SECTION 061000 - ROUGH CARPENTRY

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

A. Section Includes:

1. Wood blocking, cants, and nailers.
2. Plywood backing panels.

1.3 DEFINITIONS

A. Lumber grading agencies, and the abbreviations used to reference them, include the following:

1. NLGA: National Lumber Grades Authority.

1.4 DELIVERY, STORAGE, AND HANDLING

A. Stack lumber flat with spacers beneath and between each bundle to provide air circulation. Protect lumber from weather by covering with waterproof sheeting, securely anchored. Provide for air circulation around stacks and under coverings.

PART 2 - PRODUCTS

2.1 WOOD PRODUCTS, GENERAL

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

1. Factory mark each piece of lumber with grade stamp of grading agency.
2. Where nominal sizes are indicated, provide actual sizes required by DOC PS 20 for moisture content specified. Where actual sizes are indicated, they are minimum dressed sizes for dry lumber.
3. Provide dressed lumber, S4S, unless otherwise indicated.

B. Maximum Moisture Content of Lumber: 19 percent unless otherwise indicated.

2.2 FIRE-RETARDANT-TREATED MATERIALS

A. General: Where fire-retardant-treated materials are indicated, use materials complying with requirements in this article, that are acceptable to authorities having jurisdiction, and with fire-test-response characteristics specified as determined by testing identical products per test method indicated by a qualified testing agency.

B. Fire-Retardant-Treated Lumber and Plywood by Pressure Process: Products with a flame spread index of 25 or less when tested according to ASTM E 84, and with no evidence of significant progressive combustion when the test is extended an additional 20 minutes, and with the flame front not extending more than 10.5 feet beyond the centerline of the burners at any time during the test.

1. Use treatment that does not promote corrosion of metal fasteners.
2. Exterior Type: Treated materials shall comply with requirements specified above for fire-retardant-treated lumber and plywood by pressure process after being subjected to accelerated weathering according to ASTM D 2898. Use for exterior locations and where indicated.
3. Interior Type A: Treated materials shall have a moisture content of 28 percent or less when tested according to ASTM D 3201 at 92 percent relative humidity. Use where exterior type is not indicated.
4. Design Value Adjustment Factors: Treated lumber shall be tested according ASTM D 5664 and design value adjustment factors shall be calculated according to ASTM D 6841.

C. Kiln-dry lumber after treatment to a maximum moisture content of 19 percent.

D. Identify fire-retardant-treated wood with appropriate classification marking of qualified testing agency.

E. Application: Treat items indicated on Drawings, and the following:

1. Concealed blocking.
2. Plywood backing panels.

2.3 MISCELLANEOUS LUMBER

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

1. Blocking.
2. Nailers.

B. For items of dimension lumber size, provide Construction or No. 2 grade lumber of any species.

C. For concealed boards, provide lumber with 19 percent maximum moisture content and any of the following species and grades:

1. Northern species; No. 2 Common grade; NLGA.

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

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

2.4 PLYWOOD BACKING PANELS

A. Equipment Backing Panels: DOC PS 1, Exposure 1, C-D Plugged, fire-retardant treated, in thickness indicated or, if not indicated, not less than 3/4-inch nominal thickness.

2.5 FASTENERS

A. General: Provide fasteners of size and type indicated that comply with requirements specified in this article for material and manufacture.

1. Where rough carpentry is exposed to weather, in ground contact, pressure-preservative treated, or in area of high relative humidity, provide fasteners with hot-dip zinc coating complying with ASTM A 153/A 153M.

B. Nails, Brads, and Staples: ASTM F 1667.

C. Power-Driven Fasteners: NES NER-272.

D. Wood Screws: ASME B18.6.1.

E. Lag Bolts: ASME B18.2.1 .

F. Bolts: Steel bolts complying with ASTM A 307, Grade A; with ASTM A 563 hex nuts and, where indicated, flat washers.

PART 3 - EXECUTION

3.1 INSTALLATION, GENERAL

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

B. Securely attach rough carpentry work to substrate by anchoring and fastening as indicated.

END OF SECTION 061000

SECTION 061053 - MISCELLANEOUS ROUGH CARPENTRY

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

A. Section Includes:

1. Framing with dimension lumber.
2. Wood blocking and nailers.
3. Wood grounds.
4. Wood sleepers.
5. Plywood backing panels.

B. Related Requirements:

1. Division 06 Section "Sheathing."
2. Division 06 finish carpentry Sections for nonstructural carpentry items exposed to view and not specified in another Section.

1.3 DEFINITIONS

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

B. Lumber grading agencies, and the abbreviations used to reference them, include the following:

1. NeLMA: Northeastern Lumber Manufacturers' Association.
2. NHLA: National Hardwood Lumber Association.
3. NLGA: National Lumber Grades Authority.
4. SPIB: The Southern Pine Inspection Bureau.
5. WCLIB: West Coast Lumber Inspection Bureau.
6. WWPA: Western Wood Products Association.

1.4 ACTION SUBMITTALS

A. Product Data: For each type of process and factory-fabricated product. Indicate component materials and dimensions and include construction and application details.
1. Include data for wood-preservative treatment from chemical treatment manufacturer and certification by treating plant that treated materials comply with requirements. Indicate type of preservative used and net amount of preservative retained.
2. Include data for fire-retardant treatment from chemical treatment manufacturer and certification by treating plant that treated materials comply with requirements. Include physical properties of treated materials based on testing by a qualified independent testing agency.
3. For fire-retardant treatments, include physical properties of treated lumber both before and after exposure to elevated temperatures, based on testing by a qualified independent testing agency according to ASTM D 5664.
4. For products receiving a waterborne treatment, include statement that moisture content of treated materials was reduced to levels specified before shipment to Project site.
5. Include copies of warranties from chemical treatment manufacturers for each type of treatment.

1.5 INFORMATIONAL SUBMITTALS

A. Evaluation Reports: For the following, from ICC-ES:

1. Preservative-treated wood.
2. Fire-retardant-treated wood.
3. Power-driven fasteners.

4. Powder-actuated fasteners.
5. Expansion anchors.
6. Metal framing anchors.

1.6 QUALITY ASSURANCE

A. Testing Agency Qualifications: For testing agency providing classification marking for fire-retardant treated material, an inspection agency acceptable to authorities having jurisdiction that periodically performs inspections to verify that the material bearing the classification marking is representative of the material tested.

1.7 DELIVERY, STORAGE, AND HANDLING

A. Stack lumber flat with spacers beneath and between each bundle to provide air circulation. Protect lumber from weather by covering with waterproof sheeting, securely anchored. Provide for air circulation around stacks and under coverings.

PART 2 - PRODUCTS

2.1 WOOD PRODUCTS, GENERAL

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

1. Factory mark each piece of lumber with grade stamp of grading agency.
2. For exposed lumber indicated to receive a stained or natural finish, mark grade stamp on end or back of each piece or omit grade stamp and provide certificates of grade compliance issued by grading agency.
3. Where nominal sizes are indicated, provide actual sizes required by DOC PS 20 for moisture content specified. Where actual sizes are indicated, they are minimum dressed sizes for dry lumber.
4. Provide dressed lumber, S4S, unless otherwise indicated.

B. Maximum Moisture Content of Lumber: 15 percent unless otherwise indicated.

2.2 WOOD-PRESERVATIVE-TREATED MATERIALS

A. Preservative Treatment by Pressure Process: AWPA U1; Use Category UC2 for interior construction not in contact with the ground, Use Category UC3b for exterior construction not in contact with the ground, and Use Category UC4a for items in contact with the ground.

1. Preservative Chemicals: Acceptable to authorities having jurisdiction and containing no arsenic or chromium. Do not use inorganic boron (SBX) for sill plates.

B. Kiln-dry lumber after treatment to a maximum moisture content of 19 percent. Do not use material that is warped or does not comply with requirements for untreated material.

C. Mark lumber with treatment quality mark of an inspection agency approved by the ALSC Board of Review.

D. Application: Treat items indicated on Drawings, and the following:

1. Wood cants, nailers, curbs, equipment support bases, blocking, stripping, and similar members in connection with roofing, flashing, vapor barriers, and waterproofing.
2. Wood sills, sleepers, blocking, and similar concealed members in contact with masonry or concrete.

2.3 FIRE-RETARDANT-TREATED MATERIALS

A. General: Where fire-retardant-treated materials are indicated, use materials complying with requirements in this article, that are acceptable to authorities having jurisdiction, and with fire-

test-response characteristics specified as determined by testing identical products per test method indicated by a qualified testing agency.

B. Fire-Retardant-Treated Lumber and Plywood by Pressure Process: Products with a flame spread index of 25 or less when tested according to ASTM E 84, and with no evidence of significant progressive combustion when the test is extended an additional 20 minutes, and with the flame front not extending more than 10.5 feet (3.2 m) beyond the centerline of the burners at any time during the test.
   1. Use treatment that does not promote corrosion of metal fasteners.
   2. Exterior Type: Treated materials shall comply with requirements specified above for fire-retardant-treated lumber and plywood by pressure process after being subjected to accelerated weathering according to ASTM D 2898. Use for exterior locations and where indicated.

C. Kiln-dry lumber after treatment to a maximum moisture content of 19 percent. Kiln-dry plywood after treatment to a maximum moisture content of 15 percent.

D. Identify fire-retardant-treated wood with appropriate classification marking of testing and inspecting agency acceptable to authorities having jurisdiction.

E. Application: Treat items indicated on Drawings, and the following:

   1. Concealed blocking.
   2. Plywood backing panels.

2.4 DIMENSION LUMBER FRAMING

A. Non-Load-Bearing Interior Partitions: Construction or No. 2 grade and any of the following species:

   1. Hem-fir (north); NLGA.
   2. Mixed southern pine; SPIB.
   3. Northern species; NLGA.

B. Other Framing: Construction or No. 2 grade and any of the following species:

   1. Hem-fir (north); NLGA.
   2. Mixed southern pine; SPIB.
   3. Spruce-pine-fir (south); NeLMA, WCLIB, or WWPA.

2.5 MISCELLANEOUS LUMBER

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

   1. Blocking.
   2. Nailers.
   3. Furring.
   4. Grounds.

B. For items of dimension lumber size, provide Construction or No. 2 grade lumber and any of the following species:

   1. Hem-fir (north); NLGA.
   2. Mixed southern pine; SPIB.
   3. Northern species; NLGA.
   4. Eastern softwoods; NeLMA.

C. For concealed boards, provide lumber with 15 percent maximum moisture content and any of ]the following species and grades:

   1. Mixed southern pine, No. 2 grade; SPIB.
   2. Hem-fir or hem-fir (north), Construction or No. 2 Common grade; NLGA, WCLIB, or WWPA.

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

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

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

2.6 PLYWOOD BACKING PANELS

A. Equipment Backing Panels: DOC PS 1, Exposure 1, C-D Plugged in thickness indicated or, if not indicated, not less than 1/2-inch (13-mm) nominal thickness.

2.7 FASTENERS

A. General: Provide fasteners of size and type indicated that comply with requirements specified in this article for material and manufacture.

1. Where carpentry is exposed to weather, in ground contact, pressure-preservative treated, or in area of high relative humidity, provide fasteners with hot-dip zinc coating complying with ASTM A 153/A 153M.

B. Nails, Brads, and Staples: ASTM F 1667.

C. Power-Driven Fasteners: NES NER-272.

D. Wood Screws: ASME B18.6.1.

E. Screws for Fastening to Metal Framing: ASTM C 1002, length as recommended by screw manufacturer for material being fastened.

F. Lag Bolts: ASME B18.2.1 (ASME B18.2.3.8M).

G. Bolts: Steel bolts complying with ASTM A 307, Grade A (ASTM F 568M, Property Class 4.6); with ASTM A 563 (ASTM A 563M) hex nuts and, where indicated, flat washers.

H. Expansion Anchors: Anchor bolt and sleeve assembly of material indicated below with capability to sustain, without failure, a load equal to 6 times the load imposed when installed in unit masonry assemblies and equal to 4 times the load imposed when installed in concrete as determined by testing per ASTM E 488 conducted by a qualified independent testing and inspecting agency.

1. Material: Carbon-steel components, zinc plated to comply with ASTM B 633, Class Fe/Zn 5.
2. Material: Stainless steel with bolts and nuts complying with ASTM F 593 and ASTM F 594, Alloy Group 1 or 2 (ASTM F 738M and ASTM F 836M, Grade A1 or A4).

2.8 METAL FRAMING ANCHORS

A. Basis-of-Design Product: Subject to compliance with requirements, provide product indicated on Drawings or comparable product by one of the following:

1. Cleveland Steel Specialty Co.
2. Simpson Strong-Tie Co., Inc.
3. USP Structural Connectors.

B. Galvanized-Steel Sheet: Hot-dip, zinc-coated steel sheet complying with ASTM A 653/A 653M, G60 (Z180) coating designation.

1. Use for interior locations unless otherwise indicated.

2.9 MISCELLANEOUS MATERIALS

A. Flexible Flashing: Composite, self-adhesive, flashing product consisting of a pliable, butyl rubber or rubberized-asphalt compound, bonded to a high-density polyethylene film, aluminum foil, or spunbonded polyolefin to produce an overall thickness of not less than 0.025 inch (0.6 mm).

PART 3 - EXECUTION

3.1 INSTALLATION, GENERAL

A. Set carpentry to required levels and lines, with members plumb, true to line, cut, and fitted. Fit carpentry to other construction; scribe and cope as needed for accurate fit. Locate nailers, blocking, grounds**,** and similar supports to comply with requirements for attaching other construction.

B. Where wood-preservative-treated lumber is installed adjacent to metal decking, install continuous flexible flashing separator between wood and metal decking.

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

D. Install plywood backing panels by fastening to studs; coordinate locations with utilities requiring backing panels. Metal Framing Anchors: Install metal framing anchors to comply with manufacturer's written instructions. Install fasteners through each fastener hole.

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

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

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

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

H. Provide fire blocking in furred spaces, stud spaces, and other concealed cavities as indicated and as follows:

1. Fire block furred spaces of walls, at each floor level, at ceiling, and at not more than 96 inches (2438 mm) o.c. with solid wood blocking or noncombustible materials accurately fitted to close furred spaces.
2. Fire block concealed spaces of wood-framed walls and partitions at each floor level, at ceiling line of top story, and at not more than 96 inches (2438 mm) o.c. Where fire blocking is not inherent in framing system used, provide closely fitted solid wood blocks of same width as framing members and 2-inch nominal (38-mm actual) thickness.
3. Fire block concealed spaces between floor sleepers with same material as sleepers to limit concealed spaces to not more than 100 sq. ft. (9.3 sq. m) and to solidly fill space below partitions.
4. Fire block concealed spaces behind combustible cornices and exterior trim at not more than 20 feet (6 m) o.c.

I. Sort and select lumber so that natural characteristics will not interfere with installation or with fastening other materials to lumber. Do not use materials with defects that interfere with function of member or pieces that are too small to use with minimum number of joints or optimum joint arrangement.

J. Comply with AWPA M4 for applying field treatment to cut surfaces of preservative-treated lumber.

1. Use inorganic boron for items that are continuously protected from liquid water.

2. Use copper naphthenate for items not continuously protected from liquid water.

K. Securely attach carpentry work to substrate by anchoring and fastening as indicated, complying with the following:

1. NES NER-272 for power-driven fasteners.
2. Table 2304.9.1, "Fastening Schedule," in ICC's International Building Code.
3. Table R602.3(1), "Fastener Schedule for Structural Members," and Table R602.3(2), "Alternate Attachments," in ICC's International Residential Code for One- and Two-Family Dwellings.

L. Use steel common nails unless otherwise indicated. Select fasteners of size that will not fully penetrate members where opposite side will be exposed to view or will receive finish materials. Make tight connections between members. Install fasteners without splitting wood. Drive nails snug but do not countersink nail heads unless otherwise indicated.

## 3.2 WOOD GROUND, BLOCKING, AND NAILER INSTALLATION

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

B. Attach items to substrates to support applied loading. Recess bolts and nuts flush with surfaces unless otherwise indicated.

## 3.3 PROTECTION

A. Protect wood that has been treated with inorganic boron (SBX) from weather. If, despite protection, inorganic boron-treated wood becomes wet, apply EPA-registered borate treatment. Apply borate solution by spraying to comply with EPA-registered label.

B. Protect miscellaneous rough carpentry from weather. If, despite protection, miscellaneous rough carpentry becomes wet, apply EPA-registered borate treatment. Apply borate solution by spraying to comply with EPA-registered label.

END OF SECTION 061053

A. Delivery and Storage: Stack lumber flat with spacers beneath and between each bundle to provide air circulation. Protect lumber from weather by covering with waterproof sheeting, securely anchored. Provide for air circulation around stacks and under coverings.

B. DIMENSION LUMBER FRAMING: Construction or No. 2 grade and any of the following species:
   - Hem-fir (north); NLGA.
   - Mixed southern pine; SPIB
   - Northern species; NLGA.

C. EQUIPMENT BACKING PANELS: Plywood at ¾" thickness min.

**END OF SECTION**

**SUBMITTALS**

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

**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 architectural woodwork can be supported and installed as indicated.

**FABRICATORS**

A. Available Fabricators: Subject to compliance with requirements, fabricators offering interior architectural woodwork that may be incorporated into the Work include, but are not limited to, the following:
   1. Pine Valley
   2. JMJ
   3. Malony
   4. Creative Surfaces

**PLASTIC LAMINATE CABINETS**

A. Grade: Custom.
B. Cabinet Construction: Flush overlay.
C. Reveal Dimension: 1/4 inch.
D. Materials
   a. Plastic Laminate: Color and Pattern: Reference Finish Plans

**CABINET HARDWARE AND ACCESSORIES**

A. Frameless Concealed Hinges (European Type): BHMA A156.9, B01602, 135 degrees of opening, self-closing.
B. Wire Pulls: Back mounted, solid metal, 4 inches (100 mm) long, 5/16 inch (8 mm) in diameter.
   a. All locations
C. Catches: Magnetic catches, BHMA A156.9, B03141.
D. Adjustable Shelves: Knape & Vogt, 82 series heavy –duty with 182 series heavy-duty designer brackets.
E. Shelf Rests: BHMA A156.9, B04013; metal.
F. Drawer Slides BHMA A156.9, B05091:
   a. Box Drawer Slides: Grade 1; for drawers not more than 6 inches (150 mm) high and 24 inches (600 mm) wide.
   b. File Drawer Slides: Grade 1HD-100; for drawers more than 6 inches (150 mm) high or 24 inches (600 mm) wide.
G. Door Locks: BHMA A156.11, E07121
   a. All sink bases
H. Grommets for Cable Passage through Countertops: 2-inch (51-mm) OD, molded-plastic grommets and matching plastic caps with slot for wire passage.

**PLASTIC LAMINATE COUNTERTOPS**

A. Grade: Custom
B. Materials:
   a. Plastic Laminate: Color and Pattern: Reference Finish Plans

**SOLID-SURFACING-MATERIAL**

A. Grade: Custom
B. Solid-Surfacing-Material Thickness: 1/2 inch
C. Install integral sink bowls in countertops in shop.
D. Drill holes in countertops for plumbing fittings and soap dispensers in shop.
E. Materials:
   a. (SSM) Solid Surfacing Materials: Color and Pattern: Reference Finish Plans
   b. (SSW) Solid Surface Window Sills: Color and Pattern : Reference Finish Plans

**CLOSET AND UTILITY SHELVING**

A. Grade: Economy
B. Shelf Material: 3/4-inch (19-mm) thermo-set decorative panel with PVC or polyester edge banding.

**COUNTERTOP BRACKET**

A. (BR1) 21x15 inches, by A & M Hardware, Inc. (or approved equal)
B. (BR2) 12x8 inches, by A & M Hardware, Inc. (or approved equal)

**INSTALLATION**

A. All countertops shall be sealed to adjacent surfaces with a bead of silicone
B. Countertops shall be fully supported with base cabinets or a countertop bracket
C. Countertop corners shall have a radius of a minimum of 1/8”

**END OF SECTION**

SECTION 076200 - SHEET METAL FLASHING AND TRIM

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

A. Section Includes:

1. Manufactured Products:

a. Manufactured reglets and counterflashing.

2. Formed Products:

a. Formed roof drainage sheet metal fabrications.
b. Formed low-slope roof sheet metal fabrications.
c. Formed wall sheet metal fabrications.

B. Related Sections:

1. Division 06 Section "Miscellaneous Rough Carpentry" for wood nailers, curbs, and blocking.
2. Division 07 Section "Metal Wall Panels" for installing sheet metal flashing and trim integral with roofing.

1.3 PERFORMANCE REQUIREMENTS

A. General: Sheet metal flashing and trim 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 and trim shall not rattle, leak, or loosen, and shall remain watertight.

B. Fabricate and install roof edge flashing and copings capable of resisting the following forces according to recommendations in FMG Loss Prevention Data Sheet 1-49:

1. Wind Zone 1: For velocity pressures of 10 to 20 lbf/sq. ft. (0.48 to 0.96 kPa): 40-lbf/sq. ft. (1.92-kPa) perimeter uplift force, 60-lbf/sq. ft. (2.87-kPa) corner uplift force, and 20-lbf/sq. ft. (0.96-kPa) outward force.

