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Perimeter Wall

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NOT APPLICABLE

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NOT APPLICABLE

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NOT APPLICABLE

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NOT APPLICABLE
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SECTION 04 CEMENT MASONRY UNIT (CMU) WALL

PART I – GENERAL

1.01 RELATED DOCUMENTS

A Drawings and General Provisions of Contract, including General and Supplementary Conditions and Division 01 Specification sections, apply to work of this section.

1.02 DESCRIPTION OF WORK

A Extent of each type of masonry work is indicated on drawings and schedule.

B Types of masonry work required include:

1. Concrete Unit Masonry.
2. Brick Masonry.
3. Architectural units:
   a. Pre-faced Unit Masonry.
   b. Polished Face Unit Masonry.
   c. Ground Face Unit Masonry.
   d. Split Face Unit Masonry.
   e. Smooth Face Unit Masonry.
   f. Split-Ribbed Unit Masonry.
4. Acoustical Unit Masonry.
5. Reinforced Unit Masonry.
6. Insulated Unit Masonry.

1.03 RELATED WORK

A Install work furnished under other sections, which must be built into unit masonry work, including, but not limited to:

1. Glass Unit Masonry.
2. Anchorage Devices.
3. Flashings.
4. Loose Steel Lintels.

1.04 QUALITY ASSURANCE

A Fire Performance Characteristics: Where indicated, provide materials and construction which are identical to those of assemblies, equivalent thickness, whose fire endurance has been determined by testing in compliance with ASTM E 119 by means acceptable to authorities having jurisdiction.

B Single Source Responsibility for Masonry Units: Obtain exposed masonry units of uniform texture and color, or a uniform blend within the ranges accepted for these characteristics, from one manufacturer for each different product required for each continuous surface or visually related surfaces.
C Single Source Responsibility for Mortar Materials: Obtain mortar ingredients of uniform quality including color for exposed masonry, from one manufacturer for each cementitious component and from one source and producer for each aggregate.

D Field Constructed Mock-Ups: Prior to installation of masonry work, erect representative sample wall panels to further verify selections made for color and texture characteristics, under sample submittals of masonry units and mortar, and to establish a standard for completed masonry work for qualities of appearance, materials, construction and workmanship.

E Build mock-ups for the following types of masonry in sizes approximately 6’ long by 4’ high, by full thickness, including face and back-up whythes, as well as accessories.

1. Each type of exposed unit masonry work.
2. Typical exterior face brick wall.
3. Typical interior brick wall.

1.05 SUBMITTALS

A Product Data: Submit manufacturer's product data for each type of masonry unit, accessory and other manufactured products.

B Compliance: Submit certifications that each type complies with specified requirements.

C Color Selection: For initial selection submit:

1. Unit masonry samples showing full extent of colors and textures available for each type of exposed masonry unit required.
2. Colored mortar samples showing full extent of colors available.

D Samples: For verification purposes submit:

1. Unit masonry samples for each type of exposed masonry unit, include full range of color and texture to be expected in completed work.
2. For selection of brick, submit products of all manufacturers that the manufacturers or their agents consider to be their closest match. Re-submit until match meets approval of Architect.
3. Colored masonry mortar samples for each color required showing the full range of color which can be expected in the finished work. Label samples to indicate type and amount of colorant used.

1.06 REFERENCED STANDARDS

A Comply with the current applicable provisions of all codes, standards and specifications referenced in this section, except as modified by the requirements of these Contract Documents, including, but not limited to, the following:

ACI 531 - Building Code Requirements for Masonry Structures.

ACI 531R - Commentary on Building Code Requirements for Masonry Structures.
1.07 DELIVERY, STORAGE AND HANDLING

A Deliver masonry materials to project in undamaged condition. Store and handle materials to prevent their deterioration or damage due to moisture, temperature changes, contaminants, corrosion or other causes.

B Limit moisture absorption of concrete masonry units during delivery and until time of installation.

C Store cementitious materials off the ground, under cover and in a dry location.

D Store and protect aggregates where grading and other required characteristics can be maintained.

E Store and protect masonry accessories including metal items to prevent deterioration by corrosion and accumulation of dirt.

1.08 PROJECT CONDITIONS

A Protection of Work: During erection, cover top of walls with waterproof sheeting at end of each day's work. Cover partially completed structures when work is not in progress.

1. Extend cover a minimum of 24" down both sides and hold cover securely in place.

B Do not apply uniform floor or roof loading for at least 12 hours after building masonry walls or columns.

C Staining: Prevent grout, mortar or soil from staining the face of masonry to be left exposed or painted. Remove grout or mortar in contact with such masonry immediately.

D Do not apply concentrated loads for at least 3 days after building masonry walls or columns.

E Protect base of walls from rain-splashed mud and/or mortar splatter by means of coverings spread on ground and over wall surfaces.
F Protect sills, ledges and projections from droppings of mortar.

G Cold Weather Protection:

1. Do not lay masonry units that are wet or frozen.
2. Remove any ice or snow formed on masonry bed by carefully applying heat until top surface is dry to the touch.
3. Remove masonry damaged by freezing conditions.
4. For clay masonry units with initial rates of absorption which require them to be wetted before laying, comply with the following:
   a. For units with surface temperature above 32 Degrees F, wet with water heated to above 70 Degrees F.
   b. For units with surface temperature below 32 Degrees F, wet with water heated to above 130 Degrees F.

H Perform the following construction procedures while masonry work is progressing. Temperature ranges indicated below apply to air temperature existing at time of installation, except for grout:

1. For Grout: Temperature ranges apply to anticipated minimum night temperatures. In heating mortar and grout materials, maintain mixing temperature selected within 10 Degrees F.
2. 40 Degrees F to 32 Degrees F:
   a. Mortar: Heat mixing water to produce mortar temperature between 40 Degrees F and 120 Degrees F.
   b. Grout: Follow normal masonry procedures.
3. 32 Degrees F to 25 Degrees F:
   a. Mortar: Heat mixing water and sand to produce mortar temperatures between 40 Degrees F and 120 Degrees F. Maintain temperature of mortar on boards above freezing.
   b. Grout: Heat grout materials to 90 Degree F to produce in-place grout temperature of 70 Degree F at end of work day.
4. 25 Degrees F to 20 Degrees F:
   a. Mortar: Heat mixing water and sand to produce mortar temperatures between 40 Degrees F and 120 Degrees F. Maintain temperature of mortar on boards above freezing.
   b. Grout: Heat grout materials to 90 Degrees F to produce in-place grout temperature of 70 Degrees F at end of work day.
   c. Heat both sides of walls under construction using salamanders or other heat sources.
   d. Use windbreaks or enclosures when wind is in excess of 15 mph.
5. 20 Degrees F and Below:
Lancaster Infill Houses

a. Mortar: Heat mixing water and sand to produce mortar temperatures between 40 Degrees F and 120 Degrees F.
b. Grout: Heat grout materials to 90 Degrees F to produce in-place grout temperature of 70 Degrees F at end of work day.
c. Masonry Units: Heat masonry units so that they are above 20 Degrees F at time of laying.
d. Provide enclosure and auxiliary heat to maintain an air temperature of at least 40 Degrees F for 24 hours after laying units.
e. Do not heat mixing water for mortar and grout to above 160 Degrees F.

I Protect completed masonry and masonry not being worked on in the following manner:
(Temperature ranges indicated apply to mean daily air temperatures except for grouted masonry; if for grouted masonry, temperature ranges apply to anticipated minimum night temperatures.)

1. 40 Degrees F to 32 Degrees F:
   a. Protect masonry from rain or snow for at least 24 hours by covering with weather-resistant membrane.

2. 32 Degrees F to 25 Degrees F:
   a. Completely cover masonry with weather-resistant membrane for at least 24 hours.

3. 25 Degrees F to 20 Degrees F:
   a. Completely cover masonry with weather-resistant insulating blankets or similar protection for at least 24 hours; 48 hours for grouted masonry.

4. 20 Degrees F and Below:
   a. Except as otherwise indicated, maintain masonry temperature above 32 Degrees F for 24 hours using enclosures and supplementary heat, electric heating blankets, infrared lamps or other methods proven to be satisfactory. For grouted masonry maintain heated enclosure to 40 Degrees F for 48 hours.

PART 2 – PRODUCTS

2.01 MASONRY UNITS, GENERAL

A Manufacturer: All concrete masonry units shall be manufactured by Angelus Block CO., INC.
4575 W. Vineyard Ave. Oxnard, CA 93036 (805) 983-7697

B Obtain masonry units from one manufacturer, of uniform texture and color for each kind required, for each continuous area and visually related areas.

2.02 CONCRETE MASONRY UNITS

A General: Comply with referenced standards and other requirements indicated below applicable to each form of concrete masonry unit required.
B Provide special shapes where required for lintels, jambs, corners, sash, control joints, headers, bonding and other special conditions.

C Concrete Block: Provide units complying with characteristics indicated below for Face Size, Exposed Face, and under each form of block included for weight classification.

   1. Size: Manufacturer's standard units with nominal face dimensions of 16" long x 8" high (15 5/8" x 7-5/8" actual) x thicknesses indicated.

D Hollow Load-Bearing Block: ASTM C-90, normal weight (125 lbs. per cubic foot dry weight).

E Solid Load-Bearing Block: ASTM C-90, normal weight (125 lbs. per cubic foot dry weight).

2.02 BRICK MADE FROM CLAY OR SHALE

A General: Comply with referenced standards and other requirements indicated below applicable to each form of brick required.

B Size: Provide brick manufactured to the following actual dimensions:

   1. (INSERT SIZE AND/OR SPECIFIC BRICK AND MANUFACTURER)

C Provide special molded shapes where indicated and for application requiring brick of form, size and finish on exposed surfaces which cannot be produced from standard brick sizes by sawing.

D For sills, caps and similar applications resulting in exposure of brick surfaces which otherwise would be concealed from view, provide uncored or unfrogged units with all exposed surfaces finished.

E Facing Brick: ASTM C-216, and as follows:

   1. Grade SW, except Grade MW or NW may be used for interior work only.
   2. Type: FBS.
   3. Texture and Color: (INSERT TYPE AND COLOR)

2.03 ARCHITECTURAL CMU

PRE FACED CONCRETE MASONRY UNITS: SPECTRA-GLAZE II

A Manufacturer: Angelus Block CO., INC. 4575 W. Vineyard Ave. Oxnard, CA 93036 (805) 983-7697.

B All units shall conform to ASTM C-90.

   1. Weight Classification: Lightweight.

C Sizes: Modular 8" x 16", 4" x 16", 8" x 8", 12" x 12", 16" x 16" including 1/4" exposed face joints; sizes as shown; long dimensions horizontal or vertical as shown.

D Pre-Faced Surfaces: All units shall meet all requirements of ASTM C-744.
1. Facing ingredients must be Spectra-Glaze Compound made with Spectra-Glaze polymers, supplied by The Burns & Russell Company, and other ingredients as required to meet or exceed ASTM C-744.

2. Surface Burning Characteristics of Facing: ASTM E 84; flame spread less than 25; fuel contribution 0; smoke density less than 50. Products of combustion considered non-toxic as determined by BRC 4690 (toxicity testing).

E Colors: Select from manufacturer's established or custom colors.

F Shapes: Provide shapes to suit the condition shown.

G Cleaning Compound: Use masonry detergent cleaners such as Spectra brand of cleaners, or Vana-Trol in strict accordance with each manufacturer's directions. Do not use steel wool, or other abrasives or any product containing unbuffered hydrochloric acid or other acids.

POLISHED FACE CMU & GLASSTONE™ CMU

A Manufacturer: Angelus Block CO., INC. 4575 W. Vineyard Ave. Oxnard, CA 93036 (805) 983-7697.

B All units will conform to ASTM C-90.

1. Weight Classification: Normal Weight.
2. Minimum Net Compressive Strength 4000 PSI

C Sizes: Manufacturers Standard Nominal Sizes.

D Color: Shall be as manufactured by Angelus Block CO., INC. 4575 W. Vineyard Ave. Oxnard, CA 93036 (805) 983-7697.

E Provide integral water-repellant in all Angelus Block CO., INC. 4575 W. Vineyard Ave. Oxnard, CA 93036 (805) 983-7697.

F All CMUs shall be sound and free of cracks or other defects that would interfere with the proper placing of the units or impair the strength or performance of the construction.

G Protection: CMUs shall be delivered to the jobsite on wood pallets and packaged with protective cushions between all layers to eliminate chipping. Each pallet to be protected with a plastic cover.

H Cleaning: No muriatic acid or acid-based solutions shall be used in the cleaning of CMU Products and Procedures shall be as outlined in Clayton Block Co. “Architectural CMU Cleaning Recommendations.”

GROUND FACE CMU

A Manufacturer: Angelus Block CO., INC. 4575 W. Vineyard Ave. Oxnard, CA 93036 (805) 983-7697.

B All units will conform to ASTM C-90.

1. Weight Classification: Normal Weight.
2. Minimum Net Compressive Strength 4000 PSI

CMU WALL

04-7
C Sizes: Manufacturers Standard Nominal Sizes.

D Color: Shall be as manufactured by Angelus Block CO., INC. 4575 W. Vineyard Ave. Oxnard, CA 93036 (805) 983-7697

F All CMUs shall be sound and free of cracks or other defects that would interfere with the proper placing of the units or impair the strength or performance of the construction.

G Protection: CMUs shall be delivered to the jobsite on wood pallets and packaged with protective cushions between all GROUND FACE BLOCK layers to eliminate chipping. Each pallet to be protected with a plastic cover.

H Cleaning: No muriatic acid or acid-based solutions shall be used in the cleaning of CMU. Products and Procedures shall be as outlined in Clayton Block Co. “Architectural CMU Cleaning Recommendations.”

SPLIT FACE CMU

A Manufacturer: Angelus Block CO., INC. 4575 W. Vineyard Ave. Oxnard, CA 93036 (805) 983-7697

1. Face design shall be split face as manufactured by Angelus Block CO., INC.

B All units will conform to ASTM C-90.

1. Weight Classification: Normal Weight.
2. Minimum Net Compressive Strength 1900 PSI.

C Sizes: Manufacturers Standard Nominal Sizes.

D Color: Shall be as manufactured by Angelus Block CO., INC. 4575 W. Vineyard Ave. Oxnard, CA 93036 (805) 983-7697.

G Cleaning: No muriatic acid or acid-based solutions shall be used in the cleaning of CMU. Products and Procedures shall be as outlined in Clayton Block Co. “Architectural CMU Cleaning Recommendations.”

2.05 REINFORCED CMU

A Manufacturer: GROUT BLOCK as produced by Angelus Block CO., INC. 4575 W. Vineyard Ave. Oxnard, CA 93036 (805) 983-7697.

B All units will comply with the following properties:

1. All units will conform to ASTM C-90.
2. Weight Classification: Normal Weight.
3. Minimum Net Compressive Strength: 3000 PSI.

C Reinforcement Bars: Provide deformed bars of following grades complying with ASTM A-615, except as otherwise indicated:

CMU WALL

04 -8
1. Provide Grade 40 for Bars No. 3 to No. 6, except as otherwise indicated.
2. Provide Grade 60 for Bars No. 6 to No. 18, except as otherwise indicated.
3. Shop fabricate reinforcement bars which are shown to be bent or hooked.

D Mortar: Type M conforming to ASTM C-270.

E Concrete Fill: 3,000 PSI, minimum slump of 8".

2.07 MORTAR AND GROUT MATERIALS

A Portland Cement: ASTM C-150, Type I, except use Type III for construction below 40 Degrees

B Hydrated Lime: ASTM C-207, Type S.

C Aggregate for Mortar: ASTM C-144, except for joints less than 1/4 inch use aggregate graded with 100% passing the No. 16 sieve.

1. White Aggregates: Natural white sand or ground white stone.

D Aggregate for Grout: ASTM C-404.

E Water: Clean and potable.

F Accelerators: Subject to compliance with requirements, non-chloride admixtures may be used in cold weather construction. Acceptable products are: Chemstrong CFTM - Great Eastern Technologies, LLC. G Integral Water Repellant Admixture: Basis for Design: AquashieldTM - Great Eastern Technologies, LLC.

2.08 MORTAR AND GROUT MIXES

A General: Use only the specified additives to mortar and grout mixes.

1. Do not use calcium chloride in mortar or grout.

B Mixing: Combine and thoroughly mix cementitious materials, water, aggregates and admixtures in a mechanical batch mixer. Comply with applicable ASTM standards and material manufacturer's recommendations for mixing time and water content. Measure and batch materials by volume so that required proportions can be accurately controlled and maintained. Measurement of sand by shovel will not be permitted; measure using container constructed for consistent volume measurement.

C Mortar for Unit Masonry: Comply with ASTM C-270, Proportion Specifications, Cement-Lime Mortar, for types of mortar required, unless otherwise indicated.

1. Use Type M mortar for masonry below grade and in contact with earth, and where indicated.
   a. Air Content: 8-12% Maximum.

2. Use Type N mortar for interior non-loadbearing walls.
a. Air Content: 8-14% Maximum.

3. Use Type S mortar for all other masonry.

   a. Air Content: 8-12% Maximum.

D Colored Aggregate Mortar: Produce mortar of color required by use of colored aggregates in combination with selected cementitious materials.

   1. Color: To be selected by Architect.

E Limit cementitious materials in mortar to Portland cement - lime.

F Grout for Unit Masonry: Comply with ASTM C-476. Use grout of consistency which at time of placement will completely fill all spaces intended to receive grout.

   1. Mix: Portland cement, sand, gravel and water, proportioned as required to provide a 28-day minimum compressive strength of 3000 PSI.
   2. Use for reinforced masonry lintels or bond beams, reinforced masonry piers, and wherever grouting full is indicated or specified.

2.09 JOINT REINFORCEMENT, TIES AND ANCHORS

A Materials: Comply with requirements indicated below for basic materials, as well as requirements for each form of joint reinforcement, tie and anchor for size and other characteristics.

B Hot-Dip Galvanized Steel Wire: ASTM A-82 for uncoated wire and with ASTM A-153, Class B-2 (1.5 oz. per sq. ft. of wire surface) for zinc coating applied after pre-fabrication into units.

C Joint Reinforcement: Welded-wire units prefabricated with deformed continuous side rods and plain cross rods into straight lengths of not less than 10'-0", with prefabricated corner and tee units.

   1. Width: Approximately 2" less than nominal width of walls and partitions, to provide mortar coverage of not less than 5/8" on joint faces exposed to exterior and 1/2" elsewhere.
   5. Configuration:

      a. Single-Wythe Masonry: Truss design with continuous diagonal cross rods spaced not more than 16" o.c.
      b. Multi-Wythe Masonry: For cavity or composite masonry walls, provide adjustable wall tie pintle section fitting into eye section of rectangular box-type cross ties spaced not more than 16" o.c. Truss type units with side rods spaced for embedment within each face shell of back-up wythe and ties extended to within 1" of exterior face of facing wythe.
D Flexible Anchors: Where flexible anchors are indicated for connecting masonry to structural framework, provide 2-piece anchors as described below which permit vertical or horizontal differential movement between wall and framework parallel to, but resist tension and compression forces perpendicular to, plane of wall.

1. Anchorage to Steel Framework: Provide manufacturer's standard anchors with crimped 1/4" diameter wire anchor section for welding to steel framework and triangular-shaped wire tie section sized to extend within 1" of exterior face of facing wythe.

E Unit Type Masonry Inserts in Concrete: Furnish cast iron or malleable iron inserts of type and size indicated.

F Dovetail Slots: Furnish dovetail slots, with filler strips, of slot size indicated, fabricated from 0.0336" (22 gauge) sheet metal.

G Anchor Bolts: Provide steel bolts with hex nuts and flat washers complying with ASTM A-307, Grade A, hot-dip galvanized to comply with ASTM C-153, Class C, in sizes and configuration indicated.

H Pencil Rods at Construction Joints: As shown, dowels dipped in tar for half of length.

I Reinforcing Bars: Deformed steel, ASTM A-615, Grade 60 for Bars No. 3 to No. 18.

J Available Manufacturers: Subject to compliance with requirements, manufacturers offering products which may be incorporated in the work include, but are not limited to, the following:

1. AA Wire Products Co.
2. Dur-O-Wal, Inc.
3. Heckman Building Products, Inc.
4. Hohmann & Barnard, Inc.
5. Masonry Reinforcing Corp. of America

2.10 MISCELLANEOUS MASONRY ACCESSORIES

A Non-Metallic Expansion Joint Strips: Premolded, flexible cellular neoprene rubber filler strips complying with ASTM D-1056, Grade RE41E1, capable of compression up to 35%, of width and thickness indicated on drawings.

B Weepholes: Provide the following for weepholes:

1. Plastic Tubing: Medium density polyethylene, outside diameter and length as indicated below:

   a. 1/4" x 4"

END OF SECTION
05 50 00 - METAL FABRICATIONS

PART 1 – GENERAL

SUMMARY

A. This Section includes the following:

1. Steel framing and supports, mounting brackets and anchorages for applications and equipment where framing and supports, mounting brackets, and anchorages are not specified in other Sections.
2. Steel plates and angles for casting into concrete, not specified in other Sections.
3. Steel frames not specified in other Sections.
4. Miscellaneous steel fabrications not specified in other Sections.
5. Metal fabrications furnished under this Section, but installed under other Sections.

1.2 PERFORMANCE REQUIREMENTS

A. Thermal Movements: Provide exterior metal fabrications that allow for thermal movements resulting from the following maximum change (range) in ambient and surface temperatures by preventing buckling, opening of joints, overstressing of components, failure of connections, and other detrimental effects. Base engineering calculation on surface temperatures of materials due to both solar heat gain and nighttime-sky heat loss.

1. Temperature Change (Range): 120 deg F(67 deg C), ambient; 180 deg F(100 deg C), material surfaces.

1.3 SUBMITTALS

A. Product Data: For manufactured products.

B. Shop Drawings: Show fabrication and installation details for metal fabrications.

1. Include plans, elevations, sections, and details of metal fabrications and their connections. Show anchorage and accessory items.
2. Provide templates for anchors and bolts specified for installation under other Sections.

C. Welding certificates.

D. Research/Evaluation Reports: For post-installed anchors.

E. Field quality-control test and inspection reports.

1.4 QUALITY ASSURANCE

A. Welding: Qualify procedures and personnel according to the following:

1. AWS D1.1, "Structural Welding Code--Steel."

1.5 PROJECT CONDITIONS

METAL FABRICATIONS
05 50 00-1
A. Field Measurements: Verify actual locations of walls and other construction contiguous with metal fabrications by field measurements before fabrication and indicate measurements on Shop Drawings. Provide allowance for trimming and fitting of metal fabrications at site.

1.6 COORDINATION

A. Coordinate installation of embedded metal fabrications and separately-installed anchorages for metal fabrications. Furnish setting drawings, templates, and directions for installing anchorages, including sleeves, concrete inserts, anchor bolts, and items with integral anchors, that are to be embedded in concrete or masonry or otherwise required for work of other Sections. Deliver such items to Project site in time for installation.

PART 2 – PRODUCTS

2.1 METALS, GENERAL

A. Metal Surfaces, General: Provide materials with smooth, flat surfaces, unless otherwise indicated. For metal fabrications exposed to view in the completed Work, provide materials without seam marks, roller marks, rolled trade names, or blemishes.

2.2 FERROUS METALS

A. Steel Plates, Shapes, and Bars: ASTM A 36/A 36M.

B. Steel Tubing: ASTM A 500, cold-formed steel tubing.

C. Steel Pipe: ASTM A 53/A 53M, standard weight (Schedule 40), unless another weight is indicated or required by structural loads.

D. Slotted Channel Framing: Cold-formed metal channels with continuous slot complying with MFMA-3.

1. Size of Channels: Not less than 1-5/8 by 1-5/8 inches (41 by 41 mm).
2. Material (Exterior and Partially-Protected Locations): Galvanized steel complying with ASTM A 653/A 653M, structural steel, Grade 33 (Grade 230), with G90 (Z275) coating; not less than 0.108-inch (2.8-mm) nominal thickness.
3. Material (Interior, and Fully-Protected Locations): Steel complying with ASTM A 1008/A 1008M, structural steel, Grade 33 (Grade 230); not less than 0.0966-inch (2.5-mm) minimum thickness; coated with manufacturer's standard rust-inhibitive, baked-on, acrylic enamel.

2.3 FASTENERS

A. General: Unless otherwise indicated, provide structural-grade fasteners for exterior use or embedded in concrete or masonry with hot-dip galvanized coating complying with ASTM A 153/A 153M. Select fasteners for type, grade, and class required.

B. Cast-in-Place and Embedded Anchors: Anchors capable of sustaining, without failure, a load equal to not less than four times the load imposed, as determined by testing according to ASTM E 488, conducted by a qualified independent testing agency.

METAL FABRICATIONS
05 50 00-2
C. Post-Installed Anchors: Chemical-adhesive-type anchor bolt assembly with capability to sustain, without failure, a load equal to not less than six times the load imposed when installed in unit masonry and not less than four times the load imposed when installed in concrete, as determined by testing according to ASTM E 488, conducted by a qualified independent testing agency.

2.4 MISCELLANEOUS MATERIALS

A. Welding Rods and Bare Electrodes: Select according to AWS specifications for metal alloy welded.

B. Shop Primers: Provide VOC-compliant, rust-inhibitive primers; and where applicable, compatible with touchup and topcoat products provided under Division 09 painting Sections.

1. Products:
   a. Sherwin-Williams Company (The)
      1) Steel Spec Weld-Thru Primer 2.3; B50RS0202 Red Oxide/B50AS0200 Gray (275g/L).
      2) Kromik Metal Primer E41N1(340g/L)
      3) Kem Bond HS Universal Metal Primer B50NZ3/B50WZ4/B50AZ8(320g/L)
      4) Hi-Solids Alkyd Metal Primer B50NZ2/B50WZ3(320g/L)

   b. Tnemec Company, Inc.; V10 Series(332g/L).

   c. Or equal.

C. Galvanizing and (Field) Touchup Repair Paint: VOC-compliant (for field-application) product as recommended by paint or primer manufacturer.


2.5 FABRICATION, GENERAL

A. Shop Assembly: Preassemble items in the shop to greatest extent possible. Disassemble units only as necessary for shipping and handling limitations. Use connections that maintain structural value of joined pieces. Clearly mark units for reassembly and coordinated installation.

B. Cut, drill, and punch metals cleanly and accurately. Remove burrs and ease edges to a radius of approximately 1/32 inch(1 mm), unless otherwise indicated. Remove sharp or rough areas on exposed surfaces.

C. Form bent-metal corners to smallest radius possible without causing grain separation or otherwise impairing work.

D. Form exposed work true to line and level with accurate angles and surfaces and straight edges.
E. Weld corners and seams continuously to comply with the following:

1. Use materials and methods that minimize distortion and develop strength and corrosion resistance of base metals.
2. Obtain fusion without undercut or overlap.
3. Remove welding flux immediately.
4. At exposed connections, finish exposed welds and surfaces smooth and blended so no roughness shows after finishing and contour of welded surface matches that of adjacent surface.

F. Form exposed connections with hairline joints, flush and smooth, using concealed fasteners where possible. Where exposed fasteners are required, use Phillips flat-head (countersunk) screws or bolts, unless otherwise indicated. Locate joints where least conspicuous.

G. Fabricate seams and other connections that will be exposed to weather in a manner to exclude water. Provide weep holes where water may accumulate.

H. Cut, reinforce, drill, tap, and otherwise prepare metal fabrications as indicated to receive hardware, fasteners, anchors, and similar items, including work of other sections.

I. Provide for anchorage of type indicated; coordinate with supporting structure. Space anchoring devices to secure metal fabrications rigidly in place and to support indicated loads.

1. Where units are indicated to be cast into concrete or built into masonry, equip with integrally welded steel strap anchors, not less than 1/8 by 1-1/2 inches (3.2 by 38 mm), with a minimum 6-inch (150-mm) embedment and 2-inch (50-mm) hook, not less than 8 inches (200 mm) from ends and corners of units and not more than 24 inches (600 mm) o.c., unless otherwise indicated.

2.6 MISCELLANEOUS FRAMING AND SUPPORTS

A. General: Provide steel framing and supports not specified in other Sections as needed to complete the Work.

B. Fabricate units from continuous steel shapes, plates, and bars of welded construction, unless otherwise indicated. Fabricate to sizes, shapes, and profiles indicated and as necessary to receive adjacent construction retained by framing and supports.

1. Furnish inserts if units are installed after concrete or masonry is placed.

2.7 STEEL FRAMES

A. Fabricate steel frames from steel shapes, plates, and bars of size and to dimensions indicated, fully welded together; provide with steel solid bar stops to accommodate other work as necessary, unless otherwise indicated. Plug-weld built-up members and continuously weld exposed joints. Secure removable stops to frame with countersunk machine screws, uniformly spaced at not more than 10 inches (250 mm) o.c. Reinforce frames and drill and tap as necessary to accept hardware fasteners, anchors, and similar items, including work of other sections.

2.8 FINISHES, GENERAL
A. Comply with NAAMM's "Metal Finishes Manual for Architectural and Metal Products" for recommendations for applying and designating finishes.

B. Finish metal fabrications after assembly.

2.9 STEEL AND IRON FINISHES

A. Unless otherwise indicated, galvanize metal fabrications at exterior (including partially protected), and interior (subject to intermittent exposure to moisture) locations.

B. Galvanizing: Hot-dip galvanize items as indicated to comply with applicable standard listed below:
   1. ASTM A 123/A 123M, for galvanizing steel and iron products.
   2. ASTM A 153/A 153M, for galvanizing steel and iron hardware.

C. Unless otherwise indicated, prime metal fabrications at interior (relatively dry) and similar fully-protected locations with rust-inhibitive shop primer.

D. Preparation for Shop Priming: Prepare uncoated ferrous-metal surfaces to comply with minimum requirements indicated below for SSPC surface preparation specifications and environmental exposure conditions of installed metal fabrications:
   1. For relatively dry, interior locations: SSPC-SP 3.
   2. Subsequent to completion of above procedures, comply with SSPC-SP 1.
   3. Perform specialized cleaning, preparation, pretreatment and similar procedures as appropriate and recommended by coating manufacture for specific type and condition of surfaces.

E. Shop Priming: Apply shop primer to uncoated surfaces of metal fabrications, except those with galvanized finishes and those to be embedded in concrete, sprayed-on fireproofing, or masonry, unless otherwise indicated. Comply with SSPC-PA 1, "Paint Application Specification No. 1: Shop, Field, and Maintenance Painting of Steel," for shop painting.

1. Stripe paint corners, crevices, bolts, welds, and sharp edges.

PART 3 – EXECUTION

3.1 INSTALLATION, GENERAL

A. Cutting, Fitting, and Placement: Perform cutting, drilling, and fitting required for installing metal fabrications. Set metal fabrications accurately in location, alignment, and elevation; with edges and surfaces level, plumb, true, and free of rack; and measured from established lines and levels.

B. Fit exposed connections accurately together to form hairline joints. Weld connections that are not to be left as exposed joints but cannot be shop welded because of shipping size limitations. Do not weld, cut, or abrade surfaces of exterior units that have been hot-dip galvanized after fabrication and are for bolted or screwed field connections.

C. Field Welding: Comply with the following requirements:
1. Use materials and methods that minimize distortion and develop strength and corrosion resistance of base metals.
2. Obtain fusion without undercut or overlap.
3. Remove welding flux immediately.
4. At exposed connections, finish exposed welds and surfaces smooth and blended so no roughness shows after finishing and contour of welded surface matches that of adjacent surface.

D. Fastening to In-Place Construction: Provide anchorage devices and fasteners where metal fabrications are required to be fastened to in-place construction. Provide threaded fasteners for use with concrete and masonry inserts, through bolts, and other connectors.

E. Provide temporary bracing or anchors in formwork for items that are to be built into concrete, masonry, or similar construction.

3.2 INSTALLING MISCELLANEOUS FRAMING AND SUPPORTS

A. General: Install framing and supports to comply with requirements of items being supported, including manufacturers' written instructions and requirements indicated on Shop Drawings.

B. Anchor framing and supports securely to and rigidly brace from building structure.

1. Where grout space under bearing plates is indicated, install as specified in "Installing Base, Bearing and Similar Plates" Article.

3.3 GROUTING BASE, BEARING AND SIMILAR PLATES


B. Set plates on wedges, shims, or leveling nuts. After bearing members have been positioned and plumbed, tighten anchor bolts. Do not remove wedges or shims but, if protruding, cut off flush with edge of plate before packing with grout.

1. Use nonshrink, nonmetallic grout, unless otherwise indicated.
2. Pack grout solidly between bearing surfaces and plates to ensure that no voids remain.
3. Neatly finish exposed surfaces; protect grout and allow to cure.

3.4 ADJUSTING AND CLEANING

A. Touchup Painting: Immediately after erection, clean field welds, bolted connections, and abraded areas. Paint uncoated and abraded areas with compatible primer of same type as used for shop painting to comply with SSPC-PA 1 for touching up shop-painted surfaces.

1. Apply by brush or spray to provide a minimum 2.0-mil(0.05-mm) dry film thickness.

B. Galvanized Surfaces: Clean field welds, bolted connections, and abraded areas and repair galvanizing and zinc-rich primed surfaces with galvanized repair paint according to manufacturer's written instructions.
SECTION 06 20 23 - INTERIOR FINISH CARPENTRY

PART 1 – GENERAL

1.1 SUMMARY

A. This Section includes miscellaneous interior finish carpentry.

1.2 DEFINITIONS

A. Interior Finish Carpentry: Includes exposed, non-structural, field-fabricated carpentry work, not requiring compliance with woodwork quality reference standards and not specified in other Sections.

1.3 SUBMITTALS

A. Product Data and Shop Drawings: For each type of interior finish carpentry item indicated. Indicate component materials (including types, and grades), dimensions, and profiles, and include fabrication and installation details.

1.4 DELIVERY, STORAGE, AND HANDLING

A. Protect materials against weather and contact with damp or wet surfaces. Stack lumber, plywood, and other panels flat with spacers between each bundle to provide air circulation. Provide for air circulation within and around stacks and under temporary coverings.

B. Deliver interior finish carpentry materials only when environmental conditions meet requirements specified for installation areas. If interior finish carpentry materials must be stored in other than installation areas, store only where environmental conditions meet requirements specified for installation areas.

1.5 PROJECT CONDITIONS

A. Environmental Limitations: Do not deliver or install interior finish carpentry materials until building is enclosed and weatherproof, wet work in space is completed and nominally dry, and HVAC system is operating and maintaining temperature and relative humidity at occupancy levels during the remainder of the construction period.

B. Do not install finish carpentry materials that are wet, moisture damaged, or mold damaged.

1. Indications that materials are wet or moisture damaged include, but are not limited to, discoloration, sagging, or irregular shape.

2. Indications that materials are mold damaged include, but are not limited to, fuzzy or splotchy surface contamination and discoloration.

1.6 COORDINATION

A. Coordinate sizes and locations of framing, blocking, furring, reinforcements, and other related units of Work specified in other Sections to ensure that interior finish carpentry can be supported and installed as indicated.
PART 2 – PRODUCTS

2.1 MATERIALS

A. Lumber: DOC PS 20 and applicable grading rules of inspection agencies certified by ALSC's Board of Review.

   1. Grade: Any closed-grain hardwood or softwood species, C Select, Superior or equivalent in accordance with WCLIB or WWPA grading rules
   2. Maximum Moisture Content: 19 percent.
   3. Face Surface: Surfaced (smooth) four sides.

B. Softwood Plywood: DOC PS 1; Interior B-D or better, not less than 1/2-inch(13-mm) nominal thickness.

C. Hardboard: AHA A135.4.

   1. Thickness: Not less than 1/4 inch(6.4 mm), unless otherwise indicated.
   2. Finish: Class I.

D. Particleboard: ANSI A208.1, Grade M-2, made with binder containing no urea-formaldehyde resin.

2.2 SHELVING AND RODS

A. Shelving: Made from one of the following materials, 3/4 inch(19 mm) thick.

   1. Particleboard with solid-wood front edge.
   2. Softwood plywood with solid-wood edge.
   3. Wood boards as specified above for lumber.

B. Shelf Cleats: Not less than 3/4-by-3-1/2-inch(19-by-89-mm) lumber with hole to receive clothes rods (where rod flanges are not provided).

C. Rods: 1-1/2-inch-(38-mm-) diameter, clear, kiln-dried hardwood.

D. Rod Flanges: Clear, kiln-dried, hardwood turnings

2.3 MISCELLANEOUS MATERIALS

A. Fasteners for Interior Finish Carpentry: Nails, screws, and other anchoring devices of type, size, material, and finish required for application indicated to provide secure attachment, concealed where possible.

B. Glue: Aliphatic-resin, polyurethane, or resorcinol wood glue recommended by manufacturer for general carpentry use.

C. Multipurpose Construction Adhesive: Formulation complying with ASTM D 3498 that is recommended for indicated use by adhesive manufacturer.

2.4 FABRICATION

INTERIOR FINISH CARPENTRY
06 20 23-2
A. Back out or kerf backs of trim and similar linear members except those with ends exposed in finished work.

B. Ease edges of lumber less than 1 inch (25 mm) in nominal thickness to 1/16-inch (1.5-mm) radius and edges of lumber 1 inch (25 mm) or more in nominal thickness to 1/8-inch (3-mm) radius.

PART 3 – EXECUTION

3.1 EXAMINATION

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

B. Examine finish carpentry materials before installation. Reject materials that are wet, moisture damaged, and mold damaged.

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

3.2 PREPARATION

A. Clean substrates of projections and substances detrimental to application.

B. Before installing interior finish carpentry, condition materials to average prevailing humidity in installation areas for a minimum of 24 hours.

3.3 INSTALLATION, GENERAL

A. Do not use materials that are unsound, warped, improperly treated or finished, inadequately seasoned, or too small to fabricate with proper jointing arrangements.

B. Install interior finish carpentry level, plumb, true, and aligned with adjacent materials. Use concealed shims where necessary for alignment.

1. Scribe and cut interior finish carpentry to fit adjoining work. Refinish and seal cuts as recommended by manufacturer.

2. Countersink fasteners, fill surface flush, and sand where face fastening is unavoidable.

3. Install to tolerance of 1/8 inch in 96 inches (3 mm in 2438 mm) for level and plumb. Install adjoining interior finish carpentry with 1/32-inch (0.8-mm) maximum offset for flush installation and 1/16-inch (1.5-mm) maximum offset for reveal installation.

4. Coordinate interior finish carpentry with materials and systems in or adjacent to it. Provide cutouts for mechanical and electrical items that penetrate interior finish carpentry.

3.4 STANDING AND RUNNING TRIM INSTALLATION

A. Install with minimum number of joints practical, using full-length pieces from maximum lengths of lumber available. Do not use pieces less than 24 inches (610 mm) long, except where necessary. Stagger joints in adjacent and related standing and running trim. Cope at returns and miter at corners to produce tight-fitting joints with full-surface contact throughout length of joint.
Use scarf joints for end-to-end joints. Plane backs of casings to provide uniform thickness across joints where necessary for alignment.

1. Install trim after gypsum board joint finishing operations are completed.
2. Drill pilot holes before fastening to prevent splitting. Fasten to prevent movement or warping. Countersink fastener heads on exposed carpentry work and fill holes.

### 3.5 SHELVING AND CLOTHES ROD INSTALLATION

A. Cut shelf cleats at ends of shelves about 1/2 inch (13 mm) less than width of shelves and sand exposed ends smooth.

B. Install shelf cleats by fastening to framing or backing with finish nails or trim screws, set below face and filled. Space fasteners not more than 16 inches (400 mm) o.c. Use 2 fasteners at each framing member or fastener location for cleats 4 inches nominal (89 mm actual) in width and wider.

1. Apply a bead of multipurpose construction adhesive to back of shelf cleats right before installing. Remove adhesive that is squeezed out immediately after fastening shelf cleats in place.

C. Install intermediate shelf brackets, fabricated of same material as shelves, spaced not more than 36 inches (900 mm) o.c. Fasten to framing members, or blocking, as specified for cleats.

D. Cut shelves to neatly fit with only minimal gap to allow shelves to be installed. Install shelves, fully seated on cleats, brackets, and supports.

1. Fasten shelves to cleats and brackets with finish nails or trim screws, set flush.

E. Install rod flanges for rods or rout holes in cleats. Fasten flanges to shelf cleats, framing members, blocking, or metal backing, with screws utilizing all fastener holes. Install rods in rod flanges or routed holes in cleats as cleats are installed.

1. Install intermediate rod support brackets, separate or integral with shelf brackets, spaced not more than 36 inches (900 mm) o.c. Fasten to framing members, or blocking, as specified for cleats.

### 3.6 ADJUSTING

A. Replace interior finish carpentry that is damaged or does not comply with requirements. Interior finish carpentry may be repaired or refinished if work complies with requirements and shows no evidence of repair or refinishing. Adjust joinery for uniform appearance.

### 3.7 CLEANING

A. Clean interior finish carpentry on exposed and semiexposed surfaces. Touch up factory-applied finishes to restore damaged or soiled areas.

### 3.8 PROTECTION

A. Protect installed products from damage from weather and other causes during remainder of the construction period.

INTERIOR FINISH CARPENTRY

06 20 23-4
B. Remove and replace finish carpentry materials that are wet, moisture damaged, and mold damaged.

1. Indications that materials are wet or moisture damaged include, but are not limited to, discoloration, sagging, or irregular shape.
2. Indications that materials are mold damaged include, but are not limited to, fuzzy or splotchy surface contamination and discoloration.

END OF SECTION 06 20 23
SECTION 07 21 00 - THERMAL INSULATION

PART 1 – GENERAL

1.1 SUMMARY

A. This Section includes the following:

1. Concealed building insulation.
2. Sound attenuation insulation.

1.2 DEFINITIONS

A. Mineral-Fiber Insulation: Insulation composed of rock-wool fibers, slag-wool fibers, or glass fibers; produced in blankets formed into batts (flat-cut lengths) or rolls.

1.3 SUBMITTALS

A. Product Data: For each type of product indicated.

B. Samples: For each type of exposed insulation indicated.

C. Product Test Reports: Based on evaluation of comprehensive tests performed by a qualified testing agency for insulation products.

1.4 QUALITY ASSURANCE

A. Fire-Test-Response Characteristics: Provide insulation and related materials with the fire-test-response characteristics indicated, as determined by testing identical products per test method indicated below by UL or another testing and inspecting agency acceptable to authorities having jurisdiction. Identify materials with appropriate markings of applicable testing and inspecting agency.


PART 2 – PRODUCTS

2.1 GLASS-FIBER BLANKET INSULATION

A. Manufacturers: Subject to compliance with requirements, manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following:

1. CertainTeed Corporation.
2. Guardian Fiberglass, Inc.
4. Knauf Fiber Glass.
5. Owens Corning.
6. Or equal.
B. Unfaced, Glass-Fiber Blanket Insulation: ASTM C 665, Type I (blankets without membrane facing); consisting of fibers; with maximum flame-spread and smoke-developed indexes of 25 and 50, respectively; passing ASTM E 136 for combustion characteristics.

C. Faced, Glass-Fiber Blanket Insulation: ASTM C 665, Type III (blankets with reflective membrane facing), Class A (membrane-faced surface with a flame-spread index of 25 or less); Category 1 (membrane is a vapor barrier), faced with foil-scrim-kraft, foil-scrim, foil-scrimpolyethylene, or polypropylene-scrim-kraft vapor-retarder membrane on 1 face.

D. Where glass-fiber blanket insulation is indicated by the following nominal thicknesses, provide blankets in batt or roll form with thermal resistances indicated:

1. 5-1/2 inches (140 mm) to 6-1/2 inches (165 mm) thick with a thermal resistance of not less than 21 deg F x h x sq. ft./Btu at 75 deg F (3.7 K x sq. m/W at 24 deg C).
2. 12 inches (300 mm) thick with a thermal resistance of not less than 38 deg F x h x sq. ft./Btu at 75 deg F (6.7 K x sq. m/W at 24 deg C).

2.2 AUXILIARY INSULATING MATERIALS

A. Vapor-Retarder Tape: Pressure-sensitive tape of type recommended by insulation manufacturers for sealing joints and penetrations in vapor-retarder facings.

B. Eave Ventilation Troughs: Preformed, rigid fiberboard or plastic sheets designed and sized to fit between roof framing members and to provide cross ventilation between insulated attic spaces and vented eaves.

2.3 ELECTRICAL JUNCTION BOX ACOUSTICAL INSULATION PADS

A. Self-adhering, non-asbestos-containing, polybutene-butyl or equivalent mastic/putty, resilient sealer pads, 1/8-inch thick.

1. Products:
   b. Kinetics Noise Control; SealTight Outlet Box Backer Pad.
   c. Or equal.

PART 3 – EXECUTION

3.1 EXAMINATION

A. Examine substrates and conditions, with Installer present, for compliance with requirements of Sections in which substrates and related work are specified and for other conditions affecting performance.

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

3.2 PREPARATION

A. Clean substrates of substances harmful to insulation or vapor retarders, including removing projections capable of puncturing vapor retarders or of interfering with insulation attachment.
3.3 INSTALLATION, GENERAL

A. Comply with insulation manufacturer's written instructions applicable to products and application indicated.

B. Install insulation that is undamaged, dry, and unsoiled and that has not been left exposed at any time to ice, rain, and snow.

C. Extend insulation in thickness indicated to envelop entire area to be insulated. Cut and fit tightly around obstructions and fill voids with insulation. Remove projections that interfere with placement.

D. Water-Piping Coordination: If water piping is located within insulated exterior walls, coordinate location of piping to ensure that it is placed on warm side of insulation and insulation encapsulates piping.

3.4 INSTALLATION OF GENERAL BUILDING INSULATION

A. Apply insulation units to substrates by method indicated, complying with manufacturer's written instructions. If no specific method is indicated, bond units to substrate with adhesive or use mechanical anchorage to provide permanent placement and support of units.

B. Set vapor-retarder-faced units with vapor retarder to warm-in-winter side of construction, unless otherwise indicated.

1. Tape joints and ruptures in vapor retarder, and seal each continuous area of insulation to surrounding construction to ensure airtight installation.

C. Install mineral-fiber insulation in cavities formed by framing members according to the following requirements:

1. Use insulation widths and lengths that fill the cavities formed by framing members. If more than one length is required to fill cavity, provide lengths that will produce a snug fit between ends.
2. Place insulation in cavities formed by framing members to produce a friction fit between edges of insulation and adjoining framing members.
3. Maintain 3-inch (76-mm) clearance of insulation around recessed lighting fixtures.
4. For wood-framed construction, install mineral-fiber blankets according to ASTM C 1320 and as follows:

a. With faced blankets having stapling flanges, lap blanket flange over flange of adjacent blanket to maintain continuity of vapor retarder once finish material is installed over it.

D. Stuff glass-fiber insulation into miscellaneous voids and cavity spaces where shown. Compact to approximately 40 percent of normal maximum volume equaling a density of approximately 2.5 lb/cu. ft. (40 kg/cu. m).

3.5 INSTALLATION OF INSULATION IN INTERIOR, FRAMED PARTITIONS FOR SOUND

THERMAL INSULATION
07 21 00-3
ATTENUATION
   A. Install unfaced mineral-fiber blanket insulation between framing members, full-depth and fullwidth cavity space.

3.6 INSTALLATION OF ELECTRICAL JUNCTION BOX ACOUSTICAL INSULATION PADS
   A. Clean exterior surfaces of electrical junction boxes of dirt, dust, and other debris. If surface is contaminated with oil, wipe with xylene or toluene to remove residue.

   B. Apply single-piece pads wherever practical, to back of electrical junction box, molding to conduit penetrations, completely covering back and sides of electrical junction box. Center electrical box pad on the back of the junction box. Mold cover around box sides covering all openings.

3.7 PROTECTION
   A. Protect installed insulation from damage due to harmful weather exposures, physical abuse, and other causes. Provide temporary coverings or enclosures where insulation is subject to abuse and cannot be concealed and protected by permanent construction immediately after installation.

END OF SECTION 07 21 00
SECTION 07311 FIBER GLASS-BASED ASPHALT SHINGLES

PART 1 – GENERAL

Related Sections

A. Rough Carpentry Section 06100.
B. Roof and Deck Insulation Section 07240 for insulation placed over roof decking.

Notes to Specifier:

1. Underlayment and shingles installed directly over roof insulation or similar type decks is not approved.
2. Roof deck must be dry, minimum 25/32” thick, maximum 6” wide boards, or APA rated sheathing (exposure 1): minimum 3/8” plywood, minimum 7/16” oriented strand board or waferboard. Consult your Owens Corning representative for other approved constructions.
3. Ventilation under roof deck must meet FHA Minimum Property Standards.

C. Flashing and Sheet Metal: Section 07600. For snow guards, metal flashing and drip edges, including step-type flashing installed with shingles.
D. Roof Accessories: Section 07800.

1. RAFT-R-MATE® UL® Listed
2. Soffits
3. VentSure® Ventilation Products
4. Hip & Ridge Shingles
5. WeatherLock®

REFERENCES

STANDARDS AND BUILDING CODES


QUALITY ASSURANCE

A. Shingles shall carry Underwriter’s Laboratories Labels:
   1. UL® 790, Class A Fire Resistance
   2. D-3161 Class “F” Wind Resistance

ASPHALT SHINGLES

07 31 01-1
3. ASTM D3462
B. Install shingles to meet requirements of published Owens Corning instructions.

SUBMITTALS

A. Manufacturer color sample showing full range of colors available for specified products.
B. Product literature and recommended installation procedures.
C. Owens Corning Limited Warranty *

DELIVERY, STORAGE, AND HANDLING

A. Deliver materials to site in manufacturer’s unopened bundles with labels intact and legible.
B. Handle and store materials on site to prevent damage. Store in a covered ventilated area at a maximum temperature of 110°F.
C. Do not stack product more than 2 pallets high. If stacking 2 pallets high, use separator boards to protect the shingles below.
D. Roof Top Loading: Lay shingle bundles flat. Do not bend over the ridge.

PROJECT CONDITIONS

A. Proceed with installing shingles only when weather is appropriate for a quality installation.
B. Do not install underlayment or shingles on wet surfaces.

WARRANTY

A. Materials: Owens Corning 30-year Limited Warranty* 110 mph wind, terms and conditions apply.

LIMITATION

Owens Corning Shingle can not be installed over an insulated roof assembly, without proper ventilation, contact manufacture for details.

PART 2 – PRODUCTS

ASPHALT SHINGLES

Owens Corning Duration™ fiber glass-based asphalt shingles complying with ASTM specifications E 108 Class A or UL 790 Class A, D 3462, D 3161 Class “F” D 228 or UL 997, D 3018 Type 1, ASTM D 228.

Duration™ Shingle Product Specification

Nominal Size: 13 ¼” x 38 ¼”
Exposure: 5 5/8”
Shingles per Square: 66
Bundles per Square: 3 bundles of 22 shingles
Coverage per Square: 99.9 sq. ft.

VENTILATION

WATERPROOFING UNDERLAYMENT


1. WeatherLock® Mat,
2. WeatherLock® G
3. WeatherLock® P

ASPHALT FELT UNDERLAYMENT

Non-perforated, [Type I, No. 15] [Type II, no. 30], asphalt saturated felt complying with ASTM D 226, ASTM D 4869 or ASTM D 6757.

HIP & RIDGE SHINGLES

Owens Corning Hip and Ridge shingles of same background color as field of roof.

Hip & Ridge Product Specification

<table>
<thead>
<tr>
<th>High Ridge Hip &amp; Ridge</th>
<th>Nominal Size: 12” x 12”</th>
</tr>
</thead>
<tbody>
<tr>
<td>Exposure:</td>
<td>8”</td>
</tr>
<tr>
<td>Pieces per Carton:</td>
<td>32</td>
</tr>
<tr>
<td>Lineal Feet per Carton:</td>
<td>21.3 ft.</td>
</tr>
</tbody>
</table>

FASTENERS

All fasteners must be driven flush with the shingle surface and penetrate at least ¾” into the wood deck. Where the deck is less than ¾” thick, the fastener should be long enough to penetrate fully and extend at least 1/8” through the roof deck.

Owens Corning recommends the use of nails as the preferred method of attaching shingles to wood decking or other nailable substrates. If staples are used they must be, corrosion resistant, zinccoated, 16-gauge minimum with minimum 15/16” crown width. Staples must be long enough to penetrate at least ¾” into solid decking, or extend a minimum of 1/8” through the APA-rated sheathing.

PART 3 – EXECUTION

EXAMINATION

Prior to starting work, examine all roof decks on which work is to be applied for defects in materials and workmanship which may be detrimental to the proper installation or long-term performance of the shingles.
INSTALLATION

Installation shall be in accordance with the Instructions Published by Owens Corning and your local building codes.

Product styles and colors change over time, for current selection of products and colors in your area, please contact your Owens Corning representative.

Owens Corning strives to accurately reproduce the images of shingles in this literature. However, due to manufacturing variances, the limitation of graphic reproduction and the variation in natural exterior lighting, actual shingle colors, and granule blends may vary from the images you see reproduced in this literature. For this reason, it is important to see an actual roofing sample or actual products installed on a home before making final color selection.

* See actual warranty for complete details.
Available in the following plant service areas: Minneapolis, Brookville, Brookville South, Medina and Summit
ROOFING INSTALLER'S WARRANTY

WHEREAS ___________________________________________________________ (name) of ___________________________________________________________ (address), herein called the "Roofing Installer," has performed roofing and associated work ("work") on the following project:

1. Owner: ________________________________________________________________.
2. Address: _______________________________________________________________.
3. Building Name/Type: _____________________________________________________.
4. Address: _______________________________________________________________.
5. Area of Work: __________________________________________________________.
6. Acceptance Date: ________________________________________________________.
7. Warranty Period: ________________________________________________________.
8. Expiration Date: _________________________________________________________.

AND WHEREAS Roofing Installer has contracted (either directly with Owner or indirectly as a subcontractor) to warrant said work against leaks and faulty or defective materials and workmanship for designated Warranty Period,

NOW THEREFORE Roofing Installer hereby warrants, subject to terms and conditions herein set forth, that during Warranty Period he will, at his own cost and expense, make or cause to be made such repairs to or replacements of said work as are necessary to correct faulty and defective work and as are necessary to maintain said work in a watertight condition.

This Warranty is made subject to the following terms and conditions:

1. Specifically excluded from this Warranty are damages to work and other parts of the building, and to building contents, caused by:
   a. Lightning;
   b. Peak gust wind speed exceeding 100 mph(m/sec);
   c. Fire;
   d. Failure of roofing system substrate, including cracking, settlement, excessive deflection, deterioration, and decomposition;
   e. Faulty construction of parapet walls, copings, chimneys, skylights, vents, equipment supports, and other edge conditions and penetrations of the work;
   f. Vapor condensation on bottom of roofing; and
   g. Activity on roofing by others, including construction contractors, maintenance personnel, other persons, and animals, whether authorized or unauthorized by Owner.

2. When work has been damaged by any of the foregoing causes, Warranty shall be null and void until such damage has been repaired by Roofing Installer and until cost and expense thereof have been paid by Owner or by another responsible party so designated.

3. Roofing Installer is responsible for damage to work covered by this Warranty but is not liable for consequential damages to building or building contents resulting from leaks or faults or defects of work.

4. During Warranty Period, if Owner allows alteration of work by anyone other than Roofing Installer, including cutting, patching, and maintenance in connection with penetrations, attachment of other work, and positioning of anything on roof, this Warranty shall become null and void on date of said alterations, but only to the extent said alterations affect work covered by

ASPHALT SHINGLES
07 31 01-5
this Warranty. If Owner engages Roofing Installer to perform said alterations, Warranty shall not become null and void unless Roofing Installer, before starting said work, shall have notified Owner in writing, showing reasonable cause for claim, that said alterations would likely damage or deteriorate work, thereby reasonably justifying a limitation or termination of this Warranty.

5. During Warranty Period, if original use of roof is changed and it becomes used for, but was not originally specified for, a promenade, work deck, spray-cooled surface, flooded basin, or other use or service more severe than originally specified, this Warranty shall become null and void on date of said change, but only to the extent said change affects work covered by this Warranty.

6. Owner shall promptly notify Roofing Installer of observed, known, or suspected leaks, defects, or deterioration and shall afford reasonable opportunity for Roofing Installer to inspect work and to examine evidence of such leaks, defects, or deterioration.

7. This Warranty is recognized to be the only warranty of Roofing Installer on said work and shall not operate to restrict or cut off Owner from other remedies and resources lawfully available to Owner in cases of roofing failure. Specifically, this Warranty shall not operate to relieve Roofing Installer of responsibility for performance of original work according to requirements of the Contract Documents, regardless of whether Contract was a contract directly with Owner or a subcontract with Owner's General Contractor.

IN WITNESS THEREOF, this instrument has been duly executed this ________________ day of __________________, 20__.

1. Authorized Signature: ____________________________________________________.

2. Name: ________________________________________________________________.

3. Title: _________________________________________________________________.

END OF ROOFING INSTALLER'S WARRANTY
PART 1 – GENERAL

1.1 SUMMARY

A. Section Includes: Shop- and field-formed sheet metal flashings and fabrications.

1.2 PERFORMANCE REQUIREMENTS

A. General: Sheet metal flashing assemblies as indicated shall withstand wind loads, structural movement, thermally induced movement, and exposure to weather without failure due to defective manufacture, fabrication, installation, or other defects in construction. Completed sheet metal flashing shall not rattle, leak, or loosen, and shall remain watertight.

B. Fabricate and install copings, roof edge, and similar flashings capable of resisting the forces according to recommendations in FMG Loss Prevention Data Sheet 1-49 for applicable Wind Zone.

C. Thermal Movements: Provide sheet metal flashing that allows for thermal movements from ambient and surface temperature changes.

   1. Temperature Change (Range): 120 deg F(67 deg C), ambient; 180 deg F(100 deg C), material surfaces.

1.3 SUBMITTALS

A. Product Data: Include material descriptions, and finishes.

B. Shop Drawings: Show fabrication and installation layouts of sheet metal flashing, including plans, elevations, expansion-joint locations, and keyed details. Distinguish between shop- and field-assembled work. Include the following:

   1. Identification of material, thickness, weight, and finish for each item and location in Project.
   2. Details for forming sheet metal flashing, including profiles, shapes, seams, and dimensions.
   3. Details for joining, supporting, and securing sheet metal flashing, including layout of fasteners, cleats, clips, and other attachments. Include pattern of seams.
   4. Details of termination points and assemblies, including fixed points.
   5. Details of expansion joints and expansion-joint covers, including showing direction of expansion and contraction.
   6. Details of edge conditions.
   7. Details of special conditions.
   8. Details of connections to adjoining work.
   9. Detail formed flashing and trim at a scale of not less than 3 inches per 12 inches(1:5).

C. Qualification Data: For qualified fabricator.

1.4 QUALITY ASSURANCE
A. Fabricator Qualifications: Shop that employs skilled workers who custom fabricate sheet metal flashing similar to that required for this Project and whose products have a record of successful in-service performance.

B. Sheet Metal Flashing Standard: Comply with SMACNA’s "Architectural Sheet Metal Manual" unless more stringent requirements are specified or shown on Drawings.

C. Preinstallation Conference: Conduct conference at Project site.

1. Meet with Owner, Architect, Owner's insurer if applicable, Installer, and installers whose work interfaces with or affects sheet metal flashing including installers of roofing materials, roof accessories, and roof-mounted equipment.
2. Review methods and procedures related to sheet metal flashing.
3. Examine substrate conditions for compliance with requirements, including flatness and attachment to structural members.
4. Review special roof details, roof drainage, roof penetrations, equipment curbs, and condition of other construction that will affect sheet metal flashing.
5. Document proceedings, including corrective measures and actions required, and furnish copy of record to each participant.

PART 2 – PRODUCTS

2.1 SHEET METALS

A. Metallic-Coated Steel Sheet: Restricted flatness steel sheet, metallic coated by the hot-dip process.

1. Zinc-Coated (Galvanized) Steel Sheet: ASTM A 653/A 653M, G90(Z275) coating designation; structural quality.
2. Surface: Smooth, flat and mill phosphatized for field painting.

2.2 UNDERLAYMENT MATERIALS

A. Self-Adhering, High-Temperature Sheet: Minimum 30 to 40 mils (0.76 to 1.0 mm) thick, consisting of slip-resisting polyethylene-film top surface laminated to layer of butyl or SBSmodified asphalt adhesive, with release-paper backing; cold applied. Provide primer when recommended by underlayment manufacturer.

1. Products:
   a. Carlisle Coatings & Waterproofing Inc.; CCW WIP 300HT.
   c. Henry Company; Blueskin PE200 HT.
   d. Metal-Fab Manufacturing, LLC; MetShield.
   e. Owens Corning; WeatherLock Metal High Temperature Underlayment.
   f. Or equal.
2.3 MISCELLANEOUS MATERIALS

A. General: Provide materials and types of fasteners, solder, welding rods, protective coatings, separators, sealants, and other miscellaneous items as required for complete sheet metal flashing installation unless otherwise indicated.

B. Fasteners: Wood screws, annular threaded nails, self-tapping screws, self-locking rivets and bolts, and other suitable fasteners designed to withstand design loads.

1. General: Blind fasteners or self-drilling screws.

   a. Exposed Fasteners: Low-profile, large-diameter heads with integral or separate EPDM-, neoprene- or silicone-rubber-bonded washers under fastener heads.
   b. Blind Fasteners: High-strength rivets suitable for metal being fastened.
   c. Spikes, Ferrules, and Similar Specialty Fasteners: Same material as material being fastened; of size and configuration required for specific sheet metal fabrications.

2. Fasteners for Zinc-Coated (Galvanized) Steel Sheet: Hot-dip galvanized steel according to ASTM A 153/A 153M or ASTM F 2329 or Series 300 stainless steel.

C. Solder:

   1. For Zinc-Coated (Galvanized) Steel: ASTM B 32, Grade Sn50, 50 percent tin and 50 percent lead or Grade Sn60, 60 percent tin and 40 percent lead.

D. Elastomeric Sealant: ASTM C 920, elastomeric silicone polymer sealant; low modulus; of type, grade, class, and use classifications required to seal joints in sheet metal flashing and trim and remain watertight.

E. Butyl Sealant: ASTM C 1311, single-component, solvent-release butyl rubber sealant; polyisobutylene plasticized; heavy bodied for hooked-type expansion joints with limited movement.

F. Bituminous Coating: Cold-applied asphalt emulsion complying with ASTM D 1187.


H. Reglets: Units of type, material, and profile indicated, formed to provide secure interlocking of separate reglet and counterflashing pieces, and compatible with flashing indicated with factorymitered and -welded corners and junctions and with interlocking counterflashing on exterior face, of same metal as reglet.

1. Manufacturers:

   a. Fry Reglet Corporation.
   c. Or equal.

2. Material: Galvanized steel, not less than 0.022 inch(0.56 mm) (24 gauge) thick.

SHEET METAL FLASHING
07 62 00-3
2.4 FABRICATION, GENERAL

A. General: Custom fabricate sheet metal flashing to comply with recommendations in SMACNA's "Architectural Sheet Metal Manual" that apply to design, dimensions, geometry, metal thickness, and other characteristics of item indicated. Fabricate items at the shop to greatest extent possible.

1. Fabricate sheet metal flashing in thickness or weight needed to comply with performance requirements, but not less than that specified for each application and metal.
2. Obtain field measurements for accurate fit before shop fabrication.
3. Form sheet metal flashing without excessive oil canning, buckling, and tool marks and true to line and levels indicated, with exposed edges folded back to form hems.
4. Conceal fasteners and expansion provisions where possible. Exposed fasteners are not allowed on faces exposed to view.
5. Coordinate fabrication of sheet metal flashings integral with roofing, to comply with requirements of roofing manufacturer.

B. Fabrication Tolerances: Fabricate sheet metal flashing that is capable of installation to a tolerance of 1/4 inch in 20 feet (6 mm in 6 m) on slope and location lines as indicated and within 1/8-inch (3-mm) offset of adjoining faces and of alignment of matching profiles.

C. Sealed Joints: Form nonexpansion but movable joints in metal to accommodate elastomeric sealant.

D. Expansion Provisions: Where lapped expansion provisions cannot be used, form expansion joints of intermeshing hooked flanges, not less than 1 inch (25 mm) deep, filled with butyl sealant concealed within joints.

E. Fabricate cleats and attachment devices from same material as accessory being anchored or from compatible, noncorrosive metal.

F. Fabricate cleats and attachment devices of sizes as recommended by SMACNA's "Architectural Sheet Metal Manual" and by FMG Loss Prevention Data Sheet 1-49 for application, but not less than thickness of metal being secured.

G. Seams: Fabricate nonmoving seams with flat-lock seams. Tin edges to be seamed, form seams, and solder.

H. Do not use graphite pencils to mark metal surfaces.

2.5 ROOF FLASHING FABRICATIONS

A. Copings: Fabricate in minimum 96-inch-(2400-mm-) long, but not exceeding 10-foot-(3-m-) long, sections. Fabricate joint plates of same thickness as copings. Furnish with continuous cleats to support edge of external leg and interior leg. Miter corners, seal, and solder or weld watertight.

1. Joint Style: Butt, with 12-inch-(300-mm-) wide, concealed backup plate and 6-inch-(150-mm-) wide, exposed cover plates.
2. Fabricate from galvanized steel, not less than 0.040 inch (1.02 mm) (20 gauge) thick.
B. Roof, Roof-to-Wall and Similar Transition and Flashing Expansion-Joint Covers: Fabricate from galvanized steel, not less than 0.034 inch (0.86 mm) (22 gauge) thick.

C. Base, Counter, Receivers, Roof Penetration, Equipment Support, and Other Flashing Not Otherwise Specified: Fabricate from galvanized steel, not less than 0.028 inch (0.71 mm) (24 gauge) thick.

D. Roof-Drain Flashing: Fabricate from materials recommended by roofing manufacturer.

PART 3 – EXECUTION

3.1 UNDERLAYMENT INSTALLATION

A. Self-Adhering Sheet Underlayment: Install self-adhering sheet underlayment, wrinkle free. Apply primer if required by underlayment manufacturer. Comply with temperature restrictions of underlayment manufacturer for installation. Apply in shingle fashion to shed water, with end laps of not less than 6 inches (150 mm) staggered 24 inches (600 mm) between courses. Overlap side edges not less than 3 1/2 inches (90 mm). Roll laps with roller. Cover underlayment within 14 days.

3.2 INSTALLATION, GENERAL

A. General: Anchor sheet metal flashing and trim and other components of the Work securely in place, with provisions for thermal and structural movement. Use fasteners, solder, welding rods, protective coatings, separators, sealants, and other miscellaneous items as required to complete sheet metal flashing and trim system.

1. Install sheet metal flashing and trim true to line and levels. Provide uniform, neat seams with minimum exposure of solder, welds, and sealant.
2. Install sheet metal flashing and trim to fit substrates and to result in watertight performance. Verify shapes and dimensions of surfaces to be covered before fabricating sheet metal.
3. Space cleats not more than 12 inches (300 mm) apart. Anchor each cleat with two fasteners. Bend tabs over fasteners.
4. Install exposed sheet metal flashing and trim without excessive oil canning, buckling, and tool marks.
5. Torch cutting of sheet metal flashing and trim is not permitted.
6. Do not use graphite pencils to mark metal surfaces.
7. Coordinate installation of sheet metal flashings integral with roofing, to comply with requirements of roofing manufacturer

B. Metal Protection: Where dissimilar metals will contact each other or corrosive substrates, protect against galvanic action by painting contact surfaces with bituminous coating or by other permanent separation as recommended by SMACNA.

C. Expansion Provisions: Provide for thermal expansion of exposed flashing and trim. Space movement joints at a maximum of 10 feet (3 m) with no joints allowed within 24 inches (600 mm) of corner or intersection. Where lapped expansion provisions cannot be used or would not be sufficiently watertight, form expansion joints of intermeshing hooked flanges, not less than 1 inch (25 mm) deep, filled with sealant concealed within joints.
D. Fastener Sizes: Use fasteners of sizes that will penetrate wood not less than 1-1/4 inches (32 mm) for nails and not less than 3/4 inch (19 mm) for wood screws and metal thicknesses not less than recommended by fastener manufacturer to achieve maximum pull-out resistance.

E. Seal joints for watertight construction.

1. Where sealant-filled joints are used, embed hooked flanges of joint members not less than 1 inch (25 mm) into sealant. Form joints to completely conceal sealant. When ambient temperature at time of installation is moderate, between 40 and 70 deg F (4 and 21 deg C), set joint members for 50 percent movement each way. Adjust setting proportionately for installation at higher ambient temperatures. Do not install sealant-type joints at temperatures below 40 deg F (4 deg C).

2. Prepare joints and apply sealants to comply with requirements in Division 07 Section "Joint Sealants."

F. Soldered Joints: Clean surfaces to be soldered, removing oils and foreign matter. Pre-tin edges of sheets to be soldered to a width of 1-1/2 inches (38 mm), except reduce pre-tinning where pre-tinned surface would show in completed Work.

1. Do not use torches for soldering. Heat surfaces to receive solder and flow solder into joint. Fill joint completely. Completely remove flux and spatter from exposed surfaces.

3.3 ROOF FLASHING INSTALLATION

A. General: Install sheet metal flashing and trim to comply with performance requirements and SMACNA's "Architectural Sheet Metal Manual." Provide concealed fasteners where possible, set units true to line, and level as indicated. Install work with laps, joints, and seams that will be permanently watertight and weather resistant.

B. Roof Edge Flashing: Anchor to resist uplift and outward forces according to recommendations in FMG Loss Prevention Data Sheet 1-49 for specified wind zone.

C. Copings: Anchor to resist uplift and outward forces according to recommendations in FMG Loss Prevention Data Sheet 1-49 for specified wind zone.

D. Pipe or Post Counterflashing: Install counterflashing umbrella with close-fitting collar with top edge flared for elastomeric sealant, extending a minimum of 4 inches (100 mm) over base flashing. Install stainless-steel draw band and tighten.

E. Counterflashing: Coordinate installation of counterflashing with installation of base flashing. Insert counterflashing in reglets or receivers and fit tightly to base flashing. Extend counterflashing 4 inches (100 mm) over base flashing. Lap counterflashing joints a minimum of 4 inches (100 mm) and bed with sealant. Secure in a waterproof manner.

F. Roof-Penetration Flashing: Coordinate installation of roof-penetration flashing with installation of roofing and other items penetrating roof. Seal with elastomeric sealant and clamp flashing to pipes that penetrate roof.

G. Equipment Support Flashing: Coordinate installation of equipment support flashing with installation of roofing and equipment. Weld or seal flashing with elastomeric sealant to equipment support member.

SHEET METAL FLASHING
07 62 00-7
3.4 ERECTION TOLERANCES

A. Installation Tolerances: Shim and align sheet metal flashing and trim within installed tolerance of 1/4 inch in 20 feet (6 mm in 6 m) on slope and location lines as indicated and within 1/8-inch (3-mm) offset of adjoining faces and of alignment of matching profiles.

3.5 CLEANING AND PROTECTION

A. Clean and neutralize flux materials. Clean off excess solder.

B. Clean off excess sealants.

C. Replace sheet metal flashing and trim that have been damaged or that have deteriorated beyond successful repair by finish touchup or similar minor repair procedures.

END OF SECTION 07 62 00
SECTION 07 92 00 - JOINT SEALANTS

PART 1 – GENERAL

1.1 SUMMARY

A. Section includes joint sealants.

1.2 PRECONSTRUCTION TESTING

A. Preconstruction Compatibility and Adhesion Testing: Submit to joint-sealant manufacturers, for testing indicated below, samples of materials that will contact or affect joint sealants.

1. Use ASTM C 1087 to determine whether priming and other specific joint preparation techniques are required to obtain rapid, optimum adhesion of joint sealants to joint substrates.
2. Submit not fewer than eight pieces of each kind of material, including joint substrates, shims, joint-sealant backings, secondary seals, and miscellaneous materials.
3. Schedule sufficient time for testing and analyzing results to prevent delaying the Work.
4. For materials failing tests, obtain joint-sealant manufacturer's written instructions for corrective measures including use of specially formulated primers.

B. Preconstruction Field-Adhesion Testing: Before installing sealants, field test their adhesion to Project joint substrates, on field-constructed mockups or actual construction, as follows:

1. Locate test joints where indicated on Project or, if not indicated, as directed by Architect.
2. Conduct field tests for each application indicated below:
   a. Each kind of sealant and joint substrate indicated.
3. Notify Architect seven days in advance of dates and times when test joints will be erected.
4. Arrange for tests to take place with joint-sealant manufacturer's technical representative present.

   1) For joints with dissimilar substrates, verify adhesion to each substrate separately; extend cut along one side, verifying adhesion to opposite side. Repeat procedure for opposite side.

5. Report whether sealant failed to adhere to joint substrates or tore cohesively. Include data on pull distance used to test each kind of product and joint substrate. For sealants that fail adhesively, retest until satisfactory adhesion is obtained.
6. Evaluation of Preconstruction Field-Adhesion-Test Results: Sealants not evidencing adhesive failure from testing, in absence of other indications of noncompliance with requirements, will be considered satisfactory. Do not use sealants that fail to adhere to joint substrates during testing.

JOINT SEALANTS
07 92 00-1
1.3 SUBMITTALS

A. Product Data: For each joint-sealant product indicated.

B. Samples for Initial Selection: Manufacturer's color charts consisting of strips of cured sealants showing the full range of colors available for each product exposed to view.

C. Samples for Verification: For each kind and color of joint sealant required, provide Samples with joint sealants in 1/2-inch-(13-mm-) wide joints formed between two 6-inch-(150-mm-) long strips of material matching the appearance of exposed surfaces adjacent to joint sealants.

D. Joint-Sealant Schedule: Include the following information:
   1. Joint-sealant application, joint location, and designation.
   2. Joint-sealant manufacturer and product name.

E. Qualification Data: For qualified Installer and testing agency.

F. Product Certificates: For each kind of joint sealant and accessory, from manufacturer.

G. Product Test Reports: Based on evaluation of comprehensive tests performed by a qualified testing agency, indicating that sealants comply with requirements.

H. Preconstruction Compatibility and Adhesion Test Reports: From sealant manufacturer, indicating the following:
   1. Materials forming joint substrates and joint-sealant backings have been tested for compatibility and adhesion with joint sealants.
   2. Interpretation of test results and written recommendations for primers and substrate preparation needed for adhesion.

I. Preconstruction Field-Adhesion Test Reports: Indicate which sealants and joint preparation methods resulted in optimum adhesion to joint substrates based on testing specified in "Preconstruction Testing" Article.

J. Warranties: Sample of special warranties.

1.4 QUALITY ASSURANCE

A. Installer Qualifications: Manufacturer's authorized representative who is trained and approved for installation of units required for this Project.

B. Source Limitations: Obtain each kind of joint sealant from single source from single manufacturer.

C. Product Testing: Test joint sealants using a qualified testing agency.
   1. Testing Agency Qualifications: An independent testing agency qualified according to ASTM C 1021 to conduct the testing indicated.
D. Mockups: Install sealant in mockups of assemblies specified in other Sections that are indicated to receive joint sealants specified in this Section. Use materials and installation methods specified in this Section.

E. Preinstallation Conference: Conduct conference at Project site.

1.5 PROJECT CONDITIONS

A. Do not proceed with installation of joint sealants under the following conditions:

1. When ambient and substrate temperature conditions are outside limits permitted by joint sealant manufacturer.
2. When joint substrates are wet.
3. Where joint widths are less than those allowed by joint-sealant manufacturer for applications indicated.
4. Where contaminants capable of interfering with adhesion have not yet been removed from joint substrates.

1.6 WARRANTY

A. Special Installer's Warranty: Manufacturer's standard form in which Installer agrees to repair or replace joint sealants that do not comply with performance and other requirements specified in this Section within specified warranty period.

1. Warranty Period: Two years from date of Substantial Completion.

B. Special Manufacturer's Warranty: Manufacturer's standard form in which joint-sealant manufacturer agrees to furnish joint sealants to repair or replace those that do not comply with performance and other requirements specified in this Section within specified warranty period.

1. Warranty Period: 5 years from date of Substantial Completion.

C. Special warranties specified in this article exclude deterioration or failure of joint sealants from the following:

1. Movement of the structure caused by structural settlement or errors attributable to design or construction resulting in stresses on the sealant exceeding sealant manufacturer's written specifications for sealant elongation and compression.
2. Disintegration of joint substrates from natural causes exceeding design specifications.
3. Mechanical damage caused by individuals, tools, or other outside agents.
4. Changes in sealant appearance caused by accumulation of dirt or other atmospheric contaminants.

PART 2 – PRODUCTS

JOINT SEALANTS
07 92 00-3
2.1 MATERIALS, GENERAL

A. Compatibility: Provide joint sealants, backings, and other related materials that are compatible with one another and with joint substrates under conditions of service and application, as demonstrated by joint-sealant manufacturer, based on testing and field experience.

B. Liquid-Applied Joint Sealants: Comply with ASTM C 920 and other requirements indicated for each liquid-applied joint sealant specified, including those referencing ASTM C 920 classifications for type, grade, class, and uses related to exposure and joint substrates.

C. Colors of Exposed Joint Sealants: As selected by Architect from manufacturer's full range.

2.2 SILICONE JOINT SEALANTS

A. Single-Component, Nonsag, Neutral-Curing Silicone Joint Sealant: ASTM C 920, Type S, Grade NS, Class 100/50, for Use NT.

1. Products: Subject to compliance with requirements, available products that may be incorporated into the Work include, but are not limited to, the following:

   a. Dow Corning Corporation; 790.
   b. GE Advanced Materials - Silicones; SilPruf LM SCS2700.
   c. Pecora Corporation; 890 or 890FTS.
   d. Sika Corporation, Construction Products Division; SikaSil-C990.
   e. Or equal.

B. Single-Component, Nonsag, Traffic-Grade, Neutral-Curing Silicone Joint Sealant: ASTM C 920, Type S, Grade NS, Class 100/50, for Use T.

1. Products: Subject to compliance with requirements, available products that may be incorporated into the Work include, but are not limited to, the following:

   a. Dow Corning Corporation; NS Parking Structure Sealant.
   b. Pecora Corporation; 301 NS or 311 NS.
   c. Or equal.

C. Single-Component, Pourable, Traffic-Grade, Neutral-Curing Silicone Joint Sealant: ASTM C 920, Type S, Grade P, Class 100/50, for Use T.

1. Products: Subject to compliance with requirements, available products that may be incorporated into the Work include, but are not limited to, the following:

   a. Dow Corning Corporation; SL Parking Structure Sealant.
   b. Pecora Corporation; 300 SL or 310 SL.
   c. Or equal.

D. Mildew-Resistant, Single-Component, Nonsag, Neutral-Curing Silicone Joint Sealant: ASTM C 920, Type S, Grade NS, Class 25, for Use NT.
1. Products: Subject to compliance with requirements, available products that may be incorporated into the Work include, but are not limited to, the following:

   a. Pecora Corporation; 898.
   b. Or equal.

2.3 URETHANE JOINT SEALANTS

   A. Multicomponent, Nonsag, Urethane Joint Sealant: ASTM C 920, Type M, Grade NS, Class 25 or greater, for Use NT.

   1. Products: Subject to compliance with requirements, available products that may be incorporated into the Work include, but are not limited to, the following:

      a. BASF Building Systems; Sonolastic NP 2.
      b. Pacific Polymers International, Inc.; Elasto-Thane 227 Type II.
      c. Pecora Corporation; Dynatrol II.
      d. Sika Corporation, Construction Products Division; Sikaflex - 2c NS or Sikaflex - 2c EZ Mix.
      e. Tremco Incorporated; Vulkem 227.
      f. Or equal.

   B. Multicomponent, Pourable, Traffic-Grade, Urethane Joint Sealant: ASTM C 920, Type M, Grade P, Class 25, for Use T. Provide slope (non-sag) grades as applicable.

   1. Products: Subject to compliance with requirements, available products that may be incorporated into the Work include, but are not limited to, the following:

      a. BASF Building Systems; Sonolastic SL 2 or SL 2 (Slope Grade).
      b. Pacific Polymers International, Inc.; Elasto-Thane 227 High Shore Type I (Self Leveling) or Type II (Non Sag).
      c. Pecora Corporation; Dynatrol II-SG or Dynatrol II-SG (5% or 15% Slope Grades).
      d. Or equal.

2.4 LATEX JOINT SEALANTS

   A. Latex Joint Sealant: Acrylic latex or siliconized acrylic latex, ASTM C 834, Type OP, Grade NF.

   1. Products: Subject to compliance with requirements, available products that may be incorporated into the Work include, but are not limited to, the following:

      a. BASF Building Systems; Sonolac.
      b. Pecora Corporation; AC-20+.
      c. Tremco Incorporated; Tremflex 834.
      d. Or equal.
2.5 ACOUSTICAL JOINT SEALANTS

A. Acoustical Joint Sealant: Manufacturer's standard nonsag, paintable, nonstaining latex sealant complying with ASTM C 834. Product effectively reduces airborne sound transmission through perimeter joints and openings in building construction as demonstrated by testing representative assemblies according to ASTM E 90.

1. Products: Subject to compliance with requirements, available products that may be incorporated into the Work include, but are not limited to, the following:
   a. Pecora Corporation; AIS-919.
   b. USG Corporation; SHEETROCK Acoustical Sealant.
   c. Or equal.

2.6 JOINT SEALANT BACKING

A. General: Provide sealant backings of material that are nonstaining; are compatible with joint substrates, sealants, primers, and other joint fillers; and are approved for applications indicated by sealant manufacturer based on field experience and laboratory testing.

B. Cylindrical Sealant Backings: ASTM C 1330, types, as approved in writing by joint-sealant manufacturer for joint application indicated, and of size and density to control sealant depth and otherwise contribute to producing optimum sealant performance.

C. Bond-Breaker Tape: Polyethylene tape or other plastic tape recommended by sealant manufacturer for preventing sealant from adhering to rigid, inflexible joint-filler materials or joint surfaces at back of joint. Provide self-adhesive tape where applicable.

2.7 MISCELLANEOUS MATERIALS

A. Primer: Material recommended by joint-sealant manufacturer where required for adhesion of sealant to joint substrates indicated, as determined from preconstruction joint-sealant-substrate tests and field tests.

B. Cleaners for Nonporous Surfaces: Chemical cleaners acceptable to manufacturers of sealants and sealant backing materials, free of oily residues or other substances capable of staining or harming joint substrates and adjacent nonporous surfaces in any way, and formulated to promote optimum adhesion of sealants to joint substrates.

C. Masking Tape: Nonstaining, nonabsorbent material compatible with joint sealants and surfaces adjacent to joints.

PART 3 – EXECUTION

3.1 EXAMINATION

A. Examine joints indicated to receive joint sealants, with Installer present, for compliance with requirements for joint configuration, installation tolerances, and other conditions affecting joint sealant performance.

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

A. Surface Cleaning of Joints: Clean out joints immediately before installing joint sealants to comply with joint-sealant manufacturer's written instructions and the following requirements:

1. Remove all foreign material from joint substrates that could interfere with adhesion of joint sealant, including dust, paints (except for permanent, protective coatings tested and approved for sealant adhesion and compatibility by sealant manufacturer), old joint sealants, oil, grease, waterproofing, water repellents, water, surface dirt, and frost.
2. Clean porous joint substrate surfaces by brushing, grinding, mechanical abrading, or a combination of these methods to produce a clean, sound substrate capable of developing optimum bond with joint sealants. Remove loose particles remaining after cleaning operations above by vacuuming or blowing out joints with oil-free compressed air. Porous joint substrates include, but is not limited to, the following:
   a. Concrete.
   b. Plaster (Stucco).
3. Remove laitance and form-release agents from concrete.
4. Clean nonporous joint substrate surfaces with chemical cleaners or other means that do not stain, harm substrates, or leave residues capable of interfering with adhesion of joint sealants. Nonporous joint substrates include, but is not limited to, the following:
   a. Metal.
   b. Glass.

B. Joint Priming: Prime joint substrates where recommended by joint-sealant manufacturer or as indicated by preconstruction joint-sealant-substrate tests or prior experience. Apply primer to comply with joint-sealant manufacturer's written instructions. Confine primers to areas of jointsealant bond; do not allow spillage or migration onto adjoining surfaces.

C. Masking Tape: Use masking tape where required to prevent contact of sealant or primer with adjoining surfaces that otherwise would be permanently stained or damaged by such contact or by cleaning methods required to remove sealant smears. Remove tape immediately after tooling without disturbing joint seal.

3.3 INSTALLATION OF JOINT SEALANTS

A. General: Comply with joint-sealant manufacturer's written installation instructions for products and applications indicated, unless more stringent requirements apply.

B. Sealant Installation Standard: Comply with recommendations in ASTM C 1193 for use of joint sealants as applicable to materials, applications, and conditions indicated.

C. Install sealant backings of kind indicated to support sealants during application and at position required to produce cross-sectional shapes and depths of installed sealants relative to joint widths that allow optimum sealant movement capability.

1. Do not leave gaps between ends of sealant backings.
2. Do not stretch, twist, puncture, or tear sealant backings.
3. Remove absorbent sealant backings that have become wet before sealant application and replace them with dry materials.

D. Install bond-breaker tape behind sealants where sealant backings are not used between sealants and backs of joints.

E. Install sealants using proven techniques that comply with the following and at the same time backings are installed:

1. Place sealants so they directly contact and fully wet joint substrates.
2. Completely fill recesses in each joint configuration.
3. Produce uniform, cross-sectional shapes and depths relative to joint widths that allow optimum sealant movement capability.

F. Tooling of Nonsag Sealants: Immediately after sealant application and before skinning or curing begins, tool sealants according to requirements specified in subparagraphs below to form smooth, uniform beads of configuration indicated; to eliminate air pockets; and to ensure contact and adhesion of sealant with sides of joint.

1. Remove excess sealant from surfaces adjacent to joints.
2. Use tooling agents that are approved in writing by sealant manufacturer and that do not discolor sealants or adjacent surfaces.
3. Provide concave joint profile per Figure 8A in ASTM C 1193, unless otherwise indicated.
4. Provide flush joint profile where indicated per Figure 8B in ASTM C 1193.
5. Provide recessed joint configuration of recess depth and at locations indicated per Figure 8C in ASTM C 1193.
   a. Use masking tape to protect surfaces adjacent to recessed tooled joints.

G. Acoustical Sealant Installation: At sound-rated assemblies and elsewhere as indicated, seal construction at perimeters, behind control joints, and at openings and penetrations with a continuous bead of acoustical sealant. Install acoustical sealant at both faces of partitions at perimeters and through penetrations. Comply with ASTM C 919 and with manufacturer's written recommendations.

3.4 CLEANING

A. Clean off excess sealant or sealant smears adjacent to joints as the Work progresses by methods and with cleaning materials approved in writing by manufacturers of joint sealants and of products in which joints occur.

3.5 PROTECTION

A. Protect joint sealants during and after curing period from contact with contaminating substances and from damage resulting from construction operations or other causes so sealants are without deterioration or damage at time of Substantial Completion. If, despite such protection, damage or deterioration occurs, cut out and remove damaged or deteriorated joint sealants immediately so installations with repaired areas are indistinguishable from original work.

3.6 JOINT-SEALANT SCHEDULE

JOINT SEALANTS
07 92 00-8
A. Joint-Sealant Application: Exterior joints in horizontal traffic surfaces.

1. Joint Locations:
   a. Isolation and contraction joints in cast-in-place concrete slabs.
   b. Joints in asphalt paving.
   c. Joints between different materials listed above.

2. Silicone Joint Sealant: Single component, nonsag or pourable (as applicable to slope of surfaces), traffic grade, neutral curing.


1. Joint Locations:
   a. Joints in exterior cement plaster finish systems.
   b. Joints between metal materials and components.
   c. Joints between different materials listed above.
   d. Perimeter joints between materials listed above and frames of doors, windows, and louvered vents.

2. Silicone Joint Sealant: Single component, nonsag, neutral curing, Class 100/50.

C. Joint-Sealant Application: Interior joints in horizontal traffic surfaces.

1. Joint Locations:
   b. Other joints as indicated.

2. Joint Sealant: Provide either of the following, subject to color selections.
   a. Silicone: Single component, pourable, traffic grade, neutral curing.
   b. Urethane: Multicomponent, pourable, traffic grade.


1. Expansion, control, contraction, and similar joints, subject to greater than minimal movement.

   a. Joint Locations:
      1) Control and expansion joints on exposed interior surfaces of exterior walls.
      2) Perimeter joints of exterior openings.
      3) Vertical joints on exposed surfaces of walls and partitions.
      4) Other joints as indicated.

2. Trim, finish and similar locations, subject to minimal movement:

   a. Joint Locations:

      1) Perimeter joints between interior wall surfaces and frames of interior doors.
      2) Other joints as indicated.


E. Joint-Sealant Application: Mildew-resistant interior joints in vertical surfaces and horizontal nontraffic surfaces.

   1. Joint Sealant Location:

      a. Joints between plumbing fixtures and adjoining walls, floors, and other surfaces.
      b. Trim, finish and similar joints in bath rooms.
      c. Other joints as indicated.

   2. Joint Sealant: Mildew resistant, single component, nonsag, neutral curing, Silicone.

F. Joint-Sealant Application: Interior acoustical joints in vertical surfaces and horizontal nontraffic surfaces.


END OF SECTION 07 92 00
SECTION 08 14 16 - FLUSH WOOD DOORS

PART 1 – GENERAL

1.1 SUMMARY

A. Section Includes:

1. Solid-core doors with hardboard or MDF faces.
2. Shop priming flush wood doors.
3. Factory fitting flush wood doors to frames and factory machining for hardware.

1.2 SUBMITTALS

A. Product Data: For each type of door indicated. Include details of core and edge construction.

B. Shop Drawings: Indicate location, size, and hand of each door; elevation of each kind of door; construction details not covered in Product Data; location and extent of hardware blocking; and other pertinent data.

1. Dimensions and locations of mortises and holes for hardware.
2. Fire-protection ratings for fire-rated doors.

C. Samples:

1. Corner sections of doors, approximately 8 by 10 inches (200 by 250 mm), with door faces and edges representing actual materials to be used.

D. Field quality-control reports by independent testing and inspecting agency.

E. Warranty: Sample of special warranty.

1.3 QUALITY ASSURANCE

A. Quality Standard: In addition to requirements specified, comply with WDMA I.S.1-A, "Architectural Wood Flush Doors."

B. Fire-Rated Wood Doors: Doors complying with NFPA 80 that are listed and labeled by a qualified testing agency, for fire-protection ratings indicated, based on testing at positive pressure according to UBC Standard 7-2.

1.4 DELIVERY, STORAGE, AND HANDLING

A. Comply with requirements of referenced standard and manufacturer's written instructions.

B. Package doors individually in cardboard cartons and wrap bundles of doors in plastic sheeting.

C. Mark each door on top and bottom rail with opening number used on Shop Drawings.

1.5 PROJECT CONDITIONS
A. Environmental Limitations: Do not deliver or install doors until spaces are enclosed and weather tight, wet work in spaces is complete and dry, and HVAC system is operating and maintaining ambient temperature and humidity conditions at occupancy levels during the remainder of the construction period.

1.6 WARRANTY

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

1. Failures include, but are not limited to, the following:
   a. Warping (bow, cup, or twist) more than 1/4 inch (6.4 mm) in a 42-by-84-inch (1067-by-2134-mm) section.
   b. Telegraphing of core construction in face veneers exceeding 0.01 inch in a 3-inch (0.25 mm in a 76.2-mm) span.

2. Warranty shall also include installation and finishing that may be required due to repair or replacement of defective doors.

PART 2 – PRODUCTS

2.1 DOOR CONSTRUCTION, GENERAL

A. WDMA I.S.1-A Performance Grade:

1. Heavy Duty: Corridor entries to living units.
2. Standard Duty: Closets, private bath/toilets, and bedrooms within living units.

B. Particleboard-Core Doors:

2. Blocking: Provide wood blocking in particleboard-core doors as follows:
   a. 5-inch (125-mm) top-rail blocking, in doors indicated to have closers.
   b. 5-inch (125-mm) bottom-rail blocking, in doors indicated to have kick plates.
   c. 5-inch (125-mm) midrail blocking, in doors indicated to have exit devices.

C. Fire-Protection-Rated Doors: Provide core specified or mineral core as needed to provide fireprotection rating indicated.

1. Edge Construction: Except where surface-applied intumescent seals are provided under Division 8 Section "Door Hardware," provide edge construction with intumescent seals concealed by outer stile. Comply with specified requirements for exposed edges.

2.2 DOORS FOR OPAQUE FINISH

A. Interior Solid-Core Doors:

1. Grade: Custom.

WOOD DOORS
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2. Faces: Hardboard or MDF.
   a. Hardboard Faces: AHA A135.4, Class 1 (tempered) or Class 2 (standard).
   b. MDF Faces: ANSI A208.2, Grade 150 or 160.

4. Construction: Five plies. Stiles and rails are bonded to core, then entire unit abrasive planed before veneering. Faces are bonded to core using a hot press.

2.3 FABRICATION

A. Factory fit fire-rated doors to suit frame-opening sizes indicated. Comply with clearance requirements of referenced quality standard for fitting unless otherwise indicated.

1. Comply with requirements in NFPA 80, Section 2-5.4.
   a. Fire-rated doors shall bear U.L. or other recognized testing laboratory label for class of door or opening indicated, designating fire performance rating in accordance with requirements of NFPA 80 and authorities having jurisdictions.
   b. Affix permanent metal label with raised or incised markings, indicating testing agency's name and tested hourly fire rating to hinge stile of each door in a clearly visible/readable location.

B. Factory machine fire-rated doors for hardware that is not surface applied; at Contractor's option, factory machine non-fire-rated doors for hardware. Locate hardware to comply with DHIWDHS- 3. Comply with final hardware schedules, door frame Shop Drawings, DHI A115-W series standards, and hardware templates.

   1. Coordinate with hardware mortises in metal frames to verify dimensions and alignment before factory machining.

2.4 SHOP PRIMING

A. Doors for Opaque Finish: Shop prime doors with one coat of wood primer specified in Division 09 Section "Interior Painting". Seal all four edges, edges of cutouts, and mortises with primer.

PART 3 – EXECUTION

3.1 INSTALLATION

A. Hardware: For installation, see Division 08 Section "Door Hardware."

B. Installation Instructions: Install doors to comply with manufacturer's written instructions and the referenced quality standard, and as indicated.

   1. Install fire-rated doors in corresponding fire-rated frames according to NFPA 80.
   2. Any field-fitting of labeled, fire-rated doors is limited to the extent permitted by NFPA 80 and label's testing agency requirements.
C. Job-Fitted Doors (Non-Fire-Rated Doors Only): Align and fit doors in frames with uniform clearances and bevels as indicated below; do not trim stiles and rails in excess of limits set by manufacturer or permitted for fire-rated doors. Machine doors for hardware. Seal edges of doors, edges of cutouts, and mortises after fitting and machining.

1. Clearances: Provide 1/8 inch (3.2 mm) at heads, jambs, and between pairs of doors. Provide 1/8 inch (3.2 mm) from bottom of door to top of decorative floor finish or covering unless otherwise indicated. Where threshold is shown or scheduled, provide ¼ inch (6.4 mm) from bottom of door to top of threshold unless otherwise indicated.
2. Bevel non-fire-rated doors 1/8 inch in 2 inches (3-1/2 degrees) at lock and hinge edges.

D. Factory-Fitted Doors: Align in frames for uniform clearance at each edge.

3.2 FIELD QUALITY CONTROL (FIRE-RATED, LABELED DOORS)

A. For labeled, fire-rated door installations requiring field replacement, rehanging, or similar remedial procedures, engage U.L. or other qualified independent testing and inspecting agency, acceptable to authorities having jurisdiction, at Contractor's expense, to inspect door installations, verify compliance with NFPA 80 and manufacturer's fire-rated labeling installation requirements, and prepare inspection reports.

B. After completion of initial, field-performed remedial procedures, arrange for inspection of door installations by testing and inspecting agency for compliance with requirements.

C. Where testing and inspecting agency inspection results indicate that door installations do not comply with specified requirements:

1. Perform additional repairs, replacements, or other remedial work (including, but not limited to, complete door and frame assembly replacement) required by initial testing and inspecting agency inspections and necessary to comply with specified requirements.
2. Arrange for testing and inspecting agency reinspections to be performed, at Contractor's expense, to determine compliance of repaired, replaced or otherwise remedied work with specified requirements.

D. Upon testing and inspecting agency inspections indicating satisfactory compliance with requirements, arrange for the following:

1. Affixing of a permanent, metal "re-examination" or "re-evaluation" label with raised or incised markings, indicating U.L. or other qualified testing agency's name, date of reexamination/ re-evaluation, and cross-reference identification to written report, to hinge stile of door in a clearly visible/readable location; locate adjacent to original, factoryapplied label.
2. Submission of independent testing and inspecting agency's written re-evaluation/reinspection report direct to parties, as directed by Architect (including Owner and authorities having jurisdiction), immediately after re-evaluation/re-inspection.

3.3 ADJUSTING

A. Operation: Rehang or replace doors that do not swing or operate freely.
B. Finished Doors: Replace doors that are damaged or that do not comply with requirements. Doors may be repaired or refinished if work complies with requirements and shows no evidence of repair or refinishing.

END OF SECTION 08 14 16
SECTION 08 53 13 - VINYL WINDOWS

PART 1 – GENERAL

1.1 SUMMARY

A. This Section includes operable vinyl-framed windows.

1.2 PERFORMANCE REQUIREMENTS

A. General: Provide vinyl windows capable of complying with performance requirements indicated, based on testing manufacturer's windows that are representative of those specified, and that are of test size required by AAMA/WDMA 101/I.S.2/NAFS.

B. Structural Performance: Provide vinyl windows capable of withstanding the effects of the following loads, based on testing units representative of those indicated for Project that pass AAMA/WDMA 101/I.S.2/NAFS, Uniform Load Structural Test:

1. Design Wind Loads: Determine design wind loads applicable to Project according to requirements of authorities having jurisdiction.

1.3 SUBMITTALS

A. Product Data: Include construction details, material descriptions, fabrication methods, dimensions of individual components and profiles, hardware, finishes, and operating instructions for each type of vinyl window indicated.

B. Shop Drawings: Include plans, elevations, sections, details, hardware, attachments to other work, installation details, and the following:

1. Mullion details, including reinforcement and stiffeners.
2. Joinery details.
4. Flashing and drainage details.
5. Weather-stripping details.
7. For installed products indicated to comply with design loads, include structural analysis data prepared by or under the supervision of a qualified professional engineer detailing fabrication and assembly of vinyl windows, and used to determine structural test pressures and design pressures from basic wind speeds indicated.

C. Samples: For vinyl windows and components required, prepared on Samples of size indicated below.

1. Window Corner Fabrication: 12-by-12-inch-(300-by-300-mm-) long, full-size window corner including full-size sections of window frame and operable sash with factory applied color finish, weather stripping, hardware, and glazing.

D. Product Schedule: For vinyl windows. Use same designations indicated on Drawings.

E. Qualification Data: For Installer, manufacturer, professional engineer, and testing agency.
F. Product Test Reports: Based on evaluation of comprehensive tests performed by a qualified testing agency for each type, class, grade, and size of vinyl window. Test results based on use of downsized test units will not be accepted.

G. Maintenance Data: For operable window sash, operating hardware, weather stripping, and finishes to include in maintenance manuals.

H. Warranty: Special warranty specified in this Section.

1.4 QUALITY ASSURANCE

A. Installer Qualifications: An installer acceptable to vinyl window manufacturer for installation of units required for this Project.

B. Manufacturer Qualifications: A manufacturer capable of fabricating vinyl windows that meet or exceed performance requirements indicated and of documenting this performance by inclusion in lists and by labels, test reports, and calculations.

1. Manufacturer’s responsibilities include providing professional engineering services needed to assume engineering responsibility.
2. Engineering Responsibility: Preparation of data for vinyl windows, including Shop Drawings, based on testing and engineering analysis of manufacturer's standard units in assemblies similar to those indicated for this Project.

C. Source Limitations: Obtain vinyl windows through one source from a single manufacturer.


E. Glazing Publications: Comply with published recommendations of glass manufacturers and with GANA's "Glazing Manual" unless more stringent requirements are indicated.

F. Preinstallation Conference: Conduct conference at Project site. Review methods and procedures related to vinyl windows including, but not limited to, the following:

1. Review, discuss, and coordinate the interrelationship of vinyl windows with other exterior wall components. Include provisions for structural anchorage, glazing, flashing, weeping, sealants, and protection of finishes.
2. Review and discuss the sequence of work required to construct a watertight and weathertight exterior building envelope.
3. Inspect and discuss the condition of substrate and other preparatory work performed by other trades.

1.5 PROJECT CONDITIONS

A. Field Measurements: Verify vinyl window openings by field measurements before fabrication and indicate measurements on Shop Drawings.

1.6 WARRANTY

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

1. Failures include, but are not limited to, the following:
   a. Failure to meet performance requirements.
   b. Structural failures including excessive deflection, water leakage, air infiltration, or condensation.
   c. Faulty operation of movable sash and hardware.
   d. Deterioration of vinyl, other materials, and finishes beyond normal weathering.
   e. Failure of insulating glass.

2. Warranty Period:
   a. Window: 10 years from date of Substantial Completion.
   b. Glazing: Five years from date of Substantial Completion.

PART 2 – PRODUCTS

2.1 MANUFACTURERS

A. Manufacturers: Subject to compliance with requirements, manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following:

   3. Weather Shield Mfg., Inc.
   4. Or equal.

2.2 MATERIALS

A. Vinyl Extrusions: Rigid (unplasticized) hollow PVC extrusions, formulated and extruded for exterior applications, complying with AAMA/WDMA 101/1.S.2/NAFS and the following:

   1. PVC Formulation: High impact, low heat buildup, lead free, nonchalking, and color and UV stabilized.
   2. Extrusion Wall Thickness: Not less than 0.060 inch (1.5 mm).
   3. Multichamber Extrusions: Profile designed with multichambers between interior and exterior faces of the extrusions.

B. Vinyl Trim and Glazing Stops: Material and finish to match frame members.

C. Fasteners: Aluminum, nonmagnetic stainless steel, epoxy adhesive, or other materials warranted by manufacturer to be noncorrosive and compatible with vinyl window members, cladding, trim, hardware, anchors, and other components.

   1. Exposed Fasteners: Unless unavoidable for applying hardware, do not use exposed fasteners. For application of hardware, use fasteners that match finish of member or hardware being fastened, as appropriate.
D. Anchors, Clips, and Accessories: Aluminum, nonmagnetic stainless steel, or zinc-coated steel or iron complying with ASTM B 633 for SC 3 severe service conditions; provide sufficient strength to withstand design pressure indicated.

E. Reinforcing Members: Aluminum, or nonmagnetic stainless steel, or nickel/chrome-plated steel complying with ASTM B 456 for Type SC 3 severe service conditions, or zinc-coated steel or iron complying with ASTM B 633 for SC 3 severe service conditions; provide sufficient strength to withstand design pressure indicated.


1. Weather Seals: Provide weather stripping with integral barrier fin or fins of semirigid, polypropylene sheet or polypropylene-coated material. Comply with AAMA 701/702.

G. Replaceable Weather Seals: Comply with AAMA 701/702.

H. Flexible Flashing Strips: Composite, self-adhesive, flashing product consisting of a pliable, rubberized-asphalt compound, bonded to a high-density, cross-laminated polyethylene film to produce an overall thickness of not less than 0.025 inch (0.6 mm), and not less than 9 inches (.

1. Products: Subject to compliance with requirements, products that may be incorporated into the Work include, but are not limited to, the following:

   b. MFM Building Products Corp.; Window Wrap PSX-20.
   c. Polyguard Products, Inc.; Polyguard 300.
   d. Protecto Wrap Company; BT-25 XL.
   e. Or equal.

I. Primer for Flexible Flashing: Product recommended by manufacturer of flexible flashing for substrate.

2.3 WINDOW

A. Window Type: Horizontal sliding.

B. AAMA/WDMA Performance Requirements: Provide vinyl windows of performance indicated that comply with AAMA/WDMA 101/I.S.2/NAFS.

1. Minimum Performance Class: R.

C. Solar Heat-Gain Coefficient (SHGC): Provide vinyl windows with a whole-window SHGC maximum of 0.39, determined according to NFRC 200 procedures.

D. Air Infiltration: Maximum rate not more than indicated when tested according to AAMA/WDMA 101/I.S.2/NAFS, Air Infiltration Test.
Lancaster Infill Houses

1. Maximum Rate: 0.3 cfm/sq. ft.(5 cu. m/h x sq. m) of area at an inward test pressure of 1.57 lbf/sq. ft.(75 Pa).

E. Water Resistance: No water leakage as defined in AAMA/WDMA referenced test methods at a water test pressure equaling that indicated, when tested according to AAMA/WDMA 101/1.S.2/NAFS, Water Resistance Test.

1. Test Pressure: 15 percent of positive design pressure, but not less than 2.86 lbf/sq. ft.(140 Pa) or more than 15 lbf/sq. ft.(720 Pa).

F. Forced-Entry Resistance: Comply with Performance Grade 10 requirements when tested according to ASTM F 588.

2.4 GLAZING

A. Glass and Glazing Materials: Refer to Division 08 Section "Glazing" for glass units and glazing requirements applicable to glazed vinyl window units.

B. Glass: Clear, insulating-glass units, with low-E coating pyrolytic on second surface or sputtered on second or third surface, complying with the following:

1. Factory-assembled units consisting of sealed lites of glass separated by a dehydrated interspace, and complying with ASTM E 774 for Class CBA units.

   a. Provide laminated glass (exterior or interior lites, as recommended by glass manufacturer/fabricator), complying with ASTM C 1172, in place of annealed glass at windows located on west elevation of building.
   b. Provide Kind FT (fully tempered) glass lites where safety glass is required.
   c. Sealing System: Dual seal, with primary and secondary sealants; manufacturer's standard sealants.
   d. Spacer Specifications: Manufacturer's standard spacer material and construction.

C. Glazing System: Manufacturer's standard factory-glazing system that produces weather tight seal.

2.5 HARDWARE

A. General: Provide manufacturer's standard hardware fabricated from aluminum, stainless steel, carbon steel complying with AAMA 907, or other corrosion-resistant material compatible with vinyl; designed to smoothly operate, tightly close, and securely lock vinyl windows, and sized to accommodate sash or ventilator weight and dimensions. Do not use aluminum in frictional contact with other metals.

B. Locks and Latches: Designed to allow unobstructed movement of the sash across adjacent sash in direction indicated and operated from the inside only.

C. Roller Assemblies: Low-friction design; glide pads and similar non-roller designs are not acceptable.
2.6 INSECT SCREENS
A. General: Design windows and hardware to accommodate screens in a tight-fitting, removable arrangement, with a minimum of exposed fasteners and latches. Fabricate insect screens to fully integrate with window frame. Locate screens on outside of window and provide for each operable exterior sash or ventilator.

B. Aluminum Insect Screen Frames: Manufacturer's standard aluminum alloy complying with SMA 1004. Fabricate frames with mitered or coped joints or corner extrusions, concealed fasteners, and removable PVC spline/anchor concealing edge of frame.

1. Aluminum Tubular Framing Sections and Cross Braces: Roll formed from aluminum sheet with minimum wall thickness as required for class indicated.
2. Finish: Manufacturer's standard to match window frame and sash.

C. Glass-Fiber Mesh Fabric: 18-by-14(1.1-by-1.4-mm) or 18-by-16(1.0-by-1.1-mm) mesh of PVC-coated, glass-fiber threads; woven and fused to form a fabric mesh resistant to corrosion, shrinkage, stretch, impact damage, and weather deterioration.

2.7 FABRICATION
A. Fabricate vinyl windows in sizes indicated. Include a complete system for assembling components and anchoring windows.

1. Welded Frame and Sash/Ventilator Corners: Miter-cut and fusion welded.

B. Fabricate vinyl windows that are reglazable without dismantling sash or ventilator framing.

C. Weather Stripping: Provide full-perimeter weather stripping for each operable sash and ventilator, unless otherwise indicated.

D. Factory-Glazed Fabrication: Glaze vinyl windows in the factory where practical and possible for applications indicated. Comply with requirements in Division 08 Section "Glazing" and with AAMA/WDMA 101/I.S.2/NAFS.

E. Glazing Stops: Provide snap-on glazing stops coordinated with Division 08 Section "Glazing" and glazing system indicated. Provide glazing stops to match sash and ventilator frames.

F. Hardware: Mount hardware through double walls of vinyl extrusions or provide corrosion-resistant steel reinforcement complying with requirements for reinforcing members, or do both.

G. Complete fabrication, assembly, finishing, hardware application, and other work in the factory to greatest extent possible. Disassemble components only as necessary for shipment and installation. Allow for scribing, trimming, and fitting at Project site.

2.8 VINYL FINISHES
A. Integral Finish and Color: Uniform, solid, homogeneous white interior and exterior.
PART 3 – EXECUTION

3.1 EXAMINATION

A. Examine openings, substrates, structural support, anchorage, and conditions, with Installer present, for compliance with requirements for installation tolerances and other conditions affecting performance of work. Verify rough opening dimensions, levelness of sill plate, and operational clearances. Examine wall flashings, vapor retarders, water and weather barriers, and other built-in components to ensure a coordinated, weathertight window installation.

1. Wood Frame Walls: Dry, clean, sound, well nailed, free of voids, and without offsets at joints. Ensure that nail heads are driven flush with surfaces in opening and within 3 inches (76 mm) of opening.
2. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 INSTALLATION

A. Comply with AAMA 2400, Drawings, Shop Drawings, and manufacturer's written instructions for installing windows, hardware, accessories, and other components.

B. Install windows level, plumb, square, true to line, without distortion or impeding thermal movement, anchored securely in place to structural support, and in proper relation to wall flashing and other adjacent construction.

C. Apply flexible flashing to comply with manufacturers written instructions.

1. Prime substrates as recommended by flashing manufacturer.
2. Lap seams and junctures with other materials at least full width of flashing strip.
3. Lap sill flashing and bottom end of jamb flashings over weather-resistant building paper where occurs.
4. Lap weather-resistant building paper over head flashing and upper portions of jamb flashing.
5. After flashing has been applied, roll surfaces with a hard rubber or metal roller to ensure that flashing is completely adhered to substrates.

D. Set sill members in bed of sealant or with gaskets, as indicated, for weathertight construction.

E. Separate aluminum and other corrodible surfaces from sources of corrosion or electrolytic action at points of contact with other materials.

3.3 ADJUSTING, CLEANING, AND PROTECTION

A. Adjust operating sashes and ventilators, screens, hardware, and accessories for a tight fit at contact points and weather stripping for smooth operation and weathertight closure. Lubricate hardware and moving parts.

B. Clean exposed surfaces immediately after installing windows. Avoid damaging protective coatings and finishes. Remove excess sealants, glazing materials, dirt, and other substances.
C. Clean factory-glazed glass immediately after installing windows. Comply with manufacturer's written recommendations for final cleaning and maintenance. Remove nonpermanent labels, and clean surfaces.

D. Remove and replace glass that has been broken, chipped, cracked, abraded, or damaged during construction period.

E. Protect window surfaces from contact with contaminating substances resulting from construction operations. In addition, monitor window surfaces adjacent to and below exterior concrete and masonry surfaces during construction for presence of dirt, scum, alkaline deposits, stains, or other contaminants. If contaminating substances do contact window surfaces, remove contaminants immediately according to manufacturer's written recommendations.

END OF SECTION 08 53 13
SECTION 08 71 00 - DOOR HARDWARE

PART 1 – GENERAL

1.1 SUMMARY

A. This Section includes commercial door hardware.

1.2 SUBMITTALS

A. Product Data: Include construction and installation details, material descriptions, dimensions of individual components and profiles, and finishes.

B. Shop Drawings: When electrified and similar hardware or (future) provisions for same is indicated, provide details, indicating the following:


C. Samples for Verification: For exposed door hardware of each type, in specified finish, full size. Tag with full description for coordination with the door hardware sets. Submit Samples before, or concurrent with, submission of the final door hardware sets.

1. Samples will be returned to Contractor. Units that are acceptable and remain undamaged through submittal, review, and field comparison process may, after final check of operation, be incorporated into the Work, within limitations of keying requirements.

D. Product Certificates:

1. Certify that door hardware approved for use on types and sizes of labeled fire doors complies with listed fire door assemblies.

E. Qualification Data: For Installer.

F. Product Test Reports: Based on evaluation of comprehensive tests performed by manufacturer and witnessed by a qualified testing agency.

G. Maintenance Data: For each type of door hardware to include in maintenance manuals.

H. Field quality-control reports by independent testing and inspecting agency.

I. Warranty: Special warranty specified in this Section.

J. Other Action Submittals:

1. Door Hardware Sets: Detailing fabrication and assembly of door hardware, as well as procedures and diagrams. Coordinate the final door hardware sets with doors, frames, and related work to ensure proper size, thickness, hand, function, and finish of door hardware.

a. Format: Use same scheduling sequence and format and use same door numbers as in the Contract Documents.

DOOR HARDWARE

08 71 00-1
b. Content: Include the following information:

1) Identification number, location, hand, fire rating, and material of each door and frame.
2) Type, style, function, size, quantity, and finish of each door hardware item. Include description and function of each lockset and exit device.
3) Complete designations of every item required for each door or opening including name and manufacturer.
4) Fastenings and other pertinent information.
5) Location of each door hardware set, cross-referenced to Drawings, both on floor plans and in door and frame schedule.
6) Explanation of abbreviations, symbols, and codes contained in schedule.
7) Mounting locations for door hardware.
8) Door and frame sizes and materials.
9) Where indicated, description of each electrified door hardware function, including location, sequence of operation, and interface with other building control systems.
10) List of related door devices specified in other Sections for each door and frame.

c. Submittal Sequence: Submit the final door hardware sets at earliest possible date, particularly where approval of the door hardware sets must precede fabrication of other work that is critical in Project construction schedule. Include Product Data, Samples, Shop Drawings of other work affected by door hardware, and other information essential to the coordinated review of the door hardware sets.

2. Keying Schedule: Detailing final keying for locks. Include schematic keying diagram and index each key set to unique door designations.

1.3 QUALITY ASSURANCE

A. Installer Qualifications:

1. Installer's responsibilities include supplying and installing door hardware and providing a qualified architectural hardware consultant available during the course of the Work to consult with Contractor, Architect, and Owner about door hardware and keying.

2. Scheduling Responsibility: Preparation of door hardware and keying schedules.

B. Source Limitations: Obtain each type and variety of door hardware from a single manufacturer, unless otherwise indicated.

C. Fire-Rated Door Assemblies: Assemblies complying with NFPA 80 that are listed and labeled by a testing and inspecting agency acceptable to authorities having jurisdiction, for fire ratings indicated, based on testing according to UBC Standard 7-2.

D. Keying Conference: Conduct conference at Project site. In addition to Owner, Contractor, and Architect, conference participants shall also include Installer's architectural hardware consultant. Incorporate keying conference decisions into final keying schedule after reviewing door hardware keying system.

DOOR HARDWARE
08 71 00-2
1.4 DELIVERY, STORAGE, AND HANDLING

A. Inventory door hardware on receipt and provide secure lock-up for door hardware delivered to Project site.

B. Tag each item or package separately with identification related to the final door hardware sets, and include basic installation instructions, templates, and necessary fasteners with each item or package.

1.5 COORDINATION

A. Templates: Distribute door hardware templates for doors, frames, and other work specified to be factory prepared for installing door hardware. Check Shop Drawings of other work to confirm that adequate provisions are made for locating and installing door hardware to comply with indicated requirements.

B. Electrical System Roughing-in: Where electrified and similar hardware or (future) provisions for same is indicated, coordinate layout and installation (including installation by others) with connections to power supplies, alarms and detection, access control, security, and other, similar devices and systems.

C. Existing Openings: Where new hardware components are scheduled for application to existing construction or where modifications to existing door hardware are required, field verify existing conditions and coordinate installation of door hardware to suit opening conditions and to provide for proper operation.

1.6 WARRANTY

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

1. Failures include, but are not limited to, the following:

   a. Structural failures including excessive deflection, cracking, or breakage.
   b. Faulty operation of operators and door hardware.
   c. Deterioration of metals, metal finishes, and other materials beyond normal weathering and use.

2. Warranty Period: Three years from date of Substantial Completion, except as follows:

   a. Delayed-Egress Locks: Five years from date of Substantial Completion.
   b. Exit Devices: Two years from date of Substantial Completion.
   c. Manual Closers: 10 years from date of Substantial Completion.

1.7 MAINTENANCE SERVICE

A. Maintenance Tools and Instructions: Furnish a complete set of specialized tools and maintenance instructions as needed for Owner's continued adjustment, maintenance, and removal and replacement of door hardware.

DOOR HARDWARE
08 71 00-3
PART 2 – PRODUCTS

2.1 SCHEDULED DOOR HARDWARE

A. General: Provide door hardware for each door to comply with requirements in this Section

1. Door Hardware Sets: Provide quantity, item, size, finish or color indicated, and named manufacturers’ products or products equivalent in function and comparable in quality to named products.
2. Sequence of Operation: Where indicated, provide electrified door hardware function, sequence of operation, and interface with other systems.

B. Designations: Requirements for design, grade, function, finish, size, and other distinctive qualities of each type of door hardware are indicated on drawings:

2.2 HINGES, GENERAL

A. Quantity: Provide the following, unless otherwise indicated:

1. Two Hinges: For doors with heights up to 60 inches (1524 mm).
2. Three Hinges: For doors with heights 61 to 90 inches (1549 to 2286 mm).
3. Four Hinges: For doors with heights 91 to 120 inches (2311 to 3048 mm).
4. For doors with heights more than 120 inches (3048 mm), provide 4 hinges, plus 1 hinge for every 30 inches (750 mm) of door height greater than 120 inches (3048 mm).

B. Template Requirements: Except for hinges and pivots to be installed entirely (both leaves) into wood doors and frames, provide only template-produced units.

C. Hinge Weight: Unless otherwise indicated, provide the following:

1. Entrance Doors: Heavy-weight hinges.
2. Doors with Closers: Antifriction-bearing hinges.

D. Hinge Base Metal: Unless otherwise indicated, provide the following:

1. Exterior Hinges: Stainless steel, with stainless-steel pin.
2. Interior Hinges: Steel, with steel pin.
4. Interior Hinges for Fire-Rated Assemblies: Steel, with steel pin.

E. Hinge Features:

1. Nonremovable Pins: Provide set screw in hinge barrel that, when tightened into a groove in hinge pin, prevents removal of pin while door is closed; for outswinging exterior doors and outswinging corridor doors with locks.
2. Corners: Square .

F. Electrified Functions for Hinges (where applicable): Comply with the following:
1. Power Transfer: Concealed PTFE-jacketed wires, secured at each leaf and continuous through hinge knuckle.
3. Power Transfer and Monitoring: Concealed PTFE-jacketed wires, secured at each leaf and continuous through hinge knuckle, and with concealed electrical monitoring switch.

G. Fasteners: Comply with the following:

2. Wood Screws: For wood doors and frames.
3. Threaded-to-the-Head Wood Screws: For fire-rated wood doors.
4. Screws: Phillips flat-head; machine screws (drilled and tapped holes) for metal doors and wood screws for wood doors and frames. Finish screw heads to match surface of hinges.

2.3 LOCKS AND LATCHES, GENERAL

A. Accessibility Requirements: Where indicated to comply with accessibility requirements, comply with the U.S. Architectural & Transportation Barriers Compliance Board's "Americans with Disabilities Act (ADA), Accessibility Guidelines for Buildings and Facilities (ADAAG)."

1. Provide operating devices that do not require tight grasping, pinching, or twisting of the wrist and that operate with a force of not more than 5 lb(22 N).

B. Latches and Locks for Means of Egress Doors: Comply with NFPA 101. Latches shall not require more than 15 lb(67 N) to release the latch. Locks shall not require use of a key, tool, or special knowledge for operation.

C. Lock Trim: Wrought or forged

D. Lock Throw: Comply with testing requirements for length of bolts required for labeled fire doors.

E. Strikes: ANSI standard strike with strike box for each latchbolt or lock bolt, with curved lip extended to protect frame, finished to match door hardware set.

2.4 DOOR BOLTS

A. Bolt Throw: Comply with testing requirements for length of bolts required for labeled fire doors.

B. Dustproof Strikes: BHMA A156.16, Grade 1.

2.5 EXIT DEVICES

A. Accessibility Requirements: Where handles, pulls, latches, locks, and other operating devices are indicated to comply with accessibility requirements, comply with the U.S. Architectural & Transportation Barriers Compliance Board's "Americans with Disabilities Act (ADA), Accessibility Guidelines for Buildings and Facilities (ADAAG)."
1. Provide operating devices that do not require tight grasping, pinching, or twisting of the wrist and that operate with a force of not more than 5 lb(22 N).

B. Exit Devices for Means of Egress Doors: Comply with NFPA 101. Exit devices shall not require more than 15 lb(67 N) to release the latch. Locks shall not require use of a key, tool, or special knowledge for operation.

C. Panic Exit Devices: Listed and labeled by a testing and inspecting agency acceptable to authorities having jurisdiction, for panic protection, based on testing according to UL 305.

D. Fire Exit Devices: Devices complying with NFPA 80 that are listed and labeled by a testing and inspecting agency acceptable to authorities having jurisdiction, for fire and panic protection, based on testing according to UL 305 and NFPA 252.

2.6 LOCK CYLINDERS

A. Cylinders: Manufacturer's standard tumbler type, constructed from brass or bronze, stainless steel, or nickel silver, and complying with the following:
   1. Mortise Type: Threaded cylinders with rings and straight- or clover-type cam.
   2. Rim Type: Cylinders with back plate, flat-type vertical or horizontal tailpiece, and raised trim ring.
   3. Bored-Lock Type: Cylinders with tailpieces to suit locks.

B. Construction Keying: Incorporate decisions made in keying conference.

2.7 KEYING

A. Keying System: Key deadbolts and door operator locksets.

B. Keys: Nickel silver.
   1. Quantity:
      a. one extra key blank for each lock.

2.8 CLOSERS

A. Accessibility Requirements: Where handles, pulls, latches, locks, and other operating devices are indicated to comply with accessibility requirements, comply with the U.S. Architectural & Transportation Barriers Compliance Board's "Americans with Disabilities Act (ADA), Accessibility Guidelines for Buildings and Facilities (ADAAG)."

   1. Comply with the following maximum opening-force requirements:
      a. Interior, Non-Fire-Rated Hinged Doors: 5 lb(22.2 N) applied perpendicular to door.
      b. Sliding or Folding Doors: 5 lb(22.2 N) applied parallel to door at latch.
      c. Fire Doors: Minimum opening force allowable by authorities having jurisdiction.
B. Door Closers for Means of Egress Doors: Comply with NFPA 101. Door closers shall not require more than 30 lbf (133 N) to set door in motion and not more than 15 lbf (67 N) to open door to minimum required width.

C. Size of Units: Unless otherwise indicated, comply with manufacturer's written recommendations for size of door closers depending on size of door, exposure to weather, and anticipated frequency of use. Provide factory-sized closers, adjustable to meet field conditions and requirements for opening force.

D. Surface Closers: Provide type of arm required for closer to be located on interior side of door, unless otherwise indicated.

2.9 STOPS AND HOLDERS

A. Stops and Bumpers: Provide wall stops for doors unless other type stops are scheduled or indicated. Do not mount floor stops where they will impede traffic. Where floor or wall stops are not appropriate, provide overhead holders.

B. Silencers for Metal Door Frames: Neoprene or rubber, minimum diameter 1/2 inch (13 mm); fabricated for drilled-in application to frame.

2.10 DOOR GASKETING

A. General: Provide continuous weather-strip gasketing on exterior doors and provide smoke, light, or sound gasketing on interior doors where indicated or scheduled. Provide noncorrosive fasteners for exterior applications and elsewhere as indicated.

1. Perimeter Gasketing: Apply to head and jamb, forming seal between door and frame.
2. Meeting Stile Gasketing: Fasten to meeting stiles, forming seal when doors are closed.
3. Door Bottoms: Apply to bottom of door, forming seal with threshold when door is closed.

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

1. Provide smoke-labeled gasketing on smoke-labeled doors.

C. Fire-Labeled Gasketing: Assemblies complying with NFPA 80 that are listed and labeled by a testing and inspecting agency acceptable to authorities having jurisdiction, for fire ratings indicated, based on testing according to UBC Standard 7-2.

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

2.11 THRESHOLDS

A. Accessibility Requirements: Where thresholds are indicated to comply with accessibility requirements, comply with the U.S. Architectural & Transportation Barriers Compliance Board's "Americans with Disabilities Act (ADA), Accessibility Guidelines for Buildings and Facilities (ADAAG)."

DOOR HARDWARE
08 71 00-7
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1. Bevel raised thresholds with a slope of not more than 1:2. Provide thresholds not more than 1/2 inch (13 mm) high.


2.12 FABRICATION

A. Manufacturer's Nameplate: Do not provide products that have manufacturer's name or trade name displayed in a visible location except in conjunction with required fire-rated labels and as otherwise approved by Architect.

1. Manufacturer's identification is permitted on rim of lock cylinders only.

B. Base Metals: Produce door hardware units of base metal, fabricated by forming method indicated, using manufacturer's standard metal alloy, composition, temper, and hardness. Furnish metals of a quality equal to or greater than that of specified door hardware units and BHMA A156.18. Do not furnish manufacturer's standard materials or forming methods if different from specified standard.

C. Fasteners: Provide door hardware manufactured to comply with published templates generally prepared for machine, wood, and sheet metal screws. Provide screws according to commercially recognized industry standards for application intended, except aluminum fasteners are not permitted. Provide Phillips flat-head screws with finished heads to match surface of door hardware, unless otherwise indicated.

1. Steel Machine or Wood Screws: For the following fire-rated applications:

   a. Mortise hinges to doors.
   b. Strike plates to frames.
   c. Closers to doors and frames.

2. Steel Through Bolts: For the following fire-rated applications unless door blocking is provided:

   a. Surface hinges to doors.
   b. Closers to doors and frames.
   c. Surface-mounted exit devices.

3. Spacers or Hex Bolts: For through bolting of hollow-metal doors.

4. Fasteners for Wood Doors: Comply with requirements in DHI WDHS.2, "Recommended Fasteners for Wood Doors."

2.13 FINISHES

A. Standard: BHMA A156.18, as indicated in door hardware sets.

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08 71 00-8
B. Protect mechanical finishes on exposed surfaces from damage by applying a strippable, temporary protective covering before shipping.

C. Appearance of Finished Work: Variations in appearance of abutting or adjacent pieces are acceptable if they are within one-half of the range of approved Samples. Noticeable variations in the same piece are not acceptable. Variations in appearance of other components are acceptable if they are within the range of approved Samples and are assembled or installed to minimize contrast.

PART 3 – EXECUTION

3.1 EXAMINATION

A. Examine doors and frames, with Installer present, for compliance with requirements for installation tolerances, labeled fire door assembly construction, wall and floor construction, and other conditions affecting performance.

B. Examine roughing-in for electrical power systems to verify actual locations of wiring connections before electrified door hardware installation.

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

3.2 PREPARATION

A. Steel Doors and Frames: Comply with DHI A115 Series.

1. Surface-Applied Door Hardware: Drill and tap doors and frames according to ANSI A250.6.

B. Wood Doors: Comply with DHI A115-W Series.

3.3 INSTALLATION

A. Mounting Heights: Mount door hardware units at heights indicated as follows unless otherwise indicated or required to comply with governing regulations.


B. Install each door hardware item to comply with manufacturer's written instructions. Where cutting and fitting are required to install door hardware onto or into surfaces that are later to be painted or finished in another way, coordinate removal, storage, and reinstallation of surface protective trim units with finishing work specified in Division 09 Sections. Do not install surface-mounted items until finishes have been completed on substrates involved.

1. Set units level, plumb, and true to line and location. Adjust and reinforce attachment substrates as necessary for proper installation and operation.
2. Drill and countersink units that are not factory prepared for anchorage fasteners. Space fasteners and anchors according to industry standards.

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08 71 00-9
C. Boxed Power Supplies: Coordinate location of power supplies. Verify location with Architect.

D. Thresholds: Set thresholds for exterior doors in full bed of sealant complying with requirements specified in Division 07 Section "Joint Sealants."

3.4 FIELD QUALITY CONTROL (FIRE-RATED, LABELED DOORS AND FRAMES)

A. For labeled, fire-rated door and frame installations requiring field modification, rehanging, or similar installation or remedial procedures for door hardware not otherwise permitted by NFPA 80, engage U.L. or other qualified independent testing and inspecting agency, acceptable to authorities having jurisdiction, at Contractor's expense, to inspect door, frame, and hardware installations, verify compliance with NFPA 80 and door, frame, and hardware manufacturer's fire-rated labeling installation requirements, and prepare inspection reports.

B. After completion of initial, field-performed installation and remedial procedures, arrange for inspection of door, frame, and hardware installations by testing and inspecting agency for compliance with requirements.

C. Where testing and inspecting agency inspection results indicate that door, frame or hardware installations do not comply with specified requirements:

1. Perform additional repairs, replacements, or other remedial work (including, but not limited to, complete door, frame, and hardware assembly replacement) required by initial testing and inspecting agency inspections and necessary to comply with specified requirements.
2. Arrange for testing and inspecting agency reinspections to be performed, at Contractor's expense, to determine compliance of repaired, replaced or otherwise remedied work with specified requirements.

D. Upon testing and inspecting agency inspections indicating satisfactory compliance with requirements, arrange for the following:

1. Affixing of a permanent, metal "re-examination" or "re-evaluation" label with raised or incised markings, indicating U.L. or other qualified testing agency's name, date of reexamination/ re-evaluation, and cross-reference identification to written report, to hinge stile of door and frame in a clearly visible/readable location; locate adjacent to original, factory-applied labels.
2. Submission of independent testing and inspecting agency's written re-evaluation/reinspection report direct to parties, as directed by Architect (including Owner and authorities having jurisdiction), immediately after re-evaluation/re-inspection.

3.5 ADJUSTING

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

1. Door Closers: Unless otherwise required by authorities having jurisdiction, adjust sweep period so that, from an open position of 70 degrees, the door will take at least 3
seconds to move to a point 3 inches (75 mm) from the latch, measured to the leading edge of the door.

3.6 CLEANING AND PROTECTION

A. Clean adjacent surfaces soiled by door hardware installation.

B. Clean operating items as necessary to restore proper function and finish.

C. Provide final protection and maintain conditions that ensure that door hardware is without damage or deterioration at time of Substantial Completion.

END OF SECTION 08 71 00
SECTION 08 80 00 – GLAZING

PART 1 – GENERAL

1.1 SUMMARY

A. Section includes glazing for products and applications specified in other Sections where glazing requirements are specified by reference to this Section:

1.2 PERFORMANCE REQUIREMENTS

A. General: Installed glazing systems shall withstand normal thermal movement and wind and impact loads (where applicable) without failure, including loss or glass breakage attributable to the following: defective manufacture, fabrication, or installation; failure of sealants or gaskets to remain watertight and airtight; deterioration of glazing materials; or other defects in construction.

B. Delegated Design: Design glass, including comprehensive engineering analysis according to ASTM E 1300 by a qualified professional engineer, using the following design criteria:

1. Design Wind Pressures: Determine design wind pressures applicable to Project according to requirements of authorities having jurisdiction.
2. Maximum Lateral Deflection: For glass supported on all four edges, limit center-of-glass deflection at design wind pressure to not more than 1/50 times the short-side length or 1 inch (25 mm), whichever is less.

C. Thermal Movements: Allow for thermal movements from ambient and surface temperature changes acting on glass framing members and glazing components.

1. Temperature Change: 120 deg F (67 deg C), ambient; 180 deg F (100 deg C), material surfaces.

1.3 PRECONSTRUCTION TESTING

A. Preconstruction Adhesion and Compatibility Testing: Test each glazing material type, tape sealant, gasket, glazing accessory, and glass-framing member for adhesion to and compatibility with elastomeric glazing sealants.

1. Testing will not be required if data are submitted based on previous testing of current sealant products and glazing materials matching those submitted.
2. Use ASTM C 1087 to determine whether priming and other specific joint-preparation techniques are required to obtain rapid, optimum adhesion of glazing sealants to glass, tape sealants, gaskets, and glazing channel substrates.
3. Test no fewer than eight Samples of each type of material, including joint substrates, shims, sealant backings, secondary seals, and miscellaneous materials.
4. Schedule sufficient time for testing and analyzing results to prevent delaying the Work.
5. For materials failing tests, submit sealant manufacturer's written instructions for corrective measures including the use of specially formulated primers.
1.4 SUBMITTALS

A. Product Data: For each glass product and glazing material indicated.
B. Glass Samples: For each type of glass product other than clear monolithic vision glass; 12 inches (300 mm) square.

C. Glazing Accessory Samples: For gaskets, sealants and colored spacers, in 12-inch (300-mm) lengths. Install sealant Samples between two strips of material representative in color of the adjoining framing system.

D. Glazing Schedule: List glass types and thicknesses for each size opening and location. Use same designations indicated on Drawings.

E. Delegated-Design Submittal: For glass indicated to comply with performance requirements and design criteria, including analysis data signed and sealed by the qualified professional engineer responsible for their preparation.

F. Qualification Data: For installers, manufacturers of insulating-glass units with sputter-coated, low-e coatings (as applicable) glass testing agency and sealant testing agency.

G. Product Certificates: For glass and glazing products, from manufacturer.

H. Product Test Reports: Based on evaluation of comprehensive tests performed by a qualified testing agency, for coated glass, insulating glass, glazing sealants, and glazing gaskets, as applicable.
    1. For glazing sealants, provide test reports based on testing current sealant formulations within previous 36-month period.

I. Preconstruction adhesion and compatibility test report.

J. Warranties: Sample of special warranties.

1.5 QUALITY ASSURANCE

A. Manufacturer Qualifications for Insulating-Glass Units with Sputter-Coated, Low-E Coatings (as applicable): A qualified insulating-glass manufacturer who is approved by coated-glass manufacturer.

B. Installer Qualifications: An experienced installer who has completed glazing similar in material, design, and extent to that indicated for this Project; whose work has resulted in glass installations with a record of successful in-service performance.

C. Sealant Testing Agency Qualifications: An independent testing agency qualified according to ASTM C 1021 to conduct the testing indicated.

D. Source Limitations for Glass: Obtain from single source from single manufacturer for each glass type.

E. Source Limitations for Glazing Accessories: Obtain from single source from single manufacturer for each product and installation method.
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F. Glazing Publications: Comply with published recommendations of glass product manufacturers and organizations below, unless more stringent requirements are indicated. Refer to these publications for glazing terms not otherwise defined in this Section or in referenced standards.


G. Safety Glazing Labeling: Where safety glazing labeling is indicated, permanently mark glazing with certification label of the SGCC or another certification agency acceptable to authorities having jurisdiction. Label shall indicate manufacturer's name, type of glass, thickness, and safety glazing standard with which glass complies.

H. Insulating-Glass Certification Program: Permanently marked either on spacers or on at least one component lite of units with appropriate certification label of IGCC or equivalent certification.

I. Preinstallation Conference: Conduct conference at Project site.

1. Review and finalize construction schedule and verify availability of materials, Installer's personnel, equipment, and facilities needed to make progress and avoid delays.
2. Review temporary protection requirements for glazing during and after installation.

1.6 DELIVERY, STORAGE, AND HANDLING

A. Protect glazing materials according to manufacturer's written instructions. Prevent damage to glass and glazing materials from condensation, temperature changes, direct exposure to sun, or other causes.

B. Comply with insulating-glass manufacturer's written recommendations for venting and sealing units to avoid hermetic seal ruptures due to altitude change.

1.7 PROJECT CONDITIONS

A. Environmental Limitations: Do not proceed with glazing when ambient and substrate temperature conditions are outside limits permitted by glazing material manufacturers and when glazing channel substrates are wet from rain, frost, condensation, or other causes.

1. Do not install glazing sealants when ambient and substrate temperature conditions are outside limits permitted by sealant manufacturer or below 40 deg F(4.4 deg C).

1.8 WARRANTY

A. Manufacturer's Special Warranty for Coated-Glass Products: Manufacturer's standard form in which coated-glass manufacturer agrees to replace coated-glass units that deteriorate within specified warranty period. Deterioration of coated glass is defined as defects developed from normal use that are not attributed to glass breakage or to maintaining and cleaning coated glass.
contrary to manufacturer's written instructions. Defects include peeling, cracking, and other indications of deterioration in coating.

1. Warranty Period: 10 years from date of Substantial Completion.

B. Manufacturer's Special Warranty on Laminated Glass: Manufacturer's standard form in which laminated-glass manufacturer agrees to replace laminated-glass units that deteriorate within specified warranty period. Deterioration of laminated glass is defined as defects developed from normal use that are not attributed to glass breakage or to maintaining and cleaning laminated glass contrary to manufacturer's written instructions. Defects include edge separation, elamination materially obstructing vision through glass, and blemishes exceeding those allowed by referenced laminated-glass standard.

1. Warranty Period: Five years from date of Substantial Completion.

C. Manufacturer's Special Warranty on Insulating Glass: Manufacturer's standard form in which insulating-glass manufacturer agrees to replace insulating-glass units that deteriorate within specified warranty period. Deterioration of insulating glass is defined as failure of hermetic seal under normal use that is not attributed to glass breakage or to maintaining and cleaning insulating glass contrary to manufacturer's written instructions. Evidence of failure is the obstruction of vision by dust, moisture, or film on interior surfaces of glass.

1. Warranty Period: 10 years from date of Substantial Completion.

PART 2 – PRODUCTS

2.1 GLASS PRODUCTS, GENERAL

A. Thickness: Where glass thickness is indicated, it is a minimum. Provide glass lites in thicknesses as needed to comply with requirements indicated.

1. Minimum Glass Thickness for Exterior Lites: Not less than 6.0 mm.
2. Thickness of Tinted Glass: Provide same thickness for each tint color indicated throughout Project.

B. Strength: Where float glass is indicated, provide annealed float glass, Kind HS heat-treated float glass, or Kind FT heat-treated float glass, subject to compliance with requirements. Where heat-strengthened glass is indicated, provide Kind HS heat-treated float glass or Kind FT heat-treated float glass, subject to compliance with requirements. Where fully tempered glass is indicated, provide Kind FT heat-treated float glass.

C. Thermal Performance Properties: Provide glass with performance properties specified, as indicated in manufacturer's published test data, based on procedures indicated below:

1. For insulating-glass units, properties are based on units of thickness indicated for overall unit and for each lite.
2. Solar Heat-Gain Coefficient and Visible Transmittance: Center-of-glazing values, according to NFRC 200 and based on LBL's WINDOW 5.2 computer program.
2.2 GLASS PRODUCTS

A. Float Glass: ASTM C 1036, Type I, Quality-Q3, Class I (clear) unless otherwise indicated.

B. Heat-Treated Float Glass: ASTM C 1048; Type I; Quality-Q3; Class I (clear) unless otherwise indicated; of kind and condition indicated.
   1. Fabrication Process: By horizontal (roller-hearth) process with roll-wave distortion parallel to bottom edge of glass as installed unless otherwise indicated.
   2. For uncoated glass, comply with requirements for Condition A.
   3. For coated vision glass, comply with requirements for Condition C (other coated glass).

2.3 LAMINATED GLASS

A. Laminated Glass: ASTM C 1172, and complying with testing requirements in 16 CFR 1201 for Category II materials, and with other requirements specified. Use materials that have a proven record of no tendency to bubble, discolor, or lose physical and mechanical properties after fabrication and installation.
   1. Construction: Laminate glass with polyvinyl butyral interlayer or cast-in-place and cured-transparent-resin interlayer to comply with interlayer manufacturer's written recommendations.
   2. Interlayer Thickness: Provide thickness not less than that indicated and as needed to comply with requirements.
   3. Interlayer Color: Clear unless otherwise indicated.

B. Glass: Comply with applicable requirements in "Glass Products" Article as indicated by designations in "Insulating-Laminated-Glass Types" Article.

2.4 INSULATING GLASS

A. Insulating-Glass Units: Factory-assembled units consisting of sealed lites of glass separated by a dehydrated interspace, qualified according to ASTM E 2190, and complying with other requirements specified.
   1. Sealing System: Dual seal, with manufacturer's standard.
   2. Spacer: Manufacturer's standard spacer material and construction.
   3. Desiccant: Molecular sieve or silica gel, or blend of both.

B. Glass: Comply with applicable requirements in "Glass Products" Article as indicated by designations in "Insulating-Glass Types" Article and in "Insulating-Laminated-Glass Types" Article.

2.5 GLAZING GASKETS

A. Dense Compression Gaskets: Molded or extruded gaskets of profile and hardness required to maintain watertight seal, made from one of the following:
   1. EPDM complying with ASTM C 864.
   2. Silicone complying with ASTM C 1115.
3. Thermoplastic polyolefin rubber complying with ASTM C 1115.

B. Soft Compression Gaskets: Extruded or molded, closed-cell, integral-skinned EPDM, silicone, or thermoplastic polyolefin rubber gaskets complying with ASTM C 509, Type II, black; of profile and hardness required to maintain watertight seal.

1. Application: Use where soft compression gaskets will be compressed by inserting dense compression gaskets on opposite side of glazing or pressure applied by means of pressure-glazing stops on opposite side of glazing.

2.6 GLAZING SEALANTS

A. General:

1. Compatibility: Provide glazing sealants that are compatible with one another and with other materials they will contact, including glass products, seals of insulating-glass units, and glazing channel substrates, under conditions of service and application, as demonstrated by sealant manufacturer based on testing and field experience.
2. Suitability: Comply with sealant and glass manufacturers' written instructions for selecting glazing sealants suitable for applications indicated and for conditions existing at time of installation.
3. Colors of Exposed Glazing Sealants: As selected by Architect from manufacturer's full range.

B. Glazing Sealant: Neutral-curing silicone glazing sealant complying with ASTM C 920, Type S, Grade NS, Class 100/50, Use NT.

1. Products:
   a. Dow Corning Corporation; 790.
   b. GE Advanced Materials - Silicones; SilPruf LM SCS2700.
   c. Pecora Corporation; 890.
   d. Sika Corporation, Construction Products Division; SikaSil-C990.
   e. Or equal.

2.7 GLAZING TAPES

A. Back-Bedding Mastic Glazing Tapes: Preformed, butyl-based, 100 percent solids elastomeric tape; nonstaining and nonmigrating in contact with nonporous surfaces; with or without spacer rod as recommended in writing by tape and glass manufacturers for application indicated; and complying with ASTM C 1281 and AAMA 800, AAMA 804.3, AAMA 806.3, AAMA 807.3, as applicable.

B. Expanded Cellular Glazing Tapes: Closed-cell, PVC foam tapes; factory coated with adhesive on both surfaces; and complying with AAMA 800, AAMA 810.1, Type 1, AAMA 810.1, Type 2, as applicable.

2.8 MISCELLANEOUS GLAZING MATERIALS
A. General: Provide products of material, size, and shape complying with referenced glazing standard, requirements of manufacturers of glass and other glazing materials for application indicated, and with a proven record of compatibility with surfaces contacted in installation.

B. Cleaners, Primers, and Sealers: Types recommended by sealant or gasket manufacturer.

C. Setting Blocks: Elastomeric material with a Shore, Type A durometer hardness of 85, plus or minus 5.

D. Spacers: Elastomeric blocks or continuous extrusions of hardness required by glass manufacturer to maintain glass lites in place for installation indicated.

E. Edge Blocks: Elastomeric material of hardness needed to limit glass lateral movement (side walking).

F. Cylindrical Glazing Sealant Backing: ASTM C 1330, Type O (open-cell material), of size and density to control glazing sealant depth and otherwise produce optimum glazing sealant performance.

2.9 FABRICATION OF GLAZING UNITS

A. Fabricate glazing units in sizes required to fit openings indicated for Project, with edge and face clearances, edge and surface conditions, and bite complying with written instructions of product manufacturer and referenced glazing publications, to comply with system performance requirements.

B. Clean-cut or flat-grind vertical edges of butt-glazed monolithic lites to produce square edges with slight chamfers at junctions of edges and faces.

C. Grind smooth and polish exposed glass edges and corners.

2.10 INSULATING-GLASS TYPES

A. Glass Type: Low-e-coated, clear insulating glass.

1. Overall Unit Thickness: Manufacturer's standard.
2. Minimum Thickness of Each Glass Lite: 4.0 mm.
3. Outdoor Lite: Float glass, except provide fully tempered float glass where safety glazing is indicated or required.
4. Interspace Content: Manufacturer's standard.
5. Indoor Lite: As specified for outdoor lite.
7. Solar Heat Gain Coefficient: 0.39 maximum.
8. Provide safety glazing labeling.

2.11 INSULATING-LAMINATED-GLASS TYPES

A. Glass Type: Low-e-coated, clear insulating laminated glass.

1. Overall Unit Thickness: Manufacturer's standard.
2. Minimum Thickness of Outdoor Lite: 4.0 mm.
3. Outdoor Lite: Fully tempered float glass.
4. Interspace Content: Manufacturer's standard.
5. Indoor Lite: Clear laminated glass with two plies of float glass.
   a. Minimum Thickness of Each Glass Ply: 3.0 mm.
   b. Minimum Interlayer Thickness: 0.030 inch (0.76 mm).
7. Solar Heat Gain Coefficient: 0.39 maximum.
8. Provide safety glazing labeling.

PART 3 – EXECUTION

3.1 EXAMINATION

A. Examine framing, glazing channels, and stops, with Installer present, for compliance with the following:
   1. Manufacturing and installation tolerances, including those for size, squareness, and offsets at corners.
   2. Presence and functioning of weep systems.
   3. Minimum required face and edge clearances.
   4. Effective sealing between joints of glass-framing members.

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

3.2 PREPARATION

A. Clean glazing channels and other framing members receiving glass immediately before glazing. Remove coatings not firmly bonded to substrates.

B. Examine glazing units to locate exterior and interior surfaces. Label or mark units as needed so that exterior and interior surfaces are readily identifiable. Do not use materials that will leave visible marks in the completed work.

3.3 GLAZING, GENERAL

A. Comply with combined written instructions of manufacturers of glass, sealants, gaskets, and other glazing materials, unless more stringent requirements are indicated, including those in referenced glazing publications.

B. Adjust glazing channel dimensions as required by Project conditions during installation to provide necessary bite on glass, minimum edge and face clearances, and adequate sealant thicknesses, with reasonable tolerances.

C. Protect glass edges from damage during handling and installation. Remove damaged glass from Project site and legally dispose of off Project site. Damaged glass is glass with edge damage or other imperfections that, when installed, could weaken glass and impair performance and appearance.

D. Apply primers to joint surfaces where required for adhesion of sealants, as determined by preconstruction testing.
E. Install setting blocks in sill rabbets, sized and located to comply with referenced glazing publications, unless otherwise required by glass manufacturer. Set blocks in thin course of compatible sealant suitable for heel bead.

F. Do not exceed edge pressures stipulated by glass manufacturers for installing glass lites.

G. Provide spacers for glass lites where length plus width is larger than 50 inches (1270 mm).
   1. Locate spacers directly opposite each other on both inside and outside faces of glass. Install correct size and spacing to preserve required face clearances, unless gaskets and glazing tapes are used that have demonstrated ability to maintain required face clearances and to comply with system performance requirements.
   2. Provide 1/8-inch (3-mm) minimum bite of spacers on glass and use thickness equal to sealant width. With glazing tape, use thickness slightly less than final compressed thickness of tape.

H. Provide edge blocking where indicated or needed to prevent glass lites from moving sideways in glazing channel, as recommended in writing by glass manufacturer and according to requirements in referenced glazing publications.

I. Set glass lites in each series with uniform pattern, draw, bow, and similar characteristics.

J. Set glass lites with proper orientation so that coatings face exterior or interior as specified.

K. Where wedge-shaped gaskets are driven into one side of channel to pressurize sealant or gasket on opposite side, provide adequate anchorage so gasket cannot walk out when installation is subjected to movement.

L. Square cut wedge-shaped gaskets at corners and install gaskets in a manner recommended by gasket manufacturer to prevent corners from pulling away; seal corner joints and butt joints with sealant recommended by gasket manufacturer.

3.4 TAPE GLAZING

A. Position tapes on fixed stops so that, when compressed by glass, their exposed edges are flush with or protrude slightly above sightline of stops.

B. Install tapes continuously, but not necessarily in one continuous length. Do not stretch tapes to make them fit opening.

C. Cover vertical framing joints by applying tapes to heads and sills first and then to jambs. Cover horizontal framing joints by applying tapes to jambs and then to heads and sills.

D. Place joints in tapes at corners of opening with adjoining lengths butted together, not lapped. Seal joints in tapes with compatible sealant approved by tape manufacturer.

E. Do not remove release paper from tape until right before each glazing unit is installed.

F. Apply heel bead of elastomeric sealant.
G. Center glass lites in openings on setting blocks and press firmly against tape by inserting dense compression gaskets formed and installed to lock in place against faces of removable stops. Start gasket applications at corners and work toward centers of openings.

H. Apply cap bead of elastomeric sealant over exposed edge of tape.

3.5 GASKET GLAZING (DRY)

A. Cut compression gaskets to lengths recommended by gasket manufacturer to fit openings exactly, with allowance for stretch during installation.

B. Insert soft compression gasket between glass and frame or fixed stop so it is securely in place with joints miter cut and bonded together at corners.

C. Installation with Drive-in Wedge Gaskets: Center glass lites in openings on setting blocks and press firmly against soft compression gasket by inserting dense compression gaskets formed and installed to lock in place against faces of removable stops. Start gasket applications at corners and work toward centers of openings. Compress gaskets to produce a weathertight seal without developing bending stresses in glass. Seal gasket joints with sealant recommended by gasket manufacturer.

D. Installation with Pressure-Glazing Stops: Center glass lites in openings on setting blocks and press firmly against soft compression gasket. Install dense compression gaskets and pressureglazing stops, applying pressure uniformly to compression gaskets. Compress gaskets to produce a weathertight seal without developing bending stresses in glass. Seal gasket joints with sealant recommended by gasket manufacturer.

E. Install gaskets so they protrude past face of glazing stops.

3.6 SEALANT GLAZING (WET)

A. Install continuous spacers, or spacers combined with cylindrical sealant backing, between glass lites and glazing stops to maintain glass face clearances and to prevent sealant from extruding into glass channel and blocking weep systems until sealants cure. Secure spacers or spacers and backings in place and in position to control depth of installed sealant relative to edge clearance for optimum sealant performance.

B. Force sealants into glazing channels to eliminate voids and to ensure complete wetting or bond of sealant to glass and channel surfaces.

C. Tool exposed surfaces of sealants to provide a substantial wash away from glass.

3.7 CLEANING AND PROTECTION

A. Protect exterior glass from damage immediately after installation by attaching crossed streamers to framing held away from glass. Do not apply markers to glass surface. Remove nonpermanent labels and clean surfaces.

B. Protect glass from contact with contaminating substances resulting from construction operations. If, despite such protection, contaminating substances do come into contact with glass, remove substances immediately as recommended in writing by glass manufacturer.
C. Examine glass surfaces adjacent to or below exterior concrete and other masonry surfaces at frequent intervals during construction, but not less than once a month, for buildup of dirt, scum, alkaline deposits, or stains; remove as recommended in writing by glass manufacturer.

D. Remove and replace glass that is broken, chipped, cracked, or abraded or that is damaged from natural causes, accidents, and vandalism, during construction period.

E. Wash glass on both exposed surfaces in each area of Project not more than four days before date scheduled for inspections that establish date of Substantial Completion. Wash glass as recommended in writing by glass manufacturer.

END OF SECTION 08 80 00
SECTION 08 83 00 – MIRRORS

PART 1 – GENERAL

1.1 SUMMARY

A. This Section includes the following types of silvered flat glass mirrors.

1. Annealed monolithic glass mirrors.

1.2 DEFINITIONS

A. Deterioration of Mirrors: Defects developed from normal use that are attributable to the manufacturing process and not to causes other than glass breakage and practices for maintaining and cleaning mirrors contrary to mirror manufacturer's written instructions. Defects include discoloration, black spots, and clouding of the silver film.

1.3 PERFORMANCE REQUIREMENTS

A. Provide mirrors that will not fail under normal usage. Failure includes glass breakage and deterioration attributable to defective manufacture, fabrication, and installation.

1.4 SUBMITTALS

A. Product Data: For the following:

1. Mirror mastic.
2. Mirror hardware.

B. Shop Drawings: Include mirror elevations, edge details, mirror hardware, and attachments to other work.

C. Samples: For each type of mirror product required, in the form indicated below:

1. Mirrors, 12 inches(300 mm) square, including edge treatment on 2 adjoining edges.
3. Mirror trim, 12 inches(300 mm) long.

D. Product Certificates: For each type of mirror and mirror mastic, signed by product manufacturer.

E. Mirror Mastic Compatibility Test Reports: From mirror manufacturer indicating that mirror mastic was tested for compatibility and adhesion with mirror backing and substrates on which mirrors are installed.

F. Warranty: Special warranty specified in this Section.
1.5 QUALITY ASSURANCE

A. Source Limitations for Mirrors: Obtain mirrors from one source for each type of mirror indicated.
B. Source Limitations for Mirror Glazing Accessories: Obtain mirror glazing accessories from one source for each type of accessory indicated.
C. Glazing Publications: Comply with the following published recommendations:
   1. GANA's "Glazing Manual" unless more stringent requirements are indicated. Refer to this publication for definitions of glass and glazing terms not otherwise defined in this Section or in referenced standards.
   2. GANA Mirror Division's "Mirrors, Handle with Extreme Care: Tips for the Professional on the Care and Handling of Mirrors."
D. Preconstruction Mirror Mastic Compatibility Test: Submit mirror mastic products to mirror manufacturer for testing to determine compatibility of mastic with mirror backing and substrates on which mirrors are installed.

1.6 DELIVERY, STORAGE, AND HANDLING

A. Protect mirrors according to mirror manufacturer's written instructions and as needed to prevent damage to mirrors from condensation, temperature changes, direct exposure to sun, or other causes.
B. Comply with mirror manufacturer's written instructions for shipping, storing, and handling mirrors as needed to prevent deterioration of silvering, damage to edges, and abrasion of glass surfaces and applied coatings. Store indoors, protected from moisture including condensation.

1.7 PROJECT CONDITIONS

A. Environmental Limitations: Do not install mirrors until ambient temperature and humidity conditions are maintained at levels indicated for final occupancy.

1.8 WARRANTY

A. Special Warranty: Manufacturer's standard (or Contractor's) form, made out to Owner and signed by mirror manufacturer (or Contractor) agreeing to replace mirrors that deteriorate as defined in "Definitions" Article, f.o.b. the nearest shipping point to Project site, within specified warranty period indicated below:
   1. Warranty Period: Five years from date of Substantial Completion.

PART 2 – PRODUCTS

2.1 SILVERED FLAT GLASS MIRROR MATERIALS

   1. Nominal Thickness: Unless otherwise indicated, not less than 6.0 mm.
B. Tempered Clear Glass Mirrors: Comply with ASTM C 1503, Mirror Glazing Quality, for blemish requirements in annealed float glass before silver coating is applied, for coating requirements, and with other requirements not affected by tempering process; and comply with ASTM C 1048 for Kind FT, Condition A, tempered float glass before silver coating is applied.

1. Nominal Thickness: Unless otherwise indicated, not less than 6.0 mm.

2.2 MISCELLANEOUS MATERIALS

A. Setting Blocks: Elastomeric material with a Type A Shore durometer hardness of 85, plus or minus 5.

B. Edge Sealer: Coating compatible with glass coating and approved by mirror manufacturer for use in protecting against silver deterioration at mirrored glass edges.

C. Mirror Mastic: An adhesive setting compound, produced specifically for setting mirrors and certified by both mirror manufacturer and mastic manufacturer as compatible with glass coating and substrates on which mirrors will be installed.

2.3 MIRROR HARDWARE

A. Top and Bottom Aluminum J-Channels: Aluminum extrusions with a return deep enough to produce a glazing channel to accommodate mirrors of thickness indicated and in lengths required to cover bottom and top edges of each mirror in a single piece.

1. Bottom Trim: J-channels formed with front leg and back leg not less than 3/8 and 7/8 inch(9.5 and 22 mm) in height, respectively, and a thickness of not less than 0.04 inch(1.0 mm).

2. Top Trim: J-channels formed with front leg and back leg not less than 5/8 and 1 inch(16 and 25 mm) in height, respectively, and a thickness of not less than 0.04 inch(1.0 mm).

3. Products:

a. Bottom Trim:

2) Sommer & Maca Industries, Inc.; Medium Gauge Aluminum Shallow Nose "J" Moulding Lower Bar.
3) Sommer & Maca Industries, Inc.; Heavy Gauge Aluminum Shallow Nose "J" Moulding Lower Bar.
4) Or equal.

b. Top Trim:

2) Sommer & Maca Industries, Inc.; Medium Gauge Aluminum Deep Nose "J" Moulding Upper Bar.
3) Sommer & Maca Industries, Inc.; Heavy Gauge Aluminum Deep Nose "J" Moulding Lower Bar.
4) Or equal.

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B. Fasteners: Fabricated of same basic metal and alloy as fastened metal and matching it in finished color and texture where fasteners are exposed.

C. Anchors and Inserts: Provide devices as required for mirror hardware installation. Provide toothed or lead-shield expansion-bolt devices for drilled-in-place anchors. Provide galvanized anchors and inserts for applications on inside face of exterior walls and where indicated.

2.4 FABRICATION

A. Mirror Sizes: To suit Project conditions, cut mirrors to final sizes and shapes.

B. Cutouts: Fabricate cutouts for notches and holes in mirrors without marring visible surfaces. Locate and size cutouts so they fit closely around penetrations in mirrors.

C. Mirror Edge Treatment: Manufacturer's standard polished edge.

1. Seal edges of mirrors after edge treatment to prevent chemical or atmospheric penetration of glass coating.
2. Perform edge treatment and sealing in factory or shop.

D. Film-Backed Safety Mirrors: Apply film backing with pressure-sensitive adhesive coating over mirror backing paint as recommended in writing by film-backing manufacturer to produce a surface free of bubbles, blisters, and other imperfections. Use adhesives and film backing compatible with mirror backing paint as certified by mirror manufacturer.

PART 3 – EXECUTION

3.1 INSTALLATION

A. General: Install mirrors to comply with mirror manufacturer's written instructions and with referenced GANA publications. Mount mirrors accurately in place in a manner that avoids distorting reflected images.

B. Provide a minimum air space of 1/8 inch (3 mm) between back of mirrors and mounting surface for air circulation between back of mirrors and face of mounting surface.

C. For wall-mounted mirrors, install mirrors with mastic and mirror hardware.

1. Attach mirror hardware securely to mounting surfaces with mechanical fasteners installed with anchors or inserts as applicable. Install fasteners so heads do not impose point loads on backs of mirrors.
2. For mirror hardware in the form of continuous J-channels at bottom, provide setting blocks 1/8 inch (3 mm) thick by 4 inches (100 mm) long at quarter points. To prevent trapping water, provide, between setting blocks, 2 slotted weeps not less than 1/4 inch (6.4 mm) wide by 3/8 inch (9.5 mm) long.
3. For mirror hardware in the form of a continuous J-channel at bottom and continuous top trim at top, fasten J-channel directly to wall and attach top trim to continuous cleat fastened directly to wall.
4. Install mirror hardware in the form of J-channels that are fabricated in single lengths to fit and cover top and bottom edges of mirrors.
5. Install mastic as follows:
a. Apply barrier coat to mirror backing where approved in writing by manufacturers of mirrors and backing material.
b. Apply mastic to comply with mastic manufacturer's written instructions for coverage and to allow air circulation between back of mirrors and face of mounting surface.
c. After mastic is applied, align mirrors and press into place while maintaining a minimum air space of 1/8 inch (3 mm) between back of mirrors and mounting surface.

3.2 CLEANING AND PROTECTION

A. Protect mirrors from breakage and contaminating substances resulting from construction operations.

B. Do not permit edges of mirrors to be exposed to standing water.

C. Maintain environmental conditions that will prevent mirrors from being exposed to moisture from condensation or other sources for continuous periods of time.

END OF SECTION 08 83 00
SECTION 09 24 23 - EXTERIOR PORTLAND CEMENT (PLASTERING) STUCCO

PART 1 – GENERAL

1.1 SUMMARY

A. This Section includes exterior Portland cement plasterwork (stucco) on metal lath.

1.2 SUBMITTALS

A. Product Data: For each type of product indicated.

B. Shop Drawings: Show locations and installation of control and expansion joints including plans, elevations, sections, details of components, and attachments to other work.

1.3 DELIVERY, STORAGE, AND HANDLING

A. Store materials inside under cover and keep them dry and protected against damage from weather, direct sunlight, surface contamination, corrosion, construction traffic, and other causes.

1.4 PROJECT CONDITIONS

A. Comply with ASTM C 926 requirements.

B. Exterior Plasterwork:

1. Apply and cure plaster to prevent plaster drying out during curing period. Use procedures required by climatic conditions, including moist curing, providing coverings, and providing barriers to deflect sunlight and wind.

2. Apply plaster when ambient temperature is greater than 40 deg F(4.4 deg C).

3. Protect plaster coats from freezing for not less than 48 hours after set of plaster coat has occurred.

C. Factory-Prepared Finishes: Comply with manufacturer's written recommendations for environmental conditions for applying finishes.

PART 2 – PRODUCTS

2.1 METAL LATH


   a. Weight: 3.4 lb/sq. yd.(1.8 kg/sq. m).

B. Wire-Fabric Lath:

Lancaster Infill Houses

a. Weight: 1.4 lb/sq. yd. (0.8 kg/sq. m).

C. Paper Backing: FS UU-B-790, Type I Grade D, Style 2 vapor-permeable paper.

1. Provide paper-backed lath unless otherwise indicated.

2.2 ACCESSORIES

A. General: Comply with ASTM C 1063 and coordinate depth of trim and accessories with thicknesses and number of plaster coats required.

B. Zinc and Zinc-Coated (Galvanized) Steel Sheet Accessories: Manufactured from zinc alloy or hot-dip galvanized steel sheet, size and profile appropriate for specific application.

1. Internal-Corner Expansion Joint: Manufactured “M,” “W,” or double-“Vee”-shaped zinc-alloy, with expanded or solid metal wings; preformed for internal corner applications.

C. Welded or Woven Wire Accessories: Manufactured from zinc coated, galvanized steel wire; preformed and sized, with or without plastic nose, as appropriate for specific application.

2.3 MISCELLANEOUS MATERIALS

A. Water for Mixing: Potable and free of substances capable of affecting plaster set or of damaging plaster, lath, or accessories.

B. Bonding Compound: ASTM C 932.

C. Fasteners for Attaching Metal Lath to Substrates: Complying with ASTM C 1063.

2.4 PLASTER MATERIALS


1. Manufacturers:

   a. La Habra Stucco.
   b. Omega Products International.
   c. Or equal.


1. Manufacturers:

   a. La Habra Stucco.
   b. Omega Products International.
   c. Or equal.

2. Color and Texture (Aggregate Gradation): To match existing.
2.5 PLASTER MIXES

A. General: Comply with ASTM C 926 for applications indicated.

B. Factory-Prepared Base-Coat Mixes: Comply with manufacturer's written instructions.

C. Factory-Prepared Finish-Coat Mixes: For ready-mixed finish-coat plasters, comply with manufacturer's written instructions.

PART 3 – EXECUTION

3.1 EXAMINATION

A. Examine areas and substrates, with Installer present, and including welded hollow-metal frames, cast-in anchors, and structural framing, for compliance with requirements and other conditions affecting performance.

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

3.2 PREPARATION

A. Protect adjacent work from soiling, spattering, moisture deterioration, and other harmful effects caused by plastering.

B. Prepare solid-plaster bases that are smooth or that do not have the suction capability required to bond with plaster according to ASTM C 926.

3.3 INSTALLATION, GENERAL

A. Fire-Resistance-Rated Assemblies: Install components according to requirements for design designations from listing organization and publication indicated on Drawings.

3.4 INSTALLING METAL LATH

A. Expanded-Metal Lath: Install according to ASTM C 1063.

2. Flat-Ceiling and Horizontal Framing: Install woven-wire lath.
4. On Solid Surfaces, Not Otherwise Furred: Install self-furring diamond-mesh or woven wire lath, subject to specified framing conditions.

3.5 INSTALLING ACCESSORIES

A. Install according to ASTM C 1063 and at locations indicated on Drawings.

B. Reinforcement for External Corners:

1. Install corner bead or lath-type external-corner reinforcement at exterior locations, as required to match existing conditions.
C. Control Joints: Unless otherwise indicated, install control joints in specific locations approved by Architect for visual effect as follows:

1. As required to delineate plasterwork into areas (panels) of the following maximum sizes:
   a. Vertical Surfaces: 144 sq. ft.(13.4 sq. m).
   b. Horizontal and other Nonvertical Surfaces: 100 sq. ft.(9.3 sq. m).

2. At distances between control joints of not greater than 18 feet(5.5 m) o.c.
3. As required to delineate plasterwork into areas (panels) with length-to-width ratios of not greater than 2-1/2:1.
4. Where control joints occur in surface of construction directly behind plaster.
5. Where plasterwork areas change dimensions, to delineate rectangular-shaped areas (panels) and to relieve the stress that occurs at the corner formed by the dimension change.

D. Expansion Joints for Internal Corners: Manufactured, internal-corner expansion joint.

3.6 PLASTER APPLICATION

A. General: Comply with ASTM C 926.

1. Do not deviate more than plus or minus 1/4 inch in 10 feet(6.4 mm in 3 m) from a true plane in finished plaster surfaces, as measured by a 10-foot(3-m) straightedge placed on surface.
2. Finish plaster flush with metal frames and other built-in metal items or accessories that act as a plaster ground, unless otherwise indicated. Where casing bead does not terminate plaster at metal frame, cut base coat free from metal frame before plaster sets and groove finish coat at junctures with metal.

B. Bonding Compound: Apply on unit masonry and concrete plaster bases and where bonding new plaster to cured/hardened plaster.

C. Plaster Finish Coats: Unless otherwise indicated, apply to provide finish to match Architect's sample.

3.7 CUTTING AND PATCHING

A. Cut, patch, replace, and repair plaster as necessary to accommodate other work and to restore cracks, dents, and imperfections. Repair or replace work to eliminate blisters, buckles, crazing and check cracking, dry outs, efflorescence, sweat outs, and similar defects and where bond to substrate has failed.

3.8 CLEANING AND PROTECTION
A. Remove temporary protection and enclosure of other work. Promptly remove plaster from doorframes, windows, and other surfaces not indicated to be plastered. Repair floors, walls, and other surfaces stained, marred, or otherwise damaged during plastering.

END OF SECTION 09 24 23
SECTION 09 29 00 - GYPSUM BOARD

PART 1 – GENERAL

1.1 SUMMARY

A. This Section includes interior gypsum board.

1.2 SUBMITTALS

A. Product Data: For each type of product indicated.

B. Samples: For trim accessories; full-size Sample in 12-inch-(300-mm-) long length for each trim accessory indicated.

1.3 QUALITY ASSURANCE

A. Fire-Resistance-Rated Assemblies: For fire-resistance-rated assemblies, provide materials and construction identical to those tested in assembly indicated according to ASTM E 119 by an independent testing agency.

B. Mockups: Before beginning gypsum board installation, install mockups of at least 100 sq. ft.(9 sq. m) in surface area to demonstrate aesthetic effects and set quality standards for materials and execution.

1. Install mockups for the following:

   a. Each type of Level 4 gypsum board finish to receive textured finish.

2. Apply or install final decoration indicated, including painting and other subsequent finishes, on exposed surfaces for review of mockups.

3. Simulate finished lighting conditions for review of mockups.

4. Approved mockups may become part of the completed Work if undisturbed at time of Substantial Completion.

1.4 PROJECT CONDITIONS

A. Environmental Limitations: Comply with ASTM C 840 requirements or gypsum board manufacturer's written recommendations, whichever are more stringent.

B. Do not install interior products until installation areas are enclosed and conditioned.

C. Do not install panels that are wet, those that are moisture damaged, and those that are mold damaged.

1. Indications that panels are wet or moisture damaged include, but are not limited to, discoloration, sagging, or irregular shape.

2. Indications that panels are mold damaged include, but are not limited to, fuzzy or splotchy surface contamination and discoloration.
PART 2 – PRODUCTS

2.1 PANELS, GENERAL

A. Size: Provide in maximum lengths and widths available that will minimize joints in each area and that correspond with support system indicated.

2.2 INTERIOR GYPSUM BOARD

A. General: Complying with ASTM C 36/C 36M or ASTM C 1396/C 1396M, as applicable to type of gypsum board indicated and whichever is more stringent.

1. Manufacturers: Subject to compliance with requirements, manufacturers of products that may be incorporated into the Work include, but are not limited to, the following:
   b. USG Corporation.
   c. Or equal.

B. Type X:

1. Thickness: 5/8 inch (15.9 mm).
2. Long Edges: Tapered and featured (rounded or beveled) for prefilling.

C. Ceiling Type: Manufactured to have more sag resistance than regular-type gypsum board.

1. Thickness: 1/2 inch (12.7 mm).
2. Long Edges: Tapered.
3. Products: Subject to compliance with requirements, products that may be incorporated into the Work include, but are not limited to, the following:
   a. National Gypsum Company; High Strength BRAND Ceiling Board.
   b. United States Gypsum Co.; SHEETROCK Brand Sag-Resistant Interior Ceiling Board.
   c. Or equal.

D. Water-Resistant Gypsum Backing Board: ASTM C 630, and ASTM C 1396, or ASTM C 1278.

1. Products: Subject to compliance with requirements, products that may be incorporated into the Work include, but are not limited to, the following:
   c. Or equal.

2. Core: 1/2 inch (12.7 mm), regular type.

2.3 TRIM ACCESSORIES
A. Interior Trim: ASTM C 1047.

1. Material: Galvanized or aluminum-coated steel sheet, rolled zinc, or paper-faced galvanized steel sheet. Plastic is not acceptable.
2. Shapes:
   a. Cornerbead.
   b. Bullnose bead.
   c. LC-Bead: J-shaped; exposed long flange receives joint compound.
   d. U-Bead: J-shaped; exposed short flange does not receive joint compound.
   e. Expansion (control) joint.
   f. Curved-Edge Cornerbead: With notched or flexible flanges.

2.4 JOINT TREATMENT MATERIALS

A. General: Comply with ASTM C 475/C 475M.

B. Joint Tape: Paper

C. Joint Compound for Interior Gypsum Wallboard: For each coat use formulation that is compatible with other compounds applied on previous or for successive coats.

   1. Prefilling: At open joints, rounded or beveled panel edges, and damaged surface areas, use setting-type taping compound.
   2. Embedding and First Coat: For embedding tape and first coat on joints, fasteners, and trim flanges, use setting-type taping compound.
   3. Fill Coat: For second coat, use setting-type, sandable topping compound.
   4. Finish Coat: For third coat, use drying-type, all-purpose compound.

2.5 AUXILIARY MATERIALS

A. General: Provide auxiliary materials that comply with referenced installation standards and manufacturer's written recommendations.

B. Steel Drill Screws: ASTM C 1002, unless otherwise indicated.

C. Acoustical Sealant: As specified in Division 07 Section "Joint Sealants."

D. Thermal Insulation: As specified in Division 07 Section "Thermal Insulation."

2.6 TEXTURE FINISHES

A. Primer: As recommended by textured finish manufacturer.

B. Non-Aggregate Finish: Water-based, job-mixed, drying-type texture finish for spray application.

   1. Products: Subject to compliance with requirements, products that may be incorporated into the Work include, but are not limited to, the following:

      a. National Gypsum; Proform Perfect Spray EM or HF.
PART 3 – EXECUTION

3.1 EXAMINATION

A. Examine areas and substrates, with Installer present, and including welded hollow-metal frames and framing, for compliance with requirements and other conditions affecting performance.

B. Examine panels before installation. Reject panels that are wet, moisture damaged, and mold damaged.

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

3.2 APPLYING AND FINISHING PANELS, GENERAL

A. Comply with ASTM C 840.

B. Install ceiling panels across framing to minimize the number of abutting end joints and to avoid abutting end joints in central area of each ceiling. Stagger abutting end joints of adjacent panels not less than one framing member.

C. Install panels with face side out. Butt panels together for a light contact at edges and ends with not more than 1/16 inch (1.5 mm) of open space between panels. Do not force into place.

D. Locate edge and end joints over supports, except in ceiling applications where intermediate supports or gypsum board back-blocking is provided behind end joints. Do not place tapered edges against cut edges or ends. Stagger vertical joints on opposite sides of partitions. Do not make joints other than control joints at corners of framed openings.

E. Form control and expansion joints with space between edges of adjoining gypsum panels.

F. Cover both faces of support framing with gypsum panels in concealed spaces (above ceilings, etc.), except in chases braced internally.

1. Unless concealed application is indicated or required for sound, fire, air, or smoke ratings, coverage may be accomplished with scraps of not less than 8 sq. ft. (0.7 sq. m) in area.

2. Fit gypsum panels around ducts, pipes, and conduits.

3. Where partitions intersect structural members projecting below underside of floor/roof slabs and decks, cut gypsum panels to fit profile formed by structural members; allow 1/4- to 3/8-inch (6.4- to 9.5-mm-) wide joints to install sealant.

G. Isolate perimeter of gypsum board applied to non-load-bearing partitions at structural abutments, except floors. Provide 1/4- to 1/2-inch (6.4- to 12.7-mm-) wide spaces at these
locations, and trim edges with edge trim where edges of panels are exposed. Seal joints between edges and abutting structural surfaces with acoustical sealant.

H. Wood Framing: Install gypsum panels over wood framing, with floating internal corner construction. Do not attach gypsum panels across the flat grain of wide-dimension lumber, including floor joists and headers. Float gypsum panels over these members, or provide control joints to counteract wood shrinkage.

3.3 APPLYING INTERIOR GYPSUM BOARD

A. Install interior gypsum board in the following locations:

1. Type X: Vertical surfaces, unless otherwise indicated.
2. Ceiling Type: Ceiling surfaces.
3. Moisture- and Mold-Resistant Type: Use bath and water-heater rooms, unless otherwise indicated.

B. Single-Layer Application:

1. On ceilings, apply gypsum panels before wall/partition board application to greatest extent possible and at right angles to framing, unless otherwise indicated.
2. On partitions/walls, apply gypsum panels vertically (parallel to framing), unless otherwise indicated or required by fire-resistance-rated assembly, and minimize end joints.
   a. Stagger abutting end joints not less than one framing member in alternate courses of panels.
   b. At stairwells and other high walls, install panels horizontally, unless otherwise indicated or required by fire-resistance-rated assembly.

3. Fastening Methods: Apply gypsum panels to supports with steel drill screws.

3.4 INSTALLING TRIM ACCESSORIES

A. General: For trim with back flanges intended for fasteners, attach to framing with same fasteners used for panels. Otherwise, attach trim according to manufacturer's written instructions.

B. Control Joints: Install control joints, unless otherwise indicated on Drawings, according to ASTM C 840 and in specific locations approved by Architect for visual effect.

C. Interior Trim: Install in the following locations:

1. Cornerbead: Use at outside corners, unless otherwise indicated.
2. Bullnose Bead: Use at outside corners where indicated.
3. LC-Bead: Use at exposed panel edges.
4. U-Bead: Use at exposed panel edges where indicated.
5. Curved-Edge Cornerbead: Use at curved openings.
3.5 FINISHING GYPSUM BOARD

A. General: Treat gypsum board joints, interior angles, edge trim, control joints, penetrations, fastener heads, surface defects, and elsewhere as required to prepare gypsum board surfaces for decoration. Promptly remove residual joint compound from adjacent surfaces.

B. Prefill open joints, rounded or beveled edges, and damaged surface areas.

C. Apply joint tape over gypsum board joints, except those with trim having flanges not intended for tape.

D. Gypsum Board Finish Levels: Finish panels to levels indicated below and according to ASTM C 840:

1. Level 1: Ceiling plenum areas, concealed areas, and where indicated.
2. Level 2: Panels that are substrate for ceramic tile or acoustical tile; storage and similar utilitarian areas; and where indicated.
3. Level 4: Surfaces indicated to receive light-textured finishes prior to painting; and at panel surfaces that will be exposed to view, unless otherwise indicated.

3.6 APPLYING TEXTURE FINISHES

A. Surface Preparation and Primer: Prepare and apply primer to gypsum panels and other surfaces receiving texture finishes. Apply primer to surfaces that are clean, dry, and smooth.

B. Texture Finish Application: Mix and apply finish using powered spray equipment, to produce a uniform texture matching approved mockup and free of starved spots or other evidence of thin application or of application patterns.

C. Prevent texture finishes from coming into contact with surfaces not indicated to receive texture finish by covering them with masking agents, polyethylene film, or other means. If, despite these precautions, texture finishes contact these surfaces, immediately remove droppings and overspray to prevent damage according to texture-finish manufacturer's written recommendations.

3.7 PROTECTION

A. Remove and replace panels that are wet, moisture damaged, and mold damaged.

1. Indications that panels are wet or moisture damaged include, but are not limited to, discoloration, sagging, or irregular shape.
2. Indications that panels are mold damaged include, but are not limited to, fuzzy or splotchy surface contamination and discoloration.

END OF SECTION 09 29 00
SECTION 09 65 – MEDIUM-DENSITY FIBERBOARD

PART 1 – GENERAL

1.1 SUMMARY

A. Section Includes:

1. Medium-density fiberboard (MDF)

1.2 SUBMITTALS

A. Product Data: For each type of product indicated.

B. Samples for Initial Selection: For each type of product indicated.

C. Samples for Verification: For each type of product indicated, in manufacturer's standard-size Samples but not less than 12 inches (300 mm) long, of each MDF product color, texture, and pattern required.

D. Product Schedule: For MDF products. Use same designations indicated on Drawings.

1.3 PROJECT CONDITIONS

A. Maintain ambient temperatures within range recommended by manufacturer, but not less than 70 deg F (21 deg C) or more than 95 deg F (35 deg C), in spaces to receive resilient products during the following time periods:

1. 48 hours before installation.
2. During installation.
3. 48 hours after installation.

B. Until Substantial Completion, maintain ambient temperatures within range recommended by manufacturer, but not less than 55 deg F (13 deg C) or more than 95 deg F (35 deg C).

C. Install MDF products after other finishing operations, including painting, have been completed.

1.4 EXTRA MATERIALS

A. Furnish extra materials that match products installed and that are packaged with protective covering for storage and identified with labels describing contents.

1. Furnish not less than 10 linear feet (3 linear m) for every 500 linear feet (150 linear m) or fraction thereof, of each type, color, pattern, and size of resilient product installed.
PART 2 – PRODUCTS

2.1 RESILIENT BASE

   1. Material Requirement: Unless otherwise indicated, Type TV (vinyl, thermoplastic).
   3. Style: Unless otherwise indicated, cove (base with toe) at resilient floors.

B. Minimum Thickness: 0.125 inch (3.2 mm).

C. Lengths: Coils in manufacturer's standard length.

D. Outside Corners: Job formed or preformed.

E. Inside Corners: Job formed or preformed.

F. Colors and Patterns: Paint grade MDF.

2.2 INSTALLATION MATERIALS

A. Trowelable Patching Compounds: Latex-modified, portland cement based or blended hydraulic-cement-based formulation provided or approved by manufacturer for applications indicated.

B. Adhesives: Water-resistant type recommended by manufacturer to suit resilient products and substrate conditions indicated.

PART 3 – EXECUTION

3.1 EXAMINATION

A. Examine substrates, with Installer present, for compliance with requirements for maximum moisture content and other conditions affecting performance of the Work.

B. Verify that finishes of substrates comply with tolerances and other requirements specified in other Sections and that substrates are free of cracks, ridges, depressions, scale, and foreign deposits that might interfere with adhesion of resilient products.

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

3.2 PREPARATION

A. Fill cracks, holes, and depressions in substrates with trowelable patching compound and remove bumps and ridges to produce a uniform and smooth substrate.

B. Do not install MDF products until they are same temperature as the space where they are to be installed.

1. Move resilient products and installation materials into spaces where they will be installed at least 48 hours in advance of installation.

MEDIUM DENSITY FIBERBOARD
09 65 13-2
C. Sweep and vacuum clean substrates to be covered by MDF products immediately before installation.

3.3 RESILIENT BASE INSTALLATION

A. Apply resilient base to walls, columns, pilasters, casework and cabinets in toe spaces, and other permanent fixtures in rooms and areas where base is required.

B. Install resilient base in lengths as long as practicable without gaps at seams and with tops of adjacent pieces aligned.

C. Tightly adhere resilient base to substrate throughout length of each piece, with base in continuous contact with horizontal and vertical substrates.

D. Do not stretch resilient base during installation.

E. Preformed Corners: Install preformed corners before installing straight pieces.

F. Job-Formed Corners:

   1. Outside Corners: Use straight pieces of maximum lengths possible. Form without producing discoloration (whitening) at bends.
   2. Inside Corners: Use straight pieces of maximum lengths possible.

3.4 CLEANING AND PROTECTION

A. Perform the following operations immediately after completing resilient product installation:

   1. Remove adhesive and other blemishes from exposed surfaces.
   2. Sweep and vacuum surfaces thoroughly.
   3. Damp-mop surfaces to remove marks and soil.

B. Protect resilient products from mars, marks, indentations, and other damage from construction operations and placement of equipment and fixtures during remainder of construction period.

C. Cover resilient products until Substantial Completion.
SECTION 09 68 00 - CARPETING

PART 1 – GENERAL

1.1 SUMMARY

A. Section includes carpeting.

1.2 SUBMITTALS

A. Product Data: For each type of product indicated.
B. Samples for Initial Selection: For each type of carpet indicated.
C. Samples for Verification: Full-size units of each color and pattern of carpet required.
D. Maintenance Data: For each type of carpet to include in maintenance manuals.
E. Warranties: Special warranties specified in this Section.

1.3 DELIVERY, STORAGE, AND HANDLING

A. Store carpet and installation materials in dry spaces protected from the weather, with ambient temperatures maintained within range recommended by manufacturer, but not less than 50 deg F(10 deg C) or more than 90 deg F(32 deg C). Store carpets on flat surfaces.

1.4 PROJECT CONDITIONS

A. Maintain ambient temperatures within range recommended by manufacturer, but not less than 70 deg F(21 deg C) or more than 95 deg F(35 deg C), in spaces to receive carpet during the following time periods:

   1. 48 hours before installation.
   2. During installation.
   3. 48 hours after installation.

B. Until Substantial Completion, maintain ambient temperatures within range recommended by manufacturer, but not less than 55 deg F(13 deg C) or more than 95 deg F(35 deg C).

C. Close spaces to traffic during carpet installation.

D. Close spaces to traffic for 48 hours after carpet installation.

E. Install carpet after other finishing operations, including painting, have been completed.

1.5 WARRANTY

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

   1. Failures include, but are not limited to, the following:

FLOORING
09 68 00-1
a. Surfaces exhibit permanent staining, scuffing; discoloration or fading from heat or sunlight,

2. Warranty Period: 5 years from date of Substantial Completion.

1.6 EXTRA MATERIALS

A. Furnish extra materials that match products installed and that are packaged with protective covering for storage and identified with labels describing contents.

1. Carpet: Furnish 1 sample of each type, color, and pattern of carpet installed.

PART 2 – PRODUCTS

2.1 CARPET

A. Style Type: Texture Loop

B. Face Weight: 26.00 oz./sq. yd.

C. Size: 12’

D. Fiber: 92% Olefin, 8% Nylon

E. Fiber Brand: Permastrand Olefin

F. Backing: Woven Polypropylene

G. Stain Treatment: Scotchgard™ Protect and Stain Release (SSR)

H. Colors and Patterns: Mohawk Horizon Collection on SP515 Color #2

I. Carpet Pad: 3/8” thick with an 8 lbs density

2.2 INSTALLATION MATERIALS

A. Tape: Water-resistant type recommended by manufacturer to suit carpet and substrate conditions indicated.

C. Adhesive: Water resistant type recommended by manufacturer to suit carpet and substrate conditions indicated.

PART 3 – EXECUTION

3.1 EXAMINATION

A. Examine substrates, with Installer present, for compliance with requirements for maximum moisture content and other conditions affecting performance of the Work.
B. Verify that finishes of substrates comply with tolerances and other requirements specified in other Sections and that substrates are free of cracks, ridges, depressions, scale, and foreign deposits that might interfere with adhesion of carpet.

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

3.2 PREPARATION

A. Concrete Substrates: Prepare according to ASTM F 710.

1. Verify that substrates are dry and free of curing compounds, sealers, and hardeners.
2. Remove substrate coatings and other substances that are incompatible with adhesives and that contain soap, wax, oil, or silicone, using mechanical methods recommended by manufacturer. Do not use solvents.
3. Alkalinity and Adhesion Testing: Perform tests recommended by manufacturer. Proceed with installation only after substrates pass testing.
4. Moisture Testing: Perform tests recommended by manufacturer and as follows. Proceed with installation only after substrates pass testing.
   a. Perform anhydrous calcium chloride test, ASTM F 1869. Proceed with installation only after substrates have maximum moisture-vapor-emission rate of 3 lb of water/1000 sq. ft. (1.36 kg of water/92.9 sq. m) in 24 hours.
   b. Perform relative humidity test using in situ probes, ASTM F 2170. Proceed with installation only after substrates have a maximum 75% relative humidity level measurement.

B. Do not install carpet until they are same temperature as space where they are to be installed.

C. Sweep and vacuum clean substrates to be covered by resilient products immediately before installation.

3.3 CARPET INSTALLATION

A. Scribe, cut, and fit carpet to butt neatly and tightly to vertical surfaces and permanent fixtures including built-in furniture, cabinets, pipes, outlets, and door frames.

B. Extend carpet into toe spaces, door reveals, closets, and similar openings.

C. Maintain reference markers, holes, and openings that are in place or marked for future cutting by repeating on carpet as marked on substrates. Use chalk or other nonpermanent, non-staining marking device.

D. Install carpet on floor covers and similar items in finished floor areas. Tightly adhere tile edges to substrates that abut covers and to cover perimeters.

E. Unless otherwise recommended by carpet manufacturer, adhere carpet to flooring substrates using a full spread of adhesive applied to substrate. Produce a completed installation without open cracks, voids, raising and puckering at joints, telegraphing of adhesive spreader marks, and other surface imperfections.

3.4 CLEANING AND PROTECTION
A. Perform the following operations immediately after completing carpet installation:

1. Remove adhesive and other blemishes from exposed surfaces.
2. Sweep and vacuum surfaces thoroughly.

B. Protect carpet products from mars, marks, indentations, and other damage from construction operations and placement of equipment and fixtures during remainder of construction period.

C. Cover carpet until Substantial Completion.

END OF SECTION 09 68 00
SECTION 09 65 19 – FLOOR TILE

PART 1 – GENERAL

1.1 SUMMARY

A. Section includes resilient tile flooring.

1.2 SUBMITTALS

A. Product Data: For each type of product indicated.

B. Samples for Initial Selection: For each type of floor tile indicated.

C. Samples for Verification: Full-size units of each color and pattern of floor tile required.

D. Maintenance Data: For each type of floor tile to include in maintenance manuals.

E. Warranties: Special warranties specified in this Section.

1.3 DELIVERY, STORAGE, AND HANDLING

A. Store floor tile and installation materials in dry spaces protected from the weather, with ambient temperatures maintained within range recommended by manufacturer, but not less than 50 deg F(10 deg C) or more than 90 deg F(32 deg C). Store floor tiles on flat surfaces.

1.4 PROJECT CONDITIONS

A. Maintain ambient temperatures within range recommended by manufacturer, but not less than 70 deg F(21 deg C) or more than 95 deg F(35 deg C), in spaces to receive floor tile during the following time periods:

1. 48 hours before installation.
2. During installation.
3. 48 hours after installation.

B. Until Substantial Completion, maintain ambient temperatures within range recommended by manufacturer, but not less than 55 deg F(13 deg C) or more than 95 deg F(35 deg C).

C. Close spaces to traffic during floor tile installation.

D. Close spaces to traffic for 48 hours after floor tile installation.

E. Install floor tile after other finishing operations, including painting, have been completed.

1.5 WARRANTY

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

1. Failures include, but are not limited to, the following:
a. Surfaces exhibit permanent staining, scuffing; discoloration or fading from heat or sunlight,

2. Warranty Period: 5 years from date of Substantial Completion.

1.6 EXTRA MATERIALS

A. Furnish extra materials that match products installed and that are packaged with protective covering for storage and identified with labels describing contents.

1. Floor Tile: Furnish 1 box of each type, color, and pattern of floor tile installed.

PART 2 – PRODUCTS

2.1 TILE FLOOR

A. Style Type: DAL Tile (DT)

C. Size: 12”x12” or 18”x18”

D. Colors and Patterns: DT Salerno SL83

2.2 INSTALLATION MATERIALS

A. Grout: Water-resistant type recommended by manufacturer to suit floor tile and substrate conditions indicated.

C. Adhesive: Water resistant type recommended by manufacturer to suit floor tile and substrate conditions indicated.

B. Floor Polish: Provide protective liquid floor polish products as recommended by manufacturer.

PART 3 – EXECUTION

3.1 EXAMINATION

A. Examine substrates, with Installer present, for compliance with requirements for maximum moisture content and other conditions affecting performance of the Work.

B. Verify that finishes of substrates comply with tolerances and other requirements specified in other Sections and that substrates are free of cracks, ridges, depressions, scale, and foreign deposits that might interfere with adhesion of floor tile.

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

3.2 PREPARATION

A. Concrete Substrates: Prepare according to ASTM F 710.

1. Verify that substrates are dry and free of curing compounds, sealers, and hardeners.
2. Remove substrate coatings and other substances that are incompatible with adhesives and that contain soap, wax, oil, or silicone, using mechanical methods recommended by manufacturer. Do not use solvents.

3. Alkalinity and Adhesion Testing: Perform tests recommended by manufacturer. Proceed with installation only after substrates pass testing.

4. Moisture Testing: Perform tests recommended by manufacturer and as follows. Proceed with installation only after substrates pass testing.

   a. Perform anhydrous calcium chloride test, ASTM F 1869. Proceed with installation only after substrates have maximum moisture-vapor-emission rate of 3 lb of water/1000 sq. ft. (1.36 kg of water/92.9 sq. m) in 24 hours.
   
   b. Perform relative humidity test using in situ probes, ASTM F 2170. Proceed with installation only after substrates have a maximum 75% relative humidity level measurement.

B. Do not install floor tiles until they are same temperature as space where they are to be installed.

C. Sweep and vacuum clean substrates to be covered by resilient products immediately before installation.

3.3 FLOOR TILE INSTALLATION

A. Match floor tiles for color and pattern by selecting tiles from cartons in the same sequence as manufactured and packaged, if so numbered.

B. Scribe, cut, and fit floor tiles to butt neatly and tightly to vertical surfaces and permanent fixtures including built-in furniture, cabinets, pipes, outlets, and door frames.

C. Extend floor tiles into toe spaces, door reveals, closets, and similar openings.

D. Maintain reference markers, holes, and openings that are in place or marked for future cutting by repeating on floor tiles as marked on substrates. Use chalk or other nonpermanent, non-staining marking device.

E. Install floor tiles on floor covers and similar items in finished floor areas. Maintain overall continuity of color and pattern between pieces of tile installed on covers and adjoining tiles. Tightly adhere tile edges to substrates that abut covers and to cover perimeters.

F. Unless otherwise recommended by resilient tile manufacturer, adhere floor tiles to flooring substrates using a full spread of adhesive applied to substrate. Produce a completed installation without open cracks, voids, raising and puckering at joints, telegraphing of adhesive spreader marks, and other surface imperfections.

3.4 CLEANING AND PROTECTION

A. Perform the following operations immediately after completing floor tile installation:

   1. Remove adhesive and other blemishes from exposed surfaces.
   2. Sweep and vacuum surfaces thoroughly.
   3. Damp-mop surfaces to remove marks and soil.
B. Protect floor tile products from mars, marks, indentations, and other damage from construction operations and placement of equipment and fixtures during remainder of construction period.

C. Floor Polish (unless otherwise recommended by resilient tile manufacturer): Remove soil, visible adhesive, and surface blemishes from floor tile surfaces before applying liquid floor polish.

   1. Unless otherwise recommended by resilient tile manufacturer, apply not less than two coats.

D. Cover floor tile until Substantial Completion.

END OF SECTION 09 65 19
SECTION 09 91 13 - EXTERIOR PAINTING

PART 1 – GENERAL

1.1 SUMMARY

A. This Section includes surface preparation and the field application of paint systems on exterior substrates.

1.2 DESCRIPTION

A. Paint exposed surfaces, except where indicated that surface or material is not to be painted or is to remain natural. Where item or a surface is not specifically indicated, paint the item or surface same as similar adjacent materials or surfaces.

1. Painting includes field painting of items and surfaces completely or partially unfinished under the work requirements specified in other sections and typically requiring painting for protection, identification, or decoration.

   a. Field paint items provided only with factory- or shop surface-preparation, treatment and priming. Touch-up prime coats damaged or otherwise abraded or removed.
   b. Field paint items provided with galvanized and similar corrosion-protective coatings.

2. Painting includes field painting of surfaces of mechanical and electrical equipment that have shop- or factory-applied finishes. Such mechanical and electrical equipment includes but not limited to, the following:

   a. Switchgear.
   b. Panel boards.

3. Painting includes field painting of surfaces of mechanical and electrical equipment that do not have a factory-applied final finish. Such mechanical and electrical equipment includes but not limited to, the following:

   a. Exposed/uncovered and insulated or jacketed pipes and ducts.
   b. Exposed hangers and supports
   c. Exposed conduit.
   d. Exposed junction boxes.

4. Painting includes field painting of surfaces behind or concealed by (permanently or temporarily) fixed equipment, and similar items.

B. Unless specifically indicated, do not paint factory- or shop-prefinished items, decorative finished metals, moving and operating parts, and labels, nameplates, and similar identification, including those required by authorities having jurisdiction.

C. Painting excludes surfaces of equipment, fixtures and similar exposed-to-view items in mechanical, electrical, storage and similar unoccupied areas, unless specifically indicated to be field painted or requires protection from environmental conditions.
1.3 SUBMITTALS

A. Product Data: For each type of product indicated. Include primers and other substrate preparatory materials.

1. Include manufacturer's technical material and product components listing and instructions for material and product handling, storage, and application.

B. Samples: For each type of paint system and each color and gloss of topcoat indicated, fully cured and dry, on samples of actual substrates.

1. Submit Samples on rigid backing, 8 inches (200 mm) square.
2. Step coats on Samples to show each coat required for system, including substrate preparatory materials. Use actual colors.
3. Label each coat of each Sample.
4. Label each Sample for location and application area.

C. Product List: For each product indicated, include the following:

1. Cross-reference to paint system and locations of application areas. Identify each material by manufacturer's name, product name and number, and substrate types to which applied. Use same designations indicated on Drawings and in schedules.

D. Maintenance Data: Complete listing of coating materials and products. Provide factory batch numbers and formulation codes for finish coating colors.

1.4 QUALITY ASSURANCE

A. Material and Product Qualifications:

1. Provide manufacturer's premium, highest quality materials and products, factory formulated.
2. Unless otherwise indicated, provide products of same manufacturer for each coat in a coating system.

B. MPI Standards:

1. Preparation and Workmanship: Comply with requirements in "MPI Architectural Painting Specification Manual" for products and paint systems indicated.

C. Mockups: Apply benchmark samples of each paint system indicated and each color and finish selected to verify preliminary selections made under sample submittals and to demonstrate aesthetic effects and set quality standards for materials and execution.

1. Architect will select one surface to represent surfaces and conditions for application of each paint system specified in Part 3.

b. Other Items: Architect will designate items or areas required.

2. Not more than three different finish colors within each mockup may be designated.
3. Prepare substrates and apply coating systems according to requirements specified for final project work. Schedule after permanent lighting has been installed and is completely functional or provide temporary lighting equivalent to final design lighting conditions.

4. Final approval of color selections will be based on benchmark samples.

   a. If preliminary color selections are not approved, apply additional benchmark samples of additional colors selected by Architect at no added cost to Owner.

1.5 DELIVERY, STORAGE, AND HANDLING

   A. Store materials not in use in tightly covered containers in well-ventilated areas with ambient temperatures continuously maintained at not less than 45 deg F(7 deg C).

      1. Maintain containers in clean condition, free of foreign materials and residue.
      2. Remove rags and waste from storage areas daily.

1.6 PROJECT CONDITIONS

   A. Unless otherwise recommended by coating manufacturer or required for curing of specific coatings, apply paints only when temperature of surfaces to be painted and ambient air temperatures are between 50 and 95 deg F(10 and 35 deg C).

   B. Do not apply paints in snow, rain, fog, or mist; when relative humidity exceeds 85 percent; at temperatures less than 5 deg F(3 deg C) above the dew point; or to damp or wet surfaces.

1.7 EXTRA MATERIALS

   A. Furnish extra materials described below that are from same production run (batch mix) as materials applied and that are packaged for storage and identified with labels describing contents.

      1. Quantity: Furnish an additional 5 percent, but not less than 1 gal.(3.8 L) of each material and color applied.

PART 2 – PRODUCTS

2.1 MANUFACTURERS

   A. Manufacturers: Subject to compliance with requirements, provide products by one of the following:

      1. Dunn-Edwards Corporation.
      2. Frazee Paint.
      3. Vista Paint.
      4. Or equal.

2.2 PAINT, GENERAL

   A. Material Compatibility:
1. Provide materials for use within each paint system that are compatible with one another and substrates indicated, under conditions of service and application as demonstrated by manufacturer, based on testing and field experience.
2. For each coat in a paint system, provide products recommended in writing by manufacturers of topcoat for use in paint system and on substrate indicated.

PART 3 – EXECUTION

3.1 EXAMINATION

A. Examine substrates and conditions, with Applicator present, for compliance with requirements for maximum moisture content and other conditions affecting performance of work.

B. Maximum Moisture Content of Substrates: When measured with an electronic moisture meter as follows:
   1. Wood: 15 percent.
   2. Plaster: 12 percent.

C. Verify suitability of substrates, including surface conditions and compatibility with existing finishes and primers.

D. Begin coating application only after unsatisfactory conditions have been corrected and surfaces are dry.
   1. Beginning coating application constitutes Contractor's acceptance of substrates and conditions.

3.2 PREPARATION

A. Comply with manufacturer's written instructions and recommendations in "MPI Architectural Painting Specification Manual" applicable to substrates and paint systems indicated.

B. Remove plates, machined surfaces, and similar items already in place that are not to be painted. If removal is impractical or impossible because of size or weight of item, provide surface applied protection before surface preparation and painting.
   1. After completing painting operations, use workers skilled in the trades involved to reinstall items that were removed. Remove surface-applied protection if any.
   2. Do not paint over labels of independent testing agencies or equipment name, identification, performance rating, or nomenclature plates.

C. Clean substrates of substances that could impair bond of paints, including dirt, oil, grease, and incompatible paints and encapsulants.
   1. Remove incompatible primers and reprime substrate with compatible primers as required to produce paint systems indicated.

D. Surfaces with Compatible, Shop- or Factory-Applied Primers: Touch-up abraded and damaged primers. Mechanical-brush and solvent-clean. Apply same primer (whenever possible) product applied in factory or shop or VOC-compliant compatible product.

EXTERIOR PAINT

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E. Surfaces with Incompatible, Shop- or Factory-Applied Primers: Apply barrier coat(s) or remove incompatible, shop- or factory-applied primers,(pretreat) and apply primer(s) as specified herein.

F. Surfaces with Shop- or Factory-Applied Finishes: Uniformly abrade (sand) or etch finished surfaces to obtain minimum surface profile recommended by coating manufacturer and ensure increased adhesion of subsequent coatings. Apply barrier coat(s), undercoat(s) and/or pretreat as recommended by coating manufacturer.

G. Cementitious Substrates: ASTM D4258, ASTM D4259, and SSPC-SP 13, as applicable. Remove efflorescence, chalk, and residual form release chemicals. Roughen smooth, glazed surfaces to achieve surface profile recommended by manufacturer. Use mechanical (e.g., blast cleaning) methods to remove applied chemical surface hardeners, sealers, and similar treatments.

1. Test surfaces for pH level and moisture content. Prior to application of paint materials and products, remedy surfaces to comply with pH level and moisture content recommended in manufacturer's written application instructions. Moisture content not to exceed 12 percent.
2. Limit use of acid, etching, and other chemical cleaners to locations and areas conducive to appropriate conditions for application. Flush and/or neutralize, allow to dry, and vacuum prior to application of paint materials and products.
3. Patch and repair cracks, holes, pits, and other imperfections with compatible, flexible patching materials. Texture to match surrounding surfaces.

H. Ferrous (Steel) Metals: Clean unprimed surfaces; clean pits to bright metal.

1. For exterior locations with protected exposure where blast-methods are not practical or cannot be utilized, comply with SSPC-SP 11.
2. For exterior locations with unprotected exposure and interior locations subject to intermittent exposure to moisture, comply with SSPC-SP 6/NACE No. 3.
3. For exterior locations with severe exposure to moisture and other elements, comply with SSPC-SP 10/NACE No. 2.
4. Subsequent to completion of above procedures, comply with SSPC-SP 1.
5. Perform specialized cleaning, preparation, pretreatment and similar procedures as appropriate and recommended by coating manufacture for specific type and condition of surfaces.

I. Stainless Steel: SSPC-SP 3 followed by SSPC-SP 1. Additionally, uniformly abrade (sand) using 80 grit silicone carbide paper or abrasive-blast to obtain minimum surface profile recommended by primer manufacturer.

J. Aluminum, Copper, and Galvanized Steel: ASTM D6386 and SSPC- SP 1, as applicable. Additionally, uniformly abrade (sand) or abrasive-blast aluminum and copper to obtain minimum surface profile recommended by primer manufacturer. Remove from galvanized steel, factory- or shop-treatments detrimental to adhesion or application of paint materials and products. Apply pretreatments as recommended by primer manufacturer; apply primer immediately after application of pretreatment as recommended by primer and pretreatment manufacturers.

K. Wood Substrates: Mechanically or chemically clean, as appropriate for wood type, species, and applied finish. Sand exposed surfaces smooth and remove dust and debris.
1. Test surfaces for moisture content. Prior to application of paint materials and products, remedy surfaces to comply with moisture content recommended in manufacturer's written application instructions. Moisture content not to exceed 15 percent.
2. Scrape and clean knots, and apply coat of knot sealer before applying primer.
3. Sand surfaces that will be exposed to view, and dust off.
4. Prime wood immediately on delivery to project site. Prime edges, ends, faces, undersides, backsides, mortises, cutouts, reveals, and similar surfaces, including surfaces fully- or semi-concealed in the completed installation.
5. After priming, fill holes and imperfections in the finish surfaces with putty or plastic wood filler. Sand smooth when dried.

L. Other Surfaces and Substrates: As recommended by coating manufacturer for specific surface and substrate types and conditions, and as required to produce intended finish results.

3.3 APPLICATION

A. Apply paints according to manufacturer's written instructions.

B. Apply (and redistribute, as necessary) paint to smooth, uniform appearance, color, texture, and coverage to match samples. Eliminate evidence of laps, runs, sags, holidays, "orangepeel", irregularity in color and texture, application equipment, skid marks, and similar visual imperfections.

1. Use applicators and techniques suited for paint and substrate indicated.
2. Paint surfaces behind movable items same as similar exposed surfaces. Before final installation, paint surfaces behind permanently fixed items with prime coat only.
3. Coat back sides of access panels, removable or hinged covers, and similar hinged items to match exposed surfaces.
4. Paint visible internal surfaces of ductwork flat black to extent visible through ventilating diffusers and grilles.
5. Paint tops and bottoms of doors same as faces and edges.

C. Tint each undercoat a lighter shade to facilitate identification of each coat if multiple coats of same material are to be applied. Tint undercoats to match color of topcoat, but provide sufficient difference in shade of undercoats to distinguish each separate coat.

D. If undercoats or other conditions show through topcoat, apply additional coats until cured film has a uniform paint finish, color, and appearance.

E. Apply paints to produce surface films without cloudiness, spotting, holidays, laps, brush marks, roller tracking, runs, sags, ropiness, or other surface imperfections. Cut in sharp lines and color breaks.

F. Scheduling Painting: Apply first coat immediately after cleaning, pretreatment, and/or other preparation has been performed and before any surface deterioration can occur.

1. Apply successive coats subsequent to complete curing of preceding coat. Sand to smooth, even surface as recommended by manufacturer; sand between successive application of each coat.
2. Delete primer application over surfaces with factory- or shop-applied primer and
touchup of primer has been performed.
Delete primer application over surfaces with factory- or shop-applied finishes and surface
preparation has been performed.
4. Apply additional topcoats until cured paint has uniform finish, color, and appearance,
without any show-through of underlying primers or undercoats. Ensure that edges,
corners, crevices, welds, and exposed fasteners receive a dry film thickness equivalent to
that of planar surfaces.
G. Minimum Thickness: Apply paint materials within manufacturer's recommended spreading
rates and/or wet film thicknesses to achieve manufacturer's recommended minimum dry film
thicknesses, for each coat and for total coating system.

3.4 CLEANING AND PROTECTION

A. At end of each workday, remove rubbish, empty cans, rags, and other discarded materials from
Project site.

B. After completing paint application, clean spattered surfaces. Remove spattered paints by
washing, scraping, or other methods. Do not scratch or damage adjacent finished surfaces.

C. Protect work of other trades against damage from paint application. Correct damage to work of
other trades by cleaning, repairing, replacing, and refinishing, as approved by Architect, and leave
in an undamaged condition.

D. At completion of construction activities of other trades, touch up and restore damaged or
defaced painted surfaces.

3.5 EXTERIOR PAINTING SCHEDULE:

A. See owner for colors.

END OF SECTION 09 91 13
SECTION 09 91 23 - INTERIOR PAINTING

PART 1 – GENERAL

1.1 SUMMARY

A. This Section includes surface preparation and the field application of paint systems on interior substrates.

1.2 DESCRIPTION

A. Paint exposed surfaces, except where indicated that surface or material is not to be painted or is to remain natural. Where item or a surface is not specifically indicated, paint the item or surface same as similar adjacent materials or surfaces.

1. Painting includes field painting of items and surfaces completely or partially unfinished under the work requirements specified in other sections and typically requiring painting for protection, identification, or decoration.

   a. Field paint items provided only with factory- or shop surface-preparation, treatment and priming. Touch-up prime coats damaged or otherwise abraded or removed.
   b. Field paint items provided with galvanized and similar corrosion-protective coatings.

2. Painting includes field painting of surfaces of mechanical and electrical equipment that have shop- or factory-applied finishes. Such mechanical and electrical equipment includes but not limited to, the following:

   a. Ventilating diffusers and grilles, including visible, internal surfaces of ductwork.
   b. Panel boards.

3. Painting includes field painting of surfaces of mechanical and electrical equipment that do not have a factory-applied final finish. Such mechanical and electrical equipment includes but not limited to, the following:

   a. Exposed/uncovered and insulated or jacketed pipes and ducts.
   b. Exposed hangers and supports
   c. Exposed conduit.
   d. Exposed junction boxes.

4. Painting includes field painting of surfaces behind or concealed by (permanently or temporarily) fixed equipment, furnishings, and similar items.

B. Unless specifically indicated, do not paint factory- or shop-prefinished items, decorative finished metals, moving and operating parts, and labels, nameplates, and similar identification, including those required by authorities having jurisdiction.
C. Painting excludes surfaces of equipment, fixtures and similar exposed-to-view items in mechanical, electrical, storage and similar unoccupied spaces, unless specifically indicated to be field painted or requires protection from environmental conditions.

1.3 SUBMITTALS

A. Product Data: For each type of product indicated. Include primers and other substrate preparatory materials.
   1. Include manufacturer's technical material and product components listing and instructions for material and product handling, storage, and application.

B. Samples: For each type of paint system and in each color and gloss of topcoat indicated, fully cured and dry, on samples of actual substrates.
   1. Submit Samples on rigid backing, 8 inches (200 mm) square.
   2. Step coats on Samples to show each coat required for system, including substrate preparatory materials. Use actual colors.
   3. Label each coat of each Sample.
   4. Label each Sample for location and application area.

C. Product List: For each product indicated, include the following:
   1. Cross-reference to paint system and locations of application areas. Identify each material by manufacturer's name, product name and number, and substrate types to which applied. Use same designations indicated on Drawings and in schedules.

D. Maintenance Data: Complete listing of coating materials and products. Provide factory batch numbers and formulation codes for finish coating colors.

1.4 QUALITY ASSURANCE

A. Material and Product Qualifications:
   1. Provide manufacturer's premium, highest quality materials and products, factory formulated.
   2. Unless otherwise indicated, provide products of same manufacturer for each coat in a coating system.

B. MPI Standards:
   1. Preparation and Workmanship: Comply with requirements in "MPI Architectural Painting Specification Manual" for products and paint systems indicated.

C. Mockups: Apply benchmark samples of each paint system indicated and each color and finish selected to verify preliminary selections made under sample submittals and to demonstrate aesthetic effects and set quality standards for materials and execution.
   1. Architect will select one surface to represent surfaces and conditions for application of each paint system specified in Part 3.
b. Other Items: Architect will designate items or areas required.

2. Not more than three different finish colors within each mockup may be designated.
3. Prepare substrates and apply coating systems according to requirements specified for final project work. Schedule after permanent lighting has been installed and is completely functional or provide temporary lighting equivalent to final design lighting conditions.
4. Apply benchmark samples after permanent lighting and other environmental services have been activated.
5. Final approval of color selections will be based on benchmark samples.

a. If preliminary color selections are not approved, apply additional benchmark samples of additional colors selected by Architect at no added cost to Owner.

1.5 DELIVERY, STORAGE, AND HANDLING

A. Store materials not in use in tightly covered containers in well-ventilated areas with ambient temperatures continuously maintained at not less than 45 deg F(7 deg C).

1. Maintain containers in clean condition, free of foreign materials and residue.
2. Remove rags and waste from storage areas daily.

1.6 PROJECT CONDITIONS

A. Unless otherwise recommended by coating manufacturer or required for curing of specific coatings, apply paints only when temperature of surfaces to be painted and ambient air temperatures are between 50 and 95 deg F(10 and 35 deg C).

B. Do not apply paints when relative humidity exceeds 85 percent; at temperatures less than 5 deg F(3 deg C) above the dew point; or to damp or wet surfaces.

1.7 EXTRA MATERIALS

A. Furnish extra materials described below that are from same production run (batch mix) as materials applied and that are packaged for storage and identified with labels describing contents.

1. Quantity: Furnish an additional 5 percent, but not less than 1 gal.(3.8 L) of each material and color applied.

PART 2 – PRODUCTS

2.1 MANUFACTURERS

A. Manufacturers: Subject to compliance with requirements, provide products by one of the following:

1. Dunn-Edwards Corporation.
2. Frazee Paint.
3. Vista Paint.
4. Or equal.

INTERIOR PAINT
09 91 23-3
2.2 PAINT, GENERAL

A. Material Compatibility:

1. Provide materials for use within each paint system that are compatible with one another and substrates indicated, under conditions of service and application as demonstrated by manufacturer, based on testing and field experience.
2. For each coat in a paint system, provide products recommended in writing by manufacturers of topcoat for use in paint system and on substrate indicated.

PART 3 – EXECUTION

3.1 EXAMINATION

A. Examine substrates and conditions, with Applicator present, for compliance with requirements for maximum moisture content and other conditions affecting performance of work.

B. Maximum Moisture Content of Substrates: When measured with an electronic moisture meter as follows:

1. Wood: 15 percent.
2. Gypsum Board: 12 percent.

C. Verify suitability of substrates, including surface conditions and compatibility with existing finishes and primers.

D. Begin coating application only after unsatisfactory conditions have been corrected and surfaces are dry.

1. Beginning coating application constitutes Contractor's acceptance of substrates and conditions.

3.2 PREPARATION

A. Comply with manufacturer's written instructions and recommendations in "MPI Architectural Painting Specification Manual" applicable to substrates indicated.

B. Remove plates, machined surfaces, and similar items already in place that are not to be painted. If removal is impractical or impossible because of size or weight of item, provide surface applied protection before surface preparation and painting.

1. After completing painting operations, use workers skilled in the trades involved to reinstall items that were removed. Remove surface-applied protection if any.
2. Do not paint over labels of independent testing agencies or equipment name, identification, performance rating, or nomenclature plates.

C. Clean substrates of substances that could impair bond of paints, including dirt, oil, grease, and incompatible paints and encapsulants.

INTERIOR PAINT

09 91 23-4
1. Remove incompatible primers and reprime substrate with compatible primers as required to produce paint systems indicated.

D. Surfaces with Compatible, Shop- or Factory-Applied Primers: Touch-up abraded and damaged primers. Mechanical-brush and solvent-clean. Apply same primer (whenever possible) product applied in factory or shop or VOC-compliant compatible product.

E. Surfaces with Incompatible, Shop- or Factory-Applied Primers: Apply barrier coat(s) or remove incompatible, shop- or factory-applied primers, (pretreat) and apply primer(s) as specified herein.

F. Surfaces with Shop- or Factory-Applied Finishes: Uniformly abrade (sand) or etch finished surfaces to obtain minimum surface profile recommended by coating manufacturer and ensure increased adhesion of subsequent coatings. Apply barrier coat(s), undercoat(s) and/or pretreat as recommended by coating manufacturer.

G. Ferrous (Steel) Metals: Clean unprimed surfaces; clean pits to bright metal.

   1. For relatively dry, interior locations: SSPC-SP 3.
   2. Subsequent to completion of above procedures, comply with SSPC-SP 1.
   3. Perform specialized cleaning, preparation, pretreatment and similar procedures as appropriate and recommended by coating manufacture for specific type and condition of surfaces.

H. Stainless Steel: SSPC-SP 3 followed by SSPC-SP 1. Additionally, uniformly abrade (sand) using 80 grit silicone carbide paper or abrasive-blast to obtain minimum surface profile recommended by primer manufacturer.

I. Aluminum, Copper, and Galvanized Steel: ASTM D6386 and SSPC- SP 1, as applicable. Additionally, uniformly abrade (sand) or abrasive-blast aluminum and copper to obtain minimum surface profile recommended by primer manufacturer. Remove from galvanized steel, factory- or shop-treatments detrimental to adhesion or application of paint materials and products. Apply pretreatments as recommended by primer manufacturer; apply primer immediately after application of pretreatment as recommended by primer and pretreatment manufacturers.

J. Wood Substrates: Mechanically or chemically clean, as appropriate for wood type, species, and applied finish. Sand exposed surfaces smooth and remove dust and debris.

   1. Test surfaces for moisture content. Prior to application of paint materials and products, remedy surfaces to comply with moisture content recommended in manufacturer's written application instructions. Moisture content not to exceed 15 percent.
   2. Scrape and clean knots, and apply coat of knot sealer before applying primer.
   3. Sand surfaces that will be exposed to view, and dust off.
   4. Prime wood immediately on delivery to project site. Prime edges, ends, faces, undersides, backsides, mortises, cutouts, reveals, and similar surfaces, including surfaces fully- or semi-concealed in the completed installation.
   5. After priming, fill holes and imperfections in the finish surfaces with putty or plastic wood filler. Sand smooth when dried.
K. Gypsum Board Substrates: Patch imperfections with spackle or drywall joint compound, permit to completely dry. Sand smooth. Do not begin paint application until finishing compound is dry and sanded smooth.

L. Other Surfaces and Substrates: As recommended by coating manufacturer for specific surface and substrate types and conditions, and as required to produce intended finish results.

3.3 APPLICATION

A. Apply paints according to manufacturer's written instructions.

B. Apply (and redistribute, as necessary) paint to smooth, uniform appearance, color, texture, and coverage to match samples. Eliminate evidence of laps, runs, sags, holidays, "orangepeel", irregularity in color and texture, application equipment, skid marks, and similar visual imperfections.

1. Use applicators and techniques suited for paint and substrate indicated.
2. Paint surfaces behind movable equipment and furniture same as similar exposed surfaces. Before final installation, paint surfaces behind permanently fixed equipment or furniture with prime coat only.
3. Paint front and backsides of access panels, removable or hinged covers, and similar hinged items to match exposed surfaces.
4. Coat back sides of access panels, removable or hinged covers, and similar hinged items to match exposed surfaces.
5. Paint visible internal surfaces of ductwork flat black to extent visible through ventilating diffusers and grilles.
6. Paint tops and bottoms of doors same as faces and edges.

C. Tint each undercoat a lighter shade to facilitate identification of each coat if multiple coats of same material are to be applied. Tint undercoats to match color of topcoat, but provide sufficient difference in shade of undercoats to distinguish each separate coat.

D. If undercoats or other conditions show through topcoat, apply additional coats until cured film has a uniform paint finish, color, and appearance.

E. Apply paints to produce surface films without cloudiness, spotting, holidays, laps, brush marks, roller tracking, runs, sags, ropiness, or other surface imperfections. Cut in sharp lines and color breaks.

F. Scheduling Painting: Apply first coat immediately after cleaning, pretreatment, and/or other preparation has been performed and before any surface deterioration can occur.

1. Apply successive coats subsequent to complete curing of preceding coat. Sand to smooth, even surface as recommended by manufacturer; sand between successive application of each coat.
2. Delete primer application over surfaces with factory- or shop-applied primer and touchup of primer has been performed.
3. Delete primer application over surfaces with factory- or shop-applied finishes and surface preparation has been performed.
4. Apply additional topcoats until cured paint has uniform finish, color, and appearance, without any show-through of underlying primers or undercoats. Ensure that edges,
corners, crevices, welds, and exposed fasteners receive a dry film thickness equivalent to that of planar surfaces.

G. Minimum Thickness: Apply paint materials within manufacturer's recommended spreading rates and/or wet film thicknesses to achieve manufacturer's recommended minimum dry film thicknesses, for each coat and for total coating system.

3.4 CLEANING AND PROTECTION

A. At end of each workday, remove rubbish, empty cans, rags, and other discarded materials from Project site.

B. After completing paint application, clean spattered surfaces. Remove spattered paints by washing, scraping, or other methods. Do not scratch or damage adjacent finished surfaces.

C. Protect work of other trades against damage from paint application. Correct damage to work of other trades by cleaning, repairing, replacing, and refinishing, as approved by Architect, and leave in an undamaged condition.

D. At completion of construction activities of other trades, touch up and restore damaged or defaced painted surfaces.

3.5 INTERIOR PAINTING SCHEDULE

A. All walls including kitchen and bathrooms shall be Behr Swiss Coffee No. 3012

B. All trim to be Semi Gloss enamel Swiss Coffee No. 3012

C. All other surfaces to be flat paint.

END OF SECTION 09 91 23
SECTION 10 28 16 - BATH ACCESSORIES

PART 1 – GENERAL

1.1 SUMMARY

A. This Section includes the following:

1. Bathroom accessories.

1.2 SUBMITTALS

A. Product Data: For each type of product indicated. Include the following:

1. Construction details and dimensions.
2. Anchoring and mounting requirements, including requirements for cutouts in other work and substrate preparation.
3. Material and finish descriptions.
4. Features that will be included for Project.

B. Product Schedule: Indicating types, quantities, sizes, and installation locations by room of each accessory required.

1. Identify locations using room designations indicated on Drawings.
2. Identify products using designations indicated on Drawings.

1.3 QUALITY ASSURANCE

A. Source Limitations: For products listed together in the same articles in Part 2, provide products of same manufacturer unless otherwise approved by Architect.

1.4 COORDINATION

A. Coordinate accessory locations with other work to prevent interference with clearances required for access by people with disabilities, and for proper installation, adjustment, operation, cleaning, and servicing of accessories.

B. Deliver inserts and anchoring devices set into other construction as required to prevent delaying the Work.

PART 2 – PRODUCTS

2.1 MATERIALS

A. Galvanized Steel Sheet: ASTM A 653/A 653M, with G60(Z180) hot-dip zinc coating.


C. Fasteners: Screws, bolts, and other devices of same material as accessory unit and tamper and theft resistant where exposed, and of galvanized steel where concealed.
2.2 BATHROOM ACCESSORIES

A. Toilet Tissue Holder:

1. Description: Single-roll holder with spring-loaded plastic spindle.
3. Capacity: Designed for 4-1/2- or 5-inch (114- or 127-mm-) diameter tissue rolls.

B. Shower Curtain Rod:

1. Outside Diameter: 1 inch (25.4 mm).

C. Shower Curtain:

1. Size: Minimum 12 inches (305 mm) wider than opening by 72 inches (1828 mm) high.
2. Material: Vinyl, minimum 0.006-inch- (0.15-mm-) thick, opaque, matte.
4. Grommets: Corrosion resistant at minimum 6 inches (152 mm) o.c. through top hem.
5. Shower Curtain Hooks: Chrome-plated or Stainless-steel, spring wire curtain hooks with snap fasteners, sized to accommodate specified curtain rod. Provide one hook per curtain grommet.

D. Toothbrush and Tumbler Holder:

1. Description: Combination toothbrush and tumbler holder; approximately 2-1/4-inch diameter hole for tumbler and not less than 4 holes for toothbrushes.

E. Towel Bar: (adjacent to shower tub)

1. Description: 3/4-inch-(19-mm-) square or round tube with rectangular or circular end brackets.
3. Length: Not less than 18 inches (457 mm).

F. Towel Ring: (adjacent to lavatory/sink)

1. Description: Flanged pin with shaped ring.
2.4 FABRICATION

A. General: Equip units for concealed anchorage and with corrosion-resistant backing plates.

PART 3 – EXECUTION

3.1 INSTALLATION

A. Install accessories according to manufacturers' written instructions, using fasteners appropriate to substrate indicated and recommended by unit manufacturer. Install units level, plumb, and firmly anchored in locations and at heights indicated.

B. Grab Bars: Install to withstand vertical or horizontal load of at least 250 lbf(1112 N), when tested according to method in ASTM F 446.

C. Shower Seats: Install to withstand vertical or horizontal load of at least 250 lbf(1112 N), when tested according to method in ASTM F 446.

3.2 ADJUSTING AND CLEANING

A. Adjust accessories for unencumbered, smooth operation. Replace damaged or defective items.

B. Remove temporary labels and protective coatings.

C. Clean and polish exposed surfaces according to manufacturer's written recommendations.

END OF SECTION 10 28 16
SECTION 32 13 13 - CONCRETE PAVING

PART 1 – GENERAL

1.1 SUMMARY

A. This Section includes exterior cement concrete pavement.

1.2 SUBMITTALS

A. Product Data: For each type of manufactured material and product indicated.

B. Design Mixtures: For each concrete pavement mixture. Include alternate mixture designs when characteristics of materials, Project conditions, weather, test results, or other circumstances warrant adjustments.

C. Qualification Data: For manufacturer.

D. Material Test Reports: From a qualified testing agency indicating and interpreting test results for compliance of the following with requirements indicated, based on comprehensive testing of current materials:

   1. Aggregates. Include service record data indicating absence of deleterious expansion of concrete due to alkali-aggregate reactivity.

E. Material Certificates: Signed by manufacturers certifying that each of the following materials complies with requirements:
   
   1. Cementitious materials.
   2. Steel reinforcement and reinforcement accessories.
   3. Admixtures.
   4. Curing compounds.

F. Minutes of preinstallation conference.

1.3 QUALITY ASSURANCE

A. Manufacturer Qualifications: Manufacturer of ready-mixed concrete products who complies with ASTM C 94/C 94M requirements for production facilities and equipment.

B. Source Limitations: Obtain each type or class of cementitious material of the same brand from the same manufacturer's plant, obtain aggregate from one source, and obtain admixtures through one source from a single manufacturer.


D. Preinstallation Conference: Conduct conference at Project site.

   1. Before submitting design mixtures, review concrete pavement mixture design and examine procedures for ensuring quality of concrete materials and concrete pavement.
construction practices. Require representatives, including the following, of each entity
directly concerned with concrete pavement, to attend conference:

a. Contractor's superintendent.
b. Ready-mix concrete producer.
c. Concrete pavement subcontractor.

PART 2 – PRODUCTS

2.1 FORMS

A. Form Materials: Plywood, metal, metal-framed plywood, or other approved panel-type
materials to provide full-depth, continuous, straight, smooth exposed surfaces.

1. Use flexible or curved forms for curves with a radius 100 feet (30.5 m) or less.

B. Form-Release Agent: Commercially formulated form-release agent that will not bond with,
stain, or adversely affect concrete surfaces and will not impair subsequent treatments of concrete
surfaces.

2.2 STEEL REINFORCEMENT

A. Welded Wire Reinforcement: ASTM A 185, fabricated from as-drawn steel wire into flat
sheets.

B. Reinforcing Bars: ASTM A 615/A 615M, Grade 60 (Grade 420); deformed.

C. Plain Steel Wire: ASTM A 82.

D. Joint Dowel Bars: Plain steel bars, ASTM A 615/A 615M, Grade 60 (Grade 420). Cut bars true
to length with ends square and free of burrs, or proprietary-designed sleeve or plate loadtransfer
systems.

E. Bar Supports: Bolsters, chairs, spacers, and other devices for spacing, supporting, and
fastening reinforcing bars, welded wire reinforcement, and dowels in place. Manufacture bar
supports according to CRSI's "Manual of Standard Practice" from steel wire, plastic, or precast
concrete of greater compressive strength than concrete, and as follows:

1. Equip wire bar supports with sand plates or horizontal runners where base material will
not support chair legs.

2.3 CONCRETE MATERIALS

A. Cementitious Material: Use same type, brand, and source throughout the Project:


B. Normal-Weight Aggregates: ASTM C 33, uniformly graded. Provide aggregates from a single
source with documented service record data of at least 10 years' satisfactory service in similar
pavement applications and service conditions using similar aggregates and cementitious
materials.
C. Water: ASTM C 94/C 94M.

D. Chemical Admixtures: Provide admixtures certified by manufacturer to be compatible with other admixtures and to contain not more than 0.1 percent water-soluble chloride ions by mass of cementitious material.

   1. Water-Reducing Admixture: ASTM C 494/C 494M, Type A.
   2. Retarding Admixture: ASTM C 494/C 494M, Type B.
   3. Water-Reducing and Retarding Admixture: ASTM C 494/C 494M, Type D.
   4. High-Range, Water-Reducing Admixture: ASTM C 494/C 494M, Type F.
   5. High-Range, Water-Reducing and Retarding Admixture: ASTM C 494/C 494M, Type G.
   6. Plasticizing and Retarding Admixture: ASTM C 1017/C 1017M, Type II.

2.4 CURING MATERIALS

A. Absorptive Cover: AASHTO M 182, Class 2, burlap cloth made from jute or kenaf, weighing approximately 9 oz./sq. yd. (305 g/sq. m) dry.

B. Moisture-Retaining Cover: ASTM C 171, polyethylene film or white burlap-polyethylene sheet.

C. Water: Potable.

D. Evaporation Retarder: Waterborne, monomolecular film forming; manufactured for application to fresh concrete.

E. Clear Waterborne Membrane-Forming Curing Compound: ASTM C 309, Type 1, Class B. dissipating.

2.5 RELATED MATERIALS


B. Color Pigment: ASTM C 979, synthetic mineral-oxide pigments or colored water-reducing admixtures; color stable, free of carbon black, nonfading, and resistant to lime and other alkalis.

C. Bonding Agent: ASTM C 1059, Type II, non-redispersible, acrylic emulsion or styrene butadiene.

2.6 CONCRETE MIXTURES

A. Prepare design mixtures, proportioned according to ACI 301, for each type and strength of normal-weight concrete determined by either laboratory trial mixes or field experience.

   1. Use a qualified independent testing agency for preparing and reporting proposed concrete mixture designs.

B. Proportion mixtures to provide normal-weight concrete with the following properties:
2. Maximum Water-Cementitious Materials Ratio at Point of Placement: Unless otherwise indicated, 0.50.
3. Slump Limit: Unless otherwise indicated, 8 inches (200 mm) for concrete with verified slump of 2 to 4 inches (50 to 100 mm) before adding high-range water-reducing admixture or plasticizing admixture, plus or minus 1 inch (25 mm).

C. Chemical Admixtures: Use admixtures according to manufacturer's written instructions.

1. Use water-reducing admixture high-range, water-reducing admixture high-range, water reducing and retarding admixture or plasticizing and retarding admixture in concrete, as required, for placement and workability.

D. Color Pigment: Add color pigment to concrete mixture according to manufacturer's written instructions and to result in consistent hardened concrete color.

2.7 CONCRETE MIXING

A. Ready-Mixed Concrete: Measure, batch, and mix concrete materials and concrete according to ASTM C 94/C 94M. Furnish batch certificates for each batch discharged and used in the Work.

1. When air temperature is between 85 deg F (30 deg C) and 90 deg F (32 deg C), reduce mixing and delivery time from 1-1/2 hours to 75 minutes; when air temperature is above 90 deg F (32 deg C), reduce mixing and delivery time to 60 minutes.

PART 3 – EXECUTION

3.1 EXAMINATION

A. Examine exposed subgrades and subbase surfaces for compliance with requirements for dimensional, grading, and elevation tolerances.

B. Proof-roll prepared subbase surface below concrete pavements with heavy pneumatic-tired equipment (or equivalent methods) to identify soft pockets and areas of excess yielding.

1. Completely proof-roll subbase in one direction and repeat in perpendicular direction.
2. Subbase with soft spots and areas of pumping or rutting exceeding depth of 1/2 inch (13 mm) require excavation and recompaction as follows:
   a. Excavate to firm, unyielding, compacted material.
   b. Backfill with excavated material and compact to density not less than that of surrounding, adjacent subgrades.

C. Proceed with concrete pavement operations only after nonconforming conditions have been corrected and subgrade is ready to receive pavement.

3.2 PREPARATION

A. Remove loose material from compacted subbase surface immediately before placing concrete.

3.3 EDGE FORMS AND SCREED CONSTRUCTION
A. Set, brace, and secure edge forms, and intermediate screed guides for pavement to required lines, grades, and elevations. Install forms to allow continuous progress of work and so forms can remain in place at least 24 hours after concrete placement.

B. Clean forms after each use and coat with form-release agent to ensure separation from concrete without damage.

3.4 STEEL REINFORCEMENT

A. General: Comply with CRSI's "Manual of Standard Practice" for fabricating, placing, and supporting reinforcement.

B. Clean reinforcement of loose rust and mill scale, earth, ice, or other bond-reducing materials.

C. Arrange, space, and securely tie bars and bar supports to hold reinforcement in position during concrete placement. Maintain minimum cover to reinforcement.

D. Install welded wire reinforcement in lengths as long as practicable. Lap adjoining pieces at least one full mesh, and lace splices with wire. Offset laps of adjoining widths to prevent continuous laps in either direction.

3.5 JOINTS

A. General: Form construction, isolation, and contraction joints and tool edgings true to line with faces perpendicular to surface plane of concrete. Construct transverse joints at right angles to centerline, unless otherwise indicated.

1. When joining existing pavement, place transverse joints to align with previously placed joints, unless otherwise indicated.

B. Construction Joints: Set construction joints at terminations of pavement and at locations where pavement operations are stopped for more than one-half hour unless pavement terminates at isolation joints.

1. Do not continue reinforcement through construction joints, unless otherwise indicated.

2. Load-Transfer (Doweled) Joints: Install dowel bars and support assemblies or proprietary load-transfer joints assemblies/systems at joints. Lubricate or asphalt-coat one-half of dowel length and proprietary assemblies/systems (when recommended by manufacturer) to prevent concrete bonding to one side of joint.

C. Isolation Joints: Form isolation joints of preformed joint-filler strips abutting concrete curbs, catch basins, manholes, inlets, structures, walks, and other fixed objects.

1. Locate expansion joints at intervals of 50 feet (15.25 m), unless otherwise indicated.

2. Extend joint fillers full width and depth of joint.

3. Terminate joint filler not less than 1/2 inch (13 mm) or more than 1 inch (25 mm) below finished surface if joint sealant is indicated.

4. Place top of joint filler flush with finished concrete surface if joint sealant is not indicated.
5. Furnish joint fillers in one-piece lengths. Where more than one length is required, lace or clip joint-filler sections together.

6. Protect top edge of joint filler during concrete placement with metal, plastic, or other temporary preformed cap. Remove protective cap after concrete has been placed on both sides of joint.

D. Contraction Joints: Form weakened-plane contraction joints, sectioning concrete into areas as indicated. Construct contraction joints for a depth equal to at least one-fourth of the concrete thickness, by either of the following methods:

1. Grooved Joints: Form contraction joints after initial floating by grooving and finishing each edge of joint with grooving tool to a 1/4-inch (6-mm) radius. Repeat grooving of contraction joints after applying surface finishes. Eliminate groover marks on concrete surfaces.

2. Sawed Joints: Form contraction joints with power saws equipped with shatterproof abrasive or diamond-rimmed blades. Cut 1/8-inch (3-mm) wide joints into concrete when cutting action will not tear, abrade, or otherwise damage surface and before developing random contraction cracks.

E. Edging: Tool edges of pavement, curbs, and joints in concrete after initial floating with an edging tool to a 1/4-inch (6-mm) radius, unless otherwise indicated. Repeat tooling of edges after applying surface finishes. Eliminate tool marks on concrete surfaces.

3.6 CONCRETE PLACEMENT

A. Inspection: Before placing concrete, inspect and complete formwork installation, steel reinforcement, and items to be embedded or cast in. Notify other trades to permit installation of their work.

B. Remove snow, ice, or frost from subbase surface and reinforcement before placing concrete. Do not place concrete on frozen surfaces.

C. Moisten subbase to provide a uniform dampened condition at time concrete is placed. Do not place concrete around manholes or other structures until they are at required finish elevation and alignment.

D. Comply with ACI 301 requirements for measuring, mixing, transporting, and placing concrete.

E. Do not add water to concrete during delivery or at Project site.

F. Do not add water to fresh concrete after testing.

G. Deposit and spread concrete in a continuous operation between transverse joints. Do not push or drag concrete into place or use vibrators to move concrete into place.

H. Consolidate concrete according to ACI 301 by mechanical vibrating equipment supplemented by hand spading, rodding, or tamping.

1. Consolidate concrete along face of forms and adjacent to transverse joints with an internal vibrator. Keep vibrator away from joint assemblies, reinforcement, or side forms.
Use only square-faced shovels for hand spreading and consolidation. Consolidate with care to prevent dislocating reinforcement, dowels, and joint devices.

I. Screed pavement surfaces with a straightedge and strike off.

J. Commence initial floating using bull floats or darbies to impart an open textured and uniform surface plane before excess moisture or bleed water appears on the surface. Do not further disturb concrete surfaces before beginning finishing operations or spreading surface treatments.

K. Where pavement is placed in separate pours, do not operate equipment on concrete until pavement has attained 85 percent of its 28-day compressive strength.

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

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

3.7 FLOAT FINISHING

A. General: Do not add water to concrete surfaces during finishing operations.

B. Float Finish: Begin the second floating operation when bleed-water sheen has disappeared and concrete surface has stiffened sufficiently to permit operations. Float surface with power-driven floats, or by hand floating if area is small or inaccessible to power units. Finish surfaces to true planes. Cut down high spots and fill low spots. Refloat surface immediately to uniform granular texture.

1. Medium-to-Fine-Textured Broom Finish: Draw a soft bristle broom across float-finished concrete surface perpendicular to line of traffic to provide a uniform, fine-line texture.

3.8 CONCRETE PROTECTION AND CURING

A. General: Protect freshly placed concrete from premature drying and excessive cold or hot temperatures.

B. Comply with ACI 306.1 for cold-weather protection.

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

D. Begin curing after finishing concrete but not before free water has disappeared from concrete surface.

E. Curing Methods: Cure concrete by moisture curing, moisture-retaining-cover curing, curing compound, or a combination of these as follows:

1. Moist Curing: Keep surfaces continuously moist for not less than seven days with the following materials:
a. Water.
b. Continuous water-fog spray.
c. Absorptive cover, water saturated and kept continuously wet. Cover concrete surfaces and edges with 12-inch (300-mm) lap over adjacent absorptive covers.

2. Moisture-Retaining-Cover Curing: Cover concrete surfaces with moisture-retaining cover for curing concrete, placed in widest practicable width, with sides and ends lapped at least 12 inches (300 mm), and sealed by waterproof tape or adhesive. Immediately repair any holes or tears during curing period using cover material and waterproof tape.

3. Curing Compound: Apply uniformly in continuous operation by power spray or roller according to manufacturer’s written instructions. Recoat areas subjected to heavy rainfall within three hours after initial application. Maintain continuity of coating and repair damage during curing period.

3.9 PAVEMENT TOLERANCES

A. Comply with tolerances of ACI 117.

3.10 REPAIRS AND PROTECTION

A. Remove and replace concrete pavement that is broken, damaged, or defective or that does not comply with requirements in this Section.

B. Protect concrete from damage. Exclude traffic from pavement for at least 14 days after placement. When construction traffic is permitted, maintain pavement as clean as possible by removing surface stains and spillage of materials as they occur.

C. Maintain concrete pavement free of stains, discoloration, dirt, and other foreign material. Sweep concrete pavement not more than two days before date scheduled for Substantial Completion inspections.

END OF SECTION 32 13 13
SECTION 22-41-00 - FIXTURES

PART 1 – GENERAL

1.1 SUMMARY

A. This Section includes the following:

   1. Bathroom fixtures
   2. Kitchen fixtures

1.2 SUBMITTALS

A. Product Data: For each type of product indicated. Include the following:

   1. Construction details and dimensions.
   2. Anchoring and mounting requirements, including requirements for cutouts in other work and substrate preparation.
   3. Material and finish descriptions.
   4. Features the will be included for Project.

B. Product Schedule: Indicating types, quantities, sized, and installation locations by room of each accessory required.

   1. Identify locations using room designations indicated on Drawings.
   2. Identify products using designations indicated on Drawings.

1.3 QUALITY ASSURANCE

A. Source Limitations: For products listed together in the same articles in Part 2, provide products of same manufacturer unless otherwise approved by Architect.

1.4 COORDINATION

A. Coordinate accessory locations with other work to prevent interference with clearances required for access by people with disabilities, and for proper installation, adjustment, operation, cleaning, and servicing of accessories.

B. Deliver inserts and anchoring devices set into other construction as required to prevent delaying the Work.

PART 2 – PRODUCTS

2.1 BATHROOM FIXTURES

A. Toilet:

   1. Product:

      a. Kohler Co. Kelston comfort Height.; Model K-11459
      b. Or equal.
B. Lavatory:

1. Product:

   a. Kohler Co. Radiant self-rimming lavatory; Model K-2917-1L.
   b. American Standard Colony Round Countertop Sink; Model 3003.605.
   c. Or equal.

C. Bathtub:

1. Product:

   a. Kohler Co. Veracruz One-Piece and shower module; Model K-1585.
   b. Or equal.

D. Hardware

1. Trim Kit

   a. American Standard Colony Trim Kit, Model T375.120
   b. Or equal

2. Bath Waste

   a. Dearborn Brass Bath Waste, Model 228-3

3. Faucet

   a. Kohler Co Coralais Lavatory Faucet, Model K – 15182 - P
   b. American Standard Colony Soft Lavatory Faucet, Model 2175.500
   c. Or equal

2.1 KITCHEN FIXTURES

A. Kitchen Sink

1. Product

   c. Or equal.

B. Hardware

1. Garbage Disposal

   a. In-sink-erator, Badger 5
   b. Or equal.

2. Faucet
a. Kohler Co. Coralais Pullout spray Kitchen Faucet; Model 15160 - G.
c. Or equal.

C. Appliances

1. Microwave
   a. Product
      1) GE Over - the - Range Microwave Oven; Model HVM1750SMSS.
      2) Maytag Over – the - Range Microwave Oven; Model MMV4205BAS.
      3) Or equal.

2. Range
   a. Product
      1) GE Profile Free-standing Gas Range; Model PGB928TEMWW.
      2) Maytag Free-standing Gas Range; Model MGR4452BDW.
      3) Or equal.

3. Dishwasher
   a. Product
      1) GE Build-in Dishwasher; Model GHDA480NWW.
      2) Maytag Built-in Dishwasher; Model MDBH945AWW.
      3) Or equal.

PART 3 – EXECUTION

3.1 INSTALLATION

A. Install accessories according to manufacturers' written instructions, using fasteners appropriate
to substrate indicated and recommended by unit manufacturer. Install units level, plumb, and
firmly anchored in locations and at heights indicated.

3.2 ADJUSTING AND CLEANING

A. Adjust accessories for unencumbered, smooth operation. Replace damaged or defective items.

B. Remove temporary labels and protective coatings.

C. Clean and polish exposed surfaces according to manufacturer's written recommendations.

END OF SECTION
SECTION – CABINETS

PART 1 – GENERAL

1.1 SUMMARY

A. This Section includes the following:

1. Base Cabinets
2. Wall Cabinets

1.2 SUBMITTALS

A. Product Data: For each type of product indicated. Include the following:

1. Construction details and dimensions.
2. Anchoring and mounting requirements, including requirements for cutouts in other work and substrate preparation.
3. Material and finish descriptions.
4. Features the will be included for Project.

B. Product Schedule: Indicating types, quantities, sized, and installation locations by room of each accessory required.

1. Identify locations using room designations indicated on Drawings.
2. Identify products using designations indicated on Drawings.

1.3 QUALITY ASSURANCE

A. Source Limitations: For products listed together in the same articles in Part 2, provide products of same manufacturer unless otherwise approved by Architect.

1.4 COORDINATION

A. Coordinate accessory locations with other work to prevent interference with clearances required for access by people with disabilities, and for proper installation, adjustment, operation, cleaning, and servicing of accessories.

B. Deliver inserts and anchoring devices set into other construction as required to prevent delaying the Work.

PART 2 – PRODUCTS

2.1 KITCHEN CABINETS

A. Base Cabinet:

1. Product:
   a. Kraftmaid Brand Cabinets

   1) Base Double Door; B27BUTT
2) Sink Base, SB36  
3) Dishwasher Base, BDW272446  
4) Base Pull-out, Bpp9  
5) Corner Base, LSA36  
6) Base Single Door, B15  

b. Or equal.

B. Wall Cabinets:

1. Product

   a. Kraftmaid Brand Cabinets

      1) Wall Single Door, W2424  
      2) Wall Single Door, W1824  
      3) Wall Corner Cabinet, WA2436  
      4) Wall Double Door, W2424BUTT  
      5) Wall Cabinet (short), W3615

2.2 BATHROOM CABINETS

   A. Base Cabinet

      1. Product

         a. Kraftmaid Brand Cabinets

            1) Vanity Cabinet (two door, two drawer), VSB36

PART 3 – EXECUTION

3.1 INSTALLATION

A. Install accessories according to manufacturers' written instructions, using fasteners appropriate to substrate indicated and recommended by unit manufacturer. Install units level, plumb, and firmly anchored in locations and at heights indicated.

3.2 ADJUSTING AND CLEANING

A. Adjust accessories for unencumbered, smooth operation. Replace damaged or defective items.

B. Remove temporary labels and protective coatings.

C. Clean and polish exposed surfaces according to manufacturer's written recommendations.

END OF SECTION