paving</td>
<td>04</td>
</tr>
<tr>
<td>02612</td>
<td>Stabilized Decomposed Granite</td>
<td>03</td>
</tr>
<tr>
<td>02711</td>
<td>Windscreen</td>
<td>02</td>
</tr>
<tr>
<td>02750</td>
<td>Irrigation System</td>
<td>17</td>
</tr>
<tr>
<td>02760</td>
<td>Site Furnishings</td>
<td>03</td>
</tr>
<tr>
<td>02780</td>
<td>Unit Pavers</td>
<td>05</td>
</tr>
<tr>
<td>02800</td>
<td>Landscaping</td>
<td>10</td>
</tr>
<tr>
<td>02830</td>
<td>Chain Link Fences and Gates</td>
<td>04</td>
</tr>
</tbody>
</table>

## Division 03 \- Concrete

<table>
<thead>
<tr>
<th>Division</th>
<th>Description</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>03100</td>
<td>Concrete Forms and Accessories</td>
<td>04</td>
</tr>
<tr>
<td>03200</td>
<td>Concrete Reinforcement</td>
<td>04</td>
</tr>
<tr>
<td>03300</td>
<td>Cast-In-Place Concrete</td>
<td>12</td>
</tr>
<tr>
<td>03331</td>
<td>Lightweight Concrete Floor Fill</td>
<td>04</td>
</tr>
</tbody>
</table>
DIVISION 4 - MASONRY
04220 Concrete Masonry Unit ................................................................. 06
04700 Manufactured Masonry Veneer ......................................................... 04

DIVISION 5 - METALS
05120 Structural Steel ................................................................................. 08
05210 Steel Joists .......................................................................................... 03
05300 Metal Decking ....................................................................................... 04
05500 Metal Fabrications ............................................................................... 04

DIVISION 6 - WOOD AND PLASTICS
06164 Gypsum Sheathing ............................................................................. 02
06200 Finish Carpentry ................................................................................... 03
06400 Architectural Woodwork ....................................................................... 07

DIVISION 7 - THERMAL AND MOISTURE PROTECTION
07131 Sheet Waterproofing at Planters ......................................................... 04
07132 Sheet Waterproofing ............................................................................. 04
07160 Concrete Waterproofing ....................................................................... 07
07210 Building Insulation .............................................................................. 03
07250 Weather Barriers .................................................................................. 05
07410 Metal Wall Panels ............................................................................... 08
07430 Exterior Composite Wall Panels ....................................................... 06
07451 Thermoplastic PVC Roofing .............................................................. 14
07600 Flashing and Sheet Metal ..................................................................... 06
07700 Roof Specialties and Accessories ....................................................... 02
07840 Fire Stops and Smoke Seals ................................................................ 05
07900 Caulking and Sealants ......................................................................... 08
07920 Joint Sealants ....................................................................................... 06

DIVISION 8 - DOORS AND WINDOWS
08110 Steel Doors and Frames ..................................................................... 10
08210 Wood Doors ....................................................................................... 04
08210-01 Sound Control Wood Doors ......................................................... 04
08310 Access Panels ..................................................................................... 04
08330 Coiling Counter Doors ....................................................................... 02
08332 Overhead Coiling Doors .................................................................... 02
08411 Aluminum Framed Entrances and Storefronts .................................... 04
084113 Aluminum Framed Entrances and Storefronts .................................. 04
084413 Glazed Aluminum Curtain Wall ....................................................... 05
084523 Translucent Fiberglass Panels ......................................................... 05
085113 Aluminum Windows .......................................................................... 04
08520 Aluminum Windows ........................................................................... 02
08710 Door Hardware ................................................................................... 32
087500 Power Window Equipment .............................................................. 04
08800 Glazing ............................................................................................... 07

DIVISION 9 - FINISHES
09100 Metal Support Assemblies .................................................................. 07
09220 Portland Cement Plaster and Metal Lath ............................................. 10
DIVISION 10 - SPECIALTIES
10170 Solid Plastic Toilet Compartments ................................................................. 04
10185 Shower and Dressing Compartments ................................................................. 03
10190 Fire Extinguishers and Cabinets ......................................................................... 03
10400 Identification Devices ....................................................................................... 10
10501 Metal Lockers .................................................................................................. 03
10650 Operable Partitions .......................................................................................... 04
10810 Toilet Accessories ............................................................................................ 04

DIVISION 11 - EQUIPMENT
11131 Projection Screens ........................................................................................... 03
116600 Athletic Equipment ......................................................................................... 14
116833 Climbing Wall Flooring .................................................................................. 02

DIVISION 12 - FURNISHINGS
12494 Roller Shades ................................................................................................... 09
12497 Curtains and Drapes ......................................................................................... 05

DIVISION 13 - SPECIAL CONSTRUCTION
13120 Real Rock™ Climbing Wall ................................................................................ 07

DIVISION 14 - CONVEYING SYSTEMS
14240 Hydraulic Elevators ......................................................................................... 08
14422 Wheelchair Lifts ............................................................................................... 04

DIVISION 15 - MECHANICAL
15000 General Requirements .................................................................................... 20
15010 Mechanical General Provisions ........................................................................ 03
15020 Testing, Adjusting, and Balancing ................................................................... 09
15030 Identification .................................................................................................... 04
15050 Basic Mechanical Materials and Methods ...................................................... 22
15060 Pipe and Pipe Fittings ...................................................................................... 05
15100 Valves ................................................................................................................ 03
15120 Piping Specialties ............................................................................................ 02
15190 Mechanical Identification ................................................................................ 02
DIVISION 16 - ELECTRICAL

16000 Electrical Specifications .................................................................................. 53

DIVISION 26 – PV SOLAR SYSTEM

263110 Roof Integrated Crystalline Solar System (RICSS) ........................................... 08

EXHIBIT A SCOPE OF WORK .................................................................................. 06

EXHIBIT B PRELIMINARY GEOTECHNICAL REPORT ............................................ 35

EXHIBIT C STORM WATER POLLUTION PREVENTION PLAN

EXHIBIT D STANDARD URBAN STORM WATER MITIGATION PLAN

EXHIBIT E HAZARDOUS BUILDING MATERIAL SURVEY

EXHIBIT F FIRE ALARM SYSTEM ........................................................................... 16

END OF TABLE OF CONTENTS
SECTION 01005

SUMMARY OF THE WORK

PART 1 - GENERAL

1.01 SECTION INCLUDES

A. The furnishing of all labor, materials, equipment, services and incidentals necessary for Work of the Roxbury Memorial Park Community Center, located at 471 S. Roxbury Drive, Beverly Hills, California.

1.02 RELATED SECTIONS

A. Section 01010: Phasing of the Work
B. Section 01020: Project Forms
C. Section 01005: Alternates
D. Section 01100: Coordination
E. Section 01130: Field Engineering
F. Section 01360: Construction Schedule
G. Section 01450: Test and Balance
H. Section 01500: Construction Facilities and Temporary Controls

PART 2 - PRODUCTS (Not applicable)

PART 3 - EXECUTION

3.01 USE OF PREMISES

A. CONTRACTOR shall coordinate the Work of all trades, with OWNER and/or Separate Work Contract. CONTRACTOR shall sequence, coordinate and perform the Work to impose minimum hardship on the operation and use of the facilities and/or Project site. CONTRACTOR shall install all necessary protection for existing improvements, Project site, property, and new Work against dust, dirt, weather, damage, vandalism, and maintain and relocate all protection to accommodate progression of the Work.

B. CONTRACTOR shall confine entrance and exiting to the Project site and/or facilities to routes designated by OWNER.

C. Within existing facilities OWNER will remove portable equipment, furniture, and supplies from Work areas prior to start of Work. CONTRACTOR shall cover and protect remaining items in areas of the Work.

D. CONTRACTOR shall utilize all available means to prevent generation of unnecessary noise and keep noise levels to a minimum. When directed by OWNER, CONTRACTOR shall immediately discontinue noise-generating activities and/or use alternative methods to minimize noise generation. CONTRACTOR shall install and maintain air compressors, tractors, cranes, hoists, vehicles, and other internal combustion engine equipment with mufflers, including unloading cycle of compressors. CONTRACTOR shall discontinue use of equipment producing objectionable noise as determined by OWNER.
E. CONTRACTOR shall furnish, install and maintain adequate supports, shoring, and bracing to preserve structural integrity and prevent collapse of existing Work modified and or altered as a part of the Work.

F. CONTRACTOR shall secure building entrances and exits and Work areas with locking devices in accordance with OWNER instructions.

G. CONTRACTOR shall protect areas adjacent to the Work in a similar manner. Prior to OWNER occupancy CONTRACTOR shall clean all surfaces including OWNER property.

H. CONTRACTOR shall protect all surfaces, coverings, materials and finished Work from damage. Equip mobile equipment with pneumatic tires.

I. CONTRACTOR is advised OWNER will award Separate Work Contracts at this Project site.

3.02 FURNITURE, FIXTURES AND EQUIPMENT

A. Certain furniture, fixtures and equipment identified in the Contract Documents may be furnished and delivered to the Project site by OWNER.

B. CONTRACTOR shall unload, store, uncrate, assemble, install and connect OWNER supplied furniture, fixtures and equipment.

C. Within ninety (90) days prior to Substantial Completion, CONTRACTOR shall notify OWNER of the scheduled date for installation of furniture, fixtures and equipment. Upon delivery to the Project site, CONTRACTOR shall store furniture, fixtures and equipment inside rooms and or protected spaces. OWNER will sign receipt or bill of lading as applicable.

D. CONTRACTOR shall, within ten (10) days after delivery, uncrate and or unpack furniture, fixtures and equipment in presence of Owner’s Representative who shall inspect the delivered items. Owner’s Representative shall prepare an inspection report listing damaged or missing parts and accessories. Owner’s Representative shall transmit one copy of the report to OWNER and CONTRACTOR. OWNER will procure and or replace missing and or damaged furniture, fixtures and equipment.

E. CONTRACTOR shall install furniture, fixtures and equipment in the locations and orientation as indicated in the Contract Documents. CONTRACTOR shall verify exact locations with OWNER prior to final installation of furniture, fixtures and equipment.

F. If required, OWNER will furnish setting and or placement drawings for furniture, fixtures and equipment.

G. CONTRACTOR shall install furniture, fixtures and equipment by proper means and methods to ensure an installation as recommended by the manufacturer. CONTRACTOR shall furnish and install all necessary fasteners and required blocking to properly install furniture, fixtures and equipment.

H. CONTRACTOR shall install furniture, fixtures and equipment with manufacturer recommended fasteners for the type of construction the furniture, fixtures and equipment is being fastened and or anchored to.
END OF SECTION
PART 1 - GENERAL

1.01 SECTION INCLUDES

A. This Section specifies administrative and procedural requirements governing Contract allowances.

1.) Allowances as set forth in the Specifications are to be used as compensation for items as set forth in this Section. The amounts listed in the schedule and/or Specifications are to be included in the base bid and shall be listed separately in the Schedule of Values and Application for Payment.

B. Type of allowances include the following:

1.) Hazardous material abatement, removal and disposal allowance.

2.) {________} allowance

1.02 RELATED SECTIONS

A. Section 01050: Schedule of Values
B. Section 01080: Application for Payment
C. Divisions 2-16: Technical Specifications

1.03 ALLOWANCES

A. Use the allowances only as authorized for OWNER purposes and only by an approved allowance disbursement form that indicate the amounts to be charged to the respective allowance amount.

B. At Substantial Completion of the Work, credit unused amounts remaining in the allowances to the OWNER by Change Order.

1.04 ALLOWANCE DISBURSEMENT

A. CONTRACTOR shall submit a request for allowance disbursement on an allowance disbursement form. Include all substantiating and/or required data along with the request.

B. The request shall have the requested amount listed as an allowance disbursement without CONTRACTOR overhead and markup.

C. Once the OWNER has accepted the disbursement, ARCHITECT and OWNER will sign the allowance disbursement form.

PART 2 - PRODUCTS (Not Applicable)

PART 3 - EXECUTION

3.01 SCHEDULE OF ALLOWANCES

A. Include in the base bid the following allowances in the amounts stated in the Specifications:

<table>
<thead>
<tr>
<th>Specification Section</th>
<th>Description</th>
<th>Amount</th>
</tr>
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</table>

1
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<th>Hazardous Material Report</th>
<th>Hazardous material abatement</th>
<th>$50,000.00</th>
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</thead>
</table>

END OF SECTION
PART 1 - GENERAL

1.01 SECTION INCLUDES:
   A. This Section specifies administrative and procedural requirements governing bid alternates.

1.02 RELATED SECTIONS:
   A. Section 01005: Summary of the Work

PART 2 - PRODUCTS (Not applicable)

PART 3 - EXECUTION

3.01 SPECIFIC:
   A. An alternate is an amount proposed by bidder and stated on the bid form for certain Work defined in the Bidding Documents that may be added to or deducted from the base bid amount if OWNER decides to accept a corresponding change in either the amount of Work to be completed, the Contract Documents, or in the products, materials, equipment, systems, or installation methods described in the Contract Documents.

   1. The amount added or deducted from the base bid is the net addition to or deducted from the base bid to incorporate alternate Work into the Work. No other adjustments are made to the Contract Amount, Milestones and/or the Contract Time.

3.02 PROCEDURES:
   A. CONTRACTOR shall modify or adjust affected adjacent Work as necessary to completely and fully integrate OWNER accepted alternate Work.

   1. Include as part of each alternate, miscellaneous devices, accessory objects, and similar items incidental to or required for a complete installation whether or not mentioned as part of the alternate.

   B. Accepted alternates are subject to the same terms and conditions as other Work of the Contract Documents.

   C. OWNER reserves the right to accept alternates for a period of ninety (90) days after bid opening date.

   D. Schedule: A schedule of alternates is included at the end of this Section. The Contract Documents referenced in the schedule identify necessary requirements to complete the Work described as specified for each alternate.

3.03 SCHEDULE OF ALTERNATES: (See the Bidding Documents for Additional Information)
   A. Alternate 1: { describe each alternate in these sections and make reference to all appropriate sections, drawings, model numbers. Etc. }
B. Alternate 2:

C. Alternate 3:

D. Alternate 4:

E. Alternate 5:

END OF SECTION
SECTION 01050
SCHEDULE OF VALUES

PART 1 - GENERAL

1.01 SECTION INCLUDES

A. Procedure for submission of the certified Schedule of Values for review and approval by OWNER.

1.02 RELATED SECTIONS

A. Section 01025: Allowances
B. Section 01080: Application for Payment
C. Section 01300: Submittals
D. Section 01360: Construction Schedule

PART 2 - PRODUCTS (Not applicable)

PART 3 - EXECUTION

3.01 PREPARATION

A. Upon receipt of the Notice of Intent to Award, CONTRACTOR shall commence preparation of the certified Schedule of Values.

B. CONTRACTOR shall coordinate the preparation of the certified Schedule of Values with preparation of the Construction Schedule as set forth in Section 01360.

C. CONTRACTOR shall use the table of contents as a Project specific guide to establish the format for the certified Schedule of Values. Provide at least one (1) line item for each Division and/or Specification Section item. Provide separate line items for labor and material where required.

D. Include the following Project identification on the certified Schedule of Values:

1. Project name and location
2. Project Number
3. ARCHITECT name
4. CONTRACTOR name
5. Date of Submittal

E. Round amounts to the nearest whole dollar; the total shall equal the Contract Amount.

F. The approved certified Schedule of Values shall serve as the basis for the monthly certified Application for Payment.
3.02 SUBMITTAL

A. Within five (5) days after the Effective Date of the Contract, CONTRACTOR shall submit five (5) certified copies of the Schedule of Values for review and approval of OWNER.

B. OWNER will review and if necessary, return the submitted certified Schedule of Values with summary comments noting items not in compliance with the requirements of this Section. CONTRACTOR shall revise the certified Schedule of Values and submit five (5) certified copies within three (3) days of receipt of summary comments.

C. Signature by OWNER shall constitute acceptance of the certified Schedule of Values.

D. A copy of the approved certified Schedule of Values will be transmitted to CONTRACTOR, and ARCHITECT.

E. Secure OWNER approval of the certified Schedule of Values prior to submittal of the first certified Application for Payment.

END OF SECTION
SECTION 01080
APPLICATION FOR PAYMENT

PART 1 - GENERAL

1.01 SECTION INCLUDES:

A. This Section specifies administrative and procedural requirements relative to a certified Application for Payment.

1. Coordinate the certified Schedule of Values and certified Application for Payment with, but not limited to, the Construction Schedule, submittal log, and list of Subcontractors.

1.02 RELATED SECTIONS:

1. Section 01025: Allowances
2. Section 01050: Schedule of Values
3. Section 01360: Construction Schedule
4. Section 01700: Contract Closeout

PART 2 - PRODUCTS (Not applicable)

PART 3 - EXECUTION

3.01 APPLICATION FOR PAYMENT

A. Each certified Application for Payment shall be consistent with previous applications and payments as reviewed by ARCHITECT, paid for by OWNER, and:

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

B. Payment Application Times: The period of Work covered by each Application for Payment is and the payment date for each progress payment is as specified in the General Conditions. The period covered by each Application for Payment is the previous month.

C. Payment Application Forms: Use OWNER provided forms for the Application for Payment.

D. Application Preparation: Complete every entry on the form. Include notarization and execution by a person authorized to sign legal documents on behalf of CONTRACTOR. ARCHITECT will return incomplete applications without action.

E. Transmittal: Submit a minimum of three (3) signed and original copies of each certified Application for Payment to the ARCHITECT. All copies shall be complete, including releases and similar attachments.

1. Transmit each copy with a transmittal form listing attachments and recording appropriate information related to the application, in a manner acceptable to ARCHITECT.

F. Initial Application for Payment: Administrative actions and submittals, that must precede or coincide with submittal for the first certified Application for Payment include, but are not limited to, the following:

1. Certified Schedule of Values
3. Worker Compensation certificates, if applicable.
4. Auto Insurance, if applicable.
5. Hazardous Material Insurance Certificates, if applicable.
6. Construction Schedule
7. Submittal Schedule
8. Emergency Contact List
9. Copies of authorizations and licenses from governing authorities for performance of the Work

G. Application for Payment at Substantial Completion: Following ARCHITECT issuance of the certificate of Substantial Completion, submit an Application for Payment:

1. Administrative actions, submittals and/or Work that shall precede or coincide with this application include:
   a. Occupancy permits and similar approvals by authorities having legal jurisdiction over the Work.
   b. Removal of temporary facilities and services.
   c. Testing, adjusting and balance records.
   d. Removal of surplus materials, rubbish, and similar elements.
   e. Meter readings.
   f. Start-up performance reports.
   g. Owner training and orientations.
   h. Change over information related to OWNER occupancy, use, operation and maintenance.
   i. Final cleaning.
   j. Ensure that incomplete Work is not accepted and will be completed without undue delay.
   k. Advice on shifting insurance coverage.
   l. List of incomplete Work, recognized as exceptions to ARCHITECT certificate of Substantial Completion.
   m. Change of door locks to OWNER system.

H. Final Payment Application: Administrative actions and submittals that must precede or coincide with submittal of the final Application for Payment include, but are not limited to, the following:

1. Completion of Contract Closeout requirements.
2. Project record documents.
3. Completion of final punch list items.
4. Delivery of extra materials, products and or stock.
5. Identification of unsettled claims.
6. Proof that taxes, fees, and similar obligations are paid.
7. Operating and maintenance instruction manuals.
8. Consent of surety to final payment.
9. Waivers and releases.
10. Warranties, guarantees and maintenance agreements.

END OF SECTION
SECTION 01100

COORDINATION

PART 1 - GENERAL

1.1 SECTION INCLUDES

A. This Section specifies administrative and procedural requirements necessary for coordinating Work operations including, but not necessarily limited to, the following:

1. General coordination procedures.
2. Coordination drawings.

1.2 RELATED SECTIONS

A. Section 01300: Submittals
B. Section 01360: Construction Schedule
C. Section 01420: Testing and Inspection
D. Section 01450: Test and Balance
E. Section 01700: Contract Closeout

PART 2- PRODUCTS (Not applicable)

PART 3- EXECUTION

3.01 COORDINATION

A. CONTRACTOR shall coordinate operations included in various sections of the Contract Documents to assure efficient and orderly installation of each part of the Work. Coordinate Work operations included under related sections of the Contract Documents that depend on each other for proper installation, connection, and operation of the Work including but limited to:

1. Schedule construction operations in the sequence required 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 assure maximum accessibility for required maintenance, service, and repair.
3. Make provisions to accommodate items scheduled for later installation.
4. Prepare and administer provisions for coordination drawings.

B. Where necessary, prepare memoranda for distribution to each party involved, outlining special procedures required for coordination. Include such items as required in notices, reports, attendance at meetings and:

1. Prepare similar memoranda for OWNER and Separate Work Contract where 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 assure orderly progress of the Work. Such administrative activities include, but are not limited to, the following:

1. Preparation of schedules.
2. Installation, relocation and removal of temporary facilities.
3. Delivery and processing of submittals.
4. Progress meetings.
5. Project closeout activities.

D. Conservation: Coordinate Work operations to assure operations are carried out with consideration given to conservation of energy, water, materials and:

1. Salvage materials and equipment involved in performance of, but not actually incorporated into the Work.

3.02 SUBMITTALS

A. Coordination Drawings: CONTRACTOR shall prepare coordination drawings for coordination of installation of products and materials fabricated by separate entities. Prepare coordination drawings for those areas where limited space availability necessitates maximum utilization of space for efficient installation of different components.

B. Prepare coordination drawings in the following manner:

1. Mechanical, electrical and plumbing Subcontractors are to first submit their respective shop drawings for review in order to make any necessary changes prior to going through the coordination process.

2. The routing process will begin with the HVAC Subcontractor who will provide a black line mylar denoting all of the approved ductwork. HVAC Subcontractor is to locate on mylar all piping in orange pencil lines. In areas without HVAC Work, plumbing Subcontractor will provide the mylar with blue pencil line. Forward drawings to plumbing Subcontractor.

3. Plumbing Subcontractor is to locate the plumbing lines on mylar in blue pencil lines. Fire sprinkler Subcontractor is to locate all piping on mylar in red pencil lines and forward drawing to electrical Subcontractor.

4. Electrical Subcontractor to indicate service and feeder conduit runs in green pencil lines and forward to CONTRACTOR.

5. CONTRACTOR will perform the last coordination review. As each coordination drawing is completed, CONTRACTOR will meet with ARCHITECT and OWNER to review and resolve all conflicts on the coordination drawings.

6. All coordination meetings will be held in the Project field office of CONTRACTOR. CONTRACTOR is required to distribute shop drawings, cut sheets and submittals to Subcontractors where appropriate. Reviewed coordination drawings will be maintained in the Project field office of CONTRACTOR.

END OF SECTION
SECTION 01120
CUTTING AND PATCHING

PART 1 - GENERAL

1.1 SECTION INCLUDES
A. This Section specifies administrative and procedural requirements for cutting and patching.

1.2 RELATED SECTIONS
A. Section 01050: Field Engineering
B. Section 01100: Coordination
C. Section 01200: Project Meetings
D. Section 01300: Submittals
E. Section 01360: Construction Schedule
F. Section 01450: Testing and Inspection
G. Section 01740: Warranties

PART 2 - PRODUCTS (Not applicable)

PART 3 - EXECUTION

3.01 SUBMITTALS
A. The word “cutting” as used in the Contract Documents includes but is not limited to cutting, drilling, chopping, and other similar operations and the word “patching” includes but is not limited to patching, rebuilding, reinforcing, repairing, refurbishing, restoring, replacing, another similar operations.

B. Cutting and Patching Proposal: CONTRACTOR shall submit a proposal describing procedures well in advance of the time cutting and patching will be performed if the Contract Documents requires approval of these procedures before proceeding. Include the following information, as applicable, in the proposal:

1. Describe the extent of cutting and patching required. Denote how it will be performed and indicate why it cannot be avoided.

2. Describe anticipated results in terms of changes to existing construction.

3. List products to be used and firms or entities that will perform this Work.

4. Indicate dates when cutting and patching will be performed.

5. Utilities: List utilities that cutting and patching procedures will disturb or affect. List utilities that will be relocated and those that will be temporarily out-of-service. Indicate how long service will be disrupted.

6. Review by ARCHITECT prior to proceeding with cutting and patching does not waive ARCHITECT right to later require complete removal and replacement of defective Work.

3.02 QUALITY ASSURANCE
A. Operational Limitations: Do not cut and patch operating elements or related components in a manner that would result in reducing their capacity to perform as intended. Do not cut and patch operating elements or related components in a manner that would result in increased maintenance or decreased operational life or safety.
1. Obtain review of the cutting and patching proposal before cutting and patching the following operating elements or safety related systems:
   a. Primary operational systems and equipment
   b. Fire protection systems
   c. Noise and vibration control elements and systems
   d. Control systems
   e. Communication systems
   f. Electrical wiring systems
   g. Operating systems of special construction in Division 13 Sections

3.03 WARRANTY

   A. Existing Warranties: Replace, patch, and repair material and surfaces cut or damaged by methods and with materials in such a manner as not to void any warranties required or existing.

3.04 INSPECTION

   A. Examine surfaces to be cut and patched and conditions under which cutting and patching is to be performed before cutting. If unsafe or unsatisfactory conditions are encountered, take corrective action before proceeding.

   1. Before proceeding, meet at the Project site with parties involved in cutting and patching, including mechanical and electrical trades. Review areas of potential interference and conflict. Coordinate procedures and resolve potential conflicts before proceeding.

3.05 PREPARATION

   A. Temporary support: Provide adequate temporary support of Work to be cut.

   B. Protection: Protect existing improvements and Work during cutting and patching to prevent damage. Provide protection from adverse weather conditions for portions of existing improvements or Work that might be exposed during cutting and patching operations.

   C. Avoid interference with use of adjoining areas or interruption of free passage to adjoining areas.

3.06 PERFORMANCE

   A. General: Employ skilled workmen to perform cutting and patching. Proceed with cutting and patching at the earliest feasible time and complete without delay. Carefully remove existing Work to be salvaged and or reinstalled. Protect and store for reuse into the Work. Verify compatibility and suitability of existing substrates before starting the Work.

   B. Cutting: Cut existing construction using methods least likely to damage elements retained or adjoining Work. Where possible, review proposed procedures with the original installer; comply with the original installer’s recommendations.

   1. In general, where cutting, use hand or small power tools designed for sawing or grinding, not hammering and chopping. Cut holes and slots as small as possible, neatly to size required, and with minimum disturbance of adjacent surfaces. Temporarily cover openings when not in use.

   2. To avoid marring existing finished surfaces, cut or drill from the exposed or finished side into concealed surfaces.

   3. Cut through concrete and masonry using a cutting machine, such as a carborundum saw or a diamond-core drill. Saw cut reinforcing bars and paint ends with bituminous paint except where bonded into new concrete or masonry.
4. Comply with requirements of applicable Division 2 Sections where cutting and patching requires excavating, backfill and re-compaction.

C. Patching: Patch with durable seams that are as invisible as possible. Comply with specified tolerances.

1. Where feasible, inspect and test patched areas to demonstrate integrity of the installation. Verify conditions of existing substrates prior to executing new Work.

2. Restore exposed finishes of patched areas and extend finish restoration into retaining adjoining construction in a manner that will eliminate all evidence of patching and refinishing.

3. Concrete: Maintain the cut edges in a moist condition for twenty four (24) hours prior to the placement of new concrete. In lieu of this an epoxy adhesive may be provided. Finish placed concrete to match existing unless noted otherwise. Concrete shall have a compressive strength 3,000 psi where used to repair and or match existing Work, unless noted otherwise.

3.07 CLEANING

A. Clean areas and spaces where cutting and patching are performed. Completely remove paint, mortar, oils, putty, and similar items. Thoroughly clean piping, conduit, and similar features before applying paint or other finishing materials. Restore damaged pipe covering to its original condition.

END OF SECTION
SECTION 01130
FIELD ENGINEERING

PART 1 - GENERAL

1.01 SECTION INCLUDES
Surveying requirements for the Work.

1.02 RELATED SECTIONS
A. Section 01005: Summary of the Work
B. Section 01100: Coordination
C. Section 01300: Submittals
D. Section 01360: Construction Schedule
E. Section 01700: Contract Closeout

PART 2 - PRODUCTS (Not applicable)

PART 3 - EXECUTION

3.01 SUBMITTALS
A. CONTRACTOR shall submit the name and address of the State of California licensed surveyor to ARCHITECT and OWNER including any changes as they may occur.
B. At request of ARCHITECT or OWNER, CONTRACTOR shall submit copies of cut sheets, coordinate plots, data collector printouts, and other documentation as available to verify accuracy of field surveying work

3.02 LAYOUT OF THE WORK
A. CONTRACTOR shall employ a State of California licensed surveyor to lay out the entire Work, set grades, lines, levels, control points, vertical and horizontal control, elevations, grids and positions. Before the commencement of Work, surveyor shall, in conjunction with OWNER provided engineering survey of the Project site, locate all reference points and benchmarks, then lay out all lines, elevations, and measurements for the entire Work including but not limited to, buildings, grading, paving and utilities.

3.03 SURVEY REQUIREMENTS
A. Establish a minimum of two permanent horizontal and vertical control points on the Project site, remote from the building area, referenced to data established by the survey control points.
B. Indicate the reference points on the project record drawings with the basis of elevation being the established benchmarks.
C. Establish lines, grades, locations and dimensions by instrumentation. From time to time, verify the layout of all Work by the same methods.
D. Provide grade stakes and elevations to construct over excavation and re-compaction, rough and final grades, paved areas, curbs, gutters, sidewalks, building pads, landscaped areas, and other areas as required.

E. Calculate and layout proposed finished elevations and intermediate control as required to provide smooth transitions between the spot elevations indicated in the Contract Documents.

F. Provide stakes and elevations for grading, fill and topsoil placement.

G. Provide adequate horizontal and vertical control to locate utility lines, including but not limited to, storm, sewers, water mains, gas, electric and signal and provide vertical control in proportion to the slope of the line as required for accurate construction. Dry utilities will be based upon adequate horizontal and vertical control layout. Prior to trench closure, survey and record invert and flow line elevations. Survey and record top of curb and flow line elevations on finished concrete or AC surfaces at key locations such as BC’s, EC’s, grade breaks, corners or angle points in sufficient number to demonstrate the Work complies with the intent of the Contract Documents.

H. Provide horizontal and vertical control for batter boards for drainage, utility, and other on-site structures as required.

I. Furnish building corner offsets as required to adequately locate building pads. Provide cut and fill stakes within the building pad perimeter adequate to control both over excavation and re-compaction and the final sub-grade elevation of the building pad.

J. Submit a certification signed by the surveyor confirming the elevations and locations of improvements are in conformance with the Contract Documents. The statement shall include survey notes for the finish floor and building pad, showing the actual measured elevations on the completed sub-grade, recorded to the nearest 0.01’. Building pad tolerance will be ±0.10’.

3.04 RECORD DRAWINGS

A. Upon Substantial Completion, CONTRACTOR shall obtain and pay for reproducible transparencies of the as built survey drawings. Deliver to ARCHITECT, final “record” drawings of the original drawings and completed Work within specified tolerances.

B. Record drawings shall indicate locations by coordinate of all utilities onsite with top of pipe elevations at major grade and alignment changes, rim grate or top-of-curb and flow line elevations of all drainage structures and manholes.

C. Completed record drawing transparencies shall be signed and certified as correct and within specified tolerances by the licensed surveyor.

D. Attention is called to other sections of the Contract Documents requiring verification or measurements of installed Work by survey. Surveyor shall perform and certify all such surveys or verification are completed in accordance with the Contract Documents.

END OF SECTION
SECTION 01150
RESOURCE CONSERVATION

PART 1 - GENERAL

1.01 SECTION INCLUDES

A. Procedures for an environmental program at the Project site including but not limited to:
   1. Use of recycled, toxic-free, and environmentally sensitive materials, equipment, products, and procedures.
   2. Recycling program for waste materials generated by demolition and construction.

1.02 RELATED SECTIONS

A. Section 01100: Summary of the Work
B. Section 01330: Storm Water Pollution Prevention
C. Section 01500: Construction Facilities and Temporary Controls
D. Section 01600: Materials and Equipment
E. Section 01700: Contract Closeout

PART 2 – PRODUCTS (Not applicable)

PART 3 – EXECUTION

3.01 SPECIFIC DEFINITIONS RELATIVE TO THIS SECTION

A. Environmental pollution: The presence of chemical, physical, or biological elements which adversely impact human health or welfare, alter ecological balances of significance to human life or impact or alter the future viability of any species deemed to be of importance to human life or health.

B. Inert fill: Non-liquid solid waste such as soil and concrete, free of hazardous wastes or soluble pollutants.

C. Class III landfill: A landfill that accepts non-hazardous wastes such as household waste, industrial waste, construction waste and demolition waste.

D. Inorganic landfill: Non-reusable items such as solid wastes, such as building materials, packaging, rubbish, debris, and rubble resulting from construction, remodeling, repair, and demolition operations.

E. Rubbish: Combustible and non-combustible wastes, such as paper, boxes, glass, crockery, metal and lumber scrap, tin cans, and bones.

F. Debris: Combustible and non-combustible wastes, such as leaves and tree trimmings that result from construction or maintenance and repair Work.

G. Chemical waste: Substances such as petroleum products, bituminous materials, salts, acids, alkalis, herbicides, pesticides, organic chemicals and inorganic wastes.
H. Garbage: Refuse and scraps resulting from preparation, cooking, distribution, or consumption of food.

I. Sewage: Domestic sanitary sewage.

J. VOC: Volatile organic compounds.

G. MSDS: Material Safety Data Sheets.

3.02 SUBMITTALS

A. Site Management Plan: CONTRACTOR shall submit a plan for proposed solid waste management and environmental protection, including items such as the following:

1. List of federal, state and local laws, regulations and permits concerning environmental protection, pollution control and abatement that are applicable to CONTRACTOR proposed operations.

2. Procedures to be implemented to provide the required environmental protection.

3. The location of the solid waste disposal areas.

4. Procedures for recycling and re-use program.

5. Procedures for rebate programs.

B. Documentation: CONTRACTOR shall submit documentation in the form of a summary of solid wastes generated by construction and demolition operations of the Work. Include manifests, weight tickets, receipts, and invoices from recycling centers and landfills.

C. Closeout Submittals: If required for OWNER rebates, CONTRACTOR shall prepare a three-ring binder with rebate information and product documentation as required to qualify for rebate programs. Submit binder with final closeout submittals.

3.03 QUALITY ASSURANCE

A. CONTRACTOR shall comply with the following as a minimum requirement:

1. Recycling Requirements:
   a. Implement a recycling program that includes separate collection of waste materials such as concrete, porcelain fixtures, ferrous and non-ferrous metals, wood, debris, glass and paper.
   b. Handling: Clean materials contaminated with dirt, adhesives, solvents and other substances deleterious to the recycling processes. Arrange for delivery to recycling centers or salvage yards.
   c. Re-use programs: Coordinate with re-use programs, such as Habitat for Humanities. Deliver items salvaged from construction that can be utilized for re-use.

2. Environmental Controls:
a. Comply with federal, state and local regulations for water, air, solid waste, chemical waste, sanitary waste and sediment pollution.

b. Protection of Natural Resources: Preserve the natural resources within the project site. Prevent oily or other hazardous substances from entering the ground, drainage areas, or local bodies of water in such quantities as to affect normal use, aesthetics, or produce a measurable ecological impact on the area.

3. Project site Administration:

a. Provide training programs to increase awareness of the environmental goals on the Project site.

b. Post MSDS sheets on the Project site. Discuss alternatives to minimize exposure to potentially harmful substances.

c. Schedule Work so that potentially harmful substances or VOC-releasing Work is completed at least seventy-two (72) hours prior to installation of materials or systems that may absorb these substances.

d. Schedule Work involving VOC-releasing substances or potentially harmful substances at night or on weekends when the least number of workers are present. Separate these Work areas with a non-permeable membrane and provide separate ventilation and exhaust during installation and for a minimum of seventy-two (72) hours after installation is complete. Exhaust directly to the exterior; locate exhaust outlets at least one hundred (100) feet from air intakes, inhabitants or workers.

3.04 DELIVERY, STORAGE AND HANDLING

A. CONTRACTOR shall recycle containers and packaging after delivery and uncrating.

3.05 EXCESS MATERIALS

A. Extra Materials: Where excess materials, in excess of the minimum quantities specified for maintenance materials, remain unused after completion of the Work, CONTRACTOR shall make such materials available to OWNER, unless such materials can and will be returned to suppliers for their subsequent reuse. In no event shall such materials be discarded.

3.06 PACKAGING

A. Provide reusable or recyclable packaging for Project site delivered items such as operations and maintenance materials, furniture, equipment, large objects. Generally applies to items over 75 pounds or larger than 120 cubic feet:

1. Polystyrene "peanuts" will be allowed, provided they are collected and recycled.

2. Plastic sheets or films will be allowed only if labeled with recycling symbol indicating type of plastic.

3. Reusable packaging: Items such as blankets, skids and crates that will be returned to the manufacturer or transportation company for future reuse as packaging materials.
4. Recyclable packaging: Items such as boxes, cardboard and paper that will be delivered to a recycling center.

B. After packaging has been removed and prior to application for payment, provide documentation to substantiate that packaging materials have been reused or recycled, and that other requirements have been met.

END OF SECTION
SECTION 01160
REQUEST FOR CLARIFICATION

PART 1 - GENERAL

1.01 SECTION INCLUDES

A. Procedure for requesting clarification of the intent of the Contract Documents.

1.02 RELATED SECTIONS

A. Section 01005: Summary of the Work
B. Section 01100: Coordination
C. Section 01360: Construction Schedule
D. Section 01700: Contract Closeout

PART 2 - PRODUCTS (Not applicable)

PART 3 - EXECUTION

3.01 PROCEDURE

A. CONTRACTOR shall prepare a Request for Clarification on the form provided. CONTRACTOR shall transmit the Request for Clarification to ARCHITECT with copy to OWNER.

B. ARCHITECT response is a clarification of the intent of the Contract Documents and does not authorize changes in the Contract Amount, Milestones and/or Contract Time.

C. A Request for Clarification may be returned with a stamp or notation "Not Reviewed", if, in the opinion of ARCHITECT:

1. The requested clarification is ambiguous or unclear to ARCHITECT

2. The requested clarification is equally available to the requesting party by researching and/or examining the Contract Documents

3. CONTRACTOR has not reviewed the Request for Clarification prior to submittal to ARCHITECT

D. Allow a minimum of seven (7) days for review and response time, after receipt by ARCHITECT. CONTRACTOR shall verify and is responsible in verifying ARCHITECT receipt of a Request for Clarification.

END OF SECTION
SECTION 01200
PROJECT MEETINGS

PART 1 - GENERAL

1.01 SECTION INCLUDES

A. This Section specifies administrative and procedural requirements for Project meetings, including, but not limited to, the following:

   1. Job start meeting.
   2. Pre-installation conferences.
   3. Progress meetings.
   4. Meetings as requested by OWNER.

1.02 RELATED SECTIONS

A. Section 01100: Coordination
B. Section 01300: Submittals
C. Section 01360: Construction Schedule

PART 2 – PRODUCTS (Not applicable)

PART 3 - EXECUTION

3.01 JOB START MEETING

A. In accordance with General Conditions, OWNER will schedule a job start meeting before starting the Work, at a time determined by OWNER. Meeting shall be held at the Project site or another location as determined by OWNER. Meeting will be held in order to review responsibilities, procedures, and other administrative requirements contained within the Contract Documents.

B. Authorized representatives of OWNER, ARCHITECT, CONTRACTOR and other parties shall attend the meeting. All participants at the meeting shall be familiar with the Project and authorized to conclude matters relating to the Work.

C. Agenda items shall include significant items which could affect progress of the Work, including, but not limited to the following:

   1. Preliminary Construction Schedule
   2. Critical work sequencing
   3. Designation of responsible personnel
   4. Identification of OAR
   5. Procedures for processing field decisions
   6. Request for Proposal
   7. Construction Directive and Change Order
   8. Procedures for processing Applications for Payment
   9. Prevailing wages
   10. Submittal of Shop Drawings, Product Data, material lists and Samples
   11. Preparation of project record documents
   12. Use of the Project site and/or premises
   13. Parking availability
   14. Office, work, and storage areas
   15. Equipment deliveries and priorities
   16. Safety procedures
   17. First Aid
   18. Security
   19. Housekeeping
20. Working hours
21. Contract Compliance Officer
22. Insurance Services
23. Environmental Health & Safety

D. ARCHITECT shall prepare and issue meeting minutes to attendees and interested parties no later than five (5) calendar days after the meeting date.

3.02 PRE-INSTALLATION CONFERENCES

A. CONTRACTOR shall coordinate and conduct pre-installation conferences at the Project site as required by related Sections of the Contract Documents.

B. CONTRACTOR, manufacturers and fabricators involved in or affected by the installation and its coordination or integration with other preceeding and or subsequent installations of Work shall attend the meeting. CONTRACTOR shall advise OWNER and ARCHITECT of scheduled meeting dates in order to secure their attendance.

1. CONTRACTOR shall review the progress of other construction activities and preparations for the particular activity under consideration at each pre-installation conference, including requirements for the following:
   a. Contract Documents
   b. Options
   c. Related Construction Directives and Change Orders
   d. Purchases
   e. Deliveries
   f. Shop Drawings, Product Data, and quality-control samples
   g. Review of mockups
   h. Possible conflicts
   i. Compatibility problems
   j. Time schedules
   k. Weather limitations
   l. Manufacturer’s recommendations
   m. Warranty requirements
   n. Compatibility of materials
   o. Acceptability of substrates
   p. Temporary facilities
   q. Space and access limitations
   r. Governing regulations
   s. Safety
   t. Inspecting and testing requirements
   u. Required performance results
   v. Recording requirements
   w. Protection

2. CONTRACTOR shall record significant discussions and directives received from each conference. CONTRACTOR shall, within three (3) calendar days after the meeting date, distribute the minutes of the meeting to all concerned parties, including, but not limited to, OWNER, IOR and ARCHITECT.

3.03 PROGRESS MEETINGS

A. Progress meetings will be held at the Project site at regular intervals, typically weekly, as determined by OWNER.

B. In addition to representatives of CONTRACTOR, OWNER and ARCHITECT, each Subcontractor, supplier, or other entity concerned with current progress or involved in planning, coordination, or performance of the Work shall, if requested by OWNER, be
represented at these meetings. All participants at the conference shall be familiar with the Project and authorized to conclude all matters relating to the Work.

C. Failure of the CONTRACTOR to be so represented at any job meeting which is held at a mutually agreed time or for which a written notice is given, shall not relieve CONTRACTOR from abiding by any and all OWNER or ARCHITECT determinations or directives issued at such meeting.

D. OWNER will review and correct or approve minutes of the previous progress meeting and will review other significant items affecting progress. Topics for discussion as appropriate to the status of the Project include but are not limited to:

a. Interface requirements
b. Construction Schedule
c. Sequence and coordination
d. Status of submittals / RFC’s
e. Deliveries
f. Off-site fabrication
g. Access
h. Site utilization
i. Temporary Construction Facilities and Controls
j. Hours of work
k. Hazards and risks
l. Housekeeping
m. Quality and workmanship
n. Unforeseen conditions
o. Testing and Inspection
p. Defective Work
q. Construction Directive
r. Request for Proposal
s. Change Order Proposals and Change Orders
t. Documentation of information for payment requests
u. Application for Payment
v. Other items as required or as brought forth.

E. No later than five (5) working days after each meeting, ARCHITECT will prepare and distribute minutes of the meeting to each present and absent party. Include a brief summary, in narrative form, of progress, decisions, directives, actions taken and all other issues since the previous meeting and report.

1. Schedule Updating: If required, CONTRACTOR shall revise the Construction Schedule after each progress meeting where revisions to the schedule have been made or recognized. Issue the revised schedule concurrently with the next scheduled meeting.

3.04 ADDITIONAL MEETINGS

A. OWNER, upon giving notice to the intended parties and without further obligation, may require additional meetings to discuss Work and/or Project related activities.

END OF SECTION
SECTION 01300

SUBMITTALS

PART 1 - GENERAL

1.01 SECTION INCLUDES

A. Administrative and procedural requirements for submittals required for the Work, including, but not limited to; Shop Drawings, Product Data, Samples, material lists, and quality control items as required by the Contract Documents.

B. Wherever possible, throughout the Contract Documents, the minimum acceptable quality of workmanship and products has been defined by the name and catalog number of a manufacturer and by reference of recognized industry standards.

C. To ensure that specified products are furnished and installed in accordance with the design intent, procedures have been established for submittal of design data and for its review by ARCHITECT, OWNER and/or others.

1.02 RELATED SECTIONS

A. Section 01010: Phasing of the Work
B. Section 01020: Project Forms
C. Section 01050: Schedule of Values
D. Section 01080: Application for Payment
E. Section 01100: Coordination
F. Section 01120: Cutting and Patching
G. Section 01130: Field Engineering
H. Section 01330: Storm Water Pollution Prevention
I. Section 01360: Construction Schedule
J. Section 01420: Testing and Inspection
K. Section 01450: Test and Balance
L. Section 01500: Construction Facilities and Temporary Controls
M. Section 01640: Substitutions
N. Section 01700: Contract Closeout
O. Section 01740: Warranties

PART 2 – PRODUCTS (Not applicable)

PART 3 - EXECUTION

3.01 PROCEDURES

A. CONTRACTOR shall package each submittal appropriately for transmittal and handling. CONTRACTOR shall transmit each submittal to ARCHITECT with copy to OWNER. ARCHITECT and/or OWNER will not accept submittals received from sources other than from CONTRACTOR.

B. After ARCHITECT review, ARCHITECT will transmit submittals to CONTRACTOR, and OWNER and/or others as required. Work shall not commence, unless otherwise approved by OWNER, unless approved submittals are transmitted to CONTRACTOR.
C. CONTRACTOR shall clearly identify any deviations from the Contract Documents on each submittal. Any deviation not so noted even though stamped reviewed is not acceptable.

D. CONTRACTOR shall coordinate each submittal with fabrication, purchasing, testing, delivery, other submittals, and related activities requiring sequential activity.

E. Timing of Submittals:

1. In accordance with General Conditions CONTRACTOR shall submit to ARCHITECT those Shop Drawings, diagrams, materials lists, Samples and other submittals required by the Contract Documents.

2. The schedule of submittals shall provide adequate time between submittals in order to allow for proper review without negative impact to the Milestones Schedule.

3. Schedule of submittals shall be related to Work progress, and shall be so organized as to allow sufficient time for transmitting, reviewing, corrections, resubmission and re-reviewing.

4. CONTRACTOR shall coordinate submittal of related items and ARCHITECT reserves the right to withhold action on a submittal requiring coordination with other submittals until all related submittals are received by ARCHITECT.

5. CONTRACTOR shall revise, update and submit submittal schedule to ARCHITECT and OWNER on the first of each month, or as required by OWNER.

6. CONTRACTOR shall allow in the Milestones Schedule, at least fourteen (14) days for ARCHITECT review following receipt of submittal. For mechanical, plumbing, electrical and other submittals requiring joint review with OWNER, CONTRACTOR shall allow a minimum of fourteen (14) days following ARCHITECT receipt of submittal.

7. No adjustments to the Contract Time and/or Milestones will be authorized because of a failure to transmit submittals to ARCHITECT sufficiently in advance of the Work to permit review and processing.

8. In case of product substitution, shop drawing preparation shall not commence until such time ARCHITECT and OWNER reviews said submittal relative to the General Conditions.

G. If required, resubmit submittals in a timely manner. Resubmit as specified for initial submittal but identify as such. Review times for re-submitted items shall be as per the time frames for initial submittal review.

H. Shop Drawing preparation shall not commence until such time as CONTRACTOR receives Product Data approval.

I. ARCHITECT, or authorized agent, will stamp each submittal with a uniform, action stamp. ARCHITECT, or authorized agent, will mark the stamp appropriately to indicate the action taken, as follows:

   1. Final Unrestricted Release: When ARCHITECT, or authorized agent, marks a submittal "Reviewed", the Work covered by the submittal may proceed
provided it complies with requirements of the Contract Documents. Final payment depends on that compliance.

2. Final-But-Restricted Release: When ARCHITECT, or authorized agent, marks a submittal "Reviewed as Noted ", the Work covered by the submittal may proceed provided it complies with notations or corrections on the submittal and requirements of the Contract Documents. Final payment depends on that compliance.

3. Returned for Re-submittal: When ARCHITECT, or authorized agent, marks a submittal “Rejected, Revise and Resubmit”, do not proceed with Work covered by the submittal, including purchasing, fabrication, delivery, or other activity. Revise or prepare a new submittal according to the notations; resubmit without delay. Repeat as necessary to obtain different action mark. In case of multiple submittals covering same items of Work, CONTRACTOR is responsible for any time delays, schedule disruptions, out of sequence Work, or additional costs due to multiple submissions of the same submittal item. Do not use, or allow others to use, submittals marked “Rejected, Revise and Resubmit “ at the Project site or elsewhere where Work is in progress.

4. Other Action: Where a submittal is for information or record purposes or special processing or other activity, the ARCHITECT, or authorized agent, will return the submittal marked " Action Not Required ".

3.02 SHOP DRAWINGS

A. Shop Drawings are original drawings prepared by CONTRACTOR, Subcontractor, supplier, or distributor illustrating some portion of Work by showing fabrication, layout, setting, or erection details. Do not reproduce Contract Documents or copy standard information as the basis of Shop Drawings.

B. Produce Shop Drawings to an accurate scale that is large enough to indicate all pertinent features and methods. Except for templates, patterns and similar full-size drawings, submit Shop Drawings on sheets at least 8-1/2 x 11 inches but no larger than 24 x 36 inches.

C. Shop Drawings shall include fabrication and installation drawings, setting diagrams, schedules, patterns, templates and similar drawings. Include the following information:

1. Dimensions
2. Identification of products and materials included by sheet and detail number.
3. Compliance with specified standards.
4. Notation of coordination requirements.
5. Notation of dimensions established by field measurement.

D. Provide a space approximately 4 by 5 inches on the label or beside the title block on Shop Drawings to record CONTRACTOR and ARCHITECT review, and the action taken. Include the following information on the label for processing and recording action taken:

1. Project name.
2. Date.
3. Name and address of ARCHITECT.
4. Name and address of CONTRACTOR.
5. Name and address of Subcontractor.
6. Name and address of supplier.
7. Name and address of manufacturer.
8. Name and title of appropriate specification section.
9. Drawing number and detail references, as appropriate.

E. Unless otherwise agreed to or indicated in individual Specification Sections, submit a sufficient number to allow for adequate CONTRACTOR, Subcontractor, supplier, manufacturer and fabricators distribution plus two sets to be retained by ARCHITECT, one set to be transmitted to IOR and one set to OWNER.

3.03 PRODUCT DATA

A. Collect Product Data into a single submittal for each element of Work or system. Product Data includes printed information, such as manufacturer’s installation instructions, catalog cuts, standard color charts, roughing-in diagrams and templates, wiring diagrams, schedules, illustrations and performance curves.

1. Mark each copy to show or delineate pertinent materials, products, models, applicable choices and options. Where Product Data includes information on several products that are not required, clearly mark copies to indicate the applicable information. Include the following information:
   
a. Manufacturer’s printed recommendations.
b. Compliance with trade association standards.
c. Compliance with recognized testing agency standards.
d. Application of testing agency labels and seals.
e. Notation of dimensions verified by field measurement.
f. Notation of coordination requirements.
g. Notation of dimensions and required clearances.
h. Indicate performance characteristics and capacities.
i. Indicate wiring diagrams and controls.

2. Do not submit Product Data until compliance with requirements of the Contract Documents has been confirmed.

C. Required Copies and Distribution: Same as denoted in sub-section 3.02, E.

3.04 SAMPLES

A. Procedure:

1. Submit Samples of sufficient size, quantity, cured and finished and physically identical to the proposed product or material. Samples include partial or full sections or range of manufactured or fabricated components, cuts or containers of materials, color range sets, and swatches denoting color, texture and or pattern.

   a. Mount or display samples in the manner to facilitate review of qualities indicated. Include the following:

      1. Specification Section number and reference.
      2. Generic description of the Sample.
      3. Sampling source.
      4. Product name or name of manufacturer.
      5. Compliance with recognized standards.
      6. Availability and delivery time.
2. Submit Samples for review of size, kind, color, pattern and texture. Submit Samples for a final check of these characteristics with other elements and a comparison of these characteristics between the final submittal and the actual component as delivered and installed.

   a. Where variations in color, pattern, texture, or other characteristic is inherent in the material or product represented, submit at least three (3) multiple units that show the approximate limits of the variations.

   b. Refer to other Specification Sections for requirements for Samples that illustrate workmanship, fabrication techniques, assembly details, connections, operation, and similar construction characteristics.

   c. Refer to other Sections for Samples to be returned to CONTRACTOR for incorporation into the Work. Such Samples must be undamaged at time of use. On the transmittal indicate special requests regarding disposition of Sample submittals.

   d. Samples not incorporated into the Work, or otherwise not designated as OWNER property, remain the property of CONTRACTOR and shall be removed from the Project site prior to Substantial Completion.

3. Color and Pattern: Whenever a choice of color or pattern is available in a specified product, submit accurate color chips and pattern charts to ARCHITECT for review and selection.

4. Number Required: Submit 5 of each. Two will be returned to CONTRACTOR with one to ARCHITECT, and OWNER.

B. When specified, erect field Samples and mock-ups at the Project site to illustrate products, materials, or workmanship and to establish standards by which completed Work shall be judged.

C. Maintain sets of Samples, as returned, at the Project site, for quality comparisons throughout the course of the Work. Sample sets may be used to obtain final acceptance of the Work associated with each set.

3.05 QUALITY CONTROL SUBMITTALS

A. Submit quality control submittals, including design data, certifications, manufacturer’s field reports, and other quality control submittals as required under other Sections of the Contract Documents.

B. When other Sections of the Contract Documents require certification of a product, material and/or installation complies with specified requirements, submit a notarized certification from the manufacturer certifying compliance with specified requirements.

C. Certification shall be signed by an officer of the manufacturer or other individual authorized to sign documents on behalf of the represented company.

D. Requirements for submittal of inspection and test reports are specified in other Sections of the Contract Documents.
END OF SECTION
PART 1 - GENERAL

1.01 SECTION INCLUDES

A. Required procedures, preparation, submittals, reviews, updates, and revisions to the construction schedule.

1.02 RELATED SECTIONS

A. Section 01005: Summary of the Work
B. Section 01050: Schedule of Values
C. Section 01080: Application for Payment
D. Section 01300: Submittals
E. Section 01420: Testing and Inspection
F. Section 01450: Test and Balance
G. Section 01500: Construction Facilities and Temporary Controls
I. Section 01700: Contract Closeout

PART 2 – PRODUCTS

2.01 SCHEDULING SOFTWARE

A. CONTRACTOR shall utilize Primavera Project Planner™ for Windows® (P3) software (latest version) by Primavera Systems, Inc., or equivalent scheduling software and employ the Critical Path Method (CPM) in the development and maintenance of the Milestones Schedule network in Precedence Diagram Mode (PDM). The scheduling software shall be capable of being resource loaded with manpower, costs and materials. It shall also be capable of generating time-scaled logic diagrams, resource histograms and profiles, bar charts, layouts and reports with any and/or all activity detail. OWNER will consider accepting SureTrak Project Manager™ software (latest version) by Primavera Systems, Inc. in lieu of P3 upon written request by CONTRACTOR and OWNER acceptance in writing.

B. In utilizing Primavera Project Planner the schedule calculation rules, auto cost rules and resource calculation rules shall be in a format acceptable to OWNER.

PART 3 – EXECUTION

3.01 SUBMITTALS

A. CONTRACTOR shall submit six (6) 11”x17” colored copies and two (2) 3.5” computer disks of all Milestones Schedules. CONTRACTOR shall submit three (3) copies of all bar charts, reports and/or other required data.

B. CONTRACTOR shall submit a resume of the proposed scheduler for review and acceptance prior to the preparation of any Milestones Schedule. CONTRACTOR shall retain at least one full time scheduler with a minimum of five (5) years direct experience using automated scheduling systems of the types set forth in this Section. Scheduler will cooperate with ARCHITECT and OWNER and shall be available on a full time basis for continuously
monitoring, maintaining and updating the detailed Milestones Schedule. OWNER has the right to refuse to accept the scheduler based upon lack of experience as required by this Section. If OWNER refuses to accept the proposed scheduler, CONTRACTOR shall propose another scheduler meeting the stated experience requirements.

C. Preliminary Milestones Schedule.

D. Initial Milestones Schedule.

E. Weekly, monthly, rolling and recovery schedules as required.

3.02 PRELIMINARY AND INITIAL SCHEDULE

A. Within ten (10) days after the Effective Date of the Contract, CONTRACTOR shall develop and submit the preliminary Milestones Schedule as required by the General Conditions. Submittal activities shall be incorporated into the schedule. ARCHITECT and/or OWNER review of the preliminary Milestones Schedule shall not confirm and/or represent it as being a complete listing of all submittals required by the Contract Documents.

B. Within ten (10) days after the commencement of the Contract Time, CONTRACTOR shall submit the initial Milestones Schedule as required by the General Conditions. The initial Milestones Schedule shall include all of the detailed activities for the first 120 calendar days of the Contract Time. CONTRACTOR shall update the initial Milestones Schedule as specified and submit until it is accepted. Since updates to the initial Milestones Schedule are basis for payment to CONTRACTOR during first four month period, submittal and acceptance of such updates shall be a condition precedent to making of monthly payment. Upon final acceptance of the initial Milestones Schedule it shall become the Milestones Schedule against which all subsequent schedule updates shall be made; against which CONTRACTOR shall report progress to and/or variances from, and by which OWNER shall measure CONTRACTOR performance and progress.

3.03 CPM NETWORK

A. CPM network shall incorporate activity descriptions, sequence, logic relationships, duration estimates, resource loading and other information as set forth in this Section including but not limited to:

1. The CPM network shall include all Milestones as well as all engineering, fabrication and delivery dates required to support the Milestones.

2. Activities to be integrated and shown in the CPM network shall include in addition to all construction activities: Milestones representing CONTRACTOR submittal dates of all critical submittals; activities representing ARCHITECT and/or OWNER review period of each submittal with each review period scheduled for no less than fourteen (14) days; procurement of materials and equipment; manufacture and/or fabrication; testing and delivery to the Project site of special material and major equipment; equipment installation and preliminary, final and performance testing of equipment or systems installed under the Contract Documents.

3. Indicate start and completion dates for all temporary facilities; construction of mock-ups, prototypes and/or samples; punch list; OWNER interfaces and furnishing of items; interfaces with Separate Work Contracts and regulatory agency approvals; securing of approvals and permits required for performance of the Work.
4. Shall take into account all foreseeable factors or risks affecting or which may affect; performance of the Work including historical and predicted weather conditions; applicable laws, regulations or collective bargaining agreements pertaining to labor, transportation, traffic, air quality, noise and any other applicable regulatory requirements.

5. CONTRACTOR shall not use any float suppression techniques such as preferential sequencing or logic, special lead/lag constraints or unjustifiably over-estimating activity durations in preparing the construction schedule except that finish no later than constraints for Milestones will be permissible.

6. CONTRACTOR will include with the CPM network a written narrative report sufficiently comprehensive to explain basis and determinations of CONTRACTOR approach to the Work including but not limited to: activity durations; manpower flow; average crew sizes; equipment requirements; production rates and long-lead items; restraints: critical path activities that contain time contingencies for impacts to be expected from normal rainfall; holidays and other non-work days; potential problem areas; permits; required coordination with authorities, utilities, Separate Work Contracts and other parties; and long lead delivery items requiring more than thirty (30) days from the date of order to delivery on the Project site.

B. ARCHITECT and/or OWNER will notify CONTRACTOR of any recommended adjustments to the CPM network. CONTRACTOR shall perform any required adjustments to the CPM network and resubmit it for acceptance certifying in writing all information contained therein complies with the Contract Documents.

C. Upon notification by OWNER of acceptance of the CPM network, CONTRACTOR shall prepare computer plots and printouts, and complete submission of the Milestones Schedule, which shall include the following, as a minimum:

1. Bar charts, generated separately using the format template provided by OWNER for:
   (a) Milestones only;
   (b) Summary level sorted by craft/trade and area;
   (c) Detail sorted by date;
   (d) Detail sorted by responsibility.

2. Reports, generated separately using the format template provided by OWNER for:
   (a) Float sorted low to high;
   (b) Resource histogram.

3. Activities must be coded to OWNER Activity Code Structure, which will be defined and provided to CONTRACTOR.

3.04 MILESTONES

A. Milestones are designated dates as set forth in the Milestones Schedule in which Work or portions thereof are required to be started and/or completed in accordance with the Contract Documents including but not limited to:
1. Where the term completion or similar terms are used in the designation of a Milestone, it shall be construed to mean all portions of the Work in the indicated phase, area and/or zone are complete and acceptable to OWNER. Where the term start or similar terms are used in the designation of a Milestone, it shall be construed to mean a portion of the Work in the indicated phase, area and/or zone is required to be commenced.

2. CONTRACTOR shall identify all OWNER defined Milestones in the Milestones Schedule. OWNER defined Milestones shall serve as an essential instrument of measurement by ARCHITECT and OWNER of CONTRACTOR compliance with the Milestones Schedule.

3.05 MILESTONES SCHEDULE

A. Milestones Schedule shall represent CONTRACTOR plan to complete the Work within the Milestones and/or Contract Time however:

1. A schedule extending beyond the Milestones and/or Contract Time will not be acceptable.

2. A schedule indicating Work completed in less than the Milestones and/or Contract Time will not be acceptable. CONTRACTOR shall indicate any available float.

3. A schedule found unacceptable by the OWNER and/or ARCHITECT shall be revised by CONTRACTOR and resubmitted within five (5) days.

B. Milestones Schedule shall clearly indicate sequence of construction activities and specifically indicate:

1. Start and completion of all items of Work and their major components, the Project and all Milestones identified by OWNER.

2. Activities for procurement, delivery, installation of equipment, materials and other supplies, including:
   a. Time for submittals, re-submittal, and reviews. Include decision dates for selection of finishes.
   b. Time for fabrication and delivery of manufactured products for the Work.
   c. Interdependence of procurement and construction activities.
   d. Dates for mobilization, test and balance of equipment, Substantial Completion, and Final Completion.

C. Milestones Schedule shall be in sufficient detail to assure adequate planning and execution of Work including but not limited to:

1. Each activity shall range in duration from 1 to 15 workdays, with exception of fabrication and procurement activities, unless directed otherwise by OWNER. Activity durations shall be total of actual days required to perform and complete that activity and shall not include consideration of weather impact on the activity.
2. Shall be cost and resource-loaded with the resulting total equal to the Contract Amount and shall include all associated interface activities contained within the Contract Documents including, but not limited to, OWNER maintenance and operations activities and/or interim housing schedules, which will be provided by OWNER.

3. Shall be designed, in judgment of the ARCHITECT and/or OWNER to allow monitoring and evaluation of progress in performance of the Work and it shall be calendar time-scaled in precedence diagramming method (PDM).

4. Activities shall include:
   a. A description of what is to be accomplished and where.
   b. Workday duration.
   c. Responsibility code identifying the performing party for each individual activity.
   d. Area of Work shall be coded on each Work activity.
   e. Phase of Work shall be coded on each Work activity.

5. Network shall show continuous flow from left to right.

6. Identify days per week and shifts per day worked; also, non-work days and holidays.

7. Identify activities that constitute controlling operations, i.e., Milestones or critical path.

8. ARCHITECT and/or OWNER may require additional coding of activities.

D. Notwithstanding acceptance of the Milestones Schedule, failure to identify and/or include any element of the Contract into the Milestones Schedule shall not release CONTRACTOR from obligation of completing all required Work in accordance with any Milestones.

E. Submittal of the Milestones Schedule shall constitute CONTRACTOR confirmation the schedule meets the requirements of the Contract Documents, and the Work will be executed in the sequence indicated in the Milestones Schedule.

F. CONTRACTOR shall allocate the following number of days within the indicated calendar month wherein rainfall in excess of 0.01 inches can be normally anticipated to occur at the Project site based on 50-year data 1947-1997 compiled from National Climate Data Cooperative network by National Climate Data center of the National Weather Service of the National Oceanographic and Atmospheric Administration:

<table>
<thead>
<tr>
<th>Month</th>
<th>Jan</th>
<th>Feb</th>
<th>Mar</th>
<th>Apr</th>
<th>May</th>
<th>Jun</th>
<th>Jul</th>
<th>Aug</th>
<th>Sep</th>
<th>Oct</th>
<th>Nov</th>
<th>Dec</th>
</tr>
</thead>
<tbody>
<tr>
<td>Days</td>
<td>6</td>
<td>5</td>
<td>5</td>
<td>4</td>
<td>1</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>1</td>
<td>0</td>
<td>3</td>
<td>5</td>
</tr>
</tbody>
</table>

These days are to be accounted for in the Milestones Schedule and are to be considered as cumulative from commencement of the Contract Time to Substantial Completion. During a
month where the actual rain days are less than the allotted rain days, the remaining days shall be used to offset rain days exceeding those given for other months. Unusually severe weather as set forth in General Condition Section 12.2 shall be defined as any month where actual rain days exceed the allotted amount.

3.06 REQUIREMENTS FOR WEEKLY/MONTHLY REVIEW AND UPDATING

A. Prepare updated Milestones Schedule by one of following two methods:

1. When updating current Milestones Schedule with actual Work progress only (non logic changes), status current Milestones Schedule with actual start and finish dates, remaining durations, and percent completion of cost and resource loaded activities and submit to OWNER and ARCHITECT for review as specified.

2. When updating current Milestones Schedule with logic changes, Construction Directives, Change Orders, delay / disruption activities, or recovery plans, prepare a fragnet as set forth in Section 3.07 and submit to OWNER and ARCHITECT for review. Incorporate changes into current Milestones Schedule prior to data date.

B. When Work is associated with a Change Order, incorporate adjustments to the schedule. The adjustments shall be resource-loaded with material unit quantities and the corresponding cost account, resources account codes, activity description, accepted costs and time adjustments. The activity ID number shall identify the number of the Change Order.

G. Float is not for exclusive use or benefit of either OWNER or CONTRACTOR but is an expiring resource available to both parties on a non-discriminatory basis. If required to meet specified Milestones, either party may utilize float. Adjustments to the Milestones and/or Contract Time will be only be authorized by Change Order and only to the extent the claimed adjustment exceed total float along the most critical path of the current Milestones Schedule in effect at the time of the claimed adjustment. The claimed adjustments to the Milestones and/or Contract Time must also cause the Final Completion date to exceed that currently indicated in the Milestones Schedule. CONTRACTOR claimed adjustments to an existing negative float path will not receive consideration until the activity with the highest negative float is driven even further negative. Claimed adjustments to the Milestones and/or Contract Time will be administered in conjunction with those set forth in the General Conditions.

H. Pursuant to the float sharing requirements of this Section, the use of float suppression techniques such as preferential sequencing or logic, special lead / lag logic restraints, and extended activity times or durations are prohibited and the use of float time disclosed or implied by the use of alternate float suppression techniques shall be proportionally shared to benefit OWNER and CONTRACTOR. The use of any network technique solely for purpose of suppressing float will be cause for rejection of the submitted Milestone Schedule.

I. CONTRACTOR shall attend weekly and monthly Milestones Schedule review meetings in order to accomplish the following:

1. Reflect current Work progress in updates.
2. Provide all specified reporting.
3. Take remedial action to mitigate schedule variances.

F. ARCHITECT, OWNER and CONTRACTOR shall conduct weekly reviews of the progress of the Work and compare such progress to the Milestones Schedule, the schedule of submittals and the four-week rolling schedule. The weekly schedule review shall include, at a minimum:
1. CONTRACTOR shall update and status the Milestones Schedule databases weekly prior to review. Utilizing the "Project Groups/Project" feature of P3, CONTRACTOR shall include submittal schedule and material procurement schedule information linked to the Milestones Schedule activity information in each update and or status.

2. When expanding activities to reduce maximum durations from twenty (20) days to five (5) days, CONTRACTOR shall identify expanded activities so the baseline activity they originate from is readily apparent. CONTRACTOR shall not allow the aggregate duration of the expanded activities to exceed the duration assigned to their parent activity in the baseline Milestones Schedule unless specifically permitted by OWNER in writing.

3. CONTRACTOR shall prepare a four-week rolling schedule immediately following the weekly update/status of and from the Milestones Schedule database and shall ensure it accurately reflects progress of the Work. CONTRACTOR shall provide ARCHITECT and OWNER with printed copies as well as electronic files on disk.

4. CONTRACTOR shall review of all submissions, submittal reviews, fabrication/delivery status, Work started and/or completed in the preceding week, all Work in progress, and scheduled Work for the upcoming twenty-one (21) days.

5. CONTRACTOR shall review all revisions, added and/or deleted Work, and shall determine and incorporate these into CONTRACTOR plan of the Work.

6. CONTRACTOR shall review all interfacing and coordination with Separate Work Contracts.

7. CONTRACTOR shall review progress and allocation of Work forces. Each report shall indicate a planned curve and an actual curve plotted on the same graph, where the planned curve derived from the accepted resource-loaded baseline Milestones Schedule.

8. CONTRACTOR shall provide variance reports including all activities in excess of two (2) days behind schedule and proposed mitigation measures for each item on the variance report.

9. CONTRACTOR shall, at a minimum, attend review meetings prepared to discuss actual activity start and/or completion dates and any applicable variances, forecast activity start and/or completion dates and any applicable variances and progress of all activities underway at the time of the review.

10. During reviews, CONTRACTOR shall alert ARCHITECT and OWNER of all activities behind schedule and further identify all activities and/or Milestones impacted by such variances. CONTRACTOR shall prepare and transmit to ARCHITECT and OWNER proposed recovery plans to regain time lost due to variances.

11. Following review of the recovery plan and all other information relevant to the progress of the Work, CONTRACTOR shall adjust its Work plan as required to assure compliance with the Milestones Schedule. If the latest calculated completion date for any critical activity (total float less than or equal to 2 work days) does not fall within the time allowed by the Milestones Schedule, the sequence of Work and or performance of the Work shall be revised by CONTRACTOR. CONTRACTOR shall, by means of utilizing concurrent operations, additional Work force allocations, additional shifts, overtime, etc., provide all such means until a subsequent Milestones Schedule indicates all Milestones will be met. The requirement for such additional Work force allocations, additional shifts, overtime, etc., does not entitle CONTRACTOR to an adjustment in the Contract Amount.
12. CONTRACTOR shall derive from the Milestones Schedule database and provide a weekly four-week rolling schedule (1-week back, 3 weeks ahead) in printed form and with electronic files on disk. At the next Project meeting review, CONTRACTOR shall submit an updated four-week rolling schedule indicating any remedial measures necessary to maintain compliance with the Milestones Schedule.

G. Simultaneously with each submittal of an Application for Payment, CONTRACTOR shall deliver to ARCHITECT and OWNER an updated Milestones Schedule reflecting progress of the Work up until the end of the previous reporting period. Each such Milestones Schedule shall indicate actual Work progress to date together with a projected schedule for completion of the Work. No changes in logic will be permitted unless agreed upon with OWNER.

H. ARCHITECT, OWNER and CONTRACTOR shall conduct monthly reviews to determine: planned versus actual progress to date; compliance with submittal requirements, Milestones and accepted Milestones Schedule; determination of any changes to the Work plan or implementation which must be made by CONTRACTOR to comply with the Milestones Schedule. The monthly schedule review shall include, at a minimum:

1. All requirements of weekly reviews listed above. Monthly update/status of electronic database shall include recording of all actual start dates and actual finish dates and status of activities in progress.

2. Review of planned versus actual Work force allocations and progress for the preceding month.

3. Review of revisions, added and/or deleted Work and how those are being integrated into CONTRACTOR Work plan.

4. Review of CONTRACTOR interface and coordination with Separate Work Contracts.

5. Review of all impacts to the Work during the preceding month and to date, CONTRACTOR evaluation of those impacts and any recovery plans or remedial actions required in order to meet the Milestones Schedule.

6. Submission of a stand alone fragmented network if current progress reflects negative float of minus ten (10) days or more for any Milestone activity. Detail activities affected, date delay and/or disruption occurred or productivity rates which were impacted and unmitigated impacts to schedule caused by such events. Submit similar fragnet detailing CONTRACTOR plan to mitigate delay and/or disruption and subsequent impacts to schedule. Provide written narrative describing circumstances that caused delay and/or disruption and methodology used to determine delay and/or disruption. Submission of such fragnets does not constitute permission to proceed with the plan.

Following review of the above and all other information relevant to the progress of the Work, CONTRACTOR shall adjust the Work plan and submit a revised Milestones Schedule for acceptance. CONTRACTOR shall, by means of utilizing concurrent operations, additional Work force allocations, additional shifts, overtime, etc., provide all such means until a subsequent Milestones Schedule indicates all Milestones will be met. The requirement for additional Work force allocations, additional shifts, overtime, etc., does not entitle CONTRACTOR to an adjustment in the Contract Amount.

I. The Milestones Schedule shall be updated by CONTRACTOR on a weekly basis and submitted to ARCHITECT and OWNER on a monthly basis for concurrent review with each payment application submitted by CONTRACTOR. The update shall incorporate actual status to date and shall include the following:
1. Computer plotted time-scaled CPM network

2. Bar Charts, generated separately using the format template provided by OWNER for:
   (a) Milestones only (Baseline vs. forecast)
   (b) Summary Level (sorted by craft/trade and area);
   (c) Detail (sorted by Dates);
   (d) Detail (sorted by Responsibility);
   (e) Detail (sorted by phase).

3. Reports, generated separately using the format template provided by OWNER for:
   (a) Variance (Baseline vs. forecast);
   (b) Progress Curves (baseline vs. earned/forecast);
   (c) Float (sorted low to high), and;
   (d) Resource Histogram.

4. Provide all data files electronically by diskette.

J. Written Narrative Report: CONTRACTOR shall include a stand-alone narrative of sufficient detail to explain the basis of the Milestones Schedule with each monthly submittal as follows:

1. CONTRACTOR shall explain determination of activity duration and describe approach for meeting required Milestones. Include as a minimum: basis and assumptions used in preparing submittal including crew sizes; equipment requirements; verified delivery dates; and restraints: critical path activities that contain time contingencies for impacts from normal rainfall; holidays and other non-work days; potential problem areas; permits; required coordination; utilities; Separate Work Contracts and other parties; and long lead items requiring more than thirty (30) days delivery time from the date of order to the date of delivery on the Project site.

2. CONTRACTOR shall state in a narrative format all Work actually started and/or completed and reflect progress along critical path in terms of days ahead of and/or behind allowable dates. Specific requirements of narrative are as follows:
   a. If updated Milestones Schedule indicates an actual or potential impact to the Contract Time and or Milestones, identify causes of impacts and provide proposed corrective action to meet Milestones and/or Contract Time. Document and log in matrix format all activities with non-mitigated float until the negative float is mitigated. Identify any deviation from previous month’s critical path. The matrix will include applicable activity number, description, approved planned start and finish dates, current start and finish dates and float quantity.
   b. Identify activities in progress and scheduled to be completed by activity number and description.
   c. Identify by activity number and description, activities to be started during month following report period. Indicate CONTRACTOR forecast early and late start and finish dates.
   d. Discuss Construction Directive and/or Change Order items.
3. Implementation of revised schedule logic and/or activity duration estimates for updating the Milestones Schedule whether furnished by CONTRACTOR or OWNER does not constitute an adjustment to the Contract Amount, Milestones and/or Contract Time. Such revisions are for the purpose of maintaining the accuracy of the Milestones Schedule. A detailed time-impact analysis with a narrative shall be submitted explaining the means and methods, basis and assumptions for same. The process used to develop the time impact and fragnets shall be detailed as set forth in Section 3.07.

4. In updating status of the Milestones Schedule, CONTRACTOR shall make no modifications to Activity ID numbers in the accepted Milestones Schedule, schedule calculation rules/criteria or the Activity Coding Structure provided by OWNER without the explicit written permission of OWNER.

5. As Built Schedule Submittals: CONTRACTOR shall describe basis for any logic or activity duration changes from the initial Milestones Schedule.

3.07 FRAGNETS

A. In order to consider the purported impact of events predicated by Sections 10 and 12 of the General Conditions, CONTRACTOR shall prepare and submit fragnet schedules in order to determine the impacts of the event. The submitted format shall compare the current approved Milestones Schedule minus the event under consideration, to a revised Milestones Schedule including the event under consideration. Include a detailed written narrative setting forth the basis and assumptions made in preparing the fragnet schedule.

B. The fragnet shall properly connect to, and be constrained by, pre-event predecessor and successor activities and post-event event predecessor and successor activities. The submitted fragnet shall band impacted activities in separate networks indicating the specific impact of the event.

C. CONTRACTOR shall submit two computer file copies of the fragnet, computer generated tabular reports and time scaled logic diagrams.

3.08 PAYMENT FOR SCHEDULING

A. Preparation, revising, maintenance, and compliance with the Milestones Schedule is an integral part of the Contract Documents and is specified to have a minimum value equal to 5% of the original Contract Amount or $50,000, whichever is less. This amount shall be included as a line item in the Application for Payment. Payment will be made against that line item as follows:

1. An initial payment of fifteen percent (15%) of the total line item value upon submission and OWNER acceptance of the initial Milestones Schedule.

2. The remaining eighty-five percent (85%) will be paid in equal monthly payments determined by dividing the remainder of the line item value divided by the total number of months in the Contract Time. Payments are contingent upon acceptance of the Milestones Schedule and submission of acceptable monthly updates as specified.
B. All costs associated with meeting the requirements of this Section 01360 shall be included in the Contract Amount.

3.09 FAILURE TO COMPLY WITH REQUIREMENTS

A. If CONTRACTOR fails to comply with the specified requirements, OWNER reserves the right, but will not be required, to engage an independent scheduling consultant and/or provide its own expertise to fulfill these requirements. Upon notice to CONTRACTOR, OWNER shall retain additional professional services and shall be entitled to recover by assessment all incurred costs for the additional services.

B. In such an event, OWNER will require, and CONTRACTOR shall participate and provide all requested and/or required information to ensure the resulting Milestones Schedule accurately reflects CONTRACTOR plan to execute the Work in compliance with the Contract Documents. If it becomes necessary for ARCHITECT and/or OWNER to recommend logic and/or duration revisions as a result of CONTRACTOR failure to furnish acceptable data, and if CONTRACTOR has objections to the recommendations, CONTRACTOR shall provide notice to ARCHITECT and OWNER within three (3) days and CONTRACTOR shall provide an acceptable alternate plan. If CONTRACTOR fails to so note any objections and provide an acceptable alternate plan, or if CONTRACTOR implements the recommendations of ARCHITECT and/or OWNER without so noting any objections, CONTRACTOR will be deemed to have waived all objections and concurred with the recommended logic/duration revisions provided by ARCHITECT and/or OWNER.

C. Submittal of any Milestones Schedule is subject to review and acceptance by ARCHITECT and/or OWNER. OWNER retains the right, including, but not limited to Section 14.13.9 of the General Conditions, to withhold progress payments in whole or part until CONTRACTOR submits a Milestones Schedule acceptable to OWNER.

3.10 CONTRACTOR RESPONSIBILITY

A. Nothing in this Section shall be construed to be a usurpation of CONTRACTOR authority, responsibility and obligation to plan and schedule Work as CONTRACTOR deems, subject to all other requirements of the Contract Documents.

3.11 RECORD DOCUMENTS

A. Prior to Final Completion of the Work, CONTRACTOR shall submit as-built report and time-scaled network diagram reflecting as-built Project critical paths.

END OF SECTION
SECTION 01420
TESTING AND INSPECTION

PART 1 - GENERAL

1.01 SECTION INCLUDES
A. Testing and inspection services to meet requirements of the California Building Code (CBC), Title 24, Parts 1 and 2, 2010 Edition or as applicable.

1.02 RELATED SECTIONS
A. Section 01300: Submittals
B. Section 01360: Construction Schedule
C. Section 01450: Test and Balance
D. Section 01500: Construction Facilities and Temporary Controls
E. Section 01600: Materials and Equipment
F. Section 01700: Contract Closeout
G. Section 01740: Warranties

PART 2 – PRODUCTS (Not applicable)

PART 3 – EXECUTION

3.01 TESTS
A. OWNER will select an independent testing agency to conduct tests, sampling and testing of materials. Selection of material to be tested shall be by the agency and not by CONTRACTOR.

B. Any material shipped from the source of supply prior to having satisfactorily passed such testing and inspection or prior to the receipt of notice from Owner’s Representative such testing and inspection will not be required shall not be incorporated into the Work.

C. OWNER will select and directly reimburse testing agency costs for all tests and inspections, unless otherwise noted in the Contract Documents, but may be reimbursed by CONTRACTOR for such costs as noted in related sections of the Contract Documents.

D. The independent testing agency is not authorized to release, revoke, alter, or enlarge requirements of the Contract Documents or approve or accept any portion of the Work. The agency shall not perform any duties of CONTRACTOR.

E. CONTRACTOR shall provide an insulated curing box with the capacity for twenty (20) concrete cylinders and will relocate said box and cylinders as rapidly as required in order to provide for progress of the Work.

3.02 TEST REPORTS
A. Test reports shall include all tests made, regardless of whether such tests indicate the material is satisfactory or unsatisfactory. Samples taken but not tested shall also be reported. Records of special sampling operations as required shall also be reported. Reports shall show that material or materials were sampled and tested in accordance with requirements of CBC, Title 24, Parts 1 and 2 2010 Edition or as applicable and with
the approved Specifications. Test reports shall show specified design strength. They shall also state definitely whether or not material or materials tested comply with the specified requirements.

3.03 VERIFICATION OF TEST REPORTS

A. Each testing agency shall submit to the Building Department a verified report in duplicate covering tests which are required to be made by that agency during progress of the Work. Such report shall be furnished each time construction on the Work is suspended, covering tests up to that time, and at Final Completion of the Work, covering all tests.

3.04 INSPECTION BY OWNER

A. OWNER and its representatives shall at all times have access, for purpose of inspection, to all parts of the Work and to shops wherein the Work is in preparation, and CONTRACTOR shall at all times maintain proper facilities and provide safe access for such inspection.

B. OWNER shall have the right to reject materials and or workmanship deemed defective Work, and to require correction. Defective workmanship shall be corrected in a satisfactory manner and defective materials shall be removed from the premises and legally disposed of, all without charge to OWNER. If CONTRACTOR does not correct such defective Work within a reasonable time, fixed by written notice and in accordance with the terms and conditions of the Contract Documents, OWNER may correct such defective Work and proceed in accordance with related sections of the General Conditions.

C. CONTRACTOR is responsible for compliance to all applicable local, state and federal regulations regarding codes, regulations, ordinances, restrictions and requirements.

3.05 TESTS AND INSPECTIONS

A. The following tests and inspections do not limit inspection of the Work but are required by other agencies, or are required in related Sections of the Contract Documents.

B. Concrete - CBC, Chapter 19A:

1. Materials:
   a. Test of Materials 1903A.1
   b. Portland Cement Tests 1903A.2, 1929
   c. Concrete Aggregate 1903A.3
   d. Shotcrete Aggregate 1903A.3
   e. Reinforcing Bars 1903A.5.1; 1903A.5.2; 1903A.5.3; 1903A.5.4;
   f. Prestressing Steel & Anchorage 1903A.5.5;
   g. Structural Steel, Steel Pipe or tubing 1903A.5.6
   h. Admixtures 1903A.6
2. Quality:
   a. Proportions of Concrete 1905A.1; 1905A.2; 1905A.3; 1905A.4; 1905A.5; 1905A.6,
   b. Mixing and Placing 1905A.1.1; 1905A.1.2; 1905A.1.3
   c. Concrete Testing 1905A.6;
   d. Test Of Shotcrete 1905A.6; 1924A.10
   e. Composite Construction Cores 1929A.8
   f. Gypsum Concrete Strength Tests 1925A.1; 1929A.13
   g. Insulating Concrete Tests DSA IR 27-1

3. Inspection:
   a. Job Site Inspection 1905A.7.1
   b. Batch Plant or Weigh-master Inspection 1929A.4, 1929A.5; 1929A.6
   c. Pre-stressed Concrete Inspection 1929A.9
   d. Shotcrete Inspection 1929A.10
   e. Reinforcing Bar Welding Inspection 1929A.12, 1903A.10

C. Lightweight Metal - CBC, Chapter 20A:
   1. Materials:
      a. Alloys 2001A.2
      b. Identification 2001A.4
   2. Inspection:
      a. Welding 2004A.8

D. Steel - CBC, Chapter 22A:
   1. Materials:
      a. Structural Steel, Cold Formed Steel 2202A.1; 2205A.4
      b. Material Identification 2203.4
   2. Inspection and Tests:
      a. Test of Structural & Cold Formed Steel 2213A
b. Tests of High Strength Bolts, Nuts, and Washers 2231A.2

c. Tests of End Welded Studs 2231A.3

d. Shop Fabrication Inspection 2231A.4

e. Welding Inspection 2231A.5

f. High Strength Bolt Inspection 2231A.6

g. Steel Joist Load Tests 2231A.7

E. Exterior Wall Coverings - CBC, Chapter 14A, 25A:

1. Materials:
   a. Portland Cement Plaster 2508A, 2509A, 2510A

2. Inspection:
   a. Veneer Inspection 1405A

END OF SECTION
SECTION 01450
TEST AND BALANCE

PART 1 - GENERAL

1.01 SECTION INCLUDES
A. This Section specifies the requirements for test and balance of HVAC and related systems.

1.02 RELATED SECTIONS
A. Section 01005: Summary of the Work
B. Section 01100: Coordination
C. Section 01300: Submittals
D. Section 01360: Construction Schedule
E. Section 01700: Contract Closeout

PART 2 - PRODUCTS (Not applicable)

PART 3 - EXECUTION

3.01 DEFINITIONS AND APPLICABLE PUBLICATIONS
A. For the purposes of this Section definitions are as indicated in applicable publications of AABC, NEBB, ASHRAE, ANSI and SMACNA.

3.02 QUALITY ASSURANCE
A. The test and balance agency shall be directly subcontracted to the CONTRACTOR. The qualifications of the agency shall comply with Section 3.02, Quality Assurance. The agency shall be responsible for furnishing labor, instruments, and tools required to test and balance the heating, ventilating and air conditioning (HVAC) systems and related plumbing systems, as described and/or as indicated in the Contract Documents.

B. CONTRACTOR shall obtain services of an independent, qualified testing agency acceptable to ARCHITECT to perform testing and balancing Work as specified and as follows:
   1. Agency shall be currently certified by either The Associated Air Balance Council (AABC) or The National Environmental Balancing Bureau (NEBB).
   2. Work shall be in accordance with the latest edition of the AABC or NEBB National Standards. If the Contract Documents impose a more stringent standard then the Contract Documents shall prevail.

C. Performance Criteria: Work of this Section shall be performed in accordance with approved TAB agenda.

D. Test Equipment Criteria: Basic instrumentation requirements and accuracy/calibration required by Section Two of the AABC or Section II of the NEBB Procedural Standards for Testing, Adjusting and Balancing of Environmental Systems.

3.03 SUBMITTALS
A. Submit name of agency to perform the Work. Include in the submittal the certified qualifications of all persons responsible for supervising and performing actual Work of this Section. Agency shall submit a minimum of five (5) commercial or industrial HVAC system TAB projects of
similar type, size, and degree of difficulty completed within the last two years. Agency shall provide name and telephone number of contact person for each listed project.

B. Submit, for approval, 6 copies of the Agenda as indicated in Section 3.06 to test and balance all mechanical and relevant plumbing systems.

C. Preliminary Report: Review the Contract Documents, examine Work installations and submit a written report to ARCHITECT and/or others indicating deficiencies in Work precluding proper testing and balancing of the Work.

D. Final TAB Report: Submit the final TAB report for review by ARCHITECT and/or others outlining the conditions and Work completed on each HVAC system. All outlets, devices, HVAC equipment, etc. shall be identified, along with a numbering system corresponding to report unit identification.

E. Submit an AABC “National Project Performance Guaranty” assuring the Project systems were tested, adjusted and balanced in accordance with the Specifications and AABC or NEBB National Standards.

F. CADD drawings: Submit single line, multi-color CADD drawings indicating outside return and supply air, volume control boxes, each outlet and inlet, room numbers, duct sizes at traverse locations, temperatures and pressures, systems balanced, components changed and CONTRACTOR installed access points. In addition, drawings shall identify controls, equipment settings, including manual damper quadrant positions, manual valve indicators, fan speed control levers, and similar controls and devices shall be marked on the drawings to show final settings. CADD files shall be submitted on CD-ROM upon final submittal of TAB report. Reports shall identify discrepancies between completed Work and the Contract Documents affecting the performance and/or longevity of the system.

3.04 GENERAL SCOPE OF WORK

A. The general scope of Work shall include but not be limited to the following:

1. Measure airflow rates of HVAC systems and make adjustments to achieve design airflow rates, tabulate results and submit reports.

2. Measure water-flow rates of HVAC systems and make adjustments to achieve design water flow rates, tabulate results and submit reports.

3. Measure flow velocities, temperatures, static pressures or head, rotational speed, and electrical power demand of fans, pumps and other related HVAC system components, tabulate results and submit reports.

4. Measure sound levels in each conditioned space, tabulate results and submit reports.

5. Measure ambient sound levels of outdoor HVAC units and system components such as chillers and cooling towers, tabulate results and submit reports.

6. Reports shall contain sufficient data for the system designer to evaluate system performance and solve installation problems.

3.05 SPECIFIC SCOPE OF WORK

A. The specific scope of Work shall include, but not be limited to, the following HVAC system components:

1. Air Handling Units
2. Air Conditioning Units
3. Heating and Ventilating Units
4. Heating and Cooling Coils
5. Supply, Return, Relief and Exhaust Fans
6. Outside Air and Return Air Plenums
7. Outside Air Intakes
8. All Supply and Return Ductwork
9. All associated Air Terminal Devices, i.e. Supply Diffusers, Return Registers, etc.
10. Mixing Boxes and Variable Air Volume (VAV) boxes
11. Reheat Coils (Electric or Hot Water)
12. Exhaust Duct Systems
13. Fire and Fire/Smoke Dampers
14. Kitchen Hoods

3.06 TESTING, ADJUSTING AND BALANCING AGENDA

A. Provide proposed materials, methods, procedures, forms, diagrams and reports for test and balance Work.

B. Agenda to be completed by the test and balance agency and submitted to ARCHITECT and others for review and approval.

C. Agenda shall include one complete set of AABC or NEBB publications listed in Section 3.02, B, 2, applicable publications, or, in case of other test and balance agencies and or organizations, comparable publications to establish an approved, systematic and uniform set of procedures.

D. Agenda shall also include the following detailed narrative procedures, system diagrams and forms for test results:
   1. Specific standard procedures required and proposed for each system of the Work.
   2. Specified test forms for recording each procedure and for recording sound and vibration measurements.
   3. Systems diagrams for each air, water and steam system. Diagrams may be single line.

E. In addition to information recorded for standard AABC or NEBB procedures, the following information is required:
   1. Fan Data
   2. System number, Location, Manufacturer, Model and Serial Number
   3. Fan wheel type and size
   4. Motor horse power, type and rpm
   5. Drive size, type, number of grooves, and open turns on Variable Pitch Drives
   6. Number and size of belts, motor and fan shaft sizes, center-to-center of shafts in inches, and adjustment available motor data, including nameplate data, actual amps, rated and actual motor rpm, volts, phase, hp, kW, starter heater size, and capacity
   7. Fan, return and outside air
   8. Fan static pressure, suction/discharge, static profile and static control point.

F. The following traverse data is required:
   1. Traverse location, size of duct (inside dimensions), Area of duct in square feet
   2. Column for each hole traversed/lines for each reading
   3. Barometric pressure
   4. Temperature/Static Pressure in the duct
   5. Actual CFM corrected to SCFM
   6. Notes

G. The following air distribution data is required:
1. Room identification
2. Outlet or intake balance sequence number
3. Size of outlet or inlet
4. AK Factor
5. Design and Actual FPM and CFM
6. Notes

H. The following IAQ data is required:
1. Location/room identification, time and date of each test
2. Contaminants as specified in Section 3.10
3. Measured results of contaminant tests
4. Number of occupants in the room
5. Calculated CFM Fresh Air per person
6. CO₂ level with corresponding ASHRAE / CAC Title 24 permissible CO₂ levels for areas tested
7. Temperature and humidity
8. Pass or fail indications for each space tested
9. Deficiencies

I. The following hydronic coil data is required:
1. Air flow through the coil in CFM
2. Dry bulb and wet bulb temperatures entering/leaving coil
3. Enthalpy or total heat differences in BTU/lb.
4. Capacity in BTU/hr at time of test
5. Water temperature and pressure entering/leaving coil
6. Flow (in GPM) through coil
7. Notes

J. The following DX coil data is required:
1. Air flow through the coil in CFM
2. Dry and wet bulb temperatures entering/leaving coil
3. Enthalpy or total heat difference across coil in BTU/ lb.
4. Capacity in BTU/hr at time of test
5. Notes

K. The following electric heating coil data is required:
1. Heating coil identification number
2. Nameplate data; manufacturer, model and serial number
3. Amperage/Voltage on each phase
4. Phase, kW and Stages
5. Safety device installed
6. Notes

L. The following water cooled chiller data is required:
1. Identification number
2. Nameplate data; manufacturer, model and serial number
3. Chilled water flow through evaporator in GPM
4. Water temperature entering/leaving evaporator
5. Pressure drop through evaporator
6. Condenser water flow through
7. Pressure drop through condenser
8. Water temperature entering/leaving condenser
9. Motor data, amps, volts, rpm, starter type, overload protection type, phase, hertz, nameplate, and actual measured kW input
10. Type of refrigerant
11. Notes

M. The following air-cooled split system condensing unit data is required:

1. Performance test results for rated capacity
2. Unit identification number
3. Nameplate data, manufacturer, model and serial number.
4. Compressor nameplate and actual amps, volts, phase, and hertz
5. RPM of motors, where applicable
6. Refrigerant type
7. Suction/Discharge pressure when gauge installed
8. Number of stages
9. Low-pressure/High-pressure control setting
10. Condenser fan sequence stages
11. Crankcase heater watts (nameplate)
12. Hot gas bypass installed - yes/no
13. SCFM Air Flow Measurement vs. Design CFM

N. The following air-cooled split system heat pump data is required:

1. Performance test results for rated heating and cooling capacities
2. Unit identification number
3. Nameplate data, manufacturer, model and serial number.
4. Compressor nameplate and actual amps, volts, phase, and hertz
5. RPM of motors, where applicable
6. Refrigerant type
7. Suction/Discharge pressure for both heating and cooling modes when gauge installed
8. Number of stages
9. Low-pressure/High-pressure control setting
10. Condenser fan sequence stages
11. Crankcase heater watts (nameplate)
12. Hot gas bypass installed - yes/no
13. SCFM Air Flow Measurement vs. Design CFM

O. The following sound test data is required:

1. Area or location
2. Sound level in dB(A) as specified in Section 3.20
3. Sound level at the center band frequencies of eight non-weighted octaves with equipment on and off.
4. Plot corrected sound-level reading on Noise Criteria (NC) curve.

P. The following vibration test data is required:

1. Equipment identification number
2. Vibration levels at all accessible bearings, motors, fans, pumps, casings, and isolators
3. Measurements in mils deflection and velocity in inches per second as specified per section XIV of this document
4. Each measurement taken in horizontal, vertical, and axial planes as accessible.

Q. The following mixing damper leakage test data is required:

1. Equipment identification number (unit, box, zone, etc.)
2. Dry bulb temperature in the cold/hot (or bypass) deck
3. Dry bulb temperature in the mixed air stream
4. Calculated percent leakage
5. Data above taken in the full cool and full heat (or bypass) mode
6. Notes

R. The following airflow station data is required:

1. Station identification number
2. Nameplate data including effective area
3. Differential test pressure or velocity
4. Calculated CFM
5. Actual CFM (From Pitot tube traverse form)
6. Read out CFM
7. Notes

S. The following unit heater data is required:

1. Equipment identification number
2. Nameplate data; manufacturer, model and serial number
3. Test CFM (use manufacturer rated CFM if not ducted)
4. Heat test data per applicable procedure (hot water, electric, etc.)
5. Notes

T. The following fan coil and unit ventilator data is required:

1. Equipment identification number
2. Nameplate data; manufacturer, model and serial number
3. Tested supply CFM or manufacturer rated CFM if not ducted
4. Tested outside air in CFM
5. Motor data and actual amps and volts
6. Cooling/Heating test data
7. Notes

U. The following kitchen hood data is required:

1. Hood identification number
2. Nameplate data; manufacturer, model and serial number
3. Pitot-tube traverse total air flow
4. Exhaust and supply (when part of hood) CFM
5. Exhaust and supply (when part of hood) test velocities shown on hood face diagram
6. Face velocities
7. Hood opening dimensions
8. Notes (turbulence and flow patterns at the face and inside the hood)

V. The following data for water-to-water heat exchangers for domestic and/or heating is required:

1. Exchanger identification number
2. Nameplate data; manufacturer, model and serial number
3. GPM and Pressure drop through each side
4. Capacity of each side
5. Notes

W. The following pump data, including but not limited to, chilled water, heating hot water, cooling tower water, boiler feed, domestic hot water booster, domestic hot water circulation, sewage ejectors, sump pumps and domestic hot water booster is required:

1. Pump number
2. Nameplate data; manufacturer, model and serial number
3. Motor data including nameplate data, actual amps, volts, RPM, horsepower, starter heater size and capacity
4. Pump discharge and suction pressure along with total dynamic head in the following modes
5. Shut-off head FT, Wide open Head FT and Final operating Head FT
6. Final GPM Test plotted on a pump curve
7. Notes

X. The following water flow station data is required:
1. Station identification number
2. Nameplate data; manufacturer, model, and serial number
3. Design and actual GPM
4. Differential test pressure
5. Setting (open turns, degree, etc.) if required GPM
6. Notes

Y. The following terminal box data is required:
1. Box identification number
2. Node, address or designation on system
3. Box size
4. Cooling CFM
5. Minimum CFM (if applicable)
6. Heating CFM (if applicable)
7. Box fan amps and volts (if applicable)
8. For DDC controlled boxes, record computer readout maximum, minimum, and heat, along with box correction factor for calibrating to true CFM
9. Notes

3.07 PROCEDURES

A. Schedule the Work of this Section in order for test and balance activities to be completed prior to the date of Substantial Completion. CONTRACTOR shall place all heating, ventilating, and air conditioning equipment into operation during each day and until all HVAC adjusting, balancing, testing, demonstrations, and instructions on systems are completed. Agency shall prepare and submit reports within ten (10) days from completion of the Work of this Section to allow sufficient time for corrective measures to be completed before Final Completion of the Work. When an individual building or portion thereof is ready for occupancy, all equipment relative to such portion of Work shall be put into service, tested and balanced.

B. Prior to the date of Substantial Completion, and upon completion of test and balance Work, place all exhaust fans in operation, force all air handling units and air conditioning units into a 100% outdoor air economizer mode with heating and cooling locked out and flush the building continuously for a period of fourteen (14) days.

C. Coordinate test and balance procedures with any phased Project requirements so test and balance procedures on each phased portion of the Work will be completed prior to completion of said designated phase.

3.08 FIELD EXAMINATION

A. Before the commencement of test and balance Work, CONTRACTOR shall ascertain that following conditions are fulfilled:
1. Ensure that all water heating and water cooling systems have been flushed, cleaned, filled and high points vented
2. Refrigerant systems are fully charged with specified refrigerant
3. Over-voltage and current protection have been provided for motors
4. Equipment has been labeled as required
5. Curves and descriptive data on each piece of equipment to be tested and adjusted are available as required
6. Operations and maintenance manuals have been supplied
7. Controls manufacturer and boiler-burner representatives shall be available for consultation and supervision of adjustments during tests
8. Verify that heating and cooling coil fins are cleaned and combed and air filters clean and installed
9. Verify that duct systems are clean of debris and leakage is minimized, access doors are closed and duct end caps are in place, fire and volume dampers are in place and open
10. Automatic control systems are completed and operating
11. Start up and initial commissioning of all HVAC equipment except fans shall be by the manufacturer.

B. In addition to the above, CONTRACTOR shall establish a specific, coordinated plan which details how each area of existing building will be balanced during the various phases of the Work. The evaluation shall address, at a minimum, the following concerns:

1. OWNER operations
2. Building safety and security policies. Prior to any fire safety or security systems shutdown at any time during the Work, CONTRACTOR shall first advise and coordinate with OWNER to ensure all concerned parties are notified.
3. Protecting furniture, computers, photocopiers, and other office equipment.
4. Protecting classroom fixtures and equipment.
5. Concerns specific and unique to building related issues.
6. Downtime required for each AHU including projected time to return each portion of the building back to its normal occupancy temperature and humidity.
7. Shutdown and reactivation of the fire alarm system to avoid accidental alarms during test and balance and related Work.

3.09 TEST AND BALANCE

A. For each heating, ventilating, or air conditioning system the following shall be performed, recorded and submitted in a approved format for review. Make, type, and model of unit, and location of each piece of equipment shall be included in the report. Readings shall include but not be limited to following:

1. AIR SYSTEMS:
   a. General

   Verify all ductwork, dampers, grilles, registers, and diffusers have been installed per design and set in the full open position. Agency shall perform the following TAB procedures in accordance with AABC or NEBB National Standards:

   b. Zone, Branch and Main Ducts:

      1. Adjust ducts to within design CFM requirements by means of Pitot-tube duct traverse.

   c. Supply Fans:
1. Fan speeds: Test and adjust fan RPM to achieve maximum or design CFM. CONTRACTOR shall provide new belt pulleys when required.

2. Current and Voltage: Test and record motor voltage and amperage, and compare data with the nameplate limits. Ensure fan motor is not in or above the service factor as published by the motor manufacturer.

3. Pitot-Tube Traverse: Perform a Pitot-tube traverse of main supply and return ducts, record total CFM.

4. Outside Air: Test and adjust the outside air using Pitot-tube traverse.

5. Static Pressure: Test and record system static profile of each supply fan.

6. Current and Voltage: Test and record motor voltage and amperage, and compare data with the nameplate limits. Ensure fan motor is not in or above the service factor as published by the motor manufacturer.

d. Return, Relief and Exhaust Fans:

1. Fan speeds: Test and adjust fan RPM to achieve maximum or design CFM. CONTRACTOR shall provide new belt pulleys when required.

2. Pitot-Tube Traverse: Perform a Pitot-tube traverse of the main return ducts to obtain total CFM.

3. Static Pressure: Test and record system static profile of each fan.

e. VAV Systems:

1. Set volume regulators on all terminal boxes to meet design maximum and minimum CFM requirements.

2. Identification: Identify the type, location, and size of each terminal box. This information shall be recorded on terminal box data sheets.

f. Diffusers, Registers and Grilles:

1. Tolerances: Test and balance each diffuser, grille, and register to within 5% of design requirements.

2. Identification: Identify the type, location, and size of each grille, diffuser, and register. This information shall be recorded on air outlet data sheets.

g. Coils:

1. Air Temperature: Once airflow is set to acceptable limits, agency shall take wet bulb and dry bulb air temperatures on the entering and leaving side of each cooling coil. Dry-bulb temperature shall be taken on the entering and leaving side of each heating coil.

h. Duct Leakage Testing:

1. On existing ductwork, agency shall calculate duct leakage by traversing the unit and reading associated diffusers.

2. On new installations, agency shall base one test per isolated section unless otherwise noted. New ductwork shall be tested at one and one-half times (1-1/2) design static pressure. New supply ducts shall demonstrate 0.5% leakage maximum. New return ducts shall demonstrate 1.0% leakage maximum.

2. WATER SYSTEMS:

CONTRACTOR shall confirm all equipment, piping, and coils have been filled and purged, strainers are clean and all balancing valves (except bypass valves) are set full open. Agency shall perform the following TAB procedures in accordance with the AABC or NEBB National Standards:
A. Pumps:

1. Test and adjust chilled water, hot water, and condenser water pumps to achieve maximum or design GPM.
2. Measure and record suction and discharge pressures.
3. Check pumps for proper operation. Pumps shall be free of vibration and cavitation.
4. Current and Voltage: agency shall test and record motor voltage and amperage, and compare data with the nameplate limits. Ensure pump motor is not in or above the service factor as published by the motor manufacturer.
5. Adjust pump flow by adjusting and setting balancing valves, to obtain amperage reading on a clamp-on ammeter, to correspond to amperage indicated on pump's curves for required flow.
6. Verify that the motor is not drawing more current than indicated on motor plate rating. When actual flows of primary pumps are found by test to vary more than 5% from specified amount, system shall be re-balanced to regulate flow within this tolerance. When a flow indicating device(s) is in circuit, it shall be used to verify pump flows.
7. When testing is completed, a pump capacity chart with pump number and location indicated there on, shall be marked indicating operating point of pump on the curve. Chart shall then be included in the report.

B. Heat Exchangers:

1. Steam to Hot Water Heat Exchanger: Steam pressure, entering and leaving hot water temperatures, gpm flow, pressure drop, and control set point.
2. Water to Water Heat Exchanger:
   a. Primary Heating Water: Entering and leaving hot water temperatures, gpm flow, and pressure drop.
   b. Secondary Heated Water: Entering and leaving hot water temperatures, gpm flow, pressure drop, and control set point.

C. Coils:

1. Tolerances: Test and balance all chilled-water and hot-water coils within 5% of design requirements.
2. Verify the type, location, final pressure drop and GPM of each coil.

D. System Mains and Branches including chilled water, heating hot water, cooling tower water, domestic hot water and domestic cold water:

1. Balance water flow in pipes to achieve maximum or design GPM.

3.10 INDOOR AIR QUALITY (IAQ)

A. Agency shall take measurements at design outside air, shall measure temperature and humidity uniformity throughout the Work, check filter installation for proper fit, seal, and operation, and verify condensate drain operation. Agency shall note any water damage or obvious contamination sources from inside or outside.

B. Agency shall conduct an IAQ assessment to include samples for analysis of the following air contaminants and pollutants. Agency is required to be duly certified by a nationally recognized certification agency or shall obtain the services of such an organization:
1. Respirable dust  
2. Airborne fiberglass  
3. Volatile Organic Compounds (VOC’s)  
4. Carbon dioxide (CO₂)  
5. Carbon monoxide (CO)  
6. Ozone (O₃)  
7. Bioaerosols  
8. Mold, Fungi and Yeast’s  
9. Temperature and Relative Humidity  
10. Hydrogen sulfide (H₂S)  
11. Combustible gasses (LEL)

C. Samples shall be taken at three (3) representative areas of the building for each air handling system (three samples from the supply side down stream of the cooling coils, three from the return before the air filters and three from the return side after the air filters). One additional sample set shall be taken outside to baseline ambient conditions.

D. Samples shall be sent to an independent laboratory for analysis. All sampling shall be performed in accordance with the methods certified by the American Conference of Governmental Industrial Hygienists (ACGIH) and The American Society of Heating, Refrigeration and Air Conditioning Engineers (ASHRAE).

3.11 VERIFICATION OF HVAC CONTROLS

A. Agency shall verify in conjunction with CONTRACTOR all control components are installed in accordance with the intent of the Contract Documents and are functioning according to the design intent, including all electrical interlocks, damper sequences, air and water resets, fire stat's, and other safety devices.

B. CONTRACTOR shall verify all control components are calibrated and set for design operating conditions and intent.

3.12 TEMPERATURE TESTING

A. To verify system control and operation, agency shall perform a series of three temperature tests taken at approximately two-hour intervals in each separately controlled zone. The resulting temperatures shall not vary more than two (2) degrees Fahrenheit from the thermostat or control set point during the tests. Outside temperature and humidity shall also be recorded during the testing periods.

3.13 KITCHEN HOOD TESTING

A. Agency shall test and adjust hood total airflow by duct Pitot-tube traverse. If a Pitot-tube traverse is not practical, an explanation of why a traverse was not made must made in writing to ARCHITECT and subsequently appear on the appropriate data sheet. Face velocities shall be tested under design operating conditions using a maximum of a one square foot grid
pattern across the entire open face. CONTRACTOR shall set sash height on hoods to obtain face velocities within 20% of 100 feet per minute unless specified otherwise. Agency shall test and adjust exhaust airflows and make-up air flows to maintain design hood pressures and face velocities, and design room pressurization. Agency shall test for turbulence and proper air flow patterns at the face and inside the hoods using a hand-held smoke puffer or other approved smoke-emitting device.

3.14 BUILDING/ZONE PRESSURIZATION
A. Agency shall test and adjust building/zone pressurization by setting the design flows to meet the required flow direction and pressure differentials. Positive/Negative area(s) supply air shall be set to design flow and exhaust air rates adjusted to obtain the required pressure differential(s).

3.15 FIRE AND SMOKE DAMPER TESTING
A. This work is to be performed by OWNER and State Fire Marshall. Do not include in agency scope of work.

3.16 LIFE SAFETY CONTROLS TESTING
A. This work is to be performed by OWNER and State Fire Marshall. Do not include in agency scope of work.

3.17 FINAL TABULATION
A. After heating, ventilating, and air conditioning components are satisfactorily tested and balanced, entire system shall be put into operation and all pressures, temperatures, gpm, cfm, velocities, etc., shall be recorded and checked against design schedules. Design requirements shall be listed on reports and final tabulation shall be within a tolerance of plus or minus 5% of design requirements.

B. Readings at various locations as described herein will be made every hour for four (4) hours, during normal working hours for three (3) days. Boilers, forced air furnaces and chillers shall be started up far enough in advance to meet design conditions during period of testing.

3.18 VIBRATION TESTING
A. Furnish instruments and perform vibration measurements if specified in Division 15. Provide measurements for all rotating HVAC equipment half horsepower and larger, including centrifugal/screw compressors, pumps, fans and motors.

B. Record initial and final measurements for each unit of equipment on test forms. Where vibration readings exceed allowable tolerance and efforts to make corrections have proved unsuccessful, forward a separate report to ARCHITECT.

3.19 SOUND TESTING
A. Perform and record sound measurements as specified in this section and if specified in Section 15240: Sound Vibration and Seismic Control. Take additional readings if required by ARCHITECT.

B. Take measurements with a calibrated sound level meter and octave band analyzer of accuracy required by AABC or NEBB.

C. Sound reference levels, formulae and coefficients shall be according to ASHRAE handbook, Current Systems Volume; Chapter: Sound and Vibration Control.
D. Determine compliance with the Contract Documents as follows:

1. Where sound pressure levels are specified as noise criteria or room criteria in Section 15240: Sound, Vibration and Seismic Control.
   a. Reduce background noise as much as possible by shutting off unrelated audible equipment.
   b. Measure octave band sound pressure levels with specified equipment "off".
   c. Measure octave band sound pressure levels with specified equipment "on".
   d. Use difference in corresponding readings to determine sound pressure due to equipment.

   DIFF. : 0 1 2 3 4 5 9-10 or More
   FACTOR: 10 7 4 3 2 1 0

   Sound pressure level, due to equipment, equals sound pressure level with equipment "on" minus factor.

   e. Plot octave bands of sound pressure level due to equipment for typical rooms, on a graph which also shows noise criteria (NC) curves.

2. When sound power levels are specified:
   a. Perform steps in Section 3.20, D, 1.a. through 1.d.
   b. For indoor equipment: Determine room attenuating effect; i.e., difference between sound power level and sound pressure level. Determine sound power level will be sum of sound pressure level due to equipment, plus room attenuating effect.
   c. For outdoor equipment: Use directivity factor and distance from noise source to determine distance factor, i.e., difference between sound power level and sound pressure level. Measured sound power level will be sum of sound pressure level due to equipment, plus distance factor.

3. Where sound pressure levels are specified in terms of dbA, measure sound levels using the "A" scale of meter. Single value readings will be used instead of octave band analysis.

E. Where measured sound levels exceed specified level, CONTRACTOR shall take all remedial action and necessary sound tests shall be repeated.

F. Measure and record sound levels in decibels at each diffuser, grille or register in occupied areas. Sound levels shall be measured approximately 5'-0" above floor on a line approximately 45 degrees to center of opening, on the "A" and "C" scales of a General Radio Company sound level meter, or similar instrument.

G. Report shall also include ambient sound levels of rooms in which above openings are located, taken without air-handling equipment operating. A report shall also be made of any noise caused by mechanical vibration, which is at an intensity deemed to be objectionable.

END OF SECTION
SECTION 01500
CONSTRUCTION FACILITIES AND TEMPORARY CONTROLS

PART 1 - GENERAL

1.01 SECTION INCLUDES
A. Temporary utilities, construction facilities and controls to be provided and maintained during the Work.

1.02 RELATED SECTIONS
A. Section 01005: Summary of the Work
B. Section 01360: Construction Schedule
C. Section 01420: Testing and Inspection
D. Section 01450: Test and Balance
E. Section 01700: Contract Closeout

PART 2 - PRODUCTS (Not applicable)

PART 3 - EXECUTION

3.01 QUALITY ASSURANCE
A. CONTRACTOR shall comply with industry standards and with applicable laws and regulations of authorities having jurisdiction including, but not limited to, the following:

1. Building Code requirements
2. City Building Department
3. Health and safety regulations
4. Utility company regulations
5. Police, fire department and rescue squad requirements
6. Environmental protection regulations

B. CONTRACTOR shall arrange for the inspection and testing of each temporary utility prior to use. Obtain required certifications and permits and transmit to OWNER.

3.02 TEMPORARY UTILITIES
A. CONTRACTOR shall submit to OWNER reports of tests, inspections, meter readings and similar procedures performed on temporary utilities.

B. CONTRACTOR shall coordinate with the appropriate utility company to install temporary services. Where the utility company provides only partial service, CONTRACTOR shall provide and install the remainder with matching compatible materials and equipment.

C. Temporary Water:

1. CONTRACTOR shall furnish, install and pay for all necessary permits, inspections, move ins/out, temporary water lines, connections & fees, extensions and distribution, metering devices and use charges, deliveries/pick ups, rentals, storage, transportation, taxes, labor, insurance, bonds, material, equipment and
all other miscellaneous items for the temporary water system, and upon Substantial Completion of the Work, removal of all such temporary water system devices and appurtenances.

2. CONTRACTOR shall provide and maintain temporary water service, including water distribution piping and outlet devices of the size and required flow rates in order to provide service to all areas of the Project site.

3. CONTRACTOR shall provide and pay for all potable water needed for construction and all other uses associated with the Work.

4. CONTRACTOR shall at their expense and without limitation, remove, extend and/or relocate temporary water systems as rapidly as required in order to provide for progress of the Work.

D. Temporary Electric:

1. CONTRACTOR shall furnish, install, maintain and pay for all necessary permits, inspections, temporary wiring, metering devices and use charges, move ins/outs, connections & fees, service, extension and distribution, deliveries/pickups, rentals, storage, transportation, taxes, labor, insurance, bonds, materials, equipment and all other required miscellaneous items for the temporary electric systems and upon Substantial Completion of Work, removal of all such temporary electric systems and appurtenances.

2. CONTRACTOR shall furnish, install, maintain, extend and distribute temporary electric area distribution boxes, so located that individual trades can obtain adequate power and artificial lighting, at all points required for the Work, for inspection and for safety.

3. CONTRACTOR shall provide temporary electric for construction, temporary facilities, and connections for construction equipment requiring power or lighting, at all points required for the Work, for inspection and safety.

4. CONTRACTOR shall provide 20 foot candles minimum lighting levels inside building(s) and 5 foot candles outside for safety and security.

5. CONTRACTOR shall ensure welding equipment is supplied by electrical generators.

6. CONTRACTOR shall at their expense and without limitation remove, extend and/or relocate temporary electric systems as rapidly as required in order to provide for progress of the Work.

E. Temporary Heating, Ventilation and Air Conditioning:

1. CONTRACTOR shall furnish, install, maintain, and pay for all necessary permits, inspections, move ins/out, extensions and distribution, connections and fees, use charges, metering devices and use charges, equipment, rentals, deliveries/pickups, storage, transportation, taxes, labor, insurance, bonds, material, equipment and all other required miscellaneous items for temporary heat and ventilation needed for proper installation of the Work and to protect materials and finishes from damage due to weather. Upon Substantial Completion of the Work,
CONTRACTOR shall remove all such temporary heating and ventilating system devices and appurtenances.

2. CONTRACTOR shall provide, maintain and pay for all temporary ventilation of enclosed Work areas to cure materials, disperse humidity, remove fumes, and to prevent accumulation of dust, irritants, or gases.

3. OWNER will not accept utilization of the permanent HVAC system for temporary HVAC until Substantial Completion.

4. CONTRACTOR shall maintain manufacturer required levels of room and/or space temperature, humidity and ventilation necessary to install products, materials and/or systems of the Work.

5. CONTRACTOR shall at their expense and without limitation, remove, extend and/or relocate temporary heating and ventilating systems as rapidly as required in order to provide for progress of the Work.

F. Temporary Telephone:

1. CONTRACTOR shall furnish, install, maintain and pay for all necessary permits, inspections, move ins/outs, extensions and distribution, devices, connections and fees, use charges, rentals, deliveries/pickups, storage, transportation, taxes, labor, insurance, bonds, material, equipment and all other required miscellaneous items for temporary phone service and distribution to the on site temporary office as described in this Section and Section 01500, 3.03.

2. CONTRACTOR shall arrange for the supply, installation, and maintenance of one (1) Project site exterior pay phone booth and/or equivalent facility.

3. CONTRACTOR shall at their expense and without limitation, remove, extend and/or relocate temporary phone service and distribution as rapidly as required in order to provide for progress of the Work.

4. Upon Substantial Completion of the Work, CONTRACTOR shall remove all such temporary phone service, distribution, devices and appurtenances.

3.03 CONTRACTOR FACILITIES

A. CONTRACTOR shall provide temporary storage units, fencing, barricades, chutes, elevators, hoists, scaffolds, railings and other facilities or services as required. CONTRACTOR shall be responsible for providing, installation, maintenance, supplying and all use charges for the items provided under Section 01500.

B. Temporary Offices:

1. CONTRACTOR shall provide and maintain a minimum of one (1) construction trailer on the Project site for duration of the Work. Trailer shall be of sufficient size to house a conference room with a table and adequate seating for twelve (12) in addition to two (2) separate offices: one for CONTRACTOR personnel and operations, and one for OWNER. Construction trailer shall be accessible by OWNER on a 7 day a week 24-hour basis.
2. Trailer shall have two (2) exterior entrance doors with one located in the OWNER office. Each door shall be equipped with both a dead bolt and cylinder lock with 6 keys. Exterior doors and windows shall be provided with exterior mounted burglar bars. Security of trailer and contents is a continuous obligation of CONTRACTOR.

3. Trailer shall have ample headroom; it shall be properly lighted, heated and ventilated. CONTRACTOR shall provide an electric drinking fountain or potable bottled water.

4. OWNER office shall be approximately 180 sq. ft. in size and shall be equipped with a minimum of four (4) 120 volt single phase convenience outlets, a 3'-0" deep by 6'-0" wide counter, and four (4) 1'-0" deep by 6'-0" wide shelves. Provide coat hooks, three (3) desks, three (3) chairs and three (3) four (4) drawer legal size file cabinet. Provide and install two wall-mounted 42" wide plan racks with 36 individual plan holders.

5. CONTRACTOR shall provide data transmission lines and related appurtenances for use by OWNER as specified below:

   a. Two separate phone lines, one dedicated fax line and one DSL line with LAN, capable of providing DSL access to 3 computer workstations.

5. CONTRACTOR shall be responsible for maintaining all transmission lines and related devices and if transmission equipment becomes inoperable and downtime exceeds two (2) days, CONTRACTOR shall replace and/or provide equivalent interim transmission equipment.

6. Trailer, furniture, and related ancillary devices shall remain property of CONTRACTOR. CONTRACTOR shall remove such property upon Final Completion of Work or as otherwise determined in writing by the OWNER.

7. At CONTRACTOR expense and without limitation remove and/or relocate temporary office(s) and related facilities as rapidly as required in order to provide for progress of the Work.

C. Temporary Storage Units:

1. CONTRACTOR shall provide secure and waterproof storage units for the temporary storage of furniture, equipment and other items requiring protection.

2. Walls, roof and doors shall be a minimum of 16-gage steel with floors of 1" tongue and groove hardwood or 3/4" minimum exterior type plywood. The undercarriage shall be designed to accommodate forklift blades 42" to 60" long. There shall be doublewide swing out lockable doors at one end equipped with waterproof gaskets.

3. CONTRACTOR shall be responsible for all delivery charges and will install the storage unit in an appropriate area.

4. CONTRACTOR shall remove the storage unit from the Project site when the storage unit is no longer required for the Work or upon Substantial Completion of the Work.
d. Chain link fencing shall be free from barbs, icicles or other projections resulting from galvanizing process. Fence having such defects will be replaced even if it has been installed.

e. Gates shall be fabricated of steel pipe with welded corners, and bracing as required. Fence and fabric to be attached to frame at 12" centers. Provide all gate hardware of a strength and quality to perform satisfactorily until barricade is removed upon Substantial Completion of the Work. Each gate shall have a chain and padlock. Provide two (2) gate keys to OWNER. At Substantial Completion of the Work, remove barricade from Project site, backfill and compact fence footing holes. Existing surface paving that is cut into or removed shall be patched and sealed to match surrounding areas.

f. At CONTRACTOR expense and without limitation remove and/or relocate fencing, fabric and barricades or other security and protection facilities as rapidly as required in order to provide for progress of the Work.

F. Other Temporary Enclosures & Barricades:

1. Provide lockable, temporary weather-tight enclosures at openings in exterior walls to create acceptable working conditions, to allow for temporary heating and for security.

2. Provide protective barriers around trees, plants and other improvements designated to remain.

3. Temporary partitions shall be installed at all openings where additions connect to existing buildings, and where to protect areas, spaces, property, personnel, students and faculty and to separate and control dust, debris, noise, access, sight, fire areas, safety and security. Temporary partitions shall be as designated on the Drawings or as specified by ARCHITECT. At CONTRACTOR expense and without limitation remove and/or relocate enclosures, barriers and temporary partitions as rapidly as required in order to provide for progress of the Work.

4. Since the Work of this Project may be immediately adjacent to existing occupied structures and vehicular and pedestrian right of ways, CONTRACTOR shall, in his sole judgment and in accordance with applicable safety standards, provide all temporary facilities, additional barricades, protection and care to protect existing structures, occupants, property, pedestrians and vehicular traffic. CONTRACTOR is responsible for any damage, which may occur to the property and occupants of the property of OWNER or adjacent private or public properties which in any way results from the acts or neglect of CONTRACTOR.

G. Temporary Storage Yards:

1. CONTRACTOR shall fence and maintain storage yards in an orderly manner.

2. Provide storage units for materials that cannot be stored outside.

3. At CONTRACTOR expense and without limitation remove and/or relocate storage yards and units as rapidly as required in order to provide for progress of the Work.

H. Temporary De-watering Facilities & Drainage:
5. CONTRACTOR shall at their expense and without limitation remove and/or relocate storage units as rapidly as required in order to provide for progress of the Work.

D. Temporary Sanitary Facilities:

1. CONTRACTOR shall provide portable chemical toilet facilities. Quantity of portable chemical toilet facilities shall be based on total number of workers and shall be in accordance with CAL/OSHA standards.

2. Portable chemical toilet facilities shall be maintained with adequate supplies and in a clean and sanitary condition and shall be removed from the Project site upon Substantial Completion of the Work.

3. CONTRACTOR employees shall not use school toilet facilities.

4. At CONTRACTOR expense and without limitation remove and/or relocate portable chemical toilet facilities as rapidly as required in order to provide for progress of the Work.

5. CONTRACTOR will contain their breaks and lunch periods to the areas designated by OWNER or any public area outside the Project site. CONTRACTOR shall provide a suitable container within the break/lunch area for the placement of trash. Areas used for break/lunch must be maintained clean and orderly. Once finish flooring has been installed in a particular area, no food or beverages will be permitted in that area.

E. Temporary Security Fence/Barricade:

1. CONTRACTOR shall install temporary Project site security barricade(s) indicated on Drawings or as required for safety and as specified herein. New or used material may be furnished. Security of Project site and contents is a continuous obligation of CONTRACTOR.

2. Unless otherwise indicated or specified, security fence shall be constructed of 6'-0" high chain link fencing with a 6'-0" high windscreen. Space posts not to exceed 10'-0" on centers. Posts shall be of following nominal pipe dimensions: terminal, corner, and gatepost 2-1/2", line posts 2". Chain link fence shall be not less than #13 gage, 2" mesh, and in one width. Posts, fence and accessories shall be galvanized and as follows:

a. Shall be set in the earth a depth of 30" with soil firmly compacted around post, unless required otherwise in writing by OWNER.

b. Fence fabric shall be attached to posts with #14 gage tie wire at 16" on centers. A #6 gage steel tension wire with turnbuckles shall be installed at top and bottom of barricade fencing. Wire tie fabric to tension wires at 18" centers.

c. Windscreen shall be attached to fence fabric and steel tension wires at 18" centers with a minimum of #14 gage tie wire. Windscreen shall be maintained and all rips, tears, missing sections shall be corrected upon notification by OWNER.
1. For temporary drainage and de-watering facilities and operations not directly associated with construction activities included under individual sections, comply with de-watering requirements of applicable Division 01 sections. CONTRACTOR shall maintain the Work, Project site and related areas free of water.

2. For temporary drainage and de-watering facilities and operations directly associated with new buildings, additions or other construction activities, comply with Division 01 & 02 Sections. CONTRACTOR shall be responsible for, but not limited to, de-watering of excavations, trenches & below grade areas of buildings, structures, the Project site and related areas.

I. Temporary Protection Facilities Installation:

1. CONTRACTOR shall not change over from using temporary facilities and controls to permanent facilities until Substantial Completion, except as permitted by OWNER.

2. Until permanent fire protection needs are supplied and approved by authorities having jurisdiction, CONTRACTOR shall provide, install and maintain temporary fire protection facilities of the types needed in order to adequately protect against fire loss. CONTRACTOR shall adequately supervise welding operations, combustion type temporary heating and similar sources of fire ignition.

3. CONTRACTOR shall provide, install and maintain substantial temporary enclosures of partially completed areas of construction. Provide locking entrances to prevent unauthorized entrance, vandalism, theft and similar violations of security. Where materials, tools and equipment are stored within the Work area, CONTRACTOR shall provide secure lock up to protect against vandalism, theft and similar violations of security. OWNER accepts no financial responsibility for loss, damage, vandalism or theft.

4. CONTRACTOR operations shall not block, hinder, impede or otherwise inhibit the use of required exits during an emergency. CONTACTOR shall maintain unobstructed access to fire extinguishers, fire hydrants, temporary fire protection facilities, stairways and other access routes for fire fighting equipment and/or personnel.

5. With approval of OWNER and at the earliest feasible date in each area of the Work, complete installation of the permanent fire protection facilities including connected services and place into operation and use. Instruct OWNER personnel in use of permanent fire protection facilities.

6. In the event of an emergency drill or an actual emergency, designated by the sounding of the fire alarm and/or other sounding device, all construction activities must cease. CONTRACTOR shall evacuate the Work area and remain outside the Work area until permitted to return. No Work shall be conducted during the evacuation of a building or during an emergency.

J. Temporary Security and Safety Measures:
1. During performance of the Work in existing facilities CONTRACTOR shall provide, install and maintain substantial temporary barriers and/or partitions separating all Work areas from areas occupied by the public.

K. Temporary Access Roads and Staging Areas:

1. CONTRACTOR shall provide legal access to and maintain CONTRACTOR designated areas for the legal parking, loading, off-loading & delivery of all vehicles associated with the Work. CONTRACTOR shall be solely responsible for providing and maintaining these requirements whether on or off the Project site.

2. Temporary access roads are to be installed and maintained by CONTRACTOR to all areas of the Project site.

3. CONTRACTOR will be permitted to utilize existing facility roads as designated by OWNER. CONTRACTOR shall only utilize those entrances and exits as designated by OWNER and CONTRACTOR shall observe all traffic regulations of OWNER.

4. CONTRACTOR shall maintain roads and walkways in a clean condition including removal of debris and/or other deleterious material on a daily basis.

3.04 PROJECT SIGNAGE

A. CONTRACTOR shall furnish and install a Project sign on the Project site at a location established by ARCHITECT. A graphical layout of the proposed sign shall be submitted to ARCHITECT and OWNER for review before fabrication.

B. Sign construction shall be 10'-0" wide by 6'-0" high with 6" x 6" posts and 1" exterior grade plywood, bolted to posts.

C. Sign lettering shall be painted white with exhibit lettering by a professional sign painter, in accordance with details reviewed by ARCHITECT. The following shall be listed on sign:

1. OWNER – City of Beverly Hills.
2. Name of Project.
4. Contractor.
5. Other Principal Contractors.
6. Others that may be designated by the Owner.

D. No other signs shall be displayed without approval of OWNER. At CONTRACTOR expense and without limitation remove and/or relocate Project sign and related facilities as rapidly as required in order to provide for progress of the Work.

E. CONTRACTOR shall remove Project sign at Substantial Completion of the Work.

F. CONTRACTOR shall provide and install signage to provide directional information to construction personnel and visitors as follows and as reviewed by OWNER:

1. For construction traffic control/flow at Entrances/Exits, and as designated by OWNER.
2. To direct visitors.
3. For construction parking.
4. To direct deliveries.
5. For Warning Signs as required.
6. Per CAL/OSHA standards as necessary.
7. For trailer identification and Project site address.
8. For "No Smoking" safe work site at designated locations.

3.05 TRENCHES

A. Open trenches for installation of utility lines (water, gas, electrical and similar utilities) and open pits outside barricaded working areas shall be barricaded at all times in a legal manner determined by CONTRACTOR. Trenches shall be backfilled and patch-paved within twenty-four (24) hours after approval of installation by authorities having jurisdiction or shall have "trench plates" installed. CONTRACTOR shall comply with all applicable statutes, codes & regulations regarding trenching and trenching operations. Open trenches deeper than 3'-6", and not located within a public street access, shall be enclosed within an 8'-0" high chain-link fence.

3.06 DUST CONTROL

A. CONTRACTOR is responsible for dust control on and off the Project site. When Work operations produce dust the Project site and/or streets shall be sprinkled with water to minimize the generation of dust. CONTRACTOR shall clean all soils and debris from construction vehicles and cover both earth and debris loads prior to leaving the Project site. CONTRACTOR shall, on a daily basis, clean all streets and/or public improvements within the right of way of any and all debris, dirt, mud and/or other materials attributable to operations of CONTRACTOR.

3.07 WASH OUT

A. CONTRACTOR shall provide and maintain a minimum of four (4) wash out boxes of sufficient size and strength to provide for concrete mixer wash out. CONTRACTOR shall locate and relocate both the wash out boxes and wash out areas in order to accommodate the progression of the Work. The wash out area shall be located as to minimize the amount of potential run off onto adjacent private and/or public property. CONTRACTOR shall legally dispose of the contents of the wash out boxes and area on an as needed basis or as required by OWNER.

3.08 WASTE DISPOSAL

A. CONTRACTOR shall provide and maintain trash bins on the Project site. Trash bins shall be serviced on an as needed basis and CONTRACTOR is responsible for the transportation of and the legal disposal of all contents.

3.09 ADVERSE WEATHER CONDITIONS
A. Should warnings of adverse weather conditions such as heavy rain and/or high winds be forecasted, CONTRACTOR shall provide every practical precaution to prevent damage to the Work, Project site and adjacent property. CONTRACTOR precautions shall include, but not be limited to, enclosing all openings, removing and/or securing loose materials, tools, equipment and scaffolding.

B. CONTRACTOR shall provide and maintain drainage away from buildings and structures.

C. CONTRACTOR shall implement all required storm water mitigation measures as required under related Division 01 Sections.

3.10 DAILY REPORTS

A. CONTRACTOR shall provide and maintain in the Project site office of CONTRACTOR, a daily sign in sheet for use by all employees of CONTRACTOR and all Subcontractors at whatever tier. At the beginning of each work day, the foreman, project manager, superintendent of CONTRACTOR and/or Subcontractors shall visit the site office of the CONTRACTOR and shall enter onto the daily sign in sheet: all employee names; trade classification; and represented company. The completed sign in sheet shall serve as the basis of and shall be submitted with the daily construction report as set forth in Section 3.10 B.

B. By the end of each workday, CONTRACTOR shall submit to OWNER and IOR a daily construction report denoting the daily manpower counts and a brief description/location of the workday activities. Manpower shall be broken down by trade classification such as foreman, journeyman or apprentice. The report shall also note the date, day of the week, weather conditions, deliveries, equipment on the Project site whether active and/or idle, visitors, inspections, accidents and unusual events, meetings, stoppages, losses, delays, shortages, strikes, orders and requests of governing agencies, Construction Directive and/or Change Orders received and implemented, services disconnected and/or connected, equipment start up or tests and partial use and/or occupancies. CONTRACTOR shall also include on the daily construction report the above information for all Subcontractors at whatever tier.

END OF SECTION
SECTION 01600
MATERIALS AND EQUIPMENT

PART 1 - GENERAL

1.1 SECTION INCLUDES

A. This Section includes administrative and procedural requirements governing selection of products for incorporation into the Work.

1.2 RELATED SECTIONS

A. Section 01100: Coordination
B. Section 01300: Submittals
C. Section 01360: Construction Schedule
D. Section 01420: Testing and Inspection
E. Section 01640: Substitutions
F. Section 01740: Warranties

1.3 DEFINITIONS

A. Definitions used in this Section are not intended to change the meaning of other terms used in the Contract Documents, such as “specialties”, “systems”, “structure”, “finishes”, “accessories”, and other similar terms. Such terms are self-explanatory and have well-recognized meanings in the construction industry.

1. “Products” are items purchased for incorporation into the Work, whether purchased for the Work or taken from previously purchased stock. The term “product” includes the terms “material” and “equipment”, and terms of similar intent.

a. “Named Products” are items identified by the manufacturer’s product name, including make or model number or other designation, shown or listed in the manufacturer’s published product literature, that is current as of the date of the Contract Documents.

b. “Foreign Products”, as distinguished from “domestic products”, are items substantially manufactured (50 percent or more of value) outside the United States and its possessions. Products produced or supplied by entities substantially owned (more than 50 percent) by persons who are not citizens of, nor living within, the United States and its possessions are also considered to be foreign products.

2. “Materials” are products substantially shaped, cut, worked, mixed, finished, refined or otherwise fabricated, processed, or installed to form a part of the Work.

3. “Equipment” is a product with operational parts, whether motorized or manually operated, that requires service connections, such as wiring or piping.

1.4 SUBMITTALS

A. Material list: Prepare a list in tabular form acceptable to ARCHITECT showing proposed products. Include generic names. Include the manufacturer’s name and proprietary names for each item listed.

1. Coordinate material list with the Construction Schedule and the submittal schedule.

2. Form: Prepare material list with information on each item tabulated under the following column headings.

a. Related Specification Section number
b. Generic name used in Contract Documents
c. Proprietary name, model number, and similar designations
d. Manufacturer’s name and address
e. Supplier’s name and address
f. Installer’s name and address
g. Projected delivery date or time span of delivery period

3. Initial Submittal: Within ten (10) days after execution of each subcontract agreement, as set forth in General Condition Section 6.25, submit three (3) copies of an initial material list. Provide a written explanation for omissions of data and for known variations from the Contract Documents.

4. ARCHITECT Action: ARCHITECT will respond in writing to CONTRACTOR within fourteen (14) days of receipt of the completed material list. No response outside this period constitutes no objection to listed items but does not constitute a waiver of the requirement that selected items comply with the Contract Documents. ARCHITECT response will include a list of unacceptable item selections, containing a brief explanation of reasons for this action.

1.5 QUALITY ASSURANCE

A. Source Limitations: To the fullest extent possible, provide products of the same kind from a single source.

1. CONTRACTOR is to verify necessary lead times for all materials; however, when specified products are available only from sources that do not, or cannot, produce a quality adequate to complete Work in a timely manner, consult with the ARCHITECT to determine the most important product qualities before proceeding. Qualities may include attributes, such as visual appearance, strength, durability, or compatibility. When a determination has been made, select products from sources producing these qualities, to the fullest extent possible.

B. Compatibility of Options: When the CONTRACTOR is given the option of selecting between two or more products for use in the Work, the product selected shall be compatible with products previously selected, even if previously selected products were also options.

C. Nameplates: Except for required labels and operating data, do not attach or imprint manufacturer’s or producer's nameplates or trademarks on exposed surfaces of products that will be exposed in view in occupied spaces or on the exterior.

1. Labels: Locate required product labels and stamps on concealed surfaces or, where required for observation after installation, on accessible surfaces that are not conspicuous.

2. Equipment Nameplates: Provide a permanent nameplate on each item of service-connected or power-operated equipment. Locate on an easily accessible surface that is inconspicuous in occupied spaces. The nameplate shall contain the following information and other essential operating data:

a. Name of product and manufacturer
b. Model and serial number
c. Capacity
d. Speed
e. Ratings

1.6 PRODUCT DELIVERY, STORAGE, AND HANDLING

A. Deliver, store, and handle products according to the manufacturer’s recommendations, using means and methods that will prevent damage, deterioration, and loss, including theft.
1. Schedule delivery to minimize long-term storage at the Project site and to prevent overcrowding of Work spaces.

2. Coordinate delivery with installation time to assure minimum holding time for items that are flammable, hazardous, easily damaged, or sensitive to deterioration, theft, and other losses.

3. Deliver products to the Project site in an undamaged condition in the manufacturer’s original sealed container or other packaging system, complete with labels and instructions for handling, storing, unpacking, protecting, and installing.

4. Inspect products upon delivery to ensure compliance with the Contract Documents and to ensure that products are undamaged and properly protected.

5. Store products at the Project site in a manner that will facilitate inspection and measurement of quantity or counting of units.

6. Store heavy materials away from structures in a manner that will not endanger the structure’s supporting construction.

7. Store products subject to damage by the elements above ground, under cover in a weather-tight enclosure, with ventilation adequate to prevent condensation. Maintain temperature and humidity within range required by manufacturer’s instructions.

PART 2 - PRODUCTS

2.1 MATERIAL SELECTION

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

1. Provide products complete with accessories, trim, finish, safety guards, and other devices and details needed for a complete installation and the intended use and effect.

2. Standard Products: Where available, provide standard products of types that have been produced and used successfully in similar situations on other Projects.

B. Product Selection Procedures: The Contract Documents and governing regulations govern product selection. Procedures governing product selection include the following:

1. Proprietary Specification Requirements: Where Specifications name only a single material or manufacturer, provide the product indicated. No substitutions will be permitted.

2. Semi-proprietary Specification Requirements: Where Specifications name two or more products or manufacturers, provide one of the products indicated. No substitutions will be permitted.

   a. Where Specifications specify products or manufacturers by name, accompanied by the term "or equal" or "or approved equal", comply with General Condition Section 6.14 to obtain approval for use of an unnamed product.

3. Descriptive Specification Requirements: Where Specifications describe a product or assembly, list exact characteristics required, with or without use of a brand or trade name, provide a product or assembly that provides the characteristics and otherwise complies with the Contract Documents.

4. Performance Specification Requirements: Where Specifications require compliance with performance requirements, provide products that comply with these requirements and are recommended by the manufacturer for the application indicated.
a. Manufacturer’s recommendations may be contained in published material literature or by the manufacturer’s certification of performance.

5. Compliance with Standards, Codes, and Regulations: Where Specifications only require compliance with an imposed code, standard or regulation select a product that complies with the standards, codes, or regulations specified.

6. Visual Matching: Where Specifications require matching an established Sample, decision of the ARCHITECT will be final on whether a proposed product matches satisfactorily.

7. Visual Selection: Where specified product requirements include the phrase “... as selected from manufacturer’s standard or premium colors, patterns, textures...” or a similar phrase, select a product and manufacturer that complies with other specified requirements. The ARCHITECT will select the color, pattern, and texture from the product line selected.

PART 3 - EXECUTION

3.1 INSTALLATION OF PRODUCTS

A. Comply with manufacturer’s instructions and recommendations for installation of products in the applications indicated. Anchor each product securely in place, accurately located and aligned with other Work.

1. Clean exposed surfaces and protect as necessary to ensure freedom from damage and deterioration at time of Substantial Completion.

END OF SECTION
SECTION 01640
SUBSTITUTIONS

PART 1 - GENERAL

1.1 SECTION INCLUDES

A. This Section includes administrative and procedural requirements for handling requests for substitutions made after the Effective Date of the Contract.

1.2 RELATED SECTIONS

A. Section 01300: Submittals
B. Section 01600: Materials and Equipment
C. Section 01700: Close Out

PART 2 - PRODUCTS (Not applicable)

PART 3 - EXECUTION

3.1 APPLICATION

A. CONTRACTOR proposed changes in products required by the Contract Documents after the Effective Date of the Contract are considered to be requests for substitutions. OWNER will consider requests for substitution if a product is no longer manufactured and/or cannot be acquired from existing inventories. The following are not considered to be requests for substitutions:

1. Substitutions requested during the bidding period, and accepted by Addenda prior to bid date, are included in the Contract Documents.

2. Revisions to the Contract Documents requested by OWNER or ARCHITECT.


4. Substitutions requested after bid opening and prior to the Effective Date of the Contract.

3.2 SUBMITTALS

A. Transmit submittals as described in related Sections for each request for substitution.

1. Identify the product to be replaced in each request. Include related Specification Section and Drawing number.

2. Provide complete documentation denoting compliance with the requirements for substitutions, and the following information, as appropriate.

   a. A detailed comparison of significant qualities of the proposed substitution with those specified in the Contract Documents. Significant qualities may include elements, such as performance, weight, size, durability, and visual effect.

   b. Product Data, including Drawings and descriptions of products and fabrication and installation procedures.

   c. Samples, where applicable or requested.
d. CONTRACTOR certification the proposed substitution conforms to requirements of the Contract Documents in every respect and is appropriate for the applications indicated.

e. CONTRACTOR waiver of rights to an increase in the Contract Amount, Milestones and/or Contract Time that may subsequently become necessary because of the failure of the substitution to adequately perform.

3. If required, ARCHITECT will request additional information or documentation for evaluation. OWNER will notify CONTRACTOR of acceptance or rejection of the substitution.

4. ARCHITECT will review and consider request for substitution and make a recommendation to OWNER.

5. Where a proposed substitution involves and/or effects more than one Subcontractor, CONTRACTOR shall ensure each Subcontractor cooperates with the other Subcontractor involved to coordinate the Work, provide uniformity and consistency, and assure compatibility of all products.

6. CONTRACTOR submittal and ARCHITECT review of Shop Drawings, Product Data, or Samples do not constitute an acceptable or valid request for substitution.

END OF SECTION
SECTION 01700

CONTRACT CLOSEOUT

PART 1 - GENERAL

1.1 SECTION INCLUDES

A. This Section includes administrative and procedural requirements for Contract closeout including, but not limited to, the following:

1. Inspection procedures.
2. Project record documents submittal.
3. Operation and maintenance manual submittal.
4. OWNER orientation and instruction.
5. Final cleaning.
6. Pest control.

B. Closeout requirements for specific Work activities are included in the appropriate Sections in Divisions 02 through 16.

1.2 RELATED SECTIONS

A. Section 01080: Application for Payment
B. Section 01300: Submittals
C. Section 01360: Construction Schedule
D. Section 01450: Test and Balance
E. Section 01500: Construction Facilities and Temporary Controls
F. Section 01740: Warranties

PART 2 – PRODUCTS (Not applicable)

PART 3 - EXECUTION

3.1 SUBSTANTIAL COMPLETION

A. Inspection Procedures: On receipt of a request for a certificate of Substantial Completion, OWNER will either authorize commencement of inspection or advise CONTRACTOR of unfilled requirements. OWNER, CONTRACTOR and ARCHITECT will inspect the Work and prepare a comprehensive punch list of items to be completed.

1. Owner’s Representative will repeat inspection when requested and assured the Work is complete.
2. Results of the completed inspection will form the basis of the requirements for final inspection and Final Completion.

B. Re-inspection Procedures: OWNER, CONTRACTOR and ARCHITECT will inspect the Work upon notice the Work, including final inspection list items from earlier inspections, has been completed, except for items whose completion is delayed under circumstances acceptable to OWNER.

1. Upon completion of inspection, ARCHITECT will recommend Final Completion. If the Work is incomplete, ARCHITECT will advise CONTRACTOR of Work that is incomplete or of obligations that have not been fulfilled but are required for Final Completion.
2. If necessary, re-inspection will be repeated, but may be assessed against CONTRACTOR if OWNER is subject to additional professional service and or additional costs of inspection.
3.2 PROJECT RECORD DOCUMENT SUBMITTAL

A. General: Do not use project record documents for construction purposes. Protect record documents from deterioration and loss in a secure, fire-resistant location. Provide access to record documents for ARCHITECT, IOR and OWNER reference during normal working hours. Project record document shall be updated on a weekly basis. Prior to submitting each application for payment, ARCHITECT approval of project record documents.

B. Record Drawings: Maintain a clean, undamaged set of blue or black line white prints of Drawings and Shop Drawings. Mark the set to show the actual installation where the installation varies substantially from the Work as originally shown. Mark which Drawing is most capable of showing conditions fully and accurately. Where Shop Drawings are used, record a cross-reference at the corresponding location on the Drawings. Give particular attention to concealed elements that would be difficult to measure and record at a later date.

1. Mark record sets with red erasable pencil. Use other colors to distinguish between variations in separate categories of the Work. Date and number entries in the same format as submitted. Call attention to entry by a "cloud" around the affected areas.

2. Mark new information important to OWNER but was not shown on Drawings or Shop Drawings.

3. Utility location and depth below finished grade and or above ceilings and attic spaces shall be fully dimensioned and indicated on record drawings. Dimensions shall be measured from building lines or permanent landmarks and shall be triangulated.

4. Note related Change Order or Construction Directive numbers where applicable. RFC submissions shall be referenced on each affected sheet, plan and/or Shop Drawing.

5. Organize record drawing sheets into manageable sets. Bind sets with durable-paper cover sheets; print suitable titles, dates, and other identification on the cover of each set.

6. Prior to Final Completion of the Work, and review of the project record drawings by ARCHITECT, prepare a final set of project record drawings using reproducible Mylar or vellum. Submit final set of transparencies to ARCHITECT.

C. Record Specifications: Maintain two complete copies of the Specifications, including Addenda. Include with the Specifications two copies of other written Contract Documents, such as Change Orders and/or Construction Directives issued during construction.

1. Mark these record documents to show substantial variations in actual Work performed in comparison with the text of the Specifications and modifications.

2. Give particular attention to substitutions and selection of options and information on concealed Work that cannot otherwise be readily discerned later by direct observation.


4. Prior to Final Completion of the Work, submit record Specifications to ARCHITECT for OWNER records.

D. Record Product Data: Maintain two copies of each Product Data submittal. Note related Change Orders and Construction Directives and mark-up of record drawings and Specifications.

1. Mark these documents to show significant variations in actual Work performed in comparison with information submitted. Include variations in products delivered to the Project site and from the manufacturer’s installation instructions and recommendations.
2. Give particular attention to concealed products and portions of Work that cannot otherwise be readily discerned later by direct observation.

3. Prior to Final Completion of the Work, submit complete set of record Product Data to the ARCHITECT for OWNER records.

E. Record Samples: Immediately prior to Substantial Completion, CONTRACTOR shall meet with ARCHITECT and OWNER personnel at the Project site to determine which Samples are to be transmitted to OWNER for record purposes. Comply with OWNER instructions regarding delivery to OWNER storage area.

F. Miscellaneous Records: Refer to other Specification sections for requirements of miscellaneous record keeping and submittals in connection with actual performance of the Work. Immediately prior to the date of Final Completion, complete and compile miscellaneous records and place in good order. Identify miscellaneous records properly and bind or file, ready for continued use and reference. Submit to ARCHITECT for OWNER records.

G. Maintenance Manuals: Prior to Final Completion, organize operation and maintenance data into suitable two sets of manageable size. Bind properly indexed data in individual, heavy-duty, 2-3", 3-ring, vinyl-covered binders, with pocket folders for folded sheet information. Mark appropriate identification on front and spine of each binder. Submit to ARCHITECT for OWNER records. Include the following types of information.

1. Emergency instructions
2. Spare parts list
3. Copies of warranties
4. Wiring diagrams
5. Recommended "turn-around" cycles
6. Inspection procedures
7. Shop Drawings and Product Data
8. Fixture lamping schedule

3.3 CLOSEOUT PROCEDURES:

A. Operation and Maintenance Instructions: Prior to Substantial Completion, arrange for each installer of equipment that requires regular operation and maintenance to meet with OWNER personnel to provide instruction in proper operation and maintenance. Provide instruction by manufacturer’s representatives if installers are not experienced in operation and maintenance procedures. Include a detailed review of the following items:

1. Maintenance manuals
2. Record documents
3. Spare parts and materials
4. Tools
5. Lubricants
6. Fuels
7. Identification systems
8. Control sequences
9. Hazards
10. Cleaning
11. Warranties and bonds
12. Maintenance agreements and similar continuing commitments

B. As part of instruction for operating equipment, demonstrate the following procedures:

1. Start-up
2. Shutdown
3. Emergency operations
4. Noise and vibration adjustments
3.4 FINAL CLEANING

A. General: The General Conditions specify general cleaning during the Work. General cleaning is included in Division 01 Section “Construction Facilities and Temporary Controls”.

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

1. Complete the following cleaning operations before requesting inspection for a certificate of Substantial Completion.

   a. Remove labels that are not permanent labels.

   b. Clean transparent materials, including mirrors and glass in doors and windows. Remove glazing compounds and other substances that are noticeable vision-obscuring materials. Replace chipped or broken glass and other damaged transparent materials.

   c. Clean exposed exterior and interior hard-surfac ed finished to a dust-free condition, free of stains, films, and similar foreign substances. Restore reflective surfaces to their original condition. Leave concrete floors broom clean. Vacuum carpeted surfaces.

   d. Wipe surfaces of mechanical and electrical equipment. Remove excess lubrication and other substances. Clean plumbing fixtures to a sanitary condition. Clean light fixtures and lamps.

   e. Clean the Project site, including landscape development areas, of rubbish, litter, and other foreign substances. Sweep paved areas broom clean; remove stains, spills, and other foreign deposits. Rake grounds that are neither paved nor planted to a smooth, even-textured surface.

3.5 PEST CONTROL

A. Prior to Substantial Completion, engage an experienced, licensed exterminator to make a final inspection and rid the Project site of rodents, insects, and other pests.

END OF SECTION
PART 1 - GENERAL

1.1 SECTION INCLUDES

A. This Section includes administrative and procedural requirements for warranties required by the Contract Documents, including manufacturers standard warranties on products and special product warranties.

B. Refer to the General Conditions for terms of the guarantee period for the Work.

1.2 RELATED SECTIONS

A. Section 01600: Materials and Equipment
B. Section 01700: Contract Closeout

PART 2 - PRODUCTS (Not applicable)

PART 3 - EXECUTION

3.1 WARRANTY REQUIREMENTS

A. Disclaimers and Limitations: Manufacturer’s disclaimers and limitations on product warranties shall not relieve CONTRACTOR of the warranty of the Work incorporating such materials, products and/or equipment. Manufacturer’s disclaimers and limitations on warranties do not relieve suppliers, manufacturers, and Subcontractors required to countersign special warranties with CONTRACTOR.

B. Standard warranties are preprinted written warranties published by individual manufacturers for particular products and are specifically endorsed by the manufacturer to OWNER.

C. Special warranties are written warranties required by or incorporated in the Contract Documents, either to extend time limits provided by standard warranties or to provide greater rights for OWNER.

D. Related Damages and Losses: When correcting failed or defective warranted Work, remove and replace Work that has been damaged as a result of such failure or must be removed and replaced to provide access for correction of warranted Work.

E. Reinstatement of Warranty: When Work covered by a warranty has failed and been corrected by replacement or rebuilding, reinstate the warranty by written endorsement with the reinstated warranty equal to the original warranty.

F. Replacement Cost: Upon determination the Work covered by a warranty has failed and/or is defective, replace or rebuild the Work to an acceptable condition complying with requirements of the Contract Documents. CONTRACTOR is responsible for the cost of replacing or rebuilding defective Work regardless of whether OWNER has benefited from use of the Work through a portion of its anticipated useful service life.

G. OWNER Recourse: Expressed warranties made to OWNER are in addition to implied warranties and shall not limit the duties, obligations, rights, and remedies otherwise available under the law. Expressed warranty periods shall not be interpreted as limitations on the time in which OWNER can enforce such other duties, obligations, rights, or remedies.
H. Rejection of Warranties: OWNER reserves the right to reject warranties and to limit selection to products with warranties not in conflict with requirements of the Contract Documents.

I. Where the Contract Documents require a special warranty, or similar commitment on the Work or part of the Work, OWNER reserves the right to refuse to accept the Work until CONTRACTOR presents evidence the entities required to countersign such commitments have done so.

3.2 SUBMITTALS

A. Submit written warranties to ARCHITECT prior to Final Completion of the Work. If the certificate of Substantial Completion designates a commencement date for warranties other than the date of Substantial Completion for the Work, submit written warranties as set forth in the certificate of Substantial Completion.

1. When a designated portion of the Work is partially used and or occupied by OWNER, submit properly executed warranties to ARCHITECT within fifteen (15) days of the Partial Use or Occupancy of the designated portion of the Work.

B. When the Contract Documents require CONTRACTOR, or CONTRACTOR and a Subcontractor, supplier or manufacturer to execute a special warranty, prepare a written document containing appropriate terms and identification, ready for execution by the required parties. Submit a draft to OWNER, through the ARCHITECT, for approval prior to final execution.

1. Refer to Divisions 02 through 16 for specific content requirements and particular requirements for submitting special warranties.

C. Form of Submittal: Prior to Final Completion of the Work, compile two copies of each required warranty properly executed by CONTRACTOR, or by CONTRACTOR and Subcontractor, supplier, or manufacturer. Organize the warranty documents into an orderly sequence based on the Specifications.

D. Bind warranties and bonds in heavy-duty, commercial-quality, durable 3-ring, vinyl-covered loose-leaf binders, thickness as necessary to accommodate contents, and sized to receive 8½ by 11” (115 by 280 mm) paper.

1. Provide heavy paper dividers with celluloid covered tabs for each separate warranty. Mark the tab to identify the item or installation. Provide a typed description of the product or installation, including the name of the product, and the name, address, and telephone number of the installer.

2. Identify each binder on the front and spine with the typed or printed title “WARRANTIES”, Project title and/or name, and name of CONTRACTOR.

3. When warranted Work requires operation and maintenance manuals, provide additional copies of each required warranty, as necessary, for inclusion in each required manual.

END OF SECTION
SECTION 02110

CLEARING, GRUBBING & DEMOLITION

PART 1 - GENERAL

Application and construction procedures shall conform to the requirements of the Standard Specifications for Public Works Construction, latest edition and any supplements. Provisions of the General and Supplementary Conditions and Division 01 apply to this section.

1.1 SECTION INCLUDES

A. Furnish materials, equipment and perform labor required to execute this work as indicated on the Plans, as specified and as necessary to complete the contract, including but not limited to these major items:

1. Notify local utility companies.

2. Remove surface debris.

3. Removal of plant life and grass as indicated.

4. Removal and storage of items to be salvaged, relocated or reused.

5. Clear site of plant life and grass as indicated.

6. Remove trees and shrubs.

7. Protection of plant life, grass, trees and shrubs to remain or to be relocated.

8. Remove root system of trees and shrubs.

9. Saw cut and removal of existing asphalt concrete paving, walks, curbs and miscellaneous items as indicated.

10. Remove any other items indicated on the Plans, or as directed.

11. The Contractor shall contact the regional notification center (Underground Service Alert of Southern California) at 1-800-227-2600 (or 811) and obtain an inquiry identification number. No excavation shall commence unless the Contractor has obtained the Inquiry Identification Number, and so notify the City and Architect.

1.2 RELATED WORK

<table>
<thead>
<tr>
<th>Section</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>01500</td>
<td>Construction Facilities and Temporary Controls</td>
</tr>
<tr>
<td>02200</td>
<td>Demolition</td>
</tr>
<tr>
<td>02315</td>
<td>Excavating, Backfilling and Compacting</td>
</tr>
<tr>
<td>02800</td>
<td>Landscape</td>
</tr>
</tbody>
</table>
PART 3 - EXECUTION

3.1 SURFACE CONDITIONS

A. Examine the areas and conditions under which work of this section will be performed. Correct conditions detrimental to timely and proper completion of the work.

B. All work under demolition operations shall be completed prior to the start of grading procedures.

C. Verify that existing plant life and features designated to remain are tagged or identified.

3.2 CLEARING AND GRUBBING

A. Record prints shall be available on the site and be reviewed by the Architect at appropriate times before work is covered.

B. Clear areas required for access to site and execution of work. Clear ground surface of all vegetable growth, such as trees, logs, upturned stumps, roots, brush, grass, weeds, and all objectionable material within limits of construction area. Clear undergrowth, deadwood, rubbish, debris, and other objectionable material, without disturbing subsoil. All roots 1 inch and larger, rocks and/or debris 3 inches and larger, and all other objectionable materials shall be removed 3 feet below existing ground surface or subgrade, whichever is deeper.

C. Clearing and grubbing shall consist of the removal of all natural and artificial objectionable materials from construction areas. Grubbing shall extend to the outside excavations and fill slope lines, except where slopes are rounded the areas shall extend to the outside limits of slope rounding.

D. Bituminous Pavement shall be removed to clean, straight lines. When only surface of bituminous pavement is to be removed, method of removal shall be approved by the Architect and or City representative.

E. Remove paving, curbs, and other items as indicated on the Plans.

F. All materials removed shall be legally disposed of off the site at a facility licensed to accept material, and at regular intervals, or as directed.

G. Contractor is responsible for fill and compaction of disturbed areas resulting from such removal. Filling shall not be done until disturbed areas or holes are approved by the Architect.

H. Concrete Pavement shall be removed to neatly sawed edges. Saw cuts made to a minimum depth of 1-1/2 inches. Saw cuts shall be either parallel to the original saw cuts or shall be cut on an angle which departs from the original saw cut not more than 1 inch to 6 inches.

I. Concrete Curb, Walks Gutters, Cross Gutters, Driveways and Alley Intersections shall be removed to neatly sawed edges with cuts made to a minimum depth of 1-1/2
inches. Curb and gutter shall be sawed to a depth of 1-1/2 inches on a neat line at right angles to the curb face.

J. Removal of all natural and artificial objectionable materials from the right-of-way in construction areas.

1. Existing A.C. paving, concrete curbs, walks, slabs, etc., as indicated.
2. Removal of items not designated to be salvaged, relocated or reused.
3. Any additional items as directed by the Architect or City representative.

K. Upon completion of clearing and grubbing operations the contractor shall rip the site to a depth of 18 inches in two opposing directions and remove all debris generated from the operation.

3.3 PROTECTION OF EXISTING IMPROVEMENTS

A. Protection of underground site utilities. Contractor shall locate all existing utilities and perform excavation operations to determine the depth and extent of the utility.

B. Protection of Items to be relocated, reused or salvaged.

C. Protection of plant life, grass, trees and shrubs to remain or to be relocated.

3.4 SALVAGE ITEMS

A. Salvage items are the property of the City, if the City chooses not to dispose of these items, they then become the property of the Contractor.

3.5 REMOVAL

A. Remove debris, rock and extracted materials from the site regularly and as directed by the Architect and dispose of in a legal manner.

3.6 CLEAN-UP

A. Leave surfaces free of dirt, gouges and imperfections. Clean adjacent surfaces soiled by this work. Remove equipment, surplus materials and debris from job site, and leave installation ready for succeeding work.
SECTION 02200

DEMOLITION

PART 1 – GENERAL

1.01 DESCRIPTION OF WORK

A. Provisions of the General and Supplementary Conditions and Division One apply to this section.

B. The extent of demolition work is shown on the Drawings for site and buildings. Furnishing all labor, materials and equipment necessary for demolition, dismantling, cutting and alterations as indicated, specified, and required for completion of the Contract.

C. Demolition includes complete wrecking of work and removal and disposal of demolished materials, as shown on the Drawings and herein specified.

D. Demolition and removal work shall be performed to the extent indicated plus such additional demolition and removal as is necessary for the installation of new work. Except as noted below, the Contractor may at his option, demolish or remove more than that indicated where such variation will expedite the work and restore all areas to original condition, subject to the Architect's approval, and without additional cost to the Owner.

E. Related Sections:

1. Section 01120: Cutting and Patching.

2. Section 01130: Field Engineering.

3. Section 01500: Construction Facilities and Temporary Controls.

1.02 QUALITY ASSURANCE

A. Requirements of Regulatory Agencies:

1. Demolition work shall comply with 2010 California Green Building Standards Code, Title 24, Part 11, and applicable City of Beverly Hills regulations.

2. Do not close, obstruct, or store material or equipment in street, sidewalks, alleys or passageways in accordance with the requirements of the codes.

1.03 SUBMITTALS

A. Demolition Procedures: Detailed descriptions of procedures used protect adjacent and remaining existing construction shall be submitted to Architect and subject to field demonstration.

B. Provide a detailed sequence of demolition and removal work.

C. Provide proposed pedestrian traffic control and protection plans.

D. Provide field survey documentation for items scheduled to "be removed, reworked and reinstalled at original locations".

E. Submit plans, indicating the extent of items and systems to be removed. Indicate items to be
salvaged or items to be protected during demolition. Indicate locations of utility terminations and the extent of abandoned lines to be removed. Include details indicating methods of utility terminations.


1.04 JOB CONDITIONS

A. Condition of Structures: The intent of the Drawings is to show existing site and building conditions with information developed from field surveys, and to generally show the amount and types of demolition and removals required to prepare existing areas for new Work. Contractor shall make a detailed survey of existing conditions pertaining to the Work before commencing demolition. Report discrepancies between the Drawings and actual conditions to the Architect for instructions, and do not perform any demolition or removals where such discrepancies occur prior to receipt of the Architect instructions.

B. Traffic: Conduct demolition operations and removal of debris to ensure minimum interference with roads, streets, driveways, alleys, sidewalks, corridors, and other adjacent occupied or used facilities. Flagmen shall be used as necessary for traffic control. Maintain safe access to public at all time.

C. Protection:

1. Do not begin demolition until safety partitions, barricades, warning signs and other forms of protection are installed. Refer to Section 01525: Construction Facilities and Temporary Controls. Ensure safe passage of persons around area of demolition and new work. Conduct operations to prevent injury to adjacent structures, other facilities and persons.

2. Contractor is responsible for all construction related impacts to building structure, finishes and surrounding landscape and hardscape. It is Contractor's responsibility to provide appropriate protection for areas of work.

D. Exiting:

1. All fire exit paths from occupied areas to remain open at all times. Where exit paths pass through areas of construction, path shall be kept clear and obvious at all times. Where necessary, plywood dividers, construction barricades and signage shall be provided to maintain clear and obvious exit path.

PART 2 – PRODUCTS

NOT USED

PART 3- EXECUTION

3.01 PROTECTION

A. Trees, shrubs, or other planting, either on or off the site, power poles and lines, existing structures, paving, miscellaneous built elements to remain, and adjacent property, shall be protected throughout demolition operations.
3.02 DEMOLITION

A. Pollution Controls: Use temporary enclosures and other methods to limit dust and dirt rising and scattering in air to lowest practical level.

1. Exterior Dust Control: All dust nuisance, caused by the Contractor shall be abated by sprinkling of water or any other necessary means approved by the Architect.

B. Demolition: Demolish items as indicated on the Drawings and remove from site. Use such methods as are required to complete the work. Demolition shall include the proper preparation of demolished surfaces to receive a new finish material.

1. Wherever existing materials to be removed are suitable for reuse or the Drawings require the reuse of existing materials, the removal shall be done carefully to assure a maximum amount of salvage with a minimum of waste. The removal shall be carefully done to avoid damaging material which can be or shall be reused.

2. All areas being cut shall be fully supported during the cutting operation. Temporary shoring as required to support existing structure shall remain until demolition operations and any required reinforcing is complete.

3. Demolition shall be accomplished in a manner as to minimize the disruption of adjacent structures.

   a. The following method of demolition will be permitted:

      (1) Hand wrecking.

   b. Use of explosives and other means of demolition which will cause excessive vibration shall not be permitted.

4. Removals: Carefully remove Work to be salvaged or reinstalled and store under cover as approved by Architect.

   a. Walls, Partitions and Ceilings: Remove by cutting down and not by tumbling, throwing, or dropping.

   b. Concrete: Saw with powered concrete saw, or chip where sawing is not feasible, to prevent spalling of concrete to remain. Cut off reinforcing bars, except where bonded into new concrete or masonry, and paint ends of reinforcing bars not to be encased in new concrete with bituminous paint before enclosing.

   c. Steel and Wood Framing: Remove portions as indicated or as required to complete new work. Cut to neat straight lines at points of minimum stress, or provide supplementary supports as required.
d. Miscellaneous Items: Remove items not mentioned but required to be removed in such manner as minimizes damage to Work to remain.

e. Metal Items: Grind cut edges to remain exposed smooth and rounded.

3.03 DISPOSAL OF DEMOLISHED MATERIALS

A. Removal: Work to be salvaged or reinstalled shall be removed to prevent damage. Work to be disposed of becomes the property of the Contractor, who shall remove it from the site for disposal at a legal dumping site. Debris shall be cleaned up and disposed of by Contractor promptly and continuously as work progresses. Secure and pay for required hauling permits and pay dumping fees and charges.

3.04 SALVAGE

A. Items to be Removed and Re-incorporated into the Project: Deliver items to be salvaged to location as directed by Architect.

B. In removing, handling and storing items to be removed and re-included into the project, Contractor shall take care not to damage items. Should damage occur, Contractor shall restore damaged items to original condition, or replace items with new items of equal material, construction and appearance as original.

END OF SECTION
SECTION 02280
SOIL TREATMENT

PART 1 - GENERAL

Application and construction procedures shall conform to requirements of the Standard Specifications for Public Works Construction latest edition and any supplements.

Provisions of the General and Supplementary Conditions and Division 01 apply to this section.

1.1 SECTION INCLUDES

A. Furnish materials, equipment and perform labor required to execute this work as indicated on the Plans, as specified and as necessary to complete the contract.

1. Application of herbicide to subgrade of street and parking lot prior to installation of AC Paving.

1.2 RELATED WORK

Section 01300 Submittals
Section 02315 Excavating, Backfilling and Compacting
Section 02319 Base Course
Section 02610 Asphalt Concrete Paving

1.3 PRODUCT SUBMITTALS / SHOP DRAWINGS

A. Comply with pertinent provisions of Section 01340.

B. Product Data: Within fourteen (14) calendar days after the Contractor has received the Notice to Proceed from Owner, submit:

1. Materials list of items proposed to be provided under this Section;

2. Manufacturer's specifications and other data needed to prove compliance with the specified requirements;

1.4 QUALITY ASSURANCE

A. The pest control company must have a California pest control business license.

B. This work should be performed by a state licensed and or certified and trained applicator.

C. A current product label and MSDS must be at the job site.

D. Use only skilled and certified workmen who are completely familiar with the specific requirements and methods of application for this work.

E. Do not apply soil treatment solution until excavation, filling and grade operations are complete and/or approved by the Architect.
F. Notify Architect and City two (2) days prior to application.

1.5 PRODUCT HANDLING AND STORAGE

A. Delivery by the pest control company in a sealed container.

B. Store materials in accordance with manufacturer's printed instructions. Store in a dry location. Do not store with propagative structures such as seed, bulbs, tubers, nursery stock, etc., or with food or feed products.

C. Pesticide Disposal: Wastes resulting from the use of this product will be disposed of at an approved waste disposal facility.

D. Container Disposal: Completely empty bag into application equipment. Then dispose of empty bag in a sanitary landfill.

1.6 WARRANTY

A. Warranty effectiveness for pest control operator's contract period without additional cost to the City during warranty period.

B. State dates of application and chemical used, including quantities and concentrations.

PART 2 - PRODUCTS

2.1 ACCEPTABLE MANUFACTURER

Target Specialty Products, Santa Fe Springs, CA 1-800-352-3870.

2.2 MATERIALS

A. Casoron 50W Dichlobenil Weed and Grass Killer

B. Composition:

Active Ingredients: (% by weight)
- Dichlobenil (2.6 dichlorobenzonitrile) .............................................................. 50.0%
- Inert Ingredients ..................................................................................................... 50.0%

Total ...................................................................................................................... 100.0%

PART 3 - EXECUTION

3.1 SURFACE CONDITIONS

A. Examine the areas and conditions under which work of this section will be performed. Correct conditions detrimental to timely and proper completion of the work.

B. Do not apply directly to water, or to areas where surface water is present or to intertidal areas below the mean high water mark. Do not contaminate water when disposing of equipment washwaters. Cover, collect, or incorporate granules spilled on the soil surface.
3.2 APPLICATION

A. For general weed control under asphalt (in areas such as roadways, parking lots, recreational areas); after final grade is achieved, apply 20 to 24 lbs. in 75 to 100 gallons of water per acre, (7-1/2 to 9 oz. per 1,000 sq.ft. in 1-1/2 to 2-1/2 gallons water). Treated area should be covered with asphalt as soon as possible. For resurfacing work, existing weeds should be sprayed with a contact herbicide prior to CASORON 50W application.

This chemical demonstrates the properties and characteristics associated with chemicals detected in ground water. The use of this chemical in areas where soils are permeable, particularly where the water table is shallow, may result in ground water contamination.

3.3 PROTECTION

A. The Contractor shall provide all necessary protection to prevent injury to animal or adjacent plant life and properties adjacent to the application of the soil sterilant. Contractor shall protect future planting areas from application of soil sterilant.

B. The Contractor will be held responsible for all personal injury or property damage caused by the application of soil sterilant or the storage of the same.

C. Keep all unprotected persons, children, livestock, and pets away from treated area or where there is a danger of drift. Do not rub eyes or mouth with hands. If you feel sick in anyway, STOP work and get help right away.

3.4 CLEAN-UP

A. Leave surfaces free of dirt, gouges and imperfections. Clean adjacent surfaces soiled by this work. Remove equipment, surplus materials and debris from job site, and leave installation ready for succeeding work.
SECTION 02310
GRADING

PART 1 - GENERAL


1.01 SUMMARY

A. Provisions of the General and Supplementary Conditions and Division 01 apply to this section.

B. Section Includes:

1. General exterior grading, cutting and filling, including grading for building area, paving, planting areas, banks and hillsides.

2. Fill materials.

3. Certification of imported soils.

C. Related Sections:

1. Section 02110: Clearing and Grubbing.

2. Section 02200: Demolition.


4. Section 02319: Base Course.

5. Section 02900: Landscaping.


7. Exhibit C: Storm Water Pollution Prevention Plan

8. Exhibit D: Standard Urban Storm Water Mitigation Plan

1.02 SUBMITTALS

A. Shop Drawings: Submit staking plan indicating locations of grading operations related to Project site features such as buildings, structures, parking areas, walks, and ramps.

B. Submit Sample of imported fill material.

1.03 SYSTEM DESCRIPTION

A. Import and Export of Earth Materials:

1. Fees: Pay as required by authorities having jurisdiction over the area.
2. Bonds: Post as required by authorities having jurisdiction over the area.

3. Haul Routes and Restrictions: Comply with requirements of authorities having jurisdiction over the area. Contractor shall submit a Haul Route Exhibit for approval by the governing agencies that illustrates the routes to and from the site to the nearest major arterial street and freeway.

4. Before grading, contact Underground Service Alert of Southern California (USASC) for information on buried utilities and pipelines.

PART 2 - PRODUCTS

2.01 MATERIALS

A. Materials shall conform to requirements specified in this and related sections.

B. All soil imported for use in the landscaped area shall be Class A Topsoil and meet the requirement of Section 212-1.1 Topsoil of the Standard Specification for Public Works Construction. An Agricultural Soil Suitability test must be prepared on the imported soil and approved by the Landscape Architect prior to purchase and import of the soil. The contractor shall also provide the address or location of the soil so the Landscape Architect may visit the site for a visual inspection and sampling.

PART 3 - EXECUTION

3.01 CERTIFICATION OF IMPORTED SOILS

A. Imported fill materials shall be tested for the following contaminants. Owner Consultant shall perform the tests by utilizing a state approved laboratory to test for the following substances according to the indicated method:

1. Total Petroleum Hydrocarbons, utilizing EPA Method 8015M, for gasoline and diesel.

2. Solvents and other volatile compounds, utilizing EPA Method 8260B.


4. Semivolatile Compounds, utilizing EPA Method 8270C.

5. Organochlorine pesticides, utilizing EPA Method 8081

6. Organophosphorous pesticides, utilizing EPA Method 8141.

7. Chlorinated herbicides, utilizing EPA Method 8151.

8. California Code of Regulations Title 22 Metals, utilizing EPA Method 6010A/7470A.

B. Initial sampling and testing shall be performed before importing material to the Project site. Provide a Sample of the proposed material to the Owner Consultant. Identify the location of the source site in addition to the address, name of the person and/or entity responsible for the source site. Owner Consultant shall obtain additional samples from the identified site and perform required testing on all obtained samples.
C. The Owner Consultant shall perform additional sampling and testing during import operations. If the total quantity of import is determined to be greater than 1000 cubic yards of material, one sample shall be obtained and tested for each 250 cubic yards of imported material. If the total quantity of import is determined to be less than 1000 yards, one sample shall be obtained and tested for each 100 cubic yards of imported material.

D. Bills of lading or equivalent documentation will be submitted to the IOR on a daily basis.

E. Upon completion of import operations, provide the Owner a certification statement attesting that all imported material has been obtained from the identified source site.

3.02 PREPARATION

A. Protect and maintain installed stakes until their removal is required for the Work. Provide replacement grade or location stakes lost or disturbed.

B. Install grade stakes and compare to indicated grades. If discrepancies are found between existing grades and grades indicated on Drawings, do not proceed until discrepancies are resolved.

3.03 ROUGH AND FINE GRADING

A. Rough grade area sufficiently high to require cutting by fine grading:

1. Grade area for bituminous surfacing and other paving to the indicated grades, equal to the section of the indicated base and pavement.

2. Slope banks to required finish grades as cut progresses or leave cuts full and finish grade by mechanical equipment to provide grades and soil densities indicated on the Drawings.

3. Rough grade, fill and compact banks beyond indicated finish grades. Finish grade banks and slopes to indicated grades and specified soil densities.

4. Grade Only Areas: In areas not indicated to receive pavement, rough grade to approximate finish grades and then scarify, moisten and roll to obtain required density and indicated finish grades.

5. Tolerances: Finish grades shall be within a tolerance of 0.05 inch per foot above or below grades indicated. Provide an average grade as indicated.

B. Base or Subgrade:

1. After subgrade has been constructed to approximate required grades but prior to compaction operation, scarify the soil to a depth of at least 12 inches:

   a. After scarifying, process loosened material to a finely divided condition and adjust moisture content to optimum condition by addition of water, addition and blending of dry suitable material, or by drying of existing material.

   b. Subgrade material shall be compacted by tamping, sheepsfoot rollers or pneumatic tire rollers. Required relative compaction shall be 90 percent minimum for the top 12 inches below subgrade, or as directed by Soils Report.
c. Install base course in accordance with Section 02319: Base Course.

2. Tolerance of completed grades of base or subgrade shall not vary more than 0.03 inch per foot from grades indicated. Provide an average grade as indicated.

3.04 EXCESS MATERIAL DISPOSAL

A. Remove rubbish, debris, and waste materials and legally dispose of off the Project site.

3.05 PROTECTION

A. Protect the Work of this section until Substantial Completion.

END OF SECTION
SECTION 02315
EXCAVATING, BACKFILLING AND COMPACTING

PART 1 - GENERAL


1.01 SUMMARY

A. Provisions of the General and Supplementary Conditions and Division 01 apply to this section.

B. Section Includes:

1. Excavating, filling, backfilling, and compacting for Project site pavement, planting areas, buildings, and other structures.

2. Trenches for utility lines such as water, gas, irrigation, storm drain and sewer lines, concrete-encased conduits, manholes, vaults, valve boxes, catch basins, underground tanks, thrust blocks, yard boxes, pull boxes and other utility appurtenances.

C. Related Sections:

1. Section 02110: Clearing and Grubbing.

2. Section 02200: Demolition.

3. Section 02280: Soil Treatment

4. Section 02310: Grading.

5. Section 02319: Base Course.

6. Section 02400: Shoring and Bracing.

7. Section 02500: Site Drainage System

8. Section 02510: Site Water Distribution System.


10. Section 02551: Site Domestic Water System.

11. Section 02610: Asphalt Concrete Paving


14. Section 02830: Chain Link Fences and Gates.
1.02 SYSTEM DESCRIPTION

A. Import and Export of Earth Materials:

1. Fees: Pay as required by authorities having jurisdiction over the area.

2. Bonds: Post as required by authorities having jurisdiction over the area.

3. Haul Routes and Restrictions: Comply with requirements of authorities having jurisdiction over the area.

1.03 SUBMITTALS

A. Imported Soils: Submit Sample of proposed imported soil. Testing of imported soils shall be in accordance with Section 02310 - Grading.

B. Shoring calculations as required in sub-section 3.03 of this section.

1.04 QUALITY ASSURANCE


1.05 PROJECT CONDITIONS

A. Information on Drawings or in the Preliminary Geotechnical report does not constitute a guarantee of accuracy or uniformity of soil conditions over the entire Project site.

B. A copy of the Preliminary Geotechnical report is contained within these specifications as Exhibit B. All recommendations of the report shall become part of the project plans and specifications.

PART 2 - PRODUCTS

2.01 FILL AND BACKFILL MATERIALS

A. Fill and backfill material shall be a granular material previously removed from excavation or imported fill material, free of clods and stones larger than 3 inches, (2½ inches for utility trenches) foreign materials, vegetable growths, sod, expansive soils, rubbish and debris. Material shall conform to these specified requirements and related sections.

B. Fill material exhibiting a wide variation in consistency shall be blended to stabilize and upgrade the material.

C. Bedding material from trench bottom to one foot above the pipe:
1. Sand or native free-draining granular material providing a sand equivalent of at least 30 or a coefficient of permeability greater than 1.4 inches per hour.

2. Sand complying with the Specifications for cement concrete aggregates.

D. Other Fill Materials: Brick rubble, broken asphalt pavement, and broken concrete originating from the Project site shall be legally disposed of off the Project site at a facility licensed to accept the exported material.

E. Permeable Backfill:

1. Provide permeable backfill material behind retaining structures consisting of gravel, crushed gravel, crushed rock, natural sands, manufactured sand, or combinations of these materials conforming to the following gradations:

<table>
<thead>
<tr>
<th>Sieve Size</th>
<th>Percentage Passing</th>
</tr>
</thead>
<tbody>
<tr>
<td>3/4 inch (19mm)</td>
<td>100</td>
</tr>
<tr>
<td>3/8 inch (10mm)</td>
<td>80-100</td>
</tr>
<tr>
<td>No. 100</td>
<td>0-8</td>
</tr>
<tr>
<td>No. 200</td>
<td>0-3</td>
</tr>
</tbody>
</table>

2. Those portions of fill material passing a No. 4 sieve shall provide a sand equivalent of at least 60.

3. Provided backing for weep-holes shall consist of 2 cu. ft. of aggregate in burlap sacks, securely tied. Aggregate shall conform to requirements for No. 3 concrete aggregate as specified in subsection 200-1.4 of the Standard Specifications for Public Works Construction.

4. Permeable Backfill Alternate Materials: Instead of the materials specified for retaining structures backfill, a drainage matting system such as Miradrain by Mirafi, Inc., or equal, may be provided if reviewed by the Architect.

F. Cement-sand slurry shall be provided with 1 sack of cement per cubic yard of the mixture.

2.02 BASE MATERIALS

A. Concrete Slabs on Grade: Provide "Crushed Aggregate Base" as specified in Standard Specifications for Public Works Construction, Section 200 - Rock Materials, with 3/4 inch maximum size aggregates. Provide 3 inch thick base, unless noted otherwise.

B. Bituminous Surfacing: Provide as indicated on Drawings and specified in Section 02319 - Base Course.

PART 3 - EXECUTION

3.01 GENERAL

A. Before excavation, contact Underground Service Alert of Southern California (USASC) for information on buried utilities and pipelines.

B. Where the Work includes a building extension or addition on an occupied Project site, perform Work in such a manner, and at such times, as not to disrupt performance of existing utility
services to existing Project site facilities. Where an interruption is necessary, obtain review from the Owner before proceeding.

C. Remove concrete or bituminous pavement to straight lines by saw cutting.

3.02 PROTECTION

A. Protect and guard excavations against danger to life, limb, and property as required by, but not limited to, OSHA regulations.

B. Protect existing improvements including landscaping against damage. Repair or replace damaged items.

C. Protect existing utility services and distribution systems from damage or displacement.

D. Remove conduits or pipes not in service, exposed during Work, unless a minimum cover of 2 feet is provided. Remove concrete, clay or other non-metallic pipe over 8 inches in diameter, unless otherwise indicated.

E. Shore, crib, or lag excavations and earthen banks as necessary to prevent cave in, erosion or gullying of sides.

F. Provide excavations free from standing water by pumping, draining, or providing protection against water intrusion. If soil becomes soft, soggy, or saturated, excavate to firm undisturbed earth and fill as required. Slope adjacent grades away from excavations to minimize entry of water.

3.03 SHORING

A. Provide shoring as necessary to properly and safely support earth sides of excavations, and existing curbs, sidewalks, gutter, drives and stairs, against movement and collapse.

B. Design and Calculations: Provide in accordance with requirement of governing California Building Code and Safety Orders of State of California, Division of Industrial Safety; Title 8, Subchapter 4, Article 6, Sections 1530 and 1541.

C. Remove shoring upon completion of the Work of this section or when no longer needed unless required otherwise by authorities having jurisdiction.

3.04 EXCAVATION

A. Unclassified Excavations: Comply with the Standard Specifications for Public Works Construction, Section 300: "Earthwork", except as modified herein.

B. Sides of footings, pads, grade beams, and slab foundations may be poured against undisturbed on site soil, certified compacted backfill, or formed unless otherwise indicated. Provide excavations of sufficient size to permit installation and removal of forms and other required Work.

C. Machine-drill excavation for round footings to size and depth indicated. Provide a collar or casing, or other adequate protection, to exclude dirt and debris. Protect excavations with plank covers until concrete is placed.
D. Provide excavation bottoms level and free from loose material. Excavate to indicated or required elevations of undisturbed earth.

E. Barricade trenches, ditches, pits, sumps, and similar Work outside the barricaded working area with chain link fence as specified in Section 01500: Construction Facilities and Temporary Controls, and in accord with Cal-OSHA standards and requirements.

F. Trenches over 5 feet in depth shall comply with the Construction Safety Orders of the California Division of Industrial Safety.

G. Where indicated and/or required to excavate in lawn areas, protect adjoining lawn areas outside of the Work area. Replace or install removed sod upon completion of backfill by installing sod level with adjacent lawns. If installation of removed sod fails, furnish sod and install to match existing lawns.

H. For Structures:
   1. Calculate excavation quantities based on elevations or depths indicated on Drawings.
   2. Provide 2000 psi concrete for backfill of over-excavated areas to indicated or required elevations.
   3. Special preparation of B.E.P. areas: Excavate areas designated on Drawings as bottom of excavated planes (B.E.P.), by excavating and filling to indicated grades and elevations.

I. For Utilities:
   1. Excavate trenches to required depth for utility lines, such as pipes, conduits, and tanks, with minimum allowance of 6 inches at the bottom and 6 inches at the sides for bedding or concrete encasement as indicated on Drawings. Grade bottom of all trenches to a uniform smooth surface. Remove loose soil from the excavation before placing sand bedding or concrete encasement.
   2. Do not install piping lengthwise under concrete walks without review by the Architect.
   3. Do not excavate trenches parallel to footings closer than 18 inches from the face of the footing or below a plane having a downward slope of 2 horizontal to one vertical, from a line 9 inches above bottom of footings.
      a. Unless otherwise indicated on Drawings, depth of excavations outside buildings shall provide for a minimum coverage above top of piping, tank or conduit measured from the lowest adjoining finished grade, as follows:
         Steel Pipe 24 inches below finish grade
         Copper Water Tube 18 inches below finish grade
         Cast-Iron, Pressure Pipe 36 inches below finished grade
         Plastic Pipe (other than waste) 30 inches below finished grade
         Tanks or other structure 36 inches below finished grade
Soil, sewer & storm drain minimum 18 inches below finished grade, and as required for proper pitch and traffic load. Install polypropylene sewer pipe with at least 24 inches of coverage.

Irrigation Pipe: Non-pressure pipe - 12 inches, pressure pipe - 24 inches.

b. Trench width shall provide space for fitting and joining. Excavate for piping bells and fittings, bell and spigot pipe and other fittings.

4. Where portions of existing structures, walks, paving, or other improvements are removed or cut for piping or conduit installation, replace the material with equal quality, finished to match adjoining existing improvements.

5. Provide a minimum clear dimension of 2 inches from sides of wall excavation to outer surfaces of buried pipes or conduits placed in the same trench or outside surfaces of containers and/or tanks.

3.05 FILL

A. Unclassified Fill and Compaction: Comply with the Standard Specifications for Public Works Construction, Section 300 - Earthwork, except as modified herein. Install and compact fill in layers not to exceed 6 inches in thickness.

B. Provide fill materials as specified in Part 2- Products. If excavated materials from the Project site are not of required quality or sufficient quantity, import additional materials as necessary.

3.06 INSTALLATION OF MATERIALS

A. Pavement: Fill or backfill materials shall be installed in horizontal layers of 6 inches, unless otherwise required. Each layer shall be evenly placed and moistened or aerated as necessary. Unless otherwise reviewed by the Owner Consultant, each layer of fill material shall cover the length and width of the area to be filled before the next layer of material is installed. Top surface of each layer shall be installed to an approximate level with a crown or crossfall of at least 1 in 50, but not more than 1 in 20. Provide adequate drainage at all times during installation of the Work of this section.

B. Structures:

1. After concrete has been placed, forms removed, and concrete Work inspected, backfill excavations with earth to indicated or required grades. Backfill simultaneously on each side of walls or grade beams. Remove rubbish, debris and other waste materials from excavations before placing backfill.

2. Before placing any backfill, adequately cure concrete and provide bracing, if required to stabilize structure. Protect waterproofing or dampproofing against damage during backfilling operations, with required protection board. Remove bracing as backfill operation progresses.

3. Do not furnish or install expansive soils for retaining wall backfill.
4. Rigidly control the amount of water to be installed to provide optimum moisture content for type of fill material furnished. Do not over-saturate or compact by flooding or jetting.

5. Install wall backfill before installing railings and fences on walls.

6. Install weep hole drainage at the backside of walls so the backing completely covers the weep holes, is horizontally centered and extends at least 12 inches above the bottom of the weep opening. Provide an 8 inch square section of 1/4 inch galvanized or aluminum screen, with a minimum wire diameter of 0.03 inch, and install at the backside of each weep hole before installing the backfill material.

7. Where a reviewed drainage matting system is provided instead of permeable backfill for retaining structures, install in accordance with the manufacturer recommendations.

C. Utilities:

1. Do not install backfill until the Work of this section has been inspected and tested. Do not furnish or install materials excavated from the Project site containing materials not permitted for backfill.

2. Backfill electrical or other excavated utility trenches located outside of barricaded installation areas within 24 hours after inspection by the IOR.

3. Install backfill in layers not exceeding 4 inches in thickness, except cement-sand slurry.

4. If materials excavated from the Project site are not permitted for trench backfill in paved areas, backfill trenches with a cement-sand slurry mix. Install backfill to an elevation of the existing undisturbed grades plus one inch.

3.07 COMPACTING

A. Each layer of fill material shall be compacted by tamping, sheepsfoot rollers, or pneumatic-tired rollers to provide specified relative compaction. At inaccessible locations, provide specified compaction by manually held, operated and directed compaction equipment.

B. Install and compact sand bedding to provide a uniform bearing under the full length of piping and conduits.

C. Unless otherwise indicated, compact each layer of fill material to a relative compaction of at least 90 percent, or as directed by Soils Report.

D. When fill materials, or a combination of fill materials, are encountered or provided which develop densely packed surfaces as a result of installation or compacting operations, scarify each layer of compacted fill before installing the next succeeding layer.

3.08 INSPECTION AND TESTING

A. Owner Consultant will inspect and test excavations, material quality, and installation and compaction of fill materials.

B. Owner Consultant will test imported fill materials from their designated source before delivery to the Project site.
C. Installation of backfill shall be observed by the Owner Consultant.

D. Owner Consultant will inspect and test excavation Work before the installation of fill and/or other materials.

E. Compaction: Test compaction in accordance with ASTM D 1557, Method C.

F. Owner Consultant will inspect foundation excavations when completed and ready for forms, after forms are in place and before first placement of concrete.

3.09 PROTECTION

A. Protect the Work of this section until Substantial Completion.

3.10 CLEANING

A. Remove rubbish, debris, and waste materials and legally dispose of off the Project site.

END OF SECTION
SECTION 02319
BASE COURSE

PART 1 - GENERAL


1.01 SUMMARY

A. Provisions of the General and Supplementary Conditions and Division 01 apply to this section.

B. Section Includes:
   1. Installation of base material.

C. Related Sections:
   1. Section 01300: Submittals
   2. Section 02110: Clearing and Grubbing.
   3. Section 02310: Grading.
   4. Section 02315: Excavating, Backfilling and Compacting.
   5. Section 02610: Asphalt Concrete Paving.
   6. Section 03300: Cast-in-Place Concrete.
   7. Section 03360: Integral Color Concrete.

1.02 SUBMITTALS

A. Product Data: Submit technical information and test data for base materials.

B. Sample: Submit Sample of proposed base course material.

1.03 QUALITY ASSURANCE

A. Comply with the following as a minimum requirement: Standard Specifications for Public Works Construction, current edition.

PART 2 - PRODUCTS

2.01 UNTREATED BASE MATERIALS

A. The following base materials are classified, in order of preference, in conformance with the requirements of Standard Specifications for Public Works Construction: Section 200 - Rock Materials.
   1. Crushed aggregate base.
2. Crushed miscellaneous base.

3. Processed miscellaneous base.

2.02 MATERIAL APPROVAL

A. Base material shall be reviewed by the Owner's Consultant before installation.

PART 3 - EXECUTION

3.01 INSTALLATION

A. Install base course material in layers not exceeding 4 inches in thickness, unless required otherwise. Grade and compact to indicated levels or grades, cut and fill, water and roll until the surface is hard and true to line, grade and required section. Provide a relative compaction of at least 90 percent, unless otherwise required.

B. Grade base course to elevations indicated on Drawings, ready to receive surfacing, in accordance with Section 02310: Grading.

3.02 PROTECTION

A. Protect the Work of this section until Substantial Completion.

3.03 CLEANUP

A. Remove rubbish, debris, and waste materials and legally dispose of off the Project site.

END OF SECTION
SECTION 02400
SHORING AND BRACING

PART 1 - GENERAL

Application and construction procedures shall conform to requirements of the Standard Specifications for Public Works Construction, latest edition and any supplements.

The Contractor's attention is directed to the provisions of Section 6424 of the Labor Code concerning trench excavation safety plans.

Prior to start of grading operations, Contractor shall obtain CAL-OSHA Certification, which shall remain in force during entire length of contract.

Provisions of the General and Supplementary Conditions and Division 01 apply to this section.

1.1 SECTION INCLUDES

A. Furnish materials, equipment and perform labor required to execute this work as indicated on the drawings, as specified and as necessary to complete the contract, including but not limited to these major items:

1. All shoring and bracing as may be required for installation of sewer and storm drain lines.

1.2 RELATED WORK

Section 01130 Field Engineering
Section 01300 Submittals
Section 01420 Testing and Inspection
Section 02315 Excavating, Backfilling and Compacting
Section 02500 Site Drainage System
Section 02530 Sewer Lateral Line Construction

1.3 REQUIREMENTS

A. Excavation for any trench 5 feet or more in depth shall not begin until the Contractor has received approval from the City of the Contractor's detailed plan for worker protection from the hazards of caving ground during the excavation of such trench.

B. Record prints shall be available on site and shall be reviewed by the Architect at appropriate times before work is covered.

C. The CONTRACTOR shall contact the regional notification center (Underground Service Alert of Southern California) at 1-800-227-2600 (or 811) and obtain an inquiry identification number. No excavation shall commence unless the CONTRACTOR has obtained the Inquiry Identification Number, and so notify the City.
1.4 SUBMITTALS

A. Plans shall be submitted at least 15 days prior to beginning excavation for the trench, and shall show details of the design of shoring, bracing, sloping or other provisions to be made for worker protection during such excavation.

1.5 PRODUCT HANDLING AND STORAGE

A. Deliver materials to the job site in original unopened containers bearing manufacturer's name and product designation.

B. Store materials in accordance with manufacturer's printed instructions.

1.6 QUALITY ASSURANCE

A. Use adequate numbers of skilled workmen who are thoroughly trained and experienced in the necessary crafts and who are completely familiar with the specified requirements and the methods needed for proper performance of the work of this Section.

PART 2 - PRODUCTS

Primary Products: Those required for original installation.

PART 3 - EXECUTION

3.1 SURFACE CONDITIONS

A. Examine the areas and conditions under which work of this section will be performed. Correct conditions detrimental to timely and proper completion of the work.

3.2 STANDARDS

A. No such plan shall allow the use of shoring, sloping or a protective system less effective than that required by the Construction Safety Orders of the Division of Industrial Safety. If such plan varies from the shoring system standards established by the Construction Safety Orders, the plan shall be prepared and signed by an Engineer who is registered as a Civil or Structural Engineer in the State of California.

3.3 CLEAN-UP

A. Leave surfaces free of dirt, gouges and imperfections. Clean adjacent surfaces soiled by this work. Remove equipment, surplus materials and debris from job site, and leave installation ready for succeeding work.

END OF SECTION
PART 1 - GENERAL

Application and construction procedures shall conform to requirements of the Standard Specifications for Public Works Construction, latest edition and any supplements.

Provisions of the General and Supplementary Conditions and Division 01 apply to this section.

1.1 SECTION INCLUDES

A. Furnish materials, equipment and perform labor required to execute this work as indicated on the Plans, as specified and as necessary to complete the contract, including but not limited to these major items:

1. Excavating, Bedding, Backfilling and Compacting
2. Catch Basins
3. Drain Line Piping
4. Junction Structures and Connections to Existing Piping

1.2 RELATED WORK

Section 01300 Submittals
Section 02310 Grading
Section 02315 Excavating, Backfilling and Compacting
Section 02400 Shoring and Bracing
Section 02535 Washed Plaster Sand

1.3 QUALITY ASSURANCE

A. Use adequate numbers of skilled workmen who are thoroughly trained and experienced in the necessary crafts and who are completely familiar with the specified requirements and the methods needed for proper performance of the work of this Section.

1.4 REQUIREMENTS

A. Record prints shall be available on site and shall be reviewed by the Architect at appropriate times before work is covered.

B. The Contractor shall contact the regional notification center (Underground Service Alert of Southern California) at 1-800-227-2600 (or 811) and obtain an inquiry identification number. No excavation shall commence unless the Contractor has obtained the Inquiry Identification Number, and so notify the City and the Architect.
PART 2 - PRODUCTS

2.1 MATERIALS

A. Concrete shall conform to Section 201-1 of the Standard Specifications for Public Works Construction, Latest Edition.


PART 3 - EXECUTION

3.1 SURFACE CONDITIONS

A. Examine the areas and conditions and conditions under which work of this section will be performed. Correct conditions detrimental to timely and proper completion of the work.

3.2 CATCH BASINS

A. Catch basin shall be constructed in accordance with details as shown on the Plans. All concrete shall be a minimum 2500psi and construction shall conform to Section 303-1.4.4 of the Standard Specifications for Public Works Construction.

3.3 PIPING

A. Installed in accordance with Section 306-1.2 of the Standard Specifications for Public Works Construction.

B. All trench backfill and bedding fill materials due to over excavation, shall be compacted to a relative density of 90 percent as determined by the test described in Section 211-2 of the Standard Specifications for Public Works Construction.

3.4 CLEAN-UP

A. Leave surfaces free of dirt, gouges and imperfections. Clean adjacent surfaces soiled by this work. Remove equipment, surplus materials and debris from job site, and leave installation ready for succeeding work.

END OF SECTION
PART 1 - GENERAL


Provisions of the General and Supplementary Conditions and Division 01 apply to this section.

1.1 SECTION INCLUDES

A. Furnish materials, equipment and perform labor required to execute this work as indicated on the Plans, as specified and as necessary to complete the contract, including but not limited to these major items:

1. Sewer lateral construction shall consist of installing sewer pipe, constructing sewer structures and appurtenances as shown on the Plans, in accordance with these Specifications and as directed by the Engineer.
2. Protective measures.
3. Construction of SDR 35 sewer line.
4. Connecting to existing sewer.
5. Construction of manhole.
7. Connection of sewer line to building.

B. The Contractor shall contact the regional notification center (Underground Service Alert of Southern California) at 1-800-227-2600 (or 811) and obtain an inquiry identification number. No excavation shall commence unless the Contractor has obtained the Inquiry Identification Number and so notify the City and Architect.

C. Location of Sewer Main: The Contractor shall provide line and grade for the proposed sewer main. Before laying of any pipe or digging any trench, Contractor shall determine by actual excavation and measurements the exact location and depth of existing utilities and service lines to which the new service main is to connect or cross. In the event that a conflict with the existing utilities is encountered as a result of the exploratory work that would not permit installation of piping as detailed on the drawings, or to make connection in the manner indicated, the Contractor shall confer with the Engineer before proceeding with the work. The Engineer shall inform the Contractor of required modifications and/or adjustments to be performed.

1.2 RELATED WORK

Section 01300 Submittals
Section 02315 Excavation, Backfilling and Compacting
Section 02400 Shoring and Bracing
Section 02535 Washed Plaster Sand

1.3 QUALITY ASSURANCE

A. Use adequate numbers of skilled workmen who are thoroughly trained and experienced in the necessary crafts and who are completely familiar with the
specified requirements and the methods needed for proper performance of the work of this Section.

PART 2 - PRODUCTS

2.1 MATERIALS

1. SDR35 PVC Sewer Line shall meet or exceed all the requirements of Section 207-17 of the Standard Specifications for Public Works Construction.


3. Sewer Cleanout per Standard Specifications for Public Works Construction Standard Plan #204-1

PART 3 - EXECUTION

3.1 SURFACE CONDITIONS

A. Examine the areas and conditions under which work of this section will be performed. Correct conditions detrimental to timely and proper completion of the work.

B. Trench Excavation: Trench excavation shall be per section 306-1 of the Standard Specifications for Public Works Construction. The maximum length of open trench, except by permission of the Engineer is 150 ft.

C. Installation of Pipe: Pipe installation shall be per Section 306-1.2 of the Standard Specifications for Public Works Construction. Bedding shall be Type I or per City Standards. The connections for reconnection of the sewer laterals shall be installed in the main at the appropriate locations.

D. Backfill and Densification: Backfill shall be per Section 306-113 of the Standard Specifications for Public Works Construction. Backfill compaction requirements shall conform to Section 306-1.3.4 of the Standard Specifications for Public Works Construction.

E. Testing: Sewer main testing shall be per Section 306-1.4 of the Standard Specifications for Public Works Construction. Water ex-filtration test per Section 306-1.4.2 of the Standard Specifications for Public Works Construction is an acceptable test method.

F. Remodeling Existing Sewer Manhole: Any existing manhole base shown on the Project Drawings to be rechanneled shall be constructed in accordance with Section 306-6 of the Standard Specifications for Public Works Construction.

G. Construction of New Sewer Manholes: Precast concrete manholes shall be constructed in accordance with County of Riverside Standards and Section 306 of the Standard Specifications for Public Works Construction. Ring and cover shall be installed as instructed.

H. Adjusting Manhole Ring and cover to Finished Grade: After the finished surface adjacent to the manhole is established, the manhole will then be modified if necessary, to conform to the adjacent surface. In paved areas the sequence will be as follows:
1. A 3-foot diameter circular hole shall be sawcut over the center of the structure and the pavement removed to a minimum depth of 8”. The ring and cover will then be adjusted by means of grade rings and/or blocking to the finished surface grade. Place a minimum of 6” thick, 6” wide Class 520 C-2500 concrete collar to 1-1/2” below street surface. The remaining 1-1/2” shall be filled with an asphalt concrete wearing surface mixture to match the existing pavement surface. The material shall be placed in a workmanlike manner and shall conform to the appearance of the surrounding pavement.

2. In unpaved areas, the manhole ring and cover will be adjusted to grade if the top of the ring and cover is lower than the surrounding grade or more than 2” above the adjacent finished surface. The Contractor shall adjust the ring and cover as outlined above to within the tolerance specified. The 6” thick, 6” wide concrete collar shall be poured to the top of the adjusted ring and cover and sloped away at a minimum 2% grade.

END OF SECTION
SECTION 02535
WASHED PLASTER SAND

PART 1 - GENERAL

Application and construction procedures shall conform to requirements of the Standard Specifications for Public Works Construction latest edition and any supplements.

Provisions of the General and Supplementary Conditions and Division 01 apply to this section.

1.1 SECTION INCLUDES

A. Furnish materials, equipment and perform labor required to execute this work as indicated on the Plans, as specified and as necessary to complete the contract, including but not limited to these major items:

1. Bedding and Backfilling for sewer and storm drain lines, and domestic water system.
2. Bedding and Backfill for irrigation main line.
3. 4" thick sand layer beneath slabs on grade at community building

1.2 RELATED WORK

Section 01340 Submittals
Section 02252 Sewer Lateral Line Construction
Section 02500 Site Drainage System
Section 02551 Site Domestic Water System
Section 02750 Irrigation System
Section 02800 Landscaping

1.3 PRODUCT SUBMITTALS / SHOP DRAWINGS

A. Comply with pertinent provisions of Section 01340.

B. Product Data: Within fourteen (14) calendar days after the Contractor has received the Notice to Proceed from Owner, submit:

1. Materials list of items proposed to be provided under this Section;
2. Manufacturer's specifications and other data needed to prove compliance with the specified requirements;
3. Manufacturer's recommended installation procedures which, when approved by the Architect, will become the basis for accepting or rejecting actual installation procedures used on the work.

1.4 PRODUCT HANDLING AND STORAGE

A. Deliver materials to the job site in original unopened containers bearing manufacturer's name and product designation.
B. Store materials in accordance with manufacturer's printed instructions.

1.5 QUALITY ASSURANCE

A. Use adequate numbers of skilled workmen who are thoroughly trained and experienced in the necessary crafts and who are completely familiar with the specified requirements and the methods needed for proper performance of the work of this Section.

PART 2 - PRODUCTS

2.1 MATERIAL

A. Washed Plaster Sand free of weed seed and of uniform condition. Available from Corona Dee Gee Co. (951) 737-4496.

PART 3 - EXECUTION

3.1 SURFACE CONDITIONS

A. Examine the areas and conditions under which work of this section will be performed. Correct conditions detrimental to timely and proper completion of the work.

3.2 INSTALLATION

A. Sand shall be placed and leveled after installation of work items.

B. Sand shall be furnished in such quantity as is required to meet the minimum depth required with surface plane level throughout the area of confinement and after thorough settlement.

END OF SECTION
SECTION 02551
SITE DOMESTIC WATER SYSTEM

PART 1 - GENERAL

Application and construction procedures shall conform to requirements Los Angeles County Health Department.

Provisions of the General and Supplementary Conditions and Division 01 apply to this section.

1.1 SECTION INCLUDES

A. Furnish materials, equipment and perform labor required to execute this work as indicated on the Plans, as specified and as necessary to complete the contract.

1. Installation of domestic potable water system including piping, fittings, valves, valve boxes, connections, testing, and Health Department Certification.

1.2 RELATED WORK

Section 01130 Field Engineering
Section 01300 Submittals
Section 01420 Testing and Inspection
Section 02315 Excavating, Backfilling and Compacting
Section 02535 Washed Plaster Sand

1.3 QUALITY ASSURANCE

A. Use adequate numbers of skilled workmen who are thoroughly trained and experienced in the necessary crafts and who are familiar with specified requirements and methods necessary for the proper execution of the work of this section.

PART 2 - PRODUCTS

2.1 MATERIALS

A. Potable Water Line and fittings: All potable water lines downstream of water meter shall be Type K copper hard drawn pipe with wrought copper fittings.

B. Gate Valves: All gate valves shall be Nibco T-113.

C. Valve Boxes shall be concrete with hinged cast iron lid marked Domestic Water.

PART 3 - EXECUTION

3.1 SURFACE CONDITIONS

A. Examine the areas and conditions under which work of this section will be performed. Correct conditions detrimental to timely and proper completion of the work.
3.2 POTABLE WATER LINES

A. All Potable water lines shall be installed locations as shown on project drawings. The pipe shall be bedded on a 2” layer and covered with a 4” deep layer of washed plaster sand and have full bearing upon the bottom of the pipe trench throughout the length of the trench.

END OF SECTION
SECTION 02610

ASPHALT CONCRETE PAVING

PART 1 - GENERAL

Application and construction procedures shall conform to requirements of the Standard Specifications for Public Works Construction, latest edition and any supplements.

Provisions of the General and Supplementary Conditions and Division 01 apply to this section.

1.1 SECTION INCLUDES

A. Furnish materials, equipment and perform labor required to execute this work as indicated on the Plans, as specified and as necessary to complete the contract, including but not limited to these major items:

1. Protective measures
2. Preparation and compaction of subgrade.
3. Aggregate base placement and compaction.
5. All parking stall painting and signs, per project plans.
6. Emulsified asphalt seal coat applied to all new asphaltic concrete installed under this project.

1.2 RELATED WORK

Section 01300 Submittals
Section 02280 Soil Treatment
Section 02310 Grading
Section 02315 Excavating, Backfilling and Compacting
Section 02319 Base Course

1.3 PRODUCT SUBMITTALS / SHOP DRAWINGS

A. Comply with pertinent provisions of Section 01300.

B. Product Data: Within fourteen (14) calendar days after the Contractor has received the Notice to Proceed from Owner, submit:

1. Materials list of items proposed to be provided under this Section for use.

2. Manufacturer's specifications and other data needed to prove compliance with the specified requirements;

3. Manufacturer's recommended installation procedures which, when approved by the Engineer, will become the basis for accepting or rejecting actual installation procedures used on the work.

1.4 PRODUCT HANDLING AND STORAGE

A. Deliver materials to the job site in original unopened containers bearing manufacturer's name and product designation.
B. Store materials in accordance with manufacturer's printed instructions.

1.5 QUALITY ASSURANCE

A. Use adequate numbers of skilled workmen who are thoroughly trained and experienced in the necessary crafts and who are completely familiar with the specified requirements and the methods needed for proper performance of the work of this Section.

PART 2 - PRODUCTS

2.1 MATERIALS

A. Asphaltic Concrete:
   1. Asphalt concrete binder shall be Grade PG 64-10, in conformance with Section 203-1 of the Standard Specifications for Public Works Construction.
   2. Asphalt concrete shall be Class "C-1" or C-2. Subject to the Engineers approval and/or option Class D-1 may be used for surface coarse and Class F for capping.
   3. Asphalt concrete shall be constructed in accordance with Section 302-5 of the Standard Specifications for Public Works Construction and to the limits and grades shown on the plans, and as specified by the Engineer.

B. Seal Coat:
   1. The emulsified asphalt shall be type CRS-1 and shall conform to the requirements of Section 203-3 and 203-9 of the Standard Specifications for Public Works Construction.
   2. Emulsified asphalt shall be composed of a paving asphalt base uniformly emulsified with water homogeneous throughout and when stored shall show no separation within 30 days after delivery.

C. Traffic Paint:
   1. Paint shall be specifically manufactured for traffic line markings and parking stalls. Paint shall conform to Section 210-1 of the Standard Specifications for Public Works Construction. Reflective glass beads shall be added to the paint.

D. Liquid Asphalt:
   1. Liquid asphalt used for tack coat shall be grade SS-1H Emulsified Asphalt in conformance with Section 203-3 of the Standard Specifications for Public Works Construction.

E. Aggregate Base:
   1. Aggregate base material shall be crushed miscellaneous base conforming to Section 200, of the Standard Specifications for Public Works Construction. The material shall be uniformly graded and meet the fine gradation requirements. The Contractor may substitute crushed aggregate base for that specified.
2. Aggregate base shall be delivered to the roadbed as a uniform mixture. Segregation shall be avoided, and the base shall be free from pockets of coarse or fine material.

3. Test reports and certifications will be furnished in accordance with the provisions of Section 01340.

PART 3 - EXECUTION

3.1 SURFACE CONDITIONS

A. Examine the areas and conditions under which work of this section will be performed. Correct conditions detrimental to timely and proper completion of the work.

B. No work of this section shall commence until subgrades have been inspected and accepted by the Engineer. Acceptance of subgrades shall not relieve the Contractor of the responsibility to provide positive drainage of all pavement areas and gutters.

3.2 PLACEMENT OF AGGREGATE BASE

A. All subgrade work shall be completed, inspected and approved prior to placement of aggregate base. Aggregate base shall be placed to the thickness and grades as shown on the plans and compacted to 95 percent relative compaction. Compaction tests shall be as required and approved by the Engineer prior to placement of asphalt concrete.

3.3 PLACEMENT OF ASPHALTIC CONCRETE

A. Aggregate base work shall be completed, inspected and approved prior to placement of asphaltic concrete pavement.

B. Asphaltic concrete pavement shall be placed to the thickness as shown on the Plans and compacted to required density. Compaction tests shall be as required and approved by the Engineer.

C. The rate of application of the tack coat shall be as designated in Section 302-5.3 of the Standard Specifications for Public Works Construction, Latest Edition.

D. The Contractor shall furnish and keep on site, an accurate thermometer suitable for determining the temperature of the asphalt.

E. Tack coat shall be applied to all asphaltic concrete and P.C.C. surfaces to be joined by new asphalt concrete pavement.

F. The rate of application of the tack coat shall be as designated in Section 302-5.4 of the Standard Specifications for Public Works Construction.

3.4 SEAL COAT

A. Clean surface of asphaltic concrete paving by removing all dirt, grease and other elements to leave surface in a clean condition.

B. Surface must be inspected and approved by the Engineer prior to application of seal coat.
C. Seal coat shall be applied 30 calendar days after completion and acceptance of asphaltic concrete installation.

3.5 PAINTING

A. All traffic painting on paved surfaces, including stall markings, striping, etc., shall be painted where noted on the project plans.

B. Machine apply in strict accordance with manufacturers directions and with Section 310-5.6 of the Standard Specifications.

C. A minimum of 2 coats shall be applied to achieve the desired opacity.

D. Add reflective glass beads to paint per Section 201-1.6.5 of the Standard Specifications for Public Works Construction.

E. Colors shall be white for all, except the handicap symbol. The handicap symbol is to be International Blue.

F. Install all handicap signs as required by plans per City Details.

3.6 CLEAN-UP

A. Leave surfaces free of dirt, gouges and imperfections. Clean adjacent surfaces soiled by this work. Remove equipment, surplus materials and debris from job site, and leave installation ready for succeeding work.

END OF SECTION
SECTION 02612
STABILIZED DECOMPOSED GRANITE

PART 1 - GENERAL

Application and construction procedures shall conform to requirements of the Standard Specifications for Public Works Construction, latest edition and any supplements.

Provisions of the General and Supplementary Conditions and Division 01 apply to this section.

1.1 SECTION INCLUDES

A. Furnish materials, equipment and perform labor required to execute this work as indicated on the Plans, as specified and as necessary to complete the contract, including but not limited to these major items:

2. Aggregate Base Course.
3. Soil Treatment.
4. Installation of Stabilized Decomposed Granite

1.2 RELATED WORK

Section 01300 Submittals
Section 02280 Soil Treatment
Section 02310 Grading
Section 02315 Excavating, Backfilling and Compacting
Section 02319 Base Course

1.3 PRODUCT SUBMITTALS / SHOP DRAWINGS

A. Comply with pertinent provisions of Section 01300.

B. Product Data: Within fourteen (14) calendar days after the Contractor has received the Notice to Proceed from Owner, submit:

1. Materials list of items proposed to be provided under this Section for use.

2. Manufacturer's specifications and other data needed to prove compliance with the specified requirements;

3. Shop Drawings in sufficient detail to show fabrication, installation, anchorage, and interface of the work of this Section with the work of adjacent trades;

4. Manufacturer's recommended installation procedures which, when approved by the Architect, will become the basis for accepting or rejecting actual installation

1.4 REQUIREMENTS

A. Submit one (1) sample of infield materials for approval, prior to ordering and delivery.
B. Attach supplier certification of testing.
C. Subgrade approved by Architect, prior to placing infield.
D. Record prints shall be available on site and shall be reviewed by the Architect at appropriate times before work is covered.

1.5 QUALITY ASSURANCE

A. Use adequate numbers of skilled workmen who are thoroughly trained and experienced in the necessary crafts and who are completely familiar with the specified requirements and the methods needed for proper performance of the work of this Section.

PART 2 - PRODUCTS

2.1 MATERIALS

A. Stabilizer Pro Gold Mix:

1. Gradation – A minimum of 95% of particles shall pass the 2.0mm sieve. Minimum combined silt and clay content shall be 25% with the maximum not to exceed 35%. All remaining particles will fall under the classification of sand. The USDA soil classification shall be sandy loam – sandy clay loam.

2. The color of the material shall be gold to reddish gold.

3. Stabilizer as distributed by Stabilizer Solutions Inc. (800-336-2468) shall be blended at a minimum rate of .3% by weight with the maximum rate not to exceed .4% by weight. All blending will be done with a pug mill that includes a weigh belt feeder in order to insure the proper ratio and the uniform blending of Stabilizer.

4. For installation of new field, place Stabilizer Pro Gold Infield Mix to a minimum depth of 4 inches.

5. For each 2-inch lift evenly spread the material over entire area. Thoroughly water entire area so that the entire depth of the material is moist. After the finale lift roll entire area with a minimum 1000 pound roller. Allow for the material to dry and spike drag the area to obtain desired finish. It should be noted that for a level surface it is recommended to grade the area with a laser or similar.


PART 3 - EXECUTION

3.1 SURFACE CONDITIONS

A. Examine the areas and conditions under which work of this section will be performed. Correct conditions detrimental to timely and proper completion of the work.
3.2 SITE PREPARATION

A. Existing vegetation in the area of the infield shall be killed using a non-selective systemic herbicide.

B. After all vegetation has been killed, remove all debris, organic matter, rubble, etc., as required and legally dispose of at no additional cost to the City.

C. Subgrade to be 4" below surrounding finish grade. Subgrade shall be smooth and shall conform as shown on the drawings.

D. Scarify subgrade to be 6 inch depth and compact to 90 percent relative compaction, prior to placement of infield mix.

E. Apply non-selective pre-emergent herbicide to subgrade, prior to placement of brick dust and adhering strictly to manufacturer's printed instructions. Refer to Section 0228 Soil Treatment of these specifications.

F. For new field installations, Stabilizer Mix should be at a minimum depth of 4" over a sub-base prepared to acceptable specifications. New Stabilizer Mix should be leveled to proper elevations and sloped according to standard infield construction specifications. Allow approximately 1" for compaction.

3.3 TOPPING COURSE

A. After leveling the infield, thoroughly water the mix (hand watering provides optimum moisture) and compact using a one-ton roller. Once compacted, check for low areas and ensure good drainage into the outfield. Scarify and level low areas with additional infield mix. For the best playing conditions, good surface drainage in the infield is critical.

3.4 WEED CONTROL

A. During the construction period, landscape establishment and landscape maintenance period, kill all vegetation upon discovery using a non-selective contact herbicide in strict accordance with label instructions.

3.5 CLEAN-UP

A. Leave surfaces free of dirt, gouges and imperfections. Clean adjacent surfaces soiled by this work. Remove equipment, surplus materials and debris from job site, and leave installation ready for succeeding work.

End of Section
SECTION 02711
WINDSCREEN

PART 1 - GENERAL

1.1 SECTION INCLUDES

A. This section generally consists of providing all labor, equipment and materials necessary to install the tennis court wind screening as shown on the project drawings and as described herein.

B. Provisions of the General and Supplementary Conditions and Division 01 apply to this section.

1.2 RELATED WORK

Section 01330 Submittals
Section 02830 Fence & Gates

1.3 DELIVERY, STORAGE & HANDLING

A. Contractor assumes all responsibility for storage of all materials relative to this project. City assumes no liability for losses or damages from any caused as a result of such storage.

1.4 JOB CONDITIONS & PROTECTION

A. Care shall be taken not to damage the tennis court surface. If any damage occurs the Contractor shall at his own expense repair any and all damages.

PART 2 - PRODUCTS

2.1 WINDSCREENING

A. Windscreen shall be as supplied by N.J.P Sports Polypropylene #1231-G. See plan for height requirements.

B. Available from: Mr. Norm Perry, N.J.P Sports P.O. Box 1469, Glendale, California 91209 (818) 247-3914.

2.2 INSTALLATION

A. Installation shall be per project drawings and manufacturer's recommendations with ties on all sides at 18 inches on center.

PART 3 - EXECUTION

3.1 SURFACE CONDITIONS

A. Examine the areas and conditions and conditions under which work of this section will be performed. Correct conditions detrimental to timely and proper completion of the work.
END OF SECTION
SECTION 02750
IRRIGATION SYSTEM

PART 1 - GENERAL

Application and construction procedures shall conform to the requirements of the Standard Specifications for Public Works Construction.

Provisions of the General and Supplementary Conditions and Division 01 apply to this section.

1.1 SCOPE OF WORK

A. Scope of Work includes providing and paying for all services, labor, materials, transportation, equipment, fees and taxes necessary to perform the work indicated on the drawings and specified herein and as required to properly complete the Contract. All related items as specified in the General Conditions and Special Provisions of the Contract Documents shall apply to Irrigation System Installation.

1.2 RELATED WORK

Section 01300 Submittals
Section 02310 Grading
Section 02315 Excavating, Backfilling and Compacting
Section 02800 Landscaping

1.3 GENERAL REQUIREMENTS

A. Materials shall be first quality and of domestic manufacture unless otherwise noted.

B. For purposes of legibility, sprinkler lines are essentially diagrammatic. Although size and location of sprinkler equipment are drawn to scale wherever possible, Contractor shall make use of all data of the contract documents and verify this information at the construction site.

C. All work called for on the project drawings by notes, shall be furnished and installed whether or not specifically mentioned in these Specifications.

D. When discrepancies exist between project drawings and Specifications and no specified interpretation is issued prior to bidding, the decisions regarding this interpretation will rest with the Architect, who's decision will be final, and no additional compensation will be allowed. The Contractor will be compelled to act on this decision as directed. In the event the installation is contradictory to the direction of the Landscape Architect, the installation shall be rectified by the Contractor prior to proceeding with future phases of construction, at no additional cost to the City.

E. Do not willfully install the sprinkler system as indicated on the project drawings when it is obvious in the field that unknown obstructions or grade differences exist that might not have been considered in the design, or if discrepancies in construction details, legends or specific notes are discovered. All such obstructions or discrepancies should be brought to the immediate attention of the Landscape Architect. In the event this is not done, the Contractor must assume full responsibility for revisions necessary, at no additional expense to the City.
1.4 RESPONSIBILITIES AND COORDINATION

A. Contractor shall verify the location and depth of all underground utilities prior to start of work. Contractor is also responsible for coordination of irrigation water connection and electrical connections for irrigation controller.

B. Contractor shall coordinate his work with the General Contractor and all other trades present on the job site. Any delays or scheduling problems caused by project construction shall be at no expense or claims to the City.

C. Coordinate the installation of all sprinkler materials including pipe, with the landscape project drawings to avoid interfering with the trees, shrubs or other planting.

1.5 PRODUCT SUBMITTALS / SHOP DRAWINGS

A. Comply with pertinent provisions of Section 01340.

B. Product Data: Within fourteen (14) calendar days after the Contractor has received the Notice to Proceed from Owner, submit:
   1. Materials list of items proposed to be provided under this Section;
   2. Manufacturer's specifications and other data needed to prove compliance with the specified requirements;
   3. Shop Drawings in sufficient detail to show fabrication, installation, anchorage, and interface of the work of this Section with the work of adjacent trades;
   4. Manufacturer's recommended installation procedures which, when approved by the Architect, will become the basis for accepting or rejecting actual installation procedures used on the work.

1.6 VERIFICATION OF DIMENSIONS

A. All scaled dimensions are approximate. Before proceeding with any work, carefully check and verify all dimensions and immediately inform the City's Representative of any discrepancy between the Plans and/or Specifications and actual conditions.

1.7 REFERENCES

A. ASTM D 2855 - Solvent Welded Joints
B. ASTM D 2774 - Plastic Pipe Installation
C. ASTM D 1785 - PVC 1220 (type 1, grade 2) Plastic Pipe
D. ASTM D 2466 - Schedule 40 PVC Fittings
E. ASTM D 2467 - Schedule 80 PVC Fittings
F. ASTM D 2464 - Schedule 80 Threaded PVC Fittings
G. ASTM D 2241 - PVC 1120 (Type 1, grade 1) Rubber Ring Gasketed Plastic Pipe
H. ASTM B 88 - Copper Pipe
I. ASTM D 1869 - Rubber Ring Gasket
J. SDR - Standard Dimension Ratio
K. NSF - National Sanitation Foundation
L. NEC - National Electrical Code
M. UPC - Uniform Plumbing Code
N. UBC - Uniform Building Code

1.8 TEMPORARY WATER SERVICE
A. Temporary water service shall be coordinated with General Contractor on job site. All available water for landscape installation and maintenance is "Domestic Water".

1.9 PERMITS
A. Contractor shall obtain and pay for all permits and inspections required by governing authorities for work described under Irrigation System.

1.10 CODES
A. All work and materials shall comply with governing codes, safety orders and regulations, and meet the minimum requirements of the "Uniform Building Code," and "National Electrical Code" Uniform Plumbing Code.

1.11 DISPOSAL AND CLEAN-UP
A. Remove all waste materials (including excavated material classified as unsatisfactory soil material), trash and debris generated or encountered during the course of irrigation system installation, and legally dispose of it.

1.12 DEFECTIVE AND UNAUTHORIZED WORK
A. All work which is determined by the Landscape Architect's inspection to be defective in its construction or deficient in any of the requirements of the Plans and Specifications shall be remedied or removed and replaced by the Contractor at his expense in a manner acceptable to the Landscape Architect.

1.13 SURVEY, REFERENCE POINTS AND ELEVATION
A. The Contractor is responsible for establishing all surveys, reference points and elevations required by him for proper execution of irrigation system installation.

1.14 CONTRACTOR LICENSING LAWS
A. All Contractors performing irrigation system installation work, must be licensed in accordance with the laws of the State of California.

1.15 NOTIFICATION REQUIRED
A. Ten (10) days prior to start of irrigation system installation, the Contractor shall notify the Landscape Architect and City and give starting and completion dates. Contractor shall also supply the Landscape Architect and City with the name and telephone number of the person in charge of the work. This person shall be responsible, for the work until completion and be present at all meetings and inspections.

1.16 TEMPORARY UTILITIES
A. The Contractor shall apply for and pay all cost incurred for all temporary utilities such as water, electrical power and gas as required by him for the construction of the project.

1.17 MATERIAL AND LABOR RELEASES
A. Upon completion of the work, the Contractor shall present to the City signed copies of all labor and material releases for all work performed under Irrigation System.
1.18 TRAFFIC

A. Contractor is responsible for all temporary traffic barriers and detours required by him for the construction of the project. All temporary traffic barriers and detours shall conform to all conditions required by governing authorities.

1.19 MEETINGS & INSPECTIONS

A. Ten (10) days prior to start of irrigation system installation, the Contractor shall arrange for a meeting on the job site with the Landscape Architect, General Contractor and City, prior to start of work, to review all project requirements, schedules, material supply and storage and City requirements.

B. Contractor shall arrange for inspections by notifying the Landscape Architect, City and governing authorities forty-eight (48) hours prior to time of inspection. Inspections shall be as listed below, but not necessarily in this order.

1. Finish Grading (completion of landscape berming and mounding)
2. Irrigation Main Line Pressure Test
3. Irrigation System Coverage Test
4. Irrigation System Automatic Operations Test
5. Substantial Completion Inspection (at completion of landscape improvements)
6. Final Inspection (after maintenance period)

C. No inspection will commence without record documents. In the event the Contractor calls for an inspection without record documents and/or without completing previously noted corrections or without preparing the system for inspection, the inspection will be cancelled.

1.20 GUARANTEE

A. General:

1. The entire sprinkler system, including all work done under this contract, shall be guaranteed against all defects and fault of material and workmanship for a period of one (1) year following the filing of the Notice of Completion. All materials used shall carry a manufacturer's guarantee of one (1) year. Control equipment shall carry an installer's warranty of five (5) years.

2. Should any problem with the irrigation or control system be discovered within the guarantee period, it shall be corrected by the Contractor or installer at no additional expense to the City within ten (10) calendar days of receipt of written notice from the City. When the nature of the repairs as determined by the City constitute an emergency (e.g. broken pressure line) the City may proceed to make repairs at the Contractor's/Installer's expense. Any and all damages to existing improvement resulting either from faulty materials or workmanship, or from the necessary repairs to correct same, shall be repaired to the satisfaction of the City by the Contractor/Installer, all at no additional cost to the City.

B. Form of Guarantee:

1. Guarantee/Warranty shall be submitted on Contractor's/Installers own letterhead as follows:

GUARANTEE FOR SPRINKLER IRRIGATION SYSTEM
We hereby guarantee that the sprinkler irrigation control system we have furnished and installed is free from defects in materials and workmanship, and the work has been completed in accordance with the Plans and Specifications, ordinary wear and tear and unusual abuse, or neglect excepted, and that the work, materials, and equipment as installed will fulfill the requirements of the guarantee included in the specifications. We agree to repair or replace any or all of our work together with any other adjacent work which may be displaced by so doing, that may prove to be defective in its workmanship or materials within a period of one (1) year (five (5) years for the control system) from the date of final acceptance of the above named project by the City. We shall make such repairs or replacements within 10 calendar days following written notification by the City.

When the immediate repair or replacement of the work is necessary to ensure the public safety and welfare, which would be endangered by continued usage of the facility, such circumstance will be deemed an operational emergency. In the event of such an emergency after the City contacts our firm and after authorizing 24 hours to initiate repairs, if we fail to initiate and diligently complete such repairs in a timely manner, the Parks and Recreation Director may direct City forces to perform such functions as he may deem necessary to correct the work and immediately place the facility back in operational condition. If such procedure is implemented, we shall bear all expenses incurred by the City. In all cases, the judgment of the Parks and Recreation Director shall be final in determining whether an operational emergency exists. In the event of our failure to make such repairs or replacements within the time specified after receipt of written notice from the City (other than an operational emergency), we authorize the City to proceed to have said repairs or replacements made at our expense and we will pay the costs and charges therefore upon demand.

PROJECT: ________________________________________
LOCATION: _________________________________________
ADDRESS: __________________________________________
PHONE: _____________________________________________
SIGNED: ____________________________________________

After the irrigation system installation has been completed and accepted by the Landscape Architect and City, the Contractor shall instruct the City’s maintenance personnel in the operation and maintenance of the system. The Contractor will also supply the City with two (2) operations manuals containing; catalog specification sheets supplied by equipment manufacturer for irrigation equipment, mylar copies of irrigation record documents, two (2) folded black line copies of irrigation record documents folded to 8-1/2" x 11", and an 11" x 17" reduction of each irrigation record document with valve zone colored and laminated plan after color is applied.

If within one (1) year from date of completion, settlement occurs and adjustments in pipes, valves, sprinkler heads, planting or paving is necessary, the Contractor shall bring the irrigation system to proper operating order and planting or paving to the proper level of permanent grades. The Contractor as part of the work under this Contract shall make all adjustments without extra expense to the City.

Contractor shall furnish a Faithful Performance Bond in the amount of 10% of the bid price for irrigation system installation in the name of the City, for the one (1) year guarantee period. The
City reserves the right to act on this bond if guaranteed repairs or adjustments are not satisfactorily completed within three (3) working days of notice by the City to Contractor.

1.21 SUBMITTAL REQUIREMENTS

A. Within ten (10) working days after date of Notice to Proceed issued by the City or General Contractor, submit (not fax) seven (7) copies of each proposed product with name of manufacturer, trade name, and model or catalog designation, and reference standards to the Landscape Architect for review.

B. Sequentially number the transmittal forms. Re-submittals to have original number with an alphabetic suffix.

C. Identify Project, Contractor, Subcontractor or supplier; pertinent drawing sheet and detail number(s), and specification section number, as appropriate.

D. Apply Contractor's stamp, signed or initialed certifying that review, verification of products required, field dimensions, adjacent construction work, and Contract Documents. Submittals without Contractor's stamp and signature will be returned without review.

E. Make submittals in groups containing associated and related items to make sure that information is available for checking each item when it is received.

F. Make submittals thirty (30) calendar days in advance of scheduled dates for installation, to provide time for review and possible revisions, and re-submission prior to approval and subsequent placement of orders. Ten (10) working days shall be allowed for review of submittal by Landscape Architect.

G. Re-submittals will require the same review period as an original submittal.

H. Identify variations from Contract Documents and product or system limitations which may be detrimental to successful performance of the completed work.

I. Provide space for Contractor and Landscape Architect's review stamps.

J. Revise and resubmit submittals within five (5) working days of receipt, identify all changes made since previous submittal.

K. Distribute copies of reviewed submittals to concerned parties. Instruct parties to promptly report any inability to comply with provisions.

1.22 PROPOSED PRODUCTS LIST

A. Within ten (10) working days after date of Notice to Proceed issued by the City or General Contractor, submit complete list of major products proposed for use, with name of manufacturer, trade name, and model or catalog designation, and reference standards.

1.23 CONSTRUCTION PROGRESS SCHEDULE

A. Submit initial progress schedule in duplicate to City, Landscape Architect and General Contractor within ten (10) working days after date of Notice to Proceed, issued by the City or General Contractor for review and approval.
B. Revise and resubmit as required when progress is not in compliance with project schedule.

C. Progress schedule shall be a horizontal bar chart with separate line for each major section of work or operation, identifying first work day of each week. Show complete sequence of construction by activity, identifying work of separate stages and other logically grouped activities. Indicate the early and late start, early and late finish, float dates, and duration.

1.24 SUBSTITUTIONS

A. The Contract is based on the standards of quality established in the Contract Documents. No substitutions will be allowed if not approved in writing by the City and Landscape Architect prior to bid.

1.25 MANUFACTURERS’ INSTRUCTIONS

A. When specified in individual specification sections, submit manufacturer's printed instructions for delivery, storage, assemble, installation, start-up, adjusting, and finishing, in quantities specified for product data.

1.26 MANUFACTURERS’ CERTIFICATES

A. When specified in individual specification sections, submit seven (7) copies of manufacturers’ certificate to the City and Landscape Architect prior to purchase.

B. Indicate material or project conforms to or exceeds specified requirements, submit supporting reference date, affidavits, and certifications as appropriate.

C. Certificates may be recent or previous test results on material or product, but must be acceptable to the City and Landscape Architect.

1.27 APPROVALS

A. All areas to be irrigated shall have finish grade approval by City and Landscape Architect prior to start of irrigation system installation.

B. All submittals and substitutions must be approved prior to start of irrigation system installation.

1.28 PRODUCT HANDLING & STORAGE

A. Deliver materials to the job site in original unopened containers bearing manufacturers/suppliers name and product designation.

B. Store materials in accordance with manufacturer's printed instructions.

1.29 QUALITY ASSURANCE

A. Use adequate number of skilled workmen who are thoroughly trained and experienced in the necessary crafts and who are completely familiar with the specified requirements and methods needed for proper performance of the work of this section.
1.30 PROTECTION AND CLEAN-UP

A. Exercise all reasonable diligence in the protection of materials and planting areas during the work and until completion of project. Any damage to work or adjoining work shall be repaired immediately by the Contractor without cost to the City. All excess material and equipment shall be removed from the site at completion of the work. All landscaped areas and adjacent hardscape shall be left in a clean and satisfactory condition. Legally dispose of all debris.

B. Continuously correct and prevent hazardous conditions to employees and pedestrians during the duration of this project, no additional compensation will be allowed for this item.

1.31 RECORD DOCUMENTS

A. The Contractor shall furnish to the Landscape Architect, after acceptance of the work, a detailed set of record documents showing all construction changes. Plans shall be on CD in AutoCADD Format and one Mylar quality plan of each plan.

B. Record Documents: The Contractor shall record all changes which are made from the contract documents including changes in the pressure and non-pressure lines and indicated routing of all valve wiring.

C. The Contractor shall record changes in ink on a set of black line prints of the drawings and provide the prints to the Landscape Architect prior to final inspection of the irrigation system. He shall not use these prints for any other purpose.

D. The Contractor shall maintain changes daily and keep drawings at the site at all times available for review by the Landscape Architect.

E. Contractor shall pay all costs associated with record documents. No additional compensation will be allowed.

PART 2 - PRODUCTS

2.1 MATERIALS

A. Materials shall be first quality and of domestic manufacture unless otherwise noted.

B. Materials to be Furnished at Project Close-Out:

1. 10 additional sprinkler heads of each type and spray pattern shown, including one valve of each size.
2. 2-wrenches for disassembly and adjustment of each type sprinkler head installed;
3. 2-keys for each automatic controller;
4. 2-Quick coupler keys with a 3/4 inch swivel bronze hose bib, bent nose type with hand wheel.
5. 4-valve box cover keys.
6. Project manuals, refer to this section 1.19.

C. The above items shall be turned over to the City upon the final inspection at conclusion of the project prior to final acceptance of the irrigation system by the landscape architect and city.
2.2 PLASTIC PIPE & FITTINGS

A. All plastic pipe and fittings shall be PVC Polyvinyl Chloride Plastic.
   
   1. Constant pressure PVC mainline shall be 1120/1220 normal impact, Class 315 Rubber Gasket Pipe and Fittings.
   
   2. Intermittent pressure PVC laterals piping shall be 1120/1220 normal impact, Schedule 40 PVC solvent weld type.

B. All PVC pipe shall be permanently and continuously marked with manufacturer's name, pipe size (IPS) Class or Schedule, SDR number (class-pipe only), ASTM D 2241-69 for class pipe and D 01785-68 for Schedule pipe, manufacturers lot number and NSF number.

C. The manufacturer shall also mark the date of extrusion on the pipe. The dating is to be done in conjunction with records to be held by the manufacturer for two (2) years covering quality control test, raw material batch number and other information deemed necessary by the manufacturer.

D. All PVC pipe shall meet the requirements of the Commercial Standards (CS 256-63) with the following modifications:

   Out-Of-Round-Tolerances
   Maximum and Minimum Out-Of-Round from Average

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<thead>
<tr>
<th>Pipe O.D.</th>
<th>Fitting I.D.</th>
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<tr>
<td>+0.006</td>
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<td>+0.008</td>
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E. Schedule 40 PVC Pipe Fittings. All plastic fittings to be installed shall be molded Geon Type, and be suitable for either solvent weld or screwed connection. No fittings made of other material shall be used. Fittings shall be made by Lasco Industries, Sloan of Johns Manville Factory Assembled Fittings or equal. All fittings shall be PVC Schedule 40 unless noted otherwise on plans.

F. Slip fitting socket taper shall be so sized that a dry un-softened pipe end, conforming to these special provisions, can be inserted no more than half way into the socket. Plastic saddle and flange fittings will not be permitted.

G. When connection is plastic to metal, male adapters shall be used. The male adapter shall be hand tightened, plus one turn with a strap wrench. Joint compound shall be Permatex Type II. All joints, slip or threaded are to be coated with an approved joint compound.

H. All metal pipe and fittings on pressure side of control valves shall be nominal size schedule 40 galvanized steel.

I. Risers and nipples shall be Schedule 80 Type 1, 3" minimum length except where detailed on Plans.
J. Pipe compound PVC joints, threaded connections including PVC to steel make-up shall be best grade Teflon tape.

K. Steel pipe shall be galvanized standard weight, Schedule 40 complying with the requirements of ASTM A 120. Steel pipe shall be jointed with galvanized, threaded, standard weight malleable iron fittings and couplings.

L. Copper pipe shall be Type K in accordance with ASTM B 88. Copper pipe shall be jointed with the appropriate solder type wrought copper fittings for 2-1/2" and smaller sizes. Cast brass fittings shall be used for sizes over 2-1/2".

2.3 JOINT CEMENT & PRIMER

A. Non-pressure plastic pipe and fittings shall be cemented using a 100% active solvent, blue in color.

B. Pressure plastic pipe and fittings shall be coated with primer and then with a 100% active solvent.

C. Both primer and solvent shall be similar in all respects to that manufactured by Christy's or approved equal.

2.4 VALVES & VALVE BOXES

A. Gate Valves (all valves are to be located in the landscaped areas)
   1. All gate valves 3 inch and smaller shall be bronze double disc wedge, integral tape seats with non-rising stem and 2 inch operating nut for T-handle extension wrench.
   2. All gate valves of 4 inch and larger shall be iron body, brass trimmed, double disc wedge, and integral taper seats with non-rising stem and 2 inch operating nut for T-handle extension wrench.
   3. All gate valves shall be capable of withstanding a minimum working pressure of not less than 150 PSI.

B. Quick coupler valves shall be 150 PSI rating two piece cast bronze body, self-closing metal cover with purple vinyl protective caps, locking types. All valves are to be located in the landscaped and directly adjacent to sidewalk or curb.

C. Couplers (keys): Shall be same manufacturer as quick coupling valve, cast bronze and garden valve. Include hose swivel.

D. Remote Control Valve: Remote control valves shall be as specified on the plans and approved by the Landscape Architect. They shall be electrically operated with accurately machined valve seat surfaces, flow control adjustment and be capable of manual operation. They shall be manufactured to permit disassembly for service and maintenance without removal from main line. All valves are to be located in the landscaped areas directly adjacent to sidewalk or curbs.

E. Valve Boxes: Manufacturer shall be Ametek, Brooks or approved equal. Rectangle box for control valves and round box for gate valves and quick coupler valves. All valve boxes shall be equipped with locking lid. All valve boxes shall be integral color Green with the words "Irrigation Control Valve" molded into lid. Emboss valve number of lid
2.5 IRRIGATION HEADS

A. All rotary and spray heads shall be as specified on plans and shall be pop-up type. Install on triple swing joint.

B. All bubble heads shall be as specified on plan and shall be installed on triple swing joint with flex riser.

C. All irrigation head riser assemblies shall be of Schedule 40 PVC pipe and of the triple swing joint type as manufactured by Dura or equal, unless otherwise designated on the plans, and shall have a "flexriser" (of the proper size) incorporated in the horizontal position.

2.6 STRAINER

A. Strainer and strainer assembly shall be as designated on plans with 100 mesh screen. Paint strainer assembly purple to match color of pipe.

2.7 ELECTRICAL MATERIALS

A. General: The contractor shall furnish and install all electrical equipment and materials required for a complete electrical system. All equipment and materials shall comply with the requirements of the governing code and the serving utility and shall be approved and identified by Underwriters Laboratories, Inc. (UL).

B. Conduit and Conductors:

1. Conduit: Conduit shall be PVC underground and conforming to the applicable provisions of Uniform Electrical Code.

2. Conductors: Line voltage conductors shall be supplied in the sizes and types required and shall be THW and THWN, 600-volt insulation rating, conforming to the applicable provisions of ASTM D 2219 and D 2220. Low voltage control conductors shall by Type UF and supplied in the sizes indicated below and in accordance with the control equipment manufacturer's recommendation, and shall be UL approved for direct burial installation.

   Common - #12 gauge
   Pilot - #14 gauge

C. Controller Unit shall be as called for on the Plans. It shall be fully automatic, with provisions for manual operation, sized to accommodate the number of stations or control valves included in the system. Outdoor models shall be housed in vandal-proof and weather-proof enclosure with locking cover as manufactured by LeMur or equal.

D. Weather Proof enclosure shall be constructed of 3/16" thick steel plate, welded edges, smooth ground corners, hinged door of 10 ga. steel hinged on the same side as controller used, interior brackets for mounting the type of controller used, prime coated one coat mineral-spirit primer paint at factory. Contractor shall apply two coats of enamel, over all interior and exterior surfaces, of type compatible with primer, and of color acceptable to the City's Representative. Painting shall be done prior to installation of the controllers. Controller unit and cabinet shall be pre-assembled prior to delivery to job site.
E. Wire connectors for direct burial conductors (24 volt): Shall be 600 volt 60 degrees Centigrade AWG-UF type, waterproof, epoxy of PVC compound filled containers.

2.8 SLEEVING

A. All pipe used for sleeving of irrigation pipe and wiring shall be Schedule 40 PVC or Schedule 40 ABS.

2.9 BRASS PIPE & FITTINGS

A. All brass pipe and fittings shall be standard Class 125 85% red brass.

PART 3 - EXECUTION

3.1 SURFACE CONDITIONS

A. Examine the areas and conditions under which work of this section will be performed. Correct incidental conditions detrimental to timely and proper completion of the work.

3.2 WATER SUPPLY

A. Connections shall be at the approximate locations shown on the plans. Minor changes caused by actual site conditions shall be made without additional cost to the City. Contractor shall pay all costs associated with the connection.

3.3 LAYOUT

A. Layout sprinkler heads and make minor adjustments required due to differences between site and plans. Any such deviations in the layout shall be within the intent of the original plans and without additional cost to the City. Layout shall be approved by the Landscape Architect before installation.

3.4 ASSEMBLIES

A. Install lines and various assemblies to conform with details on plans.

B. Install no manifold assemblies or crosses and provide each assembly with its own outlet. Install all assemblies specified according to the respective detail plans or specifications using the best standards of practice.

C. All threaded pipe and fittings shall be assembled using Teflon pipe compound to male threads only.

3.5 LINE CLEARANCE

A. All lines shall have a minimum clearance of 4" from each other and parallel lines shall not be installed directly over one another.

B. Proximity of Utilities - Horizontal Separation: A 10 ft. separation of the non potable water pipe should be maintained at all times between a potable water pipe and / or a parallel sanitary sewer system. If a 10 ft. separation is not possible, special construction methods should be considered. Common trench construction should not be permitted. In any event, a minimum of 4 ft. horizontal separation should be maintained.
C. Proximity of Utilities - Vertical Separation: The potable water pipe should be installed a minimum of 1 ft. above the non potable water pipe, which in turn, should be installed a minimum of 1 ft. above a sanitary sewer system. If a 1 ft. separation is not possible, the approval for special construction requirements should be obtained from the regulatory agencies.

D. Proximity to existing trees. No trenching for irrigation lines shall be closer than drip line of tree.

E. Installation of reclaimed water irrigation system and domestic water system shall comply with the 'Guidelines for Distribution of Non potable Water’ Published by California-Nevada section of the America Water Works Associates, the ’Standard Specifications for Public Works Construction ‘ latest edition, project specifications and project plans.

3.6 TRENCHING & BACKFILLING

A. Provide all excavation for installation of will work included in the Contract. Mechanical trenching machines shall cut trenches with straight sides. Trenches shall be only wide enough as may be required to lay the pipe and control wires. "Pulling" of pipe and/or control wires will not be permitted.

1. Provide for a minimum 24" of dirt cover for all sleeves under paving.

2. Provide for a minimum of 24" of cover for all pressure supply lines, control wiring and lateral lines under paving.

3. Provide for a minimum of 12" of cover for all non-pressure lines.

4. Provide for a minimum of 24" of cover for all pressure supply lines.

B. Dig trenches and support pipe continuously on bottom of ditch. Trenching depth shall be 2" below normal pipe depth to allow for proper bedding.

C. Lay pipe to an even grade. Trenching excavation shall follow layout indicated on Plans. Where lines occur under paved areas, these dimensions shall be considered below subgrade. Discrepancies between Plans and actual site conditions shall be brought to the attention of the Landscape Architect prior to trenching.

D. Install all sleeves as indicated on Plans under future paved areas prior to placement of paving. If cutting or breaking of pavement is necessary, Contractor shall replace with like material at his own expense. Obtain approval from Landscape Architect prior to proceeding with this work.

E. After all work has been installed, flushed, tested and proved in the presence of the Landscape Architect, backfill with fine materials or other objects larger than 1/2" in diameter to fall in the first 6" of cover.

F. Backfill carefully and tamp properly to avoid any voids. All sandy soils shall be flooded during the backfill compaction operations. Do not sheet roll any trenches to achieve compaction. Compact backfill over lateral lines to equal density of adjoining undisturbed soils and compact to 85% over mainlines, remove all remaining debris caused by operation from the site and dispose of same at Contractor's expense in a legal manner. Any work covered prior to field reviews by the Landscape Architect shall be uncovered at the expense of the Contractor to allow for such review.
G. All boring under existing paved areas required for proper installation of irrigation piping and sleeves shall be performed by the Contractor and shall be considered as part of the installation operations. No additional compensation will be allowed for this item.

H. No fittings including couplings will be permitted under surfaces to be paved except where the length of the lines are encased in sleeves i.e., parking lots, plaza, etc.

3.7 PIPE ASSEMBLY

A. PVC pipe: Handle with care when loading, unloading, transporting and storing to avoid damage. Do not store pipe and fitting in direct sunlight. Store pipe and fittings under cover before using. Rejected materials shall be immediately removed from the site and replaced with new material of different batch numbers.

B. Joining by solvent weld: Use non-synthetic brush to spread primer and solvent. Cut pipe square, ream chamfer outside end. Clean and dry pipe and fittings socket. Scrub inside socket and pipe with primer, prime inside socket. Apply solvent to pipe end and to socket, and again to pipe end. Bottom the pipe in socket and turn. Hold joint together 30 seconds. Wipe off excess solvent. Allow to set 30 minutes before moving. Snake pipe side to side in trench bottom keeping 4” horizontal clearance between two pipes in same trench. Do not lay pipe in trench containing water or at less than 32 degrees F. Center load immediately, leaving joints exposed.

C. Galvanized steel pipeline: Ends of pipe shall be cut square and reamed to full size with a long taper reamer. Thread shall be cut with clean, sharp dies and shall conform to American Standards Association Specification B2. Joints shall be made with a non-toxic non-hardening joint compound applied to the male threads only.

D. Brass pipe: Cut brass piping by power backsaw, circular cutting machine using an abrasive wheel or hand hacksaw. Cut no piping with metallic wheel cutter of any description. Ream and remove rough edges of burrs so smooth and unobstructed flow is obtained. Carefully and smoothly place on male thread only. Tighten screwed joints with tongs or wrenches. Caulking is not permitted. Use Teflon tape joint compound at all points.

E. Copper pipeline: Copper pipeline joints shall be made with sweated solder joints. Before jointing, the end of the pipe for the depth of the fitting, and the interior of the fitting shall be buffed to a bright finish and coated with solder flux. The assembled joint shall be made with a 50-50 tin-lead solder. A continuous solder bead shall show around the joint circumference after soldering.

Copper pipe shall be joined to steel or cast iron pipe with a dielectric union.

3.8 FLUSHING AND TESTING

A. Mains to be flushed before attaching remote control valves, quick coupler valves, drain valves, hose bibbs or pressure relief valves and with pipe center-loaded. The entire mainline must be complete and in place prior to pressure test.
All water being discharged to be piped up and out of the trenches. Trenches to be kept dry for pressure tests. Install all valves after acceptance of pressure test.

B. Laterals to be flushed of all foreign matter and capped prior to test or installation of sprinkler heads. All lateral systems must be complete and in place prior to pressure test.

C. A water pressure test shall be performed on all pressure mains and laterals before any couplings, fittings, valves, and the like are concealed. All open ends shall be capped after the water is turned into the line in such a manner that all air will be expelled. Pressure mains shall be tested with all control valves to lateral lines closed. After the pressure main test, all valves shall be opened to test lateral lines. The constant test pressure and the duration of the test are as follows:

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<th>Laterals</th>
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<td>6</td>
<td>2</td>
</tr>
<tr>
<td>PSI</td>
<td>125</td>
<td>100</td>
</tr>
</tbody>
</table>

D. Contractor shall supply and pay for all equipment necessary to perform test. If mainline or lateral line pressure test fails, the system shall be retested until it passes. Contractor shall make all necessary adjustments and repairs at no cost to City. If system fails initial test, all subsequent inspections by Landscape Architect will be backcharged per this Section 1.18.

3.9 SPRINKLER HEAD INSTALLATION

A. Sprinkler heads shall be installed only after testing of the system has been accomplished to the complete satisfaction of the Landscape Architect and per details on project plans.

1. Install sprinkler heads as designated on the plans. Manufacturer's name and number are used for descriptive purposes. Sprinkler heads to be installed in this work shall be equivalent in all conditions as the specified heads.

2. Spacing of heads shall not exceed the maximum indicated on the plans. In no case shall the spacing exceed the maximum spacing recommended by the manufacturer. Heads adjacent to curbs, walks and paving shall be a minimum 1-1/2” and not more than 2-1/2” away from the edges.

3.10 VALVE INSTALLATION

A. Install remote control valve, master control valve, strainer, gate valves and shut-off valves prior to pressure test. All equipment failing during pressure test shall be replaced at Contractor expense and retested until approval.

B. Do not install quick coupler valve prior to pressure test.

C. Install all valve per details on project plans.

3.11 ELECTRICAL SERVICE

A. 120 Volt electrical service will be provided by other at controller locations as designated on the plans. Contractor shall make connect at service location and provide all additional electrical work to complete electrical service connect to the controllers.
B. If temporary power is supplied prior to permanent power, the Contractor shall connect to temporary power source provided and then to permanent power source when available. All cost shall be included in bid price. No additional compensation will be allowed.

3.12 CONTROLLER UNIT INSTALLATION

A. Install controller per details on project plans. All exposed valve wiring to be installed in metal raceways from valve wire conduit to controllers.

3.13 VALVE BOXES

A. Install all valve boxes as detailed on project plans. Fill area under box with minimum of 1 cubic foot of pea gravel before box is installed.

B. Identification:
   1. Attach identification tag showing valve number on each solenoid "pigtail".
   2. Tags shall be manufactured of polyurethane Behr Desopaid, yellow in color with black letters 2-3/4" by 2-1/4".
   3. Tags shall be manufactured by Christy’s or equal.

3.14 LOW VOLTAGE WIRING

A. Place wiring in the same trench and along the same routing as the pressure supply lines unless otherwise approved.
   1. Install wiring prior to main line whenever possible. Do not wrap wire around mainline.
   2. When more than one wire is placed in a trench, tape wires together at maximum 12ft on center.

B. Provide a 24" expansion loop at each connection to valve and directional change in mainline.

C. Use a continuous wire between controller and remote control valves.

D. Provide 3 extra valve wires per controller unit, from controller to furthermost control valve.

3.15 IRRIGATION COVERAGE TEST

A. When irrigation system installation is completed, perform a coverage test in the presence of the Landscape Architect to determine that water coverage for planting area is complete and adequate. Furnish all materials and perform all work required to correct all inadequacies. This coverage test shall be approved by the Landscape Architect prior to plant material installation.

B. System shall be tested for automatic and manual operations. Controllers shall be set for automatic operations of all valves for 2 minute intervals during coverage test.
3.16 PAINTING

A. Paint all ferrous valves, fittings and pipe installed above grade with one coat oil base primer and two coats of accepted epoxy paint using a color as accepted by the Landscape Architect. All parts shall be painted, sanded and cleaned with a degreaser fluid prior to applying the primer. Submit type and manufacturer's name of paint materials to Landscape Architect.

3.17 MAINTENANCE

A. Maintain all irrigation equipment to operate at peak performance. Replace, at no cost to the City, any equipment damaged during the maintenance period.

3.18 SITE CLEANING

A. Clean all debris from site, remove all storage rooms and all other construction materials.

END OF SECTION
PART 1 - GENERAL


Provisions of the General and Supplementary Conditions and Division 01 apply to this section.

1.1 SECTION INCLUDES

A. Furnish materials, equipment and perform labor required to execute this work as indicated on the drawings, as specified and as necessary to complete the contract, including but not limited to these major items:

1. Play equipment
2. Trash Receptacles
3. Benches
4. Volleyball Net and Post
5. Group Picnic area Shade Shelter
6. Bicycle Racks
7. Barbeques
8. Picnic Tables
9. Basketball backstops
10. Tree Grates
11. Senior Courtyard Shade Shelters
12. Main Entry and Gymnasium Shade Shelters
13. ADA Picnic Tables
14. Planter Pots

1.2 RELATED WORK

Section 01300 Submittals
Section 03300 Cast-In-Place Concrete

1.3 REQUIREMENTS AND SUBMITTALS

A. Comply with Section 01300.

B. Play equipment guarantee and liability insurance: Manufacturer shall guarantee all materials and workmanship for a period of one (1) year, exclusive of vandalism. Manufacturer will be required to provide product liability insurance coverage in the minimum amounts of ten million ($10,000,000) dollars, naming Owner and Hirsch & Associates, Inc. as additionally insured with respect to the project. Play equipment manufacturers’ representatives must inspect equipment installation and provide written approval.

C. The manufacturer will be required to provide complete installation drawings including specifications and replacement parts list for all products.
D. Contractor shall provide written guarantee on firm’s letterhead for all materials and workmanship for a period of one (1) year exclusive of vandalism. Written guarantee shall be submitted to Landscape Architect at the final inspection prior to final acceptance of the work.

1.4 DELIVERY AND STORAGE

A. Comply with Section 01620.

B. Contractor assumes all responsibility for storage of all materials relative to this project.

C. Owner assumes no liability for losses or damages from any cause as a result of such storage. Contractor shall allow at least six (6) to eight (8) weeks delivery time for all items.

1.5 PRODUCT SUBMITTALS / SHOP DRAWINGS

A. Comply with pertinent provisions of Section 01340.

B. Product Data: Within fourteen (14) calendar days after the Contractor has received the Notice to Proceed from Owner, submit:

1. Materials list of items proposed to be provided under this Section;

2. Manufacturer's specifications and other data needed to prove compliance with the specified requirements;

3. Manufacturer's recommended installation procedures which, when approved by the Architect, will become the basis for accepting or rejecting actual installation procedures used on the work.

PART 2 - PRODUCTS

2.1 MATERIALS

A. As shown on project plans.

PART 3 - EXECUTION

3.1 SURFACE CONDITIONS

A. Examine the areas and conditions under which work of this section will be performed. Correct conditions detrimental to timely and proper completion of the work.

B. No equipment, apparatus or foundations for same shall be placed until location stakes have been inspected and accepted by the Landscape Architect.

C. Contractor shall stake or mark locations for all slabs and foundations and shall obtain the approval of the Landscape Architect, prior to commencing any digging.

D. Locations shall be adjusted to provide minimum clear distances required from all edges of slabs, trees, irrigation heads or other obstructions.
3.2 INSTALLATION

A. All fasteners shall be either deformed or tack welded together to prevent unauthorized removal of the fasteners. Paint with Galvalloy or Galvicon after deformation/welding, over-paint to match existing.

B. Install all site furnishing materials per project plans, details and manufacturer recommendations.

C. Contractor shall obtain approval of all forming from the Landscape Architect prior to pouring any concrete slabs. Foundation holes shall be inspected and approved by the Landscape Architect prior to pouring concrete.

3.5 CLEAN-UP

A. Contractor shall clean-up and legally dispose of all unused materials excess soil and debris at regular intervals throughout the duration of the work and as directed by the Landscape Architect and City representative, at no additional cost to the City.

B. Comply with provisions of Section 01710.

END OF SECTION
PART 1 – GENERAL

Provisions of the General and Supplementary Conditions and Division 01 apply to this section.

1.01 DESCRIPTION

A. Work Included:
   1. Stone pavers set in mortar setting bed.

B. Related Work:
   1. Documents affecting work of this Section include, but are not necessarily limited to, General Conditions, Supplementary Conditions and Sections in Division 1 of these Specifications.

1.02 SUBMITTALS

A. Product Data: For the following:
   1. Stone pavers.
   2. Grout, including:
      a. Design Mix
      b. Color and Texture

B. Samples for Verification: Full-size units of each type of unit paver indicated; in sets for each color, texture, and pattern specified, showing the full range of variations expected in these characteristics.
   1. Provide Samples with joints grouted and cured, showing the full range of colors to be expected in the completed Work.

C. Qualification Data: For firms and persons specified in "Quality Assurance" Article to demonstrate their capabilities and experience. Include lists of completed projects with project names and addresses, names and addresses of architects and owners, and other information specified.

1.03 QUALITY ASSURANCE

A. Installer Qualifications: An experienced installer who has completed unit paver installations 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.

B. Source Limitations: Obtain each type of unit paver, joint material, and setting material from one source with resources to provide materials and products of consistent quality in appearance and physical properties.

C. Mockups: Before installing unit pavers, build mockups for each form and pattern of unit pavers required to verify selections made under sample Submittals and to demonstrate aesthetic effects and qualities of materials and execution. Build mockups to comply with the following requirements, using materials indicated for the
completed Work, including same base construction, special features for expansion joints, and contiguous work as indicated:

1. Install at project site a job mock-up using acceptable products and approved installation methods. Obtain Owner's and Architect's acceptance of finish color, texture, pattern, and workmanship standard before proceeding with this work.

2. Build mockups in the location and of the size indicated or, if not indicated, as directed by Architect.

3. Demonstrate the proposed range of aesthetic effects and workmanship.


5. Maintain mockups during construction in an undisturbed condition as a standard for judging the completed Work.

6. Approved mockups may become part of the completed Work if undisturbed at time of Substantial Completion.

1.04 DELIVERY, STORAGE, AND HANDLING

A. Protect unit pavers during storage and construction against soiling or contamination from earth and other materials. Cover pavers with plastic or use other packaging materials that will prevent rust marks from steel strapping.

B. Store cementitious materials on elevated platforms, under cover, and in a dry location. Do not use cementitious materials that have become damp.

1.05 PROJECT CONDITIONS

A. Cold-Weather Protection: Do not use frozen materials or materials mixed or coated with ice or frost. Do not build on frozen subgrade or setting beds. Remove and replace unit paver work damaged by frost or freezing.

B. Weather Limitations for Mortar and Grout: Comply with the following requirements:

1. Cold-Weather Requirements: Protect unit paver work against freezing when atmospheric temperature is 40 deg F and falling. Provide the following protection for completed portions of work for 24 hours after installation when the mean daily air temperature is below 40 deg F, cover with weather-resistant membrane. Do not install pavers if the atmospheric temperature is 25 deg F or if the mean daily air temperature is predicted to be below 25 deg F 24 hours after installation.

2. Hot-Weather Requirements: Protect unit paver work when temperature and humidity conditions produce excessive evaporation of setting beds and grout. Provide artificial shade and windbreaks and use cooled materials as required. Do not apply mortar to substrates with temperatures of 100 deg F and higher.

   a. When ambient temperature exceeds 100 or 90 deg F with a wind velocity greater than 8 mph, set pavers within 1 minute of spreading setting-bed mortar.

PART 2 - PRODUCTS

2.01 PAVER

A. Travertine Dorado Classic.

2.02 COLORS AND TEXTURES

A. Colors and Textures: Color and pattern to be selected by Architect.
2.03 UNIT PAVERS

A. Stone Pavers: Rectangular paving stones, with split faces and edges
   1. Size: 12 inches by 12 inches, and approximately 3/8 inches thick. Pavers for exterior Decks shall be minimum 1-1/2” thick.

2.04 ACCESSORIES

A. Job-Built Concrete Edge Restraints: Comply with Section 02753 – Plan Cement Concrete Pavement as indicated on the Drawings.

B. Cork Joint Filler – at locations without sealants: Preformed Strips complying with ASTM D 1752, Type II.

C. Compressible Foam Filler – at locations where sealants are used:: Preformed strips complying with ASTM D 1056, Grade 2A1.

2.05 PORTLAND CEMENT MORTAR SETTING-BED MATERIALS

A. Portland Cement: ASTM C 150, Type I or II.

B. Hydrated Lime: ASTM C 207, Type S.

C. Aggregate: ASTM C 144.

D. Water: Potable.

2.06 GROUT MATERIALS

A. Latex-Portland Cement Grout: ANSI A118.6, composition as follows:
   1. Packaged, dry grout mix consisting of portland cement, graded aggregate, and ethylene vinyl acetate in the form of a reemulsifiable powder to which only water is added at Project site.

B. Water: Potable.

2.07 MORTAR AND GROUT MIXES

A. General: Comply with referenced standards and with manufacturers' written instructions for mix proportions, mixing equipment, mixer speeds, mixing containers, mixing times, and other procedures needed to produce setting-bed and joint materials of uniform quality and with optimum performance characteristics. Discard mortars and grout when they have reached their initial set.

B. Cement-Paste Bond Coat: Mix bond coat to a consistency similar to that of thick cream and consisting of either neat cement and water or cement, sand, and water.


D. Latex-Modified Portland Cement Slurry Bond Coat: Proportion and mix portland cement, aggregate, and latex additive for slurry bond coat to comply with directions of latex-additive manufacturer.
E. Latex-Modified Portland Cement Grout: Add latex additive to dry grout mix in proportion and concentration recommended by latex-additive manufacturer. Proportion cement and aggregate to comply with directions of latex-additive manufacturer.

1. Job-Mixed, Pigmented Grout: Select and proportion pigments with other ingredients to produce color required. Do not exceed pigment-to-cement ratio of 1 to 10, by weight.

PART 3 - EXECUTION

3.01 EXAMINATION

A. Examine areas indicated to receive paving, with Installer present, for compliance with requirements for installation tolerances and other conditions affecting performance. Proceed with installation only after unsatisfactory conditions have been corrected.

3.02 PREPARATION

A. Vacuum clean concrete substrates to remove dirt, dust, debris, and loose particles.

B. Remove substances, from concrete substrates, that could impair mortar bond, including curing and sealing compounds, form oil, and laitance.

3.03 INSTALLATION, GENERAL

A. Do not use unit pavers with chips, cracks, voids, discolorations, and other defects that might be visible or cause staining in finished work.

B. Mix pavers from several pallets or cubes, as they are placed, to produce uniform blend of colors and textures.

C. Cut unit pavers with motor-driven masonry saw equipment to provide clean, sharp, unchipped edges. Cut units to provide pattern indicated and to fit adjoining work neatly. Use full units without cutting where possible. Hammer cutting is not acceptable.

D. Joint Pattern: As indicated on the Drawings.

E. Tolerances: Do not exceed 1/16-inch unit-to-unit offset from flush (lippage) nor 1/8 inch in 24 inches and 1/4 inch in 10 feet from level, or indicated slope, for finished surface of paving.

F. Expansion and Control Joints: Provide joint filler at locations and of widths indicated. Install joint filler before setting pavers. Make top of joint filler flush with top of pavers.

3.04 MORTAR SETTING-BED APPLICATIONS

A. Saturate concrete subbase with clean water several hours before placing setting bed. Remove surface water about one hour before placing setting bed.

B. Apply cement-paste bond coat over surface of concrete subbase about 15 minutes before placing setting bed. Limit area of bond coat to avoid its drying out before placing setting bed. Do not exceed 1/16-inch thickness for bond coat.
C. Apply mortar bed over bond coat immediately after applying bond coat. Spread and screed setting bed to uniform thickness at subgrade elevations required for accurate setting of pavers to finished grades indicated.

D. Mix and place only that amount of mortar bed that can be covered with pavers before initial set. Cut back, bevel edge, remove, and discard setting-bed material that has reached initial set before placing pavers.

E. Place pavers before initial set of cement occurs. Immediately before placing pavers on setting bed, apply uniform 1/16-inch- (1.5-mm-) thick, slurry bond coat to bed or to back of each paver with a flat trowel.

F. Tamp or beat pavers with a wooden block or rubber mallet to obtain full contact with setting bed and to bring finished surfaces within indicated tolerances. Set each paver in a single operation before initial set of mortar; do not return to areas already set and disturb pavers for purposes of realigning finished surfaces or adjusting joints.

G. Spaced Joint Widths: Provide 1/2 inch nominal joint width with variations not exceeding plus or minus 1/16 inch.

H. Grout joints as soon as possible after initial set of setting bed. Force grout into joints, taking care not to smear grout on adjoining pavers and other surfaces. After initial set of grout, finish joints by tooling to produce a slightly concave polished joint, free from drying cracks.

I. Cure grout by maintaining in a damp condition for seven days, unless otherwise recommended by latex-additive manufacturer.

3.05 REPAIR, POINTING, CLEANING, AND PROTECTION

A. Remove and replace unit pavers that are loose, chipped, broken, stained, or otherwise damaged or that do not match adjoining units as intended. Provide new units to match adjoining units and install in same manner as original units, with same joint treatment and with no evidence of replacement.

B. Pointing: During tooling of joints, enlarge voids or holes and completely fill with mortar or grout. Point up joints at sealant joints to provide a neat, uniform appearance, properly prepared for sealant application.

C. Cleaning: Remove excess grout from exposed paver surfaces; wash and scrub clean.

END OF SECTION
SECTION 02800
LANDSCAPING

PART 1 - GENERAL

Application and construction procedures shall conform to requirements of the Standard Specifications for Public Works Construction latest edition and any supplements.

Provisions of the General and Supplementary Conditions and Division 01 apply to this section.

1.1 SECTION INCLUDES

A. Furnish materials, equipment and perform labor required to execute this work as indicated on the Project Plans, as specified and as necessary to complete the contract, including but not limited to these major items:

1. Soil Testing, Planting And Maintenance Approvals
2. Soil Preparation
3. Application Of Fertilizers, Wood Shavings And Plant Tablets, Etc.
4. Finish Grading And Fine Grading
5. Watering
6. Planting Of Trees, Shrubs, Ground Cover and lawn
7. Staking Of Trees
8. Plant Establishment Period (30 Days)
9. Landscape Maintenance Period (60 Days)

1.2 RELATED WORK

Section 01300 Submittals
Section 01620 Storage and Protection
Section 02210 Grading
Section 02750 Irrigation System

1.3 REQUIREMENTS / APPROVALS

A. All irrigation system work shall be inspected and approved by the Landscape Architect, prior to start of any work in this section.

B. An Agricultural Soil Suitability Report for all planting areas shall be furnished by the Contractor after completion of finish grading and prior to start of soil preparation work. The requirements for fertilization and amendments as specified herein, may be modified as necessary by the Landscape Architect prior to start of work in this section. Soil suitability test shall be performed by a qualified Soil and Plant Laboratory.

C. Contractor to submit seven (7) copies of seed mix specifications from supplier to Landscape Architect prior to purchase. Provide certification of application to Landscape Architect.

D. The Contractor shall obtain fine grading approval of the Landscape Architect prior to hydroseeding.
E. Written certification required which are to be submitted to the Landscape Architect upon delivery to the job site include:

1. Quantity of Commercial Fertilizers, by type.
2. Quantity of Soil Amendments and Conditions, by type.
3. Quantity of Seed, by type.
4. Quantity of Mulch, by type.
5. Quantity of Fertilizer, by type.
6. Quantity of Plant Material, by type.

1.4 PRODUCT SUBMITTALS / SHOP DRAWINGS

A. Comply with pertinent provisions of Section 01340.

B. Product Data: Within fourteen (14) calendar days after the Contractor has received the Notice to Proceed from City, submit:

1. Materials list of items proposed to be provided under this Section;
2. Manufacturer's specifications and other data needed to prove compliance with the specified requirements;
3. Shop Drawings in sufficient detail to show fabrication, installation, anchorage, and interface of the work of this Section with the work of adjacent trades;
4. Manufacturer's recommended installation procedures which, when approved by the Landscape Architect, will become the basis for accepting or rejecting actual installation procedures used on the work.

1.5 QUALITY ASSURANCE

A. Use adequate numbers of skilled workmen who are thoroughly trained and experienced in the necessary crafts and who are completely familiar with the specified requirements and the methods needed for proper performance of the work of this Section.

1.6 PRODUCT HANDLING AND STORAGE

A. Deliver materials to the job site in original unopened containers bearing manufacturer's name and product designation. All shrubs and trees shall be tagged by Nursery and have tags in-place upon delivery to site.

B. Store materials in accordance with manufacturer's printed instructions and Section 01620. Store all plant and soil preparation materials out of construction area. Plant material must be continuously cared for by the Contractor upon delivery to site and until final acceptance of the project.

1.7 GUARANTEE

A. All plantings shall be guaranteed from date of final acceptance of project for the following periods of time. **City will retain 10% of the bid amount indicated on the bid schedule for landscaping for 90 calendar days from the date of the project final acceptance.**

Trees and Shrubs 18” box and larger ............................................1 year
Trees and Shrubs 15 gallon and smaller .................................... 90 days
Ground Cover................................................................. 90 days
Bedding Plants............................................................. 90 days
Lawn 90 days

B. Replace all plants, that in the opinion of the Landscape Architect are either dead, dying or in an unacceptable condition at any time during the life of the Contract and guarantee period. Newly installed replacement plants shall carry the same guarantee period as defined in paragraph A from date of replacement planting.

PART 2 - PRODUCTS

2.1 MATERIALS

A. All plant material shall meet requirements of the Standard Specifications for Public Works Construction, Latest Edition, Section 212-1.4 except as modified herein, plant material described in quantity, size and type on project plans.

2.2 SOIL

A. On site soil or Class A Topsoil.

2.3 SOD LAWN

A. Sod to be as specified on the landscape plans or Architect approved equal. Provide strongly rooted sod, not less than 2 years old, and free of weeds and undesirable native grasses. Provide only sod capable of growth and development when planted (viable - not dormant), and in 3/4 inch thick strips not more than 18" wide x 4 ' long.

2.4 SOIL AMENDMENTS

(Quantities shown on Plans are for bid purposes only. The Contractor shall install soil amendments as specified by soil test results or designated by Landscape Architect)

A. Organic Soil Amendment: Ground or processed wood product shall be Type I, as approved by the Landscape Architect and conform to the provisions of the Standard Specifications for Public Works Construction, Latest Edition Section 212-1.2.4.


E. Iron Sulfate: Pellet or granular form containing not less than 18.5% expressed metallic iron and registered as an agricultural mineral, with the State Department of Agriculture in compliance with Article 2, “Fertilizer Materials,” Section 1030 of the Agricultural Code.
2.5 MAINTENANCE PERIOD

A. Commercial fertilizer to be Best Pro-Balance 15-15-15 and comply with the Standard Specifications for Public Works Construction, Latest Edition, Section 212-1.2.3. Free flowing material delivered in unopened sacks. Material which becomes caked or otherwise damaged shall not be used.

Lawn 7 lbs./1,000 S.F.

PART 3 - EXECUTION

3.1 SURFACE CONDITIONS

A. Examine the areas and conditions under which work of this section will be performed. Correct conditions detrimental to timely and proper completion of the work.

B. Installation shall conform to the requirements of Section 308-4 of the Standard Specifications for Public Works Construction, Latest Edition, except as modified herein.

C. All weed growth within areas to receive planting shall have a non-selective herbicide applied prior to removal. Remove all weeds after 5 days. All trash, weeds and deleterious materials on the surface of the ground shall be removed from the site and legally disposed of.

D. All areas to be planted in ground cover or shrubs shall have selected herbicide applied to entire area after plantings. Application shall be as recommended by a Certified Pest Control Applicator. Provide certification of application to Landscape Architect.

E. Lawn areas shall be graded so that after cultivation, amendment and settlement, the soil shall be 3/4" to 1" below the top of curb or paving in lawn areas and 2" in planter beds.

F. All flow lines shall be maintained to allow for free flow of surface water. Displaced material which would interfere with drainage shall be removed and placed as directed. Low spots and pockets shall be graded to drain properly.

3.2 SOIL PREPARATION

A. Incorporate the following soil amendment material into all lawn and planter areas per 1,000 S.F. Rototill materials into areas a depth of 6". Water thoroughly after rototilling is complete.

3 c.y. Organic Soil Amendment
15 lbs. Best Pro-Balance 15-15-15
50 lbs. Agricultural Gypsum

The amendments and quantities listed are for bid purpose only and must be verified by agricultural soil suitability test as specified in Part 1 of this section.
3.3 PLANTING

A. All planting areas shall be cultivated until the soil is brought to a loose friable condition to a depth of 6". Remove all rocks and debris larger than 3/4" from surface of finish grade and legally disposed of off site.

B. All areas to receive planting shall be finish graded. Finish grades shall be so graded that required tolerances are met after settlement at the completion of the project maintenance period.

C. Evenly distribute soil amendments in all lawn and shrub bed areas as indicated on plans. Thoroughly incorporate soil amendments into upper 6" of soil with mechanical tiller. Water all areas thoroughly after Rototilling is complete.

D. Plants shall be placed where shown on the project plans or as directed by the Landscape Architect. No planting shall occur until location and arrangement is approved by Landscape Architect.

E. Any plants that in the opinion of the Landscape Architect are dry, or in a wilted condition when delivered or thereafter, whether in place or not, will not be accepted and shall be replaced at the Contractor's expense.

3.4 LAWN INSTALLATION (HYDROSEED)

A. Grade smooth all surfaces to receive sod. Soil surface shall be approximately 1-1/2 inch below adjacent pavement after settling, level, smooth and moist prior to sodding. Roll lightly and fill in all soil depressions. All areas shall slope to drain.

B. The lawn planter bed shall be inspected by the Architect to determine its suitability prior to planting. The Contractor shall obtain such approval prior to laying sod. Sod installation shall not be performed until all other construction operations have been completed, except by authorization of the Architect.

C. Water areas thoroughly and allow surface to dry off before laying sod. Do not create muddy conditions when watering.

D. Lay sod within 24 hours from time of stripping. Lay sod to form a solid mass with tightly fitted overlapping joints. Stagger strips to offset joints. Lay sod strips perpendicular to he direction of the slopes. Within 2 hours after installation sod and before rolling, lightly irrigate, but do not flood. Roll sod after irrigating so seams and joints are well bonded to subgrade. Thoroughly irrigate sod after rolling but do not flood.

E. Protect all sod areas from foot traffic until sod is well established.

F. All lawn areas shall have achieved full coverage, uniform color and appearance, and all landscape planting shall be installed and approved prior to the request for Substantial Completion Inspection.

3.5 WATERING

A. Apply water to all lawn areas and plants during operations and thereafter, until acceptance of the work.
B. Immediately after planting, apply water to each shrub by means of a hose. Apply water in a moderate stream in the planting hole until the material about the roots are completely saturated from the bottom of the hole to the top of the ground.

C. Apply water in sufficient quantities and as often as seasonal conditions require to keep planted areas wet at all times, well below the root system of grass and plants.

D. All ground cover planting shall be immediately sprinkled to avoid drying out, until the entire planted area is thoroughly watered and soil soaked to the full depth of each plant hole.

E. All hydroseed lawn areas shall be kept damp at all times and irrigation should be adjusted accordingly. This normally would involve four (4) to six (6) watering periods daily, each watering period (ON) regulated to just dampen the mulch and seeds without creating run off.

F. Intervals between irrigation (OFF) sequence should be judged by the length of the time mulch and seeds remain damp. Once the mulch and seeds begin to dry out, the water (ON) sequence should be repeated.

3.6 PLANT ESTABLISHMENT (30 days)
A. General:

1. Contractor shall provide all labor, materials, and equipment to perform work during the Plant Establishment Period, as specified herein, including but not limited to; adequate watering of plant material, replacing unsuitable plant material and controlling weeds, rodents and other pests.

2. The Plant Establishment Period shall consist of thirty (30) days prior to the Post-Installation Period. Following inspection of planting operations, including hydroseeding, the Landscape Architect shall notify the Contractor in writing to establish the effective beginning date of the Plant Establishment Period.

3. Time required for plant establishment shall be considered as included in the total time limit specified in the Contract.

4. Plant Establishment Period may be extended by the Landscape Architect if the planting areas are improperly maintained, appreciable replacement is required or other corrective work becomes necessary.

5. The Facility will not be available for public use during the Plant Establishment Period. Contractor shall coordinate with City and conduct operations to cause no danger or inconvenience to the public.

6. Contractor shall be responsible for maintaining adequate protection of the facility. Costs incurred due to damage or replacement shall be the responsibility of the Contractor.

7. Contractor shall spray chemicals when air currents are still; preventing drifting onto adjoining property and preventing any toxic exposure to persons whether or not they are in or near the project.

8. In order to carry out the plant establishment work, the Contractor shall maintain a sufficient number of men and adequate equipment to perform the work specified from the time any planting is done until final acceptance.
9. Workmen shall not be allowed to walk on grass areas unnecessarily prior, during, or after planting operations. Grass areas that have been damaged or compacted shall be recultivated and re-seeded at the contractor's expense.

10. The lawn areas shall be kept moist, but not glistening wet, until time for the first cutting of grass. Water lawn to maintain a thriving condition.

11. The Landscape Architect must approve the lawn areas prior to the first mowing. All lawn areas must obtain 90 to 95 percent germination prior to first mowing. All lawn areas must then be mowed at least twice at proper mowing height of grass prior to requesting approval by Landscape Architect. Mowing height shall be 2".

12. The plant establishment period shall extend at least thirty (30) days from the date of the last planting. The date of last planting may be the replacement planting of significant areas that failed to grow at the Landscape Architect's discretion. Contractor shall bear all costs for extension of the plant establishment period.

13. All plants that show signs of failure to grow at any time during the life of the contract, or those plants so injured or damaged as to render them unsuitable for the purposes intended, shall be immediately replaced in kind at the expense of the Contractor and a new 90 day guarantee period shall be given.

B. Execution:

1. All areas, including, but not limited to turf, concrete walks and slabs and sand, shall be kept clean and free of weeds, litter and debris.

2. Contractor shall operate the irrigation system automatically and shall properly and completely maintain all parts of the irrigation system. Contractor shall deliver water in sufficient quantities and adjust water application to compensate for seasonal conditions.

3. Before weeds exceed 2" in height, they shall be removed and disposed of off-site. Serious weed pests (i.e. blackberry, sedge, Crab and Nut grass or bind weed) shall be sprayed with Roundup or Manage, as manufactured by Monsanto Co., or approved equal, at the rate of five (5) quarts per acre and left in place for ten (10) calendar days. Application shall be as recommended by manufacturer. As determined by the Landscape Architect, a second application of Roundup or Mange shall be made ten (10) calendar days after the first application. With both applications, areas sprayed shall remain unwatered for a minimum of forty-eight (48) hours. Dead weeds shall be removed ten (10) calendar days after second application and disposed of off-site (for newly planted shrub and ground cover areas only).

4. If the Landscape Architect notifies the Contractor of failure to control weeds as specified herein, the Contractor shall kill all weeds within ten (10) calendar days of such verification. The Plant Establishment Period will be extended for every day after the ten (10) calendar days until such weeds have been eradicated.
C. Fertilization:

1. Fertilize all newly planted areas (trees, shrubs and ground cover) with Best Pro-Balance 15-15-15 at rate 7 lbs. per 1000 SF at the completion of the 30 day plant establishment period.

D. Inspection:

1. Upon completion of the Plant Establishment Period, Contractor shall request an inspection of construction to establish the beginning date of the Post-Installation Period. The request shall be made to the Landscape Architect a minimum of seven (7) calendar days prior to the date for inspection.

3.7 60 DAYS POST-INSTALLATION MAINTENANCE PERIOD

A. General:

1. Contractor shall provide all labor, materials, and equipment to perform work during the Post-Installation Maintenance Period, as specified herein, including but not limited to: adequate watering of plant material, replacing unsuitable plant material and controlling weeds, rodents and other pests.

2. The Post-Installation Maintenance Period shall consist of sixty (60) days, following inspection and approval of the Plant Establishment Period and project construction performed in accordance with the contract documents. The Landscape Architect shall notify the Contractor in writing to establish the effective beginning date of the Post-Installation Maintenance Period.

3. Contractor shall maintain the project weekly on a continuous basis until acceptance of the work. Areas shall be so cared for as to present a neat and clean condition at all times.

4. The park will not be available for public use during the Post-Installation Maintenance Period. Contractor shall conduct operations so as to cause no danger or inconvenience to the public.

5. Contractor shall be responsible for maintaining adequate protection of the park. Costs incurred due to damage or replacement shall be the responsibility of the Contractor.

6. Notification shall be given to the Landscape Architect forty-eight (48) hours prior to the Contractor performing "specialty-type" operations, including but not limited to; fertilization, chemical weed abatement and turf aerification, de-thatching and fungicide applications.

7. Time required for Post-Installation Maintenance shall be considered as included in the total time limit specified in the Contract.

8. Working days when the Contractor fails to adequately perform maintenance operations as specified herein or determined to be necessary by the Landscape Architect will not be credited as Post-Installation Maintenance Period days.

9. Post-Installation Maintenance Period may be extended by the Landscape Architect if the project is improperly maintained, appreciable replacement is required, or other corrective work becomes necessary. Contractor shall schedule a preliminary walk-thru inspection five (5) calendar days prior to the
end of the first thirty (30) days of the Post-Installation Maintenance Period. Contractor shall correct deficiencies before the Post-Installation Maintenance Period will be allowed to continue to the remaining thirty (30) days.

10. Contractor shall spray chemicals when air currents are still; preventing drifting onto adjoining property and preventing any toxic exposure to persons whether or not they are in or near the project.

11. Contractor shall mow all lawn areas on a weekly basis. Mowing heights shall start at 1-1/2" to 2". Mow height shall be lowered during maintenance period to achieve a final mowing height of 1" at completion of 60 day post maintenance period.

B. Execution:

1. All areas including, but not limited to turf, concrete walks and slabs and sand, shall be kept clean and free of weeds, litter and debris.

2. Facility shall be maintained in a safe condition without damaged or broken parts and free of "graffiti" and debris. Costs incurred for repair or replacement shall be the responsibility of the Contractor.

3. Subsurface drains and catch basin grates shall be kept clear of leaves, litter and debris to ensure unimpeded passage of water. Drain lines shall be periodically flushed with clear water to avoid build-up of silt and debris.

4. Before weeds exceed 2" in height, they shall be removed and disposed of off-site. Serious weed pests (i.e. blackberry, but sedge, Crab and Nut grass or bind weed) shall be sprayed with Roundup or Manage, as manufactured by Monsanto Co., or approved equal, at the rate of five (5) quarts per acre and left in place for ten (10) calendar days. Application shall be as recommended by manufacturer. As determined by the Landscape Architect, a second application of Roundup or Manage shall be made ten (10) calendar days after the first application. With both applications, areas sprayed shall remain unwatered for a minimum of forty-eight (48) hours. Dead weeds shall be removed ten (10) calendar days after second application and disposed of off-site (for newly planted shrub and ground cover areas only).

5. If the Landscape Architect notifies the Contractor of failure to control weeds as specified herein, the Contractor shall kill all weeds within ten (10) calendar days of such verification. The Post-Installation Maintenance Period will be extended for every day after the ten (10) calendar days until such weeds have been killed.

C. Irrigation System:

1. Contractor shall operate the irrigation systems automatically and shall properly and completely maintain all parts of the irrigation system.

2. Contractor shall deliver water in sufficient quantities and adjust water application to compensate for seasonal conditions.

3. Irrigation system is designed for watering five (5) days a week, 10:00 PM. to 6:00 A.M. with even distribution.
4. Costs incurred due to repair or replacement of equipment shall be the responsibility of the Contractor. Replacement parts shall be identical to the material specified herein and on the drawings.

D. Fertilization:

1. Fertilize all newly planted areas (trees, shrubs, ground cover) at the end of the first 30 days of maintenance and at the completion of the 60 day maintenance period with Best Pro-Balance 15-15-15 at a rate of 7 lbs. per 1000 SF.

E. Inspection

1. Upon completion of the Post-Installation Maintenance Period, Contractor shall request an inspection for acceptance of the work performed in accordance with the Contract Documents. The request shall be made to the Landscape Architect a minimum of seven (7) calendar days prior to the date for inspection.

END OF SECTION
SECTION 02830
CHAIN LINK FENCE AND GATES

PART 1- GENERAL

Application and construction procedures shall conform to the requirements of the Standard Specifications for Public Works Construction, latest edition and any supplements.

Provisions of the General and Supplementary Conditions and Division 01 apply to this section.

1.1 SECTION INCLUDES

A. Furnish materials, equipment and perform labor required to execute this work as indicated on the Plans, as specified and as necessary to complete the contract including:
   1. Fence fabric, posts, rails, fittings, and braces
   2. Excavation for posts bases
   3. Concrete anchorage for posts
   4. Gates (if required) and related hardware
   5. Shade screen and windscreen

1.2 RELATED WORK

Section 01300 Submittals
Section 02711 Windscreen
Section 03300 Cast-In-Place Concrete

1.3 PRODUCT SUBMITTALS / SHOP DRAWINGS

A. Comply with pertinent provisions of Section 01340.

B. Product Data: Within fourteen (14) calendar days after the Contractor has received the Notice to Proceed from Owner, submit:
   1. Materials list of items proposed to be provided under this Section for use.
   2. Manufacturer's specifications and other data needed to prove compliance with the specified requirements.
   3. Shop Drawings in sufficient detail to show fabrication, installation, anchorage, and interface of the work of this Section with the work of adjacent trades;
   4. Manufacturer's recommended installation procedures which, when approved by the Architect, will become the basis for accepting or rejecting actual installation procedures used on the work.
   5. Submit manufacturer's details of fence and gate installation.
1.4 REFERENCES

ASTM A 392 Zinc Coated Steel Chain Link Fence Fabric
ASTM A 824, Type 1, Metallic-Coated Steel Marcelled Tension Wire for Use with Chain Link Fence Fabric
ASTM F 552 Definitions of Terms Relating to Chain Link Fencing
ASTM F 567 Installation of Chain Link Fence
ASTM F 900 Industrial and Commercial Swing Gates
ASTM F 669 Strength, Requirements of Metal Posts and Rails for Industrial Chain Link Fence
ASTM F 626 Fence Fittings
ASTM F 1083 Pipe, Steel, Hot-Dipped, Zinc-Coated (Galvanized) Welded for Fence Structures
ASTM F 1184 Industrial and Commercial Horizontal Slide Gates
ASTM F 1234 Protective Coatings for Steel Framework of Fences

1.5 GENERAL REQUIREMENTS

A. Field Conditions: Verify drawing dimensions with actual field conditions, and inspect related work and adjacent surfaces.

B. Codes: Materials and work shall conform to the governing building code. In case of conflict between these Specifications and Building Code, the more stringent shall govern.

1.6 PRODUCT HANDLING AND STORAGE

A. Deliver materials to the job site in original unopened containers bearing manufacturer's name and product designation.

B. Store materials in accordance with manufacturer's printed instructions.

1.7 QUALITY ASSURANCE

A. Use adequate numbers of skilled workmen who are thoroughly trained and experienced in the necessary crafts and who are completely familiar with the specified requirements and the methods needed for proper performance of the work of this Section.

PART 2 - PRODUCTS

2.1 MATERIALS

A. Framework: Schedule 40 Galvanized Steel pipe Class 1 per ASTM F 1083.

B. Chain Link Fabric: 9 Gauge Zinc coated steel Class 2 per ASTM A 392. Wire diameter after coating shall be 0.192” (4.88mm). Manufacturer shall provide a 15-year warranty against failure due to rust or corrosion.
C. Tension Wire: 7 gauge Metallic-coated steel per ASTM A 824, Type 1.
D. Fittings and Post Caps: Galvanized coated metal fittings Per ASTM F 626.
E. Swing Gates: Per ASTM F 900.
F. Ties: 11 Gauge galvanized steel or 6-gauge aluminum wire.
G. Truss or Tension Rods: Adjustable 9.5 mm (3/8 inch) diameter galvanized steel rods.

2.2 CONCRETE MIX
A. Concrete shall be as specified on plans.

PART 3 - EXECUTION

3.1 SURFACE CONDITIONS
A. Examine the conditions under which work of this section will be performed. Correct conditions detrimental to timely and proper completion of the work.
B. Verify that surfaces and openings are ready to receive work and field measurements are as instructed by the fabricator.

3.2 INSTALLATION
A. Place chain link fabric on the outside of the area enclosed or as directed by the Landscape Architect.
B. Place the fabric by securing one end, applying sufficient tension to remove all slack before making attachment elsewhere. Tighten the fabric to provide a smooth uniform appearance free from sag.
C. Cut the fabric by untwisting a picket and attaching each span independently at all terminal posts. Use stretcher bars with tension bands at maximum 15" (380 mm) intervals.
D. Install fence fabric 11/2" (50 mm) maximum clearance above ground level or finished surface of concrete below fencing. Fasten the fabric to the line posts at intervals not exceeding 15" (380 mm). Fasten the fabric to the rails or tension wire at intervals not exceeding 24" (609 mm).
E. Join rolls of wire fabric by weaving a single picket into the ends of the rolls to form a continuous mesh.
F. The appearance of installation shall be left neat and free of any debris caused by the erection of the fence.
G. Install post caps on top of all post. Caps shall be tightly fitted to post after installed in complete.
H. Truss or tension rods used in trussing gate frames and line posts adjacent to ends, corners, slope or gate post shall be adjustable by means of galvanized turnbuckles.
I. All welds or damaged areas made during construction shall be ground smooth and wire brushed to remove loose or burned coatings. Cleaned areas shall be painted with Galvalloy, Galvicon or aluminum paint to match surrounding finishes and surfaces.

J. Post for fences shall be sizes as shown on the project plans. Posts shall be set true and plumb and not less than 10 feet on center. Concrete footings shall be allowed sufficient time to properly set up, at least 12 hours, prior to starting fence work.

K. Inclined braces shall be placed in one panel each way from all corners and angles and in the panels adjoining terminal posts. “Corner” shall mean any point at which the fence changes direction horizontally more than 25 degrees.

L. Top rail shall form a continuous brace from end to end of each stretch of fence. Top rail shall be securely fastened to terminal posts.

M. All welding shall be performed by a certified welder in a workmanlike manner with all joints, edges, and corners ground smooth where exposed.

N. All fencing shall be complete and continuous between points indicated on the project plans with all required parts, accessories, and fittings provided and installed to provide a complete installation whether specifically mentioned herein or not but required for proper installation and approval by the Landscape Architect.

O. All gate frames corners shall be cut at a 45-degree angle and be continuously welded the entire length of the corner joint. Grind welds smooth and wire brush to clean area and paint with Galvalloy, Galvicon or aluminum paint to match surrounding finishes and surfaces.

3.3 SAFETY

A. Perform all work in a safe and orderly fashion in accordance with the Occupational Safety and Health Act.

3.4 CLEAN-UP

A. Leave surfaces free of dirt, gouges and imperfections. Clean adjacent surfaces soiled by this work. Remove equipment, surplus materials and debris from job site, and leave installation ready for succeeding work.

END OF SECTION
SECTION 03100

CONCRETE FORMS AND ACCESSORIES

PART 1 - GENERAL

1.01 SUMMARY

A. Provisions of the General and Supplementary Conditions and Division 01 apply to this section.

B. Section Includes:

1. Formwork for cast-in-place concrete.

2. Installation of items to be embedded in concrete, such as anchor bolts, inserts, embeds, and sleeves.

C. Related Sections:

1. Section 01420: Testing and Inspection.

2. Section 03200: Concrete Reinforcement.

3. Section 03300: Cast-In-Place Concrete.

4. Section 03331: Lightweight Concrete Floor Fill.

5. Section 03360: Integral Color Concrete

1.02 SYSTEM DESCRIPTION

A. Regulatory Requirements: Except as otherwise specified herein, Work of this section shall be in accordance with CBC, Chapter 19, Concrete.

1.03 SUBMITTALS

A. Shop Drawings: Submit Shop Drawings indicating locations of forms, embedded items and accessories.

B. Product Data: Submit manufacturer's Product Data for form materials and accessories.

1.04 QUALITY ASSURANCE

A. Comply with the following as a minimum requirement:

1. Conform to ACI 347, Chapter 1: Design and Chapter 3: Materials for Formwork.
2. Plywood: Conform to tables for form design and strength in APA Form V 345.

B. Mock-ups: Provide mock-ups for architectural exposed finishes; 100 square feet minimum size. Locate as required by the Architect.

PART 2 - PRODUCTS

2.01 GENERAL

A. Form materials may be reused during progress of the Work provided they are completely cleaned and reconditioned, recoated for each use, capable of producing formwork of required quality and are structurally sound.

B. Form Lumber: WCLIB Construction Grade or Better, WWPA No. 1 or Better.

C. Plywood: PS 1-95, Group I, Exterior Grade B-B Plyform or better, minimum 5-ply and 3/4 inch thick for exposed locations and at least 5/8 inch thick for unexposed locations, grade marked, not mill oiled. Furnished plywood with medium or high density overlay is permitted.

D. Coated Form Plywood: For exposed painted concrete, plastic overlaid plywood of grade specified above, factory coated with a form coating and release agent Noxcrete®, or equal.


F. Joist Forms: Code recognized steel or molded plastic types as required.

G. Special Forms: For exposed integrally-colored concrete, plywood as above with high density overlay, plywood with integral structural hardboard facing or fibrous glass reinforced plastic facing, providing specified finish.

H. For Exposed Concrete Finish:

1. Plywood: New, waterproof, synthetic resin bonded, exterior type Douglas fir or Southern pine plywood manufactured especially for concrete formwork and conforming to NIST PS 1, BB grade, class I.


3. Steel: Minimum 16 gage sheet, well matched, tight fitting, stiffened to support weight of concrete, without deflection detrimental to tolerances and appearances of finished concrete surfaces.

4. Plywood: "Finland Form," or "Combi Form" distributed by North American Plywood Corporation. The material shall be furnished
with hard smooth birch face veneers with phenolic resin thermally fused onto panel sides. Edges shall be factory sealed.

I. Form Ties: Prefabricated rod, flat band, wire, internally threaded disconnecting type, not leaving metal within 1-1/2 inch of concrete surface.

J. Form Coating: Non-staining clear coating free from oil, silicone, wax, not grain-raising, "Formshield" by A.C. Horn, Inc., "Release" by Burke Concrete Accessories, or "Cast-Off" by Sonneborn Building Products. Where form liners are furnished, provide form coatings recommended by form liner manufacturer.

K. Form Liner: Rigid or resilient type by L.M. Scofield, Labrador Forms, Symons, or Greenstreak

L. Void Forms: Manufactured by SureVoid Products, Inc, or equal. Forms shall be "WallVoid" for temporary support of concrete walls and grade beams spanning between supports, and "SlabVoid" for creating gaps between concrete slabs or steps and underlying soils. Void forms shall be fabricated of corrugated paper with moisture resistant exterior, and shall be capable of withstanding working load of 1,500 psf. Provide accessories as required.

PART 3 - EXECUTION

3.01 GENERAL

A. Forms shall be constructed so as to shape final concrete structure conforming to shape, lines and dimensions of members required by Drawings and Specifications, and shall be sufficiently tight to prevent leakage of mortar. They shall be properly braced or tied together to maintain position and shape. Forms and their supports shall be designed so that previously placed structures will not be damaged. Forms shall be true to line within a tolerance of plus-or-minus 1/250 of the span.

3.02 ERECTION

A. Plywood shall be installed with horizontal joints level, vertical joints plumb and with joints tight. Back joints by studs or solid blocking, and fill where necessary for smoothness. Reused plywood shall be thoroughly cleaned, damaged edges or surfaces repaired and both sides and edges oiled with colorless form oil. Nail plywood along edges, and to intermediate supports, with common wire nails spaced as necessary to maintain alignment and prevent warping.

B. Openings for Cleaning: Provide temporary openings at points in formwork to facilitate cleaning and inspection. At base of walls and wide piers, bottom form board on one face for entire length shall be omitted until form has been cleaned and inspected.
3.03 REMOVAL OF FORMS

A. Forms shall not be removed until concrete has sufficiently hydrated to maintain its integrity and not be damaged by form removal operations. Unless noted otherwise and/or permitted by the Architect, columns and wall forms shall not be removed in less than 5 days, floor slabs in less than 7 days, beams and girders in less than 15 days, metal pan forms for joists may be removed after 3 days, but joist centering shall not be removed until after 15 days, and ramp, landing, steps and floor slabs shall not be removed in less than 7 days. Shoring shall not be removed until member has acquired sufficient strength to support its weight, load upon it, and added load of construction.

B. Compressive strength of in-place concrete shall be determined by testing field-cured specimens representative of concrete location or members, as specified in Section 03300: Cast-In-Place Concrete.

3.04 PROTECTION

A. Protect the Work of this section until Substantial Completion.

3.05 CLEAN UP

A. Remove rubbish, debris and waste materials and legally dispose of off the Project site.

END OF SECTION
SECTION 03200
CONCRETE REINFORCEMENT

PART 1 - GENERAL

1.01 SUMMARY

A. Provisions of the General and Supplementary Conditions and Division 01 apply to this section.

B. Section Includes:

1. Concrete steel reinforcement as indicated.

C. Related Sections:

1. Section 01300: Submittals

2. Section 01420: Testing and Inspection.

3. Section 03100: Concrete Formwork.

4. Section 03300: Cast-In-Place Concrete.

5. Section 03331: Lightweight Concrete Floor Fill.

6. Section 03360: Integral Color Concrete.

1.02 SYSTEM DESCRIPTION

A. Regulatory Requirements: Fabrication and placement of reinforcing shall be in accordance with requirements of CBC, Chapter 19.

1.03 SUBMITTALS

A. Shop Drawings: Submit steel reinforcement Shop Drawings in accordance with ACI 315. Include assembly diagrams, bending charts and slab plans. Indicate lengths and location of splices, size and lengths of reinforcing steel.

B. Closeout Submittals: Record exact locations of reinforcing that vary from Shop Drawings.

1.04 QUALITY ASSURANCE

A. Comply with the following as a minimum requirement:


3. American Concrete Institute (ACI).

4. CBC, Chapter 19, Concrete.

B. Source Quality Control: Refer to Division 01 Sections for general requirements and following paragraphs for specific procedures. Testing laboratory retained by the Owner shall perform following conformance testing, select test Samples of bars, ties, and stirrups from the material at the Project site or from the place of distribution, with each Sample consisting of not less than two 18 inch long pieces, and perform the following tests according to ASTM A 615.

1. Identified Bars: If Samples are obtained from bundles as delivered from the mill, identified as to heat number, accompanied by mill analyses and mill test reports, and properly tagged with the identification certificate so as to be readily identified, perform one tensile and one bend test for each 10 tons or fraction thereof of each size of bars. Submit mill reports when Samples are selected.

2. Unidentified Bars: When positive identification of reinforcing bars cannot be performed and when random Samples are obtained, perform tests for each 2.5 tons or fraction thereof, one tensile and one bend test from each size of bars.

C. Certification of Welders: Shop and Project site welding shall be performed by certified welding operators.

1.05 DELIVERY, STORAGE AND HANDLING

A. Avoid exposure to dirt, moisture or conditions harmful to reinforcing.

B. Reinforcing steel bars, wire, and wire fabric shall be stored on the Project site to permit easy access for examination and identification of each shipment. Material of each shipment shall be separated for size and shape.

PART 2 - PRODUCTS

2.01 GENERAL

A. Provide reinforcing of sizes, gages and lengths indicated, bent to indicated shapes.

2.02 MATERIALS

A. Steel Reinforcing Bars: ASTM A 615, or ASTM A 706 deformed grade 60 billet steel unless otherwise specified or indicated for all #5 and larger bars. Provide grade 40 billet steel for all #4 and smaller reinforcing bars.

B. Bars or Rod Mats: ASTM A 184.
C. Wire Fabric for Reinforcement: ASTM A 185.

D. Tie Wire: ASTM A 82, fully annealed, copper-bearing steel wire, 16 gage minimum.

E. Chairs, Spacers, Supports, and Other Accessories: Standard manufacture conforming to ACI-315 fabricated from steel wire of required types and sizes. For reinforcement supported from grade, provide properly sized dense precast blocks of concrete.

2.03 FABRICATION OF REINFORCING BARS:


B. Bending and Forming: Fabricate bars of the indicated sizes and bend and form to required shapes and lengths by methods not injurious to materials. Do not heat reinforcement for bending. Bend bars No. 6 size and larger in the shop only. Bars with unscheduled kinks or bends are not permitted. Provide only tested and permitted bar materials.

C. Welding: Provide only ASTM A 706 steel where welding is indicated. Perform welding by the direct electric arc process in accordance with AWS D1.4 and specified low-hydrogen electrodes. Preheat 6 inches each side of joint. Protect joints from drafts during the cooling process; accelerated cooling is not permitted. Do not tack weld bars. Clean metal surfaces to be welded of loose scale and foreign material. Clean welds each time electrode is changed and chip burned edges before placing welds. When wire brushed, the completed welds must exhibit uniform section, smooth welded metal, feather edges without undercuts or overlays, freedom from porosity and clinkers, and good fusion and penetration into the base metal. Cut out welds or parts of welds deemed defective, using chisel, and replace with proper welding. Prequalification of welds shall be in accordance with CBC requirements.

D. Provide only ASTM A706 steel at longitudinal grade beam reinforcing.

PART 3 - EXECUTION

3.01 INSTALLATION

A. Bars shall be bent cold. Bars partially embedded in concrete shall not be field bent except as indicated on reviewed Shop Drawings. Before installation, clean reinforcing of loose scale, rust, oil, dirt and any coating that could reduce bond.

B. Accurately position, install, and secure reinforcing to prevent displacement during the placement of concrete.

C. Provide metal chairs to hold reinforcement the required distance above form bottoms. In beams and slab construction, provide chairs under top slab
reinforcement as well as under bottom reinforcement. Space chairs so that reinforcement will not be displaced during installation. Provide metal spacers to secure proper spacing. Stirrups shall be accurately and securely wired to bars at both top and bottom. At slabs, footings, and beams in contact with earth, provide concrete blocks to support reinforcement at required distance above grade.

D. Install and secure reinforcement to maintain required clearance between parallel bars and between bars and forms. Lapped splices shall be installed wherever possible in a manner to provide required clearance between sets of bars. Stagger lapped splices. Dowels and bars extending through construction joints shall be secured in position against displacement before concrete is installed and subsequently cleaned of concrete encrustation’s while they are still soft.

E. Do not install reinforcing in supported slabs and beams until walls and columns have been installed to underside of slabs and beams or until construction joints have been thoroughly cleaned. Reinforcing shall be inspected before placement of concrete and cleaned as required.

F. Use deformed bars unless otherwise indicated, except for spiral reinforcement.

3.02 CLEAN UP

A. Remove rubbish, debris and waste materials and legally dispose of off the Project site.

3.03 PROTECTION

A. Protect the Work of this section until Substantial Completion.

END OF SECTION
PART 1 - GENERAL

1.01 SUMMARY

A. Provisions of the General and Supplementary Conditions and Division 01 apply to this section.

B. Section Includes:

1. Lightweight concrete floor fill as indicated.

C. Related Sections:

1. Section 01300: Submittals

1. Section 03100: Concrete Forms and Accessories.

2. Section 03200: Concrete Reinforcement.

1.02 SUBMITTALS

A. Shop Drawings: Submit Shop Drawings indicating locations to receive lightweight concrete and accessories.

B. Mix Design: Submit a concrete mix design for each mix that will be provided for the Work. Include water/cement ratio, size of aggregate and types and amounts of admixtures. Predict minimum compressive strength, maximum slump and air content percentage.

C. Certificates:

1. Submit a notarized certificate that each of following conforms to standards indicated.

   a. Aggregates - Refer to Section 01451: Testing and Inspection.

   b. Admixtures - ASTM Standards.

   c. Curing materials - ASTM Standards.

2. Manufacturer of ready-mixed concrete shall deliver to the IOR a certificate with each mixer truck. Certificate shall bear the signature of representative of the testing laboratory, and shall state
quantity of cement, water, fine and coarse aggregate and admixture contained in load.

1.03 QUALITY ASSURANCE
A. Comply with the following as a minimum requirement:
1. ASTM A 185 - Welded Steel Wire Fabric for Concrete Reinforcement.
2. ASTM C 33 - Concrete Aggregates.
3. ASTM C 171 - Sheet Materials for Curing Concrete.
5. ASTM C 330 - Lightweight Aggregates for Structural Concrete.

1.04 DELIVERY, STORAGE AND HANDLING
A. Each gradation of lightweight aggregates shall be stockpiled in separate bins or piles. Method of storage shall minimize segregation and prevent contamination. Aggregates shall remain dry. Do not presoak.

PART 2 - PRODUCTS

2.01 GENERAL
A. Designated mix shall be proportioned so as to provide concrete with a minimum compressive strength of 3000 psi at 28 days, and a unit weight of 90 to 100 lbs. per cubic foot in the oven, dry condition, at 28 days.

B. Concrete shall be designed for Project site placement, with minimum slump necessary for efficient placing and finishing. Maximum slump shall be 2-1/2 inches, with a tolerance of plus or minus 1/2 inch.

C. When an air-entrainment agent is furnished, total air content shall range between a minimum of 3 percent and a maximum of 6 percent.

2.02 MATERIALS
A. Portland Cement: Standard brand conforming to ASTM C 150.

B. Aggregates:
1. Coarse Aggregate: Lightweight aggregate conforming to ASTM C 330, and shall be sealed expanded shale such as "Rocklite", as produced by Lightweight Processing Company, or equal.

2. Fine Aggregate: Hardrock aggregate conforming to ASTM C 33, or lightweight aggregate conforming to ASTM C 330.
C. Water shall be clean and free from deleterious amounts of oils, acids, alkalis, salts, or organic materials.

D. Admixture: Air entraining agent shall conform to ASTM C 260.


F. Tie Wire: Fully annealed, copper-bearing steel wire, 16 gage minimum.

G. Curing Paper: Standard brand conforming to ASTM C 171 Type 1, regular.

PART 3 - EXECUTION

3.01 PREPARATION

A. Screeds: Install screeds accurately to finish floor surfaces at 19 feet on center, maximum, in one direction. Screeds shall be properly secured to prevent movement. Screeds shall be centered on column centerlines.

3.02 INSTALLATION

A. Placing and Finishing:

1. Concrete shall be placed in its final position immediately after mixing is completed. Excessive handling of concrete for final placement shall be minimized to prevent segregation.

2. After placement, concrete shall be rodded following specified concrete placement process. Rodded concrete shall then be tamped with a grid tamper. Re-rod in see-saw method to finished elevations. After screeds and screed supports are removed, concrete in removal areas shall be re-tamped.

3. Immediately following above operation and while concrete is plastic, surface shall be bull floated to level out tamp marks and humps. After floating, wait until concrete has reached proper consistency to start steel troweling. To maintain surface in proper condition for troweling, a light film of moisture may be applied with a mist type fog sprayer. Final (second) troweling operation shall provide a hard, non-slip surface, free from defects and blemishes.

4. Finished surface shall be within a tolerance of 1/8 inch in 10 feet.

B. Curing:

1. Lightweight concrete floor fills shall be properly cured and protected against damage during construction operations.
2. Placement of curing paper shall immediately follow final troweling operation. If concrete surfaces start to dry due to high air temperatures or wind, spray concrete surface with a fine water mist.

3. Curing paper shall be lapped 3 inches and sealed. Edges shall be cemented to finish. Paper that is torn or otherwise damaged during curing period shall be immediately repaired or replaced. Paper shall remain in place for a minimum of 7 days.

4. After removal of curing paper, cement surface shall be thoroughly washed and mopped clean.

3.03 PROTECTION

A. Protect the Work of this section until Substantial Completion.

3.04 CLEAN UP

A. Remove rubbish, debris and waste materials and legally dispose of off the Project site.

END OF SECTION
SECTION 03346
GEOCOMPOSITE SUBDRAINAGE

PART 1 – GENERAL
Provisions of the General and Supplementary Conditions and Division 01 apply to this section.

1.1 SUMMARY
A. Section Includes: Prefabricated Drainage Composite.

1. Types of Prefabricated Drainage Composites include:
   a) Prefabricated drainage composite for above-grade, vertical wall applications.
   b) Prefabricated drainage composite for above-grade, horizontal applications.

B. Related Sections:
   1. Cast-in-Place Concrete: Refer to Division 03

1.2 REFERENCES (INDUSTRY STANDARDS)
A. General: Refer to Division 1 References Section.

1.3 SUBMITTALS
A. Product Data: Submit manufacturer’s product data certificates of compliance for drainage composites specified. Submit specimen copy of warranty specified herein.

B. Shop Drawings: Submit shop drawings showing layout, profiles, and product components, including accessories for drainage composites.

C. Samples: Submit verification samples for prefabricated drainage composites.

D. Quality Assurance/Control Submittals

1. The specified properties of drainage panels must be supported by test results from an independent laboratory, documenting the specified flow rate in the plane of the core and creep performance of the polymer core. The testing conditions shall comply with ASTM D-4716 as follows:

   a) Hydraulic Gradient: 1.0 for vertical installations and 0.05 for horizontal installations.
b) Normal Pressure (pressure imposed perpendicular to the plane of the core): Equal to 3600 psf.

c) Creep: Model long-term compression of the prefabricated drainage composite system and determine if the drain product flow channels become restricted with time. Long-term creep/drainage performance shall be determined by measuring flow after 300 continuous hours under the above referenced normal pressure. The test method shall utilize a loading system that models the soil/drainage product interaction.

d) Flow Direction: Flow shall be measured on only one side of the core. Where the core geometry differs in principal directions, flow shall be measured in both directions, simulating water flowing vertically down a wall and horizontally across the face of the wall to accurately determine maximum flow rate in critical principal direction.

1.4 QUALITY ASSURANCE

A. Qualifications:

1. Installer Qualifications: Installer experienced to perform work of this section, who has specialized in the installation of work similar to that required for this project, who can comply with manufacturer's warranty requirements, and who is an authorized applicator as determined by drainage manufacturer.


B. Pre-Installation Meetings: Conduct pre-installation meeting to verify project requirements, substrate conditions, manufacturer’s installation instructions and manufacturer’s warranty requirements.

C. Pre-Installation Testing: In accordance with manufacturer’s recommendations and warranty requirements, conduct pre-installation testing of substrates to receive drainage composites.

1.5 DELIVERY, STORAGE, AND HANDLING

A. Packing, Shipping, Handling and Unloading: Deliver materials in manufacturer’s original, unopened, undamaged containers with identification labels intact. Schedule deliveries to avoid construction delays but minimize jobsite storage.

1.6 PROJECT CONDITIONS/SITE CONDITIONS

A. When CCW MiraDRAIN is installed in conjunction with a waterproofing product, the CCW MiraDRAIN must be compatible with the waterproofing product and installed by methods acceptable to the waterproofing product manufacturer.
B. The outfall for any drainage pipe used with the drainage panels shall be coordinated with the site drainage.

1.7 WARRANTY

A. Upon completion and acceptance of the work required by this section, the manufacturer will issue a warranty agreeing to promptly replace defective materials for a period of 5 years.

B. The formation or presence of mold or fungi in a building is dependent upon a broad range of factors including, but not limited to, the presence of spores and nutrient sources, moisture, temperatures, climatic conditions, relative humidity, and heating/ventilating systems and their maintenance and operating capabilities. These factors are beyond the control of Carlisle and Carlisle shall not be responsible for any claims, repairs, restoration, or damages relating to the presence of any irritants, contaminants, vapors, fumes, molds, fungi, bacteria, spores, mycotoxins, or the like in any building or in the air, land, or water serving the building.

PART 2-PRODUCTS

2.1 MATERIALS

A. Prefabricated Drainage Composite: CCW MiraDRAIN, a 3-dimensional dimpled core and geotextile fabric, by Carlisle Coatings & Waterproofing Incorporated, 900 Hensley Lane, Wylie, Texas 75098, Phone: (800) 527-7092 Fax: (972) 442-0076, or approved equal.

1. CCW MiraDRAIN 9000 for horizontal plaza and roof deck applications.

B. Prefabricated Drainage Composite:

Geocomposite Sheet Drain Physical Properties Chart:

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<th>CCW MiraDRAIN Property Test Method</th>
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System
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| Fabric                            |      |      |      |
| Apparent Opening Size             | ASTM D4751 | US Std. Sieve (mm) | 40 (0.42) | 40 (0.42) | 80 (0.18) | 40 (0.42) |
| Water Flow Rate                   | ASTM D4491 | gpm/ft$^2$ (l/min/m$^2$) | 145 (5,907) | 145 (5,907) | 95 (3,866) | 145 (5,907) |
| Grab Tensile Strength             | ASTM D4632 | lbs (kN) | 365 (1.62) | 365 (1.62) | 205 (0.90) | 365 (1.62) |

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| Fabric                            |      |      |      |
| Apparent Opening Size             | ASTM D4751 | US Std. Sieve (mm) | 70 (0.21) | 70/40 (0.21/0.42) |
| Flow Rate                         | ASTM D4491 | gpm/ft$^2$ (l/min/m$^2$) | 110 (4,477) | 140/145 (5,698/5,907) |
| Grab Tensile Strength             | ASTM D4632 | lbs (kN) | 160 (0.71) | 100/365 (0.45/1.62) |

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<tr>
<td>50/24</td>
<td>24</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Puncture Resistance</td>
<td>ASTM D4833</td>
<td>lbs (kN)</td>
<td>95 (0.42)</td>
</tr>
</tbody>
</table>

| System                            |      |      |      |
| Performance Index                 | * | N/A | 17,100 |
| N/A                               |            |    |      |

<table>
<thead>
<tr>
<th>CCW MiraDRAIN Property Test Method</th>
<th>Unit</th>
<th>HC Drain</th>
</tr>
</thead>
<tbody>
<tr>
<td>Core</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Thickness</td>
<td>ASTM D1777</td>
<td>in (mm)</td>
</tr>
<tr>
<td>Compressive Strength</td>
<td>ASTM D1621</td>
<td>psf (kN/m$^2$)</td>
</tr>
<tr>
<td>Maximum Flow Rate$^1$</td>
<td>ASTM D4716</td>
<td>gpm/ft (l/min/m)</td>
</tr>
<tr>
<td>Installed Vertically$^\uparrow$</td>
<td>ASTM D4716</td>
<td>gpm/ft (l/min/m)</td>
</tr>
<tr>
<td>Installed Horizontally$^\uparrow$</td>
<td>ASTM D4716</td>
<td>gpm/ft (l/min/m)</td>
</tr>
</tbody>
</table>

<p>| Fabric                            |      |      |
| Apparent Opening Size             | ASTM D4751 | US Std. Sieve (mm) | 70 (0.21) |
| Flow Rate                         | ASTM D4491 | gpm/ft$^2$ (l/min/m$^2$) | 135 (5,500) |
| Grab Tensile Strength             | ASTM D4632 | lbs (kN) | 120 (0.50) |</p>
<table>
<thead>
<tr>
<th></th>
<th>ASTM D4632</th>
<th>%</th>
<th>50</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Grab Elongation</strong></td>
<td>ASTM D4632</td>
<td>65 (0.30)</td>
<td></td>
</tr>
<tr>
<td><strong>Puncture Resistance</strong></td>
<td>ASTM D4833</td>
<td>65 (0.30)</td>
<td></td>
</tr>
<tr>
<td><strong>System Performance Index</strong></td>
<td>N/A</td>
<td>12,750</td>
<td></td>
</tr>
</tbody>
</table>

All flow rates were tested at 3600 psf.

¹ In plane flow rate @ gradient of 1.0 ² Installed flow rate with soil overburden @ vertical gradient of 1.0 ³ Installed flow rate with concrete overburden @ vertical gradient of 1.0 ⁴ Installed flow rate with soil overburden @ horizontal gradient of 0.05 ⁵ Installed flow rate with concrete overburden @ horizontal gradient of 0.05

* Drainage Performance Index is a function of ASTM D 4833, D 4632, and D 1621

§ Contact Carlisle Coatings & Waterproofing for performance values in these applications.

PART 3-EXECUTION

3.1 EXAMINATION

A. Site Verification of Conditions: Verify substrate conditions (which have been previously installed under other sections) are acceptable for product installation in accordance with manufacturer's instructions. Do not proceed with drainage installation until substrate conditions are acceptable for compliance with manufacturer's warranty requirements.

3.2 PREPARATION

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

B. Substrate Cleaning: Clean substrate that is to receive drainage. Remove loose debris and other harmful contaminants that will affect performance of drainage composite.

3.3 DRAINAGE COURSE INSTALLATION

A. Horizontal Surfaces: CCW MiraDRAIN 9000

1. Plaza Decks:
   a) Attach the CCW MiraDRAIN panels by either placing temporary ballast on top of the CCW MiraDRAIN or adhering the panels to the waterproofing membrane with CCW DRAIN GRIP contact adhesive or SecurTape two-sided tape.

   b) Connect adjacent panels at the longitudinal edge by pulling the filter fabric back to expose the flange. The panel edge should be butted to the edge of the adjacent panel dimple to dimple or the edge of the next panel may be placed over two dimples and interlocked. Panel ends are to be attached in the same manner. Connections should be completed in shingle fashion so that moisture will flow with the overlap and not against it. Overlap fabric in the direction of water flow. Cover all terminal edges with the filter fabric flap by tucking the fabric behind the core.

   c) CCW MiraDRAIN should be channeled into an internal drain or perimeter drain system.
d) Concrete, sand, grout, or pavers may be placed directly on the CCW MiraDRAIN woven fabric side. Caution should be taken not to place point loads on the CCW MiraDRAIN that might puncture the filter fabric on the CCW MiraDRAIN. When concrete is poured against CCW MiraDRAIN, use proper chuting techniques and avoid high drop heights.

2. Planters:
   a) CCW MiraDRAIN should be placed fabric side to the inside (soil side) of the planter. The planter walls should be covered with CCW MiraDRAIN. Allow a 3" (75 mm) fabric overlap at the bottom of vertical panels in order to cover the intersection of wall and bottom sections. Any exposed panel edges must be covered with supplemental pieces of fabric to prevent soil intrusion into the flow channels.

3.4 DISCHARGE CONNECTIONS

A. Plaza Drains: Create openings in the CCW MiraDRAIN core to correspond with all discharge holes in the drain at the structural deck level. Fabric must be placed over these holes to prevent intrusion of soil, grout, sand, or concrete into the drainage core.

D. Terminal Connections and Protrusions: Cover all terminal edges with the integral fabric flap by tucking it around the edge of the core and securing it. At protrusions, cut the core around the protrusion, cut an “X” in the fabric, and tape the fabric around the protrusion. Dirt and concrete must not infiltrate the core.

3.5 CLEANING AND PROTECTION

A. Cleaning: Remove temporary coverings and protection of adjacent work areas. Repair or replace damaged installed products. 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.

B. Protection: Protection installed products finished surfaces from damage during construction.

END OF SECTION
SECTION 04220

CONCRETE UNIT MASONRY

PART 1 - GENERAL

Provisions of the General and Supplementary Conditions and Division 01 apply to this section.

1.1 SECTION INCLUDES

A. Furnish materials, equipment and perform labor required to execute this work as indicated on the Plans, as specified and as necessary to complete the contract, including but not limited to these major items:

1. Block Masonry:
   a. Vertical/horizontal reinforcing dowels placed into subsequently placed concrete.
   b. Setting of items imbedded into masonry.

1.2 RELATED WORK

Section 03200 Concrete Reinforcement
Section 03300 Cast-In-Place Concrete

1.3 PRODUCT SUBMITTALS / SHOP DRAWINGS

A. Comply with pertinent provisions of Section 01340.

B. Product Data: Within fifteen (15) calendar days after the Contractor has received the Notice to Proceed from Owner, submit:

1. Materials list of items proposed to be provided under this Section;

2. Manufacturer's specifications and other data needed to prove compliance with the specified requirements;

3. Shop Drawings in sufficient detail to show fabrication, installation, anchorage, and interface of the work of this Section with the work of adjacent trades;

4. Manufacturer's recommended installation procedures which, when approved by the Architect, will become the basis for accepting or rejecting actual installation procedures used on the work.

C. Samples: Accompanying the Shop Drawings, submit:

1. Sample of each exposed member.
2. Samples of finish, showing complete range of color from darkest to lightest proposed for use on this work. Samples when approved by the Engineer will be used to verify that finish actually furnished it within the approved range.
1.4 QUALITY ASSURANCE

A. Use adequate numbers of skilled workmen who are thoroughly trained and experienced in the necessary crafts and who are completely familiar with the specified requirements and the methods needed for proper performance of the work of this Section.

B. Record prints shall be available on site and shall be reviewed by the Engineer at appropriate times before work is covered.

1.5 PRODUCT HANDLING AND STORAGE

A. Deliver materials to the job site in original unopened containers bearing manufacturer's name and product designation.

B. Store materials in accordance with manufacturer's printed instructions.

1.6 GENERAL REQUIREMENTS

A. Field Conditions:

1. Verify plan dimensions with actual field conditions. Inspect related work and adjacent surfaces.

B. Codes:

1. Materials and work shall conform to the governing Building Code. In case of conflict between these specifications and the building code the more stringent shall apply.

C. Coordination:

1. Review installation procedures and coordinate with other work that must be integrated with masonry.

D. Tests and Inspections:

1. The City shall pay for all tests and inspections of completed installation of this work. Costs of all tests and inspections at material sources, and costs of re-tests of rejected work shall be borne by the Contractor. Arranging for, and scheduling of tests and inspections are the responsibility of the Contractor.

E. Record prints shall be available on site and shall be reviewed by the Engineer at appropriate times before work is covered.
PART 2 - PRODUCTS

2.1 MATERIALS

A. Block Units:
   1. Concrete block units shall be of the size, type and color specified on the plans, conforming to ASTM C 90, grade N-1, hollow load bearing units with compressive strength not less than 2,500 PSI, on net section.
   2. Size as specified. Provide all indicated or required open end units, special sizes and shapes.

B. Cement:
   1. Conform to ASTM C 150, Type "I" or "II" low alkali. Use only one brand.

C. Hydrated Lime:
   1. Conform to ASTM C 207, Type "S" and containing 85 percent by weight of calcium oxide.

D. Aggregates:
   1. Control to ASTM C-144 (Mortar)
      a. Mortar: Composed by volume of 1 part Portland Cement, 1/2 to 1/4 part lime putty, and sand in not less than 3-1/2 nor more than 4 times the sum of the volume of cement and lime used and, admixture in the proportion as recommended by the manufacturer. (1,800 PSI at 28 days).
   2. Conform to ASTM C-404. (Grout)
      a. Grout: Composed (by volume) of 1 part Portland Cement, 2 to 3 parts mortar sand, 1/10th part lime putty and 2 parts pea gravel, to which add 1 pint of admixture for each sack of cement.

E. Sand:
   1. Consisting of fine granular material, composed of hard, strong, durable mineral particles free from injurious amounts of saline, alkaline, organic or other deleterious substances.

F. Pea Gravel:
   1. Graded with no more than 5 percent passing No.8 sieve and with 100 percent passing the 2/8 of an inch sieve.

G. Water:
   1. Water shall be clean and from a source intended for domestic consumption
H. Lime Putty:

1. Store lime putty made from a hydrated lime, for 48 hours prior to use. Screen through a No.16 mesh.

I. Admixtures:

1. Sika Chemical Red Label Suconem for mortar. Grout Aid for grout, or equal as approved by Engineer.

2.2 REINFORCING STEEL:

A. New tested material of domestic manufacturer conforming to ASTM A615 grade as required by the project drawings, these specifications, and Section 03210.

PART 3 - EXECUTION

3.1 SURFACE CONDITIONS

A. Examine the areas and conditions under which work of this section will be performed. Correct conditions detrimental to timely and proper completion of the work.

3.2 EXECUTION

A. Mixing:

1. Mix water and cement for 2 minutes, then add lime and admixture, mix for 10 minutes in a mechanically operated batch mixer; a continuous mortar mixer will not be permitted. Make to maintain a slump of from 2-1/2 to 3 inches (1,000 psi at 28 days)

2. Mix as required for mortar except adjust the amount of water to make a creamy flow that will not allow the gravel to segregate. Properly pebble grout to fill voids. Omit gravel for grout spaces less than 2 inches clear in horizontal dimensions. (2,000 PSI at 28 days)

3. Mortar and grout not used within 30 minutes after leaving mixer, shall not be permitted on the work. Re-tempering of mixture will not be allowed.

3.3 SCAFFOLD AND PROTECTION

A. Provide, install and maintain scaffolding, staging and forms of protection necessary for execution of the work required. Substantially constructed, moved and dismantled as necessary to properly follow the sequence of operations.

3.4 SHORES AND CENTERING

A. Provide and install shores and centering for the work, constructed true to required shape, size and form, well braced and made rigid and capable of supporting and sustaining the loads to which subjected.

B. Leave shores and centering in place until the masonry is sufficiently set to safely carry its own weight and added loads of construction.
3.5 PLACING REINFORCEMENT

A. Reinforcing steel, except dowels in other materials:
   1. Accurately set and placed strictly as shown or noted on plans. In places containing reinforcement, except small rods or mesh 1/4 inch or less in diameter the clear distances between masonry and the reinforcing shall be at least 3/4 of an inch.

B. Vertical Bars:
   1. Continuous from bottom of cell to top of wall, centered in cells, except where otherwise indicated. Hold vertical steel firmly in place by frames or other suitable devices as approved by the Engineer.

C. Horizontal Bars:
   1. Wire temporarily above exact position and tag to indicate correct locations. Use calibrated vertical markers to indicate correct location. Provide horizontal bars where indicated, wire to vertical bars or dowels.

3.6 PREPARATION

A. Previously Placed Concrete or Masonry:
   1. Clean off incrustations, laitance, oil and coating which would reduce bond. Wash work thoroughly with water under pressure; leave surface damp where masonry units connect with earlier placed work.

B. Masonry Units:
   1. Thoroughly clean off dust, grease, oil and other matter which would reduce bond.

C. Wetting:
   1. Do not wet block masonry units prior to installation.

D. Reinforcement:
   1. Clean off millscale, loose rust, oil and coatings which would reduce bond. Securely anchor in place.
   2. Obtain approval of methods of placement and fastening of reinforcement, prior to start of work.

3.7 WORKMANSHIP

A. Preserve unobstructed vertical continuity of cells to be filled. Fully bed webs and cross walls forming such cells in mortar to prevent leakage of grout. Strike joints around such cells smooth.

B. Fractional parts of masonry units are prohibited where whole units can be used. The chinking of interstrices with fragments will not be allowed. Provide special units as necessary to form openings and lintels.
C. Fill all cells of masonry which contain reinforcement solidly with grout in lifts not exceeding 4 feet in height. Except at the finished course, stop grout 1/2 the course height below the top of the last course grouted.

D. No part of any masonry wall may be carried more than 6 feet higher than adjoining portions.

E. Whether it is absolutely necessary for construction purposes to stop off longitude runs of masonry, stop off only by racking back one half-unit length in each course. Tooothing will not be permitted.

F. At openings for ducts, pipes and conduit built into the masonry walls, cut to form fractional units with abrasive saw.

G. Unless otherwise indicated lay block in regular running bond.

H. When the possibility of rain occurs, cover the tops of all walls exposed to the weather and all block masonry units with sheets of polyethylene film or other approved effective forms of protection to prevent absorption of water. Store masonry units above ground if the possibility of surface flooding exists.

3.8 JOINTS

A. Mortar joints shall be pointed flush as approved with a pointing tool making solid, smooth, watertight slightly concave joints or as required on plans.

3.9 BOLTS, ANCHORS AND REGLETS

A. Set bolts, anchors, reglets and inserts necessary for the attachment of subsequent work and items furnished under other sections.

3.10 POINTING AND CLEANING

A. Leave exposed surfaces clean and free of surplus mortar or foreign material. Exercise care to keep grout and mortar droppings off finished surfaces.

B. Defective Joints - Holes or defective mortar joints in exposed masonry shall be pointed and where necessary, defective joints cut out and pointed.

END OF SECTION
SECTION 04700
MANUFACTURED MASONRY VENEER

General

Provisions of the General and Supplementary Conditions and Division 01 apply to this section.

Summary

Section Includes: Portland cement based manufactured stone veneer and trim.

Related Sections:

- 01300 – Submittals
- 06164 – Gypsum Sheathing.
- 07600 - Flashing and Sheet Metal.
- 09100 – Metal Support Assemblies.
- 09220 – Portland Cement Plaster and Metal Lath.

References

American National Standards Institute (ANSI):
ANSI A118.4 Specifications for Latex-Portland Cement Mortar.

American Society for Testing and Materials (ASTM):

City of Los Angeles: Research Report (LARR)

International Code Council (ICC):
ER Report.
UBC Standard No. 14-1, Kraft Waterproof Building Paper.
Underwriter’s Laboratory (UL): Building Materials Directory.

**Submittals**

Reference Section 01 33 00–Submittal Procedures; submit following items:

**Product Data.**

**Samples:**

*Standard sample board consisting of small-scale pieces of veneer units showing full range of textures and colors.*

Verification Samples: Following initial sample selection submit “laid-up” sample board using the selected stone and mortar materials and showing the full range of colors expected in the finished Work; minimum sample size: 3 by 3 feet (1 by 1 m).

Quality Assurance/Control Submittals:

**Qualifications:**

- Proof of manufacturer qualifications.
- Proof of installer qualifications.

**Regulatory Requirements: Evaluation reports.**

*Veneer manufacturer’s installation instructions.*

*Installation instructions for other materials.*

Closeout Submittals: Reference Section 01 700 Contract Closeout; submit following items:

**Maintenance Instructions.**

**Special Warranties.**

**Quality Assurance**

**Qualifications:**

- Manufacturer Qualifications: Licensee of Eldorado Stone, LLC.
- Installer Qualifications: Experienced mason familiar with installation procedures for manufactured veneer.

**Certifications:**

- LARR – Research Report RR25589
- UL – Classification listing in Building Materials Directory: UL 546T (F8002).

**Field Sample:**

- Prepare 4 by 4 foot sample at a location on the structure as selected by the Architect. Use approved selection sample materials and colors. Include corners, trim mortar joints and joint details abutting other materials.
- Obtain Architect’s approval.
- Protect and retain sample as a basis for approval of completed manufactured stone work. Approved sample may be incorporated into completed work.

**Delivery, Storage, and Handling**

Reference Section 01600 – Materials and Equipment.

Follow manufacturer’s instructions.

**Project/SITE Conditions**

Environmental Requirements: When air temperature is 40 degrees F (4.5 degrees C) or below, consult local building code for Cold-Weather Construction requirements.
Warranty

Special Warranty: Manufacturer’s standard warranty coverage against defects in materials when installed in accordance with manufacturer’s installation instructions.

Products

Manufacturer

Eldorado Stone, LLC
1370 Grand Ave., Bldg. B
San Marcos, CA 92069
Tel: (800) 925-1491
Fax: (760) 736-8890
E-Mail: customerservice@eldoradostone.com
Website: www.eldoradostone.com

Product: Manzanita Cliffstone veneer.

Substitutions: None Allowed.

Materials

Stone Veneer:
Profile: Cliffstone. Include matching corner pieces.

Veneer Unit properties: Precast veneer units consisting of portland cement, lightweight aggregates, and mineral oxide pigments.
Compressive Strength: ASTM C 192 and ASTM C 39, 5 sample average: greater than 1,800 psi (12.4MPa).
Shear Bond: ASTM C 482: 50 psi (345kPa).
Freeze-Thaw Test: ASTM C 67: Less than 3 percent weight loss and no disintegration.
Thermal Resistance: ASTM C 177: 0.473 at 1.387 inches thick

Moisture Barrier: ASTM D 226, Type 1, No. 15, non-perforated asphalt-saturated felt paper per CBC.

Reinforcing: ASTM C 847, 2.5lb/yd² (1.4kg/m²) galvanized expanded metal lath complying with CBC requirements for the type of substrate over which stone veneer is installed. Secure metal lath to metal studs with self-tapping stainless steel screws for minimum 3/8” penetration per manufacturers instructions and ASTM C 1063.

Mortar:
Cement: Any cement complying with ASTM C 270.
Lime: ASTM C 207.
Sand: ASTM C 144, natural or manufactured sand.
Water: Potable.
Pre-Packaged Latex-Portland Cement Mortar: ANSI A118.4.

Bonding Agent: Exterior integral bonding agent meeting ASTM C 932.

Sealer: Water based silane or siloxane masonry sealer, clear.

MORTAR Mixes
A. Jointless/Dry-Stacked Installation:
1. Mix mortar in accordance with Eldorado Stone Corp. mortar preparation instructions.
Execution

Examination

Examine substrates upon which work will be installed.

Coordinate with responsible entity to perform corrective work on unsatisfactory substrates.

Commencement of work by installer is acceptance of substrate.

Preparation

Protection: Protect adjacent work from contact with mortar.

Surface Preparation: Prepare substrate in accordance with manufacturer’s installation instructions for the type of substrate being covered.

INSTALLATION

Install and clean stone in accordance with manufacturer’s installation instructions for Jointless/Dry-Stacked installation as specified above.

Apply sealer in accordance with sealer manufacturer’s installation instructions.

Field Quality Control

Manufacturer’s Field Services: Manufacturer’s Field Service Representative shall make two periodic site visits for installation consultation and inspection as requested by Owner.

Cleaning

Remove protective coverings from adjacent work.

Cleaning Veneer Units:
Wash with soft bristle brush and water/granulated detergent solution.
Rinse immediately with clean water.

Removing Efflorescence:
Allow veneer to dry thoroughly.
Scrub with soft bristle brush and clean water.
Rinse immediately with clean water; allow to dry
If efflorescence is still visible, repeat above procedure using a solution of 1 part household vinegar and 5 parts water.
Rinse immediately with clean water.

END OF SECTION
SECTION 05120
STRUCTURAL STEEL

PART 1 - GENERAL

1.01  SUMMARY

A. Provisions of the General and Supplementary Conditions and Division 01 apply to this section.

B. Section Includes:
   1. Structural steel.

C. Related Sections:
   1. Section 01420: Testing and Inspection.
   2. Section 05410: Load-Bearing Metal Studs.
   3. Section 05500: Metal Fabrications.
   4. Section 09900: Paints and Coatings.
   5. Section 05300: Steel Decking.

1.02  SYSTEM DESCRIPTION

A. Regulatory Requirements:
   1. Structural steel shall conform to CBC requirements, except that steel manufactured by acid Bessemer process is not permitted for structural purposes.
   2. Sheet and strip steel other than those listed in CBC, if provided for structural purpose, shall comply with DSA requirements.

1.03  SUBMITTALS

A. Shop Drawings:
   1. Submit Shop Drawings, including complete details and schedules for fabrication and shop assembly of members, and details, schedules, procedures and diagrams showing the sequence of erection. Fully detail minor connections and fastenings not shown or specified in the Contract Documents to meet required conditions using similar detailing as shown in the Contract Documents. Include a fully detailed, well controlled sequence and technique plan for shop and field welding that minimizes locked in stresses and distortion; submit sequence and technique plan for review by the Architect.
      a. Include details of cuts, connections, camber, and holes in accordance with Figure 5.5 of AWS D1.1-02 or AISC Section J1.8, weld position plan and
other pertinent data. Indicate welds by standard AWS symbols, and show size, length and type of each weld.

b. Provide setting drawings, templates, and directions for installation of anchor bolts and other anchorages to be installed for Work specified in other sections.

c. Erection and Bracing Plan and Erection Procedure: Submit an erection and framing plan, including columns, beams, and girders, prepared, signed and sealed by a structural engineer registered in the State of California in accordance with Title 8 CCR, Section 1710. Maintain a copy at the Project site as required by the California Division of Industrial Safety.

d. Submit a list of steel items to be galvanized.

B. Product Data:

1. Submit copies of fabricator’s specifications and installation instructions for the following products. Include laboratory test reports and other data required demonstrating compliance with these Specifications:

   a. Structural steel, each type; including certified copies of mill reports covering chemical and physical properties.

   b. Welding electrodes.

   c. Welding gas.

   d. Unfinished bolts and nuts.

   e. Structural steel primer paint.

   f. High-strength bolts, including nuts and washers.

C. Manufacturer’s Mill Certificate:

1. Submit, certifying that products meet or exceed specified requirements.

D. Mill Test Reports:

1. Submit manufacturer’s certificates, indicating structural yield and tensile strength, destructive and non-destructive test analysis.

E. Charpy-V-Notch (CVN) Impact Test: Submit certified copies of Charpy-V-Notch (CVN) Impact Test by the manufacturer for applicable steel members and components.

1. Charpy-V-Notch (CVN) Impact Test for Base Metal: Moment frame columns, girders and other structural steel which is to be complete joint penetration welded and subjected to Charpy-V-Notch impact test in accordance with ASTM E 23 and ASTM A 673.

2. Exception: Rolled shapes listed under Groups 4 and 5 of Table 2, Page 1-8 of the 9th edition of the AISC Manual of Steel Construction shall have the Charpy-V-Notch test,
as specified above, performed on flange material at the juncture of the web and flange, shown in Figure C-A3 1C in AISC Manual – 9th edition.

3. Charpy-V-Notch test shall be performed by the manufacturer employing Test Frequency (P) in accordance with ASTM A 673 and utilizing standard specimen sizes shown in Figure 6 of ASTM E 23. The absorbed energy in a CVN impact test shall not be less than that specified in Material Part 2 of this section.

F. Submit certified copies of tests by manufacturer for fine grain practice. Structural steel base material, as described above, shall be manufactured using fully killed fine grain practice having grain size number 5 or better as determined by ASTM E 112.

G. Weld Procedures: Submit weld procedures for connections other than rigid frames. Weld procedures shall be qualified as described in AWS D1.5, Section 5.12 or 5.13 for self shielded FCAW. Weld procedures shall indicate joints details and tolerances, preheat and interpass temperature, post-heat treatment, single or multiple stringer passes, peening of stringer passes for groove welds except for the first and the last pass, electrode type and size, welding current, polarity and amperes and root treatment. The welding variables for each stringer pass shall be recorded and averaged, from these averages the weld heat input shall be calculated.

H. Welder’s Certificates: Field welders shall be Project certified in accordance with AWS D1.1-02. Shop welders shall be Project certified for FCAWS in accordance with AWS D1.1-02.

I. Test Reports: Submit reports of tests conducted on shop and field welded and bolted connections. Include data on type of test conducted and test results.

1.04 QUALITY ASSURANCE

A. Comply with the following as a minimum requirement:


B. Shop fabrication shall be inspected in accordance with CBC.

1.05 DELIVERY, STORAGE AND HANDLING

A. Store structural steel above grade on platforms, skids or other supports.

B. Protect steel from corrosion.

C. Store welding electrodes in accordance with AWS D 12.1.

D. Store other materials in a weathertight and dry place until installed into the Work.
PART 2 - PRODUCTS

2.01 GENERAL

A. Stock Materials: Provide exact materials, sections, shapes, thickness, sizes, weights, and details of construction indicated on Drawings. Changes because of material stock or shop practices will be considered if net area of shape or section is not reduced thereby, if material and structural properties are at least equivalent, and if overall dimensions are not exceeded.

2.02 MATERIALS

A. Structural Steel: All rolled shapes shall conform to ASTM A 992 grade 50. Other steel shall conform to ASTM A36.

B. Unfinished Threaded Fasteners: ASTM A 307, Grade A, regular low carbon bolts and nuts.

C. High-Strength Threaded Fasteners: ASTM A 325 or ASTM A490 quenched and tempered, steel bolts, nuts and washers.

D. Primer: Lead-free metal primer, Tnemec 10-99, Rust-Oleum X-60, or equal.

E. Steel Pipe: ASTM A 53, Type E or S, Grade B.

F. Structural Tubing:
   2. Cold-formed, ASTM A 500, Grade B.

G. Galvanizing: ASTM A 123.

H. Welding Electrodes: Provide electrodes recommended by manufacturer for seismic connections.

2.03 FABRICATION

A. Cleaning and Straightening Materials: Materials being fabricated shall be thoroughly cleaned of scale and rust, and straightened before fabrication. Cleaning and straightening methods shall not damage material. After punching or fabrication of component parts of a member, twists or bends shall be removed before parts are assembled.

B. Cutting, Punching, Drilling and Tapping: Unless otherwise indicated or specified, structural steel fabricator shall perform the cutting, punching, drilling and tapping of Work so that Work of other trades will properly connect to steel Work.

C. Milling: Compression joints depending on contact bearing shall be furnished with bearing surfaces prepared to a common plane by milling.

D. Use of Burning Torch: Oxygen cutting of members shall be performed by machine. Gouges greater than 3/16 inch that remain from cutting shall be removed by grinding. Reentrant corners shall be shaped notch free to a radius of at least 1/2 inch. Gas cutting of holes for bolts or rivets is not permitted.
E. Galvanizing: After fabrication, items indicated or specified to be galvanized shall be galvanized in largest practical sizes. Fabrication includes operations of shearing, punching, bending, forming, assembling or welding. Galvanized items shall be free from projections, barbs, or icicles resulting from the galvanizing process.

F. Welding:

1. Type of steel furnished in welded structures shall provide chemical properties suitable for welding as determined by chemical analysis. Welds shall conform to the requirements of CBC.

2. Materials and workmanship shall conform to the requirements specified herein and to CBC requirements, modified as follows:
   
a. No welded splices shall be permitted except those indicated on Drawings unless specifically reviewed by the Architect.

b. Drawings will designate joints in which it is important that welding sequence and technique be controlled to minimize shrinkage stresses and distortion.

3. Welding shall be performed in accordance with requirements of the AWS Structural Welding Code.

G. Shop Finish:

1. Notify the IOR when Work is ready to receive shop prime coat. Work shall be inspected by the IOR before installation of primer.

2. Structural steel and fittings, except galvanized items, which will be exposed when building is completed, shall receive a coat of primer.

3. The primer specified shall be spray applied, filling joints and corners and covering surfaces with a smooth unbroken film. The minimum dry film thickness of the primer shall be 2.0 mils.

2.04 SHOP AND FIELD QUALITY CONTROL

A. Owner will provide an independent testing and inspection agency to inspect high-strength bolted connections and welded connections and to perform test and prepare test reports in accordance with CBC 2212B.

B. Testing agency shall conduct and interpret test and state in each report whether test specimens comply with requirements, and specifically state any deviations therefrom.

C. Provide access for testing agency to places where structural steel Work is being fabricated or produced so required inspection and testing can be performed.

D. The testing agency may inspect structural steel at plant before shipment; however, Architect reserves the right at any time before Final Completion to deem materials not in compliance with the specified requirements as defective Work.

E. Correct defects in structural Work when inspections and laboratory test reports indicate noncompliance with specified requirements. Perform additional tests as may be required to
reconfirm noncompliance of original Work, and as may be required to show demonstrate compliance of corrected Work.

F.  Welding: Inspect and test during fabrication and erection of structural steel assemblies as follows:

1. Certify welders and conduct inspections and tests as required. Record types and locations of defects found in the Work. Record Work required and performed to correct deficiencies.

2. Inspect welds. Welds shall be visually inspected before performing any non-destructive testing. Groove weld shall be inspected by ultrasonic or other approved non-destructive test methods. Testing shall be performed to AWS D1.1 Table 6.3 cyclically loaded non-tubular connections.

3. Ultrasonic testing shall be performed by a specially trained and qualified technician who shall operate the equipment, examine welds, and maintain a record of welds examined, defects found, and disposition of each defect. Repair and test defective welds.

4. Rate of Testing: Completed welds contained in joints and splices shall be tested 100 percent either by ultrasonic testing or by radiography.

5. Welds, when installed in column splices, shall be tested by either ultrasonic testing or radiography.

6. Base metal thicker than 1-1/2 inches, when subjected to through-thickness weld shrinkage strains, shall be ultrasonically inspected by shear wave methods for discontinuities directly behind such welds. Tests shall be performed at least 48 hours after completed joint has cooled down to ambient air temperature.

7. Any material discontinuities shall be reviewed based on the defect rating in accordance with the criteria of AWS D1.1 table 6.3 by the Architect and DSA.

8. Other method of non-destructive testing and inspection, for example, liquid dye penetrate testing, magnetic particle inspection or radiographic inspection may be performed on weld if required.

9. Lamellar Tearing: Lamellar-tearing resulting from welding is a crack (with zero tolerance) and shall be repaired in accordance with AWS D1.1.

10. Lamination: The rejection criteria shall be based on ASTM A 435.

11. Where testing reveals lamination or conditions of lamellar tearing in base metal, the steel fabricator shall submit a proposed method of repair for review by the Architect. Test repaired areas as required.

12. Magnetic Particle Testing: Magnetic particle testing when required shall be provided in accordance with AWS D1.1 for procedure and technique. The standards of acceptance shall be in accordance with AWS D1.1 – Qualification.
G. Lamellar Tearing: Prior to welding plates 1 to 1-1/2 inches thick and greater and rolled shapes within the distance from 6 inches above the top of the joint to 6 inches below the bottom of the joint shall be checked by ultrasonic testing for laminations in base metal which may interfere with the inspection of the completed joint. Should these defects occur, members will be reviewed by the Architect and DSA. Welding procedure specifications in subsection 1.5G specify welding practices to minimize lamellar tearing.

H. Prior Testing of Base Material: Test material before fabrication.

I. Lines and levels of erected steel shall be certified by a State of California licensed surveyor as set forth in related Division 01 section.

J. Welded studs shall be tested and inspected by the IOR in accordance with requirements of AWS D1.1 – Stud Welding.

K. Record Drawings: After steel has been erected, correct or revise Shop Drawings and erection diagrams to correspond with reviewed changes performed in the field.

PART 3 - EXECUTION

3.01 PREPARATION

A. Verify governing dimensions and conditions of the Work before commencing erection Work.

B. Provide temporary shoring and bracing, and other support during performance of the Work. Remove after steel is in place and connected, and after cast-in-place concrete has reached its design strength.

3.02 ERECTION

A. Install structural steel accurately in locations, to elevations indicated, and according to AISC specifications and CBC requirements.

B. Clean surfaces of base plates and bearing plates.
   1. Install base and bearing plates for structural members on wedges, shims, or setting nuts as required.
   2. Tighten anchor bolts after supported members have been positioned and plumbed. Do not remove wedges or shims; cut off flush with edge of base or bearing plate before packing with grout.

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

D. Align and adjust steel members. Adjust for variations in elevation or alignment. Level and plumb structural members.

E. Do not permit thermal cutting during erection of structural steel.

F. Where indicated for field connections, provide standard bolts complying with ASTM A 307.
G. Install high strength steel bolts at locations indicated. Assembly and installation shall be in accordance with CBC requirements.

H. Erect structural steel plumb and level and to proper tolerances as set forth in the AISC Manual. Provide temporary bracing, supports or connections required for complete safety of structure until final permanent connections are installed.

I. Install column bases within a tolerance of 1/8 inch of detailed centerlines, level at proper elevations. Support bases on double nuts and solidly fill spaces under bases with dry-pack cement grout.

3.03 FINISHING

A. After erection, spots or surfaces where paint has been removed, damaged, or burned off and field rivets, bolts, and other field connections not concealed in the Work, shall be cleaned of dirt, oil, grease, and burned paint and furnished with a spot coat of the same primer installed during shop priming.

B. Touchup Painting: Immediately after erection, clean field welds, bolted connections, and abraded areas of shop paint. Install paint to exposed areas with the same material installed during shop painting. Install by brush or spray to provide a minimum dry film thickness of 1.5 mils.

3.04 FIELD QUALITY CONTROL

A. Owner will provide an independent testing and inspecting agency to perform field inspections and tests and to prepare test reports.

B. Correct deficiencies in or remove and replace structural steel that inspections and test reports indicate do not comply with specified requirements.

3.05 CLEAN UP

A. Remove rubbish, debris and waste materials and legally dispose of off the Project site.

3.06 PROTECTION

A. Protect the Work of this section until Substantial Completion.

END OF SECTION
PART 1 - GENERAL

1.01  SUMMARY

A. Provisions of the General and Supplementary Conditions and Division 01 apply to this section.

B. Section Includes:

1. Open web steel joists.

C. Related Sections:

1. Section 01420: Testing and Inspection.
2. Section 05120: Structural Steel.
3. Section 05410: Load-Bearing Metal Studs.
4. Section 09900: Paints and Coatings.

1.02  SUBMITTALS

A. Shop Drawings: Submit Shop Drawings indicating types of joists, dimensions, and layout. Include details of attachment.

B. Product Data: Submit manufacturer's specifications and installation instructions for each type of joist and accessories.

C. Certificates:

1. Submit certified test reports or witnessed affidavit certifying that steel furnished meets or exceeds specified yield strength. Provide evidence of AWS qualifications for each welder employed on the Work.

2. Submit manufacturer's certification that steel joists comply with Steel Joist Institute (SJI) specifications.

1.03  QUALITY ASSURANCE

A. Comply with the following as a minimum requirement:

1. ASTM A 36 - Structural Steel.
2. ASTM A 242 - High-Strength, Low-Alloy Structural Steel.
3. ASTM A 307 - Carbon Steel Bolts and Studs, 60,000 psi Tensile Strength.
4. ASTM A 570 - Steel, Sheet and Strip, Hot-Rolled Carbon, Structural Quality.
5. ASTM A 572 - High-Strength Low-Alloy Columbium-Vanadium Structural Steel.

6. ASTM A 588 - High-Strength, Low-Alloy Structural Steel with 50 ksi Minimum Yield Point to 4 inch Thick.

7. ASTM A 606 - Steel, Sheet and Strip, High-Strength, Low-Alloy, Hot-Rolled and Cold-Rolled, with Improved Atmospheric Corrosion Resistance.

8. ASTM A 607 - Steel Sheet and Strip, Hot-Rolled and Cold-Rolled, High-Strength, Low-Alloy, Columbium or Vanadium, or Both, Hot-Rolled and Cold-Rolled.

9. ASTM A 611 - Steel, Sheet, Carbon, Cold-Rolled, Structural Quality.


11. SJI - Standard Load Table, Open Web Steel Joists.

B. Comply with CBC, Chapter 22A, section 2231a.7, Design Verification Tests.

1.04 DELIVERY, STORAGE AND HANDLING

A. Deliver, store, and handle steel joists as recommended in SJI Standard Specification for Open Web Steel Joists. Handle and store joists in a manner to avoid deforming members and to avoid excessive stresses.

PART 2 - PRODUCTS

2.01 STEEL JOISTS

A. Steel joists shall be series as indicated on Drawings, and shall have a capacity equal to or greater than that indicated in SJI - Standard Load Table, Open Web Steel Joists.


4. High-strength, low-alloy columbium and/or vanadium steels of structural quality: ASTM A 572, Grade 50.

5. High-strength, low-alloy structural steel with 50,000 psi minimum yield point to 4 inches thick: ASTM A 588.


7. Steel sheet and strip, hot-rolled and cold-rolled, high-strength, low-alloy, columbium and/or vanadium: ASTM A 607, Grade 50.

8. Steel, cold-rolled sheet, carbon structural: ASTM A 611, Grade D.

2.02 FABRICATION

A. Provide holes in chord members where indicated for securing other Work to steel joists. Deduct area of holes from the area of chord when calculating strength of member.

B. Provide extended ends on joists where indicated or required, complying with manufacturer's standards and requirements of applicable SJI specifications and load tables.

C. Provide ceiling extensions in areas having ceilings attached directly to joist bottom chord. Provide either an extended bottom chord element or a separate unit, to comply with manufacturer's standards of supporting ceiling construction. Extend ends to within 1/2 inch of finished wall surface unless otherwise indicated.

D. Provide end anchorages to secure joists to adjacent construction, complying with SJI specifications, unless otherwise indicated. Provide horizontal or diagonal type bridging for open web joists, complying with SJI specifications.

2.03 FINISH

A. After fabrication and prior to shipment, members shall receive a rust inhibitive shop primer. Final finish shall be as specified in Section 09900: Paints and Coatings.

PART 3 - EXECUTION

3.01 INSTALLATION

A. Field weld or bolt joists to supporting steel framework in accordance with SJI specifications for type of joists installed. Coordinate welding sequence and procedure with placing of joists.

B. After welding, clean welds exposed to view, abraded areas and rust spots, and install field primer specified in Section 09900: Paints and Coatings.

C. Steel joists shall be provided with bridging top and bottom as indicated on Drawings, or as required.

D. Install bridging simultaneously with joist installation, before construction loads are applied. Anchor ends of bridging lines at top and bottom chords where terminating at walls or beams.

E. During handling and construction, distribute loads so capacity of joist is not exceeded.

3.02 CLEAN UP

A. Remove rubbish, debris and waste materials and legally dispose of off the Project site.

3.03 PROTECTION

A. Protect the Work of this section until Substantial Completion.

END OF SECTION
SECTION 05300
METAL DECKING

PART 1 - GENERAL

1.01 SUMMARY

A. Provisions of the General and Supplementary Conditions and Division 01 apply to this section.

B. Section Includes:
   1. Metal decking as indicated.
   2. Shear connectors.

C. Related Sections:
   1. Section 01420: Testing and Inspection.
   2. Section 05120: Structural Steel: Structural steel supports for metal decking.
   3. Section 07600: Flashing and Sheet Metal.

1.02 SYSTEM DESCRIPTION

A. Performance Requirements: Compute properties of deck sections on basis of effective design width as limited by provisions of the AISI specifications. Provide no less than deck section properties specified, including section modulus and moment of inertia per foot of width.

B. Regulatory Requirements:
   1. Requirements of Regulatory Agencies: Underwriters Laboratories Inc. (UL) approval for the decking when installed as a part of an assembly indicated in Drawings in which fire resistive construction ratings are required.
   2. Work of this section shall be in accordance with CBC.

1.03 SUBMITTALS

A. Shop Drawings: Drawings, sections and details indicate type of decking, location, finish, gage of metal, arrangement of sheets, necessary fabrication to incorporate decking into the Work, and relationship to openings and flashing.

1.04 QUALITY ASSURANCE

A. General: Metal decking steel shall conform to requirements of strengths and properties of standards specified.

B. Qualifications of Welders: Properly certified for the type of Work involved in compliance with CBC requirements.
C. Continuous inspection of welding will be performed by the IOR. Refer to Section 01420: Testing and Inspection.

D. Identification of metal decking steel shall conform to the standards specified in Section 01420: Testing and Inspection.
   1. Fabricator shall furnish sufficient evidence to the Architect attesting compliance with specified requirements.
   2. Conform to CBC requirements. Unclassified or unidentified decking is not permitted. Furnish deck manufacturer's certified mill analyses and test reports for each heat covering decking having Fy of 33 Ksi or less. In addition, for decking having Fy greater than 33 Ksi, testing laboratory shall perform one tension and elongation test and one bend or flattening test for each gage.

E. Unidentifiable Steel: Steel which is not readily identifiable as to grade from markings and test records shall be tested to determine conformity to specified standards.

F. Payment For Tests and Inspections:
   1. Owner shall pay inspection and testing costs of identifiable steel.
   2. Installer shall pay inspection and testing costs of unidentifiable steel.

PART 2 - PRODUCTS

2.01 ACCEPTABLE MANUFACTURERS
A. BHP Steel Building Products, Inc.
B. Verco Manufacturing Co.
C. Garland Inc.
D. Members of Steel Deck Institute (SDI).

2.02 MATERIALS
A. Metal Decking: Roll-formed sheets conforming to ASTM A 653, with G90 zinc coating.
   1. Section properties shall conform to applicable provisions of latest edition of AISI - Specification for the Design of Cold-Formed Steel Structural Members.
B. Flexible Closure Strips for Deck: Vulcanized, closed-cell, expanded chloroprene elastomer, complying with ASTM D 1056, Grade SCE #41.
C. Metal Flashing and Closures: 22 gage minimum, with ASTM A 653, G90 zinc coating.
D. Shear Connectors: Headed stud type, ASTM A 108 Grade 105 or 1020, cold-finished carbon steel complying with AISC specifications.

2.03 FABRICATION
A. Corrugated sheets or sections shall be designed to support required live load between supporting members.
B. Wherever practical, provide decking in lengths to span over three or more supports.
C. Except as detailed otherwise, provide decking with interlocking side laps, 2-1/2 inches minimum end bearing, and 1-1/2 inches minimum side bearing.
D. Welding: Provide materials and methods in accordance with recommendations of steel decking manufacturer and reviewed submittals. Hold decking tight to the supporting elements with screws or other means for proper welding or crimping of the decking edges. Conform to AWS D1.3, CBC Standards, and to the patterns and weld types indicated, with welds free from sharp edges and protrusions. Field coat welds and abraded surfaces at completion with an anodic type galvanizing repair paint. Omit the field paint coating where welds or abrasions are covered by concrete fill or sprayed fireproofing.

PART 3 - EXECUTION

3.01 OPENINGS
A. Cut and reinforce units to provide openings which are located and dimensioned on the structural and mechanical Drawings.
B. Provide openings required for other Work not indicated on the Drawings.

3.02 INSTALLATION
A. Install metal decking in accordance with decking manufacturers’ recommendations, requirements of Drawings, Shop Drawings, and Specifications.
B. Install metal decking on supporting steel framework and adjust to final position before permanently fastening in place.
   1. Install each unit to proper bearing on supports.
   2. Install units in straight alignment for entire length of run of cells with close registration of cells of one unit with those of abutting unit.
C. Fasten decking to steel framework at ends of units and at intermediate supports. Welding shall be as indicated on Drawings.
D. Fasten side laps between supports as indicated on Drawings. Button-punch side laps not indicated on Drawings to be welded.
E. Perform field cutting parallel with cells in area between cells, leaving sufficient horizontal material to permit welding to support steel.
F. Weld shear connectors to supports thru decking units as required by Drawings. Weld only on clean, dry surfaces. Do not weld shear connectors thru two layers of decking units.

3.03 METAL FLASHINGS AND CLOSURES

A. Furnish, install and weld in position, sheet metal closure flashing, closure angles, closure plates, profile plates and shear plates.

B. Close open ends of cell runs at columns, openings, walls, similar interruptions and termination.

3.04 FIELD QUALITY CONTROL

A. Inspection: Install steel decking under continuous inspection according to CBC Chapter 22, 2231.5.

3.05 CLEAN UP

A. Remove rubbish, debris, and waste materials and legally dispose of off the Project site.

3.06 PROTECTION

A. Protect the Work of this section until Substantial Completion.

END OF SECTION
PART 1 – GENERAL
Provisions of the General and Supplementary Conditions and Division 01 apply to this section.

1.01 SECTION INCLUDES
A. Fabricated miscellaneous metal items not included under structural steel and other related work, as indicated on the Drawings. Refer to elevator specifications for other work required of this Section.

1.02 RELATED SECTIONS
A. Division 1.
B. Section 09900 - Painting.
C. Section 14240 – Hydraulic Elevators

1.03 SUBMITTALS
A. Submit shop drawings of miscellaneous metal fabrications, indicating profiles, sizes, attachments, reinforcing, anchorage, size and type of fasteners and accessories, including:
   1. Welded connections, using standard AWS welding symbols.

1.04 QUALITY ASSURANCE
A. Welding shall be in accordance with AWS D1.1, performed by certified welders who shall demonstrate to the satisfaction of the Architect, sufficient proficiency equal or exceeding AWS requirements.

PART 2 - PRODUCTS

2.01 MATERIALS
A. Steel Channels and angles: ASTM A36. Materials exposed to weather shall be galvanized per ASTM A123
B. Steel Plates and Bars: ASTM A283. Materials exposed to weather shall be galvanized per ASTM A123.
C. Steel Tubing: ASTM A501. Materials exposed to weather shall be galvanized per ASTM A123.
D. Steel Pipe: ASTM A53, Grade B, (35 KSI), Schedule 40. Materials exposed to weather shall be galvanized per ASTM A123.
E. Steel Sheet: ASTM A653. (Galvanized)
F. Welding Materials: AWS D1.1, type required for material being welded.
G. Shop Primer: Tnemec 10-99 or acceptable equal modified alkyd VOC compliant primer.
I. Malleable Iron Castings: ASTM A47.

J. Machine Bolts: ASTM A307, galvanized when assembling galvanized units.

K. Tubing: ASTM A554, Grade MT 304.

L. Pipe: ASTM A312/A 312M, Grade TP 304.

M. Castings: ASTM A743/A 743M, Grade CF 8 or CF 20.

N. Sheet, Strip, Plate, and Flat Bar: ASTM A666, Type 304.

O. Bars and Shapes: ASTM A276, Type 304.

P. Anchorage: Mechanical anchors for securing items of miscellaneous metal to cementitious materials shall be cinch anchors, or acceptable equal, not less than 3/8 inch and of thread type for anchoring with bolt head out; anchors set in concrete shall be hook type, not less than 1/2 inch.

2.02 FABRICATION

A. General:

1. Fabrication shall be performed by mechanics skilled in the trade and in accordance with the manufacturer's directions. Miscellaneous metalwork shall be well formed to shape and size, with sharp lines and angles, and true curves. Work shall be fabricated with allowance for expansion and contraction of materials. Welding and bracing shall be of adequate strength, with tight, flush joints, dressed smooth and clean.

2. Verify dimensions on site prior to shop fabrication.

3. Fit and shop-assemble in largest practical sections. Provide removable type of fabrication where indicated on the Drawings.

4. Grind exposed welds smooth and flush with adjacent finished surfaces.

5. Flush countersunk screws or bolts unobtrusively located, consistent with design of structure, except where specifically indicated otherwise.

6. For mechanically fastened joints, provide flush butt type with hairline joints.

7. Supply components required for proper anchorage of miscellaneous metal. Fabricate anchorage and related components of same material and finish as metal, unless otherwise specified.

8. Provide assemblies to be exposed to the weather with G90 hot-dip galvanizing. Thoroughly clean surfaces of rust, scale, grease and foreign matter prior to galvanizing.

B. Fences and gates: Refer to drawings.

C. Handrail and posts: 1 ½" diameter and mounted 1 ½" clear from side walls, All welded joints and surfaces shall be ground smooth, no sharp or abrasive corners, edges, or surfaces. Wall surfaces adjacent to handrail shall be smooth.

D. Stair Nosings: American Safety Tread Company Type 24, or acceptable equal. The base shall consist of heat treated extruded aluminum alloy 6063-T6. The abrasive filler shall consist of a mixture of aluminum oxide and silicon carbide granules in an epoxy matrix locked into the extruded channels of
the base. The abrasive ribs shall protect a minimum of 1/16 inch above the extruded channels. Nosings shall terminate not more than 3" from ends of steps for poured concrete stairs; for concrete filled steel pan stairs, nosings shall be full length of steps less 1/8" clearance.

1. Provide 2" contrasting color (70% recommended) warning stripe 1" maximum from edge of nosing of ach exterior stair and top landing. Top landing and bottom tread nosing only at interior stairs.

2. Color shall be as chosen by Architect from manufacturer's standard selection.

E. Bollards: 6" diameter schedule 40 pipe, install 3' above and 2'-9" below grade, filled with concrete with rounded top. Paint safety yellow.

F. Structural Glass Balustrade System: Blumcraft RG-200, or approved equal, with factory supplied ½" thick clear tempered glass, and aluminum components with satin finished clear anodized finish. Handrail shall be satin stainless steel, Type WBN-G and 583. The railing sub-contractor shall forward shop drawings to Blumcraft for review prior to submission of Blumcraft's drawings for Architects approval.

G. Aluminum Ships Ladder: Mezzanine access folding ladder, Model #435 by ALCO Ladder Company, or approved equal.

H. Aluminum Access Ladders: Roof access ladders, Model #501 and Model #503A by O’Keeffes, Inc., or approved equal.

I. Shop Coating:

1. Shop-prime metalwork, except where otherwise indicated on the Drawings.

2. Prepare surfaces to the degree required by SSPC SP3, unless SSPC SP6 is necessary.

3. Apply prime coating to minimum dry-film-thickness of 2.0 mils.

4. Do not shop-prime surfaces to be embedded in concrete.

PART 3 - EXECUTION

3.01 INSTALLATION

A. General:

1. Obtain Architect's review prior to site cutting or making adjustments which are not part of scheduled work.

2. Erect miscellaneous metalwork square and level, accurately fitted and free from distortions and defects. Make provisions for erection stresses by temporary bracing. Keep work in alignment.

3. Furnish items, requiring to be cast or embedded to concrete and masonry work, with necessary setting templates.

4. Provide anchorage devices and fasteners where necessary for securing miscellaneous metal items to in-place construction; including, threaded fasteners for concrete inserts, toggle bolts, throughbolts, lag bolts, wood screws and other connectors as required.

5. Perform cutting, drilling, and fitting required for installation of miscellaneous metal items. Set work accurately in location, alignment, and elevation, plumb, level, true, and free of rack, measured from established lines and levels. Provide temporary bracing or anchors in formwork for items which are to be built into concrete or similar construction. Fit exposed connections accurately to form tight hairline joints.
B. Welding:

1. Perform welding, welding inspection, and corrective welding work in accordance with AWS D1.1. Welding shall be continuous along with entire area of contact except where tack-welding is permitted. Exposed connections shall not be tack-welded. Welds that will be visible in the finished installation shall be ground smooth.

2. Comply with AWS Code for procedures in manual shielded metal-arc welding, appearance and quality of welds made, and methods used in correcting welding work.

3.02 CLEANING

A. Immediately after erection, clean field welds, bolted connections and abraded areas, and touch-up exposed areas with same material as used for shop prime-coat. Apply by brush to provide minimum dry-film thickness of 2.0 mils.

END OF SECTION
SECTION 06164
GYPSUM SHEATHING

PART 1 GENERAL

Provisions of the General and Supplementary Conditions and Division 01 apply to this section.

1.01 SUMMARY

A. Section Includes: Fiberglass-mat faced, moisture and mold resistant gypsum sheathing.

B. Related Sections:
   1. Section 05120 Load Bearing Metal Studs.
   2. Section 09100 Metal Support Assemblies.

1.02 REFERENCES

A. ASTM International (ASTM):
   3. ASTM C1002 Standard Specification for Steel Self-Piercing Tapping Screws for the Application of Gypsum Panel Products or Metal Plaster Bases to Wood Studs or Steel Studs.


1.03 SUBMITTALS

A. Product Data: Manufacturer’s specifications and installation instructions for each product specified.

1.04 WARRANTY

A. Provide products that offer twelve months of coverage against in-place exposure damage delamination, deterioration and decay.

B. Manufacturer’s Warranty:
   1. Five years against manufacturing defects.
   2. Ten years against manufacturing defects when used as a substrate in architecturally specified EIFS.

PART 2 PRODUCTS

2.01 MANUFACTURERS

A. Georgia-Pacific Gypsum LLC:
1. Fiberglass-Mat Faced Gypsum Sheathing, Type X for Fire Rated Designs: DensGlass Fireguard Sheathing, or approved equal.

2.02 MATERIALS
   A. Fire-Rated Fiberglass-Mat Faced Gypsum Sheathing: ASTM C1177, Type X:
      1. Thickness: 5/8 inch.
      2. Width: 4 feet.
      3. Length: [8 feet] [9 feet] [10 feet].
      4. Weight: 2.5 lb/sq. ft.
      5. Edges: Square.
      6. Surfacing: Fiberglass mat on face, back, and long edges.
      7. Racking Strength (Ultimate, not design value) (ASTM E72): Not less than 654 pounds per square foot, dry.

2.03 ACCESSORIES
   A. Screws: ASTM C1002, corrosion resistant treated.

PART 3 EXECUTION

3.01 EXAMINATION
   A. Verification of Conditions:
      1. Inspection: Verify that project conditions and substrates are acceptable, to the installer, to begin installation of work of this section.

3.02 INSTALLATION
   A. General: In accordance with GA-253, ASTM C1280 and the manufacturer’s recommendations.
      1. Manufacturer’s Recommendations:
         a. Current “Product Catalog”, Georgia-Pacific Gypsum, or approved equal.

3.03 PROTECTION
   A. Protect gypsum board installations from damage and deterioration until date of Substantial Completion.

END OF SECTION
PART ONE   GENERAL

1.01 DESCRIPTION

A. Work Included
   1. Finish Carpentry

B. Related Work:
   1. Documents affecting work of this Section include, but are not necessarily limited to, General Conditions, Supplementary Conditions and Sections in Division 1 of these Specifications.
   2. Related Sections: Additional Requirements may also be prescribed in other Sections of these Specifications:
      a. Section 06400: Architectural Woodwork.
      b. Section 08210: Wood Doors.
      c. Section 09250: Gypsum Board.
      d. Section 09900: Painting.

1.02 SUBMITTALS

A. Shop Drawings: Submit Shop Drawings of each item of finish carpentry and millwork, indicating materials, dimensions, construction and anchorage details.

B. Mock-ups: Install at project site, a job mock-up using acceptable products and approved installation methods. Obtain Owner's and Architect's acceptance of finish color, texture, pattern, and workmanship standard before proceeding with this work.

1.03 QUALITY ASSURANCE

A. Comply with the following as a minimum requirement:
   1. Douglas fir finish lumber shall be manufactured and graded in accordance with WCLIB - Standard Grading and Dressing Rule No. 17.
   2. Hardwood finish lumber shall be manufactured and graded in accordance with NHLA - Rules for the Measurement and Inspection of Hardwood and Cypress Lumber.
   3. Softwood Plywood: Plywood shall comply with APA - Product Standard PS 1-95. Plywood shall be grade marked by APA.

B. Finish lumber shall be kiln-dried according to recognized methods for the thickness and species. Lumber one inch thick or less shall be dried to an average moisture content of not more than 15 percent. Lumber 1-1/4 inches to 2 inches in thickness shall be dried to an average moisture content of not more than 19 percent.
C. Design Requirements: Provide wood products from certified sustainable harvested sources.

1.04 DELIVERY, STORAGE AND HANDLING

A. Materials shall be delivered to the Project site in undamaged condition, stored in fully covered, well ventilated areas, and protected from extreme changes in temperature and humidity.

B. Interior millwork and finish carpentry shall not be installed unless interior building temperature and humidity levels are within the ranges recommended by the manufacturer and/or recognized standards.

PART TWO PRODUCTS

2.01 MATERIALS

A. Douglas Fir: Interior trim, solid lumber shelves, partitions, door frames and other concealed members of interior finish; WIC Economy Grade.

B. Hardwood: Red Oak, Maple firsts and seconds.
   1. Red Oak: WIC Custom Grade.
   2. Maple: WIC Custom Grade.

C. Softwood Plywood: Except where otherwise specified, WIC Custom Grade, Douglas fir unless otherwise indicated.

D. Hardwood Plywood: WIC Premium Grade, species as indicated.

2.02 FABRICATION

A. General: The means of fastening various parts together shall be concealed in finished Work. Work, which is curved, shall be fabricated from solid stock, or if veneered, shall be bent to a uniform radius.

PART THREE EXECUTION

3.01 GENERAL

A. Interior and exterior wood, millwork, blocking, and lumber shall be installed level, plumb, and true to line. Members shall be neatly and accurately scribed in place, maintaining full widths of end members, wherever possible. Trim shall be installed in full lengths, without piecing, except where use of single lengths is not required. Butt joints, if necessary, shall be beveled. Exterior angles shall be mitered, and interior angles of molding parts coped. Nails shall be set for putty. Grain and color of adjoining interior finish shall match adjacent finishes. Where Work specified in this section adjoins other Work, provide a neat tight joint.

B. Interior and exterior finish carpentry and other fixed wooden equipment having hammer marks or other visible damage will be deemed defective Work.

3.02 INSTALLATION
A. Install Work of this section as specified in the WIC Manual of Millwork.

B. Wood shoe base shall be fitted and temporarily tacked in place until floor covering is installed. Provide and install corner fillets, same contour and materials as shoe base, in corners where shoe base is installed.

C. Caulking of Joints: Joints between exterior finishes and adjoining surfaces shall be primed before caulking.

3.03 CLEAN UP

A. Remove debris, rubbish and waste material and legally dispose of off the Project site.

3.04 PROTECTION

A. Protect the Work of this section until Substantial Completion.

END OF SECTION
SECTION 06400
ARCHITECTURAL WOODWORK

PART ONE   GENERAL

1.01   DESCRIPTION

A. Work Included:
   1. Architectural woodwork, wood paneling casework, cabinetry trim, hardware, countertops and shelving as indicated on Drawings.

B. Related Work:
   1. Documents affecting work of this Section include, but are not necessarily limited to, General Conditions, Supplementary Conditions and Sections in Division 1 of these Specifications.
   2. Related Sections: Additional Requirements may also be prescribed in other Sections of these Specifications:
      a. Section 05580: Stainless Steel Countertops
      b. Section 09900: Paints and Coatings.

1.02   SECTION DEFINITIONS

A. "Sustainably managed" is defined as "forests that are being managed through a professionally administered forestry management plan in which timber growth equals or exceeds harvesting rates in both quantity and quality, protecting rivers and streams from degradation, minimizing damage to the forest when harvesting and promoting biodiversity".

1.03   SYSTEM DESCRIPTION

A. Design Requirements: Provide wood products from certified sustainable harvested sources.

1.04   SUBMITTALS

A. Shop Drawings: Submit Shop Drawings of casework indicating materials and hardware, details of construction, dimensions, methods of fastening and installation details. Shop Drawings shall bear a WIC Certified Compliance Label indicating that Shop Drawings fully meet requirements of WIC grade specified. Shop Drawings shall indicate grounds, backing, blocking, sleepers and other items required for installation of casework, which are to be provided and installed as part of the Work.

B. Certificates: Provide WIC Certified Compliance Certificate certifying that materials, fabrication and installation will comply with the specified requirements.

C. Material Samples: Submit 2 inch x 3 inch plastic laminate color Samples of manufacturer's entire color range.

D. Closeout Submittals: Provide a WIC Certified Compliance Certificate for Installation.

1.05   QUALITY ASSURANCE

A. Comply with WIC Manual of Millwork, Custom & Premium grades as specified herein.
B. Each elevation of casework shall bear WIC Certified Compliance Label indicating that casework fully meets requirements of WIC grade specified.

C. Each plastic laminate countertop shall bear WIC Certified Compliance Label indicating tops fully meet requirements of WIC grade specified.

1.06 DELIVERY, STORAGE AND HANDLING

A. Materials shall be delivered to the Project site in undamaged condition, stored in fully covered, well ventilated areas, and protected from extreme changes in humidity and temperature. Refer to WIC Manual for recommended care and storage.

B. In event of damage immediately furnish necessary repairs or replacements.

1.07 PROJECT CONDITIONS

A. Store indoors, in ventilated areas with constant but minimum temperature of 60 degrees F. and maximum relative humidity of 25 percent to 55 percent. At least seven days before installation, maintain temperature of 70 degrees F. and relative humidity of 50 percent to 55 percent. Acclimate materials to the installation temperature and humidity for at least 72 hours prior to installation. Maintain conditions until Substantial Completion.

PART TWO PRODUCTS

2.01 MATERIALS

A. Wood Casework
   1. Particle Board: 45 lb. density, conforming to ANSI A-208.1, table 1, Grade 1-M-2.
   2. Solid Lumber: 
      b. Semi-exposed portions: Custom Grade hardwood veneer of the same species as exposed material with a specific gravity in excess of 0.37.
      c. Exposed portions: Premium Grade well matched for color and grain, select red oak veneer.
   3. Hardboard: Factory finished, pressure sealed hardboard conforming to requirements of PS 58.
   4. Edge Banding: Same species of wood as adjacent to exposed surfaces.

B. Hardware:
   1. Drawer Slides for Custom Grade Cabinetry:
      b. Drawers and box drawers, up to 24 inches wide: Accuride 3832A.
      c. Lateral file drawers, up to 30 inches wide: Accuride 4034 overtravel or 4033 equal travel.
      d. Lateral file drawers, more than 30 inches wide: Accuride 3640.
   2. Flipper Door Slides for Premium and Premium Grade Cabinetry:
      a. For vertically mounted retracting cabinet doors up to 75 lbs. and 72 inches tall: Accuride 1432 with hinge carrier strip.
      3. Mutes: Rubber, approximately 1/4 inch diameter, colors to match adjacent.
      4. Plastic Grommets: Doug Mockett, or equal; color as selected by Architect.
      5. Adjustable Shelves with Clips: Adjustable shelf supports (EDP type, unless otherwise noted) set in 5 mm holes spaced 32 mm on center:

6. Cabinet Hinges: Concealed type, minimum 170 degree opening, self-closing
   a. Hafele America, Co., No. 326.05.
   c. Mepla, No. MD61-253-Z00.

7. Cabinet Locks:
   a. Door Locks: Best Locks. Key per Owner’s standards
   b. Locks for Sliding Doors: Best Locks. Key per Owner’s standards
   c. Drawer Locks: Best Locks. Key per Owner’s standards
   d. Cabinet locks shall be flush with surface of door and protrude no greater than 3/16”.

8. Top-hung Hardware Assembly for Sliding Doors: Grant No. 6064.
9. Track for Sliding Doors: K & V 455 x or 455.55.
10. Pull Flush Ring at Drawers behind Doors: Safe No. 6116 or BBW 24.
11. Pulls: BBW No. 79P, Quality No. 179 x 180 or Trimco No. 553P.
12. Catches: Magnetic type - Epcos No. 592 or Lawrence No. SC1364-AL.
13. Four-way Tension Catch: Glynn-Johnson GJ21A.
15. Elbow Catch: Ives 2A.
16. Bolts: Surface type BBW No. 97-B6, Quality B6 or Trimco No. 4856-6.
17. Brackets and Shelf Strip for Glass Shelves: K & V No. 80 x 180 or Garcy 604 x 686.
18. Shelf Standards and Brackets: K & V No. 255 x 256 or line bored holes for pins as approved by WIC standards Stanley No. 798 x 799, steel zinc plated.
20. Hanger Rods: 1-1/16 inches minimum diameter metal tubing, aluminum or stainless steel clad, KV660; heavy wall steel tubing KV770.
21. Hanger Rod Flanges: KV757, or flanges KV734, KV735; Ronther Reiss R44-55; or equal.
22. Hardware Finish: With exception of finish hardware items which have finishes specified, hardware shall be furnished with dull chrome US 26D or dull stainless steel US 32D finish.
23. Keying:
   a. Key locks inside one room alike. Furnish 3 keys for each lock keyed separately, and 2 keys for each lock in keyed alike groups. Master keys shall be tagged and delivered to the Owner. Locks and keys shall be stamped with coded set number / direct digit.
   b. Cabinet locks shall be master-keyed and keyed alike. Backside of cabinet lock bolts (on visible side following installation) and change keys shall be stamped with manufacturer’s code, either direct digit or coded series. Change keys shall also be stamped with set numbers direct digit.
   c. Master keys shall be per Owners requirements.

2.02 FABRICATION

A. Wood Casework: Manufacture in accordance with WIC Manual of Millwork, Premium Grade, except, modified as follows:
   1. Casework bodies shall be 3/4 inch thick particleboard core. Particleboard core shall have a minimum density of 45 pounds.
   2. Exposed surfaces for transparent finish shall be plain sliced select white birch, and shall be Premium Grade veneers and solid stock.
   3. Semi-exposed surfaces shall be natural birch Good Grade veneer. Semi-exposed portions behind glass or in open cases shall be of same species and grade as exposed portions.
4. Edge banding shall be wood edge bands of same species as adjacent exposed faces.
5. Cabinet doors shall be particleboard core a minimum of 3/4 inch thickness, unless otherwise noted. Interior faces of cabinet doors shall be same species and grade as exposed surfaces. Cabinet doors shall be flush overlay type No. 1.

C. Countertops:
   1. Quartz Surfacing Countertops per Section 12366
   2. Caesar Stone; color to be selected from manufacturer’s standard range.

2.03 FINISHING

A. Exposed hardwood parts shall be finished with one coat of lacquer sealer and 2 coats of finish lacquer. Unexposed materials such as backs, webs, back of tops, and the like, shall be sealed with one oil base prime coat. Semi-exposed wood surfaces such as drawer interiors shall be finished with one coat of sanding sealer and one coat of clear gloss lacquer.

PART THREE EXECUTION

3.01 INSTALLATION

A. Install Work of this section as specified in the WIC Manual of Millwork.
B. Cabinets: Install cabinets level, plumb, and secure to walls. Exposed screws shall have finish washers.
C. End Panels and Fillers: Furnish to match exposed surfaces and accurately scribe to walls and neatly and securely fit to cabinets.
D. Completion: Upon completion of installation, cabinets including drawers and shelves shall be cleaned. Doors and drawers shall operate easily and freely.
E. Scribe plastic laminated cabinets to walls. Installation of surface-applied moldings is not permitted.

3.02 CLEAN UP

A. Remove debris, rubbish and waste material and legally dispose of off the Project site.

3.03 PROTECTION

A. Protect the Work of this section until Substantial Completion.

END OF SECTION
PART 1 - GENERAL

1.01 SUMMARY

A. Provisions of the General and Supplementary Conditions and Division 01 apply to this section.

B. Section Includes: Sheet waterproofing as indicated and in locations including:
   1. Sheet waterproofing in planters.

C. Related Sections:
   1. Section 03300: Cast-In-Place Concrete.
   2. Section 07131: Sheet Waterproofing
   4. Division 2: Landscaping and planting sections.

1.02 SUBMITTALS

A. Manufacturer's Qualifications: Provide a list of projects of similar design and complexity completed within the past 5 years.

B. Installer's Qualifications: Submit a certificate, prepared by the waterproofing system manufacturer, stating waterproofing applicator is certified by the waterproofing material manufacturer and, upon completion, submit a certificate stating that waterproofing systems have been installed in conformance with reviewed submittals and manufacturer's recommendations.

C. Product Data: Submit manufacturer's Product Data including installation instructions.

D. Shop Drawings: Submit Shop Drawings indicating each condition of the Work. Indicate all adjoining Work, and indicate methods of adhesion and attachment, laps, and related conditions.

1.03 QUALITY ASSURANCE

A. References:
   1. ASTM E 96 - Water Vapor Transmission of Materials; Method B.
   2. ASTM E 154 - Water Vapor Retarders Used in Contact with Earth Under Concrete Slabs.

B. Qualifications of Manufacturer: Sheet membrane waterproofing system shall be manufactured by a firm with a minimum of 20 years experience in the production of self-adhesive sheet membrane waterproofing.

C. Qualifications of Installer: A firm which has at least 3 years experience in work of the type required by this section, and is recommended by manufacturer to install the specified products.

D. Materials shall comply with current State of California and local Air Quality Management District requirements for volatile organic compounds.
1.04 DELIVERY, STORAGE AND HANDLING

A. Deliver materials in original, unopened containers or packages with manufacturer's labels intact.

B. Store materials at the Project site under cover and maintain in dry condition. Protect from damage from excessive temperature and construction operations. Do not double-stack pallets of membrane. Protect mastic and adhesive from moisture and excessive heat. Store drainage composite or protection board flat and above grade. Provide cover on top and all sides of pallets and provide for adequate ventilation. Protect surface conditioner from freezing.

1.05 PROJECT CONDITIONS

A. Apply sheet waterproofing materials only in dry weather and when outside temperature is above 40 degrees F and below 90 degrees F

B. Do not apply sheet waterproofing materials to damp or wet surfaces unless specifically approved in writing by manufacturer.

1.06 WARRANTY

A. Provide a 5 year material and labor warranty.

PART 2 - PRODUCTS

2.01 ACCEPTABLE MANUFACTURERS

A. Sheet waterproofing shall be as manufactured by W.R. Grace & Co., W.R. Meadows, Inc., or equal.

B. Fabric Reinforced Monolithic Membrane shall be as manufactured by American Hydrotech, Inc., or equal.

2.02 MATERIALS

A. Sheet waterproofing material shall be self-adhesive, cold-applied such as W.R. Grace Bituthene 4000, W.R. Meadows Mel-Rol, or equal. The material shall be a self-adhesive, cold-applied composite sheet consisting of a thickness of 0.056 inches of rubberized asphalt and 0.004 inches of cross-laminated, high density polyethylene film specially formulated for use with water-based surface conditioner. Provide rubberized asphalt membrane covered with a release sheet, which is removed during installation. No special adhesive or heat shall be required to form laps.

B. Surface conditioner: W.R Grace Bituthene 4000, W.R. Meadows Mel-Rol, or equal, latex based surface conditioner.

C. Adhesives fillets and sealers: Types as recommended by manufacturer for installation with specified membrane sheet.

D. Prefabricated Drainage Sheet:

   1. For vertical surfaces: Hydroduct 2, Mel-Drain 5035B, or equal, consisting of a dimpled high impact polystyrene core and a needle punched non-woven filter fabric adhered to one side of the core. A film shall be adhered to the other side of the core.

   2. For horizontal surfaces: Hydroduct HSF, Mel-Drain 7555, or equal, consisting of dimpled high impact polystyrene core and an extra heavy woven filter fabric bonded to the core.
E. Protection board for horizontal surfaces shall be 1/8 inch thick asphalt-impregnated hardboard; APOC, W.R. Meadows PC-2, or equal. Protection board for vertical surfaces shall be 1 inch thick expanded polystyrene.

PART 3 - EXECUTION

3.01 PRELIMINARY WORK

A. Inspect and verify condition of substrates and related Work. Do not start installation of membranes until defects in substrates have been corrected. Concrete shall be smooth, dry, and free of voids.

3.02 APPLICATION OF MEMBRANE IN PLANTERS

A. Surface Conditioning: Install surface conditioner and allow to dry to surfaces to be covered with membrane the same day.

B. Corner Treatment: Pretreat inside corners with liquid membrane compound, to form a fillet or use formed reinforcement fillet recommended by manufacturer. Smooth all surfaces of outside corners.

C. Horizontal Surfaces: Install 9 inch wide strips of membrane material over construction joints, cracks, and grouted joints. Seal expansion joints as recommended by manufacturer. At drains and vertical projections, install two layers of membrane sheet extended out not less than 6 inches in all directions, and seal. At drains, extend the membrane into the clamping ring and seal. Over prepared surfaces install membrane in one layer and roll into place. Lap sheets 2-1/2 inches at edges and ends.

D. Vertical Surfaces: Install membrane vertically in heights to 8 feet. Lap seams 2-1/2 inches. Roll membrane with hand roller. Extend membrane over top of foundation walls, planter walls and parapet walls, except where reglets are provided for termination.

3.03 PREFABRICATED DRAINAGE SHEET

A. Vertical Surfaces: Install rolls of vertical drainage sheet over the completed membrane, starting at the base of the wall. Peel the fabric back approximately 12 inches from the lower edge. Where drainage pipe occurs, install the drain core behind the pipe and extend the fabric over the outside of the pipe. Adhere the drainage sheet to the wall using strips of adhesive as recommended by manufacturer.

B. Horizontal Surfaces: Adhere the drainage sheet to the membrane with strips of adhesive. Butt adjacent panels together and overlap fabric onto the previous panel. At corners, cut the core and cover the core with filter fabric or tape.

3.07 PROTECTION BOARD

A. Cover all surfaces, vertical and horizontal, with protection board, unless indicated otherwise. Install with adhesive recommended by manufacturer, and compatible with membrane materials.

3.08 TESTS OF MEMBRANES

A. All horizontal membranes shall be subjected to standing water test after completion, but before protection board is applied. Tests shall be conducted as soon as possible after completion of membrane in each area. When membrane installation is completed, seal drain, sandbag perimeter, fill membrane with water to height of not less than 2 inches, pond test for not less than 24 hours, repair all leaks or defects disclosed, and test until results are satisfactory. Remove all sandbags, plugs and drain when testing is completed. Clean surfaces of membrane.
3.09 PROTECTION
   A. Protect the Work of this section until Substantial Completion.

3.10 CLEANUP
   A. Remove rubbish, debris and waste materials and legally dispose of off the Project site.

END OF SECTION
SECTION 07132

SELF-ADHERING SHEET WATERPROOFING

PART 1 – GENERAL

Provisions of the General and Supplementary Conditions and Division 01 apply to this section.

1.1 SECTION INCLUDES:

Installation of sheet membrane waterproofing on surfaces indicated on drawings, consisting of preparation of existing and repaired concrete surfaces, sealing of cracks and joints, and application of CCW MiraDRI 860/861Sheet Membrane Waterproofing.

1.2 RELATED SECTIONS

A. Section 03100 – Concrete Accessories/Expansion Joints
B. Section 03300 - Cast-In-Place Concrete
C. Section 07900 - Caulking and Sealants
D. Division 15 – Mechanical/Floor Drains and Standpipes
E. Division 16 – Electrical/Conduit and other Electrical

1.3 REFERENCES

A. ASTM D 412 Tests for Rubber Properties in Tension
B. ASTM E 154 Puncture Resistance
C. ASTM E 96 (B) Water Vapor Transmission of Materials
D. ASTM D 1970 Self-Adhering Polymer Modified Bituminous Sheet Materials
E. ASTM D 882 Test Method for Tensile Properties
F. ASTM D 3767 Practice for Rubber – Measurement of Dimensions
G. ASTM D 751 Test Method for Coated Fabrics
H. ASTM D 570 Test Method for Water Absorption of Plastics
I. UL 790 Tests for Fire Resistance of Roof Covering Materials

1.4 SYSTEM DESCRIPTION

Product provided by this Section is a self-adhesive membrane of not less than 60 mils thickness, consisting of a rubberized asphalt membrane laminated to a 4 mil cross-laminated polyethylene film.

1.5 SUBMITTALS

A. General: Submit in accordance with Section 01 30 00.
B. Product Data: Submit manufacturer's product literature and installation instructions.
C. Subcontractor=s approval by Manufacturer: Submit document stating manufacturer's acceptance of subcontractor as an Approved Applicator for the specified materials.
D. Warranty: Submit a sample warranty identifying the terms and conditions stated in Section 1.7.

1.6 QUALITY ASSURANCE

A. Applicator Qualifications: Applicator shall be experienced in applying the same or similar materials and shall be specifically approved in writing by the membrane manufacturer.
B. Regulatory Requirements: Comply with applicable codes, regulations, ordinances, and laws regarding use and application of products that contain volatile organic compounds (VOC).
C. Pre-Application Conference: Prior to beginning work, convene a conference to review conditions, installation procedures, schedules and coordination with other work.

1.7 WARRANTY

A. Upon completion and acceptance of the work required by this section, the manufacturer will issue a warranty agreeing to promptly replace defective materials for a period of 5 years.

B. The formation or presence of mold or fungi in a building is dependent upon a broad range of factors including, but not limited to, the presence of spores and nutrient sources, moisture, temperatures, climatic conditions, relative humidity, and heating/ventilating systems and their maintenance and operating capabilities. These factors are beyond the control of Carlisle and Carlisle shall not be responsible for any claims, repairs, restoration, or damages relating to the presence of any irritants, contaminants, vapors, fumes, molds, fungi, bacteria, spores, mycotoxins, or the like in any building or in the air, land, or water serving the building.

1.8 DELIVERY, STORAGE, AND HANDLING

A. Deliver materials to project site in original, factory-sealed, unopened containers bearing manufacturer's name and label intact and legible with following information.
1. Name of material.
2. Manufacturer's stock number and date of manufacture.

B. Store materials in protected and well ventilated area.

1.9 PROJECT CONDITIONS

A. Do not apply membrane when surface temperature is below or inclement weather conditions conflict with manufacturer's published requirements.

B. Coordinate waterproofing work with other trades. The applicator shall have sole right of access to the specified areas for the time needed to complete the installation.

C. Warn personnel against breathing of vapors and contact of material with skin or eyes. Wear applicable protective clothing and respiratory protection gear.

D. Keep flammable products away from spark or flame. Do not allow the use of spark producing equipment during application and until all vapors have dissipated. Post “NO SMOKING” signs.

E. Maintain work area in a neat and orderly condition, removing empty containers, rags, and rubbish daily from the site.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

Provide CCW MiraDRI 860/861 Sheet Membrane Waterproofing as manufactured by Carlisle Coatings and Waterproofing Incorporated, 900 Hensley Lane, Wylie, Texas 75098, Phone: (800) 527-7092 Fax: (972) 442-0076, or approved equal.

2.2 PRODUCTS

A. Self-Adhesive Sheet Membrane Waterproofing: Shall be CCW MiraDRI 860/861 consisting of a 56 mil rubberized asphalt membrane laminated to 4 mil cross-laminated polyethylene film, and shall meet or exceed the following requirements:
1. Tensile Strength: 325 psi minimum, ASTM D 412
2. Ultimate Elongation: 350% minimum, ASTM D 412
3. Puncture Resistance: 60 lbs. minimum, ASTM E 154
4. Permeance: 0.05 Perm maximum, ASTM E 96 (B)
5. Low Temperature Flexibility: Unaffected at -45°F, ASTM D 1970, 1" mandrel
6. Tensile to Film: 5000 psi, ASTM D 882
7. Thickness: 60 mils, ASTM D 3767  
8. Hydrostatic Head: 230 ft., ASTM D 751  
9. Water Absorption: 0.1% by wt., ASTM D 570

B. For application temperatures between 25 and 65°F, use CCW-861 Sheet Membrane and CCW-702. For application temperatures above 40°F use CCW MiraDRI 860 sheet membrane and CCW-702, CCW-714 primer, or CCW-AWP.

2.3 ACCESSORY PRODUCTS

A. Surface Primer: Shall be CCW-702LV Solvent-Based Contact Adhesive, 702WB or Cav-Grip.
B. Mastic: Shall be CCW-704 Mastic.
C. Sealants: Shall be CCW-703 Vertical Grade Liquiseal® Membrane, one component approved sealant by CCW, CCW-201 two-component Polyurethane Sealant or CCW LM-800XL
D. Backing Rod: Shall be closed-cell polyethylene foam rod.
E. Protection Course: Shall be CCW Protection Board-H or CCW 300H for horizontal surfaces or CCW Protection Board-V or CCW 200V for vertical surfaces.
F. Drainage Composite: Shall be CCW MiraDRAIN® as recommended by the manufacturer for each condition.
G. Perimeter Drainage System: Where required shall be CCW QuickDRAIN™.

PART 3 - EXECUTION

3.1 INSPECTION

A. Before any waterproofing work is started the waterproofing applicator shall thoroughly examine all surfaces for any deficiencies. Should any deficiencies exist, the architect, owner, or general contractor shall be notified in writing and corrections made.
B. Condition of Concrete Surfaces:
   1. The concrete surfaces shall be of sound structural grade and shall have a smooth finish, free of fins, ridges, protrusions, rough spalled areas, loose aggregate, exposed course aggregate, voids or entrained air holes. Rough surfaces shall receive a well-adhered parget coat.
   2. Concrete shall be cured by water curing method. Any curing compounds must be of the pure sodium silicate type and be approved by the Carlisle representative.
   3. Concrete shall be cured at least 7 days and shall be sloped for proper drainage.
   4. Voids, rock pockets and excessively rough surfaces shall be repaired with approved non-shrink grout or ground to match the unrepaired areas.
   5. Two-stage drains shall have a minimum 3 inch flange and be installed with the flange flush and level with the concrete surface.
   6. Surfaces at cold joints shall be on the same plane.

3.2 SURFACE PREPARATION

A. The concrete surface must be thoroughly clean, dry and free from any surface contaminates or cleaning residue that may harmfully affect the adhesion of the membrane.
B. Install a 3/4" face, 45 degree cant of CCW-201 Polyurethane Sealant or CCW LM-800XL at all angle changes and inside corners including penetrations through the deck, walls, curbs, etc.
C. All cracks over 1/16" in width and all moving cracks under 1/16" in width shall be routed out to 1/4" minimum in width and depth and filled flush with an approved sealant by CCW or CCW-201 polyurethane sealant.
D. All expansion joints less than 1" wide shall be cleaned, primed, fitted with a backing rod and caulked with CCW-201 Polyurethane Sealant. For larger joints, contact Carlisle representative.
E. Allow all sealant to cure at least overnight.
F. Stir Primer. Apply a thin film of primer 10" wide, centered over sealed cracks and joints, hairline cracks, and cold joints. Apply primer 8" on each side of all corners. Prime concrete around drain flanges. Allow primer to dry per manufacturer’s recommendations.
G. Install an 8" wide strip of CCW MiraDRI 860/861 centered over joints and cracks. Install a 12" wide strip of CCW MiraDRI 860/861 centered over the axis of all corners.

H. Terminate membrane around drains per CCW MiraDRI 860 series details. Terminate the membrane under the clamping ring. Seal all edges with CCW-704 Mastic. Do not interfere with weep holes.

3.3 APPLICATION

A. Priming: Clean surfaces to remove residual dust before priming. Stir primer. Apply by spray or roller at a rate recommended by manufacturer. Allow to dry per manufacturer’s recommendation.

B. Horizontal surfaces: Install sheet membrane from low to high point, so that laps will shed water. Overlap edge seams 2½", end laps 5". Stagger end seams. Roll in place with an 18 to 24" wide, 100 lb. (min.) resilient roller. Ensure that all laps are firmly adhered and that there are no gaps or fishmouths.

C. Vertical Surfaces: Apply in lengths of 8' or less. Overlap edge seams 2½". On walls over 8' high, apply in 8' sections, starting at the lowest point with the higher section overlapping the lower section 5". Roll in place using firm pressure with a hand roller.

D. Terminations: Consult Carlisle 860-9 Details for proper terminations. Roll terminating edges firmly. Apply CCW-704 mastic to all terminations and joints. Apply CCW-704 Mastic or CCW-703-V Liquiseal to laps at angle changes, extending 9" in each direction.

3.4 INTEGRITY TESTING

A. Test is required for all expanded warranties beyond the standard material warranty of horizontal applications.

B. The test can be done with Electronic Vector Mapping or flood testing. Flood testing requires 2" minimum head of water for a period of 24 hours.

3.5 PROTECTION COURSE

A. VERTICAL APPLICATION:
Install CCW QuickDRAIN Perimeter Drainage System as the first course of drainage composite immediately after membrane has been installed on vertical surfaces. Install CCW MiraDRAIN Drainage Composite (consult CCW for recommendation), CCW Protection Board-V Protection Course or CCW 200V on remainder. Stop drainage composite 6" below final grade level.

B. HORIZONTAL APPLICATION:
Install CCW MiraDRAIN Drainage Composite (consult CCW for recommendation) or CCW Protection Board-H Protection Course or CCW 300HV immediately after flood testing on horizontal surfaces. If flood testing is delayed, install a temporary covering to protect the CCW MiraDRI 860/861 membrane from damage by other trades.

END OF SECTION
PART 1 – GENERAL
Provisions of the General and Supplementary Conditions and Division 01 apply to this section.

1.01 SUMMARY
A. Section Includes: Furnishing of all labor, materials, services and equipment necessary for the supply and installation of cementitious crystalline waterproofing to concrete substrates, above-grade or below-grade, on wet side of substrates, as indicated on drawings and as specified herein.

B. Related Sections:
1. Section 03100 - Concrete Work
2. Section 07900 - Joint Sealers
3. Section 09900 - Paints and Coatings

1.02 REFERENCES
A. Applicable Standards: The following standards are referenced herein.
1. American Society for Testing and Materials (ASTM)
2. Army Corps of Engineers (CRD)
3. NSF International (NSF)

1.03 SYSTEM DESCRIPTION
A. Cementitious Crystalline Waterproofing: Blend of portland cement, fine treated silica sand and active proprietary chemicals. When mixed with water and applied as a cementitious coating, the active chemicals cause a catalytic reaction which generates a non-soluble crystalline formation of dendritic fibers within the pores and capillary tracts of concrete. This process causes concrete to become permanently sealed against the penetration of liquids from any direction.

1.04 SYSTEM PERFORMANCE REQUIREMENTS
A. Testing Requirements: Crystalline waterproofing system shall be tested in accordance with the following standards and conditions, and the testing results shall meet or exceed the performance requirements as specified herein.

B. Independent Laboratory: Testing shall be performed by an independent laboratory meeting the requirements of ASTM E 329-95 and certified by the United States Bureau of Standards. Testing laboratory shall obtain all concrete samples and waterproofing product samples.

C. Crystalline Penetration: Crystallizing capability of waterproofing material shall be
evidenced by independent SEM (Scanning Electron Microscope) photographs documenting penetration of crystal-forming waterproofing material to a depth of 2 inches (50 mm).

1.05 SUBMITTALS

A. General: Submit listed submittals in accordance with conditions of the Contract and with Division 1 Submittal Procedures Section.

B. Product Data: Submit product data, including manufacturer’s specifications, installation instructions, and general recommendations for waterproofing applications. Also include manufacturer’s certification or other data substantiating that products comply with requirements of Contract Documents.

C. Test Reports: Submit for acceptance, complete test reports from approved independent testing laboratories certifying that waterproofing system conforms to performance characteristics and testing requirements specified herein.

D. Manufacturer’s Certification: Provide certificates signed by manufacturer or manufacturer’s representative certifying that the materials to be installed comply in all respects with the requirements of this specification, and that the applicator is qualified and approved to install the materials in accordance with manufacturer’s product data.

1.06 QUALITY ASSURANCE

A. Manufacturer Qualifications: Manufacturer shall be ISO 9001 registered, and shall have no less than 10 years experience in manufacturing the cementitious crystalline waterproofing materials for the required work. Manufacturers that cannot provide the performance test data specified herein will not be considered for the project.

B. Applicator: Waterproofing applicator shall be experienced in the installation of cementitious crystalline waterproofing materials as demonstrated by previous successful installations, and shall be approved by the manufacturer in writing.

C. Pre-Installation Conference: Prior to installation of waterproofing, conduct meeting with waterproofing applicator, installers of work adjacent to or which penetrates waterproofing, Architect/Engineer, owner’s representative, and waterproofing manufacturer’s representative to verify and review the following:

2. Manufacturer’s product data including application instructions.
3. Substrate conditions, and procedures for substrate preparation and waterproofing installation.

D. Technical Consultation: The waterproofing manufacturer’s representative shall provide technical consultation on waterproofing application.

1.07 DELIVERY, STORAGE AND HANDLING

A. Delivery: Deliver packaged waterproofing materials to project site in original undamaged containers, with manufacturer’s labels and seals intact.
1.08 PROJECT CONDITIONS

A. Compliance: Comply with manufacturer’s product data regarding condition of substrate to receive waterproofing, weather conditions before and during installation, and protection of the installed waterproofing system.

1.09 WARRANTY

A. Manufacturer’s Warranty: Manufacturer shall provide standard product warranty executed by authorized company official. Term of warranty shall be ten years from Date of Substantial Completion.

B. Applicator’s Warranty: Applicator shall warrant the waterproofing installation against defects caused by faulty workmanship or materials for a period of two (2) years from Date of Substantial Completion. The warranty will cover the surfaces treated and will bind the applicator to repair, at his expense, any and all leaks through the treated surfaces which are not due to structural weaknesses or other causes beyond applicator’s control such as fire, earthquake, tornado and hurricane. The warranty shall read as follows:

1. Warranty: The applicator warrants that, upon completion of the work, surfaces treated with cementitious crystalline waterproofing will be and will remain free from water leakage resulting from defective workmanship or materials for a period of two (2) years from Date of Substantial Completion. In the event that water leakage occurs within the warranty period from such causes, the applicator shall, at his sole expense, repair, replace or otherwise correct such defective workmanship or materials. Applicator shall not be liable for consequential damages and applicator’s liability shall be limited to repair, replacement or correcting of defective workmanship or materials. Applicator shall have no responsibility with respect to water leakage or other defects caused by structural failure or movement of the structure, or any other causes beyond Applicator’s control.

PART 2 – PRODUCTS

2.01 MATERIALS

A. Acceptable Manufacturer:
Xypex Chemical Corporation
13731 Mayfield Place, Richmond, B.C., Canada V6V 2G9
Tel: 800 961.4477 or 604 273.5265 Fax: 604 270.0451

B. Proprietary Products: Xypex crystalline waterproofing materials as follows:

1. Xypex Concentrate
2. Xypex Modified
3. Xypex Patch’n Plug

C. Source Quality: Obtain proprietary crystalline waterproofing products from a single manufacturer.

2.02 MIXES
A. General: Mix waterproofing material by volume with clean water which is free from salt and deleterious materials. Mix waterproofing material in quantities that can be applied within 20 to 30 minutes from time of mixing. As mixture thickens, stir frequently, but do not add additional water. Do not mix bonding agents or admixtures with crystalline waterproofing materials.

B. Brush Application Mix: Measure dry powder and place in mixing container. Measure water and mix into the dry powder with a paddle on a slow speed electric drill (250 RPM) or other type mixer which is acceptable to manufacturer. Mixing proportions shall be as follows:

<table>
<thead>
<tr>
<th>Coverage</th>
<th>Proportions (by Volume)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.5 lb./sq. yd. (0.8 kg/m²)</td>
<td>5 powder to 2 water</td>
</tr>
<tr>
<td>2.0 lb./sq. yd. (1.0 kg/m²)</td>
<td>3 powder to 1 water</td>
</tr>
</tbody>
</table>

C. Spray Application Mix: Mixing shall be same as specified for brush application except that mixture shall be thinner. Use following proportions as a guide only. Adjust proportions to match type of spray equipment and pressures used. Mixing proportions shall be as follows:

<table>
<thead>
<tr>
<th>Coverage</th>
<th>Proportions (by Volume)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.5 lb./sq. yd. (0.8 kg/m²)</td>
<td>5 powder to 3 water</td>
</tr>
</tbody>
</table>

D. Dry-Pac Mix: Using a trowel, mix 1 part clean water with 6 parts Xypex Concentrate powder for 10 to 15 seconds. It is acceptable that lumps may be present in mixture. Mix only as much as can be applied in 15 minutes.

PART 3 – EXECUTION

3.01 EXAMINATION

A. Site Visit: Prior to waterproofing installation, arrange visit to project site with waterproofing manufacturer’s representative. Representative shall inspect and certify that concrete surfaces are in acceptable condition to receive waterproofing treatment.

B. Verification of Substrates: Verify that concrete surfaces are sound and clean, and that form release agents and materials used to cure the concrete are compatible with waterproofing treatment.

C. Examination for Defects: Examine surfaces to be waterproofed for form tie holes and structural defects such as honeycombing, rock pockets, faulty construction joints and cracks. Such defects to be repaired in accordance to manufacturer’s product data and 3.02 below.

3.02 PREPARATION

A. Concrete Finish: Concrete surfaces to receive waterproofing treatment shall have an open capillary system to provide tooth and suction, and shall be free from scale, excess form oil, laitance, curing compounds and foreign matter. Horizontal surfaces shall have a rough wood float or broom finish. Where a smooth trowel finish is
required on horizontal surface, crystalline waterproofing material shall be applied by dry shake method at time of concrete finishing in accordance with manufacturer’s product data.

B. Surface Preparation: Smooth surfaces (e.g. where steel forms are used) or surfaces covered with excess form oil or other contaminants shall be washed, lightly sand-blasted, water-blasted, or acid etched with muriatic acid as necessary to provide a clean absorbent surface. Surfaces to be acid-etched shall be saturated with water prior to application of acid.

C. Repair of Defects: Surface defects shall be repaired in accordance with manufacturer’s instructions as follows:

1. Form Tie Holes, Construction Joints, Cracks: Chip out defective areas in a “U” shaped slot one inch (25 mm) wide and a minimum of one inch (25 mm) deep. Clean slot of debris and dust. Soak area with water and remove excess surface water. Apply a slurry coat of Xypex Concentrate at the rate of 1.5 lb./sq. yd. (0.8 kg/m²) to the slot. Allow slurry to reach an initial set, then fill cavity with Dry-Pac. Compress tightly into cavity using pneumatic packer or block and hammer.

2. Rock Pockets, Honeycombing or Other Defective Concrete: Rout out defective areas to sound concrete. Remove loose materials and saturate with water. Remove excess surface water and apply a slurry coat of Xypex Concentrate to area. After slurry has set, but while still “green”, fill cavity to surface level with non-shrink grout.

D. Wetting Concrete: Prior to application of waterproofing treatment, thoroughly saturate concrete surfaces with clean water as required to ensure migration of crystalline chemicals into voids and capillary tracts of the concrete. Remove free surface water before application.

3.03 APPLICATION

A. Construction Joints: Apply Xypex Concentrate in slurry form at a rate of 2.0 lb./sq. yd. (1.08 kg/m²) to joint surfaces between concrete pours. Moisten surfaces prior to slurry application. Where joint surfaces are not accessible prior to pouring new concrete, consult manufacturer for application procedure.

B. Sealing Strips and Coves: Prepare concrete surfaces that will come into contact with sealing strips and coves by applying one coat of Xypex Concentrate in slurry form at a rate of 1.5 lb./sq. yd. (0.8 kg/m²). Then apply Xypex Concentrate in Dry-Pac form (sealing strip) or Xypex Modified in mortar consistency (cove) after slurry coat has reached an initial set but is still “green”.

1. Sealing Strips: Where indicated on drawings, fill preformed grooves, one inch (25 mm) wide and minimum of 1.5 inch (37 mm) deep, located at construction joints with Xypex Concentrate in Dry-Pac form. Compact Dry-Pac tightly into groove using a pneumatic packer or hammer and block.

2. Coves: Where indicated on drawings, trowel apply and pack Xypex Modified mortar into a cove shape.
C. Surface Application: After repairs, surface preparation, treatment of construction joints and sealing strip placement have been completed in accordance with manufacturer's product data and as specified herein, apply Xypex treatment uniformly to concrete surfaces with semi-stiff bristle brush or broom, or suitable spray equipment. Application rates and locations shall be as indicated in the drawings and in accordance with manufacturer's product data. When brushing, work slurry well into surface of the concrete, filling surface pores and hairline cracks. When spraying, hold nozzle close enough to ensure that slurry is forced into pores and hairline cracks.

1. First Coat (of one or two coat application): Apply Xypex Concentrate slurry coat to locations indicated on drawings in accordance with manufacturer’s product data.

2. Second Coat (of two coat application): Where indicated on drawings or as required by manufacturer’s product data, apply Xypex Modified slurry coat while first coat of Xypex Concentrate is still “green” but after it has reached an initial set. Use light prewatering between coats when rapid drying conditions exist.

3.04 CURING

A. General: Begin curing as soon as Xypex coating has hardened sufficiently so as not to be damaged by a fine spray. Cure Xypex treatment with a mist fog spray of clean water three times a day for 2 to 3 days, or cover treated surfaces with damp burlap for the prescribed period. In warm climates, more than three sprayings per day may be necessary to prevent excessive drying of coating.

B. Air Circulation: Do not lay plastic sheeting directly on the waterproofing coating as air contact is required for proper curing. If poor circulation exists in treated areas, it may be necessary to provide fans or blown air to aid in curing of waterproofing treatment.

C. Holding Structures: For concrete holding structures such as swimming pools, reservoirs, water treatment tanks and wet wells, cure Xypex treatment for three days and then allow treatment to set for 12 days before filling structure with liquid. For structures holding hot or corrosive liquids, cure waterproofing treatment for three days and allow to set for 18 days before filling.

D. Protection: During the curing period, protect treated surfaces from damage by wind, sun, rain and temperatures below 36oF (2oC). If plastic sheeting is used for protection, it must be raised off of waterproofing coating to allow sufficient air circulation.

E. Curing Agent: If moist curing is not possible, use a chemical curing agent that is specifically designed for or compatible with the approved crystalline waterproofing treatment. Curing agent shall have at least two years of successful field use and shall be approved by waterproofing manufacturer in writing.

3.05 INTERFACE WITH OTHER MATERIALS

A. Backfilling: Do not backfill for 36 hours after application. If backfill takes place within seven days after application, then backfill material shall be moist so as not
to draw moisture from waterproof coating.

B. Paint, Epoxy or Similar Coatings: Do not apply paint or other coatings until waterproofing treatment has cured and set for a minimum of 21 days. Before applying paint or coating, neutralize treated surface by dampening with water and then washing waterproofed surface with 15% muriatic acid, diluted in a ratio of one part acid to four parts water by volume. Flush acid off treated concrete surfaces.

C. Grout, Cement Parge Coat, Plaster or Stucco: Because the waterproof coating forms a relatively smooth surface and the resulting crystalline formation fills the concrete pores thereby reducing suction characteristics of the concrete, it may be necessary to use a suitable bonding agent for proper bonding of cementitious systems.

D. Responsibility to Ensure Compatibility: Xypex Chemical Corporation makes no representations or warranties regarding compatibility of Xypex treatment with coatings, plasters, stuccos, tiles or other surface-applied materials. It shall be the responsibility of the installer of the surface-applied material that is to be applied over the Xypex waterproofing treatment, to take whatever measures are necessary, including testing, to ensure acceptance by or adhesion to the waterproofing treatment.

3.06 FIELD QUALITY CONTROL

A. Observation: Do not conceal installed waterproofing system before it has been observed by Architect/Engineer, waterproofing manufacturer’s representative and other designated entities.

3.07 CLEANING AND PROTECTION

A. Cleaning: Clean spillage and soiling from adjacent surfaces using appropriate cleaning agents and procedures.

B. Protection: Take measures to protect completed Xypex coating from damage after application. Do not permit traffic on unprotected coating.

END OF SECTION
PART 1 - GENERAL

1.1 SUMMARY

A. Section includes:

1. Thermal insulation at following locations unless otherwise indicated or specified:
   a. In all exterior walls above grade, except parapet walls, and where louvers, vision glass, fiber-glass panels and doors occur. In ceilings where indicated on drawings.
   b. Acoustic insulation in all interior walls and above ceilings in restrooms.

2. Supplementary parts and components, such as clips, fasteners, supplementary framing, and other miscellaneous accessories required for a complete installation.

B. Related work:

1. Division 1
2. Division 15 for pipe and duct insulation.

1.2 SUBMITTALS

A. Product Data: For all insulation materials specified.
1.3 HANDLING

A. Packaging: Provide unopened containers and packages with labels bearing producer(s) name and source of product and date of manufacture, with UL classification on package.

B. Storage:
   1. Keep insulation protected while stored; keep dry during application.
   2. Outdoors, store off ground on pallets, protected with breathing type covers.
   3. Insulation shall be dry when installed.
   4. Remove insulation that becomes wet or damp immediately from the job site.

1.4 ENVIRONMENTAL REQUIREMENTS

A. Install insulation in dry weather, unless building is enclosed.

B. If insulation will be exposed to the elements after installation, cover with waterproof membrane each day.

PART 2 -PRODUCTS

2.1 FOAM BOARD INSULATION MATERIALS

A. Expanded Polystyrene Board Insulation: ASTM C 578; with the following characteristics:
   1. Flame Spread Index: 75 or less, when tested in accordance with ASTM E 84.
   2. Smoke Developed Index: 450 or less, when tested in accordance with ASTM E 84.
   6. Water Absorption: 4 percent by volume, maximum, when tested in accordance with ASTM D 2842.
   7. Board Density: 0.7 lb/cu ft.
   9. Manufacturers:
   10. Substitutions: See Section 01 60 00 - Product Requirements.

2.2 THERMAL INSULATION

A. “R” value: Minimum of R21 at exterior walls, R30 at exterior ceilings and R-11 at interior walls.
   1. Type: Glass fiber blanket insulation complying with ASTM C 553-02,
and ASTM 136, Type III, Class A, flame spread 25 or less, formaldehyde-free by Johns Manville, CertainTeed, or equal.


2. Width: Batt width shall match the stud spacing and be sized for a friction-fit to be self-supporting.

2.3 INSTALLATION MATERIALS

A. Staples, zinc-coated wires and other devices for fastening insulation: As recommended by the insulation manufacturer.

B. Insulation tape: "FSK Copolymer" by Compac Corp., (800. 631.9347), General Purpose FSK Facing Tape by Venture Tape, (800.343.1076) or equal FSK-faced cold weather tape a minimum of 2 inches wide.

C. Supplementary metal framing where required for insulation support: As specified in Section 06100.

PART 3 -EXECUTION

3.1 EXAMINATION/PREPARATION

A. Examine conditions and measurements affecting the work of this Section at site.

B. Correct detrimental conditions before proceeding with installation.

C. Before installing insulation in stud walls, thoroughly clean space of debris. Also clean spandrel cavities of debris.

3.2 INSTALLATION

A. Install insulation where shown and specified. Cut to fit irregular spaces, butt edges into firm contact with each other and adjoining surfaces.

1. Hand pack around pipes, ducts, conduits, electrical boxes, and other penetrations as required to thoroughly fill all voids and spaces between framing members and to form a continuous thermal barrier.

2. Do not compress insulation more than 10 percent.

3. Where door and window frames occur in insulated assemblies, cut additional strips of insulation and hand-pack to fill all voids in and around the frames.

4. Comply with the National Electrical Code (NEC) for installation in proximity to light fixtures. Do not install insulation closer than recommended by NEC.

B. Where insulation in stud walls is not self-supporting, hold it in place with wires spaced
not more than 16 inches o.c. horizontally or by other methods acceptable to the Architect.

C. After installation is complete, tape penetrations and ruptures in vapor barrier under deck roof insulation, and tape joints between batts continuously.

3.3 FIELD QUALITY CONTROL

A. Prior to closing-in of insulated assemblies, or prior to Substantial Completion for insulation that will remain exposed in the building, refit, reinstall and/or replace wet, damaged and displaced insulation.

END OF SECTION
SECTION 07250
WEATHER BARRIERS

PART 1 - GENERAL

1. SECTION INCLUDES
   a. Vapor-permeable water-resistive barrier for rainscreen assemblies.

2. RELATED REQUIREMENTS
   a. Division 06 Section "Sheathing" for exterior wall sheathing substrate for weather barrier.
   b. Division 07 Section "Metal Wall Panels" for rainscreen cladding assembly over water-resistive barrier.
   c. Division 07 Section "Siding" for rainscreen cladding assembly over water-resistive barrier.

3. REFERENCE STANDARDS
   a. American Association of Textile Chemists and Colorists (AATCC):
   b. ASTM International (ASTM):
      2) ASTM E 84 - Test Method for Surface Burning Characteristics of Building Materials
      3) ASTM E 96/E 96M - Test Methods for Water Vapor Transmission of Materials

4. QUALITY ASSURANCE
   a. Single Source: Provide water-resistive barrier and accessories that are products of or recommended for use by a single manufacturer.
   b. Manufacturer Qualifications: Approved manufacturer of products listed in this Section with minimum 5 years experience in manufacture of similar products in successful use in similar applications.
      1) Approval of Comparable Products: Submit the following in accordance with project substitution requirements, within time allowed for substitution review:
         a) Product data, including certified independent test data indicating compliance with requirements.
         b) Samples of each component.
         c) Sample warranty.
      2) Substitutions following award of contract are not allowed except as stipulated in Division 01 General Requirements.
   c. Fire Performance Characteristics: Provide water-resistive barrier with the following fire-test characteristics.
1) Surface-Burning Characteristics: ASTM E 84.
   a) Flame spread index: 25 or less.
   b) Smoke developed index: 450 or less.

d) Mockups: Build mockup in size and location indicated. Show details of water-resistive barrier. Demonstrate methods and details of installation. Show details of joints, penetrations, openings, inside and outside corners, and top and bottom of wall.
   1) Perform water spray test of mockup to demonstrate performance.
   2) Approved mockup may become part of installation if approved by Architect.

5. ADMINISTRATIVE REQUIREMENTS

   a. Preinstallation Meeting: Conduct preinstallation meeting at site attended by Installer, affected trade contractors, and inspector. Invite Owner and Architect.
      1) Coordinate substrate installation in relation to requirements for water-resistive barrier.
      2) Coordinate window, door, and other openings and penetrations of water-resistive barrier.
      3) Review mockup.

6. ACTION SUBMITTALS

   a. Product Data: Manufacturer’s data sheets for specified products. Include data indicating compliance with requirements of this Section.
      1) Provide manufacturer's standard installation instructions and details for water-resistive barrier and rainscreen components and accessories.

   b. Samples: Submit samples of the following:
      1) Water-resistive barrier sheet, minimum 10 by 10 inches (254 by 254 mm).
      2) Rainscreen components, minimum 12-inch (305-mm) lengths.
      3) Membrane flashings and tapes.
      4) Fasteners.
      5) Sealants.

7. INFORMATIONAL SUBMITTALS


   b. Manufacturer's warranty: Submit sample warranty.

8. WARRANTY

   a. Special Manufacturer's Warranty: On manufacturer's standard form, in which manufacturer agrees to provide replacement material for water-resistive barrier installed in accordance with manufacturer's instructions that fails due to material defects within 20 years from date of purchase.

PART 2 - PRODUCTS

1. MANUFACTURER AND PRODUCT

   a. Basis of Design: VaproShield, WallShield Water-Resistive Barrier and Rainscreen Underlayment. Provide basis of design product, or comparable product approved by Architect prior to bid.
2. WATER-RESISTIVE BARRIER

   1) Surface Burning Characteristics, ASTM E 84: Flame-spread index, less than 25; Smoke-developed index, less than 450.
   2) Water Vapor Permeance, ASTM E 96 Method B: 200 perms (11500 ng/(Pa*s*m2), minimum.
   3) Water Resistance, AATCC 127, 550 mm hydrostatic head for 5 hours: No leakage.
   4) Tensile Strength, ASTM D 882: 25 lbf/inch (43.8 N/mm), machine direction; 20 lbf/inch (35.0 N/mm), cross-machine direction.
   5) Allowable UV Exposure Time: 270 days.
   6) Thickness: 0.020 inches (0.51 mm).
   7) Weight: 5 oz per sq. yd. (17 g/sq. m).

3. RAINSCREEN ACCESSORIES

a. General: Provide manufacturer's rainscreen design components and flashing elements for a complete, weather-tight, ventilated wall installation.

b. Flashing and Lap Tapes: Self-adhering single- and double- sided adhesive flashing, lap, and transition tapes, as recommended by manufacturer for application.
   1) Single-Sided Tape: 20 mil by 3 inch (76 mm) wide lap and edge tape.
   2) Double-Sided Tape: 30 mil by 1 inch (25 mm) wide lap tape.
   3) UV-Resistant Black Tape: 35 mil by 4 inch (102 mm) wide exposed open joint tape.
   4) Aluminized Tape: 20 mil by 4.5 inch (114 mm) and 9 inch (229 mm), UV stable, moisture-resistant, and self-priming flashing and transition tape.

c. Sill Pan: Extruded PVC, with integral slope, preformed corner dams, and window unit spacer supports, configured to drain moisture from window unit base to exterior. Coordinate selection of sill pan depth with window unit frame size.
   1) Basis of Design: VaproShield, VaproSillSaver.

d. Fasteners: Manufacturer's recommended corrosion-resistant, cap-headed steel or stainless steel nails, staples, or screws used in conjunction with manufacturer's spray adhesive, as appropriate for substrate.

c. Sealants: Type recommended by manufacturer for application, meeting requirements of Division 07 Section "Joint Sealants."

PART 3 - EXECUTION

1. INSPECTION

a. Examine substrate with Installer present for compliance with requirements and other conditions that would adversely affect installation or performance of weather resistive barrier. Correct deficient conditions prior to proceeding with water-resistive barrier installation.
2. **SUBSTRATE PREPARATION**

   a. Clean and prepare substrate according to manufacturer’s written recommendations. Provide clean and dry substrate for breathable membrane application.

3. **WATER-RESISTIVE BARRIER INSTALLATION**

   a. General: Install water-resistant barrier in accordance with manufacturer’s instructions over exterior sheathing. Secure water-resistant barrier to substrate to prevent damage prior to installation of cladding.

   b. Window and Louver Openings

      1) Secure prefabricated sill pan and water-resistant barrier corners at sill of opening.
      2) Install lap strip of water-resistant barrier across sill and secure with tape or mechanical fasteners, leaving bottom of lap strip free to overlap water-resistant barrier minimum of 6 inches (150 mm).
      3) Install lap strip water-resistant barrier around jambs, extending along wall surface a minimum of 9 inches (230 mm).
      4) Secure prefabricated water-resistant barrier corners at head of opening.
      5) Install lap strip of water-resistant barrier across head of opening, extending horizontally beyond corners minimum of 6 inches (150 mm).

   c. Door Openings

      1) Install water-resistant barrier lap strip around jambs, extending along wall surface a minimum of 9 inches (230 mm).
      2) Secure prefabricated water-resistant barrier corners at head of opening.
      3) Install lap strip of water-resistant barrier across head of opening, extending horizontally beyond corners minimum of 6 inches (150 mm).

   d. Pipe and Conduit Penetrations

      1) Install manufactured penetration sleeves sized for penetration and installed as recommended by sleeve manufacturer.
      2) Prepare water-resistant barrier skirt with minimum 12 inches (300 mm) of fabric on all sides at counter-flashed penetrations. Make multiple cuts to form a star-shaped opening in fabric and place over penetration. Extend skirt fabric along penetrating item and seal to penetrating item with single-sided tape.

   e. Water-Resistant Barrier

      1) Begin water-resistant barrier installation at bottom of wall, mechanically fastening water-resistant barrier at bottom and top at 24 inches (600 mm) o.c. Seal bottom edge of water-resistant barrier to substrate in continuous bead of non-skinning butyl sealant or butyl tape.
      2) Install water-resistant barrier at overlapped lap strips and penetration skirts. Overlap at vertical laps minimum of 6 inches (150 mm) with taped joints or 12 inches (300 mm) without tape. Overlap at horizontal laps minimum of 6 inches (150 mm). Insert water-resistant barrier under bottom edge of lap strips and penetration skirts; do not tape bottom edge of skirts and lap strips.
      3) Extend water-resistant barrier 6 inches (150 mm) over corners.
      4) Shingle subsequent courses of water-resistant barrier. Do not place vertical laps above openings.
      5) Use additional mechanical fasteners in field of sheet and tape joints if water-resistant barrier will be left exposed prior to installation of cladding.

   f. Exposed Rainscreen Water-Resistive Barrier
1) Use manufacturer's recommended UV-resistant black-surfaced water-resistive barrier material or UV-resistant black tape at open joints in spaced rainscreen cladding systems.

4. FIELD QUALITY CONTROL
   a. Owner will engage independent inspector to inspect substrate, observe installation, and inspect and document completed water-resistive barrier prior to concealment. Submit photo documentation and written report of inspections.

5. PROTECTING AND CLEANING
   a. Protect installed water-resistive barrier from damage due to construction activities, high wind conditions, and extended exposure to weather.
   b. Inspect exposed water-resistive barrier prior to installation of cladding. Remove water-resistant barrier materials that have been damaged and replace. Patch damaged areas as recommended by manufacturer.

END OF SECTION
SECTION 07410
METAL WALL PANELS

General
Scope
Section Includes
The extent of panel system work is indicated on the drawings and in these specifications.
Panel system requirements include the following components:
Aluminum faced composite panels with mounting system. Panel mounting system including anchorages, shims, furring, fasteners, gaskets and sealants, related flashing adapters, and masking (as required) for a complete watertight installation. Parapet coping, column covers, soffits, sills, border, and filler items indicated as integral components of the panel system or as designed.

RELATED DOCUMENTS
Drawings and general provisions of the Contract, including General and Supplementary Conditions, Division 1 Specification Sections, and Technical Specification Divisions 2 through 16 apply to this Section.

RELATED WORK SPECIFIED ELSEWHERE
Section 07200: Insulation
Section 07600: Metal flashing and counter flashing
Section 07920: Caulking and sealants

QUALITY ASSURANCE
Composite Panel Manufacturer shall have a minimum of 5 years experience in the manufacturing of this product.
Composite Panel Manufacturer shall be solely responsible for panel manufacture and application of the finish.
Fabricator/installer shall be acceptable to the composite panel manufacturer.
Fabricator/Installer shall have a minimum 5 years experience of metal panel work similar in scope and size to this project.
Field measurements should be taken prior to the completion of shop fabrication whenever possible. However, coordinate fabrication schedule with construction progress as directed by the Contractor to avoid delay of work. Field fabrication may be allowed to ensure proper fit. However, field fabrication shall be kept to an absolute minimum with the majority of the fabrication being done under controlled shop conditions.
Shop drawings shall show the preferred joint details providing a watertight and structurally sound wall panel system that allows no uncontrolled water penetration on the inside face of the panel system as determined by ASTM E 331. Systems not utilizing a construction sealant at the panel joints (i.e. Rout and Return Dry and Rear Ventilated System) shall provide a means of concealed drainage with baffles and weeps for water which may accumulate in members of the system.
Maximum deviation from vertical and horizontal alignment of erected panels: 6mm (1/4") in 6m (20') non-accumulative.
Panel fabricator/installer shall assume undivided responsibility for all components of the exterior panel system including, but not limited to attachment to sub-construction, panel to panel joinery, panel to dissimilar material joinery, and joint seal associated with the panel system.
Composite panel manufacturer shall have established a Certification Program acceptable to the local Code Authorities.

References
Aluminum Association
AA-C22-A41: Anodized - Clear Coatings.
American Architectural Manufacturers Association
AAMA 508-05: Voluntary Test Method and Specification for Pressure Equalized Rain Screen Wall Cladding Systems
American Society for Testing and Materials
E 330 Structural Performance of Exterior Windows, Curtain Walls, and Doors Under the Influence of Wind Loads
E 283 Rate of Leakage through Exterior Windows, Curtain Walls, and Doors
D 1781 Climbing Drum Peel Test for Adhesives
E 84 Surface Burning Characteristics of Building Materials
D 3363 Method for Film Hardness by Pencil Test
D 2794 Resistance of Organic Coatings to the Effects of Rapid Deformation (Impact)
D 3359 Methods for Measuring Adhesion by Tape Test
D 2247 Practice for Testing Water Resistance of Coatings in 100% Relative Humidity
B 117 Method of Salt Spray (Fog) Testing
D 822 Practice for Operating Light and Water Exposure Apparatus (Carbon-Arc Type) for Testing Paint, Varnish, Lacquer, and Related Products
D 1308 Effect of Household Chemicals on Clear and Pigmented Organic Finishes
D 1929 Standard Test Method for Determining Ignition Temperature of Plastics
D 635 Standard Test Method for Rate of Burning and/or Extent and Time of Burning of Plastics in a Horizontal Position

SUBMITTALS
Submittals shall be in conformance with Section 01300.

Samples
Panel System Assembly: Two samples of each type of assembly. 304mm (12") x 304mm (12") minimum.
Two samples of each color or finish selected, 76mm (3") x 102mm (4") minimum.

Shop Drawings
Submit shop drawings showing project layout and elevations; fastening and anchoring methods; detail and location of joints, sealants, and gaskets, including joints necessary to accommodate thermal movement; trim; flashing; and accessories.

Affidavit certifying material meets requirements specified.

Two copies of manufacturer's literature for panel material.

Code Compliance
Documents showing product compliance with the national and local building code shall be submitted prior to the bid. These documents shall include, but not be limited to, appropriate Evaluation Reports and/or test reports supporting the use of the product.

Alternate materials must be approved by the architect prior to the bid date.

DELIVERY, STORAGE AND HANDLING
Protect finish and edges in accordance with panel manufacturer's recommendations.
Store material in accordance with panel manufacturer's recommendations.

Products
PANELS
Composite Panels
ALUCOBOND material manufactured by 3A Composites USA, Inc. 208 West 5th Street, Benton, KY 42025 (800-626-3365 or 270-527-4200)

Items of the same function and performance, which have received prior approval from the architect, shall be allowed for this project. Approval shall be based on documentation submitted showing the adequacy of the material.

Thickness: 4mm (0.157")

Product Performance

Bond Integrity
When tested for bond integrity, in accordance with ASTM D1781 (simulating resistance to panel delamination), there shall be no adhesive failure of the bond
a) between the core and the skin nor b) cohesive failure of the core itself below the following values:

Peel Strength: 115 N mm/mm (22.5 in lb/in) as manufactured
115 N mm/mm (22.5 in lb/in) after 21 days soaking in water at 70°F
Fire Performance

ASTM E 84  Flame Spread Index must be less than 25, Smoke Developed Index must be less than 450.
ASTM D 1929  A self ignition temperature of 650°F or greater
ASTM D-635  Requires a CC1 classification

Finishes
Coil coated KYNAR® 500 or HYLAR® 5000 based Polyvinylidene Fluoride (PVDF) or Fluoro Ethylene – Alkyl Vinyl Ether (FEVE) resin in conformance with the following general requirements of AAMA 2605.

Color:
West Pewter Mica.

Coating Thickness:
Colors: 1.0 mil (±0.2 mil).

Hardness:  ASTM D-3363; HB minimum using Eagle Turquoise Pencil.

Impact:
Coating shall withstand reverse impact of 1.5"/pounds per mil substrate thickness.
Coating shall adhere tightly to metal when subjected to #600 Scotch Tape pick-off test. Slight minute cracking permissible. No removal of film to substrate.

Adhesion:
Coating shall not pick off when subjected to an 11" x 11" x 1/16" grid and taped with #600 Scotch Tape.

Humidity Resistance
Test Method: ASTM D-2247.
No formation of blisters when subject to condensing water fog at 100% relative humidity and 100°F for 4000 hours.

Salt Spray Resistance:
Test Method: ASTM B-117; Expose coating system to 4000 hours, using 5% NaCl solution.
Corrosion creepage from scribe line: 1/16" max.
Minimum blister rating of 8 within the test specimen field.

Weather Exposure
Outdoor:
Ten-year exposure at 45° angle facing south Florida exposure.
Maximum color change of 5 Delta E units as calculated in accordance with ASTM D-2244.
Maximum chalk rating of 8 in accordance with ASTM D-4214.
No checking, crazing, adhesion loss.

Chemical Resistance:
ASTM D-1308 utilizing 10% Muriatic Acid for an exposure time of 15 minutes. No loss of film adhesion or visual change when viewed by the unaided eye.
ASTM D-1308 utilizing 20% Sulfuric Acid for an exposure time of 18 hours. No loss of film adhesion or visual change when viewed by the unaided eye.
AAMA 2605 utilizing 70% reagent grade Nitric Acid vapor for an exposure time of 30 minutes. Maximum color change of 5 Delta E units as calculated in accordance with ASTM D-2244.

PANEL FABRICATION
Composition:
Two sheets of aluminum sandwiching a solid core of extruded thermoplastic material formed in a continuous process with no glues or adhesives between dissimilar materials.
The core material shall be free of voids and/or air spaces and not contain foamed insulation material. Products laminated sheet by sheet in a batch process using glues or adhesives between materials shall not be acceptable.

Aluminum Face Sheets:
Thickness: 0.50mm (0.0197") (nominal)
Alloy: AA3000 Series (Painted material)

Panel Weight:
4mm (0.157") : 1.12 lbs./ft²

Tolerances
Panel Bow: Maximum 0.8% of any 1828mm (72") panel dimension.
Panel Dimensions: Field fabrication shall be allowed where necessary, but shall be kept to an absolute minimum. All fabrication shall be done under controlled shop conditions when possible.
Panel lines, breaks, and angles shall be sharp, true, and surfaces free from warp and buckle. Maximum deviation from panel flatness shall be 1/8" in 5'0" on panel in any direction for assembled units. (Non-accumulative - No Oil Canning)

System Characteristics
Plans, elevations, details, characteristics, and other requirements indicated are based upon standards by one manufacturer. It is intended that other manufacturers, receiving prior approval, may be acceptable, provided their details and characteristics comply with size and profile requirements, and material/performance standards.
System must not generally have any visible fasteners, telegraphing or fastening on the panel faces or any other compromise of a neat and flat appearance.
System shall comply with the applicable provisions of the "Metal Curtain Wall, Window, Storefront, and Entrance Guide Specifications Manual" by AAMA and ANSI/AAMA 302.9 requirements for aluminum windows.
Fabricate panel system to dimension, size, and profile indicated on the drawings based on a design temperature of 70°F.
Fabricate panel system so that no restraints can be placed on the panel, which might result in compressive skin stresses. The installation detailing shall be such that the panels remain flat regardless of temperature change and at all times remain air and water tight.
The finish side of the panel shall have a removable plastic film applied prior to fabrication, which shall remain on the panel during fabrication, shipping, and erection to protect the surface from damage.

System Type
Pressure Equalized Rain Screen System:
System must provide air/vapor barrier as indicated in AAMA 508-05.

System Performance
Composite panels shall be capable of withstanding building movements and weather exposures based on the following test standards required by the Architect and/or the local building code.

Wind Load
If system tests are not available, mock-ups shall be constructed and tests performed under the direction of an independent third party laboratory, which show compliance to the following minimum standards:

Panels shall be designed to withstand the Design Wind Load based upon the local building code, but in no case less than 20 pounds per square foot (psf) and 30 psf on parapet and corner panels. Wind load testing shall be conducted in accordance with ASTM E330 to obtain the following results.

Normal to the plane of the wall between supports, deflection of the secured perimeter-framing members shall not exceed L/175 or 3/4", whichever is less.

Normal to the plane of the wall, the maximum panel deflection shall not exceed L/60 of the full span.
Maximum anchor deflection shall not exceed 1/16".

At 1-1/2 times design pressure, permanent deflections of framing members shall not exceed L/100 of span length and components shall not experience failure or gross permanent distortion. At connection points of framing members to anchors, permanent set shall not exceed 1/16".

**Air/Water System Test**

If system tests are not available, mock-ups shall be constructed and tests performed under the direction of an independent third party laboratory, which show compliance to the following minimum standards:

**Air Infiltration** - When tested in accordance with ASTM E283, air infiltration at 1.57 psf must not exceed 0.06 cfm/ft² of wall area.

**Water Infiltration** - Water infiltration is defined as uncontrolled water leakage through the exterior face of the assembly. Systems not using a construction sealant at the panel joints (i.e. Rout and Return Dry and Rear Ventilated Systems) shall be designed to drain any water leakage occurring at the joints. No water infiltration shall occur in any system under a differential static pressure of 6.24 psf after 15 minutes of exposure in accordance with ASTM E331.

**Pressure Equalized Rain Screen Systems** shall comply with AAMA 508-05 Voluntary Test Method and Specification for Pressure Equalized Rain Screen Wall Cladding Systems

**ACCESSORIES**

Extrusions, formed members, sheet, and plate shall conform with ASTM B209 and the recommendations of the manufacturer.

Panel stiffeners, if required, shall be structurally fastened or restrained at the ends and shall be secured to the rear face of the composite panel with silicone of sufficient size and strength to maintain panel flatness. Stiffener material and/or finish shall be compatible with the silicone.

Sealants and gaskets within the panel system shall be as per manufacturer's standards to meet performance requirements.

Fabricate flashing materials from 0.030" minimum thickness aluminum sheet painted to match the adjacent curtain wall / panel system where exposed. Provide a lap strap under the flashing at abutted conditions and seal lapped surfaces with a full bed of non-hardening sealant.

Fasteners (concealed/ non-corrosive): Fasteners as recommended by panel manufacturer. Do not expose fasteners except where unavoidable and then match finish of adjoining metal.

**EXECUTION**

**INSPECTION**

Surfaces to receive panels shall be even, smooth, sound, clean, dry and free from defects detrimental to work. Notify contractor in writing of conditions detrimental to proper and timely completion of the work. Do not proceed with erection until unsatisfactory conditions have been corrected.

Surfaces to receive panels shall be structurally sound as determined by a registered Architect/Engineer.

**INSTALLATION**

Erect panels plumb, level, and true.

Attachment system shall allow for the free and noiseless vertical and horizontal thermal movement due to expansion and contraction for a material temperature range of -20°F to +180°F. Buckling of panels, opening of joints, undue stress on fasteners, failure of sealants or any other detrimental effects due to thermal movement will not be permitted. Fabrication, assembly, and erection procedure shall account for the ambient temperature at the time of the respective operation.
Panels shall be erected in accordance with an approved set of shop drawings. Anchor panels securely per engineering recommendations and in accordance with approved shop drawings to allow for necessary thermal movement and structural support. Conform to panel fabricator’s instructions for installation of concealed fasteners. Do not install component parts that are observed to be defective, including warped, bowed, dented, abraised, and broken members. Do not cut, trim, weld, or braze component parts during erection in a manner which would damage the finish, decrease strength, or result in visual imperfection or a failure in performance. Return component parts which require alteration to shop for refabrication, if possible, or for replacement with new parts. Separate dissimilar metals and use gasketed fasteners where needed to eliminate the possibility of corrosive or electrolytic action between metals.

**ADJUSTING AND CLEANING**

Remove and replace panels damaged beyond repair as a direct result of the panel installation. After installation, panel repair and replacement shall become the responsibility of the General Contractor. Repair panels with minor damage. Remove masking (if used) as soon as possible after installation. Masking intentionally left in place after panel installation on an elevation, shall become the responsibility of the General Contractor. Any additional protection, after installation, shall be the responsibility of the General Contractor. Make sure weep holes and drainage channels are unobstructed and free of dirt and sealants. Final cleaning shall not be part of the work of this section.
PART 1 - GENERAL

1.1 WORK

A. Provide everything required to complete the work as shown on the Drawings and specified herein.

1.2 QUALITY STANDARDS

A. Provide experienced, well-trained workers competent to complete the work as specified. Fabricator/installer shall be experienced in performing work of similar type and scope.

B. Unless approved by the Architect, provide all related products and accessories from one manufacturer.

C. Ventilated rainscreen system shall provide complete secondary drainage system, draining at base of wall. Supporting substrate for exterior wall panels shall comply with all current codes and regulations.

1.3 SUBMITTALS

A. Submit the following within 30 calendar days after receiving the Notice to Proceed.

B. Submit list of materials to be provided for this work; manufacturer's data required to prove compliance with these Specifications, manufacturer's installation instructions; shop drawings of the ventilated rainscreen system, as required, with complete details and assembly instructions.

C. Submit samples as required for approval by the Architect.

D. Shop Drawings for Ventilated Rainscreen System: Shop Drawings shall be complete with specific instructions for the installation of panels, sub-frame assemblies and other component parts. Include engineering analysis. Drawings shall indicate sizes of ventilation openings and methods of preventing unwanted insects or animals from entering cavity behind panels.

1.4 PRECONSTRUCTION AND PREPARATION

A. Examine and verify that job conditions are satisfactory for speedy and acceptable work.

B. Field Measurements: Secure field measurements before preparation of shop drawings and fabrication where possible, for proper fabrication and installation of the work.

C. Preinstallation Meeting: Conduct preinstallation meeting to verify project requirements, substrate conditions, manufacturer's installation instructions and manufacturer's warranty requirements.

1.5 DELIVERY, STORAGE, AND HANDLING
A. Deliver materials in manufacturer's original, unopened, undamaged containers with identification labels intact. Materials must be transported flat and kept dry and protected from the elements and handled with care.

B. Storage and Protection: Materials must be stored flat and kept dry in a warehouse/storage facility, protected from exposure to harmful weather conditions, at temperatures and humidity conditions recommended by the manufacturer.

1.6 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.

1.7 WARRANTY

A. Project Warranty: Refer to Conditions of the Contract for project warranty provisions.

B. Manufacturer's Warranty: Submit, for Owner's acceptance, manufacturer's standard warranty document executed by authorized company official. Manufacturer's warranty is in addition to, and not a limitation of, other rights Owner may have under Contract Documents.

PART 2 PRODUCTS

2.1 MANUFACTURERS

A. Provide PARKLEX FACADE Exterior Grade Wood Composite Panels

Distributed by: Finland Color Plywood Corporation Headquarters
1310 Main St.
Venice, CA 90291
Bus: (310) 396-9991
Bus Fax: (310) 396-4482
E-mail: info@fcpcusa.com
Warehouses in Los Angeles, CA & Port Newark, NJ
http://www.fcpcusa.com/

Manufactured by: Composites Gurea, S.A.
Zalain 13
31780 Vera de Bidasoa, Navarra
Spain
http://www.parklex.com/

B. Substitutions: per Section 01640.

2.2 MATERIALS

A. EXTERIOR GRADE WOOD COMPOSITE PANEL: Laminated wood panel, double-face, outerply Ayous, or oak wood coated with phenolic resins; inner core paper fibers treated with thermo-hardened resins. Assembly system shall be hidden fastening with hanger system.
1. WOOD VENEER: AMBAR

Smooth surface (standard).

2. PANEL DIMENSIONS:

1220mm (48") x 2440mm (96") x thickness.

Thickness: as indicated on drawings.

3. DIMENSIONAL TOLERANCES:

Length ±2mm, Width ±2mm, Thickness ±0.55mm (10mm thick panel).

4. WEIGHT:

(8mm); 1220mm x 2440mm x 8mm panel weighs approximately 73 pounds.

(10mm); 1220mm x 2440mm x 10mm panel weighs approximately 93 pounds.

5. SURFACE BURNING CHARACTERISTICS:

Report on surface burning characteristics determined by ASTM E-84 Class B - 75 or under flame spread, with a flame spread index of 40 and smoke developed index of 35.

6. THERMAL PROPERTIES:

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<tr>
<th>Parameter</th>
<th>Description Metric</th>
<th>Metric</th>
<th>English</th>
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<tr>
<td>Thermal Conductivity k</td>
<td>0.18 W/m·K</td>
<td>0.104 (Btu/h)/ft·F</td>
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</tr>
<tr>
<td>Thermal Resistance R (10mm)</td>
<td>0.0556 K·m²/W</td>
<td>0.315 h·ft²·F/Btu</td>
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</tr>
<tr>
<td></td>
<td>Equivalent to R-9.61 (thermal resistance of 1 ft of Parklex insulation, given in h·ft²·F/Btu).</td>
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<td></td>
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7. TECHNICAL DATA:

**ASTM Test Results**

<table>
<thead>
<tr>
<th>Characteristics</th>
<th>Standards and test methods</th>
<th>Values</th>
</tr>
</thead>
<tbody>
<tr>
<td>Density (10mm)</td>
<td>ASTM D 2395 Method A</td>
<td>1.51 g/cc</td>
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<tr>
<td>Moisture Content</td>
<td>ASTM D 4442 Method A</td>
<td>2.1%</td>
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<tr>
<td>Water Absorption h/23°C</td>
<td>(24) ASTM D 1037 Method B</td>
<td>0.34% by mass</td>
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<tr>
<td></td>
<td></td>
<td>0.56% by volume</td>
</tr>
<tr>
<td>Thickness Swelling</td>
<td></td>
<td>0.59%</td>
</tr>
<tr>
<td>Flexural Properties</td>
<td>ASTM D 1037</td>
<td></td>
</tr>
</tbody>
</table>
Modulus of Elasticity
veneer parallel to long dimension
dry soaked
19.0 GPa (2,756,000 psi) 18.0 GPa (2,611,000 psi)
veneer perpendicular to long dim.
dry soaked
9.0 GPa (1,305,000 psi) 8.7 GPa (1,261,000 psi)
Bending Strength (MOR)
parallel to long direction
dry soaked
193 MPa (28,000 psi) 200 MPa (29,000 psi)
perpendicular to long direction
dry soaked
93 MPa (13,500 psi) 108 MPa (15,700 psi)
Bond Durability
maximum load reference vacuum/pressure soaked boiled (2 cycles)
APA PS-1 6.1.5 2.58 kN (580 lb-f) 3.47 kN (780 lb-f) 2.68 kN (600 lb-f)
Surface Burning ASTM E-84 Class B (II) / Class A (I)

Click on the following link for Interpretation of ASTM Test Data on Parklex Facade.
ASTM Testing Performed at AEWC Advanced Engineered Wood Composites Center, University of Maine; ASTM E-84 Testing (Surface Burning) performed at Hardwood Plywood & Veneer Association Laboratory, Reston Virginia.

2.3 FABRICATION
A. Fabricate composite panels and accessory items in accordance with manufacturer's recommendations and approved submittals.

B. Fabricate panels to sizes indicated on drawings.

PART 3 EXECUTION
3.1 INSPECTION
A. Examine alignment of backup structure prior to installing sub-frame. Do not proceed until all defects are corrected.

3.2 INSTALLATION

B. Install solid exterior wall panels plumb and level and accurately spaced in accordance with manufacturer's recommendations and approved submittals.

C. Fasten support rails for solid exterior wall panels to supporting substrate with fasteners approved for use with adjoining construction. Fasteners to be manufactured from Grade 304 austenitic stainless steel; self-drilling with an inserted drill blade based on the bi-metal principle. Fasteners to be 0.216” (5.5mm) minimum diameter with a 1/2” (12mm) diameter modified truss head and tapered Torx 25 drive recess or iris drive system. The fastener’s head, shank and all fastener threads shall be Grade 304 austenitic stainless steel to provide total corrosion resistance.
and optimum structural performance. Provide blocking for positive connection from studs of same size and gauge as wall construction. Fasteners to be located at a maximum of 16 inches on center.

D. Interface with Other Work: as indicated on drawings

E. Accessory Items: Install corner profiles, gaskets, trim and accessory items with fasteners and adhesive appropriate for use with adjoining construction as indicated on drawings and as recommended by manufacturer.

F. Provide and maintain integrity of sheet waterproofing in all areas of work per section 07131

3.3 DAMAGED MATERIAL

A. Repair or replace all damaged material to the satisfaction of the Architect.

3.4 CLEANING

A. Do not use abrasive cleaners or cleaning tools. Dry wipe down panel sections as work progresses.

B. Provide final cleaning of the wall system.

3.5 PROTECTION

A. Protect installed product and finish surfaces from damage during construction.

END OF SECTION
PART 1 - GENERAL

1.01 SUMMARY

A. Section Includes
   1. Thermoplastic Polyolefin Single-Ply Roofing Membrane
   2. Insulation

B. Related Sections
   1. Section 06100: Rough Carpentry
   2. Section 07620: Sheet Metal Flashing and Trim
   3. Section 15430: Plumbing Specialties

1.02 REFERENCES

A. Factory Mutual (FM Global) - Approval Guide

B. Underwriters Laboratories (UL) - Roofing Systems and Materials Guide (TGFU R1306)

C. American Society for Testing and Materials (ASTM) - Annual Book of ASTM Standards

D. Sheet Metal and Air Conditioning Contractors National Association, Inc. (SMACNA) - Architectural Sheet Metal Manual

E. National Roofing Contractors Association (NRCA)

F. American Society of Civil Engineers (ASCE)

G. U.S. Green Building Council (USGBC)

1.03 DEFINITIONS

A. Roofing Terminology: Refer to ASTM D1079 and the glossary of the National Roofing Contractors Association (NRCA) Roofing and Waterproofing Manual for definitions of roofing terms related to this section.

1.04 SUBMITTALS

A. Product Data: Provide product data sheets for each type of product indicated in this section.

B. Shop Drawings: Provide manufacturers standard details and approved shop drawings for the roof system specified.

C. Samples: Provide samples of insulations, fasteners, membrane materials and accessories for verification of quality.

D. Certificates: Installer shall provide written documentation from the manufacturer of their authorization to install the roof system, and eligibility to obtain the warranty specified in this section.
1.05 QUALITY ASSURANCE
A. Manufacturer’s Qualifications: GAF shall provide a roofing system that meets or exceeds all criteria listed in this section.
B. Installer’s Qualifications:
   1. Installer shall be classified as a Master Select™ contractor as defined and certified by GAF.
C. Source Limitations: All components listed in this section shall be provided by a single manufacturer or approved by the primary roofing manufacturer.
D. Final Inspection
   Manufacturer’s representative shall provide a comprehensive final inspection after completion of the roof system. All application errors must be addressed and final punch list completed.

1.06 PRE-INSTALLATION CONFERENCE
A. Prior to scheduled commencement of the roofing installation and associated work, conduct a meeting at the project site with the installer, architect, owner, GAF representative and any other persons directly involved with the performance of the work. The installer shall record conference discussions to include decisions and agreements reached (or disagreements), and furnish copies of recorded discussions to each attending party. The main purpose of this meeting is to review foreseeable methods and procedures related to roofing work.

1.07 PERFORMANCE REQUIREMENTS
A. Provide an installed roofing membrane and base flashing system that does not permit the passage of water, and will withstand the design pressures calculated in accordance with the most current revision of ASCE 7.
B. GAF shall provide all primary roofing materials that are physically and chemically compatible when installed in accordance with manufacturers current application requirements.

1.08 REGULATORY REQUIREMENTS
A. All work shall be performed in a safe, professional manner, conforming to all federal, state and local codes.

1.09 DELIVERY, STORAGE AND HANDLING
A. Deliver all roofing materials to the site in original containers, with factory seals intact. All products are to carry either a GAF®, GAFMC® or BMCA® label.
B. Store all pail goods in their original undamaged containers in a clean, dry location within their specified temperature range.
C. Do not expose materials to moisture in any form before, during, or after delivery to the site. Reject delivery of materials that show evidence of contact with moisture.
D. Remove manufacturer supplied plastic covers from materials provided with such. Use “breathable” type covers such as canvas tarpaulins to allow venting and protection from...
weather and moisture. Cover and protect materials at the end of each work day. Do not remove any protective tarpaulins until immediately before the material will be installed.

E. Materials shall be stored above 55°F (12.6°C) a minimum of 24 hours prior to application.

1.10 PROJECT CONDITIONS

A. Weather
   1. Proceed with roofing only when existing and forecasted weather conditions permit.
   2. Ambient temperatures must be above 45°F (7.2°C) when applying hot asphalt or water based adhesives.

1.11 WARRANTY

A. Provide Manufacturers standard WeatherStopper® Diamond Pledge™ Guarantee with single source coverage and no monetary limitation where the manufacturer agrees to repair or replace components in the roofing system, which cause a leak due to a failure in materials or workmanship.
   1. Duration: Thirty (30) years from the date of completion.

   *Materials and workmanship of listed products within this section when installed in accordance with current manufacturer application and specification requirements. Contact manufacturer Contractor Services for the full terms and conditions of the guarantee.

EverGuard® TPO Reflectivity Limited Warranty: GAF warrants to the original building owner, that the EverGuard® TPO white roof membrane will meet or exceed the initial and “aged” ENERGY STAR® reflectivity requirements for low slope roofing membranes (65% initial, 50% aged) when installed and maintained in accordance with GAF’s requirements. The aged reflectivity shall meet or exceed these requirements when measured after cleaning the membrane in accordance with GAF recommendations.

PART 2 – MATERIALS

2.01 ACCEPTABLE MANUFACTURER

A. GAF Materials Corporation - 1361 Alps Road, Wayne, NJ 07470 or an approved equal
B. Basis of Design: GAF mechanically attached roof system.
C. Other TPO Roofing Systems meeting or exceeding the manufacture, performance and quality criteria will be acceptable. Submit all proposed alternates a minimum of ten days prior to bid date for design team evaluation.

2.02 INSULATION

A. Rigid polyisocyanurate board, with a strong white or black fibrous glass facer conforming to or exceeding the requirements of ASTM C 1289 / FS HH-I-1972. **EnergyGuard™ Polyiso**, with the following characteristics:
   1. Board Thickness: Min. 1.5
   2. Thermal Resistance (LTTR value) of: 9.0

2.03 ROOF BOARD
A. Underlayment or overlayment board with a water-resistant and silicone treated gypsum core with glass fiber facers embedded on both sides. **GP Dens-Deck® Roof Board**, distributed by GAF®
   1. Board Thickness: Min. ¼”

### 2.04 MEMBRANE MATERIALS

A. A smooth type, polyester scrim reinforced thermoplastic polyolefin membrane with a nominal 0.080 inch (80 mil) thickness, for use as a single ply roofing membrane. Engineered to provide high solar reflectivity and extremely high UV and thermal resistance. These combined characteristics produce a single-ply membrane suitable for the most demanding solar installations as well as any other high heat or solar loading applications. Meets or exceeds the minimum requirements of ASTM D-6878. UL Listed and FM Approved. Each full roll contains approximately 1000 sq.ft. of roofing material, 10’ X 100’, weighing 420 lbs. **EverGuard® Extreme™ TPO 80 mil** thermoplastic single-ply roofing membrane by GAFMC.

### 2.05 FLASHING MATERIALS

A. A smooth type, polyester scrim reinforced thermoplastic polyolefin membrane with a nominal 0.080 inch (80 mil) thickness, for use as a single ply roofing membrane. Engineered to provide high solar reflectivity and extremely high UV and thermal resistance. These combined characteristics produce a single-ply membrane suitable for the most demanding solar installations as well as any other high heat or solar loading applications. Meets or exceeds the minimum requirements of ASTM D-6878. UL Listed and FM Approved. Each full roll contains approximately 1000 sq.ft. of roofing material, 10’ X 100’, weighing 420 lbs. **EverGuard® Extreme™ TPO 80 mil** thermoplastic single-ply roofing membrane by GAFMC.

### 2.06 ADHESIVES, SEALANTS and PRIMERS

A. Solvent-based Bonding Adhesive: Solvent based rubberized adhesive for use with EverGuard TPO membranes, **EverGuard 1121 Bonding Adhesive**, by GAF.

B. Low VOC solvent-based Bonding Adhesive: Solvent based rubberized adhesive for use with EverGuard TPO membranes, **EverGuard Low VOC Bonding Adhesive**, by GAF.

C. Water-based Bonding Adhesive: Water based rubberized adhesive for use with EverGuard TPO membranes, **EverGuard WB181 Bonding Adhesive**, by GAF.

D. Solvent based liquid, required to protect field cut edges of EverGuard TPO membranes. Applied directly from a squeeze bottle, **EverGuard TPO Cut Edge Sealant**, by GAF.

E. Solvent based primer for preparing surfaces to receive butyl based adhesive tapes, **EverGuard Primer**, by GAF.

F. Low VOC solvent based primer for preparing surfaces to receive butyl based adhesive tapes, **EverGuard TPO Low VOC Primer**, by GAF.

G. Solvent based seam cleaner used to clean exposed or contaminated seam prior to heat welding, **EverGuard TPO Seam Cleaner**, by GAF.

H. Solvent based, trowel grade synthetic elastomeric sealant. Durable and UV resistant suitable for use where caulk is typically used. Available in 10 oz. tubes, **FlexSeal™ Caulk Grade** by GAF.
I. Commercial grade roofing sealant suitable for sealing the upper lip of exposed termination bars and penetrations and around clamping rings and comes with a 20 yr ltd warranty against leaks caused by manufacturing defects. Meets the performance criteria of ASTM D412, ASTM D2196, ASTM D1475 and ASTM D1644, FlexSeal™ Roof Sealant, by GAF.

J. One part butyl based high viscosity sealant suitable for sealing between flashing membrane and substrate surface behind exposed termination bars and for sealing between roofing membrane and drain flange. EverGuard® Water Block, by GAF.

K. 100% solids epoxy based two-part sealant suitable for filling sealant pans at irregularly-shaped penetrations. Epoxy is part A. Polyamide is part B. EverGuard® 2-Part Pourable Sealant, by GAF.

2.07 ACCESSORIES

A. Mechanical Fasteners
2. Drill•Tec™ XHD Screws: Heavy gauge alloy steel fastener with CR-10 coating with a .275” diameter thread. Factory Mutual Standard 4470 Approved, #3 Phillips truss head for use on heavy steel decks, O.S.B or aluminum roof decks.
3. Drill•Tec™ Insulation Plates: Galvalume, 3” (7.6 cm) diameter, suitable for use with Drill•Tec™ Standard and HD screws, and Drill•Tec™ Spikes. Special design available for use with Drill•Tec™ Polymer Screws.
4. Drill•Tec™ XHD Plates: Galvalume, 2 3/8” (6 cm) diameter, with a barbed underside. Suitable for use with Drill•Tec™ Standard, HD, and XHD Screws, and Drill•Tec™ Spikes.

B. FLASHING ACCESSORIES
1. A smooth type, unreinforced thermoplastic polyolefin based membrane for use as an alternative flashing/reinforcing material for penetrations and corners. Required whenever preformed vent boots cannot be used, available in White, Tan, Gray, Regal Red, Regal Blue, and Hartford Green, 0.055 inches (55 mils) nominal thickness and sheet size: 24in x 50ft. EverGuard® TPO Detailing Membrane, by GAF.

2. An 8 inch (20 cm) wide smooth type, polyester scrim reinforced thermoplastic polyolefin membrane strip for use as a cover strip over coated metal and stripping-in coated metal flanges and general repairs: 0.045 inches (45 mils) nominal thickness with 100 foot length, available in White, Tan, Gray, Regal Red, Regal Blue, and Hartford Green EverGuard® TPO Flashing Membrane, by GAF.

3. Extruded aluminum termination bar with angled lip caulk receiver and lower leg bulb stiffener. Pre-punched slotted holes at 6” on center or 8” on center. ¾” x 10’ with 0.090” cross section, EverGuard® Lip Termination Bar, by GAF.

4. A 6 inch (14 cm) wide, smooth type, heat-weldable polyester scrim reinforced thermoplastic polyolefin membrane strip. Designed for use as a cover strip over non-coated metal edges and flanges. Each full roll contains approximately 100
5. .045” reinforced TPO membrane with pressure sensitive adhesive, to be installed on horizontal surfaces using plates and fasteners as a base attachment in fully adhered systems. Size 6” x 100’, EverGuard® RTA (Roof Transition Anchor) Strip™, by GAF.

6. 24 gauge steel with 0.025” thick TPO based film as required for fabrication into metal gravel stop and drip edge profiles, metal base and curb flashings, sealant pans, and scupper sleeves. Standard sheet size 4’ x 10’, sheet weight 47 lbs. Custom sizes available, EverGuard® TPO Coated Metal, by GAF.

C. WALL & CURB ACCESSORIES

1. 55 mil TPO membrane and 24 gauge coated metal prefabricated into standard and custom size thru wall scuppers. Available in two sizes: 4” x 6” x 12” (l x w x d) with a 5.75” x 3.75” opening and 8” x 10” x 12” (l x w x d) with a 9.75” x 7.75” opening, EverGuard® TPO Scupper, by GAF.

2. .045” or .060” thick reinforced TPO membrane fabricated corners. Available in four standard sizes to flash curbs that are 24”, 36”, 48”, and 60” in size. Four corners are required to flash the curb, EverGuard® Corner Curb Wraps, by GAF.

3. 0.060” thick molded TPO membrane outside corners of base and curb flashing. Hot-air welds directly to EverGuard TPO membrane. Size 4” x 4” with 6” flange, EverGuard® TPO Universal Corners by GAF.

4. 0.055” molded TPO membrane inside corners of base and curb flashing. Hot-air welds directly to Everguard TPO membrane. Size 6” x 6” x 5.5” high EverGuard® TPO Preformed Corners by GAF.

5. 8” diameter, nominal .050” vacuum formed unreinforced TPO membrane for use in flashing outside corners of base and curb flashings, EverGuard® TPO Fluted Corner, by GAF.

D. PENETRATION ACCESSORIES

1. 0.075” thick molded TPO membrane sized to accommodate most common pipe and conduits, (1” to 6” diameter pipes), including square tube. Hot-air welded directly to EverGuard TPO membrane, supplied with stainless steel clamping rings, EverGuard® TPO Preformed Vent Boots by GAF.

2. 0.045” or 0.60” thick molded TPO membrane preformed boots are split to accommodate most common pipes and conduits and available in three standard sizes, EverGuard® TPO Split Pipe Boots, by GAF.

3. 0.045” or 0.60” thick molded TPO membrane preformed square boots are split to accommodate most common square penetrations and conduits and available in three standard sizes, EverGuard® TPO Square Tube Wraps, by GAF.

4. .070 thick molded penetration pocket to provide structure and foundation for the application of a pourable sealant for a variety of roof penetrations, weldable and 9” x 6” x 4” (l x w x h). EverGuard TPO Pourable Sealer Pocket.
5. .055” thick smooth type, unreinforced thermoplastic polyolefin membrane designed for use as a conforming membrane seal over T-joints in 60 and 80 mil membrane applications. **EverGuard® TPO Drain** by GAF

E. FIELD OF ROOF ACCESSORIES

1. Pre-manufactured expansion joint covers used to bridge expansion joint openings in a roof structure. Fabricated to accommodate all roof to wall and roof to roof applications, made of .060” reinforced TPO membrane, available in 5 standard sizes for expansion joint openings up to 8” wide. **EverGuard® TPO Expansion Joint Covers**, by GAF

2. .055” thick smooth type, unreinforced thermoplastic polyolefin membrane designed for use as a conforming membrane seal over T-joints in 60 and 80 mil membrane applications. **EverGuard® T-Joint Patches**, by GAF.

3. 1/8” thick extruded and embossed TPO roll 30” x 50’, heat welds directly to roofing membrane. Unique herringbone traction surface. Gray in color, **EverGuard® TPO Walkway Rolls**, GAF.

PART 3 – EXECUTION

COVERBOARD AND INSULATION INSTALLATION

A. Coordinate installing membrane roofing system components so insulation is not exposed to precipitation or left exposed at the end of the workday.

B. Install one or more layers of insulation under area of roofing to achieve required thickness. Where installing 2 or more layers creates overall insulation thickness, stagger the joints of each succeeding layer from joints of previous layer a minimum of 6 inches in each direction.

C. Trim surface of insulation where necessary at roof drains so completed surface is flush and does not restrict flow of water.

D. Install insulation with long joints of insulation in a continuous straight line with end joints staggered between rows, abutting edges and ends between boards. Cut and fit insulation within 1/4 inch of nailers, projections, and penetrations.

E. Mechanical Attached Insulation: Mechanically fasten Coverboard into the roof deck through the insulation board with approved fasteners and plates at a rate of 6 fasteners/board (8 feet x 4 feet). Coverboard and Insulation boards are to rest evenly on the roof deck avoiding air spaces between the boards and the substrate. Install each board tightly against the adjacent boards on all sides.
F. Install fasteners consistently with a 1” minimum penetration into structural deck as determined by the manufacturer. Concrete decks require a 1 ½ inch deep 7/32 inch diameter pilot hole for the XP and CD10 Fasteners.

G. Use fastener tools with a depth locator and torque-limiting attachment as recommended or supplied by fastener manufacturer to ensure proper installation.

INSTALLATION OF TPO MEMBRANE

A. EXAMINATION

1. Verify that the surfaces and site conditions are ready to receive work.

2. Verify that the deck is supported and secured.

3. Verify that the deck is clean and smooth, free of depressions, waves, or projections, and properly sloped to drains, valleys, eaves, scuppers or gutters.

4. Verify that the deck surfaces are dry and free of ice or snow.

5. Verify that all roof openings or penetrations through the roof are solidly set, and that all flashings are tapered.

6. SUBSTRATE PREPARATION

B. Steel Deck

1. Metal decks must be a minimum uncoated thickness of 22 gauge (0.8 mm) and shall have a G-90 galvanized finish on all panels. FM requirements may supersede those set forth in this section. Consult the current FM Guide for more information.

2. Decks must comply with the gauge and span requirements in the current Factory Mutual FM Approval Guide and be installed in accordance with Loss Prevention Data Sheet 1-28 or specific FM approval.

3. When re-roofing over steel decks, surface corrosion shall be removed, and repairs to severely corroded areas made. Loose or inadequately secured decking shall be fastened, and irreparable or otherwise defective decking shall be replaced.

3.03 INSTALLATION - GENERAL

A. Install GAF’s EverGuard® TPO roofing system according to all current application requirements in addition to those listed in this section.

B. GAF EverGuard® TPO Specification #: T-MA-N-I-80(X)

C. Start the application of membrane plies at the low point of the roof or at the drains, so that the flow of water is over or parallel to, but never against the laps.

3.04 INSULATION - GENERAL
A. Do not apply roof insulation or roofing until all other work trades have completed jobs that require them to traverse the deck on foot or with equipment. A vapor retarder coated lightly with asphalt may be applied to protect the inside of the structure prior to the insulation and final roofing installation. Before the application of the insulation, any damage or deterioration to the vapor retarder must be repaired.

B. Do not install wet, damaged or warped insulation boards.

C. Install insulation boards with staggered board joints in one direction (unless taping joint).

D. Install insulation boards snug. Gaps between board joints must not exceed ¼" (6 mm). All gaps in excess of ¼" (6 mm) must be filled with like insulation material.

E. Wood nailers must be 3-1/2" (8.9 cm) minimum width or 1" (25 mm) wider than metal flange. They shall be of equal thickness as the insulation, and be treated for rot resistance. All nailers must be securely fastened to the deck.

F. Do not kick insulation boards into place.

G. Miter and fill the edges of the insulation boards at ridges, valleys and other changes in plane to prevent open joints or irregular surfaces. Avoid breaking or crushing of the insulation at the corners.

H. Insulation should not be installed over new lightweight insulating concrete.

I. Roof tape, if required over insulation joints, must be laid evenly, smoothly and embedded in a uniform coating of hot steep asphalt with 4" (10.2 cm) end laps. Care must be taken to assure smooth application of tape, and full embedment of the tape in the asphalt.

J. Do not install any more insulation than will be completely waterproofed each day.

3.05 INSULATION – BASE LAYER

ALoose apply the base layer of insulation for subsequent layers to be simultaneously attached or for ballast applications. Minimal fastening should be performed to avoid movement of the boards.

3.06 INSULATION – SUBSEQUENT LAYERS

A. The insulation must be securely attached to the roof deck. A minimum FMRC 1-60 attachment is recommended. Refer to FMRC Approval Guide for FM fastening patterns. Factory Mutual requires fastener density increases in corner areas for FM 1-60 as well as perimeter, and corner area fastener density increases for FM 1-90 or greater. Refer to FM Loss Prevention Data Sheets 1-7, 1-28, and 1-49.

B. Multiple layers of insulation of the same, non-tapered insulation material may be simultaneously mechanically fastened with approved fasteners and plates through the top layer of insulation to the structural deck. Individual layers of insulation must not exceed 3” (7.6 mm) in thickness nor total thickness of all layers should not exceed 5” (12.7 cm) without written approval of GAF Contractor Services. FM Type attachments may differ.
C. Use only fasteners with a minimum 3 inch (7.6 cm) stress plate when mechanically attaching insulation. Do not attach insulation with nails.

D. Do not install any more insulation than will be completely waterproofed each day.

3.07 MEMBRANE APPLICATION

A. Mechanically Attached:

1. Place membrane so that wrinkles and buckles are not formed. Any wrinkles or buckles must be removed from the sheet prior to permanent attachment. Roof membrane shall be mechanically fastened immediately after it is rolled out, followed by welding to adjacent sheets.

2. Overlap roof membrane a minimum of 6" for side laps and 3" for end laps.

3. Install membrane so that the side laps run across the roof slope lapped towards drainage points.

4. All exposed sheet corners shall be rounded a minimum of 1".

5. Use full width rolls in the field of roof and half width rolls in the perimeter and corner region of the roof and mechanically fastened in the side lap area to the roof deck.

6. Membrane laps shall be heat-welded together. All welds shall be continuous, without voids or partial welds. Welds shall be free of burns and scorch marks.

7. Weld shall be a minimum of 1-1/2" in width for automatic machine welding and a minimum 2" in width for hand welding.

8. All cut edges of reinforced membrane must be sealed with EverGuard® TPO Cut Edge Sealant.

9. The membrane shall be mechanically fastened in the side lap area to the roof deck with appropriate Drill-Tec™ fasteners and plates as required by roof system specification and/or Factory Mutual classification requirements.

10. The metal plates must be placed within ¼ to ½ of the membrane edge. Plates shall not be placed less than ¼ from the membrane edge.

11. In the corner regions, additional fasteners shall be installed through the perimeter membrane to form a grid pattern, with an 8" (40.5 cm) wide EverGuard® TPO reinforced membrane flashing-strip welded over the additional fasteners. Corners include both outside and inside corners that measure 75 - 105 angle degrees.

12. Membrane attachment to the roof deck is required at locations of deck angle changes in excess of five (5) angle degrees (1" in 12").

13. Supplemental membrane attachment is required at the base of all walls and curbs, and where the angle of the substrate changes by more than ten (10) degrees (1" in 12"). Roofing membrane shall be secured to the structural deck with screws and plates of the same type and spacing used for in-lap attachment. The screws and plates must be installed no less than ½" from the membrane edge. Alternatively, the roofing membrane may be turned up the vertical plane a minimum of 3" and secured with screws and termination bar. Fastener spacing is the same as is used for in-lap attachment. The termination bar must be installed within 1-1/2" to 2" of the plane of the roof membrane, with a minimum of 1" of membrane extending above the termination bar.

14. Supplemental membrane attachment to the structural deck is required at all penetrations. Roofing membrane shall be secured to the deck with appropriate Drill-Tec™ screws and plates.

15. Fasteners must be installed to achieve the proper embedment depth. Install fasteners without lean or tilt.

16. Install fasteners so that the plate or termination bar is drawn down tightly to the membrane surface. Properly installed fasteners will not allow the plate or termination bar to move (underdriving), but will not cause wrinkling of the membrane (overdriving).
3.08 FLASHINGS

A. General:
1. All penetrations must be at least 24” (61 cm) from curbs, walls, and edges to provide adequate space for proper flashing.
2. Flash all perimeter, curb, and penetration conditions with coated metal, membrane flashing, and flashing accessories as appropriate to the site condition.
3. All coated metal and membrane flashing corners shall be reinforced with preformed corners or non-reinforced membrane.
4. Hot-air weld all flashing membranes, accessories, and coated metal. A minimum 2" wide (hand welder) weld or minimum 1 - 1/2" automatic machine weld is required.
5. All cut edges of reinforced membrane must be sealed with EverGuard® TPO Cut Edge Sealant.
6. Consult the EverGuard® Application and Specifications Manual or GAF Contractor Services for more information on specific construction details, or those not addressed in this section.

B. Coated Metal Flashings:
1. Coated metal flashings shall be formed in accordance with current EverGuard construction details and SMACNA guidelines.
2. Coated metal sections used for roof edging, base flashing and coping shall be butted together with a ¼” gap to allow for expansion and contraction. Hot-air weld a 6” wide reinforced membrane flashing strip to both sides of the joint, with approximately 1” on either side of the joint left un-welded to allow for expansion and contraction. 2” wide aluminum tape can be installed over the joint as a bond-breaker, to prevent welding in this area.
3. Coated metal used for sealant pans, scupper inserts, corners of roof edging, base flashing and coping shall be overlapped or provided with separate metal pieces to create a continuous flange condition, and pop-riveted securely. Hot-air weld a 6” wide reinforced membrane flashing strip over all seams that will not be sealed during subsequent flashing installation.
4. Provide a ½” hem for all exposed metal edges to provide corrosion protection and edge reinforcement for improved durability.
5. Provide a ½” hem for all metal flange edges whenever possible to prevent wearing of the roofing and flashing membranes at the flange edge.
6. Coated metal flashings shall be nailed to treated wood nailers or otherwise mechanically attached to the roof deck, wall or curb substrates, in accordance with construction detail requirements.

C. Reinforced Membrane Flashings:
1. The thickness of the flashing membrane shall be the same as the thickness of the roofing membrane.
2. Membrane flashing may either be installed loose or fully adhered to the substrate surface in accordance with “Construction Detail Requirements”.
3. Where flashings are to be fully adhered, apply bonding adhesive at a rate resulting in 60 square feet/gallon of finished roofing material for solvent-based bonding adhesives, and at a rate of 125 square feet/gallon of finished roofing material for water-borne bonding adhesive. Apply bonding adhesive to both the underside of the membrane and the substrate surface at 120 square feet per gallon (Solvent Based) and 250 square feet per gallon (Water Based). A greater quantity of bonding adhesive may be required based upon the substrate surface condition. The bonding adhesive must be allowed to dry until tacky to the touch before flashing membrane application.
4. Apply the adhesive only when outside temperature is above 40°F. Recommended minimum application temperature is 50°F to allow for easier adhesive application.
5. The membrane flashing shall be carefully positioned prior to application to avoid wrinkles and buckles.

D. Un-reinforced Membrane Flashings:
1. Un-reinforced membrane is used to field-fabricate penetration or reinforcement flashings in locations where preformed corners and pipe boots cannot be properly installed.
2. Penetration flashings constructed of un-reinforced membrane are typically installed in two sections, a horizontal piece that extends onto the roofing membrane and a vertical piece that extends up the penetration. The two pieces are overlapped and hot-air welded together.
3. The un-reinforced membrane flashing shall be adhered to the penetration surface. Apply bonding adhesive at a rate resulting in 60 square feet/gallon of finished roofing material for solvent-based bonding adhesives, and at a rate of 125 square feet/gallon of finished roofing material for water-borne bonding adhesive. Apply bonding adhesive to both the underside of the membrane and the substrate surface at 120 square feet per gallon (Solvent Based) and 250 square feet per gallon (Water Based). A greater quantity of bonding adhesive may be required based upon the substrate surface condition. The bonding adhesive must be allowed to dry until tacky to the touch before flashing membrane application.

E. Roof Edges:
1. Roof edge flashings are applicable for gravel stop and drip edge conditions as well as for exterior edges of parapet walls.
2. Flash roof edges with metal flanges nailed 4” O.C. to pressure-treated wood nailers. Where required, hot-air weld roof membrane to coated metal flanges.
3. When the fascia width exceeds 4”, coated metal roof edging must be attached with a continuous cleat to secure the lower fascia edge. The cleat must be secured to the building no less than 12” O.C.
4. Alternatively, roof edges may be flashed with a 2-piece snap on fascia system, adhering the roof membrane to a metal cant and face nailing the membrane 8” on center prior to installing a snap-on fascia.
5. Flash roof edge scuppers with a coated metal insert that is mechanically attached to the roof edge and integrated as a part of the metal edging.

F. Parapet and Building Walls:
1. Flash walls with EverGuard TPO membrane adhered to the substrate with bonding adhesive, loose applied (Less than 24” in height) or with coated metal flashing nailed 4” on center to pressure-treated wood nailers.
2. Secure membrane flashing at the top edge with a termination bar. Water Block shall be applied between the wall surface and membrane flashing underneath all exposed termination bars. Exposed termination bars shall be mechanically fastened 8” on center; termination bars that are counter flashed shall be fastened 12” on center.
3. Roof membrane must be mechanically attached along the base of walls with screws and plates (deck securement) or screws and inverted termination bar (wall securement) at the following rate:

Mechanically Attached Systems Per in-lap on center spacing, with a 12” maximum
4. All coated metal wall flashings and loose applied membrane flashings must be provided with separate metal counterflashings, or metal copings.
5. Metal counterflashings may be optional with fully adhered flashings depending on guarantee requirements. Exposed termination bars must be sealed with Flexseal® roofing cement or Flexseal® caulk grade.
6. Flash wall scuppers with a coated metal insert that is mechanically attached to the wall and integrated as part of the wall flashing.

G. Curbs and Ducts:
1. Flash curbs and ducts with EverGuard TPO membrane adhered to the curb substrate with bonding adhesive, loose applied (Less than 18” in height) or with coated metal flashing nailed 4” on center to pressure-treated wood nailers.
2. Secure membrane flashing at the top edge with a termination bar. Water Block shall be applied between the curb/duct surface and membrane flashing underneath all termination bars. Exposed termination bars shall be mechanically fastened every 8”o.c.; termination bars that are counter flashed shall be fastened 12” on center.
3. Roof membrane must be mechanically attached along the base of walls with screws and plates (deck securement) or screws and inverted termination bar (wall securement) at the following rate:

Mechanically Attached Systems Per in-lap on center spacing, with a 12” maximum

4. All coated metal curb flashings and loose applied membrane flashings must be provided with separate metal counterflashings, or metal copings.
5. Metal counterflashings may be optional with fully adhered flashings depending on guarantee requirements. Exposed termination bars must be sealed with Flexseal® roofing cement or Flexseal® caulk grade.

H. Roof Drains:
1. Roof drains must be fitted with compression type clamping rings and strainer baskets. Original-type cast iron and aluminum drains, as well as retrofit-type cast iron, aluminum or molded plastic drains are acceptable.
2. Roof drains must be provided with a minimum 36” x 36” sump. Slope of tapered insulation within the sump shall not exceed 4” in 12”.
3. Extend the roofing membrane over the drain opening. Locate the drain and cut a hole in the roofing membrane directly over the drain opening. Provide a ½” of membrane flap extending past the drain flange into the drain opening. Punch holes through the roofing membrane at drain bolt locations.
4. For cast iron and aluminum drains, the roofing membrane must be set in a full bed of water block on the drain flange prior to securement with the compression clamping ring. Typical water block application is one 10.5 ounce cartridge per drain.
5. Lap seams shall not be located within the sump area. Where lap seams will be located within the sump area, a separate roof membrane drain flashing a minimum of 12” larger than the sump area must be installed. The roof membrane shall be mechanically attached 12” on center around the drain with screws and plates. The separate roof drain flashing shall be heat welded to the roof membrane beyond the screws and plates, extended over the drain flange, and secured as above.
6. Tighten the drain compression ring in place.

3.09 TRAFFIC PROTECTION
A. Install walkway rolls at all roof access locations and other designated locations including roof-mounted equipment work locations and areas of repeated rooftop traffic.

B. Walkway pads must be spaced 2” apart to allow for drainage between the pads.

C. Heat-weld walkway rolls to the roof membrane surface continuously around the perimeter of the roll.

D. Walkway rolls may be installed with TPO primer and 3” seam tape.
   1. Roll or brush the TPO primer on the back of the TPO pad along the edges and down the middle length of the pad.
   2. Clean and prime the roof membrane where the pad will be installed.
   3. Install tape to the back of the cleaned area of the pad and roll in with a silicone hand roller.
   4. Remove release paper and install the tapes pads directly onto the roof membrane. Roll pads to secure in place

3.09 ROOF PROTECTION

A. Protect all partially and fully completed roofing work from other trades until completion.

B. Whenever possible, stage materials in such a manner that foot traffic is minimized over completed roof areas.

C. When it is not possible to stage materials away from locations where partial or complete installation has taken place, temporary walkways and platforms shall be installed in order to protect all completed roof areas from traffic and point loading during the application process.

D. Temporary tie-ins shall be installed at the end of each workday and removed prior to commencement of work the following day.

3.10 CLEAN-UP

A. All work areas are to be kept clean, clear and free of debris at all times.

B. Do not allow trash, waste, or debris to collect on the roof. These items shall be removed from the roof on a daily basis.

C. All tools and unused materials must be collected at the end of each workday and stored properly off of the finished roof surface and protected from exposure to the elements.

D. Dispose of or recycle all trash and excess material in a manner conforming to current EPA regulations and local laws.

E. Properly clean the finished roof surface after completion, and make sure the drains and gutters are not clogged.

Clean and restore all damaged surfaces to their original condition.

END OF SECTION
PART 1 - GENERAL

1.01 SUMMARY

A. Provisions of the General and Supplementary Conditions and Division 01 apply to this section.

B. Section Includes:

1. Sheet metal flashings in connection with roofing not specified under Section 075419.

2. Reglet and counterflashing assemblies.

3. Miscellaneous metal flashing and counterflashing as required, except where provided under mechanical and electrical sections.

4. Coping caps.

5. Gravel stops and Metal Edging.


7. Drip flashings.

8. Sheet metal wall coverings.

9. Roof pipe and beam flashings.

10. Roof expansion joint covers.

11. Other sheet metal items, not necessarily specified herein or in other sections, but required to prevent penetration of water into building.

C. Related Sections:

1. Section 075419: PVC Thermoplastic Membrane Roofing

2. Section 07920: Joint Sealants.

3. Section 09220: Portland Cement Plaster and Metal Lath

4. Division 15: Mechanical.

5. Division 16: Electrical.
1.02 SUBMITTALS

A. Shop Drawings: Submit for fabricated sheet metal indicating shapes, details, methods of joining, anchoring and fastening, thicknesses and gages of metals, concealed reinforcement, expansion joint details, sections, and profiles.

B. Samples: Submit Samples for materials or assemblies as requested.

C. Product Data: Submit brochures of manufactured items.

1.03 QUALITY ASSURANCE

A. Drawings and requirements specified govern. Provide the Work of this section in conformance with the Architectural Sheet Metal Manual published by SMACNA for conditions not indicated or specified and for general fabrication of sheet metal items.

B. Materials shall conform to following standards:

1. ASTM A 167 - Stainless and Heat-Resisting Chromium-Nickel Steel Plate, Sheet and Strip.

2. ASTM A 653 - Sheet Steel, Zinc-Coated (Galvanized) or Zinc-Iron Alloy-Coated (Galvannealed) by the Hot-Dip Process.

3. ASTM B 370 - Copper Sheet and Strip for Building Construction.

4. ASTM B 749 - Lead and Lead Alloy Sheet, Strip and Plate Products.

C. Pre-installation Meetings: Refer to Division 7 roofing sections as appropriate. Attend the pre-installation and inspection meetings for roofing Work.

1.04 DELIVERY, STORAGE AND HANDLING

A. Do not install bent or damaged materials.

PART 2 - PRODUCTS

2.01 MATERIALS

A. Galvanized Sheet Steel: ASTM A 653, coating designation G90, hot-dip galvanized.

B. Copper Plate, Sheet and Strip: ASTM B 370, cold-rolled, tempered. Copper sheet and strip shall be cold-rolled-temper.

C. Sheet Lead: ASTM B 749, Type L50049 or L51121, weighing not less than 4 pounds per square foot.

D. Stainless Steel: Plate, sheet and strip shall conform to ASTM A 167, Type 304 or Type 316, No. 4 finish on exposed surfaces and No. 2 finish on concealed
surfaces unless otherwise specified or indicated. Furnish Type 304 for general applications and Type 316 where exposed to acidic or alkaline conditions.

E. Fastenings:

1. Galvanized Steel: Screws, rivets, and other fastenings furnished in connection with galvanized sheet steel Work shall be sealed with rust resistive coating. Rivets shall be tinned. Nails and other fastenings shall be zinc-coated.

F. Soldering Flux: Raw muriatic acid for galvanized steel; rosin for tin, lead and tinned copper; non-corrosive soldering salts for uncoated copper and acid-type flux formulated for soldering stainless steel.

G. Solder: ASTM B 32, Grade 50A. Name of product manufacturer and grade designation shall be stamped or cast onto each bar.

2.02 FABRICATION

A. General:

1. Accurately form sheet metal Work to dimensions and shapes indicated and required. Cope finish molded and brake metal shapes with true, straight, sharp lines and angles and, where intersecting each other, to a precise fit. Unless otherwise specified, all galvanized sheet steel shall be 22 gage. Exposed edges of sheet metal shall have a 1/2 inch minimum hemmed edge.

2. Soldering of sheet steel or copper shall be performed with well-heated copper soldering iron or soldering torch, joints full-flowing, neat and consistent. Thoroughly clean materials at joints before soldering, and tin coppers before soldering. Exposed soldering on finished surfaces shall be scraped smooth. Lock seam Work shall be fabricated flat and true to line and soldered along its entire length. Acid-fluxed Work shall be neutralized after fabrication.

3. Form and install sheet metal Work to provide proper allowances for expansion and contraction, without causing undue stresses in any part of completed Work. Installation shall be water and weathertight.

B. Gutters and Downspouts:

1. Gutters: Fabricate from 22 gage galvanized steel. Drain gutter towards nearest downspout and provide an expansion joint at mid-point between downspout outlets, but not to exceed 50 feet on center. Gutters shall not pond water. Rivet joints and ends with a minimum of 6 rivets per joint or maximum rivet spacing not to exceed 1-1/2 inch on center. Sweat solder from inside of gutter and in horizontal position where possible. Neatly fit downspouts to gutter using a slip joint. Provide expansion joints, consisting of 3 inch lap joints at not over 30 feet.
2. Form and install sheet metal Work to provide allowance for expansion and contraction without causing undue stresses in the completed Work.

3. Downspouts: Fabricate downspouts from 3 inch round, or 3 inch by 4 inch rectangular shapes, 16 gage steel tubing with butt joints and mitered elbows, sized as indicated. Downspouts exceeding 30 feet in length may be fabricated with a slip joint or leader head. Downspout shall be fabricated with elbows at bottom discharge or connected to drains as indicated. Joints, except expansion joints shall be sealed with a continuous weld. Galvanize downspouts after fabrication.

4. Outlets: Fabricate outlets of 22 gage galvanized sheet steel with a 1/4 inch rolled flanged soldered continuously to gutter. Outside diameter shall be 1/8 inch less than the diameter of the downspout and extend into downspout 3 inches. Install a 1/4 inch galvanized rod over center of outlet opening, lapping 1 inch over each side of outlet and soldered in place. Galvanize rod after fabrication, before installation.

C. Gravel Stops: Provide 24 gage galvanized sheet steel gravel stops wherever roof area drops to a lower level; at the eaves and rake of roof, where roof comes to an abrupt edge, and where indicated. Stops shall be of height indicated and shall be fabricated with 2 flanges. Horizontal flange shall be not less than 4 inches wide, and vertical flange shall extend down over vertical surfaces of trim or gutter. Gravel stops shall lap 4 inches at ends and corners, and shall be fabricated by notching and interlocking vertical face flanges. Contact surfaces of lapped flanges, including raised areas, vertical face and corners, shall be completely covered with flashing compound. Fabricate lap joints so that they will be in the direction of water flow. Where flanges are over 5 inches wide, provide 20 gage continuous cleats fastened at 24 inches on center.

D. Reglet Type Counterflashing: Where roof comes in contact with vertical surfaces, provide counterflashing. Set top of counterflashing 8 inches above roof deck unless otherwise indicated, and extend down at least 5 inches or to top of cant strip. Counterflashing and reglet shall be 22 gage galvanized sheet steel. Lap counterflashing and reglet 3 inches minimum at splices and miter at angles, or supply special metal corner fittings. Reglet and method of securing flashing shall be so constructed that flashing is firmly locked in place, but may be readily removed for replacement.

E. Roof Expansion Joint Covers: Fabricate of 22 gage galvanized sheet steel, as detailed. One side of joint shall be zee shaped, with 3 inch standing leg extended over the joint and turned down. The other side shall be box shaped, fabricated to extend over the joint, over the standing leg, and turn down to form a water barrier. Prefabricated bellows type joint covers are not permitted.

F. Miscellaneous Flashing: Unless otherwise indicated, miscellaneous flashing shall be fabricated of galvanized steel. Exterior doors and windows, unless covered by overhangs shall be provided with 22 gage galvanized steel drip flashing as detailed. At wood construction, nail flashing to framing before paper backed lath is installed.
G. Roof Pipe Flashings: Provide welded seam 4 pound lead flashings. Field fabricated flashings shall also be welded.

H. Sheet Metal Wall Covering: Wall surfaces, where indicated, shall be covered with sheet metal to height indicated. Metal covering shall be 24 gage galvanized sheet steel, with joints between sheets occurring only over studs. Joints locked together and rolled flat. Exposed edges of sheet metal shall be hemmed at least 1/2 inch. Nail sheets in field along studding at 12 inches on center, and at top and bottom edges and seams at 4 inches on center, using 3d galvanized nails.

PART 3 - EXECUTION

3.01 PREPARATION

A. Concrete and masonry materials in contact with sheet metal shall be painted with alkali resistant coating, such as heavy-bodied bituminous paint. Wood in contact with sheet metal shall be painted with 2 coats of aluminum paint or one coat of heavy-bodied bituminous paint.

3.02 INSTALLATION

A. General: Coordinate with installation of underlayment indicated in the Drawings and specified in Section 09220.

B. Gutters and Downspouts:

1. Anchor gutters to structure with 10 gage steel straps, galvanized after fabricating. Secure straps with galvanized fasteners at 3 feet on center. Drill pilot holes and use 12 x 2 inch pan head screws.

2. Install 1/4 inch galvanized wire mesh continuous cover on gutter where indicated.

3. Secure downspouts to walls with 1/8 inch x 2 inch galvanized steel straps. Straps shall be located at top, bottom, and at not over 10 feet on center. Block downspouts out 1/2 inch from the finish wall surfaces. Secure straps to wall framing with 1/4 inch by 2 inch long galvanized anchors. Expansion type anchors shall be provided when anchoring to concrete and masonry. Provide toggle bolts for attachment to masonry or plaster. At steel columns, provide fasteners as indicated. Plastic anchors are not permitted.

4. Anchor conductor heads to walls with 1/4 inch x 2-1/2 inch galvanized lag screws or 1/4 inch expansion type anchors.

C. Reglets: Install reglets at constant height above cant or as indicated. Provide minimum 3 inch lap at end splices of reglets. Caulk laps solidly.

D. Counterflashing:

1. Install at constant horizontal elevation across roof slope and slope at constant height above cant or as indicated.
2. Provide minimum 3 inch lap at all end splices of counterflashing.

E. Galvanized sheet steel parapet coping and flashing shall be continuous over top of parapet to form a watertight cap, with waterproof seams at approximately 10 feet on center, or as indicated. Anchor coping to outside of wall with a continuous cleat face nailed at 24 inch centers. Coping shall be fastened on inside wall with hex head screws and bonded sealing washers through oversized holes in the back of the coping. Corners and angles shall be lapped and soldered; do not install joint sealant.

3.03 TESTING

A. Perform field water testing to demonstrate that installation is watertight. Continue testing with a continuous hose stream applied at base of installation for at least 30 minutes. If leaking is observed, discontinue test and repair installation, then test until satisfactory results are obtained.

3.04 PROTECTION

A. Protect the Work of this section until Substantial Completion.

3.05 CLEANING

A. Remove rubbish, debris, and waste materials and legally dispose of off the Project site.

END OF SECTION
PART 1 - GENERAL

1.01 SUMMARY

A. Provisions of the General and Supplementary Conditions and Division 01 apply to this section.

B. Section Includes:

1. Fire Stops and Smoke Seals.
3. Damming material, clips, and closures.

C. Related Sections:

1. Section 07210: Building Insulation.
2. Section 09250: Gypsum Wallboard.

1.02 SYSTEM DESCRIPTION

A. Provide fire stops and smoke seals to prevent the passage of fire, smoke, toxic gasses or water from one floor or area to another. Seal openings in floors, fire rated walls and permanent partitions penetrated by pipes, ducts, conduits and other items as shown, specified, and as required for the type of construction.

B. Mineral fiber insulation installed as fire safing at non-rated penetrations not containing pipes, ducts, conduits, and other items in floor slabs, wall partitions, construction-joint conditions between slabs and adjacent construction and where indicated or required.

C. Provide damming material, clips, and closures as required for support and containment of dams, and other insulation materials required for tested and rated fire stop systems.

1.03 QUALITY ASSURANCE

A. Performance Criteria:

1. Provide materials and Work to conform to source quality control criteria specified herein and CBC requirements in fire resistant wall and floor assemblies to prevent the passage of fire, smoke, and toxic gases.

2. Installed fire stops shall be of sufficient thickness, width, and density to provide a fire resistance rating at least equal to the floor, wall, or partition construction into which it is installed.

B. Comply with CBC requirements for fire rated construction.
C. Qualifications of Manufacturer: Products furnished for fire stopping and smoke seals shall be manufactured by a firm which has been continuously and regularly employed in the manufacture of these materials for a period of at least 5 years; and which can provide evidence of these materials being satisfactorily installed on at least 5 projects of similar size and type within such period.

D. Qualifications of Installer: The Work of this section shall be installed by a firm which has been in the business of installing similar materials for at least 5 consecutive years; and can provide evidence of satisfactory completion of 5 projects of similar size and scope. Installer shall have applicators trained and certified by manufacturer for performing this Work.

1.04 SUBMITTALS

A. Product Data:

1. Submit manufacturer's Product Data for each type of fire stop and smoke seal material proposed for installation. Indicate product characteristics, typical installations, performance, and limitation criteria and test data.

2. Submit manufacturer's printed installation instructions for each type of product, system, and construction required for the Work. Indicate fire resistance rating of each installation.

3. Submit fire test reports from independent testing agency indicating the following:
   a. Fire test report of fire stop material installed to substrate and penetration materials similar to the Work of this section. Test to indicate both Flame (F) and Temperature (T) Ratings.
   b. Test reports of products to be installed shall indicate conformance to ASTM E 814, UL rating with UL classified system description, and UL classified system detail.

B. Field Samples: Not less than 30 days before the start of Work, provide field installed Samples of fire stop materials and systems.

1. Apply one Sample of fire stop material for each different penetration and related fire rating required for the Work.

2. Sample areas shall comply with thickness, fire resistance ratings, and finished appearance.

C. Manufacturer's Qualifications: Submit evidence of conformance with qualification requirements specified above.

D. Installer’s Qualifications: Submit evidence of conformance with qualification requirements specified above.

1.04 DELIVERY, STORAGE AND HANDLING

A. Deliver products to the Project site in manufacturer's original, unopened containers bearing correct UL labeling.

B. Fire stop material shall be stored above grade in an area protected from detrimental weather and moisture conditions.
C. Fire stop and seal materials shall be installed before expiration of shelf life.

PART 2 - PRODUCTS

2.01 MANUFACTURERS

A. Unless otherwise noted, products of this section shall be as manufactured by Bio Fireshield Inc. (Bio), Concord, Massachusetts; 3M Fire Protection Products; Hilti Firestop Systems; or General Electric (GE).

B. Provide materials and systems of specified manufacturers to suit penetration and substrate as determined by various conditions of installation.

2.02 MATERIALS

A. Fire Stop Sealant: Single component, noncombustible fire stop sealant Biotherm "S" gun grade, or Biotherm "T" self leveling silicone by Bio, Pensil 100 by GE, CP25WB by 3M, or equal.

B. Fire Stop Putty: One-part intumescent type MPS/MPP by 3M, or equal.

C. Cementitious Fire Stop Mortar: Novasit K-10 (55 lb. density) by Bio, 3M mortar by 3M, or equal. Cementitious mortar shall be non-shrinking, asbestos free type.

D. Fire Stop Pillows: Manufactured by Bio Fireshield, or equal.

E. Fire Safing, Mineral Fiber or Ceramic Wool Non-Combustible Insulation:

1. Mineral Fiber: Density 4 pounds per cubic foot, USG Thermafiber, Fibrex "FBX Safing Insulation," or equal.

2. Ceramic Wool: Density 6 pounds per cubic foot, Johns Manville "Ceramic Fiber Insulation", Carborundum "Fiberfrax" ceramic fiber, or equal. Provide material in tested thickness for required hour rating.
   a. Flame Spread: 0.
   b. Smoke developed: 0.

3. For mineral fiber, provide 20 gage minimum size metal retainer clips and plates for fire safing support in vertical applications and in compliance with tested rating.

F. Supplemental Material: Provide supplementary materials required for complete, fire rated, installation.

2.03 SOURCE QUALITY CONTROL

A. Fire stop and smoke seal material shall be tested by an independent testing agency for conformance to Flame (F) and Temperature (T) requirements of ASTM E-814/UL 1479.

B. Conform to UL Fire Hazard Classification Requirements. Material shall be classified as a fill, void, or cavity material and system for UL Through Penetration Firestop System. Comply with UBC 43-6.

C. Material shall be tested and classified noncombustible per ASTM E 84.
PART 3 - EXECUTION

3.01  APPLICATION REQUIREMENTS

A. Provide single component, noncombustible, fire stop sealant or putty:

1. Within penetrations subject to movement including conduit, cable bundles, buss duct, and noncombustible pipe.

2. As a sealant or caulking for smoke barrier construction, fire, and smoke dampers, mechanical/electrical framed elements in masonry and gypsum board partition systems, and other conditions.

B. Provide mineral fiber insulation for fire safing at joints and openings through floor slabs, walls, and partitions not indicated to be grouted, gaskets, sealed or otherwise made sound or air tight in this or other sections. Fire safing shall be packed and wedged solidly from both sides of walls and partitions, and from both top and bottom sides of slabs with noncombustible mineral fiber insulation.

3.02  PREPARATION

A. Examine the areas and conditions where fire stops and smoke seals are to be installed for conditions detrimental to the proper completion of the Work. Do not proceed with the Work until unsatisfactory conditions have been corrected for rated fire protection.

B. Surface to receive fire stops or smoke seals shall be free of dirt, dust, grease, form release agents, or other matter that would impair the bond of the fire stop material to the substrate or penetrating items. Substrate shall be frost free and when required, dry.

C. Voids and cracks in substrate shall be filled and unnecessary projections removed before installation of fire stops.

D. Penetrating items shall be permanently installed before fire stop and smoke seal installation.

E. Assure that all pipes, conduit, cable, and other items, which penetrate fire rated construction, have been permanently installed before installation of fire stops. Schedule and sequence the Work to assure that partitions and other construction, which would conceal penetrations, are not installed before the installation of fire stops and smoke seals.

3.03  INSTALLATION

A. General: Provide installation in accordance with manufacturer’s installation procedures, as required. Install fire stops in accordance with fire test reports, UL fire resistance requirements, and reviewed Sample installations.

B. Dam Construction:

1. Install dams when required to properly contain fire stopping materials within openings and as required to achieve fire resistance rating as tested and rated.

2. Provide in conformance with installation requirements for type of floor, wall, and partition construction, and as recommended by fire stop manufacturer.
3. Combustible damming material shall be removed after appropriate curing. Noncombustible damming material may be left as a permanent component of the fire stop system.

4. Placement of dams shall not interfere with function, or adversely affect the appearance, of adjacent construction.

C. Installation of Single Component Fire Stop Sealant:

1. Provide noncombustible insulation as required to achieve fire resistance rating.

2. Install with manual or powered caulking gun. For up to 3 hour rating, install in 1/2 inches total thickness to both sides of wall penetrations, and to one side in floor penetrations.

3. Surface of gun grade fire stop sealant shall be tooled with clean potable water.

4. Remove excess materials from adjacent surfaces within 10 minutes, with either water or other material compatible with sealant and recommended by sealant manufacturer, leaving the Work in a neat, clean condition.

D. Installation of Cementitious Fire Stop Mortar:

1. Mixing: Add dry powder to water and mix with mechanical mixer or hand mixing tools. Ratio and duration of mix shall be as instructed by fire stop mortar manufacturer. Average wet density of mortar shall be 70 pounds per cubic foot (+/- 5).

2. Wet surfaces before installation of fire stop mortar. Mortar may be hand installed or pumped into the opening.

3. When installing around layered and/or grouped cables, vibrate or move the cables slightly to prevent voids from forming between the cables.

4. Exposed surfaces shall be finished with conventional plastering tools before curing.

5. Allow at least 48 hours for initial cure before form removal. For full cure allow 27 days.

3.04 PROTECTION

A. Protect the Work of this section until Substantial Completion.

3.05 CLEANUP

A. Remove rubbish, debris, and waste materials and legally dispose of off the Project site.

END OF SECTION
SECTION 07900

CAULKING & SEALANTS

1.0 PART 1 GENERAL


Provisions of the General and Supplementary Conditions and Division 01 apply to this section.

1.1 SECTION INCLUDES

A. Furnish materials, equipment and perform labor required to execute this work as indicated on the drawings, as specified and as necessary to complete the contract, including but not limited to these major items:

1. Caulking of interior and exterior cracks, crevices and joints between wood and plaster, metal and masonry, wood, metal, glass, control joints in plaster, at exterior openings.

2. Caulking at all expansion joints in concrete or masonry as indicated on project drawings, or directed by the Architect; to provide a watertight and weatherproof construction.

1.2 SUBMITTALS

A. Comply with pertinent provisions of Section 01340.

B. Product Data: Within 15 calendar days after the Contractor has received the Notice to Proceed, submit:

1. Materials list of items proposed to be provided under this section;

2. Manufacturer's specifications and other data needed to provide compliance with the specified requirements;

3. Shop drawings in sufficient detail to show fabrication, installation, anchorage, and interface of the work of this section with the work of adjacent trades;

4. Manufacturer's recommended installation procedures which, when approved by the Architect, will become the basis for accepting or rejecting actual installation procedures used on the work.

5. Samples: Sealant: 1/3 inch cured beads of selected colors x 10" long, mounted on 1/8 inch thick hardboard backing with description of use and its location.
1.3 PRODUCT HANDLING AND STORAGE

A. Deliver materials to the job site in original unopened containers bearing manufacturer's name and product designation.

B. Store materials in accordance with manufacturer's printed instructions.

C. Cans of sealant at job site shall bear manufacturer's label with date of manufacture of sealant, or manufacturer shall otherwise attest to date of manufacture.
   1. A period of time no longer than six months for polysulphide; 3 months for polyurethanes and "wide joint sealant," shall have elapsed from date of manufacture to date of usage on project.
   2. Do not use materials whose shelf life date has expired. Remove these materials promptly from the site.

1.4 QUALITY ASSURANCE

A. Use adequate numbers of skilled workmen who are thoroughly trained in caulking and who are completely familiar with the specified requirements and the methods needed for proper performance of the work of this section.

B. A written guarantee to the City maintaining all caulking in a watertight condition for a period of 1 year.

C. Manufacturer's Supervision:
   1. Obtain manufacturer's or manufacturer's representative presence at job site for activities called for in this section 3.03.

D. Notify the manufacturer at least 72 hours prior to sealant time for inspection of all substrates and all locations to be sealed.

E. For a period of one year from date of Final Acceptance, the Contractor shall repair and replace, at his expense, all defective sealant workmanship and/or materials.

F. Warranty shall further state that all exterior sealants will be guaranteed against:
   1. Adhesive or cohesive failure in joints where movement is under maximum 25 percent extension or compression.
   2. Any crazing greater than 3 mils. in depth developing on surface of sealant materials.
   3. Any straining of surfaces adjacent to joints by sealant or primer by mitigation through building materials in contract with them.
   4. Chalking or visible color change on surface of cured sealant.
   5. Increase or decrease of "Shore A" durometer hardness (5 second reading) of sealant of more than 30 percent of value of cured value of "Shore A" durometer hardness of sealant.
G. Include in warranty provision and agreement to repair and/or replace promptly at Contractor's expense all sealant defects as listed above which develop during warranty period.

2.0 PART 2 PRODUCTS

2.1 MATERIALS

A. At horizontal joints at floors and paving:
   1. Sealant compound shall be two-part polyurethane-base sealant of self-leveling pour-grade consistency, meeting following standards:
      a. Federal Specifications TT-S-227e.
      b. "Shore A" hardness of installed cured sealant shall be 40+/-5.
   2. Sealant compound at horizontal joints shall be produced by one of the following manufacturers' to meet requirements given herein:
      a. William Products, Inc.
      b. Products Research Corporation
      c. Sonneborn-Contech, or city approved equal.

B. At vertical joints and horizontal joints other than at floors or paving:
   1. Sealant compound shall be two-part polysulphide of non-sag consistency, meeting the following standards:
      b. Federal Specifications TT-S-227e.
      b. "Shore A" hardness of installed cured sealant shall be 30+/-5.
   2. Sealant shall be produced by one of the following manufacturers' to meet requirements given herein:
      a. Sonneborn-Contech.
      b. Products Research Corporation
      c. Toch Brothers, or city approved equal.

C. Special wide joint sealant at 1-1/2 Inch side joint
   1. Dymeric, by Trenco, applied in strict accordance with manufacturer's instructions.

D. Fire-rated Sealant: "Fire Barrier Caulk CP 25 and Putty 303" by 3M Corporation.
E. Color of Sealants:

1. Unless specified or directed otherwise, match sealant color with color of adjacent materials as closely as possible or as determined by the Architect.

2. Architect will select the sealant color where adjacent materials on each side of the joint are of different colors.

2.2 INCIDENTAL MATERIALS

A. General: Use only primer, joint filler and other materials which will not stain the sealant and contact surfaces.

B. Primers: As recommended by the sealant manufacturer for use in conjunction with the sealant for application onto the various types of materials to which the sealant is applied. When the manufacturer's instructions make reference to special surface preparations for the use of primers, comply with these instructions.

C. Bond Breaker Tape: Polyethylene or other plastic tape recommended by the sealant manufacturer to be applied to sealant contact surfaces where bond to the substrate or joint filler must be avoided for proper sealant performance or where joint backing cannot be installed. Provide self-adhering tape wherever possible.

D. Joint Backing: Compressible rod stock formed of closed cell polyethylene foam, polyethylene jacketed polyurethane foam, butyl rubber foam, neoprene foam or other flexible, permanent, durable, non-absorptive material recommended by the sealant manufacturer or rod such as Dow Chemical Company, "Ethafoam."

1. Provide size and shape of rod which will control the joint depth for sealant placement, break bond of sealant at bottom of joint, form optimum shape of sealant bead on back, and provide a highly compressible backer to minimize the possibility of sealant extrusion when joint is compressed.

E. Joint Cleaner: As recommended by sealant manufacturer.

F. Sealant Joints at Fire-rated Walls: Provide fire-rated filler material and other special components as required by governing authority.

3.0 PART 3 EXECUTION

3.1 SURFACE CONDITIONS

A. Examine the areas and conditions under which work of this section will be performed. Correct conditions detrimental to timely and proper completion of the work.

3.2 SEALANT MANUFACTURER'S RESPONSIBILITY

A. Prior to start of sealant work, the manufacturer or manufacturers', whose sealants are to be used, shall provide a qualified person to inspect all substrates and locations to be sealed.

B. Manufacturer's inspector shall give written notification to Architect and city representative of any conditions which would adversely affect the required sealant work and guarantee requirements specified herein. Do not proceed with sealing work
until such conditions have been corrected to manufacturer's inspector's satisfaction.

C. Manufacturer's inspector shall certify, in writing, to the Architect and City representative, that the correct joint fillers, bond-breakers, primer and sealants are to be used for the various substrates and locations of same.

D. Manufacturer's inspector shall, at the start of the sealant work, instruct the sealant applicators (at the job site) as to correct cleaning, priming, installing back-up material (including bond-breakers) and sealing operations for applicable substrate and locations of same. Contractor shall conform to such instructions.

E. Failure to comply with these requirements shall constitute grounds for non-acceptability of materials even though such materials have been specified or reviewed.

3.3 PREPARATION OF JOINTS

A. Joints to be sealed shall be raked as required and thoroughly cleaned of mortar or any other foreign materials in an approved manner before any sealant materials are applied. Remove any coatings from metal surfaces before installation of said metal by use of solvent recommended by manufacturer of metal.

B. Clean porous surfaces such as concrete and similar materials by sand or water blasting as required to provide a clean, sound base surface for sealant adhesion. Remove loose particles present, or resulting from blast cleaning by blowing out joints with oil-free compressed air. Concrete shall be fully cured and dried before primer is applied. Any alkaline seepage from fresh concrete shall be washed away and surface dried.

C. Clean non-porous surfaces, such as metal and glass, either mechanically or chemically. Remove protective coatings on metallic surfaces by oil free solvents such as xylol, toluol, or methylethyl ketone (MEK). Do not use soap, detergent, or water based cleaners. Use clean, white cloths, or lint-less paper towels with solvent. Do not allow solvent to air dry without wiping.

D. Joint spaces and surfaces shall be thoroughly dry before installation of sealant materials. Unless approved means of drying joint is employed, do not install sealant materials during and after rain and fog. To test for free moisture, run paper towel through joint.

E. Joint Dimensions for Polysulphide and Polyurethane Sealants:

1. Depth of joint is defined as distance from outside face of material in which joint is located to closest point of rod-shaped joint back-up.

2. Minimum Depth, Width: Joints shall be never less than 1/4" depth by 1/3" width, unless approved by Architect and City representative in writing.

3. Joint Dimensions:

   a. Over 1/4" to 1/2" wide: Minimum depth 1/4", maximum depth equal to width.

   b. Over 1/2" to 3/4" wide: Minimum depth 3/8", maximum depth 3/4" of
width.

c. Over 3/4" to 1" wide: Minimum depth 1/2", maximum depth 5/8 of width.

d. Over 1" to 2" wide: Minimum depth 1/2", maximum depth 1/2 of width.

e. For joints exceeding 2" in width, depth shall be as directed by the sealant manufacturer.

4. Width of joint shall be as calculated from Thiokol Chemical Company's "Joint Design Aid" or similar manufacturer's data, to suit 25% compression/expansion capability of sealant.

F. Exterior:

1. Sealant of joints occurring at meeting of different materials at exterior of building, unless otherwise indicated on the project drawings.

2. Sealant at perimeter of exterior frames for louvers, glass and window frames, and door frames in contact with exterior plaster, concrete or concrete block.


4. Sealing of exterior perimeters of all electrical and mechanical items which penetrate exterior building surfaces.

5. Special sealant at 1-1/2 inch wide joints.

6. Fire-rated sealant at fire rated construction.

7. Sealant as noted on project drawings, except where included in the work on another section.

8. Paving joints at building perimeter.

G. Interior:

1. Interior control joints.

2. Sealant at interior sleeves which receive piping or conduit, unless otherwise noted.

3. Sealant as noted on project drawings, except where included in the work of another section.

3.4 INSTALLATION

A. Do not proceed with the installation of sealants under adverse weather conditions when joint to be sealed is damp, wet or frozen, or when temperatures are below or above the manufacturer's recommended limitations for installation. Consult the manufacturer for specific instructions before proceeding.

B. Mixing and application of sealing compound shall be in strict accordance with the manufacturer's printed directions. Initial mixing and application shall be under the
direct supervision of the manufacturer's representative.

C. Comply with sealant manufacturer's current recommendations and instructions in mixing, preparatory work, priming, application life and procedure, and protection of caulking and sealing work for this project. Work shall be done by experienced mechanic using specified materials and proper tools.

D. Prime concrete block and, if so recommended by sealant manufacturer, other surfaces before applying sealant. Prime with brush what will reach all parts of joints to be filled with sealant compound.

E. Mask all edges not confined by other building materials, and make necessary provisions to avoid possibility of applying any sealant materials to any exposed surfaces adjacent to joints, and to prevent permanent staining or other damage to adjacent work. Contractor shall be fully responsible for any staining and/or damage caused under work of this section to adjacent work.

F. Back-up Material: Flexible of suitable size and shape so that, when compressed (25% to 50%), it will fit in joints as required. Roll stock into joint to avoid lengthwise stretching. Do not twist, braid or puncture. If finished sealant work has bubbles from gas escaping from punctured backer rod, sealant and rod shall be replaced at no additional expense to the City.

G. Bond Breaker Tape: Install bond breaker tape smoothly at back of joint. Sealant shall adhere only to the sides and not to the back of the joint so as to eliminate three-sided adhesion.

H. Fill joint with filler and back-up material so that depth and width of joint have relationships as noted hereinbefore under "Joint Dimensions."

I. Bond Breaker: Sealant shall be bonded to the two opposite sides of joint only. Apply bond-breaker between sealant and back of joints where space for back-up material does not exist.

J. Use primer as it comes from can, unadulterated. Apply as per manufacturer's printed directions, and/or recommendations. Prime joints before insertion of sealant back-up or joint filler material. Allow primer to dry before application of sealant.

K. In mixing sealant components, do not excessively whip air into sealants. Mix with low speed equipment as recommended by manufacturer.

L. Apply sealant material with approved type "caulking" gun (or container with spout or pour-grade sealant) at bottom of joint. Gun shall have nozzle of proper size and provide sufficient pressure to completely fill joints. Where use of gun is not practicable, use suitable hand "caulking" tools. Clean tools and equipment before reuse.

M. Tool to a neat, even place, using metal jointing tools. Perform tooling before sealant has had time to "film over." When tooling white, or light colored sealant, use tool or tooling solution recommended by sealant manufacturer. If manufacturer indicates there is any possibility of color of caulking material being changed by use of wetting agents while tooling, Contractor shall "dry tool."

N. Take necessary measures to prevent leakage or other malfunction at locations where
polyurethane type sealant meets polysulphide type sealant compound.

3.5 PROTECTION AND CLEANING

A. Leave work in a neat, clean condition to full satisfaction of the Architect, and per the provisions of Section 01710.

B. Adjacent surfaces shall be properly protected against stains, smearing, and other damages during the sealing operations.

C. Ladders and scaffolds shall be cushioned to prevent damage to building surfaces.

D. Cover joints or horizontal surfaces with suitable protection until sealant is cured.

3.6 CLEAN-UP

A. Leave surfaces free of dirt, gouges and imperfections. Clean adjacent surfaces soiled by this work. Remove equipment, surplus materials and debris from job site, and leave installation ready for succeeding work.

END OF SECTION
SECTION 07920
JOINT SEALANTS

PART 1 - GENERAL

1.01 SUMMARY

A. Provisions of the General and Supplementary Conditions and Division 01 apply to this section.

B. Section Includes:

1. Joint sealants as indicated or required.

C. Related Sections:

1. Section 06200: Finish Carpentry.
2. Section 07600: Flashing and Sheet Metal.
3. Section 07840: Fire Stops and Smoke Seals.
4. Section 08110: Steel Door, and Frames.
5. Section 08411: Aluminum Windows, Doors and Frames.

1.02 SUBMITTALS

A. Shop Drawings: Submit Shop Drawings indicating sealant joint locations, with full-size sealant joint details.

B. Product Data: Submit manufacturer's literature for each sealant material.

C. Material Samples: Submit Samples indicating color range available for each sealant material intended for installation in exposed locations.

D. Certifications: Submit manufacturer's certification materials comply with requirements specified.

E. Site Samples: At locations required, provide a Sample of sealant for each typical installation, approximately 24" long, including joint preparation, backing, sealant and tooling. Allow backing to extend 6" beyond end of sealant for inspection of substrate.

F. Test Reports: Submit manufacturer's adhesion compatibility test reports according to ASTM C 794 for each substrate.

1.03 QUALITY ASSURANCE

A. Qualifications of Installer: The Work of this section shall be installed by a firm which has been in the business of installing similar materials for at least 5 consecutive years; and can show evidence
of satisfactory completion of 5 projects of similar size and scope. Installer shall have applicators trained and approved by manufacturer for performing this Work.

1.04 DELIVERY, STORAGE AND HANDLING

A. Store in accordance with manufacturer’s recommendations. Provide a uniform ambient temperature between 60 and 80 degrees F.

1.05 WARRANTY

A. Provide a 5 year material warranty.

B. Provide a 2 year labor warranty.

PART 2 - PRODUCTS

2.01 GENERAL

A. Furnish sealants meeting following in-service requirements:

1. Normal curing schedules are permitted.

2. Non-staining, color fastness (resistance to color change), and durability when subjected to intense actinic (ultraviolet) radiation are required.

B. Furnish the products of only one manufacturer unless otherwise required, sealant colors as selected to match the adjoining surfaces.

2.02 MATERIALS

A. Sealants:

1. Sealant 1: Acrylic latex, one-part, non-sag, mildew resistant acrylic emulsion compound complying with ASTM C 834, Type S, Grade NS, formulated to be paintable.
   
   
   b. Bostik Construction Products Division, Chem-Calk 600.
   

2. Sealant 2: Butyl sealant, one-part, non-sag solvent-release-curing sealant complying with FS TT-S-001657 for Type 1 and formulated with a minimum of 75 percent solids.

   a. Tremco Inc., Tremco Butyl Sealant.
   
   b. Bostik Construction Products Division, Chem-Calk 300.
   
   c. Pecora Corp., BC-158.

3. Sealant 3: Silicone sealant, one-part non-acid-curing silicone sealant complying with ASTM C 920, Type S, Grade NS, Class 25.
d. Pecora Corp., 864.

4. Sealant 4: One-part mildew-resistant silicone sealant, complying with ASTM C 920, Type S, Grade NS, Class 25.
a. Dow Corning Corp., Dow Corning 786.
d. Pecora Corp. 863 White.

5. Sealant 5: One-part non-sag urethane sealant, complying with ASTM C 920, Type S, Grade NS, Class 25.
c. Tremco, Inc., Dymonic.
d. Sika Corporation, Sikaflex 1-A.

a. Tremco, Inc., HPL.
c. Sika Corporation, Sikaflex 2C NS/SL.
d. W.R. Meadows, Pourthane.

7. Sealant 7: Acoustical sealant, non-drying, non-hardening permanently flexible conforming to ASTM D 217.

B. Penetrations Through Fire Barriers: Refer to Section 07840: Fire Stops and Smoke Seals.
1. 3M Brand Fire Barrier Calk CP-25.
2. 3M Brand Fire Barrier Putty 303.

C. Joint Backing: ASTM D 1056; round, closed cell Polyethylene Foam Rod; oversized 30 to 50 percent larger than joint width, reticulated polyolefin foam.

D. Primer: Non-Staining Type. Provide primer as required and shall be product of manufacturer of installed sealant.

E. Lacquer sealer shall be clear, as recommended by sealant manufacturer.

F. Bond Breaker: Pressure sensitive tape recommended by sealant manufacturer.

G. Sealants shall have normal curing schedules, shall be nonstaining, color fast and shall resist deterioration due to ultraviolet radiation.

PART 3 - EXECUTION

3.01 EXAMINATION

A. Verify that joint openings are ready to receive Work and field measurements are as indicated on Drawings and recommended by manufacturer.

3.02 SURFACE PREPARATION

A. Joints and spaces to be sealed shall be completely cleaned of all dirt, dust, mortar, oil, and other foreign materials which might adversely affect caulking Work. Where necessary, degrease with an solvent or commercial degreasing agent. Surfaces shall be thoroughly dry before application of sealants.

B. If recommended by manufacturer, remove paint and other protective coatings from surfaces to be caulked before priming and installation of sealants.

C. Preparation of surfaces to receive sealant shall conform to the sealant manufacturer's specifications. Provide air pressure or other methods to achieve required results. Provide masking tape to keep sealants off surfaces that will be exposed in finished Work.

D. Etch concrete or masonry surfaces to remove excess alkalinity, unless sealant manufacturer's printed instructions indicate that alkalinity does not interfere with sealant bond and performance. Etch with 5 percent solution of muriatic acid; neutralize with dilute ammonia solution, rinse thoroughly with water and allow to dry before sealant installation.

E. Perform preparation in accordance with ASTM C 804 for solvent release sealants, and ASTM C 962 for elastomeric sealants.

F. Protect elements surrounding Work of this section from damage or disfiguration.

3.03 SEALANT APPLICATION SCHEDULE

<table>
<thead>
<tr>
<th>Location</th>
<th>Type</th>
<th>Color</th>
</tr>
</thead>
<tbody>
<tr>
<td>A. Exterior &amp; Interior joints in horizontal surfaces of concrete; between metal &amp; concrete masonry</td>
<td>Sealant 6</td>
<td>To match adjacent material</td>
</tr>
</tbody>
</table>
and mortar.

| B. | Exterior door, entrance & window frames. Exterior & interior vertical joints in concrete & masonry metal flashing. | Sealant 3 or 5 | To match adjacent material |
| C. | Joints within glazed curtain wall system. Skylight framing system. Aluminum entrance system glass and glazing. | Sealant 3 | Translucent or Black |
| D. | Interior joints in ceramic tile and at plumbing fixtures. | Sealant 4 | Translucent or White |
| E. | Under thresholds. | Sealant 2 | Black |
| F. | All interior joints not otherwise scheduled | Sealant 1 | To Match Adjacent Surfaces |
| G. | Heads and sills, perimeters of frames and other openings in insulated partitions | Sealant 7 | Match Adjacent Surfaces |

### 3.04 APPLICATION

**A.** Provide sealant around all openings in exterior walls, and any other locations indicated or required for weatherproofing and waterproofing building.

**B.** Sealants shall be installed by experienced mechanics using specified materials and proper tools. Preparatory Work (cleaning, etc.) and installation of sealant shall be as specified and in accordance with manufacturer's printed instructions and recommendations.

**C.** Concrete, masonry, and other porous surfaces, and any other surfaces if recommended by manufacturer, shall be primed before installing sealants. Primer shall be installed with a brush that will reach all parts of joints to be filled with sealant.

**D.** Sealants shall be stored and installed at temperatures as recommended by manufacturer. Sealants shall not be installed when they become too jelled to be discharged in a continuous flow from gun. Modification of sealants by addition of liquids, solvents, or powders is not permitted.

**E.** Sealants shall be installed with guns having proper size nozzles. Sufficient pressure shall be furnished to fill all voids and joints solid. In sealing around openings, include entire perimeter of each opening, unless indicated or specified otherwise. Where gun installation is impracticable, suitable hand tools shall be provided.

**F.** Sealed joints shall be neatly pointed on flush surfaces with beading tool, and internal corners with a special tool. Excess material shall be cleanly removed. Sealant, where exposed, shall be free of wrinkles and uniformly smooth. Sealing shall be complete before final coats of paint are installed.
G. Comply with sealant manufacturer's printed instructions except where more stringent requirements are indicated on Drawings or specified.

H. Partially fill joints with joint backing material, furnishing only compatible materials, until joint depth does not exceed 1/2 inch joint width. Minimum joint width for metal to metal joints shall be 1/4 inch. Joint depth, shall be not less than 1/4 inch and not greater than 1/2 inch.

I. Install sealant under sufficient pressure to completely fill voids. Finish exposed joints smooth, flush with surfaces or recessed as indicated. Install non-tracking sealant to concrete expansion joints subject to foot or vehicular traffic.

J. Where joint depth prevents installation of standard bond breaker backing rod, furnish non-adhering tape covering to prevent bonding of sealant to back of joint. Under no circumstances shall sealant depth exceed 1/2 inch maximum, unless specifically indicated on Drawings.


3.05 MISCELLANEOUS WORK

A. Sealing shall be provided wherever required to prevent light leakage as well as moisture leakage. Refer to Drawings for condition and related parts of Work.

B. Install sealants to depths as indicated or, if not indicated, as recommended by sealant manufacturer but within following general limitations:

1. For joints in concrete walks, slab and paving subject to traffic, fill joints to a depth equal to 75 percent of joint width, but not more than 3/4 inch deep or less than 3/8 inch deep, depending on joint width.

2. For building joints, fill joints to a depth equal to 50 percent of joint width, but not more than 1/2 inch deep or less than 1/4 inch deep.

3.06 CLEANING

A. Remove rubbish, debris, and waste materials and legally dispose of off the Project site.

3.07 CURING

A. Sealants shall cure in accordance with manufacturer's printed recommendations. Do not disturb seal until completely cured.

3.08 PROTECTION

A. Protect the Work of this section until Substantial Completion.

END OF SECTION
SECTION 08110
STEEL DOORS AND FRAMES

PART 1 - GENERAL

1.01 SUMMARY

A. Provisions of the General and Supplementary Conditions and Division 01 apply to this section.

B. Section Includes:
   1. Steel doors and frames as indicated.

C. Related Sections:
   1. Section 07920: Joint Sealants.
   2. Section 08210: Wood Doors.
   4. Section 08710: Door Hardware.
   5. Section 08800: Glazing.

1.02 SYSTEM DESCRIPTION

A. Design Requirements: Drawings indicate profile and general details of steel frame fabrication and installation, in addition to referenced details 1, 2, 3 and 3A this section.

1.03 SUBMITTALS

A. Shop Drawings:
   1. Submittal to include elevations of each hollow metal door type, details of each frame type, location schedule of doors, and frames indicating the same reference for details and openings as indicated on the Drawings, conditions of openings of various wall sections and materials, typical and special details of construction, methods of assembling sections, location and installation requirements for hardware, material size, shape, and thickness, and all joints and connections.
   2. Submit composite Shop Drawings indicating detailed relationships of installation including the Work of adjacent construction, finish hardware, security, fire, and life safety devices, glazing, caulking, and requirements for field installation.

C. Product Data: Submit manufacturer's Product Data indicating composition and construction for each fabricated item including louvers, coatings, finishes, and other components.

D. Certification: Submit to indicate compliance with specified criteria.

E. Samples:
1. Hollow Metal Frame: Corner section of typical interior frame, of sufficient composite size to illustrate corner joint, hinge reinforcement, closer re-enforcement, floor anchor, dust cover, and jamb anchors.

2. Hollow Metal Door: Section of typical interior door of sufficient composite size to illustrate edge, top, bottom, and core construction, hinge reinforcement and face stiffening, closer reinforcement and kick plate reinforcement, and corner of vision opening construction with glazing beads.

1.04 QUALITY ASSURANCE

A. Steel doors and frames shall be the product of one manufacturer.

B. Coordinate with hardware supplier for fabrication of doors and frames to receive hardware items.

C. Coordinate with intrusion alarm supplier for fabrication of doors and frames to receive intrusion detection devices.

D. References: Work not subject to more stringent provisions of regulatory agencies and the Contract Documents shall satisfy as a minimum the requirements of:

1. ANSI/SDI-100: Steel Door Institute, Recommended Specifications Standard Steel Doors and Frames.

2. AISI: American Iron and Steel Institute.


E. Standards of Manufacturer and Workmanship:

1. Finished Work shall be of uniform profile, accurately fabricated, rigid and strong, square and true, neat in appearance, smooth and free from dents, waves, warps, buckles, open joints, tool marks and/or other defects.

2. Construction joints shall be flush, tight and welded their full length, ground flush and smooth on exposed surfaces.

3. All frame and door reinforcing and hardware provisions shall be performed in the fabrication shop. Provide all cuts, welds, and other fabrications before galvanizing or shop priming.

4. Lines and molded members shall be straight and true with angles as sharp as practical for thickness involved, surfaces flat, and fastenings concealed.

5. Tolerances: Fabricate doors and/or frames to provide a maximum 1/8” gap between side edges of door face and frame after installation, a maximum of 1/8” at top edge, and maximum ¼” clearance above finish floor, except as otherwise required by floor finish material. Provide maximum 1/8” gap between door edges adjoining stiles or at astragals.
1.05 DELIVERY, STORAGE AND HANDLING

A. Frames: Before shipment, install temporary spreaders at bottom of bucks and do not remove until frames are installed.

B. Doors: Provide wrapping as required to protect doors during shipping and storage.

C. Inspect hollow metal Work upon delivery for damage. Remove and replace damaged items with new Work as required.

D. Store doors and frames in an upright position at the Project Site under cover from weather related elements. Store units on minimum 4” high wood blocking with ½” air spaces between stacked doors to provide circulation. Do not store doors and frames under plastic or canvas shelters. If shipping packaging becomes wet, immediately remove the packaging.

1.06 WARRANTY

A. Provide a 2 year material and labor warranty.

PART 2 - PRODUCTS

2.01 MANUFACTURERS

A. Steelcraft Manufacturing Co.

B. Amweld Metal Doors and Frames

C. Or approved equal.

2.02 MATERIALS

A. Steel:

   1. Galvanized Carbon Sheet Steel: Furnish best quality, stretcher-leveled, cold-rolled carbon steel conforming to ASTM A526, with ASTM A525, G90 zinc coating (0.30 ounces per square foot per side), with clean, smooth surfaces free of scale, pitting or other defects.

   2. Cold-Rolled Steel Sheets: Commercial quality carbon steel, complying with ASTM A526 with ASTM A525 G90 zinc coating (0.30 ounces per s.f. per side).

B. Sound Deadening Core Insulation: Furnish rigid, unsettling, vermin-proof, and non-combustible fiberglass or rockwool type material to provide required STC and thermal ratings within door fabrications.

C. Supports and Anchors: Fabricate of not less than 16-gauge sheet metal. Galvanize after fabrication. Units to be installed into exterior walls, comply with ASTM A-153, Class B.

D. Fasteners: Provide as shown on Drawings and to suit conditions of secure installations. Furnish 304 Grade stainless steel types at exterior doors.

E. Louvers: Air Louvers or equal
1. Louvers for exterior doors shall be furnished with not less than #12 grille welded to 18 gage steel blades, and removable bronze insert screen on inside. Install louver with tamperproof head through-bolts.

F. Vision panels shall be furnished with manufacturer's standard baked-on enamel finish.

G. Shop Paint:
   1. Conform to Steel Structures Painting Council (SSPC).
   2. Pretreatment/priming coatings shall be compatible with Project site finish painting system per Section 09900.
   3. At frames to be grouted, all surfaces that are inaccessible after installation shall be coated with bituminous or asphaltic base paint.

H. Grout: Mix shall be non-chloride. Provide a minimum slump with 6 gallons, maximum of potable water (reduced with height in frame) to each sack of Type I/II Portland cement with fine aggregate, natural and of low porosity.

2.03 SHOP FABRICATION

A. Fabricate steel door and frame units to comply with ANSI A 250.8 and to be rigid, neat in appearance, and free from defects including warp and buckle. Where practical, factory or shop fit and assemble units.

B. General: Welded Unit Construction: Fabricate hollow metal units so as to be rigid, neat in appearance, and free from defects, warp, or buckle.
   1. Accurately form metal to required sizes and profiles. Fit and assemble all units in the manufacturer’s plant. Weld all joints continuously; grind, dress, and make smooth, flush, and invisible. Metallic filler to conceal manufacturing defects is not permitted.
   2. Corner Joints: Furnish corner joints by mitering, or coping and butting, or a combination of both. In both cases, reinforce with steel angle splines. Trim and backbend shall be continuous around corner. Continuously weld joints for full depth and width of frame and trim.
   3. Comply with additional fabrication requirements, finishes, and provisions including hardware and alarm systems.

C. Exterior Door and Frame Construction: For exterior locations and elsewhere as indicated, fabricate doors, panels, and frames from metallic-coated steel sheet. Close top and bottom edges of doors flush as an integral part of door construction or by addition of 0.053-inch thick, metallic-coated steel channels with channel webs placed even with top and bottom edges.

D. Interior Door Faces: Fabricate exposed faces of doors and panels, from the following material:
   1. Cold-rolled steel sheet, unless otherwise indicated.
2.04 FRAMES

A. General: Provide welded or knocked down, field painted steel frames with integral stops and trim for doors, transoms, sidelights, borrowed lights, and other openings complying with ANSI/SDI 100, ANSI A 250.4, and with details indicated for type and profile. Furnish concealed fastenings, unless otherwise indicated.

C. Metal Gauge of Frames: Thickness indicated are minimum:

1. Interior hollow metal frames up to 4'-0" wide 16 gauge sheet steel
2. Interior hollow metal frames wider than 4'-0" 14 gauge sheet steel
3. All exterior hollow metal frames. 14 gauge sheet steel

(All exterior frames to be fully welded and ground smooth)
4. Borrowed lights up to 4'-0" wide 16 gauge sheet steel

D. Supports and Anchors: Fabricated from at least 0.042 inch thick, electrolytic zinc-coated or metallic-coated steel sheet. Frame anchors shall comply with fire rated label requirements of the opening.

1. Floor Anchors:
   a. 12 gauge minimum, sheet steel or bent steel plate, securely welded inside each jamb, with two holes in anchor at each jamb for 3/8" floor anchorage fasteners.
   b. Where required at sloping and uneven floor conditions, or to coordinate adjustments for trim alignments, provide adjustable floor anchors, providing at least 2" height adjustments.

2. Jamb Anchors:
   a. Locate anchors near top and bottom and at intermediate points not to exceed 24 inches on center. Provide 2 anchors per head for openings up to 48 inches wide; over 48 inches wide provide anchors at 24 inches on center maximum.
   b. Furnish glazed openings in frames with steel glazing stops and moulding of sizes indicated for field installation with countersunk oval head sheet metal screws. Stops and mouldings shall be 16 gage material unless otherwise indicated or specified.
   c. Anchors in masonry construction: Provide adjustable jamb anchors, "Strap-and-Stirrup" type, and 16 gauge minimum sheet steel. Stirrups shall be corrugated, 1-1/2" x 10" minimum size. Steel wire complying with ASTM A510, 0.177 inch in diameter, may be furnished instead of steel sheet.
   d. Anchors in Stud Partitions: Provide steel anchors, 16 gauge minimum sheet steel, of design to suit partition construction, securely welded inside each jamb.
e. Through Frame Anchors: At frames indicated to be anchored with bolts through the frame, provide countersunk holes for bolts with 16 gauge minimum sheet steel stiffeners full thickness of frame, and securely welded inside each frame at each hole.

E.. Inserts, Bolts, and Fasteners: Provide manufacturer's standard units. Where zinc-coated items are to be built into exterior walls, comply with ASTM A 153 Class C or D as required.

F. Head Reinforcing: Furnish reinforced heads of frames when wider than 42” with steel angles or channel of 12 gauge minimum, full width of frame and factory welded inside frame. Reinforcing shall not act as lintel or load-carrying member and shall comply with fire rating requirements.

G. Hardware Reinforcement:
   1. Butt reinforcing shall be 10 gage minimum.
   2. Head assemblies shall be reinforced internally with a full profile, full length, channel-shaped, 12 gage closer reinforcement.
   3. Reinforcing for other items of finish hardware shall be 12 gage minimum.

H. Mullion and Transom bars: Furnished and fabricated as specified for frames.

I. Not Used.

J. Finish: Thoroughly clean surfaces and chemically treat for painting. Inaccessible surfaces shall be painted before assembly. Exposed surfaces of doors, frames and accessories shall be filled, sanded smooth and shall receive manufacturer's standard rust-inhibitive primer until complete coverage is achieved. Interior surfaces of frames shall be factory primed.

K. Door Silencers: Except on weather-stripped frames, furnish stops to receive 3 silencers on strike jambs of single-door frames and 2 silencers on heads of double-door frames.

2.05 DOORS

A. Doors Construction: Custom made, flush panel “seamless type” with one-piece face panels; fully welded seamless construction with no visible seams or joints on faces or on vertical edges.
   1. Provide type and size of doors with louvers and openings for glazing where indicated.
   2. Minimum Door thickness: 1 ¾”.
   4. Stiffeners: Stiffen door face sheets with vertical continuous minimum 20 gauge formed steel (rib) sections, full thickness of interior space between door faces, spaced 6” on center maximum, and spot welded to both faces 4” to 5” on center maximum.
   5. Core Insulation: Sound deadens and insulates entire core of door (full height, width, and thickness of door) with rigid inorganic non-combustible materials, such as fiberglass. Provide STC ratings where indicated on Drawings, scheduled, or partition rating indicated on Drawings.
a. Doors, when installed without applied sound seal hardware, shall be provided with the following minimum STC rating: 29

b. Exterior doors shall be meet or exceed required thermal rating indicated on Drawings, scheduled, or partition rating.

6. Door Edges: Join door face sheets at vertical edges of door with continuous weld full height of door. Grind, fill, and dress welds smooth to provide invisible seam with smooth, flush surface.

a. Door shall be provided with all edges reinforced.

b. Close ends of doors with continuous recessed channels, 16 gauge steel minimum, spot welded to both face sheets and profile filler channels at tops of exterior doors to form flush surface. Provide openings in bottom closure of exterior doors to permit escape of entrapped moisture.

c. Vertical door edge seams shall be continuously welded, ground and finished smooth.

d. Profile of Doors Edges:

1) Single-acting swing doors: Bevel both vertical edges ½” in 2”

2) Pairs of single-acting swing doors: Bevel hinge edge 1/8” in 2”. Form integral center rabbet or edge rabbet, as reviewed by Architect, at vertical meeting edges. Surface mounted astragals are not permitted for labeled or unlabeled doors unless shown on Drawings or required.

3) Double-acting swing doors: Round both vertical edges on 2-1/8” radius.

7. Door Louvers:

a. Provide louver with minimum 50% free area.

b. Provide all louvers with mesh screens.

c. Exterior louvers shall be galvanized sheet metal.

d. All louvers shall be furnished with a gray primer.

8. Glass Moulding and Stops:

a. Furnish fixed mouldings of 18 gauge minimum sheet steel, integral with and welded to security side of door.

b. Finish: Gray primer.

9. Transom: Fabricate to requirements specified for flush doors.

2.06 FABRICATION PROVISIONS FOR HARDWARE
A. Hardware Reinforcement: Provide reinforcement for finish hardware items. Mortise, drill and tap to template requirements for mortise type hardware. Reinforcement shall be sheet steel or plate.

1. Butt reinforcing shall be 10 gauge minimum of length 4” longer than length of butt.

2. Door closer reinforcement shall be from the top of door down, 10” high, full width of door, 10 gauge sheet steel as indicated in the detail section of this Specification.

3. Kickplate reinforcement shall be located from the bottom of the door, 12” high, full width of door, 10 gauge sheet steel as indicated in the detail section of this Specification.

4. Gauge and size or reinforcement for hardware items not listed shall be as required by Reference Standards, 12 gauge minimum, or the templates of those items, whichever is heavier.

B. Silencers: Except for exterior doors, drill and punch frames for three (3) silencers at lock jamb of single swing doors or in double doors with astragal and one (1) silencer per leaf in heads of doubled door frames. Install plastic plugs to keep holes clear during construction.

C. Plaster Guards: Provide 26 gauge galvanized steel plaster guards or dust cover boxes, welded to frame, at back of finish hardware cutouts where mortar or other materials might obstruct hardware operation and to close off interior of openings.

D. Other Hardware Requirements: Cut, reinforce, drill, and tap doors and frames for other hardware including energy management switches or contacts and security devices in accordance with furnished hardware templates for accessory items.

1. Provide minimum 12 gauge reinforcing or manufacturer’s recommendation, whichever is greater.

2. Provide minimum 26 gauge cover boxes behind all hardware cutouts.

3. Fire rated doors shall accommodate mortised or other specified hardware.

4. Install lock strikes with required clearances for silencers and weather/sound stripping.

2.07 SHOP PRIMING

A. All exposed and concealed carbon steel metal surfaces of all hollow metal doors, frames and other hollow metal Work of this Section, not otherwise finished (galvanized) shall be shop primed.

B. All exposed metal Work shall be bonderized before shop priming.

C. All concealed surfaces shall be shop primed before assembly. All exposed surfaces shall be shop primed after assembly.

D. Hollow metal Work shall be shop prime painted by being completely immersed or coated. Items of hollow metal fabrication may be oven baked for fast dry conditions.
PART 3 - EXECUTION

3.01 FRAME INSTALLATION

A. Install steel frames accurately in location, perfect alignment, plumb, straight and true. Brace frames to prevent displacement.

B. Anchor frames in concrete and concrete unit masonry with galvanized anchor bolts; 3/8 inch diameter, counter-sunk at 24 inches on center at head and jamb.

C. Anchor frames in steel and wood frame partitions with manufacturer recommended anchors.

D. Provide adjustable floor clips for frames.

E. Furnish filler for anchor attachment screws, and sand smooth.

F. Provide acceptance of adjacent surface prior to installation.

G. Provide grouting at frames at openings in CMU walls.

3.02 DOOR INSTALLATION

A. Install steel doors in accordance with manufacturer’s instructions and as indicated on Drawings and finish hardware specifications. Coordinate with the Work of other trades.

B. Adjust operable parts for correct function.

C. Remove hardware, except primer-coated items, tag, box and install after finish painting has been completed.

3.03 PRIME COAT TOUCH-UP

A. Immediately after installation, remove rust, repair damaged surfaces to new condition, sand smooth, and install touch-up primer.

3.04 CLEAN UP

A. Remove rubbish, debris and waste materials and legally dispose of off the Project site.
Detail # 3 - Concrete Wall Condition Rain Drip
Detail for Exterior Door where Rain Drip Required
Exterior Side with rain drip welded in place.

Rain Drip Detail Concrete wall Condition
Spot weld to frame on three inch centers
one weld at each end within one inch.

Frame Header section
16 gauge steel.

Detail # 3A
Plaster Wall Condition -
Detail for Exterior doors where rain drip is required.
Exterior side with rain drip welded in place.

Rain Drip Detail Plaster wall Condition
Spot weld to frame on three inch centers
one weld at each end within one inch.

Frame Header section
16 gauge steel.

3.05 PROTECTION

A. Protect the Work of this section until Substantial Completion.
END OF SECTION
SECTION 08210
WOOD DOORS

PART 1 - GENERAL

1.1 SUMMARY

A. Section includes:
   1. Factory-finished, solid core, flush wood doors.
   2. Supplementary parts and components, such as inserts, clips, fasteners, anchors, and other miscellaneous supports and accessories required for a complete installation.

B. Work installed but furnished in other Sections:
   1. Division 8 for finish hardware and door frames.

1.2 REFERENCES

A. Window and Door Manufacturers Association (WDMA) IS 1A, Industry Standard for Architectural Wood Flush Doors.

B. Woodwork Institute (WI).


1.3 SUBMITTALS

A. Data: Submit manufacturer’s data for the finish system.

B. Sustainable Checklist Submittals:
   1. Chain-of-custody certificates certifying that flush wood doors comply with forest certification requirements. Include evidence that manufacturer is certified for chain of custody by an FSC-accredited certification body.
   2. For adhesives and composite wood products, indicating that product contains no urea formaldehyde.

C. Shop drawings: Submit the following.
   1. Door schedule indicating opening identifying number, door type, grade, size, thickness, swing and undercuts. Dimension hardware location.
   2. Prefitting and premachining requirements, including hardware locations.
   3. Use same reference numbers for openings and details as Contract Drawings.
D. Certificate: Submit manufacturer’s certificate showing door compliance with these Specifications and the WDMA.

1.4 QUALITY ASSURANCE

B. Uniformity: the same manufacturer shall make all wood doors for the Project.

C. Quality standard: In addition to requirements specified, comply with WI Manual of Woodwork.
   1. Provide WI-Certified Compliance Certificate indicating that doors comply with requirements of grades specified.

D. Marking: Mark each door on top and bottom rail with opening number used on Shop Drawings.

1.5 HANDLING

A. Delivery:
   1. Deliver prefinished doors factory-wrapped in polyethylene bags, unitized and palletized. Shrink-wrap each pallet and provide corner guards for protection.
   2. Mark each door with architectural opening number in distribution and installation.
   3. Do not deliver doors to the Project until proper storage space is available.

B. Storage:
   1. Store doors in an assigned space having controlled temperature and humidity as recommended by WI.
   2. Store doors flat on factory pallets or 3 full 2 by 4s, one centered and the other two 12 inches from each end.
   3. Protect doors from construction activity with plywood and store away from direct sunlight.

C. Handling:
   1. Handle doors with clean white gloves.
   2. Do not drag doors across one another.
   3. Maintain factory packaging or other means of protection of doors until Substantial Completion.

1.6 JOB CONDITIONS

A. Do not deliver or install doors until conditions for temperature and relative humidity have been stabilized and will be maintained in storage and installation areas during remainder of construction period.
B. Comply with referenced WI quality standard including Technical Bulletin 419 for moisture content and relative humidity.

1.7 WARRANTY

A. Furnish to the Owner the door manufacturer written warranty against doors delaminating, telegraphing core through face veneer and against non-conformance with tolerance limitations of referenced quality standards for life of the installation after installation.

B. Include reinstallation that may be required due to repair or replacement of defective doors, during the warranty period, when defect was not apparent prior to hanging.

PART 2 -PRODUCTS

2.1 MANUFACTURERS

A. One of the following, or equal:
   1. Baillargeon.
   2. Buell Door Co.
   3. Eggers Industries.
   4. Vancouver Door.

2.2 DOORS

A. Low-Emitting Materials: Provide doors made with adhesives and composite wood products that do not contain urea formaldehyde.

B. Flush wood doors -general: The following complying with WDMA “Extra Heavy Duty” classification.

C. Non-rated doors:
   1. Grade: Premium.
      a. PC-7. 7-plies, particleboard bonded core.
   2. Wood veneer for doors scheduled to receive a painted finish:
      b. Face veneer grade: Paint Grade.

2.3 FACTORY-MACHINING/FINISHING
A. Sustainable Requirements:

1. General: Comply with referenced quality standard for factory finishing. Complete fabrication, including fitting doors for openings and machining for hardware that is not surface applied, before finishing.

2. Finish faces, all four edges, edges of cutouts, and mortises. Stains and fillers may be omitted on top edges, edges of cutouts, and mortises.

3. Door edges to be hardwood, finish and specie to match door face.

B. Factory-machine doors by manufacturer or qualified distributor for cutouts, hinges, louvers, vision panels, locks and all hardware requiring routing or mortising.

C. Refer to Article 3.2 below for door clearances.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Examine frames, adjacent construction and supports.

B. Verify that openings are within allowable tolerances, plumb, level, clean, will provide a solid anchoring surface.

C. Correct other conditions detrimental to the proper or timely completion of this work before proceeding with installation.

3.2 INSTALLING FINISH HARDWARE/HANGING DOORS

A. Install finish hardware in compliance with its manufacturer's instructions and the requirements of Section 08710.

1. Fit accurately to doors.

2. Locate as specified for steel doors in Section 08110.

B. Condition doors to average prevailing humidity in installation area prior to hanging.

C. Factory fit doors to suit frame opening sizes indicated, with the following uniform clearances and bevels. Comply with clearance requirements of referenced quality standard for fitting.

D. Hang doors to operate freely for their entire travel, but not loosely, without sticking or hinge binding, with all hardware adjusted and functioning properly.

REPLACING DAMAGED DOORS

A. Replace doors showing chips, scratches, unbonded face veneers, glue stains, excessive warp or other damage that cannot be satisfactorily repaired, as determined by the Architect, with acceptable doors.

END OF SECTION
SECTION 08210-01

WOOD SOUND CONTROL DOORS (STC - 46)

PART 1 - GENERAL

1.01 WORK INCLUDED

A. This section includes the furnishing and installation of wood sound retardant doors and frames and adjusting of all acoustical seals as scheduled on the drawings and specified herein.

1. Include sound retardant fire doors as scheduled.
2. Provide complete assemblies, including door, frame and seals.
3. Supervision by door manufacturer of adjusting acoustical seals.

1.02 RELATED WORK SPECIFIED ELSEWHERE

A. Grouting of Frames
B. Other hollow Metal Work
C. Finish Hardware
D. Glazing
E. Finish Painting

1.03 ACCEPTABLE MANUFACTURERS

A. The doors shall be manufactured by a company that has regularly specialized in the manufacture of sound retardant doors for a period of at least ten (10) years.

B. A specific product or material manufactured by any of the following listed manufacturers is "Acceptable" (not "approved") only if the specific product or material can demonstrate exact compliance with the Contract Documents. Other manufacturer's must be approved in writing prior to bidding by the project's Acoustical Consultant.

1. Krieger Steel Products
2. Overly Door Company

1.04 GUARANTEE

A. All material furnished under this section shall be guaranteed free from defects in workmanship and material for a period of one year from the date of final acceptance.

1.05 SUBMITTALS

A. At time of bid submittal, test reports from an independent acoustical laboratory and complete shop drawings of the door, seals and frames shall be available for review by the Architect.

B. Prior to start of fabrication provide the following for approval by the Architect:
1. Acoustical test reports from an independent acoustical testing laboratory as specified below including installation instructions. The acoustical testing laboratory shall have been accredited by the U.S. Department of Commerce, National Institute of Standards and Technology (NIST) under the National Voluntary Laboratory Accreditation Program (NVLAP) for this test procedure.

2. Manufacturer's detailed specifications.

3. Shop drawings showing door, door frames, head and jamb seals and door bottom construction. Also show frame and door sizes and types as scheduled and detailed.

4. Manufacturer's written instructions for adjusting sound seals.

1.06 ACOUSTICAL PERFORMANCE

A. All assemblies shall have a minimum Sound Transmission Class (STC) rating as scheduled.

B. The sound transmission loss of the door assembly shall be certified by a test report from an independent acoustical testing laboratory. The test method shall meet ASTM E90 for the laboratory measurement of airborne sound transmission loss. The test date shall not be older than ten (10) years from the project bid date.

C. The door shall be fully operable at the time of test and shall be opened and closed several times prior to measurement. The test shall be on the exact door/frame/seal assembly that is to be supplied for the project. It shall be tested as a complete assembly. A test for the door and a separate test for the acoustical seals is not acceptable.

D. The door and frame assembly shall meet or exceed the stated STC values and in addition shall meet or exceed the following sound transmission loss values:

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<th>Frequency in Khz</th>
<th>STC Value</th>
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PART 2 - PRODUCTS

2.01 DOOR CONSTRUCTION

A. All sound control doors shall be 1-3/4" thick, constructed of wood veneer with a sound deadening acoustical core. Stile edges of doors shall be minimum 1 3/8" after trim and rail edges shall be minimum of 3" after trim. All adhesives, as well as warp tolerance, shall be in accordance with NWWDA A I.S.1. All wood end-grain exposed at edges of doors shall be sealed prior to shipment. Door facing shall be decorative laminate or wood veneer as specified by the Architect.

B. Sound control doors shall weigh not less than the following:

1. STC-46: 6.5 Lbs/Sq. Ft.

2.02 DOOR FRAME

A. Frames shall be fabricated from minimum 14 gauge steel with the corners mitered, welded and ground smooth.
2.03 DOOR SEALS

A. All head and jamb seals shall be an extruded neoprene type in a fully adjustable retainer assembly. The hinge edge seal shall be constructed to avoid any pinching, or distortion of the seal when closing the door.

B. On pairs of doors provide astragal seals in a fully adjustable retainer assembly that maintains the specified STC rating.

C. The door bottom shall be a mortised type and shall close the entire gap between the door and the floor. The door bottom shall be a sponge neoprene type. The door bottom shall assure a continuous, positive, reliable seal at the floor with minimum friction, drag and roll of the assembly on the floor.

PART 3 - EXECUTION

3.01 GENERAL

A. Coordinate installation with work of other trades.

B. Level subfloor and threshold so that they contact a straightedge for the length of the threshold.

C. Doors and frames shall be installed in accordance with the manufacturer’s written instructions. Frames shall be securely anchored to the floor and held plumb and square by the wall construction.

D. Area inside frame shall be grouted solid full height of jambs and across head with "Gypsolite" manufactured by Gold Bond or "Structo-lite" by U.S. Gypsum, or equal. Where split frames occur, each side of the frame shall be grouted separately taking care not to "bridge" the sections of the walls or frames together.

E. After the assembly has been built into the walls and all finish hardware installed, all operating parts shall be adjusted for smooth operation and continuous contact between perimeter seals and adjoining surfaces. Adjusting of acoustical seals shall be personally supervised by an authorized representative of the door manufacturer. All costs associated with this supervision shall be borne by the door manufacturer.

3.02 SPECIAL PRECAUTIONS

A. The seals shall be installed so that they are in contact with the entire length of the jambs and head.

B. No gaps shall occur at the joint between the head and jamb seals.

C. The door bottom shall be adjusted so that the seal is in full contact with the floor surface. Under no circumstances shall the downward force exerted by the drop seal against the floor cause binding at the head. If this occurs and cannot be corrected, the entire installation shall be replaced as required at no additional cost to the Owner.

-END OF SECTION-
SECTION 08310
ACCESS PANELS AND FRAMES

PART 1 - GENERAL
1.1 SUMMARY

A. Section includes:
   1. Access panels not provided by other trades but required for access to concealed equipment and assemblies.

B. Work installed but furnished in other Sections:
   1. Access panels furnished by other trades.

C. Related work:
   1. Division 9 for finish painting access panels, except stainless steel surfaces.

1.2 SUBMITTALS

A. Data: Submit the following manufacturer product data.
   1. For each type of door and frame indicated, including compliance with Code requirements for those in fire-resistant assemblies.
   2. Include construction details relative to materials, individual components and profiles, finishes, and fire ratings for access doors and frames.
   3. Supplement with shop drawings where required to show special installation conditions.

B. Samples: Submit samples for each door face material, at least 3 by 5 inches, in specified finish.

C. Schedule: Submit complete door and frame schedule, including types, general locations, sizes, construction details, latching or locking provisions, and other data pertinent to installation.

D. Closeout: Deliver keys properly tagged to the Owner

1.3 QUALITY ASSURANCE

A. All access panels for the Project shall be made by the same manufacturer.

B. In fire-resistant construction, provide fire-resistant assemblies bearing the label of a testing agency acceptable to the Building Department for the fire resistance indicated.

PART 2 - PRODUCTS

2.1 ACCESS PANELS
A. General: Provide trimless, prime-coated units, except where stainless steel is specified, equipped with flush, key-operated cam lock.

B. Manufacturers: Basis of design is for Nystrom products. Equal products by one of the following manufacturers will be accepted if approved by the Architect.

1. Babcock-Davis.
2. JL Industries.
4. Milcor.
5. Williams Brothers Corp.

C. Models:

1. In veneer plaster and gypsum board surfaces, except as specified below for toilet room walls: Nystrom Type NW.
   a. Material: Commercial grade cold-rolled steel with 16-gage (0.053 inch) frame and 14-gage (0.067 inch) door.
   b. Trim: 22-gage (0.0299 inch) steel drywall bead.

2. In plaster surfaces: Nystrom Type RP where the door is plastered; Type NP where door is painted.
   a. Material: Commercial grade cold-rolled steel with 16-gage (0.053 inch) frame and 14-gage (0.067 inch) door.
   b. Trim: 22-gage (0.0299 inch) steel plaster bead with expanded metal lath.

3. Toilet rooms walls: Nystrom Type NT.
   a. Material: Stainless steel, 16-gage (0.053 inch) frame and 14-gage (0.067 inch) door.
   b. Trim: 22-gage (0.0299 inch) stainless steel drywall bead.

4. Size: Unless otherwise indicated on the Drawings, provide 24-inch square or larger opening where a serviceman needs to enter the space accessible through the access door or panel; elsewhere not less than 12-inch square.

5. Where door cannot swing open, provide lift off type with safety wire or chain; Similar to Karp Type DSC-212.

2.2 MATERIALS

A. General:

1. Provide sheet metal selected for its surface flatness, smoothness and freedom from surface blemishes where exposed to view in the finished unit.
2. Do not use materials whose exposed surfaces exhibit pitting, seam marks, roller marks, variations in flatness exceeding those permitted by referenced standards for stretcher-leveled metal sheet, stains, discoloration or other imperfections.

B. Galvanized steel sheet: ASTM A 653 CQ (commercial quality), or ASTM A 653 LQ (lock-forming quality), coating designation G90, mill-phosphatized, stretcher-leveled.

C. Steel sheet: Commercial quality cold-rolled carbon steel sheet, stretcher-leveled, complying with the following requirements at the fabricator's option.

1. Electrolytic zinc-coated steel sheet: ASTM A 591, with Class C zinc coating; chemically treated in mill with phosphate solution and light chromate rinse.

2. Cold-rolled steel sheet: ASTM A 1008.

D. Stainless steel sheet: ASTM A 167, Type 302 or 304, stretcher-leveled.

E. Hardware:

1. Hinges: Concealed spring hinges or concealed continuous piano hinge set to open 175 degree. For fire-resistive units, provide self-closing mechanism.

2. Locking device: Flush, screwdriver-operated cam lock of number required to hold door in flush, smooth plane when closed.

   a. Where shown or scheduled, provide one cylinder lock per access door. Furnish 2 keys per lock. Key all locks alike, unless otherwise noted.

   b. For recessed panel, provide access sleeves for each locking device. Furnish plastic grommets and install in holes cut through finish.

   c. For locks on panels 24 inches in any dimension, provide interior latch mechanism to allow door to be opened from the inside without a key.

2.3 FABRICATION

A. Fabricate to profiles indicated without exposed cut edges.

B. Produce flat, flush surfaces without cracking and grain separation at bends.

C. Continuously weld exposed joints and seams; grind, fill, and dress welds to produce smooth flush exposed surfaces in which welds are invisible after final finishing is completed.

D. Provide exterior access panels with weatherproof extruded door gasket.

E. Finish:

1. When installed in ceramic tile surfaces, provide stainless steel panels finished with a NAAMM No. 4 (brushed) finish.

2. When installed in an exterior wall or soffit, fabricate assemblies from commercial quality carbon steel sheets complying with ASTM A 653 CQ, hot-dip galvanized to comply with ASTM A 924, G90, or hot-dip galvazine after fabrication to provide an equivalent zinc coating weight.
3. Elsewhere provide access panels with a baked-on rust-inhibitive primer.

PART 3 -EXECUTION

3.1 EXAMINATION

A. Examine adjacent construction and supports.

B. Verify that openings are properly framed, within allowable tolerances, plumb, level, clean, will provide a solid anchoring surface, and that other conditions detrimental to the proper or timely completion of this work are corrected before proceeding with installation.

3.2 INSTALLATION

A. Install at indicated locations, plumb, level, and square with adjacent construction.

B. Attach assemblies securely to supports.

C. When installed in ceramic tile surfaces, coordinate panel location with the tilework so that the panel will align and fit within the tile module with no tile cutting, or a minimum of cutting.

3.3 FIELD QUALITY CONTROL

A. Adjust hardware so that panels operate freely, but not loosely, without sticking or hinge binding, with hardware adjusted and functioning properly.

END OF SECTION
1.0 GENERAL

Provisions of the General and Supplementary Conditions and Division 01 apply to this section.

1.1 Summary

A. All Stainless Steel Rolling Counter Doors shall be Series CD10-SS as manufactured by The Cookson Company, Phoenix, Arizona, or approved equal. Furnished materials shall include all curtains, bottom bars, guides, brackets, hoods, operating mechanisms and any special features.

B. Work not to be included by The Cookson Company includes design of, material for and preparation of door openings but not limited to structural or miscellaneous iron work, metal or wood trim, access panels, and finish painting.

1.2 Quality Assurance

A. All rolling counter doors shall be designed to a standard maximum of 10 cycles per day and an overall maximum of 20,000 operating cycles for the life of the door.

2.0 PRODUCTS

2.1 Materials

A. The door curtain shall be constructed of interconnected strip stainless steel slats. The curtain shall be constructed of 22 gauge No. 10 (1-1/4" high by 3/8" deep) slats as designated by The Cookson Company. The finish on the door curtain shall be #4.

B. The bottom bar shall be constructed of tubular stainless steel, measuring 2" high by 1-1/4" deep, with a foam astragal on the bottom edge. The bottom bar shall receive a #4 finish.

C. The guides shall be constructed of a stainless steel angle and channel, 1-7/8" square. The guides shall receive a #4 finish.

D. The brackets shall be constructed of 3/16" thick die cast aluminum and shall have stainless steel end covers.

E. The barrel shall be steel tubing of not less than 4" in diameter. Oil tempered torsion springs shall be capable of correctly counter balancing the weight of the curtain. The barrel shall be designed to limit the maximum deflection to .03" per foot of opening width. The finish on the barrel shall be one (1) coat of bronze rust-inhibiting prime paint.

F. The hood shall be fabricated from 24 gauge stainless steel and shall be formed to fit the square brackets. The finish on the hood shall be #4.

2.2 Operation
A. Push-up operated doors shall open and close with a maximum of 30 pounds of effort utilizing finger lifts in the bottom bar. This type of operation should not be used for doors over 10 feet wide.

2.3 Locking Mechanisms
A. The push-up doors shall be secured by means of a concealed sliding bolt deadlock in the bottom bar operated by a [thumbturn] [cylinder lock].

3.0 EXECUTION

3.1 Installation
A. All Cookson Rolling Stainless Steel Counter Doors shall be installed by an authorized Cookson Distributor.

3.2 Warranty
A. All Cookson Rolling Stainless Steel Counter Doors shall be warranted for a period of 2 years from the time of shipment against defects in workmanship and materials.

END OF SECTION
SECTION 08332
OVERHEAD COILING DOORS

PART 1 - GENERAL

1.01 SUMMARY

A. Provisions of the General and Supplementary Conditions and Division 01 apply to this section.

B. Section Includes:
   1. Overhead coiling doors as indicated.

C. Related Sections:
   1. Section 08710: Door Hardware.
   2. Section 09900: Paints and Coatings.
   3. Division 16: Electrical

1.02 SYSTEM DESCRIPTION

A. Design Requirements: Drawings indicate sizes, locations, profiles, and general details of
overhead coiling door construction and installation.

B. All rolling service doors shall be designed to a standard maximum of 25 cycles per day and an
overall maximum of 50,000 operating cycles for the life of the door.

1.03 SUBMITTALS

A. Product Data: Submit manufacturer's specifications, rough-in diagrams, installation instruction
and manufacturer's data. Submit manufacturer's data on locking devices, which are included in
this Work.

B. Shop Drawings: Indicate materials, anchorage, wiring diagrams, and installation details.

1.04 DELIVERY, STORAGE AND HANDLING

A. Provide protection as required by manufacturer to protect products from damage during storage.

PART 2 - PRODUCTS

2.01 MANUFACTURER

A. Provide overhead coiling doors complete with guides, hoods, operating mechanism, and special
features and control systems. Doors shall be as manufactured by Cookson, Pacific Rolling Door,
or equal.

B. Electrically Operated Overhead Coiling Doors:
1. Doors Curtain:
   
a. Furnish interlocking slats, fabricated from at least 20 gage galvanized strip steel. Slats shall be flat-faced section, 5/8 inch minimum depth, designed to withstand a wind load of 20 pounds per square foot. Furnish alternate slats with end locks and where required by wind loads, furnish wind locks. Bottom bar shall consist of two 1/8” galvanized steel angles placed back to back with vinyl or neoprene closure strip. Galvanizing shall provide a minimum of 1.25 ounces per square foot, in accordance with ASTM A 123.

b. The guides shall consist of 3 steel angles bolted together with 3/8” fasteners to form a channel for the curtain to travel and shall include an extruded vinyl snap-on weatherstripping continuously on the exterior leg of the guide. The wall angle portion shall be continuous and fastened to the surrounding structure with either minimum 1/2” fasteners or welds, both on 36” centers. The finish on the guide angles shall be one (1) coat of bronze rust-inhibiting prime paint.

c. Provide a vinyl-jacket device mounted on the bottom bar to stop and reverse the door instantly upon contact with an obstruction.

d. The brackets shall be constructed of steel not less than 1/4” thick and shall be bolted to the wall angle with minimum 1/2” fasteners. The finish on the brackets shall be one (1) coat of bronze rust-inhibiting prime paint.

e. The barrel shall be steel tubing of not less than 4” in diameter. Oil tempered torsion springs shall be capable of correctly counter balancing the weight of the curtain. The barrel shall be designed to limit the maximum deflection to .03” per foot of opening width. The springs shall be adjusted by means of an exterior wheel. The finish on the barrel shall be one (1) coat of bronze rust-inhibiting prime paint.

f. The hood shall be fabricated from 24 gauge galvanized steel and shall be formed to fit the curvature of the brackets. The hood shall contain a waterproof baffle to control air infiltration.

g. Provide manufacturer’s standard baked-on finish on slats and hood.

h. End links shall be engaged in steel guides designed in a manner to safeguard against curtain leaving guides under excessive pressure.

2. Motor Operation: The door shall be operated at a speed of 2/3 foot per second by an open drip-proof electric motor with gear reducer in oil bath. The motor operator shall include a geared limit switch, and an electrically interlocked emergency chain operator. The motor starter shall be housed in a NEMA 1 housing and include a magnetic reversing starter size 0, a 24 volt control transformer, and complete terminal strip to facilitate field wiring. The motor operator shall be activated by a 3 button push-button station in a NEMA 1 enclosure. The motor operator shall be mounted to the door bracket as shown on shop drawings. All motor operators shall be U.L. listed.

3. The unit shall be furnished with an interlocked reversing contactor, and operating components preconnected to a terminal strip within the control box to facilitate field connection to power source and control system.
4. The size of the motor shall be determined by the manufacturer to meet the design criteria. Motor rating shall be 208 volts, three phase, 60 Hz.

5. The service door shall include the Featheredge rolling door safety edge system as manufactured by The Cookson Company and shall include the following features:
   1. The Featheredge shall be installed on the bottom bar of the door and shall automatically reverse the door if the device detects an obstruction in the downward travel of the door.
   2. The Featheredge shall consist of a rubber boot attached below the bottom bar with an electrical switch secured to the back of the bottom bar. The Featheredge shall operate with air wave technology and shall not rely on pneumatic pressure or electrical strip contacts to operate properly. The Featheredge shall create an air wave that shall be detected and reverse the direction of the rolling door.
   3. The operation of the Featheredge shall not be subject to interferences by temperature, barometric pressure, water infiltration, or cuts in the rubber boot.
   4. The Featheredge shall be connected to the motor operator with a coil cord.

PART 3 - EXECUTION

3.01 INSTALLATION

   A. Installation shall be by an authorized representative of coiling overhead door manufacturer.
   B. Install curtains and operating equipment plumb, in true alignment, free of springing, forcing, racking or distortion.
   C. Provide necessary hardware, jamb and head mold stops, anchors, inserts, hanger and equipment supports in accordance with manufacturer's literature, as indicated.
   D. Fasten curtain guide assembly to adjacent members with galvanized fasteners at 24 inches on center for a rigid installation of curtain and operating equipment.
   E. Upon completion of installation, lubricate, test and adjust rolling doors to operate easily, free from warp, twist or distortion and fitting weathertight around entire perimeter.

3.02 CLEAN UP

   A. Remove rubbish, debris and waste materials and legally dispose of off the Project site.

3.03 PROTECTION

   A. Protect the Work of this section until Substantial Completion.

END OF SECTION
SECTION 08 41 13

ALUMINUM – FRAMED ENTRANCES and STOREFRONTS

Series D300 Medium Stile Entrance Door

PART 1 GENERAL

Provisions of the General and Supplementary Conditions and Division 01 apply to this section.

1.01 Work Included

A. Furnish and install aluminum entrance, entrance door frames complete with hardware, and related components as shown on the drawings and specified in this section.
B. All doors shall be EFCO® Series D300 Medium Stile Entrance Door. Other manufacturers requesting approval to bid their product as an equal must submit the following information fifteen days prior to close of bidding.
   1. A sample door (size and configuration) as per requirements of architect.
   2. Test reports documenting compliance with requirements of Section 1.05.
C. Glass and Glazing
   1. All units shall be factory glazed. Refer to schedule for glazing type.
D. Single Source Requirement
   1. All products listed in Section 1.02 shall be by the same manufacturer.

1.02 Related Work

A. Section 084113 – Aluminum Entrances and Storefronts
B. Section 08 44 13 – Glazed Aluminum Curtain Walls
C. Section 08800 – Glazing

1.03 Items Installed but Not Furnished

A. Structural support of the framing, wood framing, structural steel, and final cleaning.

1.04 Laboratory Testing and Performance Requirements

A. Test Units
   1. Air test unit shall be minimum size of 36" (914 mm) x 84" (2134 mm).
B. Test Procedures and Performances
   1. Entrance doors shall conform to all requirements for the door type referenced in 1.01.B. In addition, the following specific performance requirements shall be met.
   2. Air Infiltration Test
      a. With door sash closed and locked, test unit in accordance with ASTM E 283 at a static air pressure difference of 1.57 psf (75 Pa).
      b. Air infiltration shall not exceed .50 cfm/SF (2.54 l/s•m²) of unit, for single doors.

1.05 Quality Assurance
A. Provide test reports from AAMA accredited laboratories certifying the performance as specified in 1.05.
B. Test reports shall be accompanied by the entrance door manufacturer's letter of certification stating that the tested door meets or exceeds the referenced criteria for the appropriate AAMA door type.

1.06 Submittals

A. Contractor shall submit shop drawings, finish samples, test reports, and warranties.
   1. Samples of materials as may be requested without cost to owner, i.e., metal, glass, fasteners, anchors, frame sections, mullion section, corner section, etc.

1.07 Warranties

A. Total Entrance Door System
   1. The responsible contractor shall assume full responsibility and warrant for one year the satisfactory performance of the total door installation which includes that of the manufacturer supplied doors, hardware, glass (including insulated units), glazing, anchorage and setting system, sealing, flashing, etc., as it relates to air, and structural adequacy as called for in the specifications and approved shop drawings.
   2. Any deficiencies due to such elements not meeting the specifications shall be corrected by the responsible contractor at their expense during the warranty period.

B. Material and Workmanship
   1. Per AAMA standard 601, provide written guarantee against defects in material and workmanship.
   2. Warranty period shall be for 3 years from the date of final shipment.

C. Glass
   1. Provide written warranty for insulated glass units that they will be free from obstruction of vision as a result of dust or film formation on the internal glass surfaces caused by failure of the hermetic seal due to defects in material and workmanship.
   2. Warranty period shall be for 10 (ten) years.

D. Organic Finish
   1. Provide organic finish and warranty based on AAMA standard 2603.

PART 2 PRODUCTS

2.01 Material

A. Aluminum
   1. Extruded aluminum shall be 6063-T6 alloy and temper.

B. Fasteners
   1. All exposed fasteners shall be aluminum or stainless steel.

C. Glass
   1. See schedule for glass types.

2.02 Fabrication

A. General
   1. Major portions of the door sections shall have .125” (3 mm) wall thickness. Glazing stop sections shall have .050” (1.2 mm) wall thickness.
B. Entrance Doors
   1. Door stiles shall be no less than 3 1/2" (88 mm) wide (not including glass stops).
   2. Door stiles and rails shall have hairline joints at corners. Heavy concealed reinforcement
      brackets shall be secured with screws and shall be of deep penetration and fillet welded.
   3. All doors shall have an adjusting mechanism in the top rail to provide for minor clearance
      adjustments.
   4. Weather stripping shall be wool pile and shall be installed in one stile of pairs of doors and in
      jamb stiles of center pivoted doors.
C. Door stops shall include a bulb weather-strip that complies with ASTM E 2203 specification.
D. Glazing
   1. All units shall be dry glazed with extruded pressure fitting aluminum glazing stops, and a
      gasket that complies with ASTM E 2203 specification.
E. Finish
   1. Organic
      a. Finish all exposed areas of aluminum doors and components with 50% PVDF fluoropolymer
         Ultraflur™. Color shall be custom as selected by Architect.

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2.03 Hardware

A. Hardware for entrance doors is specified under “Hardware Section” of the specifications and shall
   be sent to the door manufacturer for application. The finish hardware supplier shall be
   responsible for furnishing physical hardware and templates of all hardware to the entrance door
   manufacturer prior to fabrication, and for coordinating hardware delivery requirements with the
   hardware manufacturer, the general contractor and the entrance door manufacturer to ensure the
   building project is not delayed.

PART 3 EXECUTION

3.01 Inspection

A. Job Conditions
   1. Verify that openings are dimensionally within allowable tolerances, plumb, level, clean,
      provide a solid anchoring surface and are in accordance with approved shop drawings.

3.02 Installation

A. Use only skilled tradesmen with work done in accordance with approved shop drawings and
   specifications.
B. Plumb and align entrance door faces in a single plane for each wall plane and erect doors and
   materials square and true. Adequately anchor to maintain positions permanently when subjected
   to normal thermal movement, specified building movement, and specified wind loads.
C. Adjust doors for proper operation after installation.
D. Furnish and apply sealants to provide a weather tight installation at all joints and intersections
   and at opening perimeters. Wipe off excess material and leave all exposed surfaces and joints
   clean and smooth.

3.03 Anchorage
A. Adequately anchor to maintain positions permanently when subjected to normal thermal movement, specified building movement, and specified wind loads.

3.04 Protection and Cleaning

A. After completion of entrance installation, entrance doors shall be inspected, adjusted, put into working order and left clean, free of labels, dirt, etc. Protection from this point shall be the responsibility of the general contractor.

END OF SECTION
SECTION 08411

ALUMINUM ENTRANCES and STOREFRONTS

System 401 Flush-Glazed Shear Block Storefront

PART 1 GENERAL

1.01 Work Included

A. Furnish and install aluminum architectural storefront system complete with hardware and related components as shown on drawings and specified in this section.

B. All storefront systems shall be EFCO® System 401 Flush-Glazed Shear Block Storefront. Other manufacturers requesting approval to bid their product as an equal must submit the following information fifteen days prior to close of bidding.
   1. A sample storefront system (size and configuration) as per requirements of architect.
   2. Test reports documenting compliance with requirements of Section 1.05.

C. Glass
   1. Reference Section 08 81 00 for Glass and Glazing.

D. Single Source Requirement
   1. All products listed in Section 1.02 shall be by the same manufacturer.

1.02 Related Work

A. Section 08 41 13 – Aluminum – Framed Entrances and Storefronts
B. Section 08 44 13 – Glazed Aluminum Curtain Walls
C. Section 08 800 – Glazing

1.03 Laboratory Testing and Performance Requirements

A. Provision for Thermal Movements

   1. Storefront framing systems shall be designed to provide for thermal movement of all component materials resulting from surface temperatures ranging from 25 degrees F to 180 degrees F without causing buckling, stresses on glass, failure of joint seals, undue stress on structural elements, damaging loads on fasteners, reduction of performance, or other detrimental effects. Operating windows and doors shall function normally over this temperature range.

B. Test Procedures and Performance

   1. Air Infiltration Test
      a. Test unit in accordance with ASTM E 283 at a static air pressure difference of 1.56 psf (75 Pa).
      b. Air infiltration shall not exceed .06 cfm/SF (.30 l/s•m²) of unit.

   2. Water Resistance Test
      a. Test unit in accordance with ASTM E 331.
      b. There shall be no uncontrolled water leakage at a static test pressure of 10.0 psf (479 Pa).
3. Uniform Load Deflection Test
   a. Test in accordance with ASTM E 330.
   b. Deflection under design load shall not exceed L/175 of the clear span.

4. Uniform Load Structural Test
   a. Test in accordance with ASTM E 330 at a pressure 1.5 times the design wind pressure in 1.05.B.3.b.
   b. At conclusion of the test, there shall be no glass breakage, permanent damage to fasteners, storefront parts, or any other damage that would cause the storefront to be defective.

1.04 Quality Assurance

A. Provide test reports from AAMA accredited laboratories certifying the performance as specified in 1.05.
B. Test reports shall be accompanied by the storefront manufacturer’s letter of certification stating that the tested storefront meets or exceeds the referenced criteria for the appropriate storefront type.

1.05 Submittals

A. Contractor shall submit copies of all shop drawings to the architect for his approval. Drawings shall show scale elevations and sections. Full size sections shall be shown only when needed for clarity. Drawings shall show construction of all parts of the work, including metal and glass thickness, methods of joining, details of all field connections and anchorage, fastening and sealing methods, metal finishes and all pertinent information. Relationship to other work should be clearly indicated. No work shall be fabricated until shop drawings for that work have been finally approved for fabrication.
B. Contractor shall submit finish samples, test reports, and warranties.
   1. Samples of materials as may be requested without cost to owner, i.e., metal, glass, fasteners, anchors, frame sections, mullion section, corner section, etc.

1.06 Warranties

A. Total Storefront System
   1. The responsible contractor shall assume full responsibility and warrant for one year the satisfactory performance of the total storefront installation. This includes the glass (including insulated units), glazing, anchorage and setting system, sealing, flashing, etc., as it relates to air, water, and structural adequacy as called for in the specifications and approved shop drawings.
   2. Any deficiencies due to such elements not meeting the specifications shall be corrected by the responsible contractor at their expense during the warranty period.

B. Material and Workmanship
   1. Per AAMA standard 601, provide written guarantee against defects in material and workmanship.
   2. Warranty period shall be for 3 years from the date of final shipment.
C. Glass
   1. Provide written warranty for insulated glass units that they will be free from obstruction of vision as a result of dust or film formation on the internal glass surfaces caused by failure of the hermetic seal due to defects in material and workmanship.
   2. Warranty period shall be for 10 (ten) years.
D. Organic Finish
   1. Provide organic finish and warranty based on AAMA standard 2605.

PART 2 PRODUCTS

2.01 Manufacturers
   A. Basis of Design: Arcadia
   B. Substitutions: Per requirements in Division 1

2.02 Materials
   A. Aluminum
      1. Extruded aluminum shall be 6063-T6 alloy and temper.
   B. Glass
      1. Glass shall be 1/4" (6 mm) monolithic. Refer to schedule for types.
   C. Dissimilar Metals
      1. All dissimilar metals must be properly insulated to prevent galvanic action.
   D. Fasteners
      1. All exposed fasteners shall be aluminum or stainless steel.

2.03 Fabrication
   A. General
      1. All aluminum frame extrusions shall have a minimum wall thickness of .080" (2 mm).
      2. All exposed work shall be carefully matched to produce continuity of line and design with all joints. System design shall be such that raw edges will not be visible at joints.
   B. Frame
      1. Depth of frame shall not be less than 4 1/2" (114 mm).
      2. Face dimension shall not be less than 1 3/4" (44 mm).
      3. Frame components shall be shear block construction.
   C. Glazing
      1. All units shall be “dry glazed” with recyclable EPDM gasket on both exterior and interior.
   D. Finish
      1. Organic
         a. Finish all exposed areas of aluminum windows and components with 70% PVDF fluoropolymer. Color shall be custom as selected by Architect.

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<th>Description</th>
<th>AAMA Guide Spec.</th>
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<td>70% PVDF Ultrapon™</td>
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PART 3 EXECUTION
3.01 Inspection

A. Job Conditions
   1. Verify that openings are dimensionally within allowable tolerances, plumb, level, clean, provide a solid anchoring surface, and are in accordance with approved shop drawings.

3.02 Installation

A. Use only skilled tradesmen with work done in accordance with architect approved shop drawings and specifications.
B. Storefront system shall be erected plumb, true, and in proper alignment and relation to established lines and grades.
C. Entrance doors shall be securely anchored in place to a straight, plumb and level condition, without distortion. Weather stripping contact and hardware movement shall be checked and final adjustment made for proper operation and performance of units.
D. Furnish and apply sealing materials to provide a weather tight installation at all joints and intersections and at opening perimeters.
E. Sealing materials specified shall be used in strict accordance with the manufacturer’s printed instructions, and shall be applied only by mechanics specially trained or experienced in their use. All surfaces must be clean and free of foreign matter before applying sealing materials. Sealing compounds shall be tooled to fill the joint and provide a smooth finished surface.

3.03 Anchorage

A. Adequately anchor to maintain positions permanently when subjected to normal thermal movement, specified building movement, and specified wind loads.

3.04 Protection and Cleaning

A. The general contractor shall protect the aluminum materials and finish against damage from construction activities and harmful substances. The general contractor shall remove any protective coatings as directed by the architect, and shall clean the aluminum surfaces as recommended for the type of finish applied.

END OF SECTION
1.01 Work Included
   
   A. Furnish and install architectural aluminum curtain wall complete with related components as shown on drawings and specified in this section.

   B. Curtain Wall System shall be EFCO® Series 5900 Outside Glazed. Other manufacturers requesting approval to bid their product as an equal must submit the following information fifteen days prior to close of bidding.

      1. A proposal drawing showing full size details of all curtain wall components including all anchors and building attachments.

      2. Test reports documenting compliance with requirements of Section 1.05.

   C. Glass

      1. Reference Section 08800 for Glass and Glazing.

   D. Single Source Requirement

      1. All products listed in Section 1.02 shall be by the same manufacturer.

1.02 Related Work

   A. Section 08411 – Aluminum Entrances and Storefronts

1.03 Laboratory Testing and Performance Requirements

   A. Test Units

      1. Air, water, and structural test unit size shall be a minimum of two (2) stories high and three (3) lites wide.

      2. Thermal test unit sizes shall be 80" (2032 mm) wide x 80" (2032 mm) high with one (1) intermediate vertical mullion and two (2) lites of glass.

   B. Test Procedures and Performance

      1. Air Infiltration Test

         a. Test unit in accordance with ASTM E 283 at a static air pressure difference of 6.24 psf (300 Pa).

         b. Air infiltration shall not exceed .06 cfm/SF (.31 l/s•m²) of fixed wall area.

      2. Water Resistance Test

         a. Test unit in accordance with ASTM E 331.
b. The test for static water penetration (ASTM E 331) shall be conducted at an air pressure difference of 15.0 psf (720 Pa). There shall be no water leakage as defined by AAMA 501.1, paragraph 5.5.

3. Uniform Load Deflection Test
   a. Test in accordance with ASTM E 330.
   b. Deflection under design load shall not exceed L/175 for spans less than 162" (4114 mm).
   c. Deflection under design load shall not exceed L/240 + 1/4" (6 mm) for spans greater than 162" (4114 mm).

4. Uniform Load Structural Test
   a. Test in accordance with ASTM E 330 at a pressure 1.5 times the design wind pressure in 1.05.B.3.b.
   b. At conclusion of the test there shall be no glass breakage, permanent damage to fasteners, curtain wall parts, or any other damage that would cause the curtain wall to be defective.

5. Dynamic Water Resistance Test
   a. Test unit in accordance with AAMA 501.
   b. There shall be no water leakage at a dynamic test pressure of 15.0 psf (720 Pa).

6. Condensation Resistance Test (CRF)
   a. Test unit in accordance with AAMA 1503.1.
   b. Condensation Resistance Factor (CRF) shall not be less than 68 (frame) and 64 (glass) when glazed with 1" (25 mm) insulated – 1/4" (6 mm) clear low emissivity, 1/2" (12 mm) air, 1/4" (6 mm) clear glass.

7. Thermal Transmittance Test (Conductive U-Value)
   a. Test in accordance with AAMA 1503.1.
   b. Conductive thermal transmittance (U-Value) shall not be more than 0.51 BTU/hr•ft²•ºF (2.89 W/m²•K) when glazed with 1" (25 mm) insulated – 1/4" (6 mm) clear low emissivity, 1/2" (12 mm) air, 1/4" (6 mm) clear glass.

8. Seismic Performance
   a. Test unit in accordance to AAMA 501.4 system to meet design displacement of 0.010 x the greater adjacent story height and ultimate displacement of 1.5 x the design displacement.

9. Sound Transmission Loss
   a. Test unit in accordance with ASTM E 90-02.
   b. Sound Transmission Class (STC) shall not be less than 30.
C. Project Wind Loads
   1. The system shall be designed to withstand the following loads normal to the plane of the wall:
      a. Positive pressure of \( \text{psf} \) (\( \text{Pa} \)) at non-corner zones.
      b. Negative pressure of \( \text{psf} \) (\( \text{Pa} \)) at non-corner zones.
      c. Negative pressure of \( \text{psf} \) (\( \text{Pa} \)) at corner zones.

1.07 Quality Assurance
   A. Provide test reports from AAMA accredited laboratories certifying the performance as specified in 1.05.
   B. Test reports shall be accompanied by the curtain wall manufacturer’s letter of certification stating that the tested curtain wall meets or exceeds the referenced criteria for the appropriate curtain wall type.

1.08 Submittals
   A. Contractor shall submit copies of all shop drawings to the architect for his approval. Drawings shall show scale elevations and sections. Full size sections shall be shown only when needed for clarity. Drawings shall show construction of all parts of the work, including metal and glass thickness, methods of joining, details of all field connections and anchorage, fastening and sealing methods, metal finishes, and all pertinent information. Relationship to other work should be clearly indicated. No work shall be fabricated until shop drawings for that work have been finally approved for fabrication.
   B. Contractor shall submit finish samples, test reports, and warranties.
      1. Samples of materials as may be requested without cost to owner, i.e., metal, glass, fasteners, anchors, frame sections, mullion section, corner section, etc.
   C. Calculations: Provide structural calculations, signed and sealed by a structural engineer licensed in the State of California, indicating that materials furnished for installation conform to requirements specified.

1.09 Warranties
   A. Total Curtain Wall System
      1. The responsible contractor shall assume full responsibility and warrant for one year the satisfactory performance of the total curtain wall installation. This includes the glass (including insulated units), glazing, anchorage and setting system, sealing, flashing, etc. as it relates to air, water, and structural adequacy and the specifications and approved shop drawings.
      2. Any deficiencies due to such elements not meeting the specifications shall be corrected by the responsible contractor at their expense during the warranty period.
   B. Material and Workmanship
      1. Per AAMA standard 601, provide written guarantee against defects in material and workmanship.
   C. Glass
1. Provide written warranty for insulated glass units, that they will be free from obstruction of vision as a result of dust or film formation on the internal glass surfaces caused by failure of the hermetic seal due to defects in material and workmanship.

2. Warranty period shall be for 10 (ten) years.

D. Organic Finish

1. Provide organic finish and warranty based on AAMA standard 2605

PART 2 PRODUCTS

2.01 Materials

A. Aluminum

1. Extruded aluminum shall be 6063-T6 alloy and temper.

B. Glass

1. Insulated glass shall be 1” (25 mm) consisting of ¼” exterior, 1” air spacer, and ¼” interior.

C. Dissimilar Metals

1. All dissimilar metals must be properly insulated to prevent galvanic action.

D. Fasteners

1. All fasteners shall be aluminum, stainless steel, or zinc plated steel.

E. Anchors

1. Perimeter and floor line anchors shall be aluminum or steel. All steel anchors shall be properly insulated from the aluminum.

F. Thermal Barrier

1. The thermal barrier shall be extruded EPDM used as an applied thermal isolator.

2.02 Fabrication

A. General

1. All aluminum vertical and horizontal main frame extrusions shall have a minimum wall thickness of .125” (3 mm).

B. Frame

1. Frame components shall be mechanically fastened by means of extruded aluminum shear blocks attached to vertical mullions.

2. Curtain wall system is able to accommodate separate interior and exterior finishes and colors.

C. Glazing

1. Outside glazed curtain wall system shall be dry glazed with an exterior aluminum pressure plate and snap cover with interior and exterior dense EPDM preset gasket.
D. Finish

1. Organic
   a. Finish all exposed areas of aluminum curtain wall and components with 50% PVDF acrodized fluoropolymer Ultraflur™. Custom color to be selected by Architect.

   AA Description | Description | AAMA Guide Spec.
   AA-M12-C42-R1X | 50% PVDF Ultraflur™ | 2604-98

PART 3 EXECUTION

3.01 Inspection

A. Job Conditions

1. All openings shall be prepared by others to the proper size and shall be plumb, level, and in the proper location and alignment as shown on the architect's drawings.

2. Provide for manufacturer representation to conduct pre-installation site meeting.

3.02 Installation

A. Use only skilled tradesmen with work done in accordance with approved shop drawings and established specifications, and erect all curtain wall components to all building bench marks and column centerlines.

B. Plumb and align curtain wall faces in a single plane for each wall plane, and erect curtain wall materials square and true. Adequately anchor to maintain positions permanently when subjected to normal thermal movement, building movement, and specified wind loads.

C. Adjust windows in curtain wall for proper operation after installation.

D. Furnish and apply sealants to provide a weather tight installation at all joints and intersections and at opening perimeters. Wipe off excess material, leave all exposed surfaces and joints clean and smooth.

3.03 Anchorage

A. Adequately anchor to maintain positions permanently when subjected to normal thermal movement, specified building movement, and specified wind loads.

3.04 Protection and Cleaning

A. The general contractor shall protect the aluminum materials and finish against damage from construction activities and harmful substances. The general contractor shall remove any protective coatings as directed by the architect, and shall clean the aluminum surfaces as recommended for the type of finish applied.

END OF SECTION
SECTION 08452
TRANSLUCENT FIBERGLASS PANELS

PART 1- GENERAL

Provisions of the General and Supplementary Conditions and Division 01 apply to this section.

1.1 SUMMARY

A. Section includes the insulated translucent sandwich panel system as shown and specified. Work includes providing and installing:
   1. Flat factory prefabricated structural insulated translucent sandwich panels.
   2. Aluminum installation system
   3. Aluminum sill flashing

B. Related Sections:
   1. Structural Steel: Section 05210
   2. Flashing & Sheet Metal: Section 07600
   3. Sealants: Section 07920
   4. Glazing: Section 08800

1.2 SUBMITTALS

A. Submit manufacturer’s product data. Include construction details, material descriptions, profiles and finishes of components.

B. Submit shop drawings. Include elevations, details and dimensions.

C. Submit manufacturer’s color charts showing the full range of colors available for factory finished aluminum.
   1. When requested, submit samples for each exposed finish required, in same thickness and material indicated for the work and in size indicated below. If finishes involve normal color variations, include sample sets consisting of two or more units showing the full range of variations expected.
      a. Sandwich panels: 14” x 28” units
      b. Factory finished aluminum: 5” long sections

D. Submit Installer Certificate, signed by installer, certifying compliance with project qualification requirements.

E. Submit complete product test reports (mere summaries are not acceptable) from a qualified independent testing agency indicating each type and class of panel system complies with the project performance requirements, based on comprehensive testing of current products. Previously completed test reports will be acceptable only if for current manufacturer and indicative of specific products used on this project.
   1. Test reports required are:
      a. Flame Spread and Smoke Developed (UL 723) – Submit UL Card
      b. Burn Extent (ASTM D 635)
      c. Color Difference (ASTM D 2244)
      d. Abrasion/Erosion Resistance (ASTM D 4060)
      e. Impact Strength (UL 972)
      f. Bond Tensile Strength (ASTM C 297 after aging by ASTM D 1037)
      g. Bond Shear Strength (ASTM D 1002)
      h. Beam Bending Strength (ASTM E 72)
1.2 SUBMITTALS (continued)
   i. Panel Insulation U-Factor (NFRC 100)
   j. NFRC System U-Factor Certification
   k. Solar Heat Gain Co-efficient
   l. Condensation Resistance Factor (AAMA 1503)

F. Submit current documentation indicating regular, independent quality control monitoring under a nationally recognized building code review and listing program.

1.3 QUALITY ASSURANCE

A. Manufacturer's Qualifications

1. Material and products shall be manufactured by a company continuously and regularly employed in the manufacture of specified materials for a period of at least ten (10) consecutive years and which can show evidence of those materials being satisfactorily used on at least six (6) projects of similar size, scope and location. At least three (3) of the projects shall have been in successful use for ten (10) years or longer.

2. Panel system must be listed by the International Code Council – Evaluation Service (ICC-ES) which requires quality control inspections and fire, structural and water infiltration testing of sandwich panel systems by an approved agency.

3. Quality control inspections shall be conducted at least once each year and shall include manufacturing facilities, sandwich panel components and production sandwich panels for conformance with “Acceptance Criteria for Sandwich Panels” as regulated by the ICC-ES.

B. Installer's Qualifications: Installation shall be by an experienced installer, which has been in the business of installing specified panel systems for at least two (2) consecutive years and can show evidence of satisfactory completion of projects of similar size, scope and type.

C. Performance Requirements: The manufacturer shall be responsible for the configuration and fabrication of the complete panel system.

1. When requested, include structural analysis data signed and sealed by the qualified professional engineer responsible for their preparation.

1.4 DELIVERY STORAGE AND HANDLING

A. Deliver panel system, components and materials in manufacturer's standard protective packaging.

B. Store panels on the long edge; several inches above the ground, blocked and under cover in accordance with manufacturer's storage and handling instructions.

1.5 WARRANTY

A. Submit manufacturer's and installer's written warranty agreeing to repair or replace panel system work which fails in materials or workmanship within one (1) year of the date of delivery. Failure of materials or workmanship shall include leakage, excessive deflection, deterioration of finish on metal in excess of normal weathering and defects in accessories, insulated translucent sandwich panels and other components of the work. (Contact local representative for extended warranty periods.)

PART 2 - PRODUCTS

2.1 MANUFACTURER

Acceptable Manufacturers:

B. Structures Unlimited, Inc. (800) 225-3895, info@structuresunlimitedinc.com.

C. Products of alternate manufacturers will be considered if written request is submitted to the architect for approval at least ten (10) days prior to bid date. Written request must include documentation of all test reports as listed in paragraph 1.2.E.1 and must show that all items are equal or exceed all performance criteria as listed within this specification. Architect’s approval will be by addenda only.

2.2 PANEL COMPONENTS

A. Face Sheets

1. Translucent faces: Manufactured from glass fiber reinforced thermoset resins, formulated specifically for architectural use.
   a. Thermoplastic (e.g. polycarbonate, acrylic) faces are not acceptable.
   b. Face sheets shall not deform, deflect or drip when subjected to fire or flame.
   c. Face sheets shall not delaminate when exposed to 200°F for 30 minutes per IBC or 300°F for 25 minutes.

2. Interior face sheets:
   a. Flamespread: Underwriters Laboratories (UL) listed, which requires periodic unannounced retesting, with flamespread rating no greater than 50 and smoke developed no greater than 250 when tested in accordance with UL 723/ASTM E 84.
   b. Burn extent by ASTM D 635 shall be no greater than 1”.

3. Exterior face sheets:
   a. Color stability: Full thickness of the exterior face sheet shall not change color more than 3.0 CIE Units DELTA E by ASTM D 2244 after 5 years outdoor South Florida weathering at 5 degrees facing south, determined by the average of at least three (3) white samples with and without a protective film or coating to ensure long-term color stability. Color stability shall be unaffected by abrasion or scratching.
   b. Erosion Resistance: Exterior face shall have a permanent glass erosion barrier embedded beneath the surface to provide long-term resistance to reinforcing fiber exposure. Exterior face surface loss shall not exceed .7 mils and 40 mgs when tested in accordance with ASTM D 4060 employing CS17 abrasive wheels at a head load of 500 grams for 1000 cycles.
   c. Strength: Exterior face sheet shall be uniform in strength, impenetrable by hand held pencil and repel an impact equal to 70 ft. lbs. without fracture or tear when impacted by a 3-1/4” diameter, 5 lb. free-falling ball per UL 972.

4. Appearance:
   a. Exterior face sheets: Smooth, 0.070” thick and Crystal in color.
   b. Interior face sheets: Smooth, 0.045” thick and White in color.
   c. Face sheets shall not vary more than +/- 10% in thickness and be uniform in color.

B. Grid Core

1. Thermally broken I-beam grid core shall be of 6063-T6 or 6005-T5 alloy and temper with provisions for mechanical interlocking of muntin-mullion and perimeter. Width of I-beam shall be no less than 7/16”. The I-beam grid shall be machined to tolerances of not greater than +/- .002”.

2. I-beam Thermal break: Minimum 1”, thermoset. Urethane poured and de-bridged is not acceptable.

C. Laminate Adhesive

1. Heat and pressure resin type adhesive engineered for structural sandwich panel use, with minimum 25-years field use. Adhesive shall pass testing requirements specified by the International Code Council “Acceptance Criteria for Sandwich Panel Adhesives.”

2. Minimum tensile strength of 750 PSI when the panel assembly is tested by ASTM C 297 after two (2) exposures to six (6) cycles each of the aging conditions prescribed by ASTM D 1037.

2.3 PANEL COMPONENTS (continued)
3. Minimum shear strength of the panel adhesive by ASTM D 1002 after exposure to five (5) separate conditions:
   a. 50% Relative Humidity at 68°F: 540 PSI
   b. 182°F: 100 PSI
   c. Accelerated Aging by ASTM D 1037 at room temperature: 800 PSI
   d. Accelerated Aging by ASTM D 1037 at 182°F: 250 PSI

2.4 PANEL CONSTRUCTION

A. Provide sandwich panels of flat fiberglass reinforced translucent face sheets laminated to a grid core of mechanically interlocking thermally broken I-beams. The adhesive bonding line shall be straight, cover the entire width of the I-beam and have a neat sharp edge.

1. Thickness: 4”
2. Light transmission: 14%.
3. Solar heat gain coefficient: 0.09.
4. Overall panel U-factor by NFRC certified laboratory: 4”: thermally broken I-beam, 0.15.
   a. Complete insulated panel system shall have NFRC certified U-factor of 0.20.
5. Grid pattern: Nominal 12” x 24”, shoji.

B. Panels shall deflect no more than 1.9” at 30 psf in 10'-0” span without a supporting frame by ASTM E-72.

C. Panels shall show evidence of withstanding 1200°F fire for minimum one (1) hour without collapse or flame penetration.

D. Thermally broken panels:
   1. Minimum Condensation Resistance Factor of 80 by AAMA 1503 measured on the bond line.

2.5 BATTENS AND PERIMETER CLOSURE SYSTEM

A. Closure system: Extruded aluminum 6063-T6 and 6063-T5 alloy and temper clamp-tite screw type closure system.
   1. Thermally broken perimeter system shall have a urethane bridge.

B. Sealing tape: Manufacturer's standard, pre-applied to closure system at the factory under controlled conditions.

C. Fasteners: 300 series stainless steel screws for aluminum closures, excluding final fasteners to the building.

D. Finish: Exposed aluminum to be manufacturer’s factory applied finish that meets the performance requirements of AAMA 2604.
   1. Color to be selected by Architect from manufacturer's standard colors.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Examine substrates, supporting structure and installation conditions. Do not proceed with panel erection until unsatisfactory conditions have been corrected.

3.2 PREPARATION

A. 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 recommended by manufacturer for this purpose.

2. Where aluminum will contact concrete or masonry, protect against corrosion by painting contact surfaces with bituminous paint or method recommended by manufacturer.

3. Where aluminum will contact pressure-treated wood; separate dissimilar materials by methods recommended by manufacturer.

3.3 INSTALLATION

A. Install the panel system in accordance with the manufacturer's installation recommendations and approved shop drawings.
   1. Anchor component parts securely in place by permanent mechanical attachment system.
   2. Accommodate thermal and mechanical movements.
   3. Set perimeter framing in a full bed of sealant compound, or with joint fillers or gaskets to provide weather-tight construction.

B. Install joint sealants at perimeter joints and within the panel system in accordance with manufacturer's installation instructions.

3.4 CLEANING

A. Clean the panel system inside and outside, immediately after installation, according to manufacturer's written recommendations.

END OF SECTION
SECTION 085113

ALUMINUM WINDOWS

PART 1 GENERAL

1.01 Work Included

A. Furnish and install aluminum architectural windows complete with hardware and related components as shown on drawings and specified in this section.
B. All windows shall be EFCO® Series 2700 Thermal AP-AW65 Projected. Other manufacturers requesting approval to bid their product as an equal must submit the following information fifteen days prior to close of bidding.
   1. Test reports documenting compliance with requirements of Section 1.05.
C. Glass and Glazing
   1. All units shall be factory glazed.

1.02 Related Work

A. Section 08 41 13 – Aluminum – Framed Entrances
B. Section 08 44 13 – Glazed Aluminum Curtain Walls

1.03 Items Furnished and Installed

A. Mechanical operators for all projected windows inserted into curtain wall.
B. Provide shop drawings and submittals for proposed mechanical operators.
C. Electrical contractor responsible for providing electrical where required.

1.04 Items Installed but Not Furnished

1.05 Laboratory Testing and Performance Requirements

A. Test Units
   1. Air, water, and structural test unit shall conform to requirements set forth in ANSI/AAMA/NWWDA 101/I.S.2/NAFS-02 and manufacturer's standard locking/operating hardware and insulated glazing configuration.
   2. Thermal test unit sizes shall be 48" (1219 mm) x 72" (1828 mm). Unit shall consist of a project-out over fixed over project-in window.

B. Test Procedures and Performances
   1. Windows shall conform to all ANSI/AAMA/NWWDA 101/I.S.2/NAFS-02 requirements for the window type referenced in 1.01.B. In addition, the following specific performance requirements shall be met.
   2. Life Cycle Testing
      a. Test in accordance with AAMA 910. There shall be no damage to fasteners, hardware parts, support arms, activating mechanisms, or any other damage that would cause the window to be inoperable. Air infiltration and water resistance tests shall not exceed specified requirements.
   3. Air Infiltration Test
      a. With ventilators closed and locked, test unit in accordance with ASTM E 283 at a static air pressure difference of 6.24 psf (299 Pa).
      b. Air infiltration shall not exceed .10 cfm/SF (.50 l/s•m²) of unit.
4. Water Resistance Test
   a. With ventilators closed and locked, test unit in accordance with ASTM E 331/ASTM E 547 at a static air pressure difference of 15.0 psf (718 Pa).
   b. There shall be no uncontrolled water leakage.

5. Uniform Load Deflection Test
   a. With ventilators closed and locked, test unit in accordance with ASTM E 330 at a static air pressure difference of 65.0 psf (3112 Pa), positive and negative pressure.
   b. No member shall deflect over L/175 of its span.

6. Uniform Load Structural Test
   a. With ventilators closed and locked, test unit in accordance with ASTM E 330 at a static air pressure difference of 97.5 psf (4668 Pa), both positive and negative.
   b. At conclusion of test there shall be no glass breakage, permanent damage to fasteners, hardware parts, support arms or actuating mechanisms, nor any other damage that would cause the window to be inoperable.

1.07 Quality Assurance

   A. Provide test reports from AAMA accredited laboratories certifying the performance as specified in 1.05.
   B. Test reports shall be accompanied by the window manufacturer's letter of certification, stating the tested window meets or exceeds the referenced criteria for the appropriate ANSI/AAMA/NWWDA 101/I.S.2/NAFS-02 window type.

1.08 References

1.09 Submittals

   A. Contractor shall submit shop drawings; finish samples, test reports, and warranties.
      1. Samples of materials as may be requested without cost to owner, i.e., metal, glass, fasteners, anchors, frame sections, mullion section, corner section, etc.

1.10 Warranties

   A. Total Window System
      1. The responsible contractor shall assume full responsibility and warrant for one year the satisfactory performance of the total window installation which includes that of the windows, hardware, glass (including insulated units), glazing, anchorage and setting system, sealing, flashing, etc., as it relates to air, water, and structural adequacy as called for in the specifications and approved shop drawings.
      2. Any deficiencies due to such elements not meeting the specifications shall be corrected by the responsible contractor at their expense during the warranty period.

   B. Material and Workmanship
      1. Per AAMA standard 601, provide written guarantee against defects in material and workmanship.
      2. Warranty period shall be for 5 years from the date of final shipment.

   C. Glass
      1. Provide written warranty for insulated glass units, that they will be free from obstruction of vision as a result of dust or film formation on the internal glass surfaces caused by failure of the hermetic seal due to defects in material and workmanship.
      2. Warranty period shall be for 10 (ten) years.
D. Finish
   1. Warranty period shall be for 10 years from the date of final shipment.
   2. Provide organic finish warranty based on AAMA standard 2605.

PART 2 PRODUCTS

2.01 Materials

A. Aluminum Windows
   1. Window units to be provided by storefront manufacturer.
   2. Finish to match specification for overall storefront system.
   3. Extruded aluminum shall be 6063-T6 alloy and tempered.

B. Hardware
   1. Locking handles shall be cam type and manufactured from a white bronze alloy with a 626 brushed finish as required.
   2. Windows shall be prepped for mechanical operator as indicated on drawings.
   3. Operating hardware shall be 4-bar stainless steel arms or equal.

C. Weather-Strip
   1. All weather-strip shall be Santoprene® or equal.

D. Thermal Barrier
   1. All exterior aluminum shall be separated from interior aluminum by a rigid, structural thermal barrier. For purposes of this specification, a structural thermal barrier is defined as a system that shall transfer shear during bending and, therefore, promote composite action between the exterior and interior extrusions.
   2. The perimeter frame thermal barrier shall be 2 thermal struts, consisting of glass reinforced polyamide nylon, mechanically crimped in raceways extruded in the exterior and interior extrusions.
   3. The sash and intermediate rails shall be poured and debridged thermal barrier made of two-part polyurethane.

E. Glass
   1. Glass shall be dual glazed per Specification 08800.

2.02 Fabrication

A. General
   1. All aluminum frame and vent extrusions shall have a minimum wall thickness of .125” (3 mm).
   2. Mechanical fasteners, welded components, and hardware items shall not bridge thermal barriers. Thermal barriers shall align at all frame and vent corners.
   3. Depth of frame and vent shall not be less than 2” (50 mm).

B. Frame
   1. Frame components shall be mortise and tenon. Other means of mechanically fastening, i.e., screws shall not be permitted.

C. Ventilator
   1. All vent extrusions shall be tubular.
   2. Each corner shall be mitered, reinforced with an extruded corner key, hydraulically crimped, and "cold welded" with epoxy adhesive.
   3. Each vent shall utilize two rows of weather stripping installed in specifically designed dovetail grooves in the extrusion. The exterior gasket will omitted at the vent bottom rail for project-
out vents and at the vent top rail for project-in vents, allowing air to pressure equalize the void between the vents and frame.

D. Glazing
   1. All units shall be glazed with the manufacturer’s standard sealant process provided the glass is held in place by a removable, extruded aluminum, glazing bead. The glazing bead must be isolated from the glazing material by a gasket.

E. Finish.
   1. Windows and accessories shall be furnished with an organic finish applied over a five-stage aluminum pre-treatment. Finish shall be a two-coat PVDF fluorocarbon coating system with a minimum of 1.2 mil thickness and conforming to AAMA 2605.

PART 3 EXECUTION

3.01 Inspection
   A. Job Conditions
      1. Verify that openings are dimensionally within allowable tolerances, plumb, level, clean, provide a solid anchoring surface, and are in accordance with approved shop drawings.

3.02 Installation
   A. Use only skilled tradesmen with work done in accordance with approved shop drawings and specifications.
   B. Plumb and align window faces in a single plane for each wall plane, and erect windows and materials square and true. Adequately anchor to maintain positions permanently when subjected to normal thermal movement, specified building movement, and specified wind loads.
   C. Adjust windows for proper operation after installation.
   D. Furnish and apply sealants to provide a weather tight installation at all joints and intersections and at opening perimeters. Wipe off excess material and leave all exposed surfaces and joints clean and smooth.

3.03 Anchorage
   A. Adequately anchor to maintain positions permanently when subjected to normal thermal movement, specified building movement, and specified wind loads.

3.04 Protection and Cleaning
   A. After completion of window installation, windows shall be inspected, adjusted, put into working order and left clean, free of labels, dirt, etc. Protection from this point shall be the responsibility of the general contractor.

END OF SECTION
SECTION 08520
ALUMINUM WINDOWS

PART 1 - GENERAL

1.01  SUMMARY

A. Provisions of the General and Supplementary Conditions and Division 01 apply to this section.

B. Section Includes:
   1. Aluminum windows as indicated.

C. Related Sections:
   1. Section 07920: Joint Sealants.
   2. Section 08800: Glazing.

1.02  SYSTEM DESCRIPTION

A. Design Requirements: Drawings indicate sizes, locations, profiles and general details of aluminum windows construction and installation.

1.03  SUBMITTALS

A. Shop Drawings: Submit Shop Drawings for the Work of this section including plans, elevations, opening identification symbols, sizes, and complete details for materials, finishes, sizes, profiles, moldings, dimensioned locations of hardware items with reinforcement, methods of anchoring, assembly, erection, isolation, glazing procedure as well as re-glazing procedures, materials, and caulking.

B. Product Data: Submit manufacturer’s Product Data, recommendations and standard details for aluminum windows units, including independent laboratory certified tests as necessary to demonstrate compliance with specified requirements.

1.04  QUALITY ASSURANCE

A. Windows shall conform to requirements of ANSI/AAMA 101 97 Voluntary Specifications for Aluminum Prime Windows and Sliding Glass Doors.

1.05  DELIVERY, STORAGE AND HANDLING

A. Deliver materials in manufacturer's packaging to protect windows during transportation and storage.

B. Store windows indoors in a clean ventilated area and stack vertically on edge with wood or plastic shims between components to provide water drainage and air circulation.

1.06  WARRANTY

A. Provide a 5 year labor warranty.
B. Provide a 10 year material warranty.

PART 2 - PRODUCTS

2.01 SERVICE WINDOWS

A. Acceptable Manufacturers:

   1. C.R. Laurence Co. Inc.; Series DW1800, or approved equal.

B. Frames and glass channels shall be 6063-T5 aluminum extrusions with window operating in nylon runners over coiled compression springs. Locking of sliding portion shall be with sliding bolt locks.

C. Fabricate window to fit between jambs so that slide up portion will provide opening of size indicated.

2.06 FINISH

A. Windows and accessories shall be furnished with an organic finish applied over a 5-stage aluminum pre-treatment. Finish shall be a 2-coat PVDF fluorocarbon coating system with a minimum of 1.2 mil thickness and conforming to AAMA 2605.

PART 3- EXECUTION

3.01 INSTALLATION

A. Windows and operators shall be installed plumb, square, level, and true within their respective openings. Adjoining units of windows or assembly of windows shall be installed in the same plane and with rails, muntins, and like members accurately aligned.

B. Upon completion of the Work of this section, including glazing, inspect windows and operating devices for proper installation and operation. Operate vents and hardware and adjust to ensure proper fitting and functioning and leave in smoothly operating condition.

3.02 CLEAN UP

A. Remove rubbish, debris and waste materials and legally dispose of off the Project site.

3.03 PROTECTION

A. Protect the Work of this section until Substantial Completion.

END OF SECTION
SECTION 08710

DOOR HARDWARE

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:

1. Door Hardware.
2. Storefront and entrance door hardware.
3. Gate Hardware.

B. Related Sections:

1. Section 06200 - Finish Carpentry: Finish Hardware Installation
2. Section 07900 - Joint Sealers – exterior thresholds
3. Section 08100 - Metal Doors and Frames
4. Section 08120 - Interior Aluminum Frames
5. Section 08150 - Integrated Door Assemblies
6. Section 08200 - Wood Doors
7. Section 08240 - Integrated Security Systems
8. Section 08400 - Entrances and Storefronts
9. Section 08900 - Glazed Curtain Walls
10. Section 10650 - Operable Partitions
11. Section 16200 - Electrical Power
12. Section 16722 - Fire/Life-Safety System
13. Section 16724 - Security Access Systems

C. Specific Omissions: Hardware for the following is specified or indicated elsewhere.

1. Windows.
2. Cabinets, including open wall shelving and locks.
3. Signs, except where scheduled.
4. Toilet accessories, including grab bars.
5. Installation.
6. Rough hardware.
7. Conduit, junction boxes & wiring.
8. Folding partitions, except cylinders where detailed.
10. Access doors and panels, except cylinders where detailed.
1.2 REFERENCES:

Use date of standard in effect as of Bid date.

A. American National Standards Institute – ANSI 156.18 – Materials and Finishes.
B. BHMA – Builders Hardware Manufacturers Association
C. DHI – Door and Hardware Institute
D. NFPA – National Fire Protection Association
   1. NFPA 80 – Fire Doors and Windows
   2. NFPA 105 – Smoke and Draft Control Door Assemblies
   3. NFPA 252 – Fire Tests of Door Assemblies
E. UL – Underwriters Laboratories
   1. UL10C – Positive Pressure Fire Tests of Door Assemblies.
   2. UL 305 – Panic Hardware
F. WHI – Warnock Hersey Incorporated
H. Local applicable codes
I. SDI – Steel Door Institute
J. WI – Woodwork Institute
K. AWI – Architectural Woodwork Institute
L. NAAMM – National Association of Architectural Metal Manufacturers

1.3 SUBMITTALS & SUBSTITUTIONS

A. SUBMITTALS: Submit six copies of schedule per Section 01330. Only submittals printed one sided will be accepted and reviewed. Organize vertically formatted schedule into “Hardware Sets” with index of doors and headings, indicating complete designations of every item required for each door or opening. Include following information:
   1. Type, style, function, size, quantity and finish of hardware items.
   2. Use BHMA Finish codes per ANSI A156.18.
   3. Name, part number and manufacturer of each item.
   4. Fastenings and other pertinent information.
   5. Description of door location using space names and numbers as published in the drawings.
   6. Explanation of abbreviations, symbols, and codes contained in schedule.
   7. Mounting locations for hardware.
   8. Door and frame sizes, handing, materials, fire-rating and degrees of swing.
   9. List of manufacturers used and their nearest representative with address and phone number.
10. Catalog cuts.
12. Manufacturer’s technical data and installation instructions for electronic hardware.

B. Bid and submit manufacturer’s updated/improved item if scheduled item is discontinued.

C. Deviations: Highlight, encircle or otherwise identify deviations from “Schedule of Finish Hardware” on submittal with notations clearly designating those portions as deviating from this section.

D. If discrepancy between drawings and scheduled material in this section, bid the more expensive of the two choices, note the discrepancy in the submittal and request direction from Architect for resolution.

E. Substitutions per Division 1. Include product data and indicate benefit to the Project. Furnish operating samples on request.

F. Furnish as-built/as-installed schedule with closeout documents, including keying schedule, wiring diagrams, manufacturers’ installation, adjustment and maintenance information, and supplier’s final inspection report.

1.4 QUALITY ASSURANCE:

A. Qualifications:
   1. Hardware supplier: direct factory contract supplier who employs a certified architectural hardware consultant (AHC), available at reasonable times during course of work for project hardware consultation to Owner, Architect and Contractor.
      a) Responsible for detailing, scheduling and ordering of finish hardware. Detailing implies that the submitted schedule of hardware is correct and complete for the intended function and performance of the openings.

B. Hardware: Free of defects, blemishes and excessive play. Obtain each kind of hardware (latch and locksets, exit devices, hinges and closers) from one manufacturer.

C. Exit Doors: Operable from inside with single motion without the use of a key or special knowledge or effort.

D. Fire-Rated Openings: NFPA 80 compliant. Hardware UL10C / California State Fire Marshal Standard 12-7-4 (positive pressure) compliant for given type/size opening and degree of label. Provide proper latching hardware, non-flaming door closers, approved-bearing hinges, and resilient seals. Coordinate with wood door section for required intumescent seals. Furnish openings complete.
   1. Note: scheduled resilient seals may exceed selected door manufacturer’s requirements.
   2. See 2.6.E for added information regarding resilient and intumescent seals.

E. Furnish hardware items required to complete the work in accordance with specified performance level and design intent, complying with manufacturers’ instructions.

F. Pre-Installation Meetings: Initiate and conduct with supplier, installer and related trades, coordinate materials and techniques, and sequence complex hardware items and systems installation. Include manufacturers’ representatives of locks, panic hardware and door closers in the meetings. Convene prior to commencement of related work.
1.5 DELIVERY, STORAGE AND HANDLING:

A. Delivery: coordinate delivery to appropriate locations (shop or field).
   1. Permanent keys and cores: secured delivery direct to Owner’s representative.

B. Acceptance at Site: Items individually packaged in manufacturers’ original containers, complete with proper fasteners and related pieces. Clearly mark packages to indicate contents, locations in hardware schedule and door numbers.

C. Storage: Provide securely locked storage area for hardware, protect from moisture, sunlight, paint, chemicals, dust, excessive heat and cold, etc.

1.6 PROJECT CONDITIONS AND COORDINATION:

A. Where exact types of hardware specified are not adaptable to finished shape or size of members requiring hardware, provide suitable types having as nearly as practical the same operation and quality as type specified, subject to Architect’s approval.

B. Coordination: Coordinate hardware with other work. Furnish hardware items of proper design for use on doors and frames of the thickness, profile, swing, security and similar requirements indicated, as necessary for proper installation and function, regardless of omissions or conflicts in the information on the Contract Documents. Furnish related trades with the following information:
   1. Location of embedded and attached items to concrete.
   2. Location of wall-mounted hardware, including wall stops.
   3. Location of finish floor materials and floor-mounted hardware.
   5. Manufacturer templates to door and frame fabricators.

C. Check Shop Drawings for doors and entrances to confirm that adequate provisions will be made for proper hardware installation. Do not order hardware until the submittal has been reviewed by the frame and door suppliers for compatibility with their products.
1.7 WARRANTY:

A. Part of respective manufacturers' regular terms of sale. Provide manufacturers' written warranties:

1. Locksets: Three years
2. Extra Heavy Duty Cylindrical Lock: Seven Years
3. Exit Devices: Three years mechanical
One year electrical
4. Closers: Ten years mechanical
Two years electrical
5. Hinges: One year
6. Other Hardware Two years

1.8 COMMISSIONING:

A. Conduct these tests prior to request for certificate of substantial completion:

1. With installer present, test door hardware operation with climate control system and stairwell pressurization system both at rest and while in full operation.
2. With installer, access control contractor and electrical contractor present, test electrical, electronic and electro-pneumatic hardware systems for satisfactory operation.
3. With installer and electrical contractor present, test hardware interfaced with fire/life-safety system for proper operation and release.
PART 2 PRODUCTS

2.1 MANUFACTURERS:

A. Listed acceptable alternate manufacturers: submit for review products with equivalent function and features of scheduled products.

<table>
<thead>
<tr>
<th>ITEM:</th>
<th>MANUFACTURER:</th>
<th>ACCEPTABLE SUB:</th>
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<tr>
<td>Hinges</td>
<td>(IVE) Ives</td>
<td>Bommer</td>
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<tr>
<td>Continuous Hinges</td>
<td>(IVE) Ives</td>
<td>Zero</td>
</tr>
<tr>
<td>Key System</td>
<td>(BES) Best [interchangeable cores keyed by owner]</td>
<td>NONE</td>
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<tr>
<td>Locks</td>
<td>(BES) Best</td>
<td></td>
</tr>
<tr>
<td>Lock trim</td>
<td>(BES) Best</td>
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<tr>
<td>Exit Devices</td>
<td>(VON) Von Duprin</td>
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<tr>
<td>Closers</td>
<td>(LCN) LCN</td>
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<tr>
<td>Auto Flush Bolts</td>
<td>(IVE) Ives</td>
<td>DCI</td>
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<tr>
<td>Coordinators</td>
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<tr>
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<tr>
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<td>(GLY) Glynn-Johnson</td>
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<td>Thresholds</td>
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<tr>
<td>Seals &amp; Bottoms</td>
<td>(NGP) NGP</td>
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<tr>
<td>Key Cabinets</td>
<td>(LUN) Lund</td>
<td>TelKee</td>
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<tr>
<td>Finger Guards</td>
<td>(FIN) Finger safe</td>
<td></td>
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<tr>
<td>Aluminum Door Locks</td>
<td>(ADA) Adams Rite</td>
<td>None</td>
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</table>
2.2 HINGING METHODS:

A. Drawings typically depict doors at 90 degrees, doors will actually swing to maximum allowable. Use wide-throw conventional or continuous hinges as needed up to 8 inches in width to allow door to stand parallel to wall for true 180-degree opening. Advise architect if 8-inch width is insufficient.

B. Conform to manufacturer's published hinge selection standard for door dimensions, weight and frequency, and to hinge selection as scheduled. Where manufacturer's standard exceeds the scheduled product, furnish the heavier of the two choices, notify Architect of deviation from scheduled hardware.

C. Conventional Hinges: Steel or stainless steel pins and concealed bearings. Hinge open widths minimum, but of sufficient throw to permit maximum door swing.
   1. Outswinging exterior doors: non-ferrous with non-removable (NRP) pins and security studs.
   2. Non-ferrous material exteriors and at doors subject to corrosive atmospheric conditions.

D. Continuous Hinges:
   1. Geared-type aluminum.
      a) Use wide-throw units where needed for maximum degree of swing, advise architect if commonly available hinges are insufficient.

2.3 LOCKSETS, LATCHSETS, DEADBOLTS:

A. Mortise Locksets and Latchsets: as scheduled.
   1. Narrow Backset mortise lock Chassis: cold-rolled steel. Accurate 8800 Series.
   2. Latch bolts: 1/2 inch throw stainless steel anti-friction type.
   3. Lever Trim: through-bolted, accessible design, cast lever or solid extruded bar type levers as scheduled. Filled hollow tube design unacceptable. Schlage 17A Design for Accurate 8800 series lock.
      a) Spindles: security design independent breakaway. Breakage of outside lever does not allow access to inside lever's hubworks to gain wrongful entry.
   4. Furnish solid cylinder collars with wave springs. Wall of collar to cover rim of mortise cylinder.
   5. Thumbturns: accessible design not requiring pinching or twisting motions to operate.
   7. Electric operation: Manufacturer-installed continuous duty solenoid.
   8. Strikes: 16 gage curved steel, bronze or brass with 1 inch deep box construction, lips of sufficient length to clear trim and protect clothing.
2.4 EXIT DEVICES / PANIC HARDWARE

A. General features: 35A and 98 series devices as scheduled:
   1. Independent lab-tested 1,000,000 cycles.
   3. 0.75-inch throw deadlocking latch bolts.
   4. End caps: impact-resistant, flush-mounted. No raised edges or lips to catch carts or other equipment.
   5. No exposed screws to show through glass doors.
   6. Non-handed basic device design with center case interchangeable with all functions, no extra parts required to effect change of function.
   7. Releasable in normal operation with 15-lb. maximum operating force per California State Fire Marshal Standard 12-10-3, and with 32 lb. maximum pressure under 250-lb. load to the door.
   9. Where devices span over door lite frame and the face of the selected lite manufacturer’s frame is raised from the face of the door, furnish panic hardware manufacturer’s fitted shims or glass-bead kits at no additional cost to the project.
   10. Comply with CBC Section 1003.3.1.9.

B. Specific features:
   2. Lever Trim: breakaway type, forged brass or bronze escutcheon min .130” thickness, compression spring drive, match lockset lever design.
   4. Removable Mullions: Removable with single turn of building key. Securely reinstalled without need for key. Furnish storage brackets for securely stowing the mullion away from the door when removed.

2.5 CLOSERS

A. Surface Closers: [4041]
   1. Full rack-and-pinion type cylinder with removable non-ferrous cover and cast iron body. Double heat-treated pinion shaft, single piece forged piston, chrome-silicon steel spring.
   2. ISO 2000 certified. Units stamped with date-of-manufacture code.
   3. Independent lab-tested 10,000,000 cycles.

5. Plates, brackets and special templating when needed for interface with particular header, door and wall conditions and neighboring hardware.

6. Adjustable to open with not more than 5.0lbs pressure to open at exterior doors and 5.0lbs at interior doors. As allowed per California Building Code, Section 1133B.2.5, local authority may increase the allowable pressure for fire doors to achieve positive latching, but not to exceed 15lbs.

7. Separate adjusting valves for closing speed, latching speed and backcheck, fourth valve for delayed action where scheduled.

8. Extra-duty arms (EDA) at exterior doors scheduled with parallel arm units.

9. Exterior door closers: tested to 100 hours of ASTM B117 salt spray test, furnish data on request.

10. Exterior doors: seasonal adjustments not required for temperatures from 120 degrees F to -30 degrees F, furnish checking fluid data on request.

11. Non-flaming fluid, will not fuel door or floor covering fires.

12. Pressure Relief Valves (PRV) not permitted.

2.6 OTHER HARDWARE

A. Automatic Flush Bolts: Low operating force design.

B. Overhead Stops: Non-plastic mechanisms and finished metal end caps. Field-changeable hold-open, friction and stop-only functions.

C. Kick Plates: Four beveled edges, .050 inches minimum thickness, height and width as scheduled. Sheet-metal screws of bronze or stainless steel to match other hardware.

D. Door Stops: Provide stops to protect walls, casework or other hardware.

1. Unless otherwise noted in Hardware Sets, provide floor type with appropriate fasteners. Where floor type cannot be used, provide wall type. If neither can be used, provide overhead type.


E. Seals: Finished to match adjacent frame color. Resilient seal material: polyurethane, polypropylene, nylon brush, silicone rubber or solid high-grade neoprene as scheduled. Do not furnish vinyl seal material. UL label applied to seals on rated doors. Substitute products: certify that the products equal or exceed specified material’s thickness and durability.

1. Proposed substitutions: submit for approval.


3. Non-corroding fasteners at in-swinging exterior doors.
4. Sound control openings: Use components tested as a system using nationally accepted standards by independent laboratories. Ensure that the door leafs have the necessary sealed-in-place STC ratings. Fasten applied seals over bead of sealant.

5. Fire-rated Doors, Resilient Seals: UL10C / UBC Standard 7-2 compliant. Coordinate with selected door manufacturers’ and selected frame manufacturers’ requirements. Where rigid housed resilient seals are scheduled in this section and the selected door manufacturer only requires an adhesive-mounted resilient seal, furnish rigid housed seal at minimum, or both the rigid housed seal plus the adhesive applied seal. Adhesive applied seals alone are deemed insufficient for this project where rigid housed seals are scheduled.

6. Fire-rated Doors, Intumescent Seals: Furnished by selected door manufacturer. Furnish fire-labeled opening assembly complete and in full compliance with UL10C / UBC Standard 7-2. Where required, intumescent seals vary in requirement by door type and door manufacturer – careful coordination required

F. Automatic door bottoms: low operating force units. Doors with automatic door bottoms plus head and jamb seals cannot require more than two pounds operating force to open when closer is disconnected.

G. Thresholds: As scheduled and per details. Comply with CBC Section 1133B.2.4.1. Substitute products: certify that the products equal or exceed specified material’s thickness. Proposed substitutions: submit for approval.

1. Exteriors: Seal perimeter to exclude water and vermin. Use sealant complying with requirements in Division 7 “Thermal and Moisture Protection”. Non-ferrous 1/4inch fasteners and lead expansion shield anchors, or Red-Head #SFS-1420 (or approved equivalent) Flat Head Sleeve Anchors (SS/FHSL).

2. Fire-rated openings, 90min or less duration: use thresholds to interrupt floor covering material under the door where that material has a critical radiant flux value less than 0.22 watts per square centimeter, per NFPA 253. Use threshold unit as scheduled. If none scheduled, request direction from Architect.
   a) City of Los Angeles: regardless of critical radiant flux values of organic-material floor coverings, furnish metal or stone thresholds at fire-rated openings.

3. Fire-rated openings, 3hour duration: Thresholds, where scheduled, to extend full jamb depth.

4. Acoustic openings: Set units in full bed of Division-7-compliant, leave no air space between threshold and substrate.

5. Plastic plugs with wood or sheet metal screws are not an acceptable substitute for specified fastening methods.

6. Fasteners: Generally, exposed screws to be Phillips or Robertson drive. Pinned TORX drive at high security areas. Flat head sleeve anchors (FHSL) may be slotted drive. Sheet metal and wood screws: full-thread. Sleeve nuts: full length to prevent door compression.

H. Exposed Through-Bolts: Do not use SNB, grommet nuts, sleeve nuts or other such clamping type fasteners, intent is for minimal exposed hardware. Coordinate with wood doors; ensure provision of proper blocking to support wood screws for mounting panic hardware and door closers. Coordinate with metal doors and frames; ensure provision of proper reinforcement to support machine screws for mounting panic hardware and door closers.
I. Silencers: Interior hollow metal frames, 3 for single doors, 4 for pairs of doors. Omit where adhesive mounted seal occurs. Leave no unfilled/uncovered pre-punched silencer holes.

2.7 FINISH:

A. Generally BHMA 626 Satin Chromium.
   1. Areas using BHMA 626 to have push-plates, pulls and protection plates of BHMA 630, Satin Stainless Steel, unless otherwise noted.
B. Door closers: factory powder coated to match other hardware, unless otherwise noted.
C. Aluminum items: match predominant adjacent material. Seals to coordinate with frame color.

2.8 KEYING REQUIREMENTS:

A. Key System: Existing Best small format interchangeable core. For estimate use Best factory GMK charge. Initiate and conduct meeting(s) with Owner representatives to determine system keyway(s), keybow styles, structure and degree of geographic exclusivity. Furnish Owner’s written approval of the system. Keys
   1. New factory master key system.
   3. Owner may install the permanent cores themselves. Coordinate with the owner
   4. Furnish 10 construction keys.
   5. Furnish 2 construction control keys.
B. Key Cylinders: furnish 7-pin solid brass construction.
C. Cylinder cores: furnish keyed at factory of lock manufacturer where permanent records are maintained. Locks and cylinders same manufacturer.
D. Permanent keys & Cores: use secured shipment direct from point of origination to Owner.
   1. For estimate: 3 keys per change combination, 5 master keys per group, 5 grand-master keys, 3 control keys.
   2. For estimate: VKC stamping plus “Do Not Duplicate”.
E. Bitting List: use secured shipment direct from point of origination to Owner upon completion.

PART 3 - EXECUTION

3.1 ACCEPTABLE INSTALLERS:

A. Can read and understand manufacturers’ templates, suppliers’ hardware schedules and printed installation instructions. Can readily distinguish drywall screws from manufacturers’ furnished fasteners. Available to meet with manufacturers’ representatives and related trades to discuss installation of hardware.
3.2 PREPARATION:

A. Ensure that walls and frames are square and plumb before hardware installation. Make corrections before commencing hardware installation.

B. Locate hardware per SDI-100 and applicable building, fire, life-safety, accessibility, and security codes.
   1. Notify Architect of code conflicts before ordering material.
   2. Locate levers, key cylinders, t-turn pieces, touchbars and other operable portions of latching hardware between 30 inches to 44 inches above the finished floor, per CBC Section 1133B.2.5.1.
   3. Where new hardware is to be installed near existing doors/hardware scheduled to remain, match locations of existing hardware.

C. Overhead stops: before installing, determine proposed locations of furniture items, fixtures, and other items to be protected by the overhead stop's action.

3.3 INSTALLATION

A. Install hardware per manufacturer’s instructions and recommendations. Do not install surface-mounted items until finishes have been completed on substrate. Set units level, plumb and true to line and location. Adjust and reinforce attachment substrate for proper installation and operation. Remove and reinstall or replace work deemed defective by Architect.
   1. Gaskets: install jamb-applied gaskets before closers, overhead stops, rim strikes, etc; fasten hardware over and through these seals. Install sweeps across bottoms of doors before astragals, cope sweeps around bottom pivots, trim astragals to tops of sweeps.
   2. When hardware is to be attached to existing metal surface and insufficient reinforcement exists, use RivNuts, NutSerts or similar anchoring device for screws.
   3. Use manufacturers’ fasteners furnished with hardware items, or submit Request for Substitution with Architect.
   4. Replace fasteners damaged by power-driven tools.

B. Locate floor stops no more that 4 inches from walls and not within paths of travel. See paragraph 2.2 regarding hinge widths, door should be well clear of point of wall reveal. Point of door contact no closer to the hinge edge than half the door width. Where situation is questionable or difficult, contact Architect for direction.

C. Core concrete for exterior door stop anchors. Set anchors in approved non-shrink grout.

D. Locate overhead stops for minimum 90 degrees and maximum allowable degree of swing.

E. Drill pilot holes for fasteners in wood doors and/or frames. Centerpunch hole locations before using self-drilling type screws to prevent skating. Replace screws that are not centered in their holes.

F. Lubricate and adjust existing hardware scheduled to remain. Carefully remove and give to Owner items not scheduled for reuse.
3.4. ADJUSTING

A. Adjust and check for proper operation and function. Replace units, which cannot be adjusted to operate freely and smoothly.
   1. Hardware damaged by improper installation or adjustment methods: repair or replace to Owner's satisfaction.
   2. Adjust doors to fully latch with no more than 1 pound of pressure.
   3. Adjust delayed-action closers on fire-rated doors to fully close from fully-opened position in no more than 10 seconds.
   4. Adjust door closers per 1.9 this section.

B. Inspection: Use hardware supplier's consultant or consultant's agent. Include supplier's report with closeout documents.

C. Final inspection: Installer to provide letter to Owner that upon completion installer has visited the Project and has accomplished the following:
   1. Re-adjust hardware.
   2. Evaluate maintenance procedures and recommend changes or additions, and instruct Owner's personnel.
   3. Identify items that have deteriorated or failed.
   4. Submit written report identifying problems

3.5 DEMONSTRATION:

A. Demonstrate mechanical hardware and electrical, electronic and pneumatic hardware systems, including adjustment and maintenance procedures.

3.6 PROTECTION/CLEANING:

A. Cover installed hardware, protect from paint, cleaning agents, weathering, carts/barrows, etc. Remove covering materials and clean hardware just prior to substantial completion.

B. Clean adjacent wall, frame and door surfaces soiled from installation/reinstallation process.

3.7 SCHEDULE OF FINISH HARDWARE

A. See hardware sets for door & hardware set assignments.

B. Miscellaneous Material:

C. Coordinate all electrical hardware voltages and functions with owner's Card Access contractor before ordering any material.

SPECWORKS # 114224

HW SET: 01
DOOR NUMBER: D-002A
EACH TO HAVE:
1 EA MEMO ALL HARDWARE BY GATE MFGR.

HW SET: 03
DOOR NUMBER: D-105D

EACH TO HAVE:
2 EA POWER TRANSFER EPT-10 689 VON
2 EA CONTINUOUS HINGE 224HD EPT 628 IVE
1 EA MULLION KR1654 689 VON
2 EA PANIC HARDWARE RX-LD-35A-EO 1606 626 VON
1 EA RIM CYLINDER 1E72 626 BES
1 EA MORTISE CYLINDER 1E74 (VERIFY CAM) 626 BES
2 EA CYLINDER GUARD K-24 626 KEE
2 EA OFFSET DOOR PULL 8190-0-O 630 IVE
2 EA SURFACE CLOSER 4041 DEL EDA 689 LCN
2 EA MOUNTING PLATE 4040-18PA 689 LCN
2 EA SECURITY FLOOR STOP FS18L BLK IVE
2 EA DOOR SWEEP C607A DOOR WIDTH CL NGP
1 EA THRESHOLD 513 1/4"-20 COMBO ANCHOR OR AS DETAILED AL NGP
2 EA MEMO DOOR POSITION SWITCH BY SECURITY SECTION
1 EA MEMO SEALS BY ALUM FRAME MFGR

OPERATION: EXIT ONLY - MONITOR

HW SET: 03E
DOOR NUMBER: D-101D D-101E D-105C D-111A

EACH TO HAVE:
2 EA POWER TRANSFER EPT-10 689 VON
2 EA CONTINUOUS HINGE 224HD EPT 628 IVE
1 EA MULLION KR1654 689 VON
1 EA PANIC HARDWARE RX-EL35A-EO 626 VON
1 EA PANIC HARDWARE RX-EL35A-NL-OP 1606 626 VON
1 EA RIM CYLINDER 1E72 626 BES
1 EA MORTISE CYLINDER 1E74 (VERIFY CAM) 626 BES
1 EA CYLINDER GUARD K-24 626 KEE
2 EA OFFSET DOOR PULL 8190-0-O 630 IVE
2 EA SURFACE CLOSER 4041 DEL EDA 689 LCN
2 EA MOUNTING PLATE 4040-18PA 689 LCN
2 EA SECURITY FLOOR STOP FS18L BLK IVE
2 EA DOOR SWEEP C607A DOOR WIDTH CL NGP
1 EA THRESHOLD 513 1/4"-20 COMBO ANCHOR OR AS DETAILED AL NGP
1 EA POWER SUPPLY PS914-2RS GRY VON
1 EA MEMO CARD READER BY ACCESS CONTROL SECTION
2 EA MEMO DOOR POSITION SWITCH BY SECURITY SECTION
1 EA MEMO SEALS BY ALUM FRAME MFR

OPERATION: DOOR NORMALLY CLOSED AND LOCKED. ALWAYS FREE EGRESS FROM THE INSIDE. OPENABLE BY CARD ACCESS FROM THE OUTSIDE.

HW SET: 04E
DOOR NUMBER:
D-107A

EACH TO HAVE:
1 EA CONTINUOUS HINGE 224HD TW8 628 IVE
1 SET WORKING TRIM SET 09-449 17A WORKING TRIM FOR ACC 8859 626 SCH
1 EA ELECTRIC LOCK RX-8859ELEC 2-1/4" BS FSE 626 ACC
1 EA CYLINDER GUARD K-24 626 KEE
1 EA SURFACE CLOSER 4041 DEL SCUSH 689 LCN
1 EA MOUNTING PLATE 4040-18PA 689 LCN
1 EA DOOR SWEEP C607A DOOR WIDTH CL NGP
1 EA THRESHOLD 513 1/4"-20 COMBO ANCHOR OR AS DETAILED AL NGP
1 EA FINGER GUARD MK1A X DOOR HEIGHT (PUSH SIDE) AL FIN
1 EA MEMO CARD READER BY ACCESS CONTROL SECTION
1 EA MEMO DOOR POSITION SWITCH BY SECURITY SECTION
1 EA MEMO POWER SUPPLY BY SECURITY
1 EA MEMO SEALS BY ALUM FRAME MFR

OPERATION: DOOR NORMALLY CLOSED AND LOCKED. ALWAYS FREE EGRESS FROM THE INSIDE. OPENABLE BY CARD ACCESS FROM THE OUTSIDE.

HW SET: 05
DOOR NUMBER:
D-121A D-127A

EACH TO HAVE:
1 EA PADLOCK 21B772-L-M5 606 BES
1 EA MEMO BALANCE BY DOOR MFR.

HW SET: 06
DOOR NUMBER:
D-121B

EACH TO HAVE:
1 EA CONTINUOUS HINGE 224HD 628 IVE
1 EA STOREROOM LOCK 8859 2-1/4" BS 626 ACC
1 SET WORKING TRIM SET 09-449 17A WORKING TRIM FOR ACC 8859 626 SCH
1 EA MORTISE CYLINDER 1E74 (VERIFY CAM) 626 BES
<table>
<thead>
<tr>
<th>Quantity</th>
<th>Item Description</th>
<th>Model No.</th>
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</thead>
<tbody>
<tr>
<td>1</td>
<td>CYLINDER GUARD</td>
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<tr>
<td>1</td>
<td>SURFACE CLOSER</td>
<td>4040XP SCUSH</td>
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<tr>
<td>1</td>
<td>KICK PLATE</td>
<td>8400 10&quot; X 2&quot; LDW</td>
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<tr>
<td>1</td>
<td>SET SEALS</td>
<td>9700E HEAD &amp; JAMBS</td>
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<tr>
<td>1</td>
<td>DRIP CAP</td>
<td>16A DOOR WIDTH + 4&quot;</td>
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<tr>
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<td>DOOR SWEEP</td>
<td>C627A DOOR WIDTH</td>
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<td>THRESHOLD</td>
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HW SET: 08E
DOOR NUMBER: D-127B

EACH TO HAVE:

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<tr>
<th>Quantity</th>
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<tbody>
<tr>
<td>1</td>
<td>POWER TRANSFER</td>
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<tr>
<td>1</td>
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<td>RIM CYLINDER</td>
<td>1E72</td>
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<tr>
<td>1</td>
<td>CYLINDER GUARD</td>
<td>K-24</td>
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<tr>
<td>1</td>
<td>SURFACE CLOSER</td>
<td>4041 DEL</td>
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<tr>
<td>1</td>
<td>KICK PLATE</td>
<td>8400 10&quot; X 2&quot; LDW</td>
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<tr>
<td>1</td>
<td>DOOR BOTTOM</td>
<td>15NA</td>
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<tr>
<td>1</td>
<td>THRESHOLD</td>
<td>513 1/4&quot;-20 COMBO ANCHOR OR AS DETAILED</td>
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<td>1</td>
<td>MEMO</td>
<td>CARD READER BY ACCESS CONTROL</td>
</tr>
<tr>
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<td>MEMO</td>
<td>DOOR POSITION SWITCH BY SECURITY</td>
</tr>
<tr>
<td>1</td>
<td>MEMO</td>
<td>POWER SUPPLY BY SECURITY</td>
</tr>
</tbody>
</table>

OPERATION: DOOR NORMALLY CLOSED AND LOCKED. ALWAYS FREE EGRESS FROM THE INSIDE. OPENABLE BY CARD ACCESS FROM THE OUTSIDE.


HW SET: 10
DOOR NUMBER: D-129C

EACH TO HAVE:

<table>
<thead>
<tr>
<th>Quantity</th>
<th>Item Description</th>
<th>Model No.</th>
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<tbody>
<tr>
<td>1</td>
<td>POWER TRANSFER</td>
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<tr>
<td>1</td>
<td>CONTINUOUS HINGE</td>
<td>224HD EPT</td>
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<tr>
<td>1</td>
<td>PANIC HARDWARE</td>
<td>RX-LD-35A-E0</td>
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<tr>
<td>1</td>
<td>OFFSET DOOR PULL</td>
<td>8190-0-0-O</td>
</tr>
<tr>
<td>1</td>
<td>SURFACE CLOSER</td>
<td>4040XP EDA</td>
</tr>
<tr>
<td>1</td>
<td>SURFACE CLOSER</td>
<td>4040XP SCUSH</td>
</tr>
<tr>
<td>1</td>
<td>MOUNTING PLATE</td>
<td>4040-18PA</td>
</tr>
<tr>
<td>1</td>
<td>DOOR SWEEP</td>
<td>C607A DOOR WIDTH</td>
</tr>
<tr>
<td>1</td>
<td>THRESHOLD</td>
<td>513 1/4&quot;-20 COMBO ANCHOR OR AS DETAILED</td>
</tr>
<tr>
<td>1</td>
<td>MEMO</td>
<td>CARD READER BY ACCESS CONTROL</td>
</tr>
<tr>
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<td>DOOR POSITION SWITCH BY SECURITY</td>
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<tr>
<td>1</td>
<td>MEMO</td>
<td>SEALS BY ALUM FRAME MFGR</td>
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**OPERATION: EXIT ONLY DOORS**

HW SET: 10E  
DOOR NUMBER:  
D-129B D-214A

EACH TO HAVE:

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<tbody>
<tr>
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<td>EA</td>
<td>CONTINUOUS HINGE</td>
<td>224HD EPT</td>
<td>628</td>
<td>IVE</td>
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<tr>
<td>1</td>
<td>EA</td>
<td>PANIC HARDWARE</td>
<td>RX-EL35A-NL-OP</td>
<td>626</td>
<td>VON</td>
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<tr>
<td>1</td>
<td>EA</td>
<td>RIM CYLINDER</td>
<td>1E72</td>
<td>626</td>
<td>KEE</td>
</tr>
<tr>
<td>1</td>
<td>EA</td>
<td>CYLINDER GUARD</td>
<td>K-24</td>
<td>626</td>
<td>KEE</td>
</tr>
<tr>
<td>1</td>
<td>EA</td>
<td>OFFSET DOOR PULL</td>
<td>8190-0-O</td>
<td>630</td>
<td>IVE</td>
</tr>
<tr>
<td>1</td>
<td>EA</td>
<td>SURFACE CLOSER</td>
<td>4040XP SCUSH</td>
<td>689</td>
<td>LCN</td>
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<tr>
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<td>EA</td>
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<td>LCN</td>
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<td>DOOR SWEEP</td>
<td>C607A DOOR WIDTH</td>
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<tr>
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<td>EA</td>
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<td>NGP</td>
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<td>1</td>
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<td>POWER SUPPLY</td>
<td>PS914-2RS</td>
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<td>ACC</td>
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<td>CARD READER BY ACCESS CONTROL SECTION</td>
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<td>MEMO</td>
<td>SEALS BY ALUM FRAME MFGR</td>
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**OPERATION: DOOR NORMALLY CLOSED AND LOCKED. ALWAYS FREE EGRESS FROM THE INSIDE. OPENABLE BY CARD ACCESS FROM THE OUTSIDE.**

HW SET: 11E  
DOOR NUMBER:  
D-130B

EACH TO HAVE:

<table>
<thead>
<tr>
<th>1</th>
<th>EA</th>
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<td>224HD EPT</td>
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<tr>
<td>1</td>
<td>SET</td>
<td>WORKING TRIM SET</td>
<td>09-449 17A WORKING TRIM FOR ACC 8859</td>
<td>626</td>
<td>SCH</td>
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<tr>
<td>1</td>
<td>EA</td>
<td>MORTISE CYLINDER</td>
<td>1E74 (VERIFY CAM)</td>
<td>626</td>
<td>BES</td>
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<tr>
<td>1</td>
<td>EA</td>
<td>ELECTRIC LOCK</td>
<td>RX-8859ELEC 2-1/4&quot; BS FSE</td>
<td>626</td>
<td>ACC</td>
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<tr>
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<td>EA</td>
<td>CYLINDER GUARD</td>
<td>K-24</td>
<td>626</td>
<td>KEE</td>
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<tr>
<td>1</td>
<td>EA</td>
<td>SURFACE CLOSER</td>
<td>4040XP SHCUSH</td>
<td>689</td>
<td>LCN</td>
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<tr>
<td>1</td>
<td>EA</td>
<td>KICK PLATE</td>
<td>8400 10&quot; X 2&quot; LDW</td>
<td>630</td>
<td>IVE</td>
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<tr>
<td>1</td>
<td>SET</td>
<td>SEALS</td>
<td>9700E HEAD &amp; JAMBS</td>
<td>AL</td>
<td>NGP</td>
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<tr>
<td>1</td>
<td>EA</td>
<td>DOOR SWEEP</td>
<td>C627A DOOR WIDTH</td>
<td>CL</td>
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<td>AL</td>
<td>NGP</td>
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<tr>
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<td>LG10</td>
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<td>PS902</td>
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<td>Manufacturer</td>
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<td>Memo Card Reader by Access Control Section</td>
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<tr>
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<td>Memo Door Position Switch by Security Section</td>
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<tr>
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<td>Memo Mount Seals before Installing Closer</td>
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<tr>
<td>1</td>
<td>Memo Power Supply by Security</td>
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</tbody>
</table>

**HW Set: 11E.1**

**Door Number:**
D-132A

**Each To Have:**

- **Power Transfer:** EPT-10 689 VON
- **Continuous Hinge:** 224HD EPT 628 IVE
- **Working Trim Set:** 09-449 17A Working Trim for ACC 8859 626 SCH
- **Mortise Cylinder:** 1E74 (Verify Cam) 626 BES
- **Electric Lock:** RX-8859ELEC 2-1/4" BS FSE 626 ACC
- ** Cylinder Guard:** K-24 626 KEE
- **Surface Closer:** 4040XP SHCUSH 689 LCN
- **Kick Plate:** 8400 10" X 2" LDW 630 IVE
- **Seals:** 9700E Head & Jams 689 AL NGP
- **Door Sweep:** C627A Door Width 626 SCH
- **Threshold:** 513 1/4"-20 COMBO ANCHOR OR AS DETAILED AL NGP
- **Power Supply:** PS902 626 SCE
- **Memo Card Reader by Access Control Section**
- **Memo Door Position Switch by Security Section**
- **Memo Mount Seals before Installing Closer**
- **Memo Power Supply by Security**

**Operation:** Door normally closed and locked. Always free egress from the inside. Openable by card access from the outside.

**HW Set: 12**

**Door Number:**
D-134B  D-134C

**Each To Have:**

- **Power Transfer:** EPT-10 689 VON
- **Continuous Hinge:** 224HD EPT 628 IVE
- **Mullion:** KR1654 689 VON
- **Mullion Storage Kit:** MT54 689 VON
- **Panic Hardware:** RX-LD-35A-E0 1606 626 VON
- **Rim Cylinder:** 1E72 626 BES
- **Mortise Cylinder:** 1E74 (Verify EO) 626 BES
- **Cylinder Guard:** K-24 626 KEE
- **Offset Door Pull:** 8190-0-O 630 IVE
1  EA MULLION SEAL  5100S  BLK  NGP
2  EA SURFACE CLOSER  4040XP SHCUSH  689  LCN
2  EA MOUNTING PLATE  4040-18PA  689  LCN
2  EA DOOR SWEEP  C607A DOOR WIDTH  CL  NGP
1  EA THRESHOLD  513 1/4"-20 COMBO ANCHOR OR AS DETAILED AL NGP
1  EA MEMO DOOR POSITION SWITCH BY SECURITY SECTION
1  EA MEMO SEALS BY ALUM FRAME MFGR

MONITOR ONLY

HW SET: 12E
DOOR NUMBER: D-134D

EACH TO HAVE:
2  EA POWER TRANSFER  EPT-10  689  VON
2  EA CONTINUOUS HINGE  224HD EPT  628  IVE
1  EA MULLION  KR1654  689  VON
1  EA MULLION STORAGE KIT  MT54  689  VON
1  EA PANIC HARDWARE  RX-EL3547A-EO  626  VON
1  EA PANIC HARDWARE  RX-EL3547A-NL-OP  626  VON
1  EA RIM CYLINDER  1E72  626  BES
1  EA MORTISE CYLINDER  1E74 (VERIFY CAM)  626  BES
1  EA CYLINDER GUARD  K-24  626  KEE
2  EA OFFSET DOOR PULL  8190-0-O  630  IVE
1  EA MULLION SEAL  5100S  689  BLK  NGP
2  EA SURFACE CLOSER  4040XP SHCUSH  689  LCN
2  EA MOUNTING PLATE  4040-18PA  689  LCN
2  EA DOOR SWEEP  C607A DOOR WIDTH  CL  NGP
1  EA THRESHOLD  513 1/4"-20 COMBO ANCHOR OR AS DETAILED AL NGP
1  EA POWER SUPPLY  PS914-2RS  626  GRY  VON
1  EA MEMO CARD READER BY ACCESS CONTROL SECTION
2  EA MEMO DOOR POSITION SWITCH BY SECURITY SECTION
1  EA MEMO SEALS BY ALUM FRAME MFGR

OPERATION: DOOR NORMALLY CLOSED AND LOCKED. ALWAYS FREE EGRESS FROM THE INSIDE. OPENABLE BY CARD ACCESS FROM THE OUTSIDE.

HW SET: 13E
DOOR NUMBER: D-201D  D-204B

EACH TO HAVE:
2  EA POWER TRANSFER  EPT-10  689  VON
2  EA CONTINUOUS HINGE  224HD EPT  628  IVE
1  EA PANIC HARDWARE  RX-EL3547A-EO  626  VON
1  EA PANIC HARDWARE  RX-EL3547A-NL-OP  626  VON
1 EA RIM CYLINDER 1E72 626 BES
1 EA CYLINDER GUARD K-24 626 KEE
2 EA OFFSET DOOR PULL 8190-0-O 630 IVE
2 EA SURFACE CLOSER 4040XP SHCUSH 689 LCN
2 EA MOUNTING PLATE 4040-18PA 689 LCN
1 EA THRESHOLD 513 1/4"-20 COMBO ANCHOR OR AS DETAILED AL NGP
1 EA POWER SUPPLY PS914-2RS GRY VON
1 EA MEMO CARD READER BY ACCESS CONTROL SECTION
2 EA MEMO DOOR POSITION SWITCH BY SECURITY SECTION
1 EA MEMO SEALS BY ALUM FRAME MFGR

HW SET: 14
DOOR NUMBER:
D-219A

EACH TO HAVE:
1 EA CONTINUOUS HINGE 224HD 628 IVE
1 EA DEADLOCK MS1850S - ADVISE BACKSET 628 ADA
1 EA MORTISE CYLINDER 1E74 (VERIFY CAM) 626 BES
1 EA CYLINDER GUARD K-24 626 KEE
1 EA SURFACE CLOSER 4041 DEL SHCUSH 689 LCN
1 EA MOUNTING PLATE 4040-18PA 689 LCN
1 EA DOOR SWEEP C607A DOOR WIDTH CL NGP
1 EA THRESHOLD 513 1/4"-20 COMBO ANCHOR OR AS DETAILED AL NGP
1 EA MEMO SEALS BY ALUM FRAME MFGR

HW SET: 14E
DOOR NUMBER:
D-208B

EACH TO HAVE:
1 EA CONTINUOUS HINGE 224HD TW8 628 IVE
1 SET WORKING TRIM SET 09-449 17A WORKING TRIM FOR ACC 8859 626 SCH
1 EA MORTISE CYLINDER 1E74 (VERIFY CAM) 626 BES
1 EA ELECTRIC LOCK RX-8859ELEC 2-1/4" BS FSE 626 ACC
1 EA CYLINDER GUARD K-24 626 KEE
1 EA SURFACE CLOSER 4041 DEL SHCUSH 689 LCN
1 EA MOUNTING PLATE 4040-18PA 689 LCN
1 EA DOOR SWEEP C607A DOOR WIDTH CL NGP
1 EA THRESHOLD 513 1/4"-20 COMBO ANCHOR OR AS DETAILED AL NGP
1 EA MEMO CARD READER BY ACCESS CONTROL SECTION
1 EA MEMO DOOR POSITION SWITCH BY SECURITY SECTION
1 EA MEMO POWER SUPPLY BY SECURITY
1 EA MEMO SEALS BY ALUM FRAME MFGR
HW SET: 16E
DOOR NUMBER:
D-101A  D-101B  D-105A

EACH TO HAVE:
1 EA  POWER TRANSFER  EPT-10  689  VON
1 EA  CONTINUOUS HINGE  224HD EPT  628  IVE
1 EA  PANIC HARDWARE  RX-EL35A-NL-OP  626  VON
1 EA  RIM CYLINDER  1E72  626  BES
1 EA  CYLINDER GUARD  K-24  626  KEE
1 EA  OFFSET DOOR PULL  8190-0-O  630  IVE
1 EA  SURFACE CLOSER  4041 DEL EDA  689  LCN
1 EA  MOUNTING PLATE  4040-18PA  689  LCN
1 EA  SECURITY FLOOR STOP  FS18S  BLK  IVE
1 EA  POWER SUPPLY  PS914-2RS  GRY  VON
1 EA  MEMO  CARD READER BY ACCESS CONTROL SECTION

OPERATION: DOOR NORMALLY CLOSED AND LOCKED. ALWAYS FREE EGRESS FROM THE INSIDE. OPENABLE BY CARD ACCESS FROM THE OUTSIDE.

---

HW SET: 16E.1
DOOR NUMBER:
D-108A  D-132B

EACH TO HAVE:
1 EA  CONTINUOUS HINGE  224HD TW8  628  IVE
1 SET WORKING TRIM SET  09-449 17A WORKING TRIM FOR ACC 8859  626  SCH
1 EA  MORTISE CYLINDER  1E74 (VERIFY CAM)  626  BES
1 EA  ELECTRIC LOCK  RX-8859ELEC 2-1/4" BS FSE  626  ACC
1 EA  CYLINDER GUARD  K-24  626  KEE
1 EA  SURFACE CLOSER  4041 DEL EDA  689  LCN
1 EA  MOUNTING PLATE  4040-18PA  689  LCN
1 EA  SECURITY FLOOR STOP  FS18S  BLK  IVE
1 EA  POWER SUPPLY  PS902  SCE
1 EA  MEMO  CARD READER BY ACCESS CONTROL SECTION
OPERATION: DOOR NORMALLY CLOSED AND LOCKED. ALWAYS FREE EGRESS FROM THE INSIDE. OPENABLE BY CARD ACCESS FROM THE OUTSIDE.

HW SET: 16E.2
DOOR NUMBER: D-208A
EACH TO HAVE:
1 EA CONTINUOUS HINGE 224HD TW8 628 IVE
1 SET WORKING TRIM SET 09-449 17A WORKING TRIM FOR ACC 8859 626 SCH
1 EA MORTISE CYLINDER 1E74 (VERIFY CAM) 626 BES
1 EA ELECTRIC LOCK RX-8859ELEC 2-1/4" BS FSE 626 ACC
1 EA CYLINDER GUARD K-24 626 KEE
1 EA SURFACE CLOSER 4041 DEL EDA 689 LCN
1 EA MOUNTING PLATE 4040-18PA 689 LCN
1 EA SECURITY FLOOR STOP FS18S BLK IVE
1 EA MEMO CARD READER BY ACCESS CONTROL SECTION
1 EA MEMO DOOR POSITION SWITCH BY SECURITY SECTION
1 EA MEMO POWER SUPPLY BY SECURITY SECTION

OPERATION: DOOR NORMALLY CLOSED AND LOCKED. ALWAYS FREE EGRESS FROM THE INSIDE. OPENABLE BY CARD ACCESS FROM THE OUTSIDE.

HW SET: 16E.3
DOOR NUMBER: D-101C
EACH TO HAVE:
1 EA CONTINUOUS HINGE 224HD TW8 628 IVE
1 SET WORKING TRIM SET 09-449 17A WORKING TRIM FOR ACC 8859 626 SCH
1 EA MORTISE CYLINDER 1E74 (VERIFY CAM) 626 BES
1 EA ELECTRIC LOCK RX-8859ELEC 2-1/4" BS FSE 626 ACC
1 EA CYLINDER GUARD K-24 626 KEE
1 EA SURFACE CLOSER 4041 DEL EDA 689 LCN
1 EA MOUNTING PLATE 4040-18PA 689 LCN
1 EA SECURITY FLOOR STOP FS18S BLK IVE
1 EA MEMO DOOR POSITION SWITCH BY SECURITY SECTION
OPERATION: EXIT ONLY - MONITOR

<table>
<thead>
<tr>
<th>HW SET: 16E.4</th>
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<tr>
<td><strong>EACH TO HAVE:</strong></td>
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<tr>
<td>1 EA CONTINUOUS HINGE</td>
<td>224HD TW8 628 IVE</td>
</tr>
<tr>
<td>1 SET WORKING TRIM SET</td>
<td>09-449 17A WORKING TRIM FOR ACC 8859 626 SCH</td>
</tr>
<tr>
<td>1 EA MORTISE CYLINDER</td>
<td>1E74 (VERIFY CAM) 626 BES</td>
</tr>
<tr>
<td>1 EA ELECTRIC LOCK</td>
<td>RX-8859ELEC 2-1/4&quot; BS FSE 626 ACC</td>
</tr>
<tr>
<td>1 EA CYLINDER GUARD</td>
<td>K-24 626 KEE</td>
</tr>
<tr>
<td>1 EA SURFACE CLOSER</td>
<td>4041 DEL EDA 689 LCN</td>
</tr>
<tr>
<td>1 EA MOUNTING PLATE</td>
<td>4040-18PA 689 LCN</td>
</tr>
<tr>
<td>1 EA SECURITY FLOOR STOP</td>
<td>FS18S BLK IVE</td>
</tr>
<tr>
<td>1 EA POWER SUPPLY</td>
<td>PS902 SCE</td>
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<tr>
<td>1 EA MEMO</td>
<td>CARD READER BY ACCESS CONTROL SECTION</td>
</tr>
<tr>
<td>1 EA MEMO</td>
<td>DOOR POSITION SWITCH BY SECURITY SECTION</td>
</tr>
<tr>
<td>1 EA MEMO</td>
<td>POWER SUPPLY BY SECURITY</td>
</tr>
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OPERATION: DOOR NORMALLY CLOSED AND LOCKED. ALWAYS FREE EGRESS FROM THE INSIDE. OPENABLE BY CARD ACCESS FROM THE OUTSIDE.

<table>
<thead>
<tr>
<th>HW SET: 18</th>
<th>DOOR NUMBER: D-103A D-105B D-114A</th>
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</thead>
<tbody>
<tr>
<td><strong>EACH TO HAVE:</strong></td>
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<td>2 EA CONTINUOUS HINGE</td>
<td>224HD 628 IVE</td>
</tr>
<tr>
<td>1 SET CONST LATCHING BOLT</td>
<td>FB61P 630 IVE</td>
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<tr>
<td>1 EA DUST PROOF STRIKE</td>
<td>DP1/DP2 IVE</td>
</tr>
<tr>
<td>1 EA STOREROOM LOCK</td>
<td>8859 2-1/4&quot; BS 626 ACC</td>
</tr>
<tr>
<td>1 SET WORKING TRIM SET</td>
<td>09-449 17A WORKING TRIM FOR ACC 8859 626 SCH</td>
</tr>
<tr>
<td>1 EA MORTISE CYLINDER</td>
<td>1E74 (VERIFY CAM) 626 BES</td>
</tr>
<tr>
<td>1 EA CYLINDER GUARD</td>
<td>K-24 626 KEE</td>
</tr>
<tr>
<td>2 EA OVERHEAD STOP</td>
<td>450S 630 GLY</td>
</tr>
<tr>
<td>2 EA KICK PLATE</td>
<td>8400 10&quot; X 1&quot; LDW 630 IVE</td>
</tr>
<tr>
<td>Item</td>
<td>Description</td>
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<tr>
<td>------</td>
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<tr>
<td>1.</td>
<td>邮袋</td>
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<tr>
<td>1.</td>
<td>隐私</td>
</tr>
<tr>
<td>1.</td>
<td>工作装饰套件</td>
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<td>1.</td>
<td>表面闭锁器</td>
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<tr>
<td>1.</td>
<td>安装板</td>
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<tr>
<td>1.</td>
<td>安全地板止动器</td>
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<td>1.</td>
<td>邮袋</td>
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<tr>
<td>1.</td>
<td>邮袋</td>
</tr>
<tr>
<td>1.</td>
<td>表面闭锁器</td>
</tr>
</tbody>
</table>

**操作：** 门正常关闭并锁定。从内部始终可以自由离开。从外部通过卡访问可开启。隐私按钮由内部占用者按下时关闭。隐私按钮通过RX开关在内部关闭。
LEVER ACTIVATED. PROVIDE SIGNAGE @ PRIVACY BUTTON TO INSTRUCT PRIVACY USAGE.

HW SET: 20
DOOR NUMBER:
D-106A    D-203A

EACH TO HAVE:
1 EA CONTINUOUS HINGE  224HD    628  IVE
1 EA STOREROOM LOCK   8859 2-1/4" BS    626  ACC
1 SET WORKING TRIM SET 09-449 17A WORKING TRIM FOR ACC 8859    626  SCH
1 EA MORTISE CYLINDER  1E74 (VERIFY CAM)    626  BES
1 EA CYLINDER GUARD K-24    626  KEE
1 EA KICK PLATE  8400 10" X 2" LDW    630  IVE
1 EA SECURITY FLOOR STOP FS18S    BLK  IVE
1 EA MEMO  SEALS BY ALUM FRAME  MFGR

HW SET: 21E
DOOR NUMBER:
D-108B

EACH TO HAVE:
1 EA CONTINUOUS HINGE  224HD   TW8    628  IVE
1 SET WORKING TRIM SET 09-449 17A WORKING TRIM FOR ACC 8859    626  SCH
1 EA MORTISE CYLINDER  1E74 (VERIFY CAM)    626  BES
1 EA ELECTRIC LOCK RX-8859ELEC 2-1/4" BS FSE    626  ACC
1 EA CYLINDER GUARD K-24    626  KEE
1 EA SURFACE CLOSER  4041 DEL    689  LCN
1 EA MOUNTING PLATE  4040-18    689  LCN
1 EA SECURITY FLOOR STOP FS18S    BLK  IVE
1 EA FINGER GUARD MK1A X DOOR HEIGHT (PUSH SIDE)    AL  FIN
1 EA MEMO  CARD READER BY ACCESS CONTROL SECTION
1 EA MEMO  SEALS BY ALUM FRAME  MFGR

OPERATION: DOOR NORMALLY CLOSED AND LOCKED. ALWAYS FREE EGRESS FROM THE INSIDE. OPENABLE BY CARD ACCESS FROM THE OUTSIDE.

HW SET: 22E
DOOR NUMBER:
D-102A    D-109A    D-110A    D-118A    D-135A    D-209A
D-210A    D-212A

EACH TO HAVE:
1 EA CONTINUOUS HINGE  224HD   TW8    628  IVE
1 SET WORKING TRIM SET 09-449 17A WORKING TRIM FOR ACC 8859    626  SCH
1 EA MORTISE CYLINDER  1E74 (VERIFY CAM)    626  BES
1 EA ELECTRIC LOCK RX-8859ELEC 2-1/4" BS FSE    626  ACC
OPERATION: DOOR NORMALLY CLOSED AND LOCKED. ALWAYS FREE EGRESS FROM THE INSIDE. OPENABLE BY CARD ACCESS FROM THE OUTSIDE.

HW SET: 23
DOOR NUMBER:
D-112B

EACH TO HAVE:

1 EA CONTINUOUS HINGE 224HD 628 IVE
1 EA FIRE EXIT HARDWARE 98EO-F 626 VON
1 EA RIM CYLINDER 1E72 626 BES
1 EA CYLINDER GUARD K-24 626 KEE
1 EA KICK PLATE 8400 10" X 2" LDW 630 IVE
1 EA SECURITY FLOOR STOP FS18S BLK IVE
1 EA MEMO DOOR POSITION SWITCH BY SECURITY SECTION
1 EA MEMO SEALS BY ALUM FRAME MFGR

OPERATION: EXIT ONLY - MONITOR

HW SET: 23E
DOOR NUMBER:
D-112A

EACH TO HAVE:

1 EA CONTINUOUS HINGE 224HD TW8 628 IVE
1 EA FIRE EXIT HARDWARE RX-98L-F E996L - 17 626 VON
1 EA RIM CYLINDER 1E72 626 BES
1 EA CYLINDER GUARD K-24 626 KEE
1 EA SURFACE CLOSER 4040XP EDA 689 LCN
1 EA KICK PLATE 8400 10" X 2" LDW 630 IVE
2 EA WALL STOP WS401 / WS402 ANCHOR REQUIRED 630 IVE
1 EA MEMO CARD READER BY ACCESS CONTROL SECTION
1 EA MEMO POWER SUPPLY BY SECURITY
OPERATION: DOOR NORMALLY CLOSED AND LOCKED. ALWAYS FREE EGRESS FROM THE INSIDE. OPENABLE BY CARD ACCESS FROM THE OUTSIDE.

HW SET: 24E
DOOR NUMBER:
D-113A

EACH TO HAVE:
1 EA CONTINUOUS HINGE 224HD TW8 628 IVE
1 SET WORKING TRIM SET 09-449 17A WORKING TRIM FOR ACC 8859 626 SCH
1 EA MORTISE CYLINDER 1E74 (VERIFY CAM) 626 BES
1 EA ELECTRIC LOCK RX-8859ELEC 2-1/4" BS FSE 626 ACC
1 EA CYLINDER GUARD K-24 626 KEE
1 EA SURFACE CLOSER 4041 DEL SCUSH 689 LCN
1 EA MOUNTING PLATE 4040-18PA 689 LCN
1 EA MEMO CARD READER BY ACCESS CONTROL SECTION
1 EA MEMO POWER SUPPLY BY SECURITY
1 EA MEMO SEALS BY ALUM FRAME MFGR

OPERATION: DOOR NORMALLY CLOSED AND LOCKED. ALWAYS FREE EGRESS FROM THE INSIDE. OPENABLE BY CARD ACCESS FROM THE OUTSIDE.

HW SET: 25
DOOR NUMBER:
D-115A  D-120A

EACH TO HAVE:
1 EA CONTINUOUS HINGE 224HD 628 IVE
1 EA PRIVACY 8839 2-1/4" BS 626 ACC
1 WORKING TRIM SET 09-447 17A WORKING TRIM FOR ACC 8839 W/ADA TT 626 SCH
1 EA MORTISE CYLINDER 1E74 (VERIFY CAM) 626 BES
1 EA CYLINDER GUARD K-24 626 KEE
1 EA SURFACE CLOSER 4041 DEL 689 LCN
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<thead>
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<th>Model/Type</th>
<th>Brand</th>
<th>Notes</th>
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<tr>
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<td>8400 10&quot; X 2&quot; LDW</td>
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<td>1</td>
<td>SECURITY FLOOR STOP</td>
<td>FS18S</td>
<td>BLK</td>
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<tr>
<td>1</td>
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HW SET: 26

DOOR NUMBER:
D-116A       D-119A

EACH TO HAVE:

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<td>MORTISE CYLINDER</td>
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<td>1</td>
<td>ELECTRIC LOCK</td>
<td>RX-8859ELEC 2-1/4&quot; BS FSE</td>
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<td>ACC</td>
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<tr>
<td>1</td>
<td>CYLINDER GUARD</td>
<td>K-24</td>
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<td>KEE</td>
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<td>KICK PLATE</td>
<td>8400 10&quot; X 2&quot; LDW</td>
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<td>SECURITY FLOOR STOP</td>
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<td>BLK</td>
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<tr>
<td>1</td>
<td>MEMO POWER SUPPLY BY SECURITY</td>
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<tr>
<td>1</td>
<td>MEMO SEALS BY ALUM FRAME MFGR</td>
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<tr>
<td>1</td>
<td>MEMO SIGNAGE BY OTHERS</td>
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OPERATION: DOOR NORMALLY CLOSED AND LOCKED. ALWAYS FREE EGRESS FROM THE INSIDE. OPENABLE BY CARD ACCESS FROM THE OUTSIDE.

HW SET: 28E

DOOR NUMBER:
D-122A       D-122D

EACH TO HAVE:

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<th>Model/Type</th>
<th>Brand</th>
<th>Notes</th>
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<td>2</td>
<td>CONTINUOUS HINGE</td>
<td>224HD EPT</td>
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<td>IVE</td>
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<tr>
<td>2</td>
<td>MULLION STABILIZER</td>
<td>154</td>
<td></td>
<td>VON</td>
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<tr>
<td>1</td>
<td>MULLION</td>
<td>KR1654</td>
<td></td>
<td>VON</td>
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</table>
1 EA MULLION STORAGE KIT MT54 689 VON
1 EA PANIC HARDWARE RX-EL35A-EO 1606 626 VON
1 EA PANIC HARDWARE RX-EL35A-NL-OP 626 VON
1 EA RIM CYLINDER 1E72 626 BES
1 EA MORTISE CYLINDER 1E74 (VERIFY CAM) 626 BES
2 EA CYLINDER GUARD K-24 626 KEE
2 EA OFFSET DOOR PULL 8190-0-O 630 IVE
2 EA SURFACE CLOSER 4040XP EDA 689 LCN
2 EA KICK PLATE 8400 10" X 1" LDW 630 IVE
2 EA SECURITY FLOOR STOP FS18S BLK IVE
1 EA THRESHOLD 513 1/4"-20 COMBO ANCHOR OR AS DETAILED AL NGP
1 EA POWER SUPPLY PS914-2RS GRY VON
1 EA MEMO CARD READER BY ACCESS CONTROL SECTION
1 EA MEMO SEALS BY ALUM FRAME MFGR

OPERATION: DOOR NORMALLY CLOSED AND LOCKED. ALWAYS FREE EGRESS FROM THE INSIDE. OPENABLE BY CARD ACCESS FROM THE OUTSIDE.

HW SET: 28E.1
DOOR NUMBER:
D-122B D-122C

EACH TO HAVE:
2 EA POWER TRANSFER EPT-10 689 VON
2 EA CONTINUOUS HINGE 224HD EPT 628 IVE
2 EA MULLION STABILIZER 154 689 VON
1 EA MULLION KR1654 689 VON
1 EA MULLION STORAGE KIT MT54 689 VON
1 EA PANIC HARDWARE RX-EL35A-EO 1606 626 VON
1 EA PANIC HARDWARE RX-EL35A-NL-OP 626 VON
1 EA RIM CYLINDER 1E72 626 BES
1 EA MORTISE CYLINDER 1E74 (VERIFY CAM) 626 BES
2 EA CYLINDER GUARD K-24 626 KEE
2 EA OFFSET DOOR PULL 8190-0-O 630 IVE
2 EA SURFACE CLOSER 4040XP EDA 689 LCN
2 EA KICK PLATE 8400 10" X 1" LDW 630 IVE
2 EA SECURITY FLOOR STOP FS18S BLK IVE
1 EA THRESHOLD 513 1/4"-20 COMBO ANCHOR OR AS DETAILED AL NGP
1 EA POWER SUPPLY PS914-2RS GRY VON
1 EA MEMO CARD READER BY ACCESS CONTROL SECTION
2 EA MEMO DOOR POSITION SWITCH BY SECURITY SECTION
1 EA MEMO SEALS BY ALUM FRAME MFGR

OPERATION: DOOR NORMALLY CLOSED AND LOCKED. ALWAYS FREE EGRESS FROM THE INSIDE. OPENABLE BY CARD ACCESS FROM THE OUTSIDE.
HW SET: 29E
DOOR NUMBER:
D-123A

EACH TO HAVE:
1 EA CONTINUOUS HINGE 224HD TW8 628 IVE
1 SET WORKING TRIM SET 09-449 17A WORKING TRIM FOR ACC 8859 626 SCH
1 EA MORTISE CYLINDER 1E74 (VERIFY CAM) 626 BES
1 EA ELECTRIC LOCK RX-8859ELEC 2-1/4" BS FSE 626 ACC
1 EA CYLINDER GUARD K-24 626 KEE
1 EA SURFACE CLOSER 4041 DEL 689 LCN
1 EA KICK PLATE 8400 10" X 2" LDW 630 IVE
1 EA POWER SUPPLY PS902 SCE
1 EA MEMO CARD READER BY ACCESS CONTROL SECTION
1 EA MEMO SEALS BY ALUM FRAME MFGR

OPERATION: DOOR NORMALLY CLOSED AND LOCKED. ALWAYS FREE EGRESS FROM THE INSIDE. OPENABLE BY CARD ACCESS FROM THE OUTSIDE.

---

HW SET: 29E.1
DOOR NUMBER:
D-124A

EACH TO HAVE:
1 EA CONTINUOUS HINGE 224HD TW8 628 IVE
1 SET WORKING TRIM SET 09-449 17A WORKING TRIM FOR ACC 8859 626 SCH
1 EA MORTISE CYLINDER 1E74 (VERIFY CAM) 626 BES
1 EA ELECTRIC LOCK RX-8859ELEC 2-1/4" BS FSE 626 ACC
1 EA CYLINDER GUARD K-24 626 KEE
1 EA SURFACE CLOSER 4041 DEL 689 LCN
1 EA KICK PLATE 8400 10" X 2" LDW 630 IVE
1 EA POWER SUPPLY PS902 SCE
1 EA MEMO CARD READER BY ACCESS CONTROL SECTION
1 EA MEMO SEALS BY ALUM FRAME MFGR

OPERATION: DOOR NORMALLY CLOSED AND LOCKED. ALWAYS FREE EGRESS FROM THE INSIDE. OPENABLE BY CARD ACCESS FROM THE OUTSIDE.

---

HW SET: 30
DOOR NUMBER:
D-125A D-126A

EACH TO HAVE:
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<td>PRIVACY</td>
<td>8839 2-1/4&quot; BS</td>
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<td>WORKING TRIM SET</td>
<td>09-447 17A WORKING TRIM FOR ACC8839 W/ADA TT</td>
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<td>1 EA</td>
<td>CYLINDER GUARD</td>
<td>K-24</td>
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<td>1 EA</td>
<td>SURFACE CLOSER</td>
<td>4041 DEL</td>
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<tr>
<td>1 EA</td>
<td>KICK PLATE</td>
<td>8400 10&quot; X 2&quot; LDW</td>
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<tr>
<td>1 EA</td>
<td>DOME STOP</td>
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<tr>
<td>1 EA</td>
<td>MEMO</td>
<td>SEALS BY ALUM FRAME MFGR</td>
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**HW SET: 32**
**DOOR NUMBER:**
D-215A  D-218A  D-221A

**EACH TO HAVE:**
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<td>09-449 17A WORKING TRIM FOR ACC 8845</td>
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<td>1E74 (VERIFY CAM)</td>
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<td>1 EA</td>
<td>CYLINDER GUARD</td>
<td>K-24</td>
</tr>
<tr>
<td>1 EA</td>
<td>DOME STOP</td>
<td>FS436/FS438 AS REQUIRED</td>
</tr>
<tr>
<td>1 EA</td>
<td>MEMO</td>
<td>SEALS BY ALUM FRAME MFGR</td>
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**HW SET: 32A**
**DOOR NUMBER:**
D-117A  D-128A

**EACH TO HAVE:**
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<tr>
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<td>1 EA</td>
<td>STOREROOM LOCK</td>
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<td>MORTISE CYLINDER</td>
<td>1E74 (VERIFY CAM)</td>
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<tr>
<td>1 EA</td>
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**HW SET: 33E**
**DOOR NUMBER:**
D-129A  D-201A  D-206A

**EACH TO HAVE:**
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OPERATION: DOOR NORMALLY CLOSED AND LOCKED. ALWAYS FREE EGRESS FROM THE INSIDE. OPENABLE BY CARD ACCESS FROM THE OUTSIDE.

**HW SET: 34**

**DOOR NUMBER:**

D-131A

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**DOOR NUMBER:**

D-130A  D-130C  D-204A  D-216A

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OPERATION: DOOR NORMALLY CLOSED AND LOCKED. ALWAYS FREE EGRESS FROM THE INSIDE. OPENABLE BY CARD ACCESS FROM THE OUTSIDE.

**HW SET: 36**

**DOOR NUMBER:**
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**HW SET: 43**

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D-205B

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OPERATION: DOOR NORMALLY CLOSED AND LOCKED. ALWAYS FREE EGRESS FROM THE INSIDE. OPENABLE BY CARD ACCESS FROM THE OUTSIDE.

HW SET: 49
DOOR NUMBER:
D-101F   D-201E

EACH TO HAVE:
1       ALL HARDWARE BY DOOR MANUFACTURER

END OF SECTION
PART 1 GENERAL

Provisions of the General and Supplementary Conditions and Division 01 apply to this section.

1.1 SUMMARY
A. Section includes requirements for motor operated window hardware.

1.2 DEFINITIONS
A. Motor operator: The mechanical device that opens and closes the operable vent.
B. Actuator: The electric product(s) that motorizes (i.e., opens and closes) the window by means of an electric motor and a motor operator—typically a double-link chain or spindle.
C. Controller: The electronic device that controls one or more actuators as directed by a manual or digital signal from a Direct Digital Controller.
D. Direct Digital Controller: The control system (e.g., smoke evacuation system, building automation system, HVAC system or lighting system) that issues control signals to the Controllers, which control the position of the motorized windows.
E. Window Groups: All vents in a “window group” shall move together.

1.3 SYSTEM DESCRIPTION
A. Design Requirements: Provide low voltage motorized actuator(s) for each window in each window group. Each window group shall be controlled by signals from a Direct Digital Controller and/or a typical wall switch.

1. Actuator: Single or coupled units as necessary for each window, sized to open and close sash with insulating glazing in the size and configuration indicated on building elevations and details. Provide electronic or mechanical limit switches to govern operator movement. Provide electric current overload protection.

2. Controller: Controls actuators within each independently controlled window group. The controller receives signals from the building DDC system, causing the controller to direct the actuators to open or close the windows. The controllers may also receive signals from a typical momentary contact wall switch as a secondary means of control (for testing and window cleaning purposes). Locate switch at standard switch mounting height at location adjacent to group being controlled.

3. DDC System: Provides signals to the controller of each window group. The signal will be in response to automated input from building sensor(s) or timing devices programmed for night flush, fresh air supply or other purpose for each window group and shall cause the required operation of the windows.

4. Coordinate actuator and controllers with characteristics of building electrical system. Conceal from view the electrical wiring for actuators to the extent practicable. Wiring shall meet requirements of the National Electric Code.
B. Performance Requirements: Low-voltage motor operator designed for durable operation with windows in size, configuration and function required and complying with the following criteria.

1. Wind Loads: Comply with criteria in the General Structural Notes on S101 for building elevations and configuration required.

2. Power source: 24 Volt low voltage power supplies that connect to standard building power (110 Vac, 60 Hz) in coordination with requirements of Division 16 Sections.


4. Provide mounting hardware for installation of motor units as required, including pivoting brackets and sash connectors.

1.4 SUBMITTALS

A. Product Data: Submit as required for each product to be incorporated into the Work, include information on electrical characteristics.

B. Shop Drawings:
   1. Coordination Drawings: Mounting provisions for actuators, including reinforcing and necessary alterations to aluminum windows, operable sash and screens and as required.
   2. Wiring Diagrams: Provide wiring cut sheets for components of motorized window system, including provisions for each window group. Coordinate with Division 23 requirements for controls, and Division 26 for power.
   3. Templates: Furnish to Section 08 44 13 as necessary for coordinated preparation of windows and sash to receive power operators.

C. Maintenance Tools and Instructions: A set of specialized tools (if required) and instructions for routine maintenance of actuators and controllers. Provide a schedule for routine maintenance actions and a complete listing of parts and components as necessary for maintenance and ordering replacement parts.

1.5 QUALITY ASSURANCE

A. Installer Qualifications: Approved by the manufacturer of the window operating hardware and having two years successful experience with motorized window actuators.

B. Pre-Installation Conference: Coordinate work of this Section with work of Section 08 44 13 and related work of Mechanical and Electrical Sections.

1.6 WARRANTY

A. Actuators and Controllers: two year manufacturer’s limited warranty providing for repair or replacement of defective components.
PART 2 PRODUCTS

2.1 MANUFACTURED UNITS

A. Power Window Operators: Subject to compliance with System Description and other contract requirements. Basis of design is identified below.
   2. Actuator: Quasar & Synchro-Quasar (for extra wide vents), and/or other models as necessary and appropriate for the application.

B. Reinforce and modify aluminum window components as necessary for application of actuators and mounting hardware. Coordinate with window contractor and manufacturer representative.

PART 3 EXECUTION

3.1 INSTALLATION

A. Mounting: Provide as required and in compliance with operator manufacturer's recommendations (in size, configuration and function required) for mounting on windows.

B. Install work level, plumb, and true to line and location, comply with the manufacturer's instructions and recommendations. Prevent conflicts between mounting heights for the various components.

C. Work of the Contract includes thorough coordination of power requirements for operators and integration with building control systems. Provide all components, wiring and accessories necessary to power and control the motorized windows in the required sequence. Ensure that work of power and control wiring is provided to comply with Division 16 requirements and the System Description included in this Section.

D. Adjust and reinforce window frame as necessary for installation and operation, provide backing for surface mounted hardware; cut and fit as required for installation of hardware, and remove hardware prior to application of final finish; reinstall hardware once finishing is complete.

E. Provide final connection of controllers and power supplies to building power supply. Provide final field connection between actuators and controllers for each window group.

F. Coordinate final connection of controllers to receive DDC signal(s) as required.

3.2 ADJUST AND CLEAN

A. Adjust and check each motorized window to ensure proper operation of every unit. Replace units which cannot be adjusted to operate freely and smoothly as intended.

B. Demonstrate proper function of units integrated into building automation system.

C. Final Adjustment: Inspect and adjust hardware one week prior to scheduled inspection for final acceptance, and instruct Owner's personnel in adjustment and maintenance of hardware.
1. Clean operating items as necessary to restore proper function and finish of hardware and windows. Thoroughly clean and lubricate window hardware at conclusion of the work.

END OF SECTION
SECTION 08800
GLAZING

PART 1 - GENERAL

1.01 SUMMARY

A. Provisions of the General and Supplementary Conditions and Division 01 apply to this section.

B. Section Includes:

1. Glass and glazing as indicated.

C. Related Sections:

1. Section 08210: Wood Doors.
2. Section 08411: Aluminum Entrances and Storefronts.
3. Section 084413: Glazed Aluminum Curtain Walls.
4. Section 08520: Aluminum Windows.
5. Section 08710: Door Hardware.

1.02 SUBMITTALS

A. Product Data: Submit manufacturer's descriptive literature and installation recommendations for glass, glazing and accessories.

B. Material Samples: Submit 6-inch square units of each type of glass specified.

1.03 QUALITY ASSURANCE

A. Labeling: Label each piece of glass and glazing and mirrors with manufacturer's name, and the grade or quality of the material. Labels shall be intact before and after installation.

B. Comply with the following as a minimum requirement:

1. ASTM C 1036 - Standard Specification For Flat Glass.
2. ASTM C 1048 - Standard Specification For Heat-Treated Flat Glass.
3. ASTM E 774 - Standard Specification For Sealed Insulated Glass Units.

C. Qualifications of Installer: Minimum 10 years experience installing glass in projects of similar scope and complexity.
1.04 DELIVERY, STORAGE AND HANDLING

A. Deliver glass and glazing materials with manufacturer's labels intact.

B. Do not remove labels until glass has been installed and inspected by IOR.

C. Protect glass from staining, marking or damage.

D. Putty and glazing compound shall be delivered to the Project site in manufacturer's original unbroken containers labeled to identify contents.

1.05 PROJECT CONDITIONS

A. Perform glazing when ambient temperature is above 40 degrees F.

B. Perform glazing on clean, dry surfaces only.

1.06 WARRANTY

A. Warrant system to be watertight and free from distortion or harmonics for a period of 10 years. Warrant coatings and thermally or acoustically rated insulation units against deterioration in acoustic or thermal rating for a period of 20 years.

PART 2 - PRODUCTS

2.01 ACCEPTABLE MANUFACTURERS AND FABRICATORS

A. To maximum extent possible, provide domestically manufactured and fabricated glass, and provide glass from one manufacturer.

B. Types of glass specified or indicated shall be manufactured or fabricated by one of the following:
   1. Pilkington.
   2. PPG Architectural Glass.

2.02 GLASS MATERIALS

A. General: Conform to ASTM C 1036, ASTM C 1048 and to ANSI Z97.1. Label factory cut panes.

B. Float Glass: Type I, (transparent glass flat), Class 1 (clear), Quality q3, (glazing select), minimum 3/8 inch thickness unless otherwise indicated or required.

C. Tempered Glass: Condition A, Type I or II, Class 1, Quality q3, Kind FT, minimum 3/8 inch thickness unless otherwise indicated or required. Match color of clear or tinted glass as applicable; fully thermal tempered, heat strengthening or chemical tempering is not permitted. Perform tempering by horizontal oscillating roller hearth or high speed roller hearth process. Do not permit fabrication processes leaving gripper or tong marks. Handle and size glass according to manufacturer's written instructions.

D. Clear Laminated Glass: 2 layers of 1/8 inch clear float glass with 0.030 inch thick high strength polyvinyl butyral laminating sheet Saflex AC acoustical interlayer, or equal. Edges of laminated
glass shall be treated with Ardis 500, or equal, edge protection to prevent contact of laminating sheet with sealants.

E. Low Emissivity Glass (Low E Glass): Provide units with thin metallic high-transmittance coating applied to the number 3 surface of the unit, unless otherwise indicated. The U-value for the IGU shall be no greater than 0.34, unless otherwise indicated. Insulating glass units shall be one-inch thick with 1/2" airspace and two 1/4" lites. Solarban 60 with clear glass lites by PPG Performance Glazings, or approved equal.

F. Wire Glass: ¼" thick, Type II (patterned and wired glass, flat), Class 1 (translucent), Quality q8 (glazing), Form 1 (wired, polished both sides), mesh m2 (square). Wire glass for fire rated openings shall bear an identifying UL label or the label of a recognized testing agency, and shall be rated for fire resistance indicated.

G. Unframed Mirrors: Mirror-quality float glass, 1/4 inch thick, edges finished and polished, double silvered with electro-deposited copper coating plus an organic protective coating, equal to Palmer Products Mirro-Bac Paint. Include polished stainless steel edge channels at top and bottom edges, plus mirror adhesive bonding to wall.

H. Framed Mirrors: Fabricated of one-piece Type 304 stainless steel angle frame, 3/4 inch x 3/4 inch, with continuous integral stiffener on sides and beveled front to hold frame tightly against mirror. Corners shall be heliarc welded, ground and polished smooth. Exposed surfaces shall have stain finish with vertical grain. Mirror shall be fabricated of 1/4 inch mirror glazing quality float glass, free from tong marks. Edges shall be protected by plastic filler strips. Full-size, shock-absorbing, water-resisting, non-abrasive 1/8 inch thick polyethylene padding shall protect backs of mirrors. Mirrors shall be provided with 24 gage galvanized steel back with integral hanging brackets for mounting on concealed, rectangular wall hangers, and shall be secured with concealed Phillips head locking screws on bottom of frame.

2.03 GLASS SETTING MATERIALS

A. Setting Blocks: ASTM C 864, channel shape; having 1/4 inch internal depth, Shore A hardness of 80 to 90 Durometer. Blocks shall be a minimum 2 inch long. Block width shall be approximately 1/16 inch less than the full width of the rabbet. Block thickness shall be at least 3/16 inch, sized for rabbet depth as required.

B. Spacers: ASTM C 864, channel shape, with 1/4 inch internal depth, 3/32 inch flanges, web, 1/8 inch thick, one to 3 inches long. Spacers shall provide Shore A hardness of 40 to 50 Durometer.

C. Vinyl Glazing Channels: Profile compatible with framing system and designed to accommodate glass of specified thickness, light gray in color. Provide for dry glazing aluminum frames where indicated or permitted.

D. Glazing Tape: Poly-isobutylene based sealant tape, conforming to AAMA 804.1, with adhesive one side protected by temporary paper cover, Extru-Seal manufactured by Pecora Corp., No. 303 by Protective Treatments, Inc., or equal.

E. Spring Steel Spacers: Galvanized steel wire or strip designed to position glazing in channel or rabbet sash with stops.

F. Glazing Clips: Galvanized steel spring wire designed to hold glass in position in rabbet sash without stops.
G. Glazing Points (Sprigs): Pure zinc stock, thin, flat, triangular or diamond-shaped pieces, 1/4 inch minimum size.

H. Glazing Sealants for Metal Sash: GE Silicones Silglaze II 2800, GE Silicones Silpruf, GE Silicones 1200 Silicone, and Dow Corning 999A. Polybutylene, oleoresinous, asphalt, and oil base sealants are not permitted. Provide sealant of same color as structural silicone sealant unless otherwise required.

I. Glazing Compound for Wood Sash: Acrylic latex caulk by Tremco. Provide for bedding and caulking glass in wood frames.

J. Glazing Compounds and Sealants for Thermoplastic: Provide silicone, butyl, or polysulfide glazing compound.

K. Mirror Setting Materials: Manufactured by Palmer Products Corporation, or equal, for installation of mirrors, and as follows:

1. Mirror backing paint: Mirro-Bac Paint, or equal, formulated to protect mirror silvering.
2. Mirror bond coat: Mirro-Mastic Bond, or equal, formulated to isolate deleterious backing materials from mastic and mirror.
3. Mirror mastic: Mirro-Mastic, or equal, formulated for adhering mirrors and glass to substrates.

PART 3 - EXECUTION

3.01 TOLERANCES

A. Thickness indicated or specified are nominal within standard tolerances. Maximum size of vertical panes shall not exceed following:

<table>
<thead>
<tr>
<th>Glass Thickness Double Strength:</th>
<th>1/8 inch</th>
<th>3/16 inch</th>
<th>1/4 inch</th>
</tr>
</thead>
<tbody>
<tr>
<td>Maximum Areas in Square Feet:</td>
<td>12</td>
<td>16</td>
<td>20</td>
</tr>
</tbody>
</table>

3.02 INSTALLATION, GENERAL

A. Glazed cabinet doors, windows, transoms, and fixtures, not otherwise noted or indicated, shall be glazed with clear float glass. Room or entrance doors shall be glazed with clear wire glass.

B. Obscure glass in exterior openings shall be installed with smooth side of glass to weather. Patterned glass shall be installed with pattern running vertically, unless otherwise indicated.

C. Glazing tapes or sealants shall be installed wherever glass contacts wood or metal surfaces. Width of strips shall be as required.

D. Glazing compound shall be neatly and cleanly installed in straight lines, even with inside edge of sash members. Thumb puttying is not permitted.

E. Display Cases and Sliding Glass Doors in Casework: Glass in display cases shall be 1/4 inch thick clear wire glass or float glass as indicated. Edges of glass shall be rounded and polished.

F. Serving windows in cafeterias with speak holes shall be tempered glass.
G. Glazing Aluminum Sash: Glazing material in aluminum sash shall be installed in compound and secured in place with aluminum glazing beads. In addition, horizontal beads shall be installed with 6 inch x one inch, type A, self-tapping, stainless steel, Phillips-head screws, installed into pre-drilled, counter-sunk holes and spaced 2 inches from each end and 9 inches on centers.

H. Speak holes shall be installed according to glass manufacturer's written recommendations.

3.03 INSTALLATION OF GLASS

A. Conform to requirements of GANA Glazing Manual.

B. Provide edge blocking to comply with requirements of referenced glazing standard, except where otherwise required by glass unit manufacturer.

C. Provide compressible filler rods or equivalent back-up material to prevent sealant from extruding into glass channel weep systems, from adhering to back surface of joints and to control depth of sealant for optimum performance.

D. Force sealants into glazing channels, in manner to eliminate voids and to ensure complete bond of sealant to glass and channel surfaces.

E. Tool exposed surfaces of sealants to provide for drainage away from glass. Install pressurized tapes and gaskets to protrude slightly out of channel to eliminate dirt and moisture pockets.

F. Where dry glazing of aluminum frame is indicated or permitted, provide vinyl glazing channels installed in accordance with frame manufacturers written recommendations. Do not stretch channels. Miter corners.

G. For tape glazing, furnish tape of thickness to provide approximately 30 percent compression. Cut tape to proper length and install to permanent stops, the entire length of the head and sill first, then to jambs. Butt tape together with no overlap and remove paper backing. Install glass on setting blocks at quarter points and maintain uniform glass edge clearance around entire perimeter of glass. Maintain manufacturer's recommended edge clearance and bite on glass. Install glass firmly into tape with a slight lateral movement to assure proper adhesion. Install tape to removable stop with evenly distributed firmness, smoothing out wrinkles in tape. Secure removable stop in proper position so tape makes contact with glass as stop is installed, forcing contact with glass and completely sealing joint. Remove excess tape from both sides at slight angle over sight line. Do not undercut.

H. Glass in Wood Frames: Install glass with glazing points and setting blocks as required. Seal glass with glazing compound and secure with wood stops. Install stops with fine finishing nails, and set for putty stopping.

I. Patterned Glass: Install glass with one patterned smooth surface on the weather side.

J. Wire Glass: Install glass for fire doors in accordance with installation requirements of NFPA 80.

K. Laminated Glass: Sashes, which are to receive laminated glass, shall be weeped to the outside to permit water in the channel to drain from the frame.

L. Unframed Mirrors: Walls shall be clean, dry, plumb, rigid and smooth. Install mirror backing paint to back of mirror and to edges. Install mirror bond coat over painted backing, wood backing, concrete and masonry to receive mirrors. Bond coat is not required over vitreous surfaces. Install sufficient mirror adhesive to provide 100 percent coverage when mirror is
installed. Install mirror into place, providing 3/16 inch clearance between mirror and substrate. Support mirrors with temporary edge channels to allow mastic set-up, and where indicated or required, provide permanent top and bottom edge channels.

M. Framed Mirrors: Walls shall be clean, dry, plumb, rigid and smooth. Install mirrors with concealed mounting devices, and secure with concealed screws on bottom of mirror. Conform to manufacturers written recommendations.

3.04 PROTECTION AND CLEANING

A. Protect exterior glass from breakage by furnishing crossed streamers attached to framing and away from glass surface. Do not directly install markers to glass surfaces. Remove non-permanent labels and clean surfaces.

B. Protect glass from contact with contaminating substances resulting from construction operations. If, despite such protection, contaminating substances do come into contact with glass, remove immediately by method recommended by glass manufacturer.

C. Examine glass surfaces adjacent to or below exterior concrete and other masonry surfaces at frequent intervals during construction, but not less often than once a month, for build-up of dirt, scum, alkali deposits or staining. When examination reveals presence of these forms of residue, remove by method recommended by glass manufacturer.

D. Remove and replace glass, which is broken, chipped, cracked, abraded, or damaged during construction.

E. Remove protective covering from thermoplastic not more than 4 days before Substantial Completion, and immediately before cleaning. Methods of final cleaning and finishing shall be as prescribed by thermoplastic glazing publications referenced above.

F. Wash glass on both faces not more than 4 days before Substantial Completion. Wash glass by method recommended by glass manufacturer. Do not furnish harsh cleaning agents, caustics, abrasives, or acids for cleaning. Polish glass both sides and leave free of soil, streaks, and labels.

3.05 CLEAN UP

A. Remove rubbish, debris and waste materials and legally dispose of off the Project site.

3.06 PROTECTION

A. Protect the Work of this section until Substantial Completion.

END OF SECTION
SECTION 09100
METAL SUPPORT ASSEMBLIES

PART 1 - GENERAL

1.01 SUMMARY

A. Provisions of the General and Supplementary Conditions and Division 01 apply to this section.

B. Section Includes:

1. Metal support systems as indicated and described.

C. Related Sections:

2. Section 09250: Gypsum Board.

1.02 SYSTEM DESCRIPTION

A. Regulatory Requirements: Comply with CBC requirements.

B. Design Requirements:

1. Metal Studs: Studs for interior partitions shall be roll-formed channel or c-shapes, at least 18 gage at typical partitions and 16 gage at partitions with ceramic tile finishes.

2. Track: Stud track for floor and ceiling anchorage shall be channel configuration, sized to fit studs. Galvanized steel as manufactured for installation with specified metal studs.

3. Design: Design shall be based on minimum 5 pounds per square foot load applied perpendicular to the walls. Deflection shall not exceed 1/240 under the design load.

1.03 SUBMITTALS

A. Shop Drawings: Submit plans, elevations and details indicating extent of Work and connection details.

B. Product Data: Submit manufacturer's catalog data for each item proposed for installation.

C. Certificates: Furnish manufacturer's certification that materials meet or exceed Specification requirements.

1.04 QUALITY ASSURANCE

A. Coordinate with related Work to provide blocking for items mounted on finished surfaces and to provide allowances for pipes and other items inside partitions and walls.
B. Comply with the following as a minimum requirement:

1. ANSI A 42.3 Lathing and Furring for Portland Cement Based Plaster, Exterior and Interior.


3. American Welding Society (AWS): Structural Welding Code (D1.1); Specification for Welding Sheet Steel in Structures (D1.3).

4. ASTM Standards:
   a. ASTM A 653 - Steel Sheet, Zinc-Coated (Galvanized) by the Hot-Dip Process.
   b. ASTM A 570 - Hot-Rolled Carbon Steel Sheet and Strip, Structural Quality.
   c. ASTM A 611 - Steel, Cold-Rolled Sheet Carbon, Structural Quality.
   d. ASTM A 641 - Zinc Coated (Galvanized) Carbon Steel Wire.
   e. ASTM C 841 - Installation of Interior Lathing and Furring.
   f. ASTM C 847 - Metal Lath.
   g. ASTM C 933 - Welded Wire Lath.
   h. ASTM C 955 - Load Bearing (Transverse and Axial) Steel Studs, Runners (Tracks), and Bracing or Bridging, for Screw Application of Gypsum Board and Metal Plaster Bases.
   i. ASTM C 1002 - Steel Drill Screws for the Application of Gypsum Board.
   j. ASTM C 1047 - Accessories for Gypsum Wallboard and Gypsum Veneer Base
   k. ASTM C 1063 - Installation of Lathing and Furring For Portland Cement Based Plaster.

C. Tolerances: Install walls and partitions on straight lines, plumb, free of twists or other defects, and contacting a 10 foot straightedge for its entire length at any location within a 1/8 inch tolerance. Install horizontal framing level within a tolerance of 1/8 inch in 12 feet in any direction.

1.05 DELIVERY, STORAGE AND HANDLING

A. Provide all means necessary to protect metal framing, furring and lathing materials before, during and after installation. If damaged, immediately provide required repairs and replacements.
PART 2 - PRODUCTS

2.01 MATERIALS

A. Wall Framing and Furring for Gypsum Wallboard:

1. Load bearing: Studs for load-bearing walls shall conform to ASTM C 955. Studs shall be C-shaped, roll-formed steel fabricated from minimum 18 gage, and G60 hot-dip galvanized coated sheet. Stud sizes shall be as indicated. Floor and ceiling runner tracks shall conform to ASTM C 955. Tracks shall be prefabricated, U-shaped with minimum 3/4 inch flanges, unpunched web, fabricated from G60 hot-dip galvanized coated sheet. Bridging in load bearing walls shall conform to ASTM C 955. Bridging shall be minimum 3/4 inch wide x 7/16 inch deep cold-rolled steel channel with weld attachment clips at each stud location or V-bar type weld or screw attached to each stud flange. Bridging shall provide lateral support for the stud.

2. Non-load bearing: Studs for non-load bearing walls shall conform to ASTM C 645. Studs shall be C-shaped, roll-formed steel with minimum uncoated design thickness of 20 gage, fabricated from G40 hot-dip galvanized coated sheet. Floor and ceiling runner tracks shall conform to ASTM C 645. Tracks shall be U-shaped, unpunched web, thickness to match studs, fabricated from G40 hot-dip galvanized coated sheet.

B. Stud gages indicated on Drawings or specified are minimum. Where required stud height exceeds code requirements or manufacturer's recommendations, provide heavier gage studs and/or decrease stud spacing as necessary to conform to code requirements.

C. Suspended and Furred Ceiling Systems and Wall Furring: Suspended ceiling framing system shall have the capability to support the finished ceiling, light fixtures, air diffusers, and accessories, as required. The suspension system shall provide a maximum deflection of L/240. Carrying channels shall be fabricated from minimum 0.0548 inch thick cold-rolled steel, 1-1/2 inch wide x 7/16 inch deep. Carrying channels for supports under ducts shall be 2 inches in size as specified. Carrying channels shall be fabricated from hot-dip galvanized coated sheet.

1. Plaster Ceilings: Cross furring members shall conform to ASTM C 645, and shall be fabricated from cold-rolled steel, 3/4 inch wide x 7/16 inch deep. Furring members shall be fabricated from hot-dip galvanized coated sheet.

2. Gypsum Wallboard Ceilings: Furring members shall be fabricated from cold-rolled steel, 7/8 inch x 2-9/16 inches. Furring members shall be fabricated from hot-dip galvanized coated sheet.

D. Shaft Wall Framing Members: CH studs, 22 gage for 2-1/2 inch studs, 20 gage for 4 inch studs, conforming to ASTM 645, fabricated of steel conforming to ASTM A 653, Grade A, yield point 40 ksi, hot-dip galvanized.

E. Framing Accessories: Provide all standard related accessories including floor and ceiling tracks, clips, web stiffeners, anchors, and similar items, of the same manufacture as each type of stud specified, and as required for a complete installation.

1. Fire Rated Top Tracks: Approved assemblies bearing UL or ITS rating, required fire ratings and code requirements. Tracks shall be "Sliptrack," manufactured by Sliptrack
F. Splay Wires and Compression Struts: Approved manufacturers acceptable to manufacturer of ceiling grids, gages and types as required by building codes for ceiling types and weights specified.

G. Wires: Soft-annealed galvanized steel wire, 8 gage for hanger wires and 16 gage for framing unless otherwise specified.

H. Fasteners: Wafer-head screws, self-drilling type for 20 gage metal and heavier.

I. Fire Rated Acoustical Foam Tape: Compressible, closed cell polyvinyl chloride foam with pressure sensitive adhesive, in rolls with protective release liner on non-adhesive face, 6 pounds per cubic foot density, 1 inch wide x not less than 1/4 inch thick, self-extinguishing, UL 94 recognized, Norseal V740FR, manufactured by Norton Performance Plastics Corporation, or equal.

J. Acoustical Sealant: Permanently resilient type, non-hardening, manufactured by USG, Gold Bond, or equal.


L. Steel Backing Plates: Provide a minimum 4 inch wide by 16 gage steel, or sections of studs and stud track welded to web of studs, except as otherwise indicated. Apply shop coat of metal primer.

PART 3 - EXECUTION

3.01 EXAMINATION

A. Verify that overhead or concealed Work is completed, tested, inspected, and finished as required before starting Work of this section.

3.02 INSTALLATION

A. Walls and Partitions:

1. Fasten floor runners for exterior walls and interior partitions to concrete slab with required power driven fasteners. Spacing of fasteners not to exceed 24 inch on center. Fasten ceiling runners to structure.

2. Space studs not over 16 inch on center unless indicated otherwise. Studs shall be located approximately 2 inches from door frame jams, abutting partitions and partition corners, except those providing support for door and window openings.

3. Furnish and install manufacturer's standard floor track and shoes. Securely wire studs to shoes. Studs may be tack-welded to floor track instead of providing wired shoes. Fasten track to floor by means of 1/4 inch x 1-1/4 inch Star "Dryvin" hammer drive anchors or 3/16 inch x 1 inch round head, "Rawl-Drives" one-piece expansion bolts spaced not to exceed 3 feet, and installed in drilled holes in slab, or to wood joist with
nails as indicated. Track may be fastened to concrete floor slabs with 1/4 inch x 7/8 inch low-velocity, power-driven fasteners.

4. Studs shall be seated squarely in track with stud web and flanges abutting track web, plumbed and securely fastened with sheet metal screws, to flanges or web of both floor and top tracks. Provide 4 screws per stud.

5. Where there is no suspended ceiling, tops of stud walls shall be provided with track and shoes and be fastened as specified for floors. Welding of studs to ceiling track will not be permitted except where bearing studs are installed.

6. Over metal doorframes, install a cut-to-length section of runner track, with flanges slit and web-bent to allow flanges to overlap adjacent vertical studs, and securely fasten to studs. At doorjambs, extend studs continuous to structure above.

7. Bridging, or horizontal bracing of 1-1/2 inch, cold-rolled channels shall be fastened in a manner to prevent stud rotation. Bridging shall be furnished as follows: walls up to 10 feet high, one row at mid-height; walls exceeding 10 feet high, bridging or bracing rows spaced not to exceed 5 feet on center.

8. Wind bracing shall be fastened where indicated on Drawings. Minimum size of strap shall be as indicated on Drawings. Track where strap terminates shall be anchored as indicated on Drawings.

B. Gypsum Wallboard Ceiling Suspension and Framing: Suspended ceiling system framing shall be installed in accordance with ASTM C 754, and as follows.

1. Hangers shall be spaced not more than 48 inches along runner channels and 36 inches in the other direction or 42 inches in both directions unless otherwise indicated. Locations of hanger wires shall be coordinated with other Work. Hangers at ends of runner channels shall be located not more than 6 inches from walls. Hanger wire shall be fastened to structural elements with required fasteners. Sags or twists, which develop in the suspended system, shall be adjusted. Damaged or faulty parts shall be replaced.

2. Main Runners: Hanger wires shall be double strand saddle-tied to runner channels and the ends of hanger wire shall be twisted three times around itself. Main runners shall be located to within 6 inches of the parallel wall to support the ends of cross furring. Main runners shall not come in contact with abutting masonry or concrete walls. Where main runners are spliced, ends shall be overlapped 12 inches with flanges of channels interlocked, and shall be securely tied at each end of splice with wire looped twice around the channels.

3. Furring channels shall be fastened to the runner channels and to structural supports at each crossing with tie wire, hairpin clips, or required fastenings. Furring channels shall be located within 2 inches of parallel walls and beams, and shall be cut 1/2 inch short of abutting walls.

4. Ceiling Openings: Support members shall be provided as required at ceiling openings for access panels, recessed light fixtures, and air supply or exhaust. Support members shall be not less than 1-1/2 inch main runner channels and vertically installed suspension wires or straps shall be located to provide at least the minimum support specified for furring and wallboard attachment. Intermediate
structural members not a part of the structural system, shall be provided for attachment or suspension of support members.

5. Light fixtures and air diffusers shall be supported directly from suspended ceiling runners. Wires shall be provided at required locations to support the weight of recessed or surface mounted light fixtures and air diffusers.

6. Control Joints: Ceiling control joints for expansion and contraction shall be located where indicated or on reviewed submittals. A control joint or intermediate blocking shall be installed where ceiling framing members change direction.
   a. Interior Ceilings With Perimeter Relief: Control joints shall be installed so the linear dimensions between control joints shall not exceed 50 feet in either direction or more than 2500 square feet in area.
   b. Interior Ceilings Without Perimeter Relief: Control joints shall be installed so the linear dimensions between control joints shall not exceed 30 feet in either direction nor more than 900 square feet in area.

C. Splay Wires and Compression Struts: Install as detailed and as required to prevent upward and sideward motion under seismic conditions, as required by code.

D. Suspension Under Ducts: For hangers spaced at 4 to 5-1/2 foot centers, provide 6 gage hanger wires with minimum 2 inch runner channels spaced at maximum 48 inch centers. For greater spans, design system for live load of 10 pounds per square foot of area plus dead load and provide a detail in the Shop Drawings.

E. Furring: Provide framing for horizontal furring as shown or required. Conform to above requirements as applicable.

3.03 CONNECTIONS TO METAL DECKING

A. Provide pre-molded neoprene filler strips matching the flute profile for non-fire-rated walls and partitions covered on one or both sides up to metal decking.

B. The top runner track of fire-rated partitions shall be a minimum of 20 gage and fastened to the metal deck with required fasteners at spacing required for fire rating, but in no case over 16 inches on center. Neither the wallboard nor the metal studs shall be fastened to the top runner to allow for slab deflection. Areas above the runner shall be friction fit with a minimum depth of 2-1/2 inch of 4 pounds per cubic foot mineral wool insulation. A minimum of 1/2 inch of firestopping compound shall be installed to each side of the mineral wool insulation for 1-hour system, and 1 inch of firestopping for a 2-hour system. Install required special tracks, angles, fasteners and strips of gypsum wallboard as required to achieve required fire resistance rating.

C. If proprietary fire-rated top tracks are installed, the installation shall be in accordance with manufacturer's recommendations and fire rating approval requirements.

3.04 CLEANING

A. Remove debris, rubbish and waste material and legally dispose of off the Project site.

3.05 PROTECTION
A. Protect the Work of this section until Substantial Completion.

END OF SECTION
PART 1 - GENERAL

1.01 SUMMARY

A. Provisions of the General and Supplementary Conditions and Division 01 apply to this section.

B. Section Includes:
   1. Lath and Portland cement plaster and stucco as indicated.
   2. Scratch coat plaster as a substrate for ceramic wall tile.

C. Related Sections:
   1. Section 09100: Metal Support Assemblies.
   2. Section 09300: Tile.

1.02 DESIGN REQUIREMENTS

A. Provide pre-formulated products that require only addition of clean water for mixing.

1.03 SUBMITTALS

A. Shop Drawings: Submit elevations and details indicating locations and types of components, splices, connections and accessory items. Indicate locations and types of framing substrates.

B. Material Samples: Submit 48 inch x 48 inch Samples of each stucco and Portland cement plaster texture for review. Samples shall be representative of texture, color, and proposed workmanship. Maintain reviewed Samples on Project site for reference.

C. Product Data: Submit manufacturer's catalog data for each material and component proposed for installation.

D. Certificates: Furnish manufacturer's certification that materials meet or exceed Specification requirements.

E. Mock-ups: Provide a mock-up at least 10 feet x 10 feet x 1 foot. Include at least one control joint and one corner condition. Locate where required by the Architect.

1.04 QUALITY ASSURANCE

A. Coordinate with related Work to provide backing support for items mounted on finished surfaces and to provide allowances for pipes and other items in wall cavities.

B. Comply with the following as a minimum requirement:
1. ANSI A42.3 Lathing and Furring for Portland Cement Based Plaster, Exterior and Interior.

2. Federal Specifications (FS):
   a. UU-B-790a - Grade D Building Paper, Vegetable Fiber: (Kraft Waterproofed, Water Repellent and Fire Resistant).

3. ASTM Standards:
   a. ASTM A 570 - Hot-Rolled Carbon Steel Sheet and Strip, Structural Quality.
   b. ASTM A 611 - Steel, Cold-Rolled Sheet Carbon, Structural Quality.
   c. ASTM A 641 - Zinc-Coated (Galvanized) Carbon Steel Wire.
   d. ASTM A 653 - Steel Sheet, Zinc-Coated (Galvanized) or Zinc-Iron Alloy-Coated by the Hot-Dip Process.
   e. ASTM C 150 - Portland Cement.
   f. ASTM C 206 - Finishing Hydrated Lime.
   g. ASTM C 841 - Installation of Interior Lathing and Furring.
   h. ASTM C 897 - Aggregate for Job Mixed Portland Cement Based Plasters.
   i. ASTM C 926 - Application of Portland Cement Based Plaster.
   j. ASTM C 933 - Welded Wire Lath.
   k. ASTM C 1047 - Accessories for Gypsum Wallboard and Gypsum Veneer Base.
   l. ASTM C 1509 - Accessories for Gypsum Wallboard and Gypsum Veneer Base.
   m. ASTM E 11 - Wire-Cloth Sieves for Testing Purposes.

C. Exterior and Interior Lath: Where lath is fastened to horizontal wood supports, comply with CBC requirements.

D. Plaster: Conforming to general requirements of Stucco Manufacturers Association - Specifications and Standards for Manufactured Stucco Finishes.

1.05 DELIVERY, STORAGE AND HANDLING

A. Protect metal lathing and plastering materials before, during and after installation. In event of damage immediately provide required repairs and replacements.

B. Deliver and store Portland cement materials on the Project site in a manner to provide protection from exposure and damage by moisture. Pile materials to permit easy access for proper
inspection and identification of each shipment. Stockpile adequate supplies of sand on the Project site to permit sampling and testing before installation. Store to avoid inclusion of foreign material.

C. Deliver stucco to the Project site in manufacturer's sealed and labeled packages.

PART 2 - PRODUCTS

2.01 LATH AND ACCESSORY MATERIALS

A. Each bundle of lath shall be sealed with a metal tag bearing the lath designation, weight and manufacturer's name.

B. Water Repellant Backing for Horizontal Surfaces: W.R. Grace & Co., "Bituthene 4000" sheet, 0.060 inch thick, consisting of polyethylene sheet and rubberized asphalt, self-adhering.

C. Adhesives and sealers for water repellant backing: Types as recommended by manufacturer for installation with specified membrane sheet.

D. Expanded Metal Lath: ASTM C 841, small diamond mesh expanded metal lath, 3.4 pounds per square yard, expanded from steel sheets with hot-dip galvanized coating G60 in accordance with ASTM A 653. Lath shall be self-furring type for installation over sheathing, flat type for installation over spaced framing; and 3/8 inch ribbed lath for soffits and ceilings.

E. Backing for Metal Lath: Reinforced, laminated water resistant paper backing conforming to Fed Spec UU-B-790A (1), manufactured by Fortifiber Corp. Super Jumbo Tex, USG, Inryco or Western Metal Lath. Paper backings shall provide flame spread rating of 25 or less when tested according to ASTM E 84 and shall bear UL label. Furnish for exterior plastering (except on soffits and ceilings), and for mortar-set ceramic wall tile.

1. Furnish paper Grade D, 60 minute rating, on wood studs without sheathing, and on plywood sheathing.

2. Furnish Grade B, 16-hour rating, on gypsum sheathing.

F. Corner and Strip Reinforcing Lath: Flat or shaped lath reinforcing units, galvanized metal or wire lath types, no less than 2.5 pounds per square yard, outstanding legs minimum of 2 inches for wire lath and 3 inches for metal lath when formed for angle reinforcing. Furnish galvanized type for installation with galvanized metal lath.

G. Plastering Accessories: Minimum 26 gage galvanized steel with expanded wings. PVC and zinc alloy are not permitted. Furnish casing beads, expansion screeds, foundation screeds, ventilating screeds and other items as indicated or required. Accessories shall be as noted or by Flannery, or Fry-Reglet.

1. Exterior Expansion Screeds: Sizes and profiles indicated or required, furnished with expanded wings unless otherwise indicated or required by installation.

2. Drip Screed: Similar to Superior No. 10.

3. Casing Beads: Milcor, Superior, USG, or equal, similar to Milcor Type 66 by 7/8 inch high for exterior plaster.

5. Ventilating Screeds: Alabama Metal Industries, or equal, soffit vent screed, perforated web type, with integral plaster grounds.


H. Screws: USG Type S and Type S12, "ClimaSeal" finish.

I. Wire for fastening lath to metal framing, fastening lath together and fastening corner beads, metal grounds and base screeds to lath and framing shall be 18 gage, galvanized conforming with ASTM A 641.

J. Nails: 11 gage roofing nails, 7/16 inch head, barbed, diamond point, zinc-coated, 1-1/2 inch long for horizontal application; 1 inch long for vertical application. Furnish watered furring nails for fastening lath to wood framing.

2.02 PLASTER MATERIALS

A. Exterior Stucco: As manufactured by California Stucco, LaHabra, Highland Stucco, or Merlex Stucco, Inc. Furnish formulations requiring only addition of water for installation. Sand shall pass the No. 20 sieve. Mix and sand shall provide the specified finish. Furnish integral colored stucco in color as selected by Architect.

B. Portland Cement: ASTM C 150, Type II, low alkali.

C. Hydrated Lime: ASTM C 206, Type S.

D. Finish Coat Plaster: Highland "Exterior Stucco," or equal, factory formulated blend of portland cement, hydrated lime, aggregates and color, requiring addition of water only at the Project site.

E. Water: Clean, potable and from domestic source.

F. Waterproofing Admix: Red Label Suconem by Super Concrete Emulsions Ltd., AntiHydro, or equal.

G. Plaster Bonding Agent: "PlasterWeld", manufactured by Larsen Products Co., Jessup, MD, Upco Bonding Adhesive No. 705, or Merlex Stucco "Acrylex".

H. Sand: Washed natural sand conforming to ASTM C 144, except gradation of sand shall be as follows:

<table>
<thead>
<tr>
<th>Sieve Size</th>
<th>Maximum</th>
<th>Minimum</th>
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</thead>
<tbody>
<tr>
<td>No. 4</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>No. 8</td>
<td>10</td>
<td>0</td>
</tr>
<tr>
<td>No. 16</td>
<td>40</td>
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<tr>
<td>No. 30</td>
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<tr>
<td>No. 50</td>
<td>90</td>
<td>70</td>
</tr>
<tr>
<td>No. 100</td>
<td>100</td>
<td>95</td>
</tr>
</tbody>
</table>
I. Base Coat Reinforcement: Alkali resistant fiberglass shorts, 1/2 inch chopped strands, Type AR, manufactured by OCF, PPG Industries, or equal.

J. Plaster Patching Materials:

1. Bonding Agent: Acrylic resin type, Acryl 60, LHP Bonder, or equal.

2. Patching Plaster: Manufactured by Merlex Stucco, Inc., Orange, CA, or equal. ; Furnish fast setting, compatible with existing plaster materials, "Exterior Pronto Patch," Portland cement base coat material, requiring only addition of water. Material shall provide initial set within 20 minutes, and final set within one hour.

K. Miscellaneous Materials

1. Underlayment: Single ply self-adhesive waterproofing membrane as manufactured by W.R. Grace Company, Jiffy-Seal, or equal. Furnish for installation behind stress relief joints and backing on horizontal and vertical surfaces exposed to weather; under metal copings and flashings; and window jambs and sills.

2. Provide additional components and materials required for a complete installation.

PART 3 - EXECUTION

3.01 EXAMINATION

A. Verify that overhead or concealed Work is finished, completed, tested and inspected as required before starting Work of this Section.

3.02 LATH INSTALLATION

A. General: Where exterior and interior lath is fastened to horizontal wood supports, the current edition of the CBC shall be complied with. Refer to Section 01420: Testing and Inspection.

B. Exterior Lathing, General:

1. Application of Metal Lath: Metal lath or wire fabric lath shall be installed in accordance with the provisions of CBC current editions. Lath shall be furred out from vertical supports or backing not less than 1/4 inch.

2. Self-furring lath meets furring requirements. Furring of expanded metal lath is not required on supports providing a bearing surface width of 1-5/8 inch or less.

3. Where external corner reinforcement is not installed, lath shall be furred out and carried around corners, extending and fastened to at least one support.

4. A weep screed shall be provided at or below foundation plate line on exterior stud walls. Screed shall be installed a minimum of 4 inches above grade and shall be of a type permitting water to drain to exterior of building. Weather-resistant barrier and exterior lath shall cover and terminate on attachment flange of screed.

C. Interior Lathing, General:
1. Applications of Metal Lath: Type and weight of metal lath, and gage and spacing of wire in welded or woven lath, spacing of supports, and method of fastening to wood supports shall be as set forth in CBC.

2. Metal lath shall be fastened to metal supports with specified tie wire spaced not more than 6 inches apart or with other recognized fasteners.

3. Metal lath or wire fabric lath shall be installed with long dimension of sheets perpendicular to supports.

4. Metal lath shall be lapped not less than 1/2 inch at sides and 1 inch at ends. Wire fabric lath shall be lapped not less than one mesh at sides and ends, but not less than 1 inch. Rib metal lath with edge ribs greater than 1/8 inch shall be lapped at sides by nesting outside ribs. When edge ribs are 1/8 inch or less, rib metal lath may be lapped 1/2 inch at sides, or outside ribs may be nested. Where end laps of sheets do not occur over supports, they shall be securely fastened together with specified tie wire.

5. “Cornerite” shall be installed in internal corners to retain position during plastering. “Cornerite” may be omitted when lath is continuous or when plaster is not continuous from one plane to an adjacent plane.

6. Install 5 inch x 16 inch strips of metal lath diagonally at corners of openings in walls.

3.03 INSTALLATION-WEATHER BARRIER MEMBRANE

A. Install one layer of underlayment over areas to receive lath with weather barrier membrane. Install horizontally with each course weatherlapped 2 in. over layer below. Over wood based sheathing, install a second layer with laps offset from the first layer.

B. Install lath over underlayment in accordance with manufacturer’s instructions.

C. Install single ply self-adhesive waterproofing membrane per manufacturer’s recommendations in areas indicated on the Drawings.

3.04 PLASTER APPLICATION - GENERAL

A. Install plaster in conformance with ASTM C 926.

B. Install each plaster coat to an entire wall or ceiling panel without interruption to avoid cold joints and abrupt changes in uniform appearance of succeeding coats. Wet plaster shall abut existing plaster at naturally occurring interruptions in plane of plaster (such as corner angles, openings and control joints) wherever possible. Cut joining, where necessary, square and straight and at least 6 inches away from a joining in preceding coat.

C. Provide sufficient moisture in plaster mix or by curing methods to permit continuous and complete hydration of cementitious materials, considering climatic and Project site conditions.

D. Provide sufficient time between coats to permit each coat to cure or develop enough rigidity to resist cracking or other damage when next coat is installed.

3.05 EXTERIOR PLASTERING

A. Concrete surfaces, except where noted as "Exposed Concrete" or "Painted Concrete," shall be finished with stucco dash finish coats, as specified.
B. Preparation of Surfaces:

1. Exterior concrete and masonry surfaces to be plastered shall be free of oily or waxy substances, and loose or foreign material. Uniformly spray with nozzle-type water spray at least 12 hours before installation of plaster.

2. Concrete and masonry surfaces to receive 5/8 inch thick Portland cement plaster shall be treated with bonding agent. This surface preparation shall not be installed instead of a brown coat of plaster.

3. Concrete surfaces to receive stucco dash finish shall be lightly sandblasted to provide a roughened surface.

4. Verify that lath has been installed securely and that grounds, screeds, casing beads and other accessories are straight, in correct position, and securely fastened in place.

C. Number of Coats and Thickness: Exterior plaster shall be portland cement as follows with minimum thickness from face of supports or surfaces to finish face of plaster as follows:

1. Lathed Surfaces: 3 coats, scratch, brown and finish, 7/8 inch thick, one inch thick where required by CBC.

2. Stucco Dash Finish Coats: 2 coats, 1/8 inch thick.

3. Concrete and Masonry Base: 2 coats, brown and finish, 5/8 inch thick.

D. Proportions:

1. Proportion ingredients for Portland cement. Calibrated boxes are required to determine the accuracy of proportioning. Proportions shall adhere to current edition of CBC.

2. Dash Bond Coat: Mixed in the proportion of 1 cubic foot of standard portland cement to 1-1/2 cubic feet of sand.

3. Stucco Finish: Stucco shall be factory prepared, exterior type, colored stucco containing a portland cement base, required aggregates and mineral pigments. Colors shall be as selected by the Architect. Selected colors are not limited to standard stock colors and certain Work, such as ceilings, soffits and walls, may be finished in non-standard colors as selected.

E. Mixing: Provide stucco mix, plaster and aggregate in proportions specified, furnishing only sufficient water to obtain proper consistency before installation. Do not mix any more material at any time than can be installed within 1/2 hour after mixing. Do not allow material to remain in mixer or mixing boxes overnight. Maximum allowable slump shall be 2-1/2 inch, based on a 2 inch x 4 inch x 6 inch slump cone.

F. Application:

1. Dash Bond Coat: Dash on surface, leave undisturbed, and maintain damp for at least 24 hours following installation.
2. Scratch Coat: Install with sufficient material to completely cover laths and scratch across supports.

3. Brown Coat: Rod to a straight, true, even surface and float to receive finish coat.

4. Stucco Finish Coat: Install in 2 coats to a total thickness of 1/8 inch, each coat covering surface uniformly. First coat shall be installed to form texture pattern and second coat shall provide uniform color and texture.

   a. First coat shall be installed by providing several passes with nozzle to completely cover surface.

   b. The second coat shall be installed by doubling back same day, when first coat is sufficiently dry.

   c. Over concrete surfaces, second coat shall be installed 24 hours after installation of first coat. In warm weather, first coat shall be cured by light water spray after material has set.

   d. Protection: Protect those surfaces, which are not to receive dash finish coats. Such surfaces shall be shielded and shall have any sand left from dashing operation removed.

G. Curing Exterior Plaster: Adhere to current edition of CBC for curing requirements.

H. Option for Machine Application, Scratch and Brown Coats: Instead of hand installed plaster, the furnishing of plastering machines for interior or exterior scratch and brown coats is permitted. Machine installation shall be in accordance with the following:

1. Qualifications: Provide proper equipment and apparatus.

2. Apparatus: Pump shall be equipped with an air pressure gage and required safety devices. Hoses and connections shall be tight and pressure shall be maintained constant.

3. Tests: Tests for determining proper consistency of plaster mix shall be taken at nozzle using slump cone method. Tests shall be observed by the IOR at least twice each day and as often as deemed necessary. Perform required tests and maintain an accurate log of such tests to ascertain compliance with material slump requirements. Material slump shall not exceed 2-1/2 inches at nozzle. Furnish an adequate number of standard 2 inch x 4 inch x 6 inch slump cones for testing. Cones shall be on the Project site before Work is started and at all times during performance of the Work of this section.

4. Proportion and Application: Proportioning, mixing, number of coats and thickness shall be same as specified for hand application. Cement aggregate and water shall be mixed to plaster machine. Plaster mix shall be projected into and conveyed through a hose to the nozzle at end of hose and deposited by pressure in its final position ready for manual straightening and finishing.

5. Follow-Up: Perform scoring operation of plaster, based on settings and drying conditions at time of installation. Curing shall be as previously specified.

6. Protection: Before installing any plaster, thoroughly protect other adjacent Work.
3.06 QUALITY CONTROL

A. Finish interior and exterior plaster to a uniform texture, free of imperfections and flat within 1/8 inch in 5 feet. Form a suitable foundation for paint and other finishing materials. Avoid joining marks in finish coats.

3.07 TESTING

A. Samples of sand shall be obtained at the Project site. Tests may be performed as deemed necessary by the IOR.

B. Provide a supply of 6 inch x 4 inch x 2 inch cones for slump testing of Portland cement plaster. Samples of plaster taken at nozzle shall have a maximum slump of 2-1/2 inches. Plaster material not complying with this requirement shall be deemed as defective Work.

3.08 REPAIR REQUIREMENTS FOR DAMAGED PLASTER

A. Plaster Detached from Framing:
   1. Remove loose and broken plaster.
   2. Repair or replace damaged water-resistant backing and lath in compliance with specified standards.
   3. Remove stucco finish from surrounding area in the same plane by sandblasting.
   4. Install a scratch coat and a brown coat mixed with liquid bonding agent instead of water to the areas devoid of plaster.
   5. Install a coat of liquid bonding agent to entire wall plane.
   6. Install a 1/8 inch thick stucco finish coat to entire wall plane and match existing texture and color.

B. Cracked Plaster - Unpainted:
   1. Remove loose material from crack with a wire brush.
   2. Remove stucco finish from entire wall plane by sandblasting.
   3. Fill crack with slurry of stucco and liquid bonding agent.
   4. Install a coat of liquid bonding agent to entire wall plane.
   5. Install 1/8 inch thick stucco finish to entire wall plane and match existing texture and color.

C. Cracks Larger Than 1/2 inch - Painted:
   1. Remove loose material from crack with a wire brush.
2. Fill crack with slurry of one part plastic portland cement to 3 parts masonry/stucco sand and liquid bonding agent to match existing texture of adjacent surface.

3. Paint entire wall plane, color to match existing.

D. Where patching of plaster over existing lath is feasible, fasten loose lath and install new lath with nails at 6 inch centers. Where metal is furnished, lap new lath over existing 6 inches and tie at 6 inch centers. Install paper backings as required, shingled into existing. Spray existing gypsum lath with water over a period of several hours to moisten it thoroughly. Install a bonding coat to the cut edges of existing plaster and plaster as specified above. Work deemed to be defective, shall be removed and replaced as required.

E. Patching of Holes, Cracks, and Gouges: Holes, cracks, gouges, missing sections, and other defects in existing improvements shall be patched. For holes over 1 inch in size, cut small sections of lath and place in opening attached to existing material. Install 3 coats of plaster. For holes one inch and smaller, install bonding agent to existing surfaces and neatly fill hole with plaster, installing necessary coats to match adjacent surfaces, eliminate cracks and match existing surface texture. Cracks, gouges, and other defects shall be filled with plaster or spackle as required and neatly finished to match adjacent existing improvements.

3.09 CLEANING

A. Remove rubbish, debris and waste material and legally dispose of off the Project site.

3.10 PROTECTION

A. Protect the Work of this section until Substantial Completion.

END OF SECTION
SECTION 09250
GYPSUM BOARD

PART 1 - GENERAL

1.01 SUMMARY

A. Provisions of the General and Supplementary Conditions and Division 01 apply to this section.

B. Section Includes:

1. Gypsum board systems and accessory components as indicated.

C. Related Sections:

1. Section 09100: Metal Support Assemblies.

1.02 SYSTEM DESCRIPTION

A. Design Requirements: Provide systems capable of resisting deflection as required by CBC and authorities having jurisdiction.

B. Regulatory Requirements: Comply with CBC requirements for design and installation.

1.03 SUBMITTALS

A. Shop Drawings: Submit Shop Drawings indicating complete suspension system including connections, anchorage and trim features.

B. Material Samples: Submit 18 inch x 18 inch Samples of the texture coat of gypsum board panels with edges taped.

C. Product Data: Submit manufacturer's catalog data for each product proposed for installation.

1.04 QUALITY ASSURANCE

A. Comply with the following as a minimum requirement:

1. ASTM C 36 - Gypsum Wallboard.
2. ASTM C 645 - Nonstructural Steel Framing Members.
3. ASTM C 840 - Application and Finishing of Gypsum Board.
4. ASTM C 841 - Installation of Interior Lath and Furring.
5. ASTM C 1002 - Steel Drill Screws for the Application of Gypsum Panel Products or Metal Plaster Bases.
7. NFPA or ULI requirements for fire-rated assemblies per ASTM E119.

8. Underwriters Laboratories (ULI) requirements and listings for fire-rated materials and products classification.

9. GA 214 - Gypsum wallboard finish shall conform to requirements of GA 214, and as specified herein. Levels required for the Work are described as follows:

<table>
<thead>
<tr>
<th>LEVELS OF GYPSUM BOARD FINISH</th>
</tr>
</thead>
<tbody>
<tr>
<td>Level</td>
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<tr>
<td>-------</td>
</tr>
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<td>1</td>
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</table>

*At completion of specified taping and finishing, install one coat of high solids primer as specified hereafter.

B. Qualifications:

1. Installer: Minimum 5 years experience in installing and finishing gypsum board.
1.05 DELIVERY, STORAGE AND HANDLING

A. Deliver materials in original, factory sealed packages, containers or bundles bearing brand name and name of manufacturer.

B. Materials shall be kept dry. Gypsum wallboard shall be neatly stacked flat; avoid sagging and damage to edges, ends and surfaces.

C. Fire-rated materials shall have fire classifications numbers attached and legible.

D. Provide all means necessary to protect gypsum board systems before, during and after installation.

PART 2 - PRODUCTS

2.01 MATERIALS

A. Gypsum Board:

1. Type X (fire-resistant), 5/8 inch thick 48 inch wide, up to 16 feet long conforming to ASTM C 36 with long edges tapered.

2. Water resistant, WR, 5/8 inch thick, 48 inch wide, up to 16 feet long conforming to ASTM C 630 with long edges tapered.

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## GYPSUM PANEL SYSTEM

<table>
<thead>
<tr>
<th>Panel</th>
<th>Fasteners</th>
<th>Jt. Tape</th>
<th>Jt. Treat.</th>
<th>Panel Source</th>
</tr>
</thead>
<tbody>
<tr>
<td>5/8&quot; SHEETROCK regular, FIRECODE Core, or FIRECODE C Core Gypsum panels</td>
<td>Wood: 1 3/8&quot; drywall nails or 1&quot; 8-18x.323 drywall screws. Steel:1&quot; 8-18x.323 Type S or S-12 drywall screw.</td>
<td>SHEETROCK paper tape regular or Heavy</td>
<td>SHEETROCK Setting Type, Lightweight Setting, SHEETROCK Taping, Topping, or All-Purpose, SHEETROCK Ready-Mixed Taping, Topping, or All-Purpose, or SHEETROCK Lightweight All-Purpose or Ready-Mixed - Plus 3</td>
<td>United States Gyp. Co. 125 So. Franklin St. Chicago, Il 60606 1-800-289-4874</td>
</tr>
<tr>
<td>5/8&quot; Georgia Pacific, Type X, Type T, or Type TG-C (Fire-Rated)</td>
<td>Wood: 1 3/8&quot; drywall nails or 1&quot; 8-18x.323 drywall screws. Steel:1&quot; 8-18x.323 Type S or S-12 drywall screw.</td>
<td>SHEETROCK paper tape regular or Heavy</td>
<td>Same as above</td>
<td>Georgia Pacific</td>
</tr>
<tr>
<td>5/8&quot; Gold Bond regular, Fire-Shield or Fire-Shield C gypsum wallboard</td>
<td>Wood: 1 1/2&quot; drywall nails or 1 1/4&quot; Rock-On drywall screws. Steel:11/4&quot; Rock-On Type S or S-12 drywall screw.</td>
<td>ProForm Joint Tape, ProForm Multi-Flex Tape Bead or Sta-Smooth HS Tape.</td>
<td>ProForm Multi-Use Joint Compound, All Purpose, Lite, Triple-T, Topping, or Easy Finish All Purpose, Light Weight, Topping, or Sta-Smooth, Lite, or HS Joint Compound.</td>
<td>Gold Bond National Gypsum Co. 2001 Rexford Road Charlotte, NC 28211</td>
</tr>
</tbody>
</table>
### ABUSE RESISTANT SYSTEMS

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<th>Panel</th>
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<th>Jt. Treat.</th>
<th>Panel Source</th>
</tr>
</thead>
<tbody>
<tr>
<td>5/8&quot; FIBEROCK VHI Gypsum fiber panels</td>
<td>Wood: 1 3/8&quot; drywall nails or 1&quot; 8-18x.323 drywall screws. Steel: 1&quot; 8-18x.323 Type S-12 drywall screw.</td>
<td>SHEETROCK paper tape</td>
<td>SHEETROCK Setting compound</td>
<td>United States Gyp. Co. 125 So. Franklin St. Chicago, Il 60606 1-800-289-4874</td>
</tr>
<tr>
<td>5/8&quot; CoreGuard (FIRECODE C w/.030 LEXAN)</td>
<td>Wood: 1 3/8&quot; drywall nails or 1&quot; 8-18x.323 drywall screws. Steel: 1&quot; 8-18x.323 Type S-12 drywall screw.</td>
<td>SHEETROCK paper tape</td>
<td>SHEETROCK Setting compound</td>
<td>CoreGuard Inc. P.O. Box 144 Kirkwood, NY 13795 1-888-673-8540</td>
</tr>
</tbody>
</table>
| 5/8" Hi-Impact 3000 gypsum wallboard       | Wood: 1 1/2" drywall nails or 1 1/4" Rock-On drywall screws. Steel: 11/4" Rock-On Type S-12 drywall screw. | ProForm paper tape         | Sta-Smooth Setting joint compound | Gold Bond National Gypsum Co. 2001 Rexford Road Charlotte, NC 28211 |}

### SHAFTWALL SYSTEMS

<table>
<thead>
<tr>
<th>Panel</th>
<th>Fasteners</th>
<th>Jt. Tape</th>
<th>Jt. Treat.</th>
<th>Panel Source</th>
</tr>
</thead>
<tbody>
<tr>
<td>5/8&quot; SHEETROCK regular, FIRECODE Core, or FIRECODE C Core Gypsum panels, 3/4&quot; ULTRACODE Core and/or 1&quot; SHEETROCK Liner panels</td>
<td>1&quot;, 1 5/8&quot;, or 2 1/4&quot; 8-18x.323 Type S or S-12 drywall screw.</td>
<td>SHEETROCK paper tape regular or Heavy</td>
<td>SHEETROCK Setting Type, Lightweight Setting, SHEETROCK Taping, Topping, or All-Purpose, SHEETROCK Ready-Mixed Taping, Topping, or All-Purpose, or SHEETROCK Lightweight All-Purpose or Ready-Mixed - Plus 3</td>
<td>United States Gyp. Co. 125 So. Franklin St. Chicago, Il 60606 1-800-289-4874</td>
</tr>
<tr>
<td>5/8&quot; Type X, Type T, or Type TG-C (Fire-Rated) and 1&quot; Temple Liner Type X panels (Studs by approved others)</td>
<td>1&quot;, 1 5/8&quot;, or 2 1/4&quot; 8-18x.323 Type S or S-12 drywall screw.</td>
<td>SHEETROCK paper tape regular or Heavy</td>
<td>Same as above</td>
<td>Georgia Pacific</td>
</tr>
<tr>
<td>5/8&quot; Gold Bond regular, Fire-Shield or Fire-Shield C gypsum wallboard and 1&quot; Gold Bond Fire-Shield Shaftliner</td>
<td>11/4&quot;, 1 5/8&quot;, or 2 1/4&quot; Rock-On Type S or S-12 drywall screw.</td>
<td>ProForm Joint Tape, ProForm Multi-Flex Tape Bead or Sta-Smooth HS Tape.</td>
<td>ProForm Multi-Use Joint Compound, All Purpose, Lite, Triple-T, Topping, or Easy Finish All Purpose, Light Weight, Topping, or Sta-Smooth, Lite, or HS Joint Compound.</td>
<td>Gold Bond National Gypsum Co. 2001 Rexford Road Charlotte, NC 28211</td>
</tr>
</tbody>
</table>

B. Metal Framing: Refer to Section 09100: Metal Support Assemblies.

C. Fastenings:

1. ASTM C 1002 self-drilling, self-tapping bugle-head drywall screws; No. 6 Type S, 1 inch long for metal framing, Type W 1-1/4 inch long for wood framing (for single-layer panels). Screws shall be furnished with a corrosion-resistant treatment.

D. Wire: Galvanized and annealed carbon steel wire:
1. Tie Wire: No. 16 SWG.

2. Hanger Wire: No. 8 SWG, annealed and galvanized.

E. Metal Trim: ASTM C 1047, fabricated from minimum 26 gage galvanized, treated for adhesion of joint compound and paint, and with slotted, drilled or punched perforations in flanges or special joint compound attached paper-faced beads as manufactured by USG, Beadex or National Gypsum. Trim units shall be of size and type to fit gypsum board construction and shall include corner beads, casings, edge trim and other shapes indicated and required. Aluminum trim shall be standard extruded aluminum alloy 6063 T5,.050 thick with 90 degree intersections, outside and inside corners by Flannery, Fry-Reglet or approved equal.

F. Finishing Materials:

1. High solids primer to be SHEETROCK Brand First Coat manufactured by USG or High-build primer by Sherwin Williams.

2. Texture coat finish material shall be manufactured by the U.S. Gypsum, Hamilton, or Highland Stucco and Lime Products, Inc.

G. Sheathing and Backing Board: Provide one of the following, as indicated:

1. Cementitious Backing Panels: Water-resistant cementitious panels reinforced with a fiberglass scrim, complying with ANSI A118.9.

<table>
<thead>
<tr>
<th>Panel</th>
<th>Fasteners</th>
<th>Jt. Tape</th>
<th>Jt. Treat.</th>
<th>Panel Source</th>
</tr>
</thead>
<tbody>
<tr>
<td>5/8&quot; DUROCK Cement Board</td>
<td>Wood: 1 1/2&quot; galvanized roofing nails or 1 1/4&quot;, 1 5/8&quot;, or 2 1/4&quot; DUROCK No. 8 wood screws. Steel:1 1/4&quot; or 1 5/8&quot; DUROCK No. 8 screws.</td>
<td>DUROCK glassfiber tape</td>
<td>ANSI A136.1 Type I: Organic adhesive or ANSI A118.1 acrylic latex modified dry-set mortar or ANSI A118.4 Latex portland cement mortar.</td>
<td>United States Gyp. Co. 125 So. Franklin St. Chicago, IL 60606 1-800-289-4874</td>
</tr>
<tr>
<td>5/8&quot; Wonderboard Cement Backerboard</td>
<td>Wood: 1 1/2&quot; galvanized roofing nails or 1 1/4&quot; SuperiorBilt Concrete Backerboard screws. Steel:1 1/4&quot; SuperiorBilt Concrete Backerboard screws.</td>
<td>2&quot; glassfiber tape (Alkili resistant)</td>
<td>ANSI A136.1 Type I: Organic adhesive or ANSI A118.1 acrylic latex modified dry-set mortar or ANSI A118.4 Latex portland cement mortar.</td>
<td>Custom Bldg Products Seal Beach, CA 1-800-272-8786</td>
</tr>
<tr>
<td>5/8&quot; Hardy Board Cement Board</td>
<td>Wood: 1 1/2&quot; galvanized roofing nails or 1 1/4&quot;, 1 5/8&quot; Rock-On Type-S screws. Steel:1 1/4&quot; or 1 5/8&quot; Rock-On Type S-12 screws.</td>
<td>glassfiber tape (Alkili resistant)</td>
<td>ANSI A136.1 Type I: Organic adhesive or ANSI A118.1 acrylic latex modified dry-set mortar or ANSI A118.4 Latex portland cement mortar.</td>
<td>United States Gyp. Co. 125 So. Franklin St. Chicago, IL 60606 1-800-289-4874</td>
</tr>
</tbody>
</table>

2. Screws for board attachment: ASTM C 1002.

PART 3 - EXECUTION
3.01 INSTALLATION

A. Metal Trim:

1. Provide corner beads at outside corners and angles, metal casing where gypsum board terminates at uncased openings, metal edge trim where board edges abut horizontal and vertical surfaces of other construction.

2. Install trim in accordance with manufacturer’s directions and fasten to framing with proper fasteners through flange perforations. Install trim in longest practical pieces.

B. Gypsum Board:

1. Install gypsum board in conformance with ASTM C 840.

2. Gypsum board shall be cut by scoring and breaking or by sawing, working from face side. Where board meets projecting surfaces it shall be scribed and neatly cut. Unless conditions require otherwise, gypsum board shall be installed first to ceilings, then to walls. End joints shall occur over a support. Install panels of maximum practical length so a minimum number of end joints occur.

3. End joints shall be staggered and joints on opposite sides of a partition shall be arranged to occur on different studs. Joint layout at openings shall be installed so no end joints will align with edges of openings.

4. Except where specified otherwise, fasteners shall be spaced not less than 3/8 inch from edges and ends of gypsum board. Do not stagger fasteners at adjoining edges and ends.

5. Install gypsum board vertically or horizontal as permitted by specific UL Design at walls. Fasten board with drywall screws spaced not to exceed 8 inch on centers around perimeter of boards and 8 inches on centers on intermediate studs. Space screws at 8 inches on centers along top and bottom runners. Screws shall be driven to provide screwhead penetration just below gypsum board surface without breaking surface paper. Where electrical outlet and switch boxes are indicated, provide adjustable attachment brackets between studs.

6. Install gypsum board to ceiling framing with long dimension at right angles to furring channels, or wood framing members, and fasten with specified drywall screws or nails spaced 6 inch to 7 inch on centers across board. Screws or nails shall be not less than 1/2 inch from side joints and 3/8 inch from butt end joints. Abutting end joints shall occur over furring channels and end joints of boards shall be staggered. Support cutouts or openings in ceilings with furring channels.

7. Install access doors, furnished under another section, in correct location, plumb, or level, flush with adjacent construction, and securely fastened to framing.

3.02 TOLERANCES

A. Install gypsum board flat within 1/8 inch in 10 feet.
3.03  JOINT TREATMENT AND FINISHING

A. Conform to GA 214-M and the following.

B. All Levels: Install tape bedding compound, tape, and finishing cement on joints in wallboard as required for specified levels of finish.

C. Levels 2 through 5:
   1. Install joint cement and finishing cement over screw heads. Treat all inside corners with joint cement, tape, and finishing cement. Treat outside corners with corner beads and finishing cement.
   2. Provide metal casing beads at all edges of gypsum wallboard, which abut ceiling, wall, or column finish, and elsewhere as required, such as openings, offsets, etc. Install all exposed joints, trims, and attachments non-apparent following installation of paint or other finishes. If the joints and fasteners are visibly apparent, correct defects as required.
   3. Seal the raw edges of plumbing openings and boards that have been cut to fit with sealing compound brushed on.
   4. When entire installation is completed and before installation of finish materials by other trades, correct and repair broken, dented, scratched or damaged wallboard.

D. Levels 3 and 4: Install one coat of high solids primer over entire surface.

E. Level 5: Install one coat of skim coat over entire surface, followed by one coat of high solids primer over entire surface.

3.04  REQUIRED LEVELS OF FINISH

A. Unless otherwise indicated or specified, levels of finish required shall be as follows:
   1. Level 1: Plenum areas above ceilings, insides of shafts, and other concealed areas.
   2. Level 2: Water-resistant wallboard backing for tile.
   3. Level 3: Backing for vinyl wall covering and adhered acoustic tile. Also, provide where textured finish is indicated.
   4. Level 4: Exposed painted wallboard in utility rooms, and similar spaces not requiring Level 5 finish.
   5. Level 5: Exposed, painted wallboard in offices and corridors.

3.05  TEXTURE COAT

A. Spray install texture coat to interior gypsum board surfaces which are scheduled to receive a painted finish, except in food preparation areas.

B. Texture coat shall provide a uniform splatter pattern finish with an 80 percent minimum coverage of surface.
C. Provide protection from spray for interior surfaces of electrical boxes and wiring.

3.06 CLEAN-UP

A. Remove rubbish, debris, and waste materials and legally dispose of off the Project site.

3.07 PROTECTION

A. Protect the Work of this section until Substantial Completion.

END OF SECTION
SECTION 09310
CERAMIC TILE

PART 1 - GENERAL

1.1 SUMMARY
A. Section includes:
   1. Ceramic floor and wall tile, and trim shapes.
   2. Setting materials, grouts and sealants.
   3. Miscellaneous materials and accessories required for complete installations.

1.2 REFERENCES
A. TCA, Handbook for Ceramic Tile Installation.
B. ANSI A118.3, Chemical Resistant, Water-Cleanable, Tile-Setting and Grouting Epoxy and Water-Cleanable Tile-Setting Epoxy Adhesive
C. ANSI A118.4, Latex-Portland Cement Mortar.
E. ANSI A108.6, Installation of Ceramic Tile with Chemical Resistant, Water Cleanable Tile-Setting and –Grouting Epoxy.
F. ANSI A118.7, Polymer Modified Tile Grouts for Tile Installation.
H. ANSI A118.8, Modified Epoxy Emulsion Mortar/Grout.
I. ANSI A137.1, Ceramic Tile.

1.3 SUBMITTALS
A. Data: Submit manufacturer’s data for waterproof membrane, pre-mixed mortars and grouts, with certification that they meet ANSI standards specified when applicable.
B. Samples:
   1. Submit 24-inch square, of each type and color of tile glued to hardboard backing; grout joints.
   2. Submit one full sample of each type, color and shape of trim and base.
3. Approved samples will serve as Architect’s control samples.

1.4 QUALITY ASSURANCE

A. Uniformity:

1. Obtain each color, grade, finish, type, composition, and variety of tile from a single source with resources to provide products of consistent quality in appearance and physical properties without delaying progress of the Work.

2. Obtain materials of a uniform quality from one manufacturer for each cementitious and admixture component and from one source or producer for each aggregate.

B. Installer’s qualifications: Experienced firm who has successfully completed tile installations similar in material, design, and extent to that indicated for Project for at least 5 years.

C. Mockup: Before starting tile installation, erect mockups for each form of construction and finish required. Build mockups complying with the following, using materials indicated for final Work.

   1. Make mockups a minimum of 6 feet square. Locate on site where directed by the Architect.
   2. Make modifications requested by the Architect, or remove unsatisfactory mockups and construct new ones.
   4. Retain and maintain mockups during construction in undisturbed condition as a standard for judging completed tile work.
   5. When accepted by the Architect, accepted mockups in undisturbed condition at time of Substantial Completion may become part of the Work.

D. Master grade certificate: Submit, bearing the Certification Mark of the Tile Council of America, Inc., signed by the tile manufacturer, stating the type and quality of each type of tile delivered to the job site.

1.5 HANDLING

A. Comply with requirement of ANSI A137.1 for labeling sealed tile packages.

B. Delivery: Deliver tile cartons with grade seals unbroken.

1.6 JOB CONDITIONS

A. Set and grout this work when ambient temperature is at least 50 deg. F or higher. Do not install materials on surfaces (or when ambient temperature) is less than 40 deg. F.

B. Illuminate work areas during installation to provide the same or greater level of illumination required to properly perform this work and as will occur in the room or space after the building is in operation.
1.7 MAINTENANCE

A. Furnish one full box of each type, color and size of tile properly packaged and identified, by room or area, minimum 5% of installed material unless a greater amount is required by Division 1.

PART 2 -PRODUCTS

2.1 TILE AND TRIM

A. Dal Tile.

1. Floor tile: “Concrete Connection”, 13” x 13” Color to be Downtown Black CN95. Shall meet the static coefficient of friction recommended by ADAAG – 0.6 for level floors and 0.8 for sloped surfaces.

2. Wall tile and base: “Rittenhouse Square”, matte, 3 x 6, color to be Arctic White 0790. Wall accent tile: “Rittenhouse Square”, matte, 3 x 6, colors to be Navy Q189 and Timberline Q112.


4. Trim: Provide matching base, caps, stops, returns, trimmers required to complete the installation.

B. Factory-blending: For tile exhibiting color variations within the ranges selected during sample submittals, factory-blend tiles and package accordingly so that tiles taken from one package show the same color range as those taken from other packages, and match approved samples.

C. Mounting: Where tile is installed in wet areas, do not use back-or edge-mounted tile assemblies unless tile manufacturer confirms that this type of mounting is suitable for these kinds of uses and has been successfully used on other projects.

2.2 SETTING MATERIALS AND GROUT

A. Latex modified dry-set mortar: Complying with ANSI A118.4, pre-sanded, latex-modified, TEC Full Flex Mortar, or equal.

B. Epoxy mortar: ANSI A118.3on plywood or metal where high bond strength is required. Use ANSI A118.8 in commercial kitchens and laundries.

C. Water: Potable, fresh.

D. Grout:

1. Color(s) selected by the Architect.

2. Complying with ANSI A 118.7, polymer-modified grout, sanded or unsanded as applicable to the joint width and recommended by the grout manufacturer.
a. Unsanded Portland cement grout: TEC AccuColor unsanded grout, or equal by Mapei or Laticrete.
b. Sanded Portland cement grout: TEC AccuColor grout, or equal by Mapei or Laticrete.
c. Epoxy grout for restroom, prep room, locker room, and kitchen tile: Laticrete SpectraLOCK Pro grout or approved equal.

2.3 MISCELLANEOUS MATERIALS

A. Sealant and back-up for control joints in tiles: As specified in Section 07920.

PART 3 - EXECUTION

3.1 EXAMINATION/PREPARATION

A. Examine conditions and measurements affecting the work of this Section at site.

B. Remove glaze and contaminants, including remaining curing compounds, from floors by wire-brushing or sandblasting.

C. Verify that surfaces to be tiled are firm, dry, clean, and free from oil or waxy films and curing compounds, and within the following tolerances:

1. Thin-set tiles: 1/8 inch in 10 feet for floors and 1/8-inch in 8 feet for walls.

2. Walls shall have been engineered and installed for a maximum deflection of L/360 under loads prescribed by Code. Coordinate this requirement with other design criteria specified in Section 06100.

D. Examine that installation of grounds, anchors, recessed frames, electrical and mechanical work, and similar items located in or behind tile have been completed before installing tile.

E. Correct conditions detrimental to the proper and timely completion of this work before proceeding with installation.

3.2 TILE INSTALLATION

A. General: Install proprietary materials in compliance with their manufacturer’s instructions. Press or beat the tiles to obtain 100 percent coverage of mortar on back of tile; back butter tile if necessary.

1. Maintain minimum temperature limits and installation practices recommended by mortar and grout materials manufacturers in areas where this work is performed.

2. Terminate work neatly at obstructions, edges and corners without disrupting pattern or joint alignment. Saw-cut and drill tiles to obtain tight fitting, clean, sharp, undamaged cut edges.

a. Rub cuts smooth with fine abrasive stone.

b. Cut and drill so that electrical outlets, plumbing fixtures, pipes, fixtures and fittings standard plates, escutcheon and collars will overlap the tile.
c. Do not cut or split tile at penetrations.

3. Install tile in patterns indicated with uniform joints and perimeter units not less than 1/2 unit wide. Adjust to minimize cutting.

4. Accurately set tile with flush well-fitted joints, finished in true planes, plumb, square, sloped or level as required.

5. Form corners, returns, and exposed tile edges with approved trimmers.

6. Maximum deviation from true lines and levels shall not exceed 1/8-inch in 10 feet for floors, and 1/8-inch in 8 feet for walls.

7. Calk penetrations in tile with sealant and backing rod specified in Section 07920. Provide expansion joints where indicated or as recommended by TCA Method EJ171.

B. Tile blending:

1. For tile exhibiting color variations within the ranges selected during sample submittals, verify that tiles have been factory-blended and packaged accordingly so that tiles taken from one package show the same color range as those taken from other packages, and match approved samples.

2. If not factory-blended, either return to manufacturer or blend tiles at Project site before installing.

C. Tile installations:

1. Walls: Install over cement backerboard in compliance with ANSI A108.5 and TCA installation method W244.

2. Floor tile: Install in compliance with ANSI A108.5 and thin-set over concrete TCA installation method F113-03. For restrooms and kitchen use F115-03

D. Sound tile after setting. Replace or reset hollow sounding units.

3.3 GROUTING/CLEANING/CURING

A. Grouting: Comply with ANSI A108.10 and ANSI A 108.6 for epoxy grout. Finish joints of square edge tiles flush with tile surfaces; finish joints of cushion edge tiles to depth of cushion. Grout shall be free of voids and pits.

B. Leave joints of stone paving open as long as possible to allow the setting bed to cure.

C. Cleaning:


2. Polish glazed tile after cleaning with clean, dry cloths.

3.4 PROTECTION
A. Protect completed installations until acceptance by the Owner.

B. Protect floor tiles with reinforced Kraft paper or other heavy covering securely taped in place during the construction period to prevent damage and stains. Remove protection when no longer needed.

C. When recommended by tile manufacturer, apply a coat of neutral protective cleaner to completed tilework.

D. Prohibit foot and wheel traffic from tiled floors for at least 7 days after grouting is completed.

E. Before final inspection, remove protective coverings and rinse neutral cleaner from tile surfaces.

F. Leave finished installation clean and free of cracked, chipped, broken, unbonded, or otherwise defective tiles.

END OF SECTION
SECTION 09430
INTERIOR COMPOSITE WALL PANEL

PART 1 - GENERAL

1.1 WORK
A. Provide everything required to complete the work as shown on the Drawings and specified herein.

1.2 QUALITY STANDARDS
A. Provide experienced, well-trained workers competent to complete the work as specified. Fabricator/installer shall be experienced in performing work of similar type and scope.
B. Unless approved by the Architect, provide all related products and accessories from one manufacturer.

1.3 SUBMITTALS
A. Submit the following within 30 calendar days after receiving the Notice to Proceed.

B. Submit list of materials to be provided for this work; manufacturer's data required to prove compliance with these Specifications, manufacturer's installation instructions; shop drawings of the interior composite wall panel system, as required, with complete details and assembly instructions.
C. Submit samples as required for approval by the Architect.

1.4 PRECONSTRUCTION AND PREPARATION
A. Examine and verify that job conditions are satisfactory for speedy and acceptable work.

B. Field Measurements: Secure field measurements before preparation of shop drawings and fabrication where possible, for proper fabrication and installation of the work.

C. Preinstallation Meeting: Conduct preinstallation meeting to verify project requirements, substrate conditions, manufacturer's installation instructions and manufacturer's warranty requirements.

1.5 DELIVERY, STORAGE, AND HANDLING
A. Deliver materials in manufacturer's original, unopened, undamaged containers with identification labels intact. Materials must be transported flat and kept dry and protected from the elements and handled with care.

B. Storage and Protection: Materials must be stored flat and kept dry in a warehouse/storage facility, protected from exposure to harmful weather conditions, at temperatures and humidity conditions recommended by the manufacturer.

1.6 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.

1.7 WARRANTY

A. Project Warranty: Refer to Conditions of the Contract for project warranty provisions.

B. Manufacturer's Warranty: Submit, for Owner's acceptance, manufacturer's standard warranty document executed by authorized company official. Manufacturer's warranty is in addition to, and not a limitation of, other rights Owner may have under Contract Documents.

PART 2 PRODUCTS

2.1 MANUFACTURERS

A. Provide PARKLEX 500 Interior Grade Wood Composite Panels

Distributed by: Finland Color Plywood Corporation
Corporate Headquarters
1310 Main St.
Venice, CA 90291
Bus: (310) 396-9991
Bus Fax: (310) 396-4482
E-mail: info@fcpcusa.com
Warehouses in Los Angeles, CA & Port Newark, NJ
http://www.fcpcusa.com/

Manufactured by: Composites Gurea, S.A.
Zalain Auzoa 13
31780
Vera de Bidasoa, Navarra
Spain
http://www.parklex.com/

B. Substitutions: per Section 01640.

2.2 MATERIALS

A. INTERIOR GRADE WOOD COMPOSITE PANEL: Laminated wood panel, natural timber veneer with wear resistant overlay; inner core resin bonded WBP plywood with HPL balancer on back surface. Assembly system shall be hidden fastening with hanger system.

1. WOOD VENEER:

AMBAR

Smooth surface (standard).

2. PANEL DIMENSIONS:
1220mm (48") x 2440mm (96") x thickness.
Thickness: as indicated on drawings.
3. DIMENSIONAL TOLERANCES:
Length ±2mm, Width ±2mm, Thickness ±0.55mm (10mm thick panel).

4. WEIGHT:
(8mm); 1220mm x 2440mm x 8mm panel weighs approximately 73 pounds.
(10mm); 1220mm x 2440mm x 10mm panel weighs approximately 93 pounds.

5. SURFACE BURNING CHARACTERISTICS:
Class A (Class I) rating - with a flame spread index of 5 and smoke developed index of 10.

6. THERMAL PROPERTIES:

<table>
<thead>
<tr>
<th>Parameter Description</th>
<th>Metric</th>
<th>English</th>
</tr>
</thead>
<tbody>
<tr>
<td>Thermal Conductivity k</td>
<td>0.18 W/m·K</td>
<td>0.104 (Btu/h)/ft·F</td>
</tr>
<tr>
<td>Thermal Resistance R (10mm)</td>
<td>0.0556 K·m²/W</td>
<td>0.315 h·ft²/F/Btu</td>
</tr>
<tr>
<td>Equivalent to R-9.61 (thermal resistance of 1 ft of Parklex insulation, given in h·ft²/F/Btu).</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

7. TECHNICAL DATA:

**ASTM Test Results**

<table>
<thead>
<tr>
<th>Characteristics</th>
<th>Standards and test methods</th>
<th>Values</th>
</tr>
</thead>
<tbody>
<tr>
<td>Density (10mm)</td>
<td>ASTM D 2395 Method A</td>
<td>1.51 g/cc</td>
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<tr>
<td>Moisture Content</td>
<td>ASTM D 4442 Method A</td>
<td>2.1%</td>
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<tr>
<td>Water Absorption (24 h/23°C)</td>
<td>ASTM D 1037 Method B</td>
<td>0.34% by mass</td>
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<tr>
<td></td>
<td></td>
<td>0.56% by volume</td>
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<tr>
<td>Thickness Swelling</td>
<td></td>
<td>0.59%</td>
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<tr>
<td>Flexural Properties</td>
<td>ASTM D 1037</td>
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<tr>
<td>Modulus of Elasticity</td>
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<tr>
<td>veneer parallel to long dim.</td>
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<td></td>
</tr>
<tr>
<td>dry</td>
<td></td>
<td>19.0 GPa (2,756,000 psi)</td>
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<tr>
<td>soaked</td>
<td></td>
<td>18.0 GPa (2,611,000 psi)</td>
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<tr>
<td>veneer perpendicular to long dim.</td>
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<td>9.0 GPa (1,305,000 psi)</td>
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<td>dry</td>
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<td>8.7 GPa (1,261,000 psi)</td>
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<tr>
<td>soaked</td>
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<td></td>
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<tr>
<td>Bending Strength (MOR)</td>
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<tr>
<td>parallel to long direction</td>
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<td>dry</td>
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<td>193 MPa (28,000 psi)</td>
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<td>soaked</td>
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<td>200 MPa (29,000 psi)</td>
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<tr>
<td>perpendicular to long dir.</td>
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<tr>
<td>dry</td>
<td></td>
<td>93 MPa (13,500 psi)</td>
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<tr>
<td>soaked</td>
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<td>108 MPa (15,700 psi)</td>
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<tr>
<td>Bond Durability</td>
<td>APA PS-1 6.1.5</td>
<td></td>
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</tbody>
</table>
maximum load reference 2.58 kN (580 lb-f)  
vacuum/pressure soaked 3.47 kN (780 lb-f)  
boiled (2 cycles) 2.68 kN (600 lb-f)  

Surface Burning Characteristics  
ASTM E-84 Class B (II) / Class A (I)  

ASTM Testing Performed at AEWC Advanced Engineered Wood Composites Center, University of Maine; ASTM E-84 Testing (Surface Burning) performed at Hardwood Plywood & Veneer Association Laboratory, Reston Virginia.

2.3 FABRICATION

A. Fabricate composite panels and accessory items in accordance with manufacturer's recommendations and approved submittals.

B. Fabricate panels to sizes indicated.

PART 3 EXECUTION

3.1 INSPECTION

A. Examine alignment of backup structure prior to installing sub-frame. Do not proceed until all defects are corrected.

3.2 INSTALLATION


B. Install solid interior wall panels plumb and level and accurately spaced in accordance with manufacturer's recommendations and approved submittals.

C. Fasten solid interior wall panels to supporting substrate with fasteners approved for use with adjoining construction.

D. Interface with Other Work: as indicated on drawings

E. Accessory Items: Install corner profiles, gaskets, trim and accessory items with fasteners and adhesive appropriate for use with adjoining construction as indicated on drawings and as recommended by manufacturer.

3.3 DAMAGED MATERIAL

A. Repair or replace all damaged material to the satisfaction of the Architect.

3.4 CLEANING

A. Do not use abrasive cleaners or cleaning tools. Dry wipe down panel sections as work progresses.

B. Provide final cleaning of the wall system.
3.5 PROTECTION

A. Protect installed product and finish surfaces from damage during construction.

END OF SECTION
SECTION 09500

ACOUSTICAL CEILING SYSTEMS

PART 1 - GENERAL

1.01 DESCRIPTION

A. Work Included:
   1. Lay-in acoustical ceiling systems.

B. Related Work:
   1. Section 09100: Metal Support Assemblies.
   1. Sections 09250: Gypsum Board.
   2. Division 15: Mechanical.
   3. Division 16: Electrical.

1.02 QUALITY ASSURANCE

A. Qualifications of Installer: Minimum 5 years experience in installing acoustical ceiling systems of the types specified.

B. Design Criteria:
   1. Deflection of finished surface to 1/360 of span or less.
   2. 1/8 inch maximum permissible variation from true plane measured from 10 foot straightedge placed on surface of finished acoustical fiber units.

C. Requirements of Regulatory Agencies:
   1. Conform to CBC requirements and UL - Tunnel Test for Fire Hazard Classification of Building Materials.
   2. CISCA Code of Practices.
   3. Acoustical Materials:

1.03 SUBMITTALS

A. Samples:
   1. Lay-in panels, 6 inch x 6 inch minimum size.
2. Lay-in Systems: Sample of assembly system to indicate all typical members, connections, splices, wall angle, and colors.

B. Shop Drawings:
   1. Indicate complete plan layouts and installation details.
   2. Indicate related Work of other sections which is installed in, attached to, or penetrates ceiling areas, such as air distribution and electrical devices.

C. Product Data:
   1. Suspension System for Lay-in Ceiling: Printed data for all suspension system components, including load tests.

D. Maintenance Materials: Provide extra panels equal to 1 percent of the area of each typical module size of acoustical panel, but not less than 8 of each size, style and color.

1.04 DELIVERY, STORAGE AND HANDLING

A. Deliver materials to the Project site in original sealed packages.

B. Storage: Store materials in building area where they will be installed, in original package. Keep clean and free from damage due to water or deteriorating elements.

C. Handle in a manner to prevent damage during storage and installation.

D. Provide a minimum of 5% or as required in Division 1 (whichever is greater) surplus tile for repair and maintenance of each type, properly packaged and labeled for storage.

1.05 PROJECT CONDITIONS

A. Environmental Requirements: Maintain temperature in space at 55 degrees F or above for 24 hours before, during and after installation of materials.

B. Scheduling:
   1. Before concealing Work of other sections, verify required tests and inspections have been completed.
   2. Coordinate with related Work of other sections. Coordinate location and symmetrical placement of air distribution devices, electrical devices, and all penetrations with related Work section.

1.06 WARRANTY

A. Provide a 10 year material warranty. Provide a 30 year systems warranty when grid and tile by same manufacturer are used.

B. Provide a 2 year labor warranty.

PART 2 - PRODUCTS

2.01 ACCEPTABLE MANUFACTURERS

A. USG Corporation.

B. Armstrong World Industries.
2.02 MATERIALS

A. Ceiling systems shall consist of lay-in acoustical ceiling panels and suspension systems manufactured by the same company.

B. ACT 1 – Refer to reflected ceiling plans for locations:

1. Acoustical Ceiling Panels: Techzone Integrated Ceiling Systems
   a. Panel Name: Armstrong Ultima Beveled Tegular, or approved equal.
   b. Panel Size: 2 foot x 4 foot, and 6" x 48" Item #1423.
   c. Panel Thickness: 3/4 in.
   d. Edge Detail: Beveled Tegular.
   e. Light Reflectance: 0.90 minimum, complying with ASTM E 1477.
   g. Class” Class A, in accordance with ASTM E 1264.
   h. NRC: Minimum 0.70, UL Classified, complying with ASTM C 423.
   i. Color: White.
   j. Recycled Content: Minimum 50 percent.
   k. Mold and Mildew Resistance: All panels and faces shall be treated with a biocide paint additive to inhibit mold and mildew or an anti-microbial solution.

2. Suspension System: Techzone Integrated Ceiling System
   a. Suspension System Name: Interlude XL by Armstrong, or equal.
   b. Fire Class: Class A.
   e. Axiom Edge Trim: 4”, Axiom Outside Corners posts – AX4OSCP.

C. ACT 3 – Kitchen and related spaces:

1. Acoustical Ceiling Panels:
   a. Panel Name: Armstrong Clean Room VL 870, or USG Sheetrock Lay-In Ceiling Tile ClimaPlus Vinyl 3270.
   b. Panel Size: 2 foot x 4 foot.
   c. Panel Thickness: 1/2 inch minimum.
   d. Edge Detail: Lay in.
e. Light Reflectance: 0.83, complying with ASTM E 1477.
f. CAC: Minimum 40, UL Classified, complying with ASTM E 1414.
g. Class: Class A; complying with ASTM E 1264.
h. Color: White.
i. Recycled Content: 25 percent minimum.
j. Mold and Mildew Resistance: All panel faces shall be treated with a biocide paint additive to inhibit mold and mildew or an anti-microbial solution.

2. Suspension System:
   a. Suspension System Name: Prelude XL by Armstrong with aluminum cap, or Donn DXLA.
   b. Fire Class: Class A.
   d. Color: White – WA (white aluminum capping)
   e. Accessories: BERC-2 Seismic Clip with 7800 wall angle per ICC ESR-1308.

D. Brace Attachment Clip: Manufacturers’ standards to fit system furnished for acoustical panels, as indicated.

E. Vertical Strut: USG Donn Compression Post, or equal, or as indicated; types and designs complying with requirements of authorities having jurisdiction and seismic requirements.

F. Hanger Wire: No. 12 gage (9 gage for pendant fixtures), galvanized carbon steel per ASTM A 641, soft tempered, prestretched.

PART 3 - EXECUTION

3.01 PREPARATION

A. Furnish layouts for inserts, clips or other supports and struts required to be installed by the Work of other trades that depend upon support by the suspended ceiling system.

B. Coordinate related Work to ensure completion prior to installation of clips or fasteners.

C. Lay-In Ceiling Systems: Compare layouts with construction conditions. Tile shall be spaced symmetrically about the centerlines of the room or space, and shall start with a tile or joint line as required to avoid narrow tiles at the finish edges unless indicated otherwise. Joints shall be tight with joint lines straight and aligned with the walls. Ceiling moldings shall be provided where tile abuts wall with matching caulking to eliminate any space.

3.02 INSTALLATION OF SUSPENSION SYSTEMS

A. General:

1. System shall be complete; with all joints neatly and tightly joined and securely fastened; suspension members shall be installed in a true, flat, level plane.

2. Hanger Wires: 12 gage minimum; larger sizes as indicated or required.
a. Fasten wires to panel points and structure above per most stringent requirements of fabricator and CBC and as indicated on Drawings.

b. Wires exceeding 1:6 out-of-plumb shall be braced with counter-sloping wires.

c. Maintain wires 6 inches minimum clear of non-braced ducts, pipes, and other items.

d. Install wire within 6 inches of ends of all main runners and cross-tees at ceiling perimeters.

e. Where obstructions prevent direct suspension, provide trapezes or equivalent devices; 1-1/2 inches minimum cold-rolled channels back to back may be installed for spans to 6 feet max.

f. Wire to be straight, without extraneous kinks or bends and tolerate a 200-pound pull without stretching or shifting the suspension clip.

3. Bracing Wires to Resist Seismic Forces: 12 gage minimum, larger sizes as indicated or required.

   a. System for Bracing Ceilings: Lay-In Ceiling Systems: Install one four-wire set of sway-bracing wires and a vertical strut for each 144 square feet maximum of ceiling area. Locate wire-sets and struts at 12 feet maximum on center. At ceiling perimeters, wire-sets shall be within 6 feet of walls.

   b. Install four-wire sets and struts within 2 inches of cross-runner intersection with main runner; space wires 90 degrees from each other.

   c. Do not install sway bracing wires at an angle greater than 45 degrees with the ceiling plane.

   d. Wires shall be tight, without causing ceiling to lift.

   e. Fasten struts in accordance with CBC requirements.

4. Provide all additional wires, 12 gage minimum, necessary to properly support suspension at electrical devices, air distribution devices, vertical soffits, and other concentrated loads.

5. Suspension:

   a. Suspension members shall be fastened to 2 adjacent walls; but shall be 1/2 inches minimum clear of other walls.

   b. Any suspension members not fastened to walls shall be interconnected to prevent spreading, near their free end, with a horizontal metal strut or 7445 stabilizer bar or 16 gage taut tie wire. Use BERC-2 Clip per ICC ESR-1308.

   c. Provide additional tees or sub-tees to frame openings for lights, air distribution devices, electrical devices, and other items penetrating through ceiling, which do not have an integral flange to support and conceal cut edges of acoustic panels. Provide cross-bracing necessary to securely support any surface mounted fixtures or other items.

6. Attachment of Wires:
a. To Metal Deck or Steel Framing Members: Install as required by current code.

b. To Suspension Members: Insert through holes in members or supporting clips.

c. All wires to be fastened with tight turns; three tight turns minimum for hanger wires; four tight turns minimum for bracing wires. All turns to be made in a 1-1/2 inches maximum distance.

B. Suspension System for 2 Foot x 4 Foot Lay-in Acoustical Ceilings:

1. Main Runners: Install main runners 48 inches apart; 12 gage hanger wires space 48 inches on center maximum along runners, and within 6 inches of ends.

2. Install wall moldings.

3. Cross-Tees: Install between main runners in a repetitive pattern of 2 foot spacings.

4. Sub-Tees: Install at edges of penetrations.

3.03 INSTALLATION OF ACoustical PANELS

A. Install panels into suspension system. Partial panels are to be neatly cut and fitted to suspension and around penetrations and/or obstructions. Duplicate tegular edges at partial panels; cuts to be straight. Repaint cut tiles to match color or as directed by manufacturer for mylar facing at visually exposed conditions or as required by the Architect.

3.04 AIR DISTRIBUTION DEVICES

A. Refer to and coordinate with Division 15, Mechanical.

B. Install air distribution grilles and other devices into suspension system. Install 4 taut wires, each 12 gage minimum, to each device within 3 inches of device corners, to support their weight independent of the system.

3.05 LIGHT FIXTURES

A. Refer to and coordinate with Division 16: Electrical.

B. Fixtures weighing less than 56 Pounds: Install fixtures into suspension systems and fasten earthquake clips to suspension members. Install minimum 2 slack safety wires, each 12 gage minimum, to each fixture at diagonally opposite corners, to support their weight independent of the system.

C. Fixtures weighing more than 56 Pounds: Install fixtures into suspension system and fasten earthquake clips to suspension system members. Install not less than 4 taut 2 gage wires capable of supporting four times the fixture load.

3.06 CLEANING

A. General: After installation of acoustical material has been completed, clean all surfaces of the material, removing any dirt or discolorations.

B. Acoustical Panels: Minor abraded spots and cut edges shall be touched up with the same paint as was used for factory applied finish of the lay-in panels.

3.07 CLEAN UP
A. Remove rubbish, debris and waste materials and legally dispose off of the Project site.

3.08 PROTECTION

A. Protect the Work of this section until Substantial Completion.

END OF SECTION
SECTION 09510
ACOUSTICAL FIBER UNITS

PART 1 - GENERAL

1.01 SUMMARY

A. Provisions of the General and Supplementary Conditions and Division 01 apply to this section.

B. Section includes:
   1. Acoustic fiber units as indicated.
      a. Ceiling Panels

C. Related Sections:
   1. Section 09100: Metal Support Assemblies.
   2. Sections 09250: Gypsum Board.

1.02 SYSTEM DESCRIPTION

A. Product Requirements: The acoustical fiber units shall be uniformly thick with tolerances of not to exceed plus or minus 1/8 inch. Permitted span distances shall not exceed manufacturer’s recommendations.

B. Single Source Responsibility: Provide acoustical fiber units from a single manufacturer.

C. Regulatory Requirements:
   1. The acoustical fiber units shall have a flame spread rating of 25 or less when tested in accordance with ASTM E 84 for the exposed interior surface.
   2. The acoustical fiber units shall have been manufactured, fabricated and installed to provide a Noise Reduction Coefficient (NRC) rating as indicated on the Drawings.

1.03 SUBMITTALS

A. Product Data:
   1. Submit a complete list of proposed materials.
   2. Submit manufacturer’s installation instructions.
   3. Submit manufacturer’s recommended procedures for normal cleaning and removal of stains including precautions in furnishing of cleaning materials that may be detrimental to surfaces.

B. Material Samples: Submit Samples of color and texture, minimum 6 inches x 6 inches.
1.04 QUALITY ASSURANCE
A. Qualifications of Installer: Minimum 5 years experience in installing acoustical fiber units in projects of similar size and complexity.
B. Design Criteria:
   1. Deflection of finished surface limited to 1/360 of span or less.
   2. 1/8 inch maximum permissible variation from true plane measured from 10 foot straightedge placed on surface of finished acoustical fiber units.
C. Requirements of Regulatory Agencies:
   1. Conform to CBC requirements and UL - Tunnel Test for Fire Hazard Classification of Building Materials.
   2. CISCA Code of Practices.
   3. Acoustical Materials:

1.05 DELIVERY, STORAGE AND HANDLING
A. Deliver materials to the Project site in original sealed packages.
B. Storage: Store materials in building area where they will be installed, in original package. Maintain and protect from damage due to water or deteriorating elements.
C. Handle in a manner to prevent damage during storage and installation.

1.06 PROJECT CONDITIONS
A. Environmental Requirements: Maintain temperature in space at 55 degrees F or above for 24 hours before, during and after installation.
B. Scheduling:
   1. Before concealing Work of other sections, verify required inspections have been completed.
   2. Coordinate with related Work of other sections. Coordinate location and symmetrical placement of air distribution devices, electrical devices, and all penetrations with related Work section.

PART 2 - PRODUCTS

2.01 MANUFACTURER
A. Tectum Inc.: Cementitious Wood Fiber Acoustical Products, or equal.
2.02 MATERIALS

A. Acoustical Ceiling System

1. Tectum Direct-Attached Ceiling Panels, or equal.
   b. Thickness: 2”.
   c. Color: Factory painted white.
   d. Size: As indicated on Drawings.
   e. Edge trim.

PART 3 - EXECUTION

3.01 PREPARATION

A. MANUFACTURER'S INSTRUCTIONS

1. Comply with the instructions and recommendations of the acoustical wall panel system manufacturer.

2. Install materials in accordance with governing regulations, fire resistance rating requirements and applicable industry standards.

B. EXAMINATION

1. Site Verification of Conditions:
   a. Examine surfaces scheduled to receive suspended or directly attached acoustical units for unevenness, irregularities and dampness that would affect quality and installation.
   b. Do not proceed with installation of wall panel system until unacceptable conditions are corrected.

3.02 INSTALLATION

A. Screw head to be flush with panel surface.

B. Securely fasten wall panels by means of splines attached vertically to smooth wall or furring strips. Engage vertical kerfs on the edges of the wall panels with splines. Install adhesive or furnish Velcro hook and loop fastening where necessary. Fasteners to meet or exceed panel manufacturers requirements for size spacing and purchase depth.

B. Cover field cut edges by means of trim or other moldings.

3.03 CLEANING
A. Clean exposed surfaces of acoustical panel, trim, moldings and suspension members to comply with manufacturer's instructions for cleaning.

B. Touch up any minor finish damage.

C. Remove and replace damaged Work.
3.04 PROTECTION

A. Protect the Work of this section until Substantial Completion.

3.05 CLEANUP

A. Remove rubbish, debris, and waste materials and legally dispose of off the Project site.

END OF SECTION
SECTION 09621
SYNTHETIC ATHLETIC FLOORING
EXERCISE ROOM

PART 1 - GENERAL

1.01 SUMMARY
A. Provisions of the General and Supplementary Conditions and Division 01 apply to this section.
B. Section Includes:
   1. Resilient Synthetic Athletic Flooring.
C. Related Sections:
   1. Section 03300: Cast-in-Place Concrete
   2. Section 07130: Sheet Waterproofing.
   3. Section 08710: Door Hardware.
   4. Section 09658: Rubber Base
   5. Section 13100: Athletic Equipment

1.02 DEFINITIONS
A. Pop-up: A pop-up is defined as any surface deviation or looseness of substrate that is equal to or greater than 1/64 (0.015625) inch above the concrete floor level, regardless of the size.

1.03 SUBMITTALS
A. Product Data: Submit manufacturers published technical data describing materials, construction and recommended installation procedures.
B. Samples: Submit Samples of each type of synthetic athletic flooring in each available color. Submit pint cans of each type of adhesive.
C. Installers Experience Qualifications: Submit list of not less than 5 projects, extending over period of not less than 5 years, indicating installers experience record. Submit letter from manufacturer showing manufacturer's approval for installer of the products.
D. Closeout Submittals: Submit manufacturer's cleaning, maintenance and repair instructions.

1.04 QUALITY ASSURANCE
A. Comply with the following as a minimum requirement:
   1. Qualifications of Installer: Minimum 5 years experience in successfully installing the same or similar flooring materials.
   2. Installed surfaces and level changes shall be ADA compliant.
3. Permanent heat, light and ventilation shall be installed and operating during and after installation, maintaining a temperature range of 55 degrees to 78 degrees F. and a relative humidity range of 35 to 50 percent.

4. Environmental Limitations:
   a. Comply with requirements of athletic flooring material supplier’s requirements.
   b. Adhere to all MSDS requirements for materials installed in the Work of the section. Protect all persons from exposure to hazardous materials.

5. Material Fire Safety:
   a. ASTM E 84: Class A Flame Spread Rating of 25 or less.

B. Qualifications:
   1. Supplier: Synthetic athletic flooring manufacturer shall have been regularly engaged in business of manufacturing products of this section for at least 5 years.
   2. Installer: Trained and certified by flooring manufacturer.

1.05 DELIVERY, STORAGE AND HANDLING

A. Materials shall be delivered to the Project site in original unopened manufacturer’s packaging clearly labeled with manufacturer’s name. Materials shall be stored at not less than 55 degrees F and 50 percent relative humidity for not less than 48 hours before installation.

1.06 PROJECT CONDITIONS

A. Ventilation and Temperature: Verify areas that are to receive new flooring are ventilated to remove fumes from installation materials and areas are within temperature range recommended by the material manufactures for Project site installation conditions.

1.07 WARRANTY

A. Provide a 2 year material and labor warranty.

PART 2 - PRODUCTS

2.01 ACCEPTABLE MANUFACTURERS

A. Mondo USA, Sport Impact Flooring System, or equal.

2.02 MATERIALS

A. Mondo Sport Impact: Prefabricated rubber athletic flooring, calandered and vulcanized with a mixture of natural and synthetic rubber. The product is manufactured in two layers which are vulcanized together.

   1. Size: Rolls 6.0mm thick and 6' wide.
   2. Colors: as specified by the Architect from manufacturers standard selection.
B. Concrete Primer: Non-staining type recommended by manufacturer of synthetic athletic flooring.

C. Crack Filler and Leveling Compound: Cementitious type, shall be Durabond's Webcrete # 95, Ardex SD-F, Armstrong S-194 or as recommended by flooring manufacturer.

D. Moisture Detection Equipment: Calcium chloride testing system, consisting of pre-packaged anhydrous calcium chloride crystal test kits, and an electronic gram weight scale measurable in 1/10 grams. Equipment as manufactured by one of the following:

E. Adhesive – two-component polyurethane as supplied by Mondo USA, or equal.
   1. An epoxy adhesive for questionable substrates shall be as submitted and reviewed by the Architect.

F. Optional Base: Rubber wall base, 4" high; or as detailed in the Drawings.

PART 3 - EXECUTION

3.01 COORDINATION

A. Coordinate with related Work to assure level, smooth and clean finish surfaces to receive Work of this section.

B. Inspect concrete slab for proper tolerance and dryness.

3.02 EXAMINATION

A. Field verify all dimensions, examine surfaces and other conditions, and correct deficiencies before commencing the Work of this section.

3.03 PREPARATION

A. Concrete Slabs:
   1. Leveling: Check subfloors for level, and provide floor slabs true to level and plane within a tolerance of 1/8 inch in 10-feet. Test floor areas both ways with a 10-foot straightedge and repair high and low areas exceeding allowable tolerance. Pop ups shall be hammered out and floor filled with a cementitious leveling compound. Remove high areas by power sanding, stone rubbing or grinding, chipping off and filling with leveling compound, or equivalent method. Fill low areas with leveling compound. Repair and level the surfaces having abrupt changes in plane, such as trowel marks or ridges, whether or not within the allowable tolerance. Clean areas where repairs are performed.
   2. Cleaning: After leveling, if required, clean substrates of all deleterious substances and foreign matter.
   3. Cracks or Depressions: Fill void spaces with cementitious leveling compound of the type recommended by flooring manufacturer for the specific conditions.
   4. Moisture Testing: Test new and old concrete slabs for adequate dryness. Testing shall conform to ASTM F 1869 and the following minimum testing requirements of 3
calcium chloride tests for the first 1,000 square feet of floor area, and one for each additional 1,000 square feet or fraction thereof. Unless more stringent requirements are recommended by flooring manufacturer, maximum allowable moisture release at time of flooring installation shall be 3 pounds per 24 hours per 1,000 square feet. Provide report of test as specified above. For each test, perform the following steps:

a. Weigh the sealed dish of crystals immediately prior to exposure. Record starting weight, date and time.

b. Open kit and set crystal dish on clean concrete surface. Immediately install plastic dome over the dish. Make sure the dome is gasketed to the concrete and is airtight.

c. Leave test to absorb moisture for 60 to 72 hours. Keep room temperature above 55 degrees F for duration of test.

d. After exposure, remove and discard housing. Replace dish lid and tape shut. Weigh the sample within one hour of removal from floor.

e. Compute the vapor emission in pounds, indicate location of test and vapor emission on report.

f. Delay application of flooring until sub-floors are sufficiently dry, or perform remedial measures as recommended by flooring materials manufacturer.

5. Priming: Prime concrete floor slabs on grade; prime other slabs if so recommended by flooring manufacturer.

3.04 INSTALLATION OF SHEET FLOORING

A. Install product according to manufacturers written instructions,

1. Fit flooring neatly and tightly around penetrations. Scribe flooring to doorjambs. Terminate in center of doorways beneath closed doors.

A. Wall Base: Install vinyl base with recommended adhesive.

1. Installation of Trim Shapes: Provide reducer strips to cover all exposed edges of resilient flooring. Provide carpet-to-tile strips at junctions with carpet.

3.05 CLEANING

A. Maintain all floors in a clean condition as installation progresses.

B. Clean finished flooring and remove foreign substances.

C. Clean adjacent surfaces of adhesive or other materials. Replace all damaged or defective Work.
3.06 CLEAN UP
   A. Remove rubbish, debris and waste material and legally dispose of off the Project site.

3.07 PROTECTION
   A. Protect the Work of this section until Substantial Completion.

3.08 INSTRUCTION
   A. After the Work of this section is complete, and prior to Substantial Completion, flooring manufacture’s technical representative shall provide a 4 hour instruction period to Owner’s staff in maintenance of installed flooring.

END OF SECTION
SECTION 09645
RESILIENT WOOD FLOORING ASSEMBLIES
GYMNASIUMS

PART 1 - GENERAL

1.01 SUMMARY

A. Provisions of the General and Supplementary Conditions and Division 01 apply to this section.

B. Section Includes:

1. Resilient Wood Flooring System, including game lines, as indicated.

C. Related Sections:

1. Section 03300: Cast-In-Place Concrete.
2. Section 08710: Door Hardware.
3. Section 09658: Rubber Base.
4. Section 09900: Paints and Coatings
5. Section 13100: Athletic Equipment

1.02 SUBMITTALS

A. Shop Drawings: Submit Shop Drawings, including plans and details, indicating areas of flooring and details of installation and finishing. Indicate line markings and school logo locations, colors and details.

B. Material Samples: Submit Samples of finished flooring system mounted on plywood backing. Include exposed edge condition.

C. Installation Instructions: Submit manufacturer's installation instructions.

D. Closeout Submittals: Submit manufacturer's cleaning, maintenance and repair instructions.

1.03 QUALITY ASSURANCE

A. Comply with the following as a minimum requirement:

1. Installed surfaces and level changes shall be ADA compliant.

2. Hard maple flooring shall be grade marked and stamped according to standards of the Maple Flooring Manufacturers Association (MFMA) for MFMA-RL. MFMA-FJ is not permitted.

3. Wood shall be grade marked and stamped according to MFMA Standards.
4. Permanent heat, light and ventilation shall be provided and operating during and after installation, maintaining a temperature range of 55 degrees to 78 degrees F. and a relative humidity range of 35 to 50 percent.

5. Performance Testing:
   a. Flooring system shall have been independently tested and evaluated for athletic performance according to the international standard DIN 18032, Part 2.
   b. Flooring system shall have been independently tested for S.T.E.M. by the Wood Institute at Michigan Tech.

B. Qualifications:
   1. Supplier: Wood flooring manufacturer shall have been regularly engaged in business of manufacturing resilient wood flooring systems of the type specified for at least 5 years.
   2. Installer: Trained and certified by flooring manufacturer.

1.04 DELIVERY, STORAGE AND HANDLING
   A. Floor system shall not be delivered to the Project site or installed until the building is enclosed and other quality assurances are verified. Flooring shall be stored under ambient building conditions for at least 7 days before installation. Comply with flooring manufacturer's recommendations for acclimation during storage and before installation.

1.05 WARRANTY
   A. Provide a 2 year material and labor warranty.

2. PRODUCTS

2.01 ACCEPTABLE MANUFACTURERS
   A. Conner Sports Flooring, PermaFlex floating sports flooring system; Tarkett Sports, Clutch Court-Performance, or equal. *(Contractor Note: Slab depression is based on Conner Flooring 3" depth. Other manufacturers may have different depth requirements)*.

2.02 FABRICATION
   A. Vapor Barrier: 6 mil polyethylene.

   B. Sleepers
      a. Upper Flex Sleeper 8' X 3 - 3/4" X 23/32" APA rated plywood exposure 1.
      b. Lower Base Sleeper 8'X 4" X 3/4" APA rated plywood exposure 1.
      c. Steel encasement: 16 Gauge Coated Steel.
   
   C. Resilient pads 7/16" thick - 2" X 2" Din pads.
D. Subfloor - sheeting shall be 15/32” APA rated sheeting exposure 1.

E. Fasteners:
   a. Flooring fasteners - 1-3/4” barbed cleats or coated staples.
   b. Subfloor fasteners - 1 1/4” subfloor staple or screws and adhesive.

F. Flooring 25/32 inch x 2-1/4 inch, second and better grade, TGEM, Northern Hard Maple MFMA-RL, with continuous tongue and groove, and special locking groove under tongue. Flooring systems shall be treated with Woodlife preservative.

G. Wood Filler: As recommended by floor finish manufacturer.

H. Finish: Sealer and finish to be by same manufacturer.
   1. First and Second Coats: Supersport Sealer (waterborne), by Bonakemi USA, Inc., or equal
   2. Third, Fourth, Fifth, Sixth and Seventh Coats: Supersport One (waterborne), by Bonakemi USA, Inc., or equal. Gloss finish.

I. Paint: 100% acrylic paint for game lines and logo shall be as recommended by flooring finish manufacturer, and compatible with sealer and finish.

J. Base shall be maple or heavy-duty molded rubber cove base as indicated on Drawings:
   1. Where maple perimeter molding is indicated, install at wall as detailed.
   2. Where rubber base is indicated, provide 3 inch x 4 inch ventilating type with pre-molded outside corners.

PART 3 - EXECUTION

3.01 EXAMINATION
   A. Examine areas to receive wood flooring for proper tolerance and quality assurances. Correct unsatisfactory conditions before starting Work of this section.

3.02 INSTALLATION
   A. Cover concrete with polyethylene sheeting with a minimum joint lap of 6 inches. Continuously seal joints with adhesive recommended by sheeting manufacturer.

   B. Sleepers:
      1. Install sleepers 16 inches on center at a right angle to finished flooring. Joints shall be staggered at least 4 feet away from each other in each adjacent strip.

   C. Sub-Floor:
      1. Layout plywood in staggered brick pattern or according to sleeper layout with long dimensions parallel to and resting on sleepers. Offset all plywood edges at least 2 feet from all sleeper end joints. Fasten plywood with a single ribbon of adhesive and 1-1/2 inch staples installed at 12 inches on center.
      2. Provide 1-1/2 inch expansion void at perimeter and at all vertical obstructions.
D. Install maple flooring by power nailing or stapling approximately 12 inches on center with end joints tight. Flooring fasteners are not permitted to be in contact with steel channel.

E. If required, size joints between flooring strips to provide expansion in accordance with Project site humidity conditions.

F. Sanding: After other interior building Work is completed, floors shall be swept clean and sanded as follows:
   1. Floors shall be sanded diagonally from wall to wall in one direction, and then shall be sanded diagonally from wall to wall in the opposite direction with No. 2-1/2 sandpaper.
   2. Floors shall then be sanded longitudinally, first with No. 1-1/2 sandpaper, second with No. 1/2 sandpaper and third with No. 0 sandpaper, to remove sander marks.
   3. Provide a 12 inch drum sander, and sweep floor clean between each sanding.
   4. Wherever a drum sander cannot be used, floor shall be sanded as specified above, by use of a spinner to produce uniformly finished floor surfaces.
   5. Remove sanding dust from entire surface by tack or vacuum.
   6. Inspect entire area of floor to insure that surface is acceptable for finishing, completely free from sanding dust.

3.03 WOOD FILLER
   A. Install wood filler by brush, followed by wiping across grain to penetrate filler material into pores and cracks of flooring.

3.04 FINISHING
   A. Examine entire area of floor to ensure that surface is acceptable for finishing, completely free and clean from sanding dust.
   B. Install two coats of water-borne sealer and five coats of finish. Install with 18 inch applicator. Machine application is not permitted.
   C. Paint school logo and game lines as indicated on Drawings using colors indicated. Paint shall be installed between sealer and first coat of finish or between finish coats as per finish manufacturer’s written instructions.
   D. Buff and clean floor between each coat.
   E. Base shall be as indicated on Drawings:
      1. Install maple molding with 45 degree miter joints and double-nail corners. Fasten into blocking or last board.
      2. Install rubber base and pre-molded outside corners.

3.05 CLEANUP
   A. Remove rubbish, debris and waste materials and legally dispose of off the Project site.

3.06 PROTECTION
   A. Protect the Work of this section until Substantial Completion.
3.07 INSTRUCTION

A. After Work of this section is complete, but before Substantial Completion, flooring manufacturer's technical representative shall provide a 4 hour instruction period to Owner's staff in maintenance of flooring.

END OF SECTION
PART 1 GENERAL

1.1 SECTION INCLUDES
   A. Wood platform flooring system.

1.2 RELATED SECTIONS
   A. Section 03300 - Concrete: Concrete sub-floor construction and tolerances.

1.3 SUBMITTALS
   A. Submit under provisions of Section 01300.
   B. Product Data: Manufacturer's data sheets on each product to be used, including:
      1. Preparation instructions and recommendations.
      2. Storage and handling requirements and recommendations.
      3. Installation methods.
   C. Shop Drawings:
      1. Layout of flooring and details of installation.
   D. Selection Samples: For each finish product specified, two complete sets of color samples representing manufacturer's full range of available colors and patterns.
   E. Verification Samples: For each finish product specified, two samples, minimum size 6 inches (150 mm) square, representing actual product, color, and patterns.

1.4 QUALITY ASSURANCE
   A. Installer Qualifications: Installer shall have at least three years experience in installing similar dance floor systems and shall be approved by the manufacturer.
   B. Mock-Up: Provide a mock-up for evaluation of surface preparation techniques and application workmanship.
      1. Finish areas designated by Architect.
      2. Do not proceed with remaining work until workmanship, color, and sheen are approved by Architect.
      3. Refinish mock-up area as required to produce acceptable work.

1.5 DELIVERY, STORAGE, AND HANDLING
   A. Store products in manufacturer's unopened packaging until ready for installation.
   B. Store and dispose of solvent-based materials, and materials used with solvent-based materials, in accordance with requirements of local authorities having jurisdiction.

1.6 PROJECT CONDITIONS
   A. The flooring system shall not be delivered and installed until all masonry, plastering,
tile work and all overhead mechanical and electrical trades are completed and building is enclosed and weather tight.

B. Permanent heat, light and ventilation shall be installed and operating during and after installation, maintaining a temperature range of 60 to 75 degrees F (15.5 degrees to 24 degrees C) and a relative humidity range of 35 percent to 50 percent.

C. 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.

1.7 WARRANTY

A. Manufacturer warrants its sub floor construction materials to be free from manufacturing defects for a minimum of two years and its integrated vinyl surfaces to be free from manufacturing defects for five years.

PART 2 PRODUCTS

2.1 MANUFACTURERS

A. Acceptable Manufacturer: American Harlequin Corporation; 1531 Glen Ave., Moorestown, NJ 08057. ASD. Toll Free Tel: (800) 642-6440. Fax: (856) 231-4403. Email: dance@harlequinfloors.com; Web: www.harlequinfloors.com

B. Requests for substitutions will be considered in accordance with provisions of Section 01600.

2.2 HARLEQUIN LIBERTY SPRUNG FLOOR SYSTEM

A. System: The Harlequin permanent panel floor is comprised of multiple, fully pre-manufactured, panels that are joined by means of a modified tongue and groove interconnection. Panel uniformity shall be achieved by utilization of raw materials and manufacturing techniques over which exacting quality control is exercised. The nature and specific placement pattern of the progressively resistant Dual-Durometer Suspension Towers adhered to the underside of the panel produces a safe suspension that is uniform and consistent across the entirety of the assembled floor surface. Delivered in standard panel sizes of 48 inches by 96 inches (1219 mm by 2438 mm) and 48 inches by 48 inches (1219 mm by 1219 mm) panels are easily cut by the installer to fit spaces of any dimension. The method of installation and panel connection permits subsequent relocation of the Harlequin Panel Floor System.


B. Performance:

1. Maximum Static Load: 1200 lb (650 kg).
2. Maximum Dynamic Load: 555 lb (300 kg).
3. Weight per panel (permanent installation): 80 lb (36.5 kg).
4. Overall Thickness: 1-1/2 inches (37 mm) plus flooring.

C. Finish:

1. Vinyl Performance Surface: Harlequin Standfast, thickness: 0.120 inch (3 mm).

D. Panel: 3/4 inch (19 mm) thick, balanced construction, single piece.

E. Face: Maple face, engineered hardwood core compressed with water resistant phenolic resins yielding void free density of 41.3 lb/cf (656 kg/cu. M), cross band
reinforced.

F. Suspension: Synthetic, closed cell, cellular urethane, 3/4 inch (19 mm) thick, (length, width, and pattern of placement as engineered by manufacturer), Dual-Durometer, combined low and high modulus. Flammability burn rate (inches per minute) = 0.

G. Finish: Clear, abrasion resistant, nonflammable, polyurethane.

H. Tongue: Dowel, hardwood, uniform concentricity, diameter 3/8 inch (9.5 mm), length variable.

I. Bottom: Attached to suspension towers of stage panel model, 1/8 inch (3 mm) hardboard; tempered.

PART 3 EXECUTION

3.1 EXAMINATION

A. Do not begin installation until substrates have been properly prepared.
   1. The Contractor shall provide a concrete slab smooth and level to a tolerance of 1/4 inch (6.5 mm) in a 10 feet (3 m) radius. High areas shall be ground down and low areas filled with appropriate leveling compounds.
   2. Concrete sub floors shall be cured and dry to industry standards. They shall have an adequate moisture barrier beneath and at the perimeter of the slab.
   3. Wood sub floors shall be structurally sound, and level. Loose boards and nails shall be secured and gaps filled.

B. If substrate preparation is the responsibility of another installer, notify Architect of unsatisfactory preparation before proceeding.

3.2 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.

3.3 INSTALLATION

A. Install in accordance with manufacturer's instructions.
   1. Flooring shall be stored on the premises for 24-48 hours before installation commences, or as required for acclimation. The flooring installer will make final determination of acclimation period.

B. Installation:
   1. Cover membrane with lower suspension material, butt seams tightly and tape, leaving 3/8 inch (9 mm) to 1/2 inch (13 mm) expansion void at walls and other adjoining structures. Cover suspension material with top suspension material, butt seams tightly, leaving 3/8 inch (9 mm) to 1/2 inch (13 mm) expansion void at walls and other adjoining structures.
   2. Lay load distribution panels with length parallel to length of space. Lay subsurface panels at 90 degrees and secure to load distribution with adhesive and mechanical fasteners. Fill and sand seams of subsurface. Fold and trim membrane across surface edges.
   3. Install performance surface vinyl.
      a. Flooring contractor shall be approved and certified by the manufacturer of the flooring materials.
4. Install manufacturer’s perimeter skirt profile.

C. Installation:
   1. Attach neoprene pads, under first layer of 1 by 3 Clear Pine, on 16 inches (406 mm) centers.
   2. Lay three layers of basket weave stringers 1 by 3 Clear Pine.
   3. Lay load distribution panels with length parallel to length of space. Lay subsurface panels parallel and secure to load distribution with adhesive and non-return mechanical fasteners. Fill and sand seams of subsurface.
   4. Install performance surface vinyl.
      a. Flooring contractor shall be approved and certified by the manufacturer of the flooring materials.

D. Installation:
   1. Strike a chalk line parallel to the length wall 48-3/4 inches (1238 mm) from wall; this line will serve as a guide to install the first row of panels.
   2. Locate and attach 2 inches by 2 inches by 3/4 inches (51 mm by 51 mm by 19 mm) solidification blocks on back of first full panel with 1-1/4 inches (32 mm) staples or #3 finish nails.
   3. Secure first panel to sub-floor (leaving 3/4 inch (19 mm) gap at all walls) with 1/4 inch (6 mm) by 2-3/4 inches (70 mm) TapCon screws through indicated points (through center of 2 by 2 blocks). Drill 1/4 inch (6 mm) hole through panel and 2 by 2 block. Counter-sink hole with 1/2 inch (13 mm) counter sink to achieve flush installation of TapCon. Drill pilot hole in sub-floor and attach panel precisely on guide line. Install second panel with joint tight and attach only at 96 inches (2438 mm) edge with 4 screws. Continue to the end of the wall and attach last panel or cut panel with 3/4 inch (19 mm) gap at end wall, anchors at length and end wall.
   4. Proceed to the left of the room and start the second row with 48 inches by 48 inches (1219 mm by 1219 mm) panel; attach at wall with 3 anchors and install field panels securely with no anchors.
   5. Use pry bar to tighten last panel at end and length walls while attaching the sub-floor.
   6. Panels are designed with 1/32 inch (3/4 mm) gap at joints for flexing.

3.4 PROTECTION

A. Protect installed products until completion of project.

B. Touch-up, repair or replace damaged products before Substantial Completion.

END OF SECTION
SECTION 09651
RUBBER FLOORING AND STAIR COVERING

PART 1 - GENERAL

1.01 SUMMARY

A. Provisions of the General and Supplementary Conditions and Division 01 apply to this section.

B. Section Includes:

1. Rubber tile flooring and stair covering as indicated.

C. Related Sections:

1. Section 03300: Cast-in-Place Concrete.

2. Section 09658: Rubber Base.

1.02 DEFINITIONS

A. Pop-up: A pop-up is defined as any surface deviation or looseness of substrate that is equal to or greater than 1/64 (0.015625) inch above the concrete floor level, regardless of the size.

1.03 SUBMITTALS

A. Product Data: Submit manufacturer’s published technical data describing materials, construction and recommended installation procedures. Submit technical data and installation instructions for each adhesive material. Submit list and Product Data of recommended finish materials.

B. Maintenance Instructions: Submit manufacturer’s recommendations for maintenance, care, cleaning of rubber tile.

C. Samples: Submit Samples of rubber tile in each available color and pattern. Following color selections, submit full size Samples of each selected color and pattern. Submit pint cans of each type adhesive.

D. Maintenance Materials: Before Substantial Completion, deliver one unopened container of each color and pattern of rubber tile in each color and pattern installed. Label each container indicating locations installed. Include unopened cans of adhesives adequate to install the maintenance materials.

E. Installer’s Experience Qualifications: Submit list of not less than 5 projects, extending over period of not less than 5 years, indicating installer’s experience record. Submit letter from manufacturer indicating manufacturer’s approval for installer of the products.

1.04 QUALITY ASSURANCE

A. Qualifications of Installer: Minimum 5 years experience in successfully installing the same or similar flooring materials.

B. Comply with the following as a minimum requirement:

1. ASTM E 84: Class A Flame Spread Rating of 25 or less.
1.05 DELIVERY, STORAGE AND HANDLING
   A. Materials shall be delivered to Project site in original unopened manufacturer’s packaging clearly labeled with manufacturer’s name. Materials shall be stored at not less than 70 degrees F for not less than 48 hours before installation.

1.06 PROJECT CONDITIONS
   A. Ventilation and Temperature: Verify areas that are to receive new flooring are ventilated to remove fumes from installation materials, and areas are within temperature range recommended by the various material manufactures for Project site installation conditions.

1.07 WARRANTY
   A. Provide a 2 year warranty for material and labor.

PART 2 - PRODUCTS

2.01 ACCEPTABLE MANUFACTURERS
   A. Burke/Mercer Flooring Products, 2250 S. Tenth Street, San Jose, CA 95112.
   B. Roppe Corporation, 1602 North Union Street, Fostoria, OH.
   C. Flexco Company, P.O. Box 553, Tuscumbia, AL 35674.

2.02 MATERIALS
   A. Rubber Tile: ASTM F 1344 Class I B, homogeneous rubber tile, through mottled pattern, 12 inches by 12 inches, 1/8 inch thick, conforming to ADA requirements for non-slip materials.
   B. Stair Covering:
      1. Treads: Extruded rubber with 2 or more flush integral abrasive strips, designed for installation on stairs of configuration indicated, colors and patterns as selected. Provide contrasting color insets, 2-1/4” inches wide, 1-inch from nosing, unless otherwise indicated, in colors as selected, fabricated of tread material.
      2. Risers and Skirting: 1/8 inch thick rubber in selected colors, with exposed edges factory radius molded.
   C. Crack Filler and Leveling Compound: Cementitious type, shall be Durabond’s Webcrete # 95, Ardex SD-F, Armstrong S-194 or as recommended by flooring manufacturer.
   D. Concrete Primer: Non-staining type recommended by manufacturer of rubber tile.
   E. Adhesive: Water based, low odor type formulated specially for use with rubber tile, and manufactured or recommended by manufacturer of rubber tile.
   F. Reducer Strips: Tapered rubber not less than one inch wide, and thickness to match tile.
   G. Moisture Detection Equipment: Calcium chloride testing system, consisting of pre-packaged anhydrous calcium chloride crystal test kits, and an electronic gram weight scale measurable in 1/10 grams. Equipment shall be manufactured by one of the following, or equal:

H. Underlayment: One of the following, grade stamped on panels as indicated.
   1. Underlayment A-C Exterior, Sanded Face.
   2. Underlayment B-C Exterior, Sanded Face.
   4. Underlayment C-C. Plugged Exterior, Sanded Face.

I. Floor Finish: Polymer type recommended by manufacturer for rubber flooring, UL rated non-slip.

PART 3 - EXECUTION

3.01 COORDINATION
   A. Coordinate with related Work to assure level, smooth and clean finish surfaces to receive rubber floor tile and stair covering.

3.02 EXAMINATION
   A. Field verify dimensions and other conditions affecting the Work of this section.
   B. Before Work is commenced, examine surfaces that are to receive rubber tile and stair covering. Deficiencies shall be corrected before starting Work of this section.

3.03 PREPARATION
   A. Concrete Slabs:
      1. Do not start preparation until adjacent concrete floor slabs are at least 90 days old.
      2. Leveling: Check sub-floors for true to level and plane within a tolerance of 1/8 inch in 10-feet. Test floor areas both ways with a 10-foot straightedge and repair high and low areas exceeding allowable tolerance. Pop ups shall be hammered out and floor filled with a cementitious leveling compound. Remove high areas by power sanding, stone rubbing or grinding, chipping off and filling with leveling compound, or equivalent method. Fill low areas with leveling compound. Repair and level the surfaces having abrupt changes in plane, such as trowel marks or ridges, whether or not within the allowable tolerance. Clean areas where repairs are performed.
      3. Cleaning: After leveling, clean substrates of all deleterious substances and foreign matter. Fill cracks or depressions with cementitious leveling compound of the type recommended by flooring manufacturer for the specific Work conditions.
      4. Moisture Testing: Test new and old concrete slabs for adequate dryness. Testing shall conform to ASTM F 1869 and the following; minimum testing requirements are 3 calcium chloride tests for the first 1,000 square feet of floor area and one for each additional 1,000 square feet or fraction thereof. Unless more stringent requirements are recommended by flooring manufacturer, maximum allowable moisture release at time of flooring installation shall be 3 pounds per 24 hours per 1,000 square feet. Provide report of test as specified above. For each test, perform the following steps:
a. Weigh the sealed dish of crystals immediately prior to exposure. Record starting weight, date and time.

b. Open kit and set crystal dish on clean concrete surface. Immediately install plastic dome over the dish. Make sure the dome is gasketed to the concrete and is airtight.

c. Leave test to absorb moisture for 60 to 72 hours. Keep room temperature above 55 degrees F. for duration of test.

d. After exposure, remove and discard housing. Replace dish lid and tape shut. Weigh the sample within one hour of removal from floor.

e. Compute the vapor emission in pounds, indicate location of test and vapor emission on report.

f. Delay application of flooring until sub-floors are sufficiently dry, or perform remedial measures as recommended by flooring materials manufacturer.

5. Priming: Prime concrete floor slabs on grade; prime other slabs if recommended by flooring manufacturer.

3.04 INSTALLATION OF TILES

A. Color and pattern: Install tiles in a rectangular pattern, in one color without border in all rooms or spaces, unless otherwise indicated.

B. Special designs: Floor with special designs shall be installed as indicated on Drawings or as required by Architect.

C. Install rubber floor tile and stair covering when ambient temperature is 70 degrees F. or higher.

D. Install the tile adhesive in a thin film evenly with a notched trowel. Trowel notches shall be as recommended by flooring manufacturer.

1. Mix adhesive in accordance with manufacturer’s instructions. Provide safety precaution during mixing.

2. Install adhesive only in the area that can be covered by flooring material within the adhesive manufacture’s recommended working time.

3. Remove any adhesive that has dried or filmed over.

4. Adhesive application rate shall be as required to avoid telegraphing trowel lines to the surface after maintenance coatings are applied. Adjust tile runoff during installation if necessary.

E. Provide reducer where floor covering edges are exposed, such as at center of the door or where floor coverings terminate.

F. Install rubber tile in accordance with manufacturer’s recommendations. Tiles shall fit snugly at wall. Closely trim to pipes, jambs, outlets, and similar conditions.

G. Install tiles symmetrically about centerlines of areas while progressing toward walls. Adjust border tiles as required. Tiles shall be straight and joints close. Tile shall be cut to fit snugly at doorframes and walls.
H. Mechanically cut flooring material to provide square true edges.

I. As floor tile is installed, the floor shall be rolled with a clean, 150-pound roller in both directions.

3.05 INSTALLATION OF STAIR TREADS, RISERS AND SKIRTING

A. Stair Treads: Install in one-piece size on each tread, tightly jointed to walls and risers. Install full width landing treads unless otherwise indicated.

B. Clean or sand back of stair tread skirts for proper adhesion.

C. Fit the nose of the tread tightly against face of stair nosing.

D. Secure area to allow stair tread adhesive to dry completely before allowing foot traffic.

E. Fully bed treads in manufacturer's recommended adhesive.

F. Cement skirting and risers in place with tight lapped and double cut joints.

G. Cut contrasting strips to fit, and install at top, bottom and intermediate risers as indicated or as required by regulatory authorities.

H. Thoroughly roll tread and riser while adhesive is fresh allowing transfer of adhesive to the material for a firm bond.

3.06 CLEANING, WAXING, AND COMPLETION

A. Maintain all flooring and stair tread surfaces clean as installation progresses.

B. Clean flooring and treads when sufficiently seated and remove foreign substances.

C. Before Substantial Completion, install at least two coats of floor finish on rubber tile flooring, in accordance with manufacturer's instructions. Do not buff polymeric floor finish unless specifically recommended by finish manufacturer.

D. Clean adjacent surfaces of adhesive or other defacement.

3.07 CLEAN UP

A. Remove rubbish, debris and waste material and legally dispose of off the Project site.

3.08 PROTECTION

A. Protect the Work of this section until Substantial Completion.

3.09 INSTRUCTION

A. After Work of this section is complete, flooring manufacture's technical representative shall provide a 4 hour instruction period to Owner's staff in maintenance of flooring.

END OF SECTION
PART 1 - GENERAL

1.01 SUMMARY

A. Provisions of the General and Supplementary Conditions and Division 01 apply to this section.

B. Section Includes:

1. Resilient (rubber) tile flooring as indicated.

C. Related Sections:

1. Section 03300: Cast-in-Place Concrete.
2. Section 09651: Rubber Flooring and Stair Covering.
3. Section 09653: Linoleum Tile.
4. Section 09658: Rubber Base.

1.02 DEFINITIONS

A. Pop-up: A pop-up is defined as any surface deviation or looseness of substrate that is equal to or greater than 1/64 (0.015625) inch above the concrete floor level, regardless of the size.

1.03 SUBMITTALS

A. Product Data: Submit manufacturer’s published technical data describing materials, construction and recommended installation directions. Submit technical data and installation instructions for each adhesive material. Submit list and Product Data of recommended finish materials.

B. Maintenance Instructions: Submit manufacturer’s recommendations for maintenance, care, cleaning of rubber tile.

C. Samples: Submit Samples of rubber tile in each available color and pattern. Following color selections, submit full size Samples of each selected color and pattern.

D. Maintenance Materials: Before Substantial Completion, deliver one unopened container of each color and pattern of rubber tile in each color and pattern installed. Label each container indicating locations installed. Include unopened cans of adhesives adequate to install the maintenance materials.

E. Installer’s Experience Qualifications: Submit list of not less than 5 projects, extending over period of not less than 5 years, indicating installer’s experience record. Submit letter from manufacturer indicating manufacturer's approval for installer of the products.
QUALITY ASSURANCE

A. Qualifications of Installer: Minimum 5 years experience in successfully installing the same or similar flooring materials.

B. Comply with the following as a minimum requirement:
   1. All materials shall be ADA compliant.
   2. ASTM E 84: Class A Flame Spread Rating of 25 or less.

DELIVERY, STORAGE AND HANDLING

A. Materials shall be delivered to the Project site in original unopened manufacturer’s packaging clearly labeled with manufacturer’s name. Materials shall be stored at not less than 70 degrees F for not less than 48 hours before installation.

PROJECT CONDITIONS

A. Ventilation and Temperature: Verify areas that are to receive new flooring are ventilated to remove fumes from installation materials, and areas are within temperature range recommended by the various material manufactures for Project site installation conditions.

WARRANTY

A. Provide a 2 year warranty for material and labor.

PART 2 - PRODUCTS

ACCEPTABLE MANUFACTURERS

A. Mondo USA.

B. Or equal.

MATERIALS

A. Mondo Bollo Extra: Conform to ASTM F 1344, 50cm by 50cm by minimum 25mm thick, as colors and circular embossing as indicated.

B. Crack Filler and Leveling Compound: Cementitious type, shall be Durabond's Webcrete # 95, Ardex SD-F, or as recommended by flooring manufacturer.

C. Concrete Primer: Non-staining type recommended by manufacturer of vinyl composition tile.

D. Adhesive: Water based, low odor type formulated specially for installation with rubber tile, and manufactured or recommended by manufacturer.

E. Reducer Strips: Tapered rubber not less than one inch wide, and thickness to match tile.

F. Moisture Detection Equipment: Calcium chloride testing system, consisting of pre-packaged anhydrous calcium chloride crystal test kits, and an electronic gram weight scale measurable in 1/10 grams. Equipment shall be manufactured by one of the following:


PART 3 - EXECUTION

3.01 COORDINATION

A. Coordinate with related Work to assure level, smooth and clean finish surfaces to receive vinyl composition floor tile.

3.02 EXAMINATION

A. Field verify all dimensions and other conditions affecting this Work before commencing the Work of this section.

B. Before the Work of this section is commenced, examine surfaces to receive vinyl composition tile and correct deficiencies before commencing the Work of this section.

3.03 PREPARATION

A. Concrete Slabs:

1. Do not start preparation until adjacent concrete floor slabs are at least 90 days old.

2. Leveling: Check sub-floors for true to level and plane within a tolerance of 1/8 inch in 10-feet. Test floor areas both ways with a 10-foot straightedge and repair high and low areas exceeding allowable tolerance. Pop ups shall be hammered out and floor filled with a cementitious leveling compound. Remove high areas by power sanding, stone rubbing or grinding, chipping off and filling with leveling compound, or equivalent method. Fill low areas with leveling compound. Repair and level the surfaces having abrupt changes in plane, such as trowel marks or ridges, whether or not within the allowable tolerance. Clean areas where repairs are performed.

3. Cleaning: After leveling clean substrates of all deleterious substances and foreign matter.

4. Cracks or Depressions: Fill voids with cementitious leveling compound of the type recommended by flooring manufacturer for the specific Work conditions.

5. Moisture Testing: Test new and old concrete slabs for adequate dryness. Testing shall conform to ASTM F 1869, and the following. Minimum testing requirements are 3 calcium chloride tests for the first 1,000 square feet of floor area, and one for each additional 1,000 square feet or fraction thereof. Unless more stringent requirements are recommended by flooring manufacturer, maximum allowable moisture release at time of flooring installation shall be 3 pounds per 24 hours per 1,000 square feet. Provide report of test as specified above. For each test, perform the following steps:

a. Weigh the sealed dish of crystals immediately prior to exposure. Record starting weight, date and time.
b. Open kit and set crystal dish on clean concrete surface. Immediately install plastic dome over the dish. Make sure the dome is gasketed to the concrete and is airtight.

c. Leave test to absorb moisture for 60 to 72 hours. Keep room temperature above 55 degrees F for duration of test.

d. After exposure, remove and discard housing. Replace dish lid and tape shut. Weigh the sample within one hour of removal from floor.

e. Compute the vapor emission in pounds, indicate location of test and vapor emission on report.

f. Delay application of flooring until sub-floors are sufficiently dry according to flooring manufacturer’s recommendations, or perform remedial measures as recommended by flooring materials manufacturer.

3.04 INSTALLATION OF TILE

A. Color and pattern: Install tiles in a rectangular pattern, in one color without border in all rooms or spaces, unless otherwise indicated.

B. Install rubber floor tile when ambient temperature is 70 degrees F or higher.

D. Install the tile adhesive in a thin film evenly with a notched trowel. Trowel notches shall be as recommended by flooring manufacturer.

1. Mix adhesive in accordance with manufacturer’s instructions. Provide all safety precaution during mixing.

2. Install adhesive only in the area that can be covered by flooring material within the adhesive manufacture’s recommended working time.

3. Remove adhesive that has dried or filmed over.

4. Adhesive application rate shall be as required to avoid telegraphing trowel lines to the surface after maintenance coatings are applied. Adjust tile runoff during installation if necessary.

E. Provide reducer where floor covering edges are exposed, such as at center of the door or where floor coverings terminate.

F. Install rubber tile in accordance with manufacturer’s recommendations. Tiles shall fit snugly at wall. Closely trim to pipes, jambs, outlets, and similar conditions.

G. Install tiles symmetrically about centerlines of areas progressing toward walls. Adjust border tiles as required. Tiles shall be straight and joints close. Tile shall be cut to fit snugly at doorframes, and walls.

H. Mechanically cut flooring material to produce square true edges.

I. As floor tile is installed, the floor shall be rolled with a clean, 150-pound roller in both directions.
3.05 CLEANING, AND COMPLETION

A. Keep all flooring surfaces clean as installation progresses.
B. Clean flooring when sufficiently seated and remove foreign substances.
C. Clean adjacent surfaces of adhesive or other materials. Replace damaged or defective Work to the specified condition.

3.06 CLEAN UP

A. Remove rubbish, debris and waste materials and legally dispose of off the Project site.

3.07 PROTECTION

A. Protect the Work of this section until Substantial Completion.

END OF SECTION
SECTION 09653
LINOLEUM TILE

PART 1 - GENERAL

1.01 SUMMARY

A. Provisions of the General and Supplementary Conditions and Division 01 apply to this section.

B. Section Includes:

1. Linoleum tile flooring as indicated.

C. Related Sections:

1. Section 03300: Cast-in-Place Concrete.
2. Section 03331: Lightweight Architectural Concrete
3. Section 09651: Rubber Flooring and Stair Covering.
4. Section 09658: Rubber Base.

1.02 DEFINITIONS

A. Pop-up: A pop-up is defined as any surface deviation or looseness of substrate that is equal to or greater than 1/64 (0.015625) inch above the concrete floor level, regardless of the size.

1.03 SUBMITTALS

A. Product Data: Submit manufacturer’s published technical data describing materials, construction and recommended installation directions. Submit technical data and installation instructions for each adhesive material. Submit materials list and Product Data of recommended finish materials.

B. Maintenance Instructions: Submit manufacturer’s recommendations for maintenance, care and cleaning.

C. Samples: Submit Samples of each type of resilient sheet flooring in each available color and pattern. Following color selections, submit 12 inch square Samples of each selected color and pattern. Submit pint cans of each type of adhesive.

D. Installer’s Experience Qualifications: Submit list of not less than 5 projects, extending over period of not less than 5 years, indicating installer’s experience record. Submit letter from manufacturer indicating manufacturer's approval for installer of the products.

1.04 QUALITY ASSURANCE

A. Qualifications of Installer: Minimum 5 years experience in successfully installing the same or similar flooring materials.

B. Comply with the following as a minimum requirement:

1. All materials shall be ADA compliant.
2. ASTM E 84: Class A Flame Spread Rating of 25 or less.

1.05 DELIVERY, STORAGE AND HANDLING

A. Materials shall be delivered to the Project site in original unopened manufacturer’s packaging clearly labeled with manufacturer’s name. Materials shall be stored at not less than 70 degrees F for not less than 48 hours before installation.

1.06 PROJECT CONDITIONS

A. Ventilation and Temperature: Verify areas that are to receive new flooring are ventilated to remove fumes from installation materials, and areas are within temperature range recommended by the various material manufactures for site installation conditions.

1.07 WARRANTY

A. Provide a 15 year material and labor warranty.

PART 2 - PRODUCTS

2.01 MANUFACTURERS

A. Resilient Linoleum Tile: Armstrong Marmoleum Marmorette or Dual Marbleized Tile by Forbo Industries, or equal.

B. Resilient Reducer Strips: Vinyl composition reducer by Johnsonite, Flexco, Mercer Plastics Co.

C. Rubber Topset Base: Burke Flooring Products, Johnsonite or Flexco Company.

D. Floor Finish: As recommended by flooring manufacturer, but following are acceptable products:
   1. Super Polymer 85 by Maintex, City of Industry, CA.
   2. Butchers Mainstay Floor Finish by Waxie Stationery Supply, San Diego CA.
   3. Polymer LA, by Alkot Industries, Tarzana, CA.

E. Rubber Stair Nosings: Johnsonite, or equal.

F. Vinyl Corner Bumper Guards: Johnsonite, or equal.

2.02 MATERIALS

A. Resilient Linoleum Tile: Manufactured from natural materials consisting of linseed oil, wood flour, and rosin binders mixed and calendered onto a polyglass backing. No asbestos is permitted in the material. Static loads limit to be 700 psi per ASTM test No.
   1. Size: 20”x 20,” 1/10” thickness.
   2. Color: Color shall extend through thickness of tile, and be of the same dye lot and run number for specific installation.
   3. Manufacturer shall supply 5 percent additional stock of selected tiles from same dye lot and run number.

B. Slip-resistance: Minimum coefficient of 0.6
C. Base: Rubber topset type, 1/8" thick, straight or coved base, with preformed corner pieces. Height as indicated on the Drawings.

D. Crack Filler and Leveling Compound: Cementitious type, shall be Durabond's Webcrete # 95, Ardex SD-F, or Armstrong S-194 or as recommended by flooring manufacturer.

E. Primer and Adhesives: As recommended by resilient linoleum flooring manufacturer.

PART 3 - EXECUTION

3.01 COORDINATION

A. Coordinate with other trades to provide level, smooth and clean finish surfaces to receive resilient linoleum flooring and topset base.

3.02 PREPARATION

A. Adjacent Surface Protection: Protect adjacent Work areas and surfaces finish during product installation.

B. Do not begin installations of resilient linoleum flooring until other trades, including painting, have completed Work. Do not apply material when ambient temperature is lower than 70° F.

C. Concrete floors shall be dry, and cleaned of paint, dust, grease, oils, solvent, curing and hardening compounds, sealers, asphalt, and adhesive residue. Grind off high spots and fill low spots.

1. Moisture Test: Test concrete floor substrate for moisture content. Moisture emission from concrete shall not exceed 3.5 pounds per 1,000 square feet in 24 hours.

D. Sand smooth tongue and groove floors and the plywood joints flooring. Fill cracks 1/8" and wider, and minor concave areas, with plastic wood and sand. Clear floor dirt, dust, and foreign material before installing floor covering. Remove sanding dust by vacuuming.

E. Install minimum 3/4" layer of underlayment group 1 plywood free of voids over existing tongue and groove floor sheathing. Nail the underlayment 2 to 3 inches along the seams and 4 to 6 inches in the field with ring-shank nails or power cleats.

1. Furnish an underlayment that guarantees in writing that floors will not warp, delaminate, buckle, ridge or telegraph seams due to underlayment failure.

3.03 INSTALLATION

A. General: Install resilient linoleum tile flooring under base shoes, modular cabinets, floor mounted plumbing fixtures and movable equipment. Install in accordance with manufacturer's printed installation instructions.

1. Linoleum flooring, adhesive, and patch compounds shall be maintained at room temperature (at least 68° F.) for 72 hours before, during, and after installation.

B. Underlayment:

1. Staple or nails shall penetrate subfloor a minimum of 3/8"

2. Offset underlayment edges and subfloor edges at least 4", and stagger panel corners.

C. Primer and Adhesives:
1. Prepare and prime concrete floor slabs to receive floor covering as recommended by floor covering manufacturer.

2. Mix and install adhesives in accordance with manufacturer's instructions. Provide safety precautions during mixing and application as recommended by adhesive manufacturer. Install uniformly over surfaces.

3. Install only that amount of area that can be covered by flooring material within the recommended working time of the adhesive.

4. Remove any adhesive that has dried or has filmed over.

5. Do not soil walls, bases, or adjacent surfaces with adhesives.

6. Promptly remove any spillage.

7. Install tiles symmetrically about centerlines of areas. Proceed toward walls. Adjust width of border tiles as required. Tiles shall be straight, with joints closed. Tile joints shall be straight and tight. Cut tiles to fit snugly at doorframes, and walls. Install tiles under removable metal thresholds.

E. Base:

1. General: Install base around perimeter of room or space, at toe spaces of casework, and at carpet areas where indicated on Drawings. Unroll base material and cut into accurate lengths as required for minimum number of joints. Install tight to wall with tight butt joints.

F. Reducer Strips:

1. Provide where floor covering terminates, exposing edge of covering. Center under door, where floor covering terminates at door openings. Fit to doorframes and adjoining materials. Install adhesives and bond securely to substrates in straight, true lines.

G. Stair Treads:

1. Clean back of tread with alcohol or lightly sand to ensure proper adhesion.

2. Fit nose of tread tightly against face of stair riser.

3. Thoroughly roll treads and a riser while adhesive is fresh, allowing transfer of adhesive to the material to obtain a firm bond.

3.04 CLEANING AND FINISHING

A. Upon completion of resilient flooring application, allow sufficient time for flooring to seat itself before attempting to clean and finish.

B. After flooring has thoroughly seated, clean with a neutral cleaner.

C. Use minimum water for cleaning floors. Pick up water using either a dry mop or a vacuum.

D. Finish linoleum tile with 2 coats of floor finish, installed in accordance with manufacturer's directions. Inspect first coat before next coat is installed. Allow all coats to dry for manufacturer recommended time.

E. Replace damaged or defective tiles.
F. Upon completion, clean exposed surfaces soiled by Work and repair damage caused by Work.

3.05 CLEAN-UP

A. Remove rubbish, debris, and waste materials and legally dispose of off the Project site.

3.06 PROTECTION

A. Protect the Work of this section until Substantial Completion.

END OF SECTION
SECTION 09658
RESILIENT WALL BASE

PART 1 - GENERAL

1.1 SUMMARY
A. Section includes:
   1. Rubber base.
   2. Adhesive.
B. Related work:
   1. Division 9 for flooring.

1.2 SUBMITTALS
A. Data: Submit proof of compliance with specified requirements.
B. Samples: Submit 12-inch long samples of each type and color of base.

1.3 HANDLING
A. Store materials indoors at a temperature above 60-degree F for at least 24 hours before use.

1.4 JOB CONDITIONS
A. Illuminate work areas during installation to provide the same or greater level of illumination required to properly perform the work and as will occur in the room or space after the building is in operation.
B. Maintain temperature in spaces to receive resilient bases between 70-degree and 90-degree F for not less than 24 hours before and 48 hours after its installation.
C. Maintain minimum temperature of 60-degree F after bases have been installed, except as specified above.

1.5 MAINTENANCE
A. Furnish 100 feet of each type and color of base for future maintenance.
PART 2 -PRODUCTS

2.1 MATERIALS

A. Rubber bases:
   1. 0.125-inch thick by height indicated on the Drawings, ASTM F 1861, Type TS (thermoset vulcanized rubber), Group 1 (homogeneous).
   2. By Burke Flooring Products, Roppe Rubber Corp., Johnsonite, Flexco Co. or Mercer Products Co., Inc., of the color(s) selected by the Architect.
   3. Top set base where no flooring and resilient flooring occur; straight (carpet) base at all other locations; do not use preformed corners.
   4. In rolls minimum 100-foot long. Do not use short pieces. All walls 20-foot or less in one piece.

B. Primer, adhesive and crack filler: Type and brand recommended by floor covering manufacturer for the conditions of use, and the following:
   1. Use adhesives that comply with the following limits for VOC content when calculated according to 40 CFR 59, Subpart D (EPA Method 24):
      a. Cove Base Adhesives: Not more than 50 g/L.

PART 3 -EXECUTION

3.1 EXAMINATION/PREPARATION

A. Examine walls for excessive moisture content and unevenness which would prevent the proper execution of the work of this Section. Fill cracks and sand down bumps.

B. Remove dirt, oil, grease, or other foreign matter from surfaces to receive bases.

C. Correct conditions detrimental to the proper and timely completion of this work before proceeding with installation.

3.2 ADHESIVE

A. Mix and apply adhesive in compliance with its manufacturer’s instructions.

B. Provide safety precautions during mixing and application as recommended by the adhesive manufacturer.

C. Apply adhesive uniformly over backing surfaces, but only on areas which can be covered by bases
within the recommended working time of the adhesive.

D. Tape adjacent surfaces to prevent migration and misapplication of adhesive.

E. Remove adhesive which dries or films over. Do not soil walls, bases, and other adjacent surfaces with adhesive. Promptly remove spillage from adjacent surfaces without damaging those surfaces.

3.3 BASE

A. At masonry surfaces, fill voids along top edges of base with base manufacturer’s recommended adhesive filler material.

B. Match edges at seams or double cut adjoining lengths. Install with hairline, flush butt joints.

C. Locate end of runs not less than 36 inches from a corner, except where impossible due to length of wall.

D. Do not use pieces less than 6-foot long, except where impossible due to length of wall.

E. Do not use preformed corner pieces, except for vented base.

   1. Form inside corners on job from straight pieces of maximum lengths possible by cutting an inverted V-shaped notch in toe of wall base at the point where corner is formed. Shave back of base where necessary to produce snug fit to substrate.

   2. Form outside corners on job from straight pieces of maximum lengths possible by shaving back of base at point where bending will occur. Remove a strip perpendicular to length of base and only deep enough to produce a snug fit without bends whitening or removal of more than half the thickness of base.

F. Scribe base accurately to abutting materials.

3.4 FIELD QUALITY CONTROL

A. After adhesive has set, clean bases with a neutral cleaner recommended by the base manufacturer.

B. Verify that there are no open joints and that base is completely adhered for its full length. Reinstall in fresh adhesive where applicable.

C. Protect completed installations from damage until final acceptance.

END OF SECTION
SECTION 09680
CARPET

PART 1 - GENERAL

1.1 SUMMARY
A. Section includes:
   1. Carpet tile.
   2. Miscellaneous materials and accessories required for complete installations.

1.2 SYSTEM DESCRIPTION
A. Design criteria: Carpeting shall meet, and exceed where specified, minimum standards for the Carpet and Rug Institute’s Indoor Air Quality testing program, and comply with the following environmental impact characteristics:
   1. Less than 0.05 mg/square meter/per hour of formaldehyde.
   2. Less than 0.3 mg/square meter/hour of total volatile organics compounds (TVOC).
   3. Less than 0.4 mg/square meter/hour of styrene.
   4. Less than 0.05 mg/square meter/hour of 4-PC.
   5. Conduct test over 24-hour time period.

1.3 SUBMITTALS
A. Data: Manufacturer’s recommended cleaning and maintenance instructions for carpet.
   1. Manufacturer’s data on carpet installation and accessories.
   2. Evidence that the carpet and accessories to be used comply with Code requirements for combustibility, flammability and toxicity.

C. Samples:
   1. 18” x 18” of each type and color specified.
   2. Twelve-inch long samples of each linear accessory.

D. Layout drawings:
   1. Three eight inch minimum layout drawings showing grid and pile direction.
   2. Layout location shall comply with the requirements below; make adjustments and modifications requested by the Architect at no cost to the Owner.
3. Mark chalk lines on substrates showing alignments of layout. Spray lacquer on chalk lines, after Architect has approved the locations.

E. Tests: Results of test conducted on concrete (refer to Part 3 below) slabs prior to start of installation.

1.4 QUALITY ASSURANCE

A. Installer’s qualifications: FCIB or IFCI certified carpet installers, unless otherwise acceptable to the Architect.

B. Fire-test-response characteristics: Provide products with the critical radiant flux classification specified below, as determined by testing identical products in accordance with ASTM E 648 by a testing and inspecting agency acceptable to authorities having jurisdiction.

C. Static control:
   1. Below level of human sensitivity when tested at 20 percent relative humidity at 70-degree F.
   2. Carpet shall retain its static control for the useful life of the installation.

1.5 HANDLING

A. Procedure: In accordance with CRI 104 Section 5. Store carpet indoors in a protected location.

B. Delivery: Deliver carpet boxes tagged by manufacturer with match codes for installation sequence.

C. Conditioning:
   1. Condition carpet tile and adhesive on site in a heated, dry space at a minimum temperature of 65-degree and a relative humidity between 10 percent and 65 percent for at least 48 hours before installation.
   2. Maintain these conditions night and day during installation and for at least 72 hours after completion.

1.6 JOB CONDITIONS

A. Temperature: Maintain a uniform temperature, in the space being carpeted, in the range of 65 to 75-degree F during and after carpet installation.

B. Slab dryness: Do not install carpet over concrete slabs until slabs have cured and are sufficiently dry to bond with adhesive, without re-emulsification, and slabs have pH range recommended by carpet tile and adhesive manufacturers.

C. Lighting: Illuminate work areas during installation to provide the same or greater level of illumination required to properly perform the work and as will occur in the room or space after the building is in
operation.

1.7 WARRANTIES

A. Carpet manufacturer shall warrant the carpet as follows:
   1. The life of the carpet shall be 15 years under normal conditions.
   2. Carpet shall not experience edge-ravel under normal use for the life of the carpet.
   3. Primary and secondary backing shall not delaminate for the life of the carpet.
   4. There shall be no more than 10 percent face yarn loss for the life of the carpet tile.

PART 2 -PRODUCTS

2.1 CARPET

A. Provide and install Shaw Contract Group, No Rules Collection, “Blox Tile” #59357. Color to be selected by Architect.

   Contact: (310) 927-0082.

  2. Carpet Tile:
     a. Carpet tile shall be pattern loop, 24 oz/sq.yd, eco solution q nylon, 100% solution dyed, 24” x 24” tile.
     b. Tile pattern shall be as determined by Architect.

2.2 MISCELLANEOUS ACCESSORIES AND MATERIALS

A. As recommended by the carpet manufacturer for the conditions of installation and use and the following:
   1. Edge guard and transition strips: Rubber or vinyl extrusion by Mercer Plastics Co. or Johnson Rubber Co., designed specifically as carpet edge guard. The Architect will select Color(s).
   2. Floor leveling material:
      a. Provide a minimum of one 10 lbs. bag of Portland cement-based floor prep material for every 100 square yd. of carpet to be installed.
      b. Do not use gypsum-based materials.

PART 3 -EXECUTION

3.1 EXAMINATION/PREPARATION

A. Comply with the applicable specifications and recommendations of the Carpet and Rug Institute
(CRI), Standard for Installation of Textile Floor covering Materials CRI 104, except as noted.

B. Measure spaces to be carpeted, as a basis for supplying, cutting and seaming the carpet. Do not scale the Drawings or calculate sizes from dimensions shown.

C. Vacuum substrate immediately prior to carpeting and remove deleterious substances, which would interfere with the installation or be harmful to this work.

D. Prepare concrete surfaces in accordance with CRI 104 Section 6.1.1 and 6.2.

E. Check floors for moisture content. Be sure that they are sufficiently dry to receive carpet tile.
   1. Conduct calcium chloride or other acceptable moisture test, one for every 1,000 square-foot of flooring, to verify that slabs are within limits acceptable to carpet manufacturer.
   2. Allow sufficient time in the construction schedule to allow slabs to dry sufficiently, force dry slabs, or provide a compatible surface coating so that water vapor emission will be at a level acceptable to the floor-covering manufacturer.

F. Test the alkalinity level of the concrete using a Litmus test. If the pH is above a level unacceptable to the adhesive manufacturer, treat the surface so that the floor PH is within acceptable levels.

G. Remove dirt, oil, grease, or other foreign matter from surfaces to be carpeted and/or to receive floor filler.

H. Use a floor filler recommended by the carpet manufacturer, to fill-in cracks, holes and other indentation marks; grind down bumps to flat surface. Floor under carpet shall not exceed 1/8 inch in 10 feet when measured with a straightedge placed anywhere on the surface to be carpeted.

I. Correct other conditions which would prevent proper and timely completion of the carpeting.

3.2 INSTALLATION

A. General:
   1. Comply with the carpet manufacturer’s instructions and recommendations, except as modified herein.
   2. Install carpet edge guard, where edge of carpet tile is exposed to traffic, in single length without joints except at changes in direction. Cut for a tight fit against abutting surfaces. Center under doors when applicable.
   3. Install transition strips, where carpet tiles abut another material. Use single length without joints except at changes in direction. Cut for a tight fit against abutting surfaces. Center under doors when applicable.
   4. Extend carpet at the following locations:
      a. Under open-bottomed and raised bottomed obstructions, and under removable flanges of obstructions.
b. Into closets and alcoves of spaces scheduled to be carpeted, unless another floor finish is indicated for such space.

c. Under movable furniture and equipment.

5. Carpet shall have full adhesion to subfloor without loose edges.

B. Install carpet in strict accordance with manufacturer’s written instructions and in accordance with CRI 104 Section 13 and the following:

1. Terminate work neatly at obstructions, edges and corners without disrupting joint alignment. Cut to obtain clean, sharp edges.

2. Accurately align joints parallel to walls unless otherwise indicated.

3. Roll completed installation with a 35 to 75 lb. linoleum roller in both directions to ensure uniform bond everywhere.

C. Installation tolerance: Comply with CRI 104 Section 13.1.

CLEANING/PROTECTING

A. Remove debris from installation, carefully sorting pieces to be saved from scraps to be disposed of.

B. Vacuum carpet with a commercial machine, with a rotating agitator or beater in the nozzle. Remove soiled spots.

C. Close areas to traffic during installation. Cover carpet in traffic areas with protective non-staining building paper. Do not use plastic sheeting.

D. Prior to acceptance of the Work, replace damaged and stained carpet with new carpet.

END OF SECTION
PART 1    GENERAL

1.01 SECTION INCLUDES

A. Surface preparation.

B. Field application of paints, stains, varnishes, and other coatings.

C. Scope: Finish all interior and exterior surfaces exposed to view, unless fully factory-finished and unless otherwise indicated, including the following:
   1. Both sides and edges of plywood backboards for electrical and telecom equipment before installing equipment.
   2. Elevator pit ladders.
   3. Mechanical and Electrical:
      a. In finished areas, paint all insulated and exposed pipes, conduit, boxes, insulated and exposed ducts, hangers, brackets, collars and supports, mechanical equipment, and electrical equipment, unless otherwise indicated.
      b. In finished areas, paint shop-primed items.
      c. On the roof and outdoors, paint all equipment that is exposed to weather or to view, including that which is factory-finished.
      d. Paint interior surfaces of air ducts that are visible through grilles and louvers with one coat of flat black paint to visible surfaces.
      e. Paint dampers exposed behind louvers, grilles, to match face panels.

D. Do Not Paint or Finish the Following Items:
   1. Items fully factory-finished unless specifically so indicated; materials and products having factory-applied primers are not considered factory finished.
   2. Items indicated to receive other finishes.
   3. Items indicated to remain unfinished.
   4. Fire rating labels, equipment serial number and capacity labels, and operating parts of equipment.
   5. Stainless steel, anodized aluminum, bronze, terne, and lead items.
   6. Marble, granite, slate, and other natural stones.
   7. Floors, unless specifically so indicated.
   8. Ceramic and other tiles.
   10. Glass.
   11. Acoustical materials, unless specifically so indicated.
   12. Concealed pipes, ducts, and conduits.

1.02 RELATED REQUIREMENTS

A. Section 05500 - Metal Fabrications: Shop-primed items.

B. Section 05510 - Metal Stairs: Shop-primed items.

1.03 DEFINITIONS

A. Conform to ASTM D 16 for interpretation of terms used in this section.

1.04 REFERENCE STANDARDS


D. Green Seal GS-11 - Paints.
E. SSPC (PM1) - Good Painting Practice: SSPC Painting Manual, Vol. 1; Society for Protective Coatings.

1.05 SUBMITTALS
A. See Section 01330 for submittal procedures.
B. Product Data: Provide data on all finishing products, including VOC content.
C. Samples: Submit two paper chip samples, 6 x 8 inch in size illustrating range of colors and textures available for each surface finishing product scheduled.
D. Samples: Submit two painted samples, illustrating selected colors and textures for each color and system selected with specified coats cascaded. Submit on tempered hardboard, 12 x 12 inch in size.
E. Certification: By manufacturer that all paints and coatings comply with VOC limits specified by SCAQMD Rule 1113 and do not contain chemicals of concern as defined by GS-11 / 4.1.
F. Volume Solids: Products submitted by any of the six approved mfgs must demonstrate that the submitted product meets or exceeds the volume solids of the product specified. Only first line, architectural, premium grade products will be considered for submittal.
G. Manufacturer's Instructions: Indicate special surface preparation procedures.

1.06 QUALITY ASSURANCE
A. Manufacturer Qualifications: Company specializing in manufacturing the products specified, with minimum three years documented experience.

1.07 MOCK-UP
A. See Section 01400 - Quality Requirements, for general requirements for mock-up.
B. Provide panel, 4 feet long by 4 feet wide, illustrating special coating color, texture, and finish.
C. Provide door and frame assembly illustrating paint coating color, texture, and finish.
D. Locate where directed.
E. Mock-up may remain as part of the work.

1.08 DELIVERY, STORAGE, AND HANDLING
A. Deliver products to site in sealed and labeled containers; inspect to verify acceptability.
B. Container Label: Include manufacturer's name, type of paint, brand name, lot number, brand code, 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.

1.09 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 coatings during rain, or when relative humidity is outside the humidity ranges required by the paint product manufacturer.
D. Minimum Application Temperatures for Latex Paints: 45 degrees F for interiors; 50 degrees F for exterior; unless required otherwise by manufacturer's instructions.
E. Minimum Application Temperature for Varnish Finishes: 65 degrees F for interior or exterior, unless required otherwise by manufacturer's instructions.
PART 2 - PRODUCTS

2.01 MANUFACTURERS

A. Provide all paint and coating products from the same manufacturer to the greatest extent possible.

B. Paints:
   1. Base Manufacturer: Vista Paint Corporation, Fullerton, CA. (contact: Mark Brower, 323.397.9000), Carboline, or equal.
   2. Substitutions: Under the provisions of Section 01630.

2.02 PAINTS AND COATINGS - GENERAL

A. Paints and Coatings: Ready mixed, unless intended to be a field-catalyzed coating.
   1. Provide paints and coatings of a soft paste consistency, capable of being readily and uniformly dispersed to a homogeneous coating, with good flow and brushing properties, and capable of drying or curing free of streaks or sags.
   2. Provide materials that are compatible with one another and the substrates indicated under conditions of service and application, as demonstrated by manufacturer based on testing and field experience.
   3. Supply each coating material in quantity required to complete entire project's work from a single production run.
   4. Do not reduce, thin, or dilute coatings or add materials to coatings unless such procedure is specifically described in manufacturer's product instructions.

B. Primers: Where the manufacturer offers options on primers for a particular substrate, use primer categorized as "best" by the manufacturer.

C. Volatile Organic Compound (VOC) Content:
   1. Provide coatings that comply with the most stringent requirements specified in the following:
      a. Architectural coatings VOC limits of SCAQMD, Rule 1113

D. Flammability: Comply with applicable code for surface burning characteristics.

E. Colors: As indicated in Color Schedule
   1. Extend colors to surface edges; colors may change at any edge as directed by Architect.
   2. In finished areas, finish pipes, ducts, conduit, and equipment the same color as the wall/ceiling they are mounted on/under.
   3. In utility areas, finish equipment, piping, conduit, and exposed duct work in colors according to the color-coding scheme indicated.

2.03 PAINT SYSTEMS - EXTERIOR

A. Wood, Opaque, 100% Acrylic, 3 Coat:
   1. One coat of acrylic primer sealer. Vista 4200 Terminator II
   2. Semi-gloss: Two coats of 100% acrylic enamel; Vista 8400 Carefree Semi Gloss

B. Wood, Transparent, Varnish, No Stain:
   1. One coat sealer. Deft Defthane VOC Sealer
   2. Satin: One coat of varnish; Deft Defthane VOC Satin Acrylic Urethane

C. Masonry/Concrete, Opaque, 100% Acrylic, 2 Coat:
   1. One coat of acrylic block filler. Vista 018 Acrylic Block Filler
   2. Flat: One coat of 100% Acrylic enamel; Vista 2000 Duratone

D. Ferrous Metals, Unprimed, 100% Acrylic, 3 Coat:
   1. One coat of acrylic metal primer. Vista 4800 Metal Pro
   2. Semi-gloss: Two coats of 100% Acrylic enamel; Vista 8400 Carefree Semi Gloss.

E. Ferrous Metals, Primed, 100% Acrylic 2 Coat:
   1. Touch-up with rust-inhibitive primer recommended by top coat manufacturer.
   2. Semi-gloss: Two coats of 100% Acrylic enamel; Vista 8400 Carefree Semi Gloss.

F. Galvanized Metals, 100% Acrylic. 3 Coat:
   1. Pre-Treatment: Etch with Jasco Prep N Prime
   2. One coat acrylic metal primer. Vista 4800 Metal Pro
3. Semi-gloss: Two coats of 100% Acrylic enamel; Vista 8400 Carefree Semi Gloss.

G. Aluminum, Unprimed, Alkyd, 3 Coat:
   1. One coat etching primer. Etch with Jasco Prep N Prime
   2. Semi-gloss: Two coats of 100% Acrylic enamel; Vista 8400 Carefree Semi Gloss.

2.04 PAINT SYSTEMS - INTERIOR

A. Wood, Opaque, 100% Acrylic. 3 Coat:
   1. One coat 100% Acrylic primer sealer. Vista 4200 Terminator II
   2. Eggshell: Two coats of 100% Acrylic enamel; Vista 8300 Carefree Eggshell.

B. Wood, Transparent, Varnish, No Stain:
   1. One coat sealer. Deft WB SS 015 by Vista Paint
   2. Satin: One coat of Acrylic Polyurethane varnish; Deft 250 VOC Defthane Varnish by Vista Paint.

C. Wood, Transparent, Varnish, Stain:
   1. One coat of stain; Minwax VOC Semi-Transparent Stain by Vista Paint
   2. One coat sealer; Deft WB SS 015 by Vista Paint.
   3. Satin: One coat of varnish; Deft 250 VOC Defthane Varnish by Vista Paint.

D. Ferrous Metals, Unprimed, 100% Acrylic. 3 Coat:
   1. One coat of acrylic metal primer. Vista 4800 Metal Pro
   2. Semi-gloss: Two coats of 100% Acrylic enamel; Vista 8400 Carefree Semi Gloss.

E. Ferrous Metals, Primed, 100% Acrylic. 3 Coat:
   1. Touch-up with acrylic primer. Vista 4800 Metal Pro
   2. Semi-gloss: Two coats of 100% Acrylic enamel; Vista 8400 Carefree Semi Gloss.

F. Galvanized Metals, 100% Acrylic. 3 Coat:
   1. One coat etching primer. Jasco Prep N Prime
   2. One coat acrylic metal primer. Vista 4800 Metal Pro
   3. Semi-gloss: Two coats of 100% Acrylic enamel; Vista 8400 Carefree Semi Gloss.
   4. Flat: Two coats of Acrylic enamel; Vista 8100 Carefree Flat.

G. Aluminum, Unprimed, 100% Acrylic. 3 Coat:
   1. One coat etching primer. Jasco Prep N Prime
   2. One coat acrylic metal primer. Vista 4800 Metal Pro
   3. Semi-gloss: Two coats of 100% Acrylic enamel; Vista 8400 Carefree Semi Gloss

H. Gypsum Board/Plaster, Acrylic, 3 Coat:
   1. One coat of acrylic primer sealer. Vista 4000 Uniprime
   2. Semi-gloss: Two coats of 100% Acrylic enamel; Vista 8400 Carefree Semi Gloss.
   3. Eggshell: Two coats of 100% Acrylic enamel; Vista 8300 Carefree Eggshell.
   4. Flat: Two coats of Acrylic enamel; Vista 8100 Carefree Flat.

I. Paint FI-OP-2A - Fabrics/Insulation Jackets, 100% Acrylic 2 Coat:
   1. One coat of Acrylic primer sealer. Vista 4000 Uniprime
   2. Flat: One coat of Acrylic enamel; Vista 8100 Carefree Flat.

J. Ferrous Metals, Unprimed, Water-based Intumescent Fire-resistive Coating:
   1. One coat Carboline approved primer.
   2. Carboline A/D Firefilm III per manufacturer’s application instructions.
   3. Semi-gloss: One coat Carboline Carbacrylic 3350 per manufacturer’s application instructions.

2.05 ACCESSORY MATERIALS

A. Accessory Materials: Provide all primers, sealers, cleaning agents, cleaning cloths, sanding materials, and clean-up materials required to achieve the finishes specified whether specifically indicated or not; commercial quality.

B. Patching Material: Latex filler.

C. Fastener Head Cover Material: Latex filler.