C. Thermal Movements: Provide sheet metal flashing and trim 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.

1.4 SUBMITTALS

A. Product Data: For each type of product indicated. Include construction details, material descriptions, dimensions of individual components and profiles, and finishes for each manufactured product and accessory.

B. Shop Drawings: Show fabrication and installation layouts of sheet metal flashing and trim, 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 and trim, including profiles, shapes, seams, and dimensions.

3. Details for joining, supporting, and securing sheet metal flashing and trim, 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, including eaves, ridges, valleys, rakes, crickets, and counterflashings as applicable.
7. Details of special conditions.

C. Samples for Initial Selection: For each type of sheet metal flashing, trim, and accessory indicated with factory-applied color finishes involving color selection.

D. Samples for Verification: For each type of exposed finish required, prepared on Samples of size indicated below:

1. Sheet Metal Flashing: 12 inches (300 mm) long by actual width of unit, including finished seam and in required profile. Include fasteners, cleats, clips, closures, and other attachments.
2. Trim, Metal Closures, Expansion Joints, Joint Intersections, and Miscellaneous Fabrications: 12 inches (300 mm) long and in required profile. Include fasteners and other exposed accessories.
3. Accessories and Miscellaneous Materials: Full-size Sample.
4. Anodized Aluminum Samples: Samples to show full range to be expected for each color required.

E. Qualification Data: For qualified fabricator.

F. Maintenance Data: For sheet metal flashing, trim, and accessories to include in maintenance manuals.

G. Warranty: Sample of special warranty.

## 1.5 QUALITY ASSURANCE

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

1. For copings and roof edge flashings that are **SPRI ES-1 tested** and **FM Approvals** approved, shop shall be listed as able to fabricate required details as tested and approved.

B. Sheet Metal Flashing and Trim 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 and trim including installers of roofing materials, roof accessories, unit skylights, and roof-mounted equipment.
2. Review methods and procedures related to sheet metal flashing and trim.
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.

## 1.6 DELIVERY, STORAGE, AND HANDLING

A. Do not store sheet metal flashing and trim materials in contact with other materials that might cause staining, denting, or other surface damage. Store sheet metal flashing and trim materials away from uncured concrete and masonry.

B. Protect strippable protective covering on sheet metal flashing and trim from exposure to sunlight and high humidity, except to the extent necessary for the period of sheet metal flashing and trim installation.

1.7 WARRANTY

A. Special Warranty on Finishes: Manufacturer's standard form in which manufacturer agrees to repair finish or replace sheet metal flashing and trim that shows evidence of deterioration of factory-applied finishes within specified warranty period.

1. Exposed Panel Finish: Deterioration includes, but is not limited to, the following:

a. Color fading more than 5 Hunter units when tested according to ASTM D 2244.
b. Chalking in excess of a No. 8 rating when tested according to ASTM D 4214.
c. Cracking, checking, peeling, or failure of paint to adhere to bare metal.

2. Finish Warranty Period: 20 years from date of Substantial Completion.

PART 2 - PRODUCTS

2.1 PERFORMANCE REQUIREMENTS

A. General: Sheet metal flashing and trim assemblies 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 and trim shall not rattle, leak, or loosen, and shall remain watertight.

B. Sheet Metal Standard for Flashing and Trim: Comply with SMACNA's "Architectural Sheet Metal Manual" requirements for dimensions and profiles shown unless more stringent requirements are indicated.

C. FM Approvals Listing: Manufacture and install copings and roof edge flashings that are listed in FM Approvals' "RoofNav" and approved for windstorm classification, Class 1-90. Identify materials with name of fabricator and design approved by FM Approvals.

D. Thermal Movements: Allow for thermal movements from ambient and surface temperature changes to prevent buckling, opening of joints, overstressing of components, failure of joint sealants, failure of connections, and other detrimental effects. Base calculations on surface temperatures of materials due to both solar heat gain and nighttime-sky heat loss.

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

2.2 SHEET METALS

A. General: Protect mechanical and other finishes on exposed surfaces from damage by applying a strippable, temporary protective film before shipping.

B. Metallic-Coated Steel Sheet: Restricted flatness steel sheet, metallic coated by the hot-dip process and pre-painted by the coil-coating process to comply with ASTM A 755/A 755M.

1. Zinc-Coated (Galvanized) Steel Sheet: ASTM A 653/A 653M, G90 (Z275) coating designation; structural quality.
2. Aluminum-Zinc Alloy-Coated Steel Sheet: ASTM A 792/A 792M, Class AZ50 coating designation, Grade 40 (Class AZM150 coating designation, Grade 275); structural quality.
3. Surface: Smooth, flat.
4. Exposed Coil-Coated Finish:

a. Two-Coat Fluoropolymer: AAMA 621. Fluoropolymer finish containing not less than 70 percent PVDF resin by weight in color coat. Prepare, pretreat, and apply coating to exposed metal surfaces to comply with coating and resin manufacturers' written instructions.

b. Mica Fluoropolymer: AAMA 621. Two-coat fluoropolymer finish with suspended mica flakes containing not less than 70 percent PVDF resin by weight in color coat. Prepare, pretreat, and apply coating to exposed metal surfaces to comply with coating and resin manufacturers' written instructions.

c. FEVE Fluoropolymer: AAMA 621. Two-coat fluoropolymer finish containing 100 percent fluorinated ethylene vinyl ether resin in color coat. Prepare, pretreat, and apply coating to exposed metal surfaces to comply with coating and resin manufacturers' written instructions.

5. Color: Champagne Metallic or approved equal to matching metal wall panels.
6. Concealed Finish: Pre-treat with manufacturer's standard white or light-colored acrylic or polyester backer finish, consisting of prime coat and wash coat with a minimum total dry film thickness of 0.5 mil (0.013 mm).

## 2.3 UNDERLAYMENT MATERIALS

A. Felt: ASTM D 226, Type II (No. 30), asphalt-saturated organic felt, non-perforated.

B. 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 SBS-modified asphalt adhesive, with release-paper backing; cold applied. Provide primer when recommended by underlayment manufacturer.

1. Thermal Stability: ASTM D 1970; stable after testing at 240 deg F (116 deg C).
2. Low-Temperature Flexibility: ASTM D 1970; passes after testing at minus 20 deg F (29 deg C).
3. Products: Subject to compliance with requirements, available products that may be incorporated into the Work include, but are not limited to, the following:

a. Carlisle Coatings & Waterproofing Inc.; CCW WIP 300HT.
b. Grace Construction Products, a unit of W. R. Grace & Co.; Ultra.
c. Henry Company; Blueskin PE200 HT.
d. Metal-Fab Manufacturing, LLC; MetShield.
e. Owens Corning; WeatherLock Metal High Temperature Underlayment.
f. Prior approved equal.

C. Slip Sheet: Building paper, 3-lb/100 sq. ft. (0.16-kg/sq. m) minimum, rosin sized.

## 2.4 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 and trim installation and recommended by manufacturer of primary sheet metal or manufactured item 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 and recommended by manufacturer of primary sheet metal or manufactured item.

1. General: Blind fasteners or self-drilling screws, gasketed, with hex-washer head.

a. Exposed Fasteners: Heads matching color of sheet metal using plastic caps or factory-applied coating.
b. Blind Fasteners: High-strength aluminum or stainless-steel rivets suitable for metal being fastened.
c. Spikes and Ferrules: Same material as gutter; with spike with ferrule matching internal gutter width.

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

C. Sealant Tape: Pressure-sensitive, 100 percent solids, gray polyisobutylene compound sealant tape with release-paper backing. Provide permanently elastic, nonsag, nontoxic, nonstaining tape 1/2 inch (13 mm) wide and 1/8 inch (3 mm) thick.

D. Elastomeric Sealant: ASTM C 920, elastomeric polyurethane 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. Bituminous Coating: Cold-applied asphalt emulsion complying with ASTM D 1187.

F. Asphalt Roofing Cement: ASTM D 4586, asbestos free, of consistency required for application.

## 2.5 MANUFACTURED SHEET METAL FLASHING AND TRIM

A. Roof Edge Metal System: FM Global 1-90 approved system compliant with roofing assembly manufacturer.

1. Basis-of-Design:
   a. Style: Firestone, UNA-Edge CO and UNA-Edge GS or approved equal with roofing assembly.
   b. Material: Galvanized steel 24 ga. minimum.
   c. Fascia Bar Height: 4” minimum.
   d. Lengths: 8’ min to 12’ max.
   e. Color: Champagne Metallic

B. 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 interlocking counterflashing on exterior face, of same metal as reglet.

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

   a. Cheney Flashing Company.
   b. Fry Reglet Corporation.
   c. Heckmann Building Products Inc.
   d. Hickman, W. P. Company.
   e. Hohmann & Barnard, Inc.; STF Sawtooth Flashing.
   f. Keystone Flashing Company, Inc.
   g. National Sheet Metal Systems, Inc.
   h. Sandell Manufacturing Company, Inc.
   i. Prior Approved Equal.

2. Material: Galvanized steel, 0.022 inch (0.56 mm) thick.
3. Surface-Mounted Type: Provide with slotted holes for fastening to substrate, with neoprene or other suitable weatherproofing washers, and with channel for sealant at top edge.
4. Masonry Type: Provide with offset top flange for embedment in masonry mortar joint.
5. Accessories:

   a. Flexible-Flashing Retainer: Provide resilient plastic or rubber accessory to secure flexible flashing in reglet where clearance does not permit use of standard metal counterflashing or where Drawings show reglet without metal counterflashing.
   b. Counterflashing Wind-Restraint Clips: Provide clips to be installed before counterflashing to prevent wind uplift of counterflashing lower edge.

6. Finish: With manufacturer's standard color coating as selected by Architect.

## 2.6 FABRICATION, GENERAL

A. General: Custom fabricate sheet metal flashing and trim 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 and trim 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 and trim 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.

B. Fabrication Tolerances: Fabricate sheet metal flashing and trim 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 non-expansion 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" for application, but not less than thickness of metal being secured.

G. Seams: Fabricate nonmoving seams with flat-lock seams. Form seams and seal with elastomeric sealant unless otherwise recommended by sealant manufacturer for intended use. Rivet joints where necessary for strength.

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

## 2.7 LOW-SLOPE ROOF SHEET METAL 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. Coping Profile: As indicated on drawings.
2. Joint Style: Butt, with 6-inch- (150-mm-) wide, exposed cover plates.
3. Fabricate from the following materials:

    a. Galvanized Steel: [0.040 inch (1.02 mm)] <Insert thickness> thick.
    b. Aluminum-Zinc Alloy-Coated Steel: [0.040 inch (1.02 mm)] <Insert thickness> thick.

B. Roof to Roof Edge Flashing (Gravel Stop) and Fascia Cap Transition Expansion-Joint Cover: Fabricate from the following materials:

1. Galvanized Steel: 0.034 inch (0.86 mm) thick.
2. Aluminum-Zinc Alloy-Coated Steel: 0.034 inch (0.86 mm) thick.

C. Base Flashing: Fabricate from the following materials:

1. Galvanized Steel: 0.028 inch (0.71 mm) thick.
2. Aluminum-Zinc Alloy-Coated Steel: 0.028 inch (0.71 mm) thick.

D. Counterflashing: Fabricate from the following materials:

1.
2. Galvanized Steel: 0.022 inch (0.56 mm) thick.

3. Aluminum-Zinc Alloy-Coated Steel: 0.022 inch (0.56 mm) thick.

E. Flashing Receivers: Fabricate from the following materials:

1. Galvanized Steel: 0.022 inch (0.56 mm) thick.
2. Aluminum-Zinc Alloy-Coated Steel: 0.022 inch (0.56 mm) thick.

2.8 WALL SHEET METAL FABRICATIONS

A. Opening Flashings in Frame Construction: Fabricate head, sill, jamb, and similar flashings to extend 4 inches (100 mm) beyond wall openings. Form head and sill flashing with 2-inch- (50-mm-) high, end dams. Fabricate from the following materials:

1. Galvanized Steel: 0.022 inch (0.56 mm) thick.

2. Aluminum-Zinc Alloy-Coated Steel: 0.022 inch (0.56 mm) thick.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Examine substrates, areas, and conditions, with Installer present, to verify actual locations, dimensions and other conditions affecting performance of the Work.

1. Verify compliance with requirements for installation tolerances of substrates.
2. Verify that substrate is sound, dry, smooth, clean, sloped for drainage, and securely anchored.

B. For the record, prepare written report, endorsed by Installer, listing conditions detrimental to performance of the Work.

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

3.2 UNDERLAYMENT INSTALLATION

A. General: Install underlayment as indicated on Drawings.

B. Polyethylene Sheet: Install polyethylene sheet with adhesive for anchorage to minimize use of mechanical fasteners under sheet metal flashing and trim. Apply in shingle fashion to shed water, with lapped and taped joints of not less than 2 inches (50 mm).

C. Felt Underlayment: Install felt underlayment with adhesive for temporary anchorage to minimize use of mechanical fasteners under sheet metal flashing and trim. Apply in shingle fashion to shed water, with lapped joints of not less than 2 inches (50 mm).

D. 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; use primer rather than nails for installing underlayment at low temperatures. 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.

3.3 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 indicated. 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. Install sealant tape where indicated.
6. Torch cutting of sheet metal flashing and trim is not permitted.
7. Do not use graphite pencils to mark metal surfaces.

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.

1. Coat back side of uncoated aluminum sheet metal flashing and trim with bituminous coating where flashing and trim will contact wood, ferrous metal, or cementitious construction.
2. Underlayment: Where installing metal flashing directly on cementitious or wood substrates, install a course of felt underlayment and cover with a slip sheet or install a course of polyethylene sheet.

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 sheathing not less than 1-1/4 inches (32 mm) for nails and not less than 3/4 inch (19 mm) for wood screws.

E. Seal joints as shown and as required 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. Rivets: Rivet joints in uncoated aluminum where indicated and where necessary for strength.

## 3.4 ROOF FLASHING INSTALLATION

A. General: Install sheet metal flashing and trim to comply with performance requirements, sheet metal manufacturer's written installation instructions, 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 Metal Flashing System: Anchor to resist uplift and outward forces according to recommendations in FMG Loss Prevention Data Sheet 1-49 for specified wind zone and as indicated. Interlock bottom edge of roof edge flashing with continuous cleat anchored to substrate at 16-inch (400-mm) centers.

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

1. Interlock exterior bottom edge of coping with continuous cleat anchored to substrate at 16-inch (400-mm) centers.

2. Anchor interior leg of coping with screw fasteners and washers at 24-inch (600-mm) centers.

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 by means of interlocking folded seam or blind rivets and sealant.

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.

## 3.5 WALL FLASHING INSTALLATION

A. General: Install sheet metal wall flashing to intercept and exclude penetrating moisture according to SMACNA recommendations and as indicated. Coordinate installation of wall flashing with installation of wall-opening components such as windows, doors, and louvers.

B. Through-Wall Flashing: Installation of through-wall flashing is specified in Division 04 Section "Unit Masonry and Stone Masonry."

C. Opening Flashings in Frame Construction: Install continuous head, sill, jamb, and similar flashings to extend 4 inches (100 mm) beyond wall openings.

## 3.6 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.

## 3.7 CLEANING AND PROTECTION

A. Clean exposed metal surfaces of substances that interfere with uniform oxidation and weathering.

B. Clean off excess sealants.

C. Remove temporary protective coverings and strippable films as sheet metal flashing and trim are installed unless otherwise indicated in manufacturer's written installation instructions. On completion of installation, remove unused materials and clean finished surfaces. Maintain in a clean condition during construction.

D. 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 076200

## SECTION 07-8400 - FIRESTOPPING

## PART 1 - GENERAL

### 1.01 SECTION INCLUDES

A. Firestop sealers.

B. Fire safing insulation.

### 1.02 SYSTEM DESCRIPTION

A. Each firestop system to seal holes and voids in fire rated construction.

B. Each system to be listed in by UL or Warnock Hersey, and tested per ASTM E814, with hourly rating equal to the assembly being penetrated.

C. The installed product shall be stable, unaffected by freezing, humidity, or water.

D. The installed system shall be easily re-entered and repaired without special tools.

### 1.03 SUBMITTALS

A. Manufacturer's Product Data for each material used.

B. Evidence of manufacturer's training and approval of installer.

C. Schedule of firestop conditions, specific UL or Warnock Hersey listing, and other code acceptance information for each condition and assembly. Submit within 10 days after Notice to Proceed or award of Contract, whichever is earlier.

D. Shop Drawings for each combination of wall construction and penetration. For each condition, indicate:

1. Material, shape, and movement of penetrating object.
2. Materials in assembly being penetrated.
3. Type and quantity of firestop materials and accessories.
4. UL system number in current edition of Fire Resistance Directory.

E. Sample of labels.

### 1.04 QUALITY ASSURANCE

A. The installer shall have received training from the product manufacturer, and be approved in writing by the manufacturer.

B. Provide a mock-up of each assembly. Each mock-up to be accepted by the building code official. Accepted assemblies shall be the standard for remaining assemblies of the same type.

C. Systems for top-of-wall joints and other moving joints to be listed for dynamic joints with movement capabilities to match joint movement.

### 1.05 DELIVERY, STORAGE, AND HANDLING

A. Labels shall state name of manufacturer, product description, and UL listing.

## PART 2 - PRODUCTS

### 2.01 MANUFACTURERS

A. Acceptable manufacturers:

1. 3M, St. Paul, MN.
2. Hilti, Inc., Tulsa, OK.
3. Nelson Firestop Products, Tulsa, OK.
4. Rectorseal, Houston, TX.
5. Specified Technologies, Somerville, NJ.
6. Tremco, Beachwood, OH.
7. W. R. Grace & Co., Columbia, MD.
8. Other as approved.

### 2.02 FIRESTOP

A. Materials: Caulk, spray, pipe wrap, composite sheet, restricting collar, galvanized steel sleeve, moldable putty, foam, mineral wool, and backing as required for each condition by UL listed design.

### 2.03 FIRE SAFING INSULATION AND ACCESSORIES

A. Safing insulation: Semi-rigid boards designed for use as fire safing, ASTM C612, Classes 1 and 2; nominal density 4.0 pcf; passing ASTM E136 for combustion characteristics; R value 4.0 at 75 degrees F.

B. Caulk: Recommended by safing insulation manufacturer for sealing joint between safing insulation and edge of floor slab.

C. Safing clips: Galvanized steel, approved by safing insulation manufacturer.

D. Labels: Durable, 5 inches by 3 inches, with the words "Firestop System - Do Not Disturb", and identification of the manufacturer, system design number, installer, and date of installation, in non-fading, waterproof ink.

## PART 3 - EXECUTION

### 3.01 INSTALLATION

A. Install materials according to manufacturer's installation instructions for specific conditions of use and UL listing.

B. Where penetration is through construction that contains voids, including metal framed assemblies and hollow concrete masonry units, install firestop on both sides of assembly.

C. Install safing at openings between edge of slab and exterior wall panels.

D. Remove excess material from exposed surfaces.

E. Provide labels for each firestop assembly.

**END OF SECTION**

## SECTION 07-9200 - JOINT SEALANTS

### PART 1 - GENERAL

### 1.01 SECTION INCLUDES

A. Joint sealant, cleaners, primers, bond breakers, and backers.

### 1.02 RELATED WORK

A. Section 07-9201 - Joint Sealant Schedule.

B. Section 08-4003 - Aluminum Entrance, Windows, and Curtain Wall: Glazing sealants.

### 1.03 SUBMITTALS

A. Manufacturer's Product Data, including performance test data sheets for each product.

B. Manufacturer's compatibility and adhesion test reports for each combination of sealant and substrate.

C. Full range of color Samples for each exposed product for selection by the Architect.

### 1.04 QUALITY ASSURANCE

A. Failure to maintain airtight and watertight seals within limitations of wear and aging shall be recognized as failure of materials or installation.

B. If requested, submit substrate materials to sealant manufacturer for laboratory testing of adhesion and compatibility with secondary seals. Testing shall not be required if joint sealant manufacturer submits acceptable test results based on previous testing of same joint sealant, substrate, and condition of use found in this Work.

### 1.05 PRECONSTRUCTION FIELD-ADHESION TESTING AND MOCKUPS, EXTERIOR JOINTS

A. Notify the Architect 7 days in advance of times when test joints will be installed.

B. Conduct tests in the presence of the Architect and the joint sealant manufacturer's technical representative.

C. Before installing exterior sealants, field-test each combination of exterior sealant and substrate for adhesion.

1. Install joint sealants in 72 inches long joints using same materials and methods specified. Allow sealants to cure fully before testing, 14 days minimum.
2. Make knife cuts from one side of joint to the other, followed by 2 cuts approximately 2 inches long at sides of joint and meeting cross cut at one end. Place a mark 1 inch from cross-cut end of piece.
3. Use fingers to grasp 2 inch piece of sealant between cross-cut end and 1 inch mark; pull firmly at a 90 degree angle or more in direction of side cuts while holding a ruler along side of sealant. Pull sealant out of joint to the distance recommended by sealant manufacturer for testing adhesive capability, but not less than maximum movement capability in extension; hold this position for 10 seconds.
4. For joints with dissimilar substrates, check adhesion to each substrate separately. Do this by extending cut along one side, checking adhesion to opposite side, and then repeating this procedure for opposite side.

D. Note whether sealant in joint connected to pulled-out portion failed to adhere to joint substrates or tore cohesively. Include pull distance used to test each type of product and joint substrate. For sealants that fail adhesively, follow manufacturer's recommended procedures to improve performance, and retest.

E. Evaluation of field-adhesion test results: Sealants not exhibiting adhesive failure from testing shall be considered satisfactory, subject to compliance with Specifications. Do not use sealants that fail to adhere to joint substrates during testing.

F. In addition to field testing, the Architect will also review installed sealant for aesthetic effects and final approval of sealant color.

### 1.06 PRECONSTRUCTION STAIN TESTING

A. Perform stain testing of natural stone, masonry, and other porous substrates indicated to be used in the Work. Obtain actual samples of materials proposed for use and test to determine if permanent discoloration of porous surfaces will occur from direct contact with sealants. Perform stain testing in conformance with ASTM C1248 and as follows:

1. Notify the Architect 5 days before beginning test.
2. Arrange for manufacturer's field technical representative to be present during examination of test results.
3. Cut substrate to provide flat surface for application of sealant.
4. Separate substrate materials by removable shims to create 1/2 by 1/2 by 3 inches joint.
5. Fill joint with sealant, tool, and allow to cure for 21 days at room temperature.

6. After curing, remove shims, compress joint to 1/4 inch width, and place in an oven at 158 degrees F for 14 days.
7. Remove sample and allow to cool to room temperature.
8. Examine sample to determine presence of discoloration or change in appearance in any way to exposed surfaces.
9. After visual inspection, cut sample in half to determine presence of discoloration or change in appearance in any way into the sample itself at the adhesive bond line and presence of bleeding into the area around the adhesive bond line.
10. Record results in stain test log.
11. Do not install sealants that show evidence of staining substrates.

**1.07 DELIVERY AND HANDLING**

A. Deliver materials to Project site in original unopened containers or bundles with factory labels stating manufacturer, product name and designation, color, expiration times for unopened shelf life, pot life, curing time, and mixing instructions.

**1.08 WARRANTY**

A. Furnish manufacturer's 20-year non-staining warranty for sealants in contact with stone or other porous materials. Submit samples as required by manufacturer, and comply with manufacturer's instructions and details required for warranty.

**PART 2 - PRODUCTS**

**2.01 MANUFACTURERS**

A. Acceptable manufacturers:
1. Bostik Findley, Inc., Middleton, MA.
2. Dow Corning Corp., Midland, MI.
3. General Electric, Cleveland, OH.
4. Mameco International, Inc. Tremco, Beachwood, OH.
5. Sika Corporation, Lyndhurst, NJ.
6. Sonneborn, Degussa Building Systems, Shakopee, MN.
7. Tremco, Inc. Sealant/Weatherproofing Division, Beachwood, OH.
8. Other as approved.

**2.02 SEALANT**

A. Performance: Non-staining, non-shrinking, non-drying, non-migrating, permanently elastic; recommended by sealant manufacturer for conditions of service, based on field experience and laboratory testing. Where given choice of 1 part or 2 part product, use the one with optimum performance for conditions of use.

B. Compatibility: Listed or recommended by manufacturer for substrate and conditions of use.

C. Color: As selected.

D. SNT-1: ASTM C834, 1 part acrylic-latex; mildew resistant, paintable; recommended for exposed interior applications with joint movement of plus or minus 7.5 percent. Foam sealants are not acceptable.

E. SNT-2: ASTM C920, Type S, Grade NS, Class 25, air-curing, mildew resistant silicone rubber.

F. SNT-3: ASTM C920, Type S or M, Grade NS, Class 50, silicone. Non-staining to stone per ASTM C1248.
1. Dow Corning 756 SMS Silicone Building Sealant.
2. GE Silpruf NB SCS9000.
3. Tremco Spectrem 3 Construction Grade Silicone Sealant.

G. SNT-4: ASTM C920, Type S or M, Grade NS, Class 25, silicone.

H. SNT-5: ASTM C920, Type S, Grade NS, Class 50, silicone.

I. SNT-6: ASTM C920, Type S or M, Grade P, Class 25, polyurethane, rated for traffic.

J. SNT-7: ASTM C920, Type S or M, Grade P, Class 25, polyurethane.

**2.03 JOINT SEALANT BACKING**

A. General: Preformed, compressible, gas and water non-absorbent, non-extruding, low compression set. Size, shape, and density as recommended by manufacturer to control sealant depth and provide optimum sealant performance.

B. Backer rod:
1. Vertical joints: Non-outgassing polyurethane or polyolefin foam. ASTM C1330, Type B or Type O.
a. Backer Rod Mfg. Co. "Denver Foam".
b. Nomaco "Sof Rod".
c. Other as approved.
2. Horizontal joints: Closed cell polyethylene foam. ASTM C1330, Type C.

### 2.04 PRECOMPRESSED JOINT FILLER

A. Precompressed joint seal: Open-cell, high density, polyurethane foam, impregnated with water-based, stabilized, acrylics crosslinked ethylene vinyl acetate (EVA).

B. Prefinished joint seal: Open-cell, high density, polyurethane foam, impregnated with water-based, stabilized, acrylics crosslinked ethylene vinyl acetate (EVA), with integral silicone face. Color as selected.

C. Depth: As recommended by manufacturer for conditions of use.

D. Exposed exterior walls: Emseal "Colorseal", color as selected.

E. Concealed exterior walls: Emseal "25V".

### 2.05 MISCELLANEOUS

A. Cleaners, primers, bond breakers, masking tape: Recommended by sealant manufacturer for conditions of use.

## PART 3 - EXECUTION

### 3.01 PREPARATION

A. Clean joints immediately before beginning installation. Joint surfaces to be sound, smooth, clean, dry, and free of contaminants.

B. Prime joint surfaces using primer recommended by sealant manufacturer for substrate. Confine primer to areas of joint sealer bond. Exception: Do not prime surfaces when manufacturer's adhesion tests indicate better bond is achieved without primer.

C. Do not use materials stored beyond recommended shelf life, or materials that have been opened or mixed beyond manufacturer's recommended period of use.

### 3.02 INSTALLATION

A. Install when temperatures are in lower third of range recommended by manufacturer when possible.

B. Install joint fillers to support joint sealant with cross-sections and locations that will produce optimum performance of the completed joint. Do not twist, tear, stretch, or puncture joint fillers, or leave gaps at ends of pieces. Use only dry materials.

C. Apply bond breaker tape to prevent 3-sided bonding.

D. Install joint sealant in a uniform, continuous ribbon, without gaps or air pockets, completely wetting joint surfaces. Cross section and depth to be as recommended by manufacturer to provide optimum performance.

E. Tool non-sag sealants immediately after installation to form smooth, continuous, slightly concave surface. Do not use tooling agents that discolor sealants or adjacent surfaces, or that are not approved by sealant manufacturer. Do not feather-edge sealant.

### 3.03 FIELD QUALITY CONTROL, EXTERIOR JOINTS

A. Field-test joint sealant adhesion to joint surfaces in exterior substrates in the presence of the Architect.

B. Perform 1 test for each 1,000 feet of joint length of each type, using method described in this Section under Preconstruction Adhesion Testing. Perform minimum 1 test per floor, per elevation, for each type of joint sealant.

C. Inspect joints for complete fill, absence of voids, and joint configuration. Record results in a field adhesion test log. Indicate compliance or non-compliance.

D. Inspect tested joints and report the following:

1. Whether sealants in joints connected to pulled-out portion failed to adhere to joint substrates or tore cohesively. Include data on pull distance used to test each type of product and joint substrate. Compare these results to determine if adhesion passes sealant manufacturer's field- adhesion hand-pull test criteria.
2. Whether sealants filled joint cavities and are free from voids.
3. Whether sealant dimensions and configurations comply with specified requirements.

E. Record test results in a field adhesion test log. Include dates when sealants were installed, names of persons who installed sealants, test dates, test locations, whether joints were primed, adhesion results and percent elongations, sealant fill, sealant configuration, and sealant dimensions.

F. Repair sealants pulled from test area by applying new sealants following same procedures used to originally seal joints. Ensure that original sealant surfaces are clean and new sealant contacts original sealant.

G. Sealants not exhibiting adhesive failure from testing, or noncompliance with other indicated requirements, shall be considered satisfactory. Remove sealants that fail to adhere to joint substrates during testing or to comply with other

requirements. Retest failed applications until test results prove sealants comply with indicated requirements.

**3.04 PROTECTION AND CLEANING**

A. Cut out and remove joints that are damaged at time of Substantial Completion, and replace with new materials to produce repairs indistinguishable from original work.

B. Clean adjacent surfaces of excess sealant as work progresses.

**END OF SECTION**

**QUALITY ASSURANCE**

A. Source Limitations: Obtain hollow metal work from single source from single manufacturer.
B. Fire-Rated, Borrowed-Light Frame Assemblies: Assemblies complying with NFPA 80 that are listed and labeled, by a testing and inspecting agency acceptable to authorities having jurisdiction, for fire-protection ratings indicated.

**PROJECT CONDITIONS**

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

**MANUFACTURERS**

A. Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following:
    a. Amweld Building Products, LLC.
    b. Benchmark; a division of Therma-Tru Corporation.
    c. Ceco Door Products; an Assa Abloy Group company.
    d. Curries Company; an Assa Abloy Group company.
    e. Steelcraft; an Ingersoll-Rand company.
    f. Prior approved equal.

**STANDARD HOLLOW METAL FRAMES**

A. Exterior Frames: Fabricated from metallic-coated steel sheet.
    a. Fabricate frames with mitered or coped corners.
    b. Fabricate frames as full profile welded unless otherwise indicated.
    c. Frames for Level 3 Steel Doors: 0.053-inch- (1.3-mm-) thick steel sheet.

B. Interior Frames: Fabricated from cold-rolled steel sheet unless metallic-coated sheet is indicated.
    a. Fabricate frames with mitered or coped corners.
    b. Fabricate frames as full profile welded unless otherwise indicated.
    c. Frames for Level 3 Steel Doors: 0.053-inch- (1.3-mm-) thick steel sheet.
    d. Frames for Wood Doors: 0.053-inch- (1.3-mm-) thick steel sheet.
    e. Frames for Borrowed Lights: 0.053-inch- (1.3-mm-) thick steel sheet or same as adjacent door frame.

**END OF SECTION**

## SECTION 08-1513 - FLUSH LAMINATED PLASTIC DOORS

### PART 1 - GENERAL

### 1.01 SECTION INCLUDES

A. Flush, solid core doors with laminated plastic veneer.

B. Factory finishing.

### 1.02 RELATED WORK

A. Section 08-1113 - Hollow Metal Doors and Frames: Hollow metal frames for wood doors.

B. Section 08-7100 - Door Hardware: Mounting and operating hardware.

### 1.03 SUBMITTALS

A. Manufacturer's Product Data: For each type of door, including details of core and edge construction, trim for openings, finish options for each component, and factory finishing specifications.

B. Preliminary finish Samples: Full range of standard factory finishes.

C. 12 inches by 18 inches corner Sample of door and frame, including hinge mortise, and 6 inches long samples of glazing frames.

D. Shop Drawings including:

1. Door schedule showing locations, types, sizes, thickness, grade, undercuts, cutouts, label requirements, and the pre-matching of hardware locations of each opening.

2. Door elevations showing the location and size of cutouts for lite kits and louvers.

3. Certification that doors comply with ANSI/NFPA 252- Fire Tests of Door Assemblies with pressure plane at 40 inches above the sill, and UL10C.

E. Verification finish Samples: 12 inches square Samples of each factory finish for approval. Furnish sufficient number to illustrate the range of finish to be expected in the Work, minimum 2 Samples.

### 1.04 QUALITY ASSURANCE

A. Fire-rated doors: Identical in materials and construction to units tested in door and frame assemblies in accordance with NFPA-252 and UL10C Category A, Positive Pressure Fire Door Test Method. Labeled and listed for ratings indicated by ITS-Warnock Hersey, UL, or other independent agency acceptable to authorities having jurisdiction.

B. Comply with ANSI/WDMA I.S. 1-A standards for grade of door, core, construction, finish, and other requirements.

C. Temperature rise rating, stairwell enclosures: 250 degrees F maximum in 30 minutes of fire exposure.

### 1.05 DELIVERY, STORAGE, AND HANDLING

A. Comply with ANSI/WDMA I.S. 1-A.

### 1.06 SPECIAL WARRANTY

A. Comply with ANSI/WDMA I.S. 1-A, T-1 Show-Through, T-2 Warp, T-3 Square Tolerance and Delamination.

B. Furnish manufacturer’s guarantee for lifetime of the original installation. Replace doors exhibiting defects in materials or workmanship within guarantee period with new doors, including hanging and finishing, at no cost to the Owner.

## PART 2 - PRODUCTS

### 2.01 MANUFACTURERS

A. Acceptable manufacturers: Provide one of the following.

1. Algoma Hardwoods, Inc., Algoma, WI.
2. Eggers Industries, Two Rivers, WI.
3. Graham, Mason City, IA.
4. Marshfield Door Systems, Inc., Marshfield, WI.
5. VT Industries, Inc., Holstein, IA.

### 2.02 DOOR CONSTRUCTION

A. General: 5-ply, 1-3/4 inches thick, interior flush wood, bonded, solid core, ANSI/WDMA I.S. 1-A Premium Grade.

B. Face to core adhesives: Classified per WDMA TM-6 "Adhesive Bond Test Method".

1. High pressure decorative laminate: Type I, water-resistant adhesive.

C. Non-rated and 20 minute doors:

1. Core: Bonded particle core.
2. Stiles: PVC edge-banded over structural composite lumber backers (SCL), glued to core. PVC edge applied after face sheet
3. Rails: Mill option hardwood or SCL, top and bottom: PVC edge banded applied after face sheet

D. Doors with greater than 20 minute rating:

1. Core: Bonded non-combustible fire resistive material, containing no asbestos.
2. Stiles: Laminated with veneer edge-banded, to match veneer over mineral composite, glued to core.
3. Rails: Mineral composite as required by rated assembly: factory sealed

E. Intumescent gasket: Recessed into door edge, concealed by wood veneer.

F. Transom and side panels: Same laminated plastic veneer as door in same opening.

G. Hardware: Factory-machine for hinges and locksets.

### 2.03 FACE VENEERS

A. Plastic Laminate Facing: Custom grade.

1. HGS, 0.048 inch thickness, high pressure decorative laminate, matte finish.
2. Laminate Selection: Standard products of Formica; Other as approved.

### 2.04 VISION FRAMES

A. Non-rated doors: Laminated plastic veneer frames, hardwood to match face veneer.

B. 20 minute fire rated doors: Manufacturer's tested metal clip or comparable system with wood stop appearance.

C. Glass: Factory glazed, Warnock Hersey, or UL approved glazing system.

### 2.05 FABRICATION

A. Fire rated doors: Factory metal label on each door indicating temperature rise and identification of smoke & draft assemblies.

B. Blocking: Composite material, sufficient screw-holding capability so through-fasteners are not required for surface mounted hardware.

1. Thickness: Same as core.

2. Top rail, midrail: 5 inches.

3. Bottom rail: 5 inches for surface vertical rod exit devices.

4. Lock: 5 inches by 18 inches.

C. Glass and louvers: Provide cut-outs and stops. Seal prior to installation of moldings. For full light doors, provide cutout from flush wood door with vertical grain direction.

D. Hardware preparation: Prepare for indicated hardware per NFPA 80 and UL10C.

1. Edges: Prefit, bevel to net opening size less 1/4 inch in width on single swing doors, and 3/16 inch in width for paired doors.

2. Bottom: 1/4 inch clearance above finished floor, unless otherwise indicated.

3. Top: 1/8 inch clearance.

E. Pairs of doors, greater than 20 minute rating: Provide overlapping astragals or metal edge sets as required by assembly rating.

### 2.06 FINISHES

A. Standard: NEMA LD3, factory laminate veneer finished. See Drawings and opening schedule for specific laminate locations.

1. Wood grain pattern: PLAM1.

2. Wood grain pattern: PLAM2.

## PART 3 - EXECUTION

### 3.01 INSTALLATION

A. Condition doors to average temperature and humidity in area of installation minimum 48 hours before installation.

B. Install fire-rated doors in compliance with NFPA No. 80. Comply with ANSI/WDMA I.S. 1-A, "Care and Installation at Job Site".

C. Ensure smoke gaskets are in place before pre-finished door installation.

D. Pre-drill lead holes for screws.

E. Restore finish before installation if fitting or machining is required at site.

F. Adjust prefinished doors and hardware and other moving or operating parts to function smoothly and correctly.

G. Visible surfaces: Free of tool marks, open joints, and slivers.

**END OF SECTION**

SECTION 085113 - ALUMINUM WINDOWS

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

A. Section includes aluminum windows for exterior locations.

B. Related Requirements:

1. Section 084113 "Aluminum-Framed Entrances and Storefronts" for coordinating finish among aluminum fenestration units.
2. Section 084229.13 “Folding Automatic Entrances” for coordinating finish among aluminum fenestration units.
3. Section 084229.23 “Sliding Automatic Entrances” for coordinating finish among aluminum fenestration units.
4. Section 084413 “Glazed Aluminum Curtain Walls” for coordinating finish among aluminum fenestration units.
5. Section 088000 “Glazing” for glazing.

1.3 REFERENCE

A. Refer to AAMA/WDMA/CSA 101/I.S.2/A440 for a complete list of references and industry standards.

1.4 PREINSTALLATION MEETINGS

A. Preinstallation Conference: Conduct conference at Project site.

1. Review and finalize construction schedule and verify availability of materials, Installer's personnel, equipment, and facilities needed to make progress and avoid delays.
2. Review and discuss the finishing of aluminum windows that is required to be coordinated with the finishing of other aluminum work for color and finish matching.
3. Review, discuss, and coordinate the interrelationship of aluminum windows with other exterior wall components. Include provisions for anchorage, flashing, sealing perimeters, and protecting finishes.
4. Review and discuss the sequence of work required to construct a watertight and weathertight exterior building envelope.
5. Inspect and discuss the condition of substrate and other preparatory work performed by other trades.

1.5 ACTION SUBMITTALS

A. Product Data: For each type of product.

1. Include construction details, material descriptions, glazing and fabrication methods, dimensions of individual components and profiles, hardware, and finishes for aluminum windows.

B. Shop Drawings: Include plans, elevations, sections, hardware, accessories, insect screens, operational clearances, and details of installation, including anchor, flashing, and sealant installation.

C. Samples for Verification: For aluminum windows and components required, showing full range of color variations for finishes.

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

1.6 INFORMATIONAL SUBMITTALS

A. Sample Warranties: For manufacturer's warranties.

1.7 QUALITY ASSURANCE

A. Manufacturer Qualifications: A manufacturer capable of fabricating aluminum windows that meet or exceed performance requirements indicated and of documenting this performance by test reports, and calculations.

B. Installer Qualifications: An installer acceptable to aluminum window manufacturer for installation of units required for this Project. Upon request, the window manufacturer shall provide written confirmation that the installer is authorized to install window products to be used on this project.

1.8 DELIVERY, STORAGE AND HANDLING

A. Packing, Shipping, Handling and Unloading

1. Materials will be packed, loaded, shipped, unloaded, stored and protected in accordance with AAMA CW-10.

1.9 WARRANTY

A. Aluminum Window Warranty

1. Products: Submit a written warranty, executed by the window manufacturer, for a period of 10 years from the date of manufacture, against defective materials or workmanship, including substantial non-compliance with applicable specification requirements and industry standards, which result in premature failure of the windows, finish, factory-glazed glass, or parts, outside of normal wear.
2. In the event that windows or components are found defective, manufacturer will repair or provide replacements without charge at manufacturer's option.
3. Warranty for all components must be direct from the manufacturer (non pass-through) and non pro-rated for the entire term. Warranty must be assignable to the non-residential owner, and transferable to subsequent owners through its length.

B. Installation: Submit a written warranty, executed by the window installer, for a period of 5 years from the date of substantial completion, against defective materials or workmanship, including substantial non-compliance with applicable specification requirements, which result in premature failure.

1. In the event that installation of windows or components is found to be defective, installer will repair or provide replacements without charge at the installer's option.

PART 2 - PRODUCTS

2.1 WINDOW PERFORMANCE REQUIREMENTS

A. Product Standard: Comply with AAMA/WDMA/CSA 101/I.S.2/A440 for definitions and minimum standards of performance, materials, components, accessories, and fabrication unless more stringent requirements are indicated.

1. Window Certification: AMMA certified with label attached to each window.

B. Design Wind Loads

1. The design wind pressure for the project will be:

a. Per local building codes

2. All structural components, including meeting rails, mullions and anchors shall be designed accordingly, complying with deflection and stress requirements of Paragraph 1.03.B.

C. Air, Water and Structural Performance Requirements

1. When tested in accordance with cited test procedures, windows shall meet or exceed the following performance criteria, as well as those indicated in AAMA/WDMA/CSA 101/I.S.2/A440 for Architectural AW Performance Class windows, Performance Grade 100 (AW100) unless otherwise noted herein.

a. Test units shall not be smaller in either width or height than the "Gateway Test Size" specified in AAMA/WDMA/CSA 101/I.S.2/A440 for AW Performance Class.
b. "Downsize" testing to meet Optional Performance Class requirements specified herein shall not be permitted.
c. Test units shall employ manufacturer's standard sealing, lock spacing and anchorage.

2. Air Test Performance Requirements

a. Air infiltration maximum 0.1 cfm per square foot at 6.24 psf pressure differential when tested in accord with ASTM E283.

3. Water Test Performance Requirements

a. No uncontrolled water leakage at 15.00 psf static pressure differential, with water application rate of 5 gallons/hr/sq ft when tested in accord with both ASTM E331 and ASTM E547. Static water test shall be repeated after application of design test pressures. (Performance can vary with hardware package selected.)

4. Structural Test Performance Requirements

a. Uniform Load Deflection Test

1) No deflection of any unsupported span L of test unit (framing rails, muntins, mullions, etc.) in excess of L/175 at both a positive and negative load of 100 psf (design test pressure) when tested in accord with ASTM E330.

b. Uniform Load Structural Test

1) Unit to be tested at 1.5 x design test pressure, both positive and negative, acting normal to plane of wall in accord with ASTM E330.
2) No glass breakage; permanent damage to fasteners, hardware parts, or anchors; damage to make windows inoperable; or permanent deformation of any main frame or ventilator member in excess of 0.2% of its clear span.

D. Condensation Resistance and Thermal Transmittance Performance Requirements

1. Perform thermal tests in accordance with NFRC 102 and AAMA 1503, or provide finite element computer thermal modeling and calculations per NFRC 100 or AAMA 507, using DOE/LBL THERM 5.2 and WINDOWS 5.2 software.

a. Thermal Transmittance (U-Factor) for the overall curtainwall vision area and adjacent framing shall be less than or equal to 0.45 BTU/hr-ft$^2$-°F.
b. Condensation Resistance Factor (CRF) requirements: CRF minimum 68 (Frame) and CRF minimum 67 (Glass).
c. Solar Heat Gain Coefficient (SHGC) for the overall curtainwall vision area and adjacent framing shall not exceed 0.40.

2.2 MANUFACTURERS

A. Basis-of-Design Product: Subject to compliance with requirements, provide Wausau Window and Wall Systems – 4250i-XLT INvent Series Fixed Windows with extended thermal separation, or comparable product by one of the following:

1. EFCO Corporation.
2. Kawneer North America.
3. Manko Window Systems, Inc.
4. Oldcastle, Inc.
5. Tubelite.
6. United States Aluminum.

B. Source Limitations: Obtain aluminum windows from single source from single manufacturer.

2.3 MATERIALS

A. Aluminum Framing Members

1. Extruded aluminum billet, 6063-T5 or T6 alloy for primary components; 6063-T5 or T6, 6005-T5, 6105-T5 or 6061-T6 for structural components; all meeting the requirements of ASTM B221.
2. Aluminum sheet alloy 5005-H32 (for anodic finishing), or alloy 3003-H14 (for painted or unfinished sheet) meeting the requirements of ASTM B209.
3. Principal window frame will be a minimum 0.125" in thickness at hardware mounting locations.
4. Extruded or formed trim components will be a minimum 0.060" in thickness.
5. Frame depth 4 7/8" minimum.

2.4 COMPONENTS

A. Hardware

1. All steel components including attachment fasteners to be stainless steel except as noted.
2. Extruded aluminum components 6063-T5 or -T6.
3. Thermo-plastic or thermo-set plastic caps, housings and other components to be injection-molded nylon, extruded PVC, or other suitable compound.

B. Sealants

1. All sealants shall comply with applicable provisions of AAMA 800 and/or Federal Specifications FS-TT-001 and 002 Series.
2. Frame joinery sealants shall be suitable for application specified and as tested and approved by window manufacturer.

C. Glass

1. Provide in accordance with Section 088000.
2. Sealed insulated glass shall be tested and certified in accord with ASTM E2190.

D. Glazing

1. Provide in general accordance with Section 088000.
2. Glazing method shall be in general accordance with the GANA Glazing Manual for specified glass type, or as approved by the glass fabricator.

E. Glazing Materials

1. Setting Blocks/Edge Blocking: Provide in sizes and locations recommended by GANA Glazing Manual. Setting blocks used in conjunction with soft-coat low-e glass shall be silicone.
2. Back-bedding tapes, expanded cellular glazing tapes, toe beads, heel beads and cap beads shall meet the requirements of applicable specifications cited in AAMA 800.
3. Glazing gaskets shall be non-shrinking, weather-resistant, and compatible with all materials in contact.
4. Structural silicone sealant where used shall meet the requirements of ASTM C1184.
5. Spacer tape in continuous contact with structural silicone shall be tested for compatibility and approved by the sealant manufacturer for the intended application.
6. Gaskets in continuous contact with structural silicone shall be extruded silicone or compatible material.

F. Steel Components

1. Provide steel reinforcements as necessary to meet the performance requirements of 1.03.
2. Concealed steel anchors and reinforcing shall be factory painted after fabrication with TGIC powder coating, or rust-inhibitive primer complying with Federal Specification TT-P-645B.

G. Muntins:

1. Provide muntin grids as shown on architectural drawings.
2. Finish to match window frames.

H. Receptors:

1. Provide extruded aluminum receptors to receive windows, as shown on architectural drawings.
2. Finish to match window frames.

2.5 FABRICATION

A. General:

1. Finish, fabricate and shop assemble frame and sash ventilator members into complete windows under the responsibility of one manufacturer.
2. No bolts, screws or fastenings shall impair independent frame movement, or bridge the thermal barrier, unless such bridging was also present in thermal test units and thermal models.
3. Fabricate to allow for thermal movement of materials when subjected to a temperature differential from -30 • F to +180 • F.

B. Frames:

1. Cope and mechanically fasten each corner, or miter and weld each corner; then seal weather tight.
2. Make provisions for continuity of frame joinery seals at extrusion webs.

C. Glass Drainage: (field glazed units only)

1. Provision shall be made to insure that water will not accumulate and remain in contact with the perimeter area of sealed insulated glass.

D. Thermal Break Construction:

1. Continuous extruded polyamide with 25% glass fiber reinforcing, mechanically crimped into cross-knurled cavities.
2. Minimum thermal separation: 5/8".
3. Quality assurance records must be maintained and available as requested.

2.6 FINISHES

A. Color Anodic Finish: AAMA 611, AA-M12C22A42/A44, Class I, 0.018 mm or thicker.

1. Color: Medium Bronze.

PART 3 - EXECUTION

3.1 EXAMINATION

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

B. Verify rough opening dimensions, levelness of sill plate, and operational clearances.

C. Examine wall flashings, vapor retarders, water and weather barriers, and other built-in components to ensure weathertight window installation.

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

3.2 INSTALLATION

A. Erection of Aluminum Windows

1. Install all windows with skilled workers in accordance with approved shop drawings, installation instructions, specifications, and the AAMA Commercial Window and Door Installation Manual.
2. Aluminum that is not organically coated shall be insulated from direct contact with steel, masonry, concrete or other dissimilar metals by bituminous paint, rust-inhibiting primer, non-conductive shims or other suitable insulating material.

3.3 ADJUSTING, CLEANING, AND PROTECTION

A. Clean exposed surfaces immediately after installing windows. Avoid damaging protective coatings and finishes. Remove excess sealants, glazing materials, dirt, and other substances.

1. Keep protective films and coverings in place until final cleaning.

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

C. Protect window surfaces from contact with contaminating substances resulting from construction operations. If contaminating substances do contact window surfaces, remove contaminants immediately according to manufacturer's written instructions.

END OF SECTION 085113

SECTION 088000 - GLAZING

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

A. Section includes:

1. Glass for doors, interior borrowed lites, storefront framing, and glazed curtain walls.
2. Glazing sealants and accessories.

B. Related Requirements:
1. Section 088813 "Fire-Resistant Glazing."

1.3 DEFINITIONS

A. Glass Manufacturers: Firms that produce primary glass, fabricated glass, or both, as defined in referenced glazing publications.

B. Glass Thicknesses: Indicated by thickness designations in millimeters according to ASTM C 1036.

C. IBC: International Building Code.

D. Interspace: Space between lites of an insulating-glass unit.

1.4 COORDINATION

A. Coordinate glazing channel dimensions to provide necessary bite on glass, minimum edge and face clearances, and adequate sealant thicknesses, with reasonable tolerances.

1.5 PREINSTALLATION MEETINGS

A. Preinstallation Conference: Conduct conference at Project site.

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

1.6 ACTION SUBMITTALS

A. Product Data: For each type of product.

B. Glass Samples: For each type of glass product other than clear monolithic vision glass; 12 inches (300 mm) square.
1. Coated glass.
2. Insulating glass.

C. Glazing Accessory Samples: For 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.

1.7 INFORMATIONAL SUBMITTALS

A. Qualification Data: For Installer, manufacturers of insulating-glass units with sputter-coated, low-E coatings, and sealant testing agency.

B. Product Certificates: For glass.

C. Product Test Reports: For tinted glass, coated glass, insulating glass, and glazing sealants, for tests performed by a qualified testing agency.

1. For glazing sealants, provide test reports based on testing current sealant formulations within previous 36-month period.

D. Preconstruction adhesion and compatibility test report.

E. Sample Warranties: For special warranties.

1.8 QUALITY ASSURANCE

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

B. Installer Qualifications: A qualified installer who employs glass installers for this Project who are certified under the National Glass Association's Certified Glass Installer Program.

C. Glass Testing Agency Qualifications: A qualified independent testing agency accredited according to the NFRC CAP 1 Certification Agency Program.

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

1.9 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 instructions for venting and sealing units to avoid hermetic seal ruptures due to altitude change.

1.10 FIELD 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 are below 40 deg F (4.4 deg C).

1.11 WARRANTY

A. Manufacturer's Special Warranty for Coated-Glass Products: 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 for 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, delamination materially obstructing vision through glass, and blemishes exceeding those allowed by referenced laminated-glass standard.

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

C. Manufacturer's Special Warranty for 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 MANUFACTURERS

A. Basis-of-Design Glass Product: Subject to compliance with requirements, provide product indicated in glass schedules or comparable product by one of the following:
1. Guardian Industries Corp.; SuperNeutral 68 SunGuard Low-E (basis-of-design)
2. PPG Industries, Inc.; SolarBan 60 Low-E
3. Prior approved equal.

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

C. Source Limitations for Glazing Accessories: Obtain from single source from single manufacturer for each product and installation method.

### 2.2 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: Engage a qualified professional engineer, as defined in Section 014000 "Quality Requirements," to design glazing.

C. Structural Performance: Glazing shall withstand the following design loads within limits and under conditions indicated determined according to the IBC and ASTM E 1300.

1. Design Wind Pressures: As indicated on Drawings.
2. Design Wind Pressures: Determine design wind pressures applicable to Project according to ASCE/SEI 7, based on heights above grade indicated on Drawings.

    a. Wind Design Data: As indicated on Drawings.
    b. Basic Wind Speed: 90 mph (40 m/s).
    c. Importance Factor: 1.15.
    d. Exposure Category: C.

3. Thickness of Patterned Glass: Base design of patterned glass on thickness at thinnest part of the glass.

4. 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.

5. Differential Shading: Design glass to resist thermal stresses induced by differential shading within individual glass lites.

D. Safety Glazing: Where safety glazing is indicated, provide glazing that complies with 16 CFR 1201, Category II.

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

1. For monolithic-glass lites, properties are based on units with lites 6 mm thick unless noted otherwise.
2. For laminated-glass lites, properties are based on products of construction indicated.
3. For insulating-glass units, properties are based on units of thickness indicated for overall unit and for each lite.
4. U-Factors: Center-of-glazing values, according to NFRC 100 and based on LBL's WINDOW 5.2 computer program, expressed as Btu/sq. ft. x h x deg F (W/sq. m x K).
5. 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.
6. Visible Reflectance: Center-of-glazing values, according to NFRC 300.

2.3 GLASS PRODUCTS, GENERAL

A. Glazing Publications: Comply with published recommendations of glass product manufacturers and organizations below unless more stringent requirements are indicated. See these publications for glazing terms not otherwise defined in this Section or in referenced standards.

1. GANA Publications: "Laminated Glazing Reference Manual" and "Glazing Manual."
2. IGMA Publication for Insulating Glass: SIGMA TM-3000, "North American Glazing Guidelines for Sealed Insulating Glass Units for Commercial and Residential Use."

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

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

D. Thickness: Where glass thickness is indicated, it is a minimum. Provide glass that complies with performance requirements and is not less than the thickness indicated.

1. Minimum Glass Thickness for Exterior Lites: 6 mm unless noted otherwise.
2. Thickness of Tinted Glass: Provide same thickness for each tint color indicated throughout Project.

E. Strength: Where annealed float glass is indicated, provide annealed float glass, heat-strengthened float glass, or fully tempered float glass as needed to comply with "Performance Requirements" Article. Where heat-strengthened float glass is indicated, provide heat-strengthened float glass or fully tempered float glass as needed to comply with "Performance Requirements" Article. Where fully tempered float glass is indicated, provide fully tempered float glass.

2.4 GLASS PRODUCTS

A. Clear Annealed Float Glass: ASTM C 1036, Type I, Class 1 (clear), Quality-Q3.

B. Fully Tempered Float Glass: ASTM C 1048, Kind FT (fully tempered), Condition A (uncoated) unless otherwise indicated, Type I, Class 1 (clear) or Class 2 (tinted) as indicated, Quality-Q3.

1. Fabrication Process: By horizontal (roller-hearth) process with roll-wave distortion parallel to bottom edge of glass as installed unless otherwise indicated.

C. Heat-Strengthened Float Glass: ASTM C 1048, Kind HS (heat strengthened), Type I, Condition A (uncoated) unless otherwise indicated, Type I, Class 1 (clear) or Class 2 (tinted) as indicated, Quality-Q3.

1. Fabrication Process: By horizontal (roller-hearth) process with roll-wave distortion parallel to bottom edge of glass as installed unless otherwise indicated.

D. Ceramic-Coated Spandrel Glass: ASTM C 1048, Type I, Condition B, Quality-Q3.

## 2.5 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.

1. Sealing System: Dual seal, with manufacturer's standard primary and secondary sealants.
2. Spacer: Thermally broken aluminum, nonmetallic laminate, or nonmetallic tube.
3. Desiccant: Molecular sieve or silica gel, or a blend of both.

## 2.6 GLAZING SEALANTS

A. General:

1. Compatibility: Compatible with one another and with other materials they 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. Field-applied sealants shall have a VOC content of not more than 250 g/L.
4. 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 25, Use NT.

1. Products: Subject to compliance with requirements, provide one of the following:

a. Dow Corning Corporation; 1199 or 899.
b. GE Advanced Materials - Silicones; UltraGlaze SSG4000 or UltraGlaze SSG4000AC.
c. Polymeric Systems, Inc.; PSI-631.
d. Tremco Incorporated; Proglaze SSG or Tremsil 600.
e. Prior approved equal.

C. Glazing Sealant: Acid-curing silicone glazing sealant complying with ASTM C 920, Type S, Grade NS, Class 25, Use NT.

1. Products: Subject to compliance with requirements, provide one of the following:

a. Dow Corning Corporation; General Purpose Sealant or 999-A.
b. GE Advanced Materials - Silicones; Contractors SCS1000 or Construction SCS1200.
c. Polymeric Systems, Inc.; PSI-601.
d. Tremco Incorporated; Proglaze or Tremsil 200.
e. Prior approved 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 for products indicated below:

1. AAMA 804.3 tape, where indicated.
2. AAMA 806.3 tape, for glazing applications in which tape is subject to continuous pressure.
3. AAMA 807.3 tape, for glazing applications in which tape is not subject to continuous pressure.

B. Expanded Cellular Glazing Tapes: Closed-cell, PVC foam tapes; factory coated with adhesive on both surfaces; and complying with AAMA 800 for the following types:

1. AAMA 810.1, Type 1, for glazing applications in which tape acts as the primary sealant.
2. AAMA 810.1, Type 2, for glazing applications in which tape is used in combination with a full bead of liquid sealant.

## 2.8 MISCELLANEOUS GLAZING MATERIALS

A. General: Provide products of material, size, and shape complying with referenced glazing standard, with 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).

## 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.

1. Allow for thermal movements from ambient and surface temperature changes acting on glass framing members and glazing components.

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

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.

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

C. Apply primers to joint surfaces where required for adhesion of sealants, as determined by preconstruction testing.

D. 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.

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

F. 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.

G. 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.

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

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

J. 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.

K. 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, then to jambs. Cover horizontal framing joints by applying tapes to jambs, 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 pressure-glazing 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. Immediately after installation remove nonpermanent labels and clean surfaces.

B. Protect glass from contact with contaminating substances resulting from construction operations. 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.

1. If, despite such protection, contaminating substances do come into contact with glass, remove substances immediately as recommended in writing by glass manufacturer. Remove and replace glass that cannot be cleaned without damage to coatings.

C. Remove and replace glass that is damaged during construction period.

D. Wash glass on both exposed surfaces 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.

3.8 MONOLITHIC GLASS SCHEDULE

A. Glass Type [**GL-3**]: Clear float glass.

1. Minimum Thickness: 6 mm.

B. Glass Type [**GL-4**]: Clear heat-strengthened or fully tempered float glass.

1. Minimum Thickness: 6 mm.
2. Safety glazing required.

3.9 INSULATING GLASS SCHEDULE

A. Glass Type [**GL-1**]: Low-E-coated, clear insulating glass.

1. Basis-of-Design Product: Guardian Industries, Corp; SunGuard Super Neutral 68
2. Overall Unit Thickness: 1 inch (25 mm).
3. Minimum Thickness of Each Glass Lite: 6 mm.
4. Outdoor Lite: Annealed, Heat-strengthened, or Fully Tempered float glass.
5. Interspace Content: Argon.
6. Indoor Lite: Annealed.
7. Low-E Coating: Pyrolytic or sputtered on second or third surface.
8. Winter Nighttime U-Factor: .25 maximum.
9. Summer Daytime U-Factor: .28 maximum.
10. Visible Light Transmittance: 58 percent minimum.
11. Solar Heat Gain Coefficient: .35 maximum.
12. Safety glazing required.

B. Glass Type [**GL-2**]: Low-E-coated, clear insulating glass, indoor lite heat strengthened.

1. Basis-of-Design Product: Guardian Industries, Corp; SunGuard Super Neutral 68
2. Overall Unit Thickness: 1 inch (25 mm).
3. Minimum Thickness of Each Glass Lite: 6 mm.
4. Outdoor Lite: Annealed, Heat-strengthened, or Fully Tempered float glass.
5. Interspace Content: Argon.
6. Indoor Lite: Fully tempered float glass.
7. Low-E Coating: Pyrolytic or sputtered on second or third surface.
8. Winter Nighttime U-Factor: .25 maximum.
9. Summer Daytime U-Factor: .28 maximum.
10. Visible Light Transmittance: 58 percent minimum.
11. Solar Heat Gain Coefficient: .35 maximum.
12. Safety glazing required.

C. Glass Type [**GL-11**]: Ceramic-coated, tinted insulating spandrel glass.

1. Basis-of-Design Product: Guardian Industries, Corp; SunGuard Super Neutral 68.
2. Overall Unit Thickness: 1 inch (25 mm).
3. Minimum Thickness of Each Glass Lite: 6 mm.
4. Outdoor Lite: Annealed, Heat-strengthened or Fully tempered float glass.
5. Tint Color: As selected by Architect from manufacturer's full range.
6. Interspace Content: Argon.

7. Indoor Lite: Heat-strengthened or fully tempered float glass.
8. Opaque Coating Location: Fourth surface.
9. Opaque Coating Color: As selected by Architect from manufacturer's full range.
10. Winter Nighttime U-Factor: .25 maximum.
11. Summer Daytime U-Factor: .28 maximum.

END OF SECTION 088000

SECTION 092216 - NON-STRUCTURAL METAL FRAMING

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

A. Section Includes:

1. Non-load-bearing steel framing systems for interior gypsum board assemblies.

B. Related Requirements:

1. Division 06 Section “Rough Carpentry” for wood blocking/backing as an optional alternate to flat strap and backing plate by this Section.

1.3 ACTION SUBMITTALS

A. Product Data: For each type of product.

PART 2 - PRODUCTS

2.1 PERFORMANCE REQUIREMENTS

A. Fire-Test-Response Characteristics: For fire-resistance-rated assemblies that incorporate non-load-bearing steel framing, provide materials and construction identical to those tested in assembly indicated, according to ASTM E 119 by an independent testing agency.

B. STC-Rated Assemblies: For STC-rated assemblies, provide materials and construction identical to those tested in assembly indicated, according to ASTM E 90 and classified according to ASTM E 413 by an independent testing agency.

2.2 FRAMING SYSTEMS

A. Framing Members, General: Comply with ASTM C 754 for conditions indicated.

1. Steel Sheet Components: Comply with ASTM C 645 requirements for metal unless otherwise indicated.
2. Protective Coating: ASTM A 653/A 653M, G40, hot-dip galvanized unless otherwise indicated.

B. Studs and Runners: ASTM C 645. Use either steel studs and runners or dimpled steel studs and runners.

1. Steel Studs and Runners:

a. Minimum Base-Metal Thickness:

1) Studs: 0.027 inch (22 gauge).
2) Runners: 0.033 inch (20 gauge).

b. Depth: As indicated on Drawings.
c. Use deep leg runners at tops of walls.

2. Dimpled Steel Studs and Runners:

a. Minimum Base-Metal Thickness:

1) Studs: 0.025 inch (20 gauge equivalent)
2) Runners: 0.025 inch (20 gauge equivalent).

b. Depth: As indicated on Drawings.
c. Use deep leg runners at tops of walls.

C. Flat Strap and Backing Plate: Steel sheet for blocking and bracing in length and width indicated.

1. Minimum Base-Metal Thickness: 0.027 inch.

D. Hat-Shaped, Rigid Furring Channels: ASTM C 645.

1. Minimum Base-Metal Thickness: 0.018 inch.
2. Depth: As indicated on Drawings.

E. Resilient Furring Channels: 1/2-inch- deep, steel sheet members designed to reduce sound transmission.

1. Configuration: Asymmetrical or hat shaped.

F. Radius Framing: Steel sheet runner for non-load-bearing curves, bends, variable radii and arches using a work-hardened steel base strip.

1. Basis-of-Design Product: Subject to compliance with requirements, provide ClarkDietrich Building Systems; Framing Contour Track CNTB, or a comparable product.

2.3 AUXILIARY MATERIALS

A. General: Provide auxiliary materials that comply with referenced installation standards.

1. Fasteners for Metal Framing: Of type, material, size, corrosion resistance, holding power, and other properties required to fasten steel members to substrates.

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

3.2 PREPARATION

A. Coordination with Sprayed Fire-Resistive Materials:

1. Before sprayed fire-resistive materials are applied, attach offset anchor plates or ceiling runners (tracks) to surfaces indicated to receive sprayed fire-resistive materials. Where offset anchor plates are required, provide continuous plates fastened to building structure not more than 24 inches o.c.
2. After sprayed fire-resistive materials are applied, remove them only to extent necessary for installation of non-load-bearing steel framing. Do not reduce thickness of fire-resistive materials below that required for fire-resistance ratings indicated. Protect adjacent fire-resistive materials from damage.

3.3 INSTALLATION, GENERAL

A. Installation Standard: ASTM C 754.

1. Gypsum Board Assemblies: Also comply with requirements in ASTM C 840 that apply to framing installation.

B. Install supplementary framing, and blocking to support fixtures, equipment services, heavy trim, grab bars, toilet accessories, furnishings, or similar construction.

C. Install bracing at terminations in assemblies.

D. Do not bridge building control and expansion joints with non-load-bearing steel framing members. Frame both sides of joints independently.

3.4 INSTALLING FRAMED ASSEMBLIES

A. Install framing system components according to spacings indicated, but not greater than spacings required by referenced installation standards for assembly types.

1. Single-Layer Application: 16 inches o.c. unless otherwise indicated.
2. Tile Backing Panels: 16 inches o.c. unless otherwise indicated.

B. Where studs are installed directly against exterior masonry walls or dissimilar metals at exterior walls, install isolation strip between studs and exterior wall.

C. Install studs so flanges within framing system point in same direction.

D. Install tracks (runners) at floors and overhead supports. Extend framing full height to structural supports or substrates above suspended ceilings except where partitions are indicated to terminate at suspended ceilings. Continue framing around ducts penetrating partitions above ceiling.

1. Door Openings: Screw vertical studs at jambs to jamb anchor clips on door frames; install runner track section (for cripple studs) at head and secure to jamb studs.

    a. Install two studs at each jamb unless otherwise indicated.
    b. Install cripple studs at head adjacent to each jamb stud, with a minimum 1/2-inch clearance from jamb stud to allow for installation of control joint in finished assembly.
    c. Extend jamb studs through suspended ceilings and attach to underside of overhead structure.

2. Other Framed Openings: Frame openings other than door openings the same as required for door openings unless otherwise indicated. Install framing below sills of openings to match framing required above door heads.
3. Fire-Resistance-Rated Partitions: Install framing to comply with fire-resistance-rated assembly indicated and support closures and to make partitions continuous from floor to underside of solid structure.
4. Sound-Rated Partitions: Install framing to comply with sound-rated assembly indicated.

E. Direct Furring:

1. Screw to steel stud framing.
2. Attach to concrete or masonry with stub nails, screws designed for masonry attachment, or powder-driven fasteners spaced 24 inches o.c.

F. Installation Tolerance: Install each framing member so fastening surfaces vary not more than 1/8 inch from the plane formed by faces of adjacent framing.

END OF SECTION 092216

SECTION 092900 - GYPSUM BOARD

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

A. Section Includes:

1. Interior gypsum board.
2. Tile backing panels.
3. Texture finishes.

B. Related Requirements:
1. Section 061600 "Sheathing" for gypsum sheathing for exterior walls.
2. Section 092216 "Non-Structural Metal Framing" for non-structural framing and suspension systems that support gypsum board panels.
3. Section 092116.23 "Gypsum Board Shaft Wall Assemblies" for metal shaft-wall framing, gypsum shaft liners, and other components of shaft-wall assemblies.
4. Section 093000 "Tiling" for cementitious backer units installed as substrates for ceramic tile.

1.3 ACTION SUBMITTALS

A. Product Data: For each type of product.

B. Samples: For the following products:
1. Textured Finishes: 12-inches x 12-inches for each textured finish indicated and on same backing indicated for Work.

1.4 QUALITY ASSURANCE

A. 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 level of gypsum board finish indicated for use in exposed locations.
b. Each texture finish indicated.

1.5 DELIVERY, STORAGE AND HANDLING

A. Store materials inside under cover and keep them dry and protected against weather, condensation, direct sunlight, construction traffic, and other potential causes of damage. Stack panels flat and supported on risers on a flat platform to prevent sagging.

1.6 FIELD CONDITIONS

A. Environmental Limitations: Comply with ASTM C 840 requirements or gypsum board manufacturer's written recommendations, whichever are more stringent.

B. Do not install paper-faced gypsum panels until installation areas are enclosed and conditioned.

C. Do not install panels that are wet, those that are moisture damaged, and those that are mold damaged.

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

PART 2 - PRODUCTS

2.1 PERFORMANCE REQUIREMENTS

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. STC-Rated Assemblies: For STC-rated assemblies, provide materials and construction identical to those tested in assembly indicated according to ASTM E 90 and classified according to ASTM E 413 by an independent testing agency.

2.2 GYPSUM BOARD, GENERAL

A. Size: Provide maximum lengths and widths available that will minimize joints in each area and that correspond with support system indicated.

2.3 INTERIOR GYPSUM BOARD

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

1. American Gypsum.
2. CertainTeed Corp.
3. Georgia-Pacific Gypsum LLC.
4. Lafarge North America Inc.
5. National Gypsum Company.
6. USG Corporation.
7. Prior approved equal.

B. Gypsum Board, Type X: ASTM C 1396/C 1396M.

1. Thickness: 5/8 inch (15.9 mm).
2. Long Edges: Tapered.

C. Gypsum Ceiling Board: ASTM C 1396/C 1396M.

1. Thickness: 5/8 inch (15.9 mm).
2. Long Edges: Tapered.

D. Moisture- and Mold-Resistant Gypsum Board: ASTM C 1396/C 1396M. With moisture- and mold-resistant core and paper surfaces.

1. Core: 5/8 inch (15.9 mm), Type X.
2. Long Edges: Tapered.
3. Mold Resistance: ASTM D 3273, score of 10 as rated according to ASTM D 3274.

2.4 SPECIALTY GYPSUM BOARD

A. Gypsum Board, Type C: ASTM C 1396/C 1396M. Manufactured to have increased fire-resistive capability.

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. American Gypsum; Firebloc Type C.
b. CertainTeed Corp.; ProRoc Type C.
c. Georgia-Pacific Gypsum LLC; Fireguard C.
d. Lafarge North America Inc.; Firecheck Type C.
e. National Gypsum Company; Gold Bond Fire-Shield C.
f. USG Corporation; Firecode C Core.
g. Prior approved equal.

2. Thickness: As required by fire-resistance-rated assembly indicated on Drawings.

3. Long Edges: Tapered.

2.5 TILE BACKING PANELS

A. Cementitious Backer Units: ANSI A118.9 and ASTM C 1288 or 1325, with manufacturer's standard edges.

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. National Gypsum Company, Permabase Cement Board.
b. USG Corporation; DUROCK Cement Board.
c. Prior approved equal.

2. Thickness: 5/8 inch (15.9 mm), Type X.
3. Mold Resistance: ASTM D 3273, score of 10.
4. Location: At wall locations where tile is indicated on Drawings.

2.6 TRIM ACCESSORIES

A. Interior Trim: ASTM C 1047.

1. Material: Galvanized or aluminum-coated steel sheet or rolled zinc.
2. Shapes:

a. Cornerbead.
b. LC-Bead: J-shaped; exposed long flange receives joint compound.
c. L-Bead: L-shaped; exposed long flange receives joint compound.
d. U-Bead: J-shaped; exposed short flange does not receive joint compound.
e. Expansion (control) joint.

B. Aluminum Trim: Extruded accessories of profiles and dimensions indicated.

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

a. Fry Reglet Corp.
b. Gordon, Inc.
c. Pittcon Industries.
d. Prior approved equal.

2. Aluminum: Alloy and temper with not less than the strength and durability properties of ASTM B 221 (ASTM B 221M), Alloy 6063-T5.
3. Finish: Corrosion-resistant primer compatible with joint compound and finish materials specified, clear finish for Class II anodic finishes.

2.7 JOINT TREATMENT MATERIALS

A. General: Comply with ASTM C 475/C 475M.

B. Joint Tape:

1. Interior Gypsum Board: Paper.
2. Tile Backing Panels: As recommended by panel manufacturer.

C. Joint Compound for Interior Gypsum Board: For each coat use formulation that is compatible with other compounds applied on previous or for successive coats.

1. Prefilling: At open joints and damaged surface areas, use setting-type taping compound.
2. Embedding and First Coat: For embedding tape and first coat on joints, fasteners, and trim flanges, use drying-type, all-purpose compound.

a. Use setting-type compound for installing paper-faced metal trim accessories.

3. Fill Coat: For second coat, use drying-type, all-purpose compound.
4. Finish Coat: For third coat, use drying-type, all-purpose compound.
5. Skim Coat: For final coat of Level 5 finish, use high-build interior coating product designed for application by airless sprayer and to be used instead of skim coat to produce Level 5 finish.

D. Joint Compound for Tile Backing Panels:

1. Cementitious Backer Units: As recommended by backer unit manufacturer.

2.8 AUXILIARY MATERIALS

A. General: Provide auxiliary materials that comply with referenced installation standards and manufacturer's written recommendations.

B. Laminating Adhesive: Adhesive or joint compound recommended for directly adhering gypsum panels to continuous substrate.

C. Steel Drill Screws: ASTM C 1002, unless otherwise indicated.

1. Use screws complying with ASTM C 954 for fastening panels to steel members from 0.033 to 0.112 inch (0.84 to 2.84 mm) thick.
2. For fastening cementitious backer units, use screws of type and size recommended by panel manufacturer.

D. Sound Attenuation Blankets: ASTM C 665, Type I (blankets without membrane facing) produced by combining thermosetting resins with mineral fibers manufactured from glass, slag wool, or rock wool.

1. Fire-Resistance-Rated Assemblies: Comply with mineral-fiber requirements of assembly.

E. 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. Accumetric LLC; BOSS 824 Acoustical Sound Sealant.
b. Grabber Construction Products; Acoustical Sealant GSC.
c. Specified Technologies, Inc.; Smoke N Sound Acoustical Sealant.
d. USG Corporation; SHEETROCK Acoustical Sealant.
e. Prior approved equal.

F. Thermal Insulation: As specified in Division 07 Section "Thermal Insulation."

G. Vapor Retarder: As specified in Division 07 Section "Thermal Insulation."

2.9 TEXTURE FINISHES

A. Primer: As recommended by textured finish manufacturer; e.g. Sure Coat or similar.

B. Non-Aggregate Finish: Pre-mixed, vinyl texture finish for spray application.

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. CertainTeed Corp.; ProRoc Easi-Tex Spray Texture.
b. USG Corporation; BEADEX FasTex Wall and Ceiling Spray Texture.
c. Prior approved equal.

2. Texture: Light Spatter.

## PART 3 - EXECUTION

### 3.1 EXAMINATION

A. Examine areas and substrates including welded hollow-metal frames and framing, with Installer present, 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. Attachment to Steel Framing: Attach panels so leading edge or end of each panel is attached to open (unsupported) edges of stud flanges first.

I. STC-Rated Assemblies: 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 for locating edge trim and closing off sound-flanking paths around or through assemblies, including sealing partitions above acoustical ceilings.

J. Install sound attenuation blankets before installing gypsum panels unless blankets are readily installed after panels have been installed on one side.

### 3.3 APPLYING INTERIOR GYPSUM BOARD

A. Install interior gypsum board in the following locations:

1. Wallboard Type: Vertical surfaces unless otherwise indicated.
2. Type X: Where required for fire-resistance-rated assembly.
3. Ceiling Type: Ceiling surfaces.
4. Moisture- and Mold-Resistant Type: Within 4 feet of all wet locations not prepared for tile.
5. Type C: Where required for specific fire-resistance-rated assembly 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 horizontally (perpendicular 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.
    c. Maintain ½" clearance above concrete floor to bottom of gypsum panels.

3. On Z-furring members, apply gypsum panels vertically (parallel to framing) with no end joints. Locate edge joints over furring members.
4. Fastening Methods: Apply gypsum panels to supports with steel drill screws.

C. Multilayer Application:

1. On ceilings, apply gypsum board indicated for base layers before applying base layers on walls/partitions; apply face layers in same sequence. Apply base layers at right angles to framing members and offset face-layer joints one framing member, 16 inches (400 mm) minimum, from parallel base-layer joints, unless otherwise indicated or required by fire-resistance-rated assembly.
2. On partitions/walls, apply gypsum board indicated for base layers and face layers vertically (parallel to framing) with joints of base layers located over stud or furring member and face-layer joints offset at least one stud or furring member with base-layer joints, unless otherwise indicated or required by fire-resistance-rated assembly. Stagger joints on opposite sides of partitions.
    a. Maintain ½" clearance above concrete floor to bottom of gypsum panels.

3. On Z-furring members, apply base layer vertically (parallel to framing) and face layer either vertically (parallel to framing) or horizontally (perpendicular to framing) with vertical joints offset at least one furring member. Locate edge joints of base layer over furring members.
4. Fastening Methods: Fasten base layers and face layers separately to supports with screws.

D. Laminating to Substrate: Where gypsum panels are indicated as directly adhered to a substrate (other than studs, joists, furring members, or base layer of gypsum board), comply with gypsum board manufacturer's written recommendations and temporarily brace or fasten gypsum panels until fastening adhesive has set.

## 3.4 APPLYING TILE BACKING PANELS

A. Cementitious Backer Units: Comply with manufacturer's written installation instructions and install at locations indicated to receive tile. Install with 1/4-inch (6.4-mm) gap where panels abut other construction or penetrations.

B. Where tile backing panels abut other types of panels in same plane, shim surfaces to produce a uniform plane across panel surfaces.

## 3.5 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 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. LC-Bead: Use at exposed panel edges.
3. L-Bead: Use where indicated.
4. U-Bead: Use at exposed panel edges.

D. Aluminum Trim: Install in locations indicated on Drawings.

3.6 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 and damaged surface areas.

C. Apply joint tape over gypsum board joints, except for trim products specifically indicated as not intended to receive tape.

D. Gypsum Board Finish Levels: Finish panels to levels indicated below and according to ASTM C 840:

1. Level 2: Ceiling plenum areas, concealed areas, and where indicated.
2. Level 4: At panel surfaces that will be exposed to view unless otherwise indicated.

a. Primer and its application to surfaces are specified in other Division 09 Sections.

3. Level 5: Where indicated on Drawings.

a. Primer and its application to surfaces are specified in other Division 09 Sections.

E. Cementitious Backer Units: Finish according to manufacturer's written instructions.

3.7 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.

3.8 PROTECTION

A. Protect adjacent surfaces from drywall compound and promptly remove from floors and other non-drywall surfaces. Repair surfaces stained, marred, or otherwise damaged during drywall application.

B. Protect installed products from damage from weather, condensation, direct sunlight, construction, and other causes during remainder of the construction period.

C. Remove and replace panels that are wet, moisture damaged, and mold damaged.

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

END OF SECTION 092900

**MOCK-UPS**

A. Textured finishes, 24x24

**INTERIOR GYPSUM BOARD**

A. Gypsum Board, Type X: ASTM C 1396/C 1396M.
    a. Thickness: 5/8 inch (15.9 mm).
    b. Long Edges: Tapered.
B. Gypsum Ceiling Board: ASTM C 1396/C 1396M.
    a. Thickness: 5/8 inch (15.9 mm).
    b. Long Edges: Tapered.

**TILE BACKING PANELS**

A. Product: USG Corporation; DUROCK Cement Board.
B. Thickness: 5/8 inch (15.9 mm), Type X

**FINISHING GYPSUM BOARD**

A. Level 2: Ceiling plenum areas, concealed areas, and where indicated.
B. Level 4: At panel surfaces that will be exposed to view unless otherwise indicated.

**STENCILING**

Walls shall be stenciled with fire separation/rating every 20’ above ACT ceiling.

**END OF SECTION**

**SUBMITTALS**

1. Full size verification Samples for each type of approved tile, grout, and sealant, mounted on plywood or hardboard, 24 inches square
2. 6 inch long, full profile sample of Metal Edge Strip

**SITE CONDITIONS**

1. Maintain temperature in tiled areas of at least 60 degrees F for 7 days before, during and after installation.

**MAINTENANCE STOCK**

1. Furnish additional tile from same production run for a total of 5% of installed quantity

**PRODUCT**

1. (PT1) Porcelain Tile: Reference Finish Plans
2. (CT1) Ceramic Tile: Reference Finish Plans
3. Epoxy Grout: Reference Finish Plans

**ACCESSORIES**

1. Metal Edge Strip: Extruded profile sized for set tile thickness and adjoining floor finishes.
   A. Manufacturer: Schluter Systems L.P.
   B. Finish: Reference Finish Plans

**END OF SECTION**

**SUBMITTALS**

1. Full-size Samples of selected panels, and 6 inches long Samples of each linear component.

**MAINTENANCE STOCK**

2. Furnish 2 percent of the installed area for each type of panel from the same production run for maintenance stock.

**MANUFACTURER**

1. USGBC
2. or equal

**STYLE**

1. ACT1 - Halcyon Climaplus #99223 White R-3.3 (3/4" product): For Offices and Exam Rooms without walls to deck
2. ACT2 – Clean Room Climaplus Class 100 White: For Wet Rooms, Surgery Rooms, Negative Air, and Isolation Rooms
3. ACT3 – Frost Climaplus #414 White: For common spaces, corridors, etc. **(Also for offices and exam rooms if walls go to deck)**

**GRID**

1. ACT1 – Standard 2' x 2' grid
2. ACT2 – Extruded Aluminum 2' x 2' grid
1. ACT3 – Standard 2' x 2' grid

**INSTALLATION**

1. Lay out ceiling to balance border widths at opposite edges of each ceiling. Avoid use of border units that are less than half size. Comply with reflected ceiling plans.

2. Install grid supports 48 inches o.c. maximum.

**END OF SECTION**

## SECTION 09-6500 - RESILIENT FLOORING

## PART 1 - GENERAL

### 1.01 SECTION INCLUDES

A. Sheet flooring.

B. Rubber Flooring.

C. Resilient base.

D. Transition strips.

### 1.02 SUBMITTALS

A. Manufacturer's Product Data for each product and accessory.

B. Samples of selections specified, or color charts of standard colors for items not already specified, for selection by Architect.

C. Shop Drawings showing location and extent of resilient flooring, clearly indicating directions, locations, patterns, types of edge strips. Show installation details at special conditions.

### 1.03 QUALITY ASSURANCE

A. Installer of sheet flooring shall be certified in writing by the sheet flooring manufacturer.

### 1.04 DELIVERY, STORAGE, AND HANDLING

A. Store materials containing solvents in sealed containers.

### 1.05 SITE CONDITIONS

A. Continuously heat areas to receive resilient flooring to 70 degrees F 48 hours before, and until 48 hours after installation. After installation maintain 55 degrees F.

B. Store materials in the installation area at least 48 hours prior to installation.

### 1.06 MAINTENANCE STOCK

A. Furnish 2 percent of installed area of each type of resilient flooring from same production run, exclusive of material required to properly complete the installation. Wrap each type separately in protective coverings. Label with Project title and number, manufacturer, brand name, pattern, color, and lot number.

## PART 2 - PRODUCTS

### 2.01 MANUFACTURERS

A. Acceptable manufacturers: Products indicated in Section 09-0610 are the standard for color, texture, and performance.

### 2.02 GENERAL

A. Appearance: Same color run, color, and pattern uniformly distributed throughout thickness; variation in shade or pattern between containers shall be rejected.

B. Dimensions: Uniform size and thickness; edges sharply cut to permit tight, inconspicuous joints.

### 2.03 FLOORING PRODUCTS

A. Sheet vinyl without backing (RF1 and RF2): ASTM F1303, wear layer Type 1, Grade 1, Class B, 3 ply fused backing, 0.20 inch thick clear PVC wear layer, 2.34 inch total thickness.

B. Rubber flooring (RF3 thru RF11): ASTM F1344, Class 1, slip resistance meeting ASTM D2047 greater than 0.5, flammability meeting ASTM E 648 and NFPA 253 not less than 0.45 watts per square centimeter.

C. Resilient base (RB): ASTM F1861, Type TP, Group 1, rubber; Style A straight (toeless) and Style B coved (toe); height as indicated; 1/8 inch gauge.

### 2.04 ACCESSORIES

A. Adhesives: Waterproof, low VOC, stabilized type recommended by the flooring manufacturer for conditions of use.

B. Adhesives at beds: Armstrong S-240 Epoxy Adhesive to be used under entire bed area (minimum of 4 feet by 7 feet) in all rooms utilizing Hill-Rom beds.

C. Edge strips: Rubber or vinyl reducing strips of same thickness as adjacent resilient flooring; color as selected.

D. Miscellaneous: Primers, cleaners, floor finishing products, fasteners, and other accessories with low VOC recommended by primary flooring manufacturer for conditions of use.

## PART 3 - EXECUTION

### 3.01 SURFACE PREPARATION

A. Prior to start of work, clean surfaces to be covered; remove grease, oil, and other surface contamination which might prevent satisfactory results. Surface preparation and installation shall comply with manufacturer's recommendations.

B. Fill cracks, holes, and depressions with leveling compound. Remove surface irregularities which might telegraph to the finished flooring surface.

C. Perform moisture tests to ensure that new concrete floors, patches, and repairs are sufficiently cured to receive resilient flooring.

D. Apply primers as recommended by manufacturer.

**3.02 INSTALLATION**

A. Install flooring materials only after finishing operations are complete. Where movable equipment is shown, install flooring before installation of equipment.

B. Butt flooring material tightly to vertical surfaces; scribe and cut edges neatly. Extend into toe spaces, door reveals, closets, and similar openings and recesses.

C. Lay sheet flooring to provide as few seams as possible without undue waste of material. Lay with seam edges matched for color and pattern; if necessary reverse adjoining sheets so abutting edges are from the same edge of roll. Double cut seams if required. Roll material in two directions, starting at center of sheet, to remove blisters, wrinkles, and air pockets. Weld seams in sheet flooring in compliance with manufacturer's instructions to produce a seamless installation.

1. Welded seams at RF1 and RF2.
2. Welded seams only as indicated on Drawings for RF3 thru RF11.

D. If the manufacturer recommends waxing, wax and buff immediately after installation.

E. Install base on walls, columns, casework, and similar items in rooms scheduled to have resilient base.

F. Cement base to backing, using the longest lengths practicable. Both top and bottom edges shall be perfectly aligned and in continuous contact with abutting surface. Butt joints shall be tight. On irregular wall surfaces, fill voids along top edge of base with manufacturer's recommended adhesive filler.

**3.03 CLEANING AND PROTECTION**

A. Remove excess adhesive and other blemishes created by this work from flooring and adjacent surfaces using cleaning material recommended by manufacturer.

B. Protect floor against damage from rolling loads for initial period following installation by covering with plywood or hardboard. Use dollies to move stationary equipment or furnishings across floor. Protect finished work from damage with Kraft paper or other protective covering.

C. Immediately prior to final inspection, thoroughly clean floor covering and replace damaged material with new material. Clean floor by method recommended by manufacturer.

D. For patching work, match pattern of existing materials.

E. Do not wash floor until time period recommended by resilient flooring manufacturer has elapsed to allow floor to become well-sealed in adhesive. Clean resilient flooring by method recommended by the manufacturer.

**END OF SECTION**

SECTION 096513 - RESILIENT BASE AND ACCESSORIES

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

A. Section Includes:

1. Resilient base.
2. Resilient stair accessories.
3. Resilient molding accessories.

B. Related Sections:

1. Section 096516 “Resilient Sheet Flooring”.
2. Section 096519 “Resilient Tile Flooring”.
3. Section 096543 “Linoleum Flooring”.
4. Section 096813 “Tile Carpeting”.
5. Section 096816 “Sheet Carpeting”.

1.3 ACTION SUBMITTALS

A. Product Data: For each type of product.

B. Samples for Initial Selection: For each type of product indicated.

C. Samples for Verification: For each type of product indicated and for each color, texture, and pattern required in manufacturer's standard-size samples.

1.4 INFORMATIONAL SUBMITTALS

A. Product Test Reports: Submit the manufacturer's certification that the flooring has been tested by an independent laboratory and complies with the required fire tests.

1.5 MAINTENANCE MATERIAL SUBMITTALS

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 for every 500 linear feet or fraction thereof, of each type, color, pattern, and size of resilient product installed.

1.6 DELIVERY, STORAGE, AND HANDLING

A. Store resilient products 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 or more than 90 deg F.

1.7 FIELD CONDITIONS

A. Maintain ambient temperatures within range recommended by manufacturer, but not less than 65 deg F or more than 85 deg F, 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. After installation and until Substantial Completion, maintain ambient temperatures within range recommended by manufacturer, but not less than 55 deg F or more than 95 deg F.

C. Install resilient products after other finishing operations, including painting, have been completed.

PART 2 - PRODUCTS

2.1 PERFORMANCE REQUIREMENTS

A. FloorScore Compliance: Resilient base shall comply with requirements of FloorScore certification.

2.2 VINYL BASE (V-1)

A. Manufacturers: Subject to compliance with requirements, provide products by one of the following:

1. Armstrong World Industries, Inc.
2. Burke Mercer Flooring Products, Division of Burke Industries Inc.
3. Flexco.
4. Johnsonite; A Tarkett Company.
5. Roppe Corporation, USA.

B. Product Standard: ASTM F 1861, Type TV (vinyl, thermoplastic).

1. Group: I (solid, homogeneous).

C. Profile: Johnsonite Traditional with toe (coved).

1. Color: Wetlands #150.
2. Height: 4 inches.
3. Lengths: Cut lengths 48 inches long or coils in manufacturer's standard length.

D. Outside Corners: Preformed.

E. Inside Corners: Preformed.

2.3 THERMOPLASTIC-RUBBER BASE (V-2)

A. Manufacturers: Subject to compliance with requirements, provide products by one of the following:

1. Armstrong World Industries, Inc.
2. Burke Mercer Flooring Products, Division of Burke Industries Inc.
3. Flexco.
4. Johnsonite; A Tarkett Company.
5. Roppe Corporation, USA.

B. Product Standard: ASTM F 1861, Type TP (rubber, thermoplastic).

1. Group: I (solid, homogeneous).

C. Profile: Johnsonite Millwork Wall Base - Reveal or approved equal.

1. Color: Dark Beech.
2. Height: 4-1/4 inches.
3. Lengths: Cut lengths 96 inches long.

D. Outside Corners: Job formed, mitered.

E. Inside Corners: Job formed, mitered.

2.4 THERMOPLASTIC-RUBBER BASE (V-3)

A. Manufacturers: Subject to compliance with requirements, provide products by one of the following:

1. Armstrong World Industries, Inc.
2. Burke Mercer Flooring Products, Division of Burke Industries Inc.
3. Flexco.
4. Johnsonite; A Tarkett Company.
5. Roppe Corporation, USA.

B. Product Standard: ASTM F 1861, Type TP (rubber, thermoplastic).

1. Group: I (solid, homogeneous).

C. Profile: Johnsonite Traditional Straight Wall Base or approved equal.

1. Color: Dark Beech.
2. Height: 4 inches.

3. Lengths: Cut lengths 96 inches long.

D. Outside Corners: Job formed.

E. Inside Corners: Job formed.

2.5 RUBBER STAIR ACCESSORIES (RST-1)

A. Fire-Test-Response Characteristics: As determined by testing identical products according to ASTM E 648 or NFPA 253 by a qualified testing agency.

1. Critical Radiant Flux Classification: Class I, not less than 0.45 W/sq. cm.

B. Manufacturers: Subject to compliance with requirements, provide products by the following:

1. Nora Systems, Inc.; Norament Satura Stair Treads.

a. Color: Norament Satura - Indus #5108.

C. Stair Treads: ASTM F 2169.

1. Type: TS (rubber, vulcanized thermoset).
2. Nosing Style: Square, adjustable to cover angles between 60 and 90 degrees.
3. Thickness: 1/4 inch and tapered to back edge.
4. Size: Lengths and depths to fit each stair tread in one piece.
5. Integral Risers: Smooth, flat; in height that fully covers substrate.

D. Landing Tile: By Section 096519 - Resilient Tile Flooring.

2.6 VINYL MOLDING ACCESSORIES

A. Manufacturers: Subject to compliance with requirements, provide products by one of the following:

1. Armstrong World Industries, Inc.
2. Burke Mercer Flooring Products, Division of Burke Industries Inc.
3. Flexco.
4. Johnsonite; A Tarkett Company.
5. Roppe Corporation, USA.

B. Vinyl Reducer Strip For Resilient Flooring:

1. Profile and Dimensions (Model numbers indicated are Basis-of-Design Products by Johnsonite):

a. 1-5/8" wide Reducer for 1/16" or 1/8" to substrate (SSR-XXX-B).
b. 1-1/2" wide Adaptor for .080" to 1/8" material (SSR-XXX–D).
c. 1-1/4" wide Reducer for 1/8" to substrate (RRS-XXX-D).

2. Provide additional products as necessary if material heights vary from those listed above. Submit for Architect’s approval.
3. Locations: Provide vinyl molding accessories in areas indicated.
4. Colors and Patterns: As selected by Architect from full range of industry colors.

C. Vinyl Transition Strips:

1. Profiles and Dimensions (Model numbers indicated are Basis-of-Design Products by Johnsonite):

a. 2-1/2" wide Wheeled Traffic Transition, 1/4" to 1/8" material (CTA-XXX-H).
b. 2-1/2" wide Wheeled Traffic Transition, 1/4" to .080" material (CTA-XXX-HT).
c. 2-1/2" wide Wheeled Traffic Transition, 1/4" materials to subfloor (CTA-XXX-J).

2. Provide additional products as necessary if material heights vary from those listed above. Submit for Architect’s approval.
3. Locations: Provide vinyl molding accessories in areas indicated.
4. Colors and Patterns: As selected by Architect from full range of industry colors.

2.7 INSTALLATION MATERIALS

A. Trowelable Leveling and Patching Compounds: Latex-modified, portland cement based or blended hydraulic-cement-based formulation provided or approved by resilient-product manufacturer for applications indicated.

B. Adhesives: Water-resistant type recommended by resilient-product manufacturer for 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.

1. 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.

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

1. Installation of resilient products indicates acceptance of surfaces and conditions.

### 3.2 PREPARATION

A. Prepare substrates according to manufacturer's written instructions to ensure adhesion of resilient products.

B. Concrete Substrates for Resilient Stair Accessories: Prepare horizontal surfaces 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.

C. Fill cracks, holes, and depressions in substrates with trowelable leveling and patching compound; remove bumps and ridges to produce a uniform and smooth substrate.

D. Do not install resilient products until they are the same temperature as the space where they are to be installed.

1. At least 48 hours in advance of installation, move resilient products and installation materials into spaces where they will be installed.

E. Immediately before installation, sweep and vacuum clean substrates to be covered by resilient products.

### 3.3 RESILIENT BASE INSTALLATION

A. Comply with manufacturer's written instructions for installing resilient base.

B. 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.

C. Install resilient base in lengths as long as practical without gaps at seams and with tops of adjacent pieces aligned.

D. Tightly adhere resilient base to substrate throughout length of each piece, with base in continuous contact with horizontal and vertical substrates.

E. Do not stretch resilient base during installation.

F. On masonry surfaces or other similar irregular substrates, fill voids along top edge of resilient base with manufacturer's recommended adhesive filler material.

G. Install base tightly to door frames.

H. Preformed Corners: Install preformed corners before installing straight pieces.

I. Job-Formed Corners:

1. Outside Corners: Use straight pieces of maximum lengths possible and form with returns not less than 3 inches in length.

a. Form without producing discoloration (whitening) at bends.

2. Inside Corners: Use straight pieces of maximum lengths possible and form with returns not less than 3 inches in length.

a. Miter or cope corners to minimize open joints.

## 3.4 RESILIENT ACCESSORY INSTALLATION

A. Comply with manufacturer's written instructions for installing resilient accessories.

B. Resilient Molding Accessories: Butt to adjacent materials and tightly adhere to substrates throughout length of each piece. Install reducer strips at edges of floor covering that would otherwise be exposed.

C. Flush Installations: Refer to Section 096516 “Resilient Sheet Flooring” and Section 096519 “Resilient Tile Flooring” for installation requirements where too great a transition exists between flooring material heights than can be bridged by the specified vinyl molding accessories. All flooring surface transitions must be flush on either side of the transition molding.

## 3.5 CLEANING AND PROTECTION

A. Comply with manufacturer's written instructions for cleaning and protecting resilient products.

B. Perform the following operations immediately after completing resilient-product installation:

1. Remove adhesive and other blemishes from exposed surfaces.
2. Sweep and vacuum horizontal surfaces thoroughly.
3. Damp-mop horizontal surfaces to remove marks and soil.

C. Protect resilient products from mars, marks, indentations, and other damage from construction operations and placement of equipment and fixtures during remainder of construction period.

D. Cover resilient products subject to wear and foot traffic until Substantial Completion.

END OF SECTION 096513

SECTION 096519 - RESILIENT TILE FLOORING

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

A. Section Includes:

1. Rubber floor tile.

B. Related Sections:

1. Section 079200 "Joint Sealants".
2. Section 033000 “Cast-in-Place-Concrete” for concrete slab-on-grade or topping slabs.
3. Section 096513 “Resilient Base and Accessories” for resilient wall base and accessories installed with resilient tile flooring.
4. Section 096516 “Resilient Sheet Flooring” for floor finishes related to this section.
5. Section 096543 “Linoleum Flooring” for floor finishes related to this section.
6. Section 096813 “Tile Carpeting” for floor finishes related to this section.
7. Section 096816 “Sheet Carpeting” for floor finishes related to this section.

1.3 ACTION SUBMITTALS

A. Product Data: For each type of product. Include manufacturer's technical data, installation and maintenance instructions for flooring and accessories.

B. Shop Drawings: For each type of floor tile. Include floor tile layouts, edges, columns, doorways, enclosing partitions, built-in furniture, cabinets, and cutouts.

1. Show details of special patterns.

A. Samples for Initial Selection: For each type of floor tile indicated.

B. Samples: Submit the manufacturer's standard samples showing the required colors for flooring and applicable accessories.

C. Moisture Testing Locations and Results: Submit a diagram of the area showing the locations and results of each test to Architect and General Contractor. Flooring shall not be installed until sub-floor meets moisture requirements.

1.4 INFORMATIONAL SUBMITTALS

A. Product Test Reports: Submit the manufacturer's certification that the flooring has been tested by an independent laboratory and complies with the required fire tests.

1.5 CLOSEOUT SUBMITTALS

A. Maintenance Data: For each type of floor tile to include in maintenance manuals.

1.6 MAINTENANCE MATERIAL SUBMITTALS

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 one box for every 50 boxes or fraction thereof, of each type, color, and pattern of floor tile installed.

1.7 QUALITY ASSURANCE

A. Installer Qualifications: A qualified installer who employs workers for this Project who are competent in techniques required by manufacturer for floor tile installation and seaming method indicated.

1.8 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 or more than 85 deg F. Store floor tiles on flat surfaces.

1.9 FIELD CONDITIONS

A. Maintain ambient temperatures within range recommended by manufacturer, but not less than 65 deg F or more than 85 deg F, 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. After installation and until Substantial Completion, maintain ambient temperatures within range recommended by manufacturer, but not less than 55 deg F or more than 95 deg F.

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.

F. Do not install flooring over concrete slabs until they are sufficiently dry to achieve a bond with the adhesive, in accordance with the manufacturer's recommended bond and moisture tests.

PART 2 - PRODUCTS

2.1 PERFORMANCE REQUIREMENTS

A. Fire-Test-Response Characteristics: For resilient tile flooring, as determined by testing identical products according to ASTM E 648 or NFPA 253 by a qualified testing agency.

1. Critical Radiant Flux Classification: Class I, not less than 0.45 W/sq. cm.

B. FloorScore Compliance: Resilient tile flooring shall comply with requirements of FloorScore certification.

2.2 RUBBER FLOOR TILE (RT)

A. Manufacturers: Subject to compliance with requirements, provide the manufacturer/product(s) listed below.

B. RT-1:

1. Manufacturer/Product: Noraplan Environcare, Article 2462.
2. Tile Standard: ASTM F 1344, Class I-A, homogeneous rubber tile, solid color.
3. Hardness: Not less than 85 as required by ASTM F 1344, measured using Shore, Type A durometer per ASTM D 2240.
4. Wearing Surface: Smooth.
5. Thickness: 0.125 inch.
6. Size: 24 by 24 inches.
7. Colors and Patterns:

a. VT-1: Noraplan Environcare - Driftwood #2787.

2.3 INSTALLATION MATERIALS

A. Trowelable Leveling and Patching Compounds: Latex-modified, portland cement based or blended hydraulic-cement-based formulation provided or approved by floor tile manufacturer for applications indicated.

B. Adhesives: Water-resistant type recommended by floor tile and adhesive manufacturers to suit floor tile 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.

1. 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.

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

3.2 PREPARATION

A. Prepare substrates according to floor tile manufacturer's written instructions to ensure adhesion of resilient products.

B. Concrete Substrates: Prepare according to ASTM F 710.

1. Subfloor finishes comply with requirements specified in Section 033000 “Cast-in-Place Concrete” for slabs receiving installation of a finished material.
2. Verify that substrates are dry and free of curing compounds, sealers, and hardeners.
3. Remove substrate coatings and other substances that are incompatible with adhesives and that contain soap, wax, oil, or silicone, using mechanical methods recommended by floor tile manufacturer. Do not use solvents. . Remove foreign matter and curing agents at least 24 hours before anhydrous calcium chloride tests and 48 hours before relative humidity tests will be run.
4. Alkalinity and Adhesion Testing: Perform tests recommended by floor tile manufacturer. Proceed with installation only after substrate alkalinity falls within range on pH scale recommended by manufacturer in writing, but not less than 5 or more than 9 ph.
5. Moisture Testing: Proceed with installation only after substrates pass testing according to floor tile manufacturer's written recommendations, but not less stringent than the following:

    a. Perform anhydrous calcium chloride test according to ASTM F 1869. Proceed with installation only after substrates have maximum moisture-vapor-emission rate of 5 lb of water/1000 sq. ft in 24 hours.
    -OR-
    b. Perform relative humidity test using in situ probes according to ASTM F 2170 Allow 72 hours to achieve moisture equilibrium within the hole before taking measurements. Proceed with installation only after substrates have a maximum 85 percent relative humidity level.
    c. Perform a minimum of 3 tests for the first 1000 sq ft and 1 test for each 1000 sq ft after. Place the first test in the center of the room and remaining tests around the perimeter.
    d. Submit a diagram of the area showing the locations and results of each test to Architect and General Contractor.
    e. Flooring shall not be installed until sub-floor meets moisture requirements.
    f. Where results are not achieved and approved by Architect and General Contractor, apply a moisture vapor reduction/containment product following manufacturer’s recommendations.
    g. After all tests are completed and results verified and approved, floor installation must not be delayed or test results will no longer be valid.

C. Access Flooring Panels: Remove protective film of oil or other coating using method recommended by access flooring manufacturer.

D. Fill cracks, holes, and depressions in substrates with trowelable leveling and patching compound; remove bumps and ridges to produce a uniform and smooth substrate.

E. Preparation for Flush Flooring Surface Material Transitions:

1. Slope, or “feather”, sub-floor where necessary with leveling compound 1/16”/1’-0” to attain a flush flooring surface transition to adjacent metal edge profile, threshold or flooring material.

F. Do not install floor tiles until they are the same temperature as the space where they are to be installed.

1. At least 48 hours in advance of installation, move resilient floor tile and installation materials into spaces where they will be installed.

G. Immediately before installation, sweep and vacuum clean substrates to be covered by resilient floor tile.

3.3 FLOOR TILE INSTALLATION

A. Comply with manufacturer's written instructions for installing floor tile.

B. Install material in each area from the same production run. Unmatched materials will be rejected and will be replaced at no expense to the owner.

C. Lay out floor tiles from center marks established with principal walls, discounting minor offsets, so tiles at opposite edges of room are of equal width. Adjust as necessary to avoid using cut widths that equal less than one-half tile at perimeter.

1. Lay tiles square with room axis unless pattern is indicated.

D. Match floor tiles for color and pattern by selecting tiles from cartons in the same sequence as manufactured and packaged, if so numbered. Discard broken, cracked, chipped, or deformed tiles.

1. Lay tiles with grain running in one direction.

E. 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.

F. Extend floor tiles into toe spaces, door reveals, closets, and similar openings. Extend floor tiles to center of door openings.

G. 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 marking device.

H. Adhere floor tiles to flooring substrates using a full spread of adhesive applied to substrate to produce a completed installation without open cracks, voids, raising and puckering at joints, telegraphing of adhesive spreader marks, and other surface imperfections.

I. Joint Sealant: Apply clear sealant to floor tile at door frames, flooring surface transition seams, gaps between flooring and base caused by uneven subfloor, and at other joints and penetrations.

3.4 CLEANING AND PROTECTION

A. Comply with manufacturer's written instructions for cleaning and protecting floor tile.

B. 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. Do not flood floor.

C. Protect floor tile from mars, marks, indentations, and other damage from construction operations and placement of equipment and fixtures during remainder of construction period.

A. Floor Finish: Verify with manufacturer the recommended products and process for finishing/polishing resilient sheet flooring installations. Remove soil, adhesive, and blemishes from floor tile surfaces before applying manufacturer’s recommended coatings.

1. Apply number of coat(s) as recommended by manufacturer.

B. Cover floor tile until Substantial Completion.

END OF SECTION 096519

SECTION 096813 - TILE CARPETING

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

A. Section includes modular carpet tile.

B. Related Requirements:

1. Section 024119 "Selective Demolition" for removing existing floor coverings.
2. Section 033000 “Cast-in-Place-Concrete” for concrete slab-on-grade or topping slabs.
1. Section 093000 "Tiling" for floor finishes related to this section.
2. Section 096513 “Resilient Base and Accessories” for resilient wall base and accessories installed with tile carpeting.
3. Section 096516 “Resilient Sheet Flooring” for floor finishes related to this section.
4. Section 096519 “Resilient Tile Flooring” for floor finishes related to this section.
5. Section 096543 “Linoleum Flooring” for floor finishes related to this section.
6. Section 096816 “Sheet Carpeting” for floor finishes related to this section.

1.3 ACTION SUBMITTALS

A. Product Data: For each type of product.

1. Include manufacturer's written data on physical characteristics, durability, and fade resistance.

B. Shop Drawings: Show the following:

1. Columns, doorways, enclosing walls or partitions, built-in cabinets, and locations where cutouts are required in carpet tiles.
2. Carpet tile type and color.
3. Pattern type, location, and direction.
4. Type, color, and location of insets and borders.
5. Type, color, and location of edge, transition, and other accessory strips.
6. Transition details to other flooring materials.

C. Samples: For each of the following products and for each color and texture required. Label each Sample with manufacturer's name, material description, color, pattern, and designation indicated on Drawings and in schedules.

1. Carpet Tile: Full-size Sample.
2. Exposed Edge, Transition, and Other Accessory Stripping: 12-inch- long Samples.

D. Moisture Testing Locations and Results: Submit a diagram of the area showing the locations and results of each test to Architect and General Contractor. Flooring shall not be installed until sub-floor meets moisture requirements.

1.4 INFORMATIONAL SUBMITTALS

A. Product Test Reports: Submit the manufacturer's certification that the flooring has been tested by an independent laboratory and complies with the required fire tests.

B. Sample Warranty: For applicable warranties.

1.5 CLOSEOUT SUBMITTALS

A. Maintenance Data: For carpet tiles to include in maintenance manuals. Include the following:

1. Methods for maintaining carpet tile, including cleaning and stain-removal products and procedures and manufacturer's recommended maintenance schedule.
2. Precautions for cleaning materials and methods that could be detrimental to carpet tile.

1.6 MAINTENANCE MATERIAL SUBMITTALS

A. Furnish extra materials, from the same product run, that match products installed and that are packaged with protective covering for storage and identified with labels describing contents.

1. Carpet Tile: Full-size units equal to 5 percent of amount installed for each type indicated, but not less than 10 sq. yd..

1.7 QUALITY ASSURANCE

A. Installer Qualifications: An experienced installer who is certified by the International Certified Floorcovering Installers Association at the Commercial II certification level.

B. Fire-Test-Response Ratings: Where indicated, provide carpet tile identical to those of assemblies tested for fire response according to NFPA 253 by a qualified testing agency.

1.8 DELIVERY, STORAGE, AND HANDLING

A. Comply with CRI 104.

1.9 FIELD CONDITIONS

A. Comply with CRI 104 for temperature, humidity, and ventilation limitations.

B. Environmental Limitations: Do not deliver or install carpet tiles until spaces are enclosed and weathertight, wet work in spaces is complete and dry, and ambient temperature and humidity conditions are maintained at occupancy levels during the remainder of the construction period.

C. Do not install carpet tiles over concrete slabs until slabs have cured and are sufficiently dry to bond with adhesive and concrete slabs have pH range recommended by carpet tile manufacturer.

D. Where demountable partitions or other items are indicated for installation on top of carpet tiles, install carpet tiles before installing these items.

1.10 WARRANTY

A. Special Warranty for Carpet Tiles: Manufacturer agrees to repair or replace components of carpet tile installation that fail in materials or workmanship within specified warranty period.

1. Warranty does not include deterioration or failure of carpet tile due to unusual traffic, failure of substrate, vandalism, or abuse.
2. Failures include, but are not limited to, more than 10 percent edge raveling, snags, runs, dimensional stability, excess static discharge, loss of tuft bind strength, loss of face fiber, and delamination.
3. Warranty Period: 10 years from date of Substantial Completion.

PART 2 - PRODUCTS

2.1 PERFORMANCE REQUIREMENTS

A. Fire-Test-Response Characteristics: For tile carpeting, as determined by testing identical products according to test method indicated below by a qualified testing agency.

1. Flammability: Passes DOC-FF1-70 Pill Test (ASTM D 2859, NFPA 101).
2. Critical Radiant Flux Classification: Flooring Radiant Panel Test (ASTM E 648, NFPA 253) - Class I, not less than 0.45 W/sq. cm.
3. Smoke Density: Smoke Chamber Test (ASTM E 662, NFPA 258) – less than 450 in flaming mode.

B. Antimicrobial Activity: Not less than 2-mm halo of inhibition for gram-positive bacteria, not less than 1-mm halo of inhibition for gram-negative bacteria, and no fungal growth, according to AATCC 174.

C. Electrostatic Propensity: Less than 3.5 kV according to AATCC 134.

2.2 CARPET TILE (CA)

A. Manufacturers: Subject to compliance with requirements, provide the manufacturer/product(s) listed below.

B. CA-1:

1. Brand: Interface.
2. Style Name/Number: Prairie Grass, Style 123490250H.

3. Color(s):

a. CA-1: Prairie 9311.

4. Size: 50 cm by 50 cm.
5. Installation: Install in ashlar pattern.

C. CA-2:

1. Brand: Interface.
2. Style Name/Number: Farmland Loop, Style 1471502500.
3. Color(s):

a. CA-2: Prairie 101005.

4. Size: 50 cm by 50 cm.
5. Installation: Quarter-turn.

D. CA-3:

1. Brand: Interface.
2. Style Name/Number: Biodiversity – Custom Pattern/Color.
3. Color(s):

a. CA-3: MO812 Prairie, refer to sample #256310-003, copy of 256310-001.

4. Size: 36 by 36 inches.
5. Installation: Monolithic.

E. CA-4:

1. Brand: Patcraft.
2. Style Name/Number: Walk Right In II Modular, Style 10304.
3. Color(s):

a. CA-4: Natural Beige 00100.

4. Size: 24 by 24 inches.
5. Installation: Quarter-turn.

2.3 INSTALLATION ACCESSORIES

A. Trowelable Leveling and Patching Compounds: Latex-modified, hydraulic-cement-based formulation provided or recommended by carpet tile manufacturer.

B. Adhesives: Water-resistant, mildew-resistant, nonstaining, pressure-sensitive type to suit products and subfloor conditions indicated, that complies with flammability requirements for installed carpet tile and is recommended by carpet tile manufacturer for releasable installation.

C. Edge/Transition Strips:

1. Refer to Section 093000 "Tiling" for metal transition profiles installed with tile flooring products.
2. Refer to Section 096513 “Resilient Base and Accessories” for vinyl molding accessories installed with carpeting and resilient flooring products.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Examine substrates, areas, and conditions, with Installer present, for compliance with requirements for maximum moisture content, alkalinity range, installation tolerances, and other conditions affecting carpet tile performance. Examine carpet tile for type, color, pattern, and potential defects.

B. Concrete Subfloors: Verify that concrete slabs comply with ASTM F 710 and the following:

1. Subfloor finishes comply with requirements specified in Section 033000 “Cast-in-Place Concrete” for slabs receiving installation of a finished material.

2. Verify that substrates are dry and free of curing compounds, sealers, and hardeners.
3. 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. Remove foreign matter and curing agents at least 24 hours before anhydrous calcium chloride tests and 48 hours before relative humidity tests will be run.
4. Alkalinity and Adhesion Testing: Perform tests recommended by manufacturer. Proceed with installation only after substrate alkalinity falls within range on pH scale recommended by manufacturer in writing, but not less than 5 or more than 9 pH.
5. Moisture Testing: Proceed with installation only after substrates pass testing according to manufacturer's written recommendations, but not less stringent than the following:

    a. Perform anhydrous calcium chloride test according to ASTM F 1869. Proceed with installation only after substrates have maximum moisture-vapor-emission rate of 5 lb of water/1000 sq. ft in 24 hours.
    -OR-
    b. Perform relative humidity test using in situ probes according to ASTM F 2170. Allow 72 hours to achieve moisture equilibrium within the hole before taking measurements. Proceed with installation only after substrates have a maximum 85 percent relative humidity level.
    c. Perform a minimum of 3 tests for the first 1000 sq ft and 1 test for each 1000 sq ft after. Place the first test in the center of the room and remaining tests around the perimeter.
    d. Submit a diagram of the area showing the locations and results of each test to Architect and General Contractor.
    e. Carpet shall not be installed until sub-floor meets moisture requirements.
    f. Where results are not achieved and approved by Architect and General Contractor, apply a moisture vapor reduction/containment product following manufacturer’s recommendations.

C. For painted subfloors, verify the following:

1. Perform bond test recommended in writing by adhesive manufacturer.

D. For raised access flooring systems, verify the following:

1. Access floor substrate is compatible with carpet tile and adhesive if any and is ready to access carpet tiles.

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

## 3.2 PREPARATION

A. General: Comply with CRI 104, Section 6.2, "Site Conditions; Floor Preparation," and with carpet tile manufacturer's written installation instructions for preparing substrates indicated to receive carpet tile installation.

B. Use trowelable leveling and patching compounds, according to manufacturer's written instructions, to fill cracks, holes, depressions, and protrusions in substrates. Fill or level cracks, holes and depressions 1/8 inch wide or wider and protrusions more than 1/32 inch unless more stringent requirements are required by manufacturer's written instructions.

C. Preparation for Flush Flooring Surface Material Transitions:

1. Slope, or “feather”, sub-floor where necessary with leveling compound 1/16”/1’-0” to attain a flush flooring surface transition to adjacent metal edge profile, threshold or flooring material.

D. Remove coatings, including curing compounds, and other substances that are incompatible with adhesives and that contain soap, wax, oil, or silicone, without using solvents. Use mechanical methods recommended in writing by carpet tile manufacturer.

E. Clean metal substrates of grease, oil, soil and rust, and prime if directed by adhesive manufacturer. Rough sand painted metal surfaces and remove loose paint. Sand aluminum surfaces, to remove metal oxides, immediately before applying adhesive.

F. Broom and vacuum clean substrates to be covered immediately before installing carpet tile.

## 3.3 INSTALLATION

A. General: Comply with CRI 104, Section 14, "Carpet Modules," and with carpet tile manufacturer's written installation instructions.

B. Installation Method: As recommended in writing by carpet tile manufacturer.

C. Maintain dye lot integrity. Do not mix dye lots in same area.

D. Cut and fit carpet tile to butt tightly to vertical surfaces, permanent fixtures, and built-in furniture including cabinets, pipes, outlets, edgings, thresholds, and nosings. Bind or seal cut edges as recommended by carpet tile manufacturer.

E. Extend carpet tile into toe spaces, door reveals, closets, open-bottomed obstructions, removable flanges, alcoves, and similar openings.

F. Maintain reference markers, holes, and openings that are in place or marked for future cutting by repeating on finish flooring as marked on subfloor. Use nonpermanent, nonstaining marking device.

G. Install pattern: Refer to Drawings (Finish Plans) and Paragraph 2.2 of this Section.

3.4 CLEANING AND PROTECTION

A. Perform the following operations immediately after installing carpet tile:

1. Remove excess adhesive, seam sealer, and other surface blemishes using cleaner recommended by carpet tile manufacturer.
2. Remove yarns that protrude from carpet tile surface.
3. Vacuum carpet tile using commercial machine with face-beater element.

B. Protect installed carpet tile to comply with CRI 104, Section 16, "Protecting Indoor Installations."

C. Protect carpet tile against damage from construction operations and placement of equipment and fixtures during the remainder of construction period. Use protection methods indicated or recommended in writing by carpet tile manufacturer.

END OF SECTION 096813

SECTION 096816 - SHEET CARPETING

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

A. Section includes tufted broadloom carpet.

B. Related Requirements:

1. Section 024119 "Selective Demolition" for removing existing floor coverings.
2. Section 033000 “Cast-in-Place-Concrete” for concrete slab-on-grade or topping slabs.
1. Section 093000 "Tiling" for floor finishes related to this section.
2. Section 096513 “Resilient Base and Accessories” for resilient wall base and accessories installed with tile carpeting.
3. Section 096516 “Resilient Sheet Flooring” for floor finishes related to this section.
4. Section 096519 “Resilient Tile Flooring” for floor finishes related to this section.
5. Section 096543 “Linoleum Flooring” for floor finishes related to this section.
6. Section 096813 “Tile Carpeting” for floor finishes related to this section.

1.3 PREINSTALLATION MEETINGS

A. Preinstallation Conference: Conduct conference at Project site.

1. Review methods and procedures related to carpet installation including, but not limited to, the following:

a. Review delivery, storage, and handling procedures.
b. Review ambient conditions and ventilation procedures.
c. Review subfloor preparation procedures.

1.4 ACTION SUBMITTALS

A. Product Data: For the following, including installation recommendations for each type of substrate:

1. Carpet: For each type indicated. Include manufacturer's written data on physical characteristics, durability, and fade resistance.

B. Shop Drawings: Show the following:

1. Columns, doorways, enclosing walls or partitions, built-in cabinets, and locations where cutouts are required in carpet.
2. Carpet type, color, and dye lot.
3. Seam locations.
4. Pattern type, repeat size, location, direction, and starting point.
5. Type, color, and location of insets and borders.
6. Type, color, and location of edge, transition, and other accessory strips.
7. Transition details to other flooring materials.

C. Samples for Initial Selection: For each type of carpet indicated.

D. Samples: For each of the following products and for each color and texture required. Label each Sample with manufacturer's name, material description, color, pattern, and designation indicated on Drawings and in schedules.

1. Carpet: 12-inch- square Sample.
2. Exposed Edge, Transition, and Other Accessory Stripping: 12-inch- long Samples.

E. Moisture Testing Locations and Results: Submit a diagram of the area showing the locations and results of each test to Architect and General Contractor. Flooring shall not be installed until sub-floor meets moisture requirements.

1.5 INFORMATIONAL SUBMITTALS

A. Product Test Reports: Submit the manufacturer's certification that the flooring has been tested by an independent laboratory and complies with the required fire tests.

B. Sample Warranty: For applicable warranties.

1.6 CLOSEOUT SUBMITTALS

A. Maintenance Data: For carpet to include in maintenance manuals. Include the following:

1. Methods for maintaining carpet, including cleaning and stain-removal products and procedures and manufacturer's recommended maintenance schedule.
2. Precautions for cleaning materials and methods that could be detrimental to carpet.

1.7 MAINTENANCE MATERIAL SUBMITTALS

A. Furnish extra materials, from the same product run, that match products installed and that are packaged with protective covering for storage and identified with labels describing contents.

1. Carpet: Full-width rolls equal to 5 percent of amount installed for each type indicated, but not less than 10 sq. yd..

1.8 QUALITY ASSURANCE

A. Installer Qualifications: An experienced Installer who is certified by the International Certified Floorcovering Installers Association at the Commercial II certification level.

B. Fire-Test-Response Ratings: Where indicated, provide carpet identical to those of assemblies tested for fire response per NFPA 253 by a qualified testing agency.

1.9 DELIVERY, STORAGE, AND HANDLING

A. Comply with CRI 104.

1.10 FIELD CONDITIONS

A. Comply with CRI 104 for temperature, humidity, and ventilation limitations.

B. Environmental Limitations: Do not deliver or install carpet until spaces are enclosed and weathertight, wet work in spaces is complete and dry, and ambient temperature and humidity conditions are maintained at occupancy levels during the remainder of the construction period.

C. Do not install carpet over concrete slabs until slabs have cured, are sufficiently dry to bond with adhesive, and have pH range recommended by carpet manufacturer.

D. Where demountable partitions or other items are indicated for installation on top of carpet, install carpet before installing these items.

1.11 WARRANTY

A. Warranty for Carpet: Manufacturer agrees to repair or replace components of carpet installation that fail in materials or workmanship within specified warranty period.

1. Warranty does not include deterioration or failure of carpet due to unusual traffic, failure of substrate, vandalism, or abuse.
2. Failures include, but are not limited to, more than 10 percent loss of face fiber, edge raveling, snags, runs, loss of tuft bind strength, loss of face fiber, and delamination.
3. Warranty Period: 10 years from date of Substantial Completion.

PART 2 - PRODUCTS

2.1 PERFORMANCE REQUIREMENTS

A. Fire-Test-Response Characteristics: For tile carpeting, as determined by testing identical products according to test method indicated below by a qualified testing agency.

1. Flammability: Passes DOC-FF1-70 Pill Test (ASTM D 2859, NFPA 101).
2. Critical Radiant Flux Classification: Flooring Radiant Panel Test (ASTM E 648, NFPA 253) - Class I, not less than 0.45 W/sq. cm.

3. Smoke Density: Smoke Chamber Test (ASTM E 662, NFPA 258) – less than 450 in flaming mode.

B. Antimicrobial Activity: Not less than 2-mm halo of inhibition for gram-positive bacteria, not less than 1-mm halo of inhibition for gram-negative bacteria, and no fungal growth, according to AATCC 174.

C. Electrostatic Propensity: Less than 3.5 kV according to AATCC 134.

2.2 TUFTED CARPET (CA)

A. Manufacturers: Subject to compliance with requirements, provide the manufacturer/product(s) listed below.

B. CA-5:

1. Brand: Patcraft.
2. Style Name/Number: Resonate 10271.
3. Color(s):

a. CA-5: Olivine 71306.

4. Width: 12 feet.

2.3 INSTALLATION ACCESSORIES

A. Trowelable Leveling and Patching Compounds: Latex-modified, hydraulic-cement-based formulation provided or recommended by carpet manufacturer.

B. Adhesives: Water-resistant, mildew-resistant, nonstaining type to suit products and subfloor conditions indicated, that complies with flammability requirements for installed carpet and is recommended or provided by carpet manufacturer.

C. Seam Adhesive (Sealer): Hot-melt adhesive tape or similar product recommended by carpet manufacturer for sealing and taping seams and butting cut edges at backing to form secure seams and to prevent pile loss at seams.

D. Edge/Transition Strips:

1. Refer to Section 093000 "Tiling" for metal transition profiles installed with tile flooring products.
2. Refer to Section 096513 “Resilient Base and Accessories” for vinyl molding accessories installed with carpeting and resilient flooring products.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Examine substrates, areas, and conditions, with Installer present, for compliance with requirements for maximum moisture content, alkalinity range, installation tolerances, and other conditions affecting carpet performance. Examine carpet for type, color, pattern, and potential defects.

B. Concrete Subfloors: Verify that concrete slabs comply with ASTM F 710 and the following:

1. Subfloor finishes comply with requirements specified in Section 033000 “Cast-in-Place Concrete” for slabs receiving installation of a finished material.
2. Verify that substrates are dry and free of curing compounds, sealers, and hardeners.
3. 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. Remove foreign matter and curing agents at least 24 hours before anhydrous calcium chloride tests and 48 hours before relative humidity tests will be run.
4. Alkalinity and Adhesion Testing: Perform tests recommended by manufacturer. Proceed with installation only after substrate alkalinity falls within range on pH scale recommended by manufacturer in writing, but not less than 5 or more than 9 pH.
5. Moisture Testing: Proceed with installation only after substrates pass testing according to manufacturer's written recommendations, but not less stringent than the following:

a. Perform anhydrous calcium chloride test according to ASTM F 1869. Proceed with installation only after substrates have maximum moisture-vapor-emission rate of 5 lb of water/1000 sq. ft in 24 hours.

-OR-

b. Perform relative humidity test using in situ probes according to ASTM F 2170. Allow 72 hours to achieve moisture equilibrium within the hole before taking measurements. Proceed with installation only after substrates have a maximum 85 percent relative humidity level.
c. Perform a minimum of 3 tests for the first 1000 sq ft and 1 test for each 1000 sq ft after. Place the first test in the center of the room and remaining tests around the perimeter.
d. Submit a diagram of the area showing the locations and results of each test to Architect and General Contractor.
e. Carpet shall not be installed until sub-floor meets moisture requirements.
f. Where results are not achieved and approved by Architect and General Contractor, apply a moisture vapor reduction/containment product following manufacturer's recommendations.

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

## 3.2 PREPARATION

A. General: Comply with CRI 104, Section 7.3, "Site Conditions; Floor Preparation," and with carpet manufacturer's written installation instructions for preparing substrates.

B. Use trowelable leveling and patching compounds, according to manufacturer's written instructions, to fill cracks, holes, depressions, and protrusions in substrates. Fill or level cracks, holes and depressions 1/8 inch wide or wider, and protrusions more than 1/32 inch, unless more stringent requirements are required by manufacturer's written instructions.

C. Preparation for Flush Flooring Surface Material Transitions:

1. Slope, or "feather", sub-floor where necessary with leveling compound 1/16"/1'-0" to attain a flush flooring surface transition to adjacent metal edge profile, threshold or flooring material.

D. Remove coatings, including curing compounds, and other substances that are incompatible with adhesives and that contain soap, wax, oil, or silicone, without using solvents. Use mechanical methods recommended in writing by carpet manufacturer.

E. Broom and vacuum clean substrates to be covered immediately before installing carpet.

## 3.3 INSTALLATION

A. Comply with CRI 104 and carpet manufacturer's written installation instructions for the following:

1. Direct-Glue-Down Installation: Comply with CRI 104, Section 9, "Direct Glue-Down Installation."
2. Preapplied Adhesive Installation: Comply with CRI 104, Section 11.4, "Pre-Applied Adhesive Systems (Peel and Stick)."

B. Install carpet before casework.

C. Comply with carpet manufacturer's written recommendations and Shop Drawings for seam locations and direction of carpet; maintain uniformity of carpet direction and lay of pile.

1. Carpet direction to run length of corridors unless noted otherwise.
2. At doorways, center seams under the door in closed position.
3. Seams perpendicular to door openings are not acceptable.

D. Install pattern parallel to walls and borders to comply with CRI 104, Section 15, "Patterned Carpet Installations" and with carpet manufacturer's written recommendations.

E. Do not bridge building expansion joints with carpet.

F. Cut and fit carpet to butt tightly to vertical surfaces, permanent fixtures, and built-in furniture including cabinets, pipes, outlets, edgings, thresholds, and nosings. Bind or seal cut edges as recommended by carpet manufacturer.

G. Extend carpet into toe spaces, door reveals, closets, open-bottomed obstructions, removable flanges, alcoves, and similar openings.

H. Maintain reference markers, holes, and openings that are in place or marked for future cutting by repeating on finish flooring as marked on subfloor. Use nonpermanent, nonstaining marking device.

## 3.4 CLEANING AND PROTECTING

A. Perform the following operations immediately after installing carpet:

1. Remove excess adhesive, seam sealer, and other surface blemishes using cleaner recommended by carpet manufacturer.
2. Remove yarns that protrude from carpet surface.
3. Vacuum carpet using commercial machine with face-beater element.

B. Protect installed carpet to comply with CRI 104, Section 16, "Protecting Indoor Installations."

C. Protect carpet against damage from construction operations and placement of equipment and fixtures during the remainder of construction period. Use protection methods indicated or recommended in writing by carpet manufacturer and carpet adhesive manufacturer.

END OF SECTION 096816

## SECTION 09-9100 - PAINTING

## PART 1 - GENERAL

### 1.01 SECTION INCLUDES

A. Field application of a finish paint coating throughout the construction area, on all exposed surfaces of new, repaired, or patched exterior and interior materials and equipment, unless excluded.

B. Field finish painting is not required for:

1. Stainless steel or plated metal finishes.
2. Factory-applied finish coatings.
3. Glass, plastics, floors, acoustic materials, face brick, stonework, chalkboards, and other surfaces not normally requiring a painted finish.
4. Concealed or inaccessible surfaces, such as pipe or duct shafts, elevator shafts, crawl spaces, attics.

C. Requirements for shop priming steel.

D. Special coatings: Fire retardant varnish.

### 1.02 RELATED WORK

A. Prime coats for field-finished products: See respective sections.

### 1.03 SUBMITTALS

A. Manufacturer's Product Data verifying compatibility with substrates and conditions to be encountered.

~~B. LEED submittals: Refer to Section 01 8112 for submittal forms and requirements.~~

~~1. For products containing recycled materials: Documentation of post-consumer and pre-consumer recycled content, and cost of each product having recycled content.~~

~~2. Documentation of VOC content for materials used in interior spaces.~~

~~3. Documentation of place of extraction and manufacture for materials or components extracted or harvested, and manufactured within 500 miles of the project site.~~

~~C.~~B. Samples of available colors, sheens, and textures for preliminary selection.

~~D.~~C. Samples of selected finishes on clearly labeled 8 inches by 10 inches wood or hardboard surfaces to simulate actual conditions.

~~E.~~D. Finish schedule, including all surfaces to be painted; and manufacturer, type, and color to be applied to each.

### 1.04 QUALITY ASSURANCE

A. Prepare demonstration panels by duplicating the finish of the approved Samples at the work site on designated wall surfaces and building components.

B. Demonstration panels shall consist of an area of at least 50 square feet, a complete door assembly and hollow metal frame assembly.

C. Preserve accepted panels, which will be used as the standard for remaining work.

D. Paints and accessories of each type shall be produced or recommended by a single manufacturer.

### 1.05 DELIVERY

A. Deliver in original containers with manufacturer's labels intact. Labels shall indicate manufacturer's name, product name, listing of pigment and vehicle constituents, color identification, and application instructions.

B. Store materials at job site in a single location, protected from freezing.

### 1.06 SITE CONDITIONS

A. Maintain surface and air temperatures between 45 and 90 degrees F, and relative humidity below 85 percent.

B. Do not apply paint to damp or wet surfaces.

C. Do not apply paint in snow, rain, fog, or mist.

D. Enclose, heat, and dry substrates as required to maintain limits specified by the paint manufacturer.

E. Do not paint plaster containing more than 15 percent moisture.

F. Do not paint surfaces exposed to hot sun.

## PART 2 - PRODUCTS

### 2.01 MANUFACTURERS

A. Acceptable manufacturers:

1. Benjamin Moore & Co., Montvale, NJ.
2. Diamond-Vogel Paints, Orange City, IA.
3. Hirshfield's, Minneapolis, MN.
4. ICI Paints, Cleveland, OH.
5. Iowa Paint Mfg. Co., Inc., Des Moines, IA.
6. Pittsburgh Paints (PPG), Pittsburgh, PA.
7. Pratt and Lambert, Cleveland, OH.
8. Sherwin-Williams, Cleveland, OH.

B. Standard: Paint systems are specified using Sherwin-Williams product numbers to establish type, quality, and content of paint. Provide specified

products or approved equivalent by another acceptable manufacturer.

**2.02 MATERIAL QUALITY**

A. Pigments: Non-fading, suitable for conditions of use.

B. Washability: Finished surfaces shall withstand normal washing to remove ordinary soil without showing discoloration, loss of gloss, staining, or other damage.

C. Exterior or high temperature areas: Products specifically recommended by manufacturer for such use.

**2.03 ~~SPECIAL COATINGS - FIRE RETARDANT VARNISH~~ [AD1]**

A. ~~Acceptable manufacturer: Flame Control Coatings, Inc., Niagara Falls, NY.~~ [AD 1]

B. ~~Sealer: Flame Control Coatings No. 10 low VOC FR.~~ [AD 1]

C. [AD 1]

**PART 3 - EXECUTION**

**3.01 PRIMING STEEL**

A. Prepare products that are not shop-primed as follows.

B. Exterior exposed steel:

1. Surface preparation: SSPC-SP6 Commercial Blast Cleaning, surface profile: 1.5 to 2.0 mils.
2. Primer: One of the following, DFT as recommended by manufacturer.
   a. Tnemec 90-97 Tneme-Zinc.
   b. Sherwin-Williams Corothane I Zinc Primer.

C. Interior steel:

1. Surface preparation: SSPC-SP3 Power Tool Cleaning.
2. Primer: One of the following, DFT as recommended by manufacturer.
   a. Tnemec 10 Primer.
   b. Sherwin-Williams Hi-Solids Alkyd Metal Primer B50NZ2 or B50WZ3.

D. Visually evaluate surface preparation by comparison with pictorial standards in accordance with SSPC-Vis 1-89.

E. Measure dry film thickness in accordance with SSPC-PA2.

F. Repair runs, sags, dry spray, overspray, embedded particles, missed areas, and defective or damaged areas.

**3.02 PREPARATION**

A. Protect other surfaces from damage during painting. Use materials that can be removed without damaging or leaving residue on substrate.

B. Remove door hardware, device plates, light fixtures, and similar items, or provide surface-applied protection before surface preparation and painting. Replace items and remove protection after painting is completed.

C. Remove dust, dirt, rust, scale, grease, and other surface contamination.

D. Repair minor defects in concrete or masonry with spackle or patching plaster.

E. Repair minor defects in wood with putty, tinted to match stain where transparent is used.

F. Touch up shop applied prime coats where damaged or bare. Apply prime coat to surfaces that are not factory primed.

G. Remove handling marks and other finish damage from wood doors and casework by hand sanding in the direction of the wood grain. Match factory finishes.

H. Seal wood that has not been shop primed or sealed immediately upon delivery to work site. Back prime concealed wood surfaces. Use spar varnish to back prime wood that shall receive clear finish.

I. Seal tops, bottoms, and mortises of wood doors and seal with 2 coats of sealer or varnish after final field fitting. Finish tops, bottoms, and edges of doors the same as faces.

**3.03 APPLICATION**

A. Stir materials before and during application to produce uniform color and density. Use applicators and techniques best suited to substrate and material being applied. Sand lightly between coats.

B. Apply materials under adequate illumination. Provide a surface free of brush marks, laps, roller skids, and other surface imperfections.

C. Allow sufficient time between coats to permit proper drying.

D. Do not paint over UL or other code-required labels, or equipment identification, performance, or name plates. Do not paint operating portions of valves, dampers, sensing devices, controls, motors, or similar devices.

E. Tint each undercoat a slightly lighter color to facilitate identification of coats where multiple coats are specified.

F. Roller-applied coats or spray-applied coats shall provide hiding equivalent to brush-applied coats. Do not double back over wet surfaces with spray or roller for purpose of building up film thickness of more than a normal brush coat.

**3.04 NUMBER OF COATS**

A. Apply materials at the manufacturer's recommended spreading rate to establish the dry film thickness recommended by the manufacturer.

B. The minimum number of coats required is indicated. Apply additional finish coats until the surface is of uniform color, sheen, and general appearance. Wall surfaces within the same room or corridor with the same finish color shall match.

C. If factory-applied prime coats are in good condition and are compatible with finish coats, the specified prime coat may be omitted.

**3.05 MISCELLANEOUS ITEMS**

A. Extend the finish beyond the end of demolition and patching to the next vertical corner, door, or window. If terminated at a door or window, cut to a straight vertical line from floor to ceiling at the edge of the frame.

B. Finish closets the same as the room in which they occur, unless otherwise scheduled.

C. Paint all edges and frame surfaces of doors, windows, access panels, and other field-finished operable assemblies exposed when opened. Leave open until paint is dry. Operate through full range of travel after paint is dry to ensure free operation; remove excess paint and repaint if required.

D. Paint flat black the interior surfaces of ducts that are visible through grilles or registers.

E. Prime new drywall that is indicated to receive wall covering.

F. Size or seal surfaces mechanical insulation before painting.

G. Finish interior surfaces of wood cabinets without doors or drawers the same as exterior surfaces. Finish interior of closed wood cabinets, including drawers, with 1 coat of sanding sealer and 1 coat of satin varnish.

**3.06 PROTECTION AND CLEANING**

A. Provide barricades and "Wet Paint" signs to protect painted finishes.

B. Remove temporary coverings. Clean glass and paint-spattered or smeared surfaces using materials and methods that will not scratch, stain, or damage such surfaces.

**3.07 SHEEN**

A. Definitions:

1. Flat: 0 to 9 units at 85 degrees.
2. Eggshell: 10 to 24 units at 85 degrees.
3. Satin: 25 to 29 units at 60 degrees.
4. Semi-gloss: 30 to 45 units at 60 degrees.
5. Gloss: 70 units minimum at 60 degrees.

B. Exterior sheen schedule:

1. Metal: Gloss.
2. Concrete, CMU: Flat or satin.
3. Wood trim: Gloss.
4. Other wood: Satin.

C. Interior sheen schedule:

1. Steel bar joists, steel deck, mechanical insulation, exposed overhead work: Flat.
2. Ceilings: Eggshell.
3. Walls: Eggshell or satin.
4. Steel frames, radiation covers, stairs, rails; accordion door track, chain guide, wall mounted striker posts; other steel: Gloss.
5. Hollow metal door frames and doors: Semi-gloss.

D. Wood, stained: Satin.

**3.08 EXTERIOR PAINT SCHEDULE**

A. Concrete masonry units:

1. 1 coat S-W PrepRite Block Filler B25W25. 42 grams per liter VOC.*
2. 2 coats S-W 100 percent Acrylic B12WF Series, satin. 96 grams per liter VOC.

B. Ferrous metal, primed metal, zinc-coated metal, light duty:

1. 1 coat S-W Pro-Cryl Universal Metal Primer B66-310 Series. 110 grams per liter VOC.*
2. 2 coats S-W SuperPaint Exterior High Gloss A85 Series. 118 grams per liter VOC.

**3.09 INTERIOR PAINT SCHEDULE**

A. Gypsum wallboard, concrete, mineral-fiber reinforced cement panels; walls, normal exposure.

1. 1 coat S-W Harmony Interior Primer B11W900. 0 grams per liter VOC.
2. 2 coats S-W Harmony Interior Latex Eg-shel B9W900 Series. 0 grams per liter VOC.

B. Gypsum wallboard, concrete, mineral-fiber reinforced cement panels; ceilings and soffits, normal exposure.
   1. 1 coat S-W Harmony Interior Primer B11W900. 0 grams per liter VOC.*
   2. 2 coats S-W Harmony Interior Latex Flat B5W900 Series. 0 grams per liter VOC.

C. Concrete masonry units:
   1. 1 coat S-W PrepRite Block Filler B25W25. 42 grams per liter VOC.*
   2. 2 coats S-W Harmony Interior Latex Eg-shel B9W900 Series. 0 grams per liter VOC.

D. Wood, transparent finish:
   1. 1 coat (if color stain): S-W WoodClassics Wood Stain A49 Series. 524 grams per liter VOC.*
   2. 2 coats S-W WoodClassics Waterborne Polyurethane Varnish, stain. 309 grams per liter VOC.*

E. Ferrous metal, primed metal, zinc-coated metal, and aluminum; light duty:
   1. 1 coat S-W Pro-Cryl Universal Metal Primer B66-310 Series. 110 grams per liter VOC.*
   2. 2 coats S-W Harmony Interior Semi-Gloss B10W900 Series, semi-gloss. 0 grams per liter VOC.

F. Ferrous metal, primed metal, zinc-coated metal, and aluminum; heavy duty:
   1. 1 coat S-W Pro-Cryl Universal Metal Primer B66-310 Series. 110 grams per liter VOC.*
   2. 2 coats S-W Centurian Water Based 2K Urethane B65-700, gloss. 66 grams per liter VOC.

G. Exposed overhead work:
   1. 1 coat (as needed): S-W Pro-Cryl Metal Primer B66-310. 110 grams per liter VOC.*
   2. 1 coat S-W Waterborne Acrylic Eg-shel Dryfall B42W2. 58 grams per liter VOC.

H. Wall surfaces scheduled to receive vinyl wall covering:
   1. 1 coat PrepRite Classic Interior Latex Primer B28W101. 89 grams per liter VOC.*

I. * Denotes coatings that are not categorized as flat or non-flat coatings. The Environmental Protection Agency has assigned 63 different categories for architectural and industrial maintenance coatings. Four of those categories are flat (interior and exterior) and non-flat (interior and exterior). GreenSeal requirements referenced by LEED refer only to flat and non-flat coatings.

J. Pipe color coding schedule: Color coding of exposed piping color numbers are based upon Pratt and Lambert numbers, other paint systems may be specified, however, colors are to match these Pratt and Lambert numbers as listed below:
   1. Natural gas: 1104 Queen's Jubilee B2 / 4.
   2. Propane: 1869 Mandarin B0 / 7.
   3. Fuel Oil: 2049 Safari B1 / 1.
   4. Standpipe and Sprinkler Piping: Banner Red.
   5. Steam Condensate: 1836 Carrot BY / 7.
   6. Chilled Water: 1653 Chufa B1 / 1.
   7. Condensed Water: 1404 Tide Pools B2 / 2.
   8. Heating Hot Water: 1029 Doll's Dress B1 / 3.
   9. Domestic Cold Water: 1208 Blueberry B3 / 4.
   10. Domestic Hot Water: 1032 Cerise Delight B3 / 5.
   11. Stenciled pipes at appropriate intervals to indicate carried contents, (e.g. Oxygen, Fire Sprinkler, Vacuum, etc.).

~~K. Gypsum board walls and ceilings EPNT: Locations Room No.s 2102, 2105, 2106 and 2107. [AD 2]~~
   ~~1. 1 coat S-W PrepRite 200 Latex Wall Primer B28W200, 4 mils wet, 2 mils dry DFT. [AD 2]~~
   ~~2. Topcoat, Semi-Gloss: 2 coat S-W Water Based Catalyzed Epoxy, two-component, B70W211-B60V25, 6.5 to 8.0 mils wet, 2.5 to 3.0 mils dry DFT. [AD 2]~~

**END OF SECTION**

**OWNER FURNISHED ITEMS**

- Owner Furnished, Contractor Installed Items
    - Paper towel dispenser
    - Toilet paper dispenser
    - Sanitary napkin dispenser
    - Soap dispenser
    - Alcohol dispenser
    - Cubicle Curtains and track
    - TV’s and TV mounts

- Owner Furnished, Owner Installed Items
    - Fridge
    - Freezer
    - Microwave

**END OF SECTION**

**PRODUCTS**

(SWP) Sheet Wall Protection
- Construction Specialties, Inc.
- Size: 48x96 or 48x120
- Thickness: .040”
- Color: To be determined _____
- Mounting: Adhesive
- Texture: Suede

(BG) Bumper Guard
- Construction Specialties, Inc.: SCR-50N
- Profile: Convex
- Color/Texture: To be determined _____

(CG) Corner Guards
- Construction Specialties, Inc.: SSM-20
- Length: 4’-0”
- Color/Texture: To be determined _____

**MAINTENANCE STOCK**

Three full pieces or each material or 2%, whichever is greater

**END OF SECTION**

**PUBLIC-USE WASHROOM ACCESSORIES**

(GB1) Grab Bar:
1. Mounting: Flanges with concealed fasteners
2. Material: Stainless steel, 0.05 inch thick (min)
    a. Finish: Smooth, No. 4 finish (satin)
3. Outside Diameter: 1-1/2 inches
4. Configuration and Length: As indicated on drawings

(M1) Mirror 1:
1. Frame: Stainless-steel channel
2. Corners: Manufacture's standard
3. Hangers: Produce rigid, tamper and theft resistant installation
4. Size: See drawings

(CH) Coat Hook:
1. Description: Double-prong unit
2. Material and Finish: Polished chrome-plated brass

**END OF SECTION**

**FIRE PROTECTION CABINET (FEC)**

MANUFACTURER
1. J.L. Industries, Inc. – Embassy Series, 10.5 inches by 24 inches by 6 inches
2. Or equal

CABINET CONSTRUCTION
Non-rated, steel construction

DOOR STYLE
Vertical duo panel with frame, clear float tempered glass

DOOR LOCK
Cam lock that allows door to be opened during emergency by pulling sharply on door handle.

IDENTIFICATION
Lettering to comply with authorities have jurisdiction.

Semi-recessed cabients

**FIRE EXTINGUISHERS**

MANUFACTURER
1. J.L. Industries, Inc.
2. Or equal

TYPE
Multipurpose Dry-Chemical Type in Steel Container (FEC): UL rated, 5-lb nominal capacity, with monoammonium phosphate-based dry chemical in enameled-steel container.

INSTALLATION
Mounting brackets: 54 inches above finish floor to top of fire extinguisher

**END OF SECTION**

A. Window covering shall be provided on all exterior windows and all interior windows requiring privacy or light control.

B. Fabrics used for drapery, curtains and other loosely hanging decorations must meet standards set forth in NFPA.

C. Basis-of-design: MechoShade Systems, Inc.
   - Operation: Manual
   - Material: PVC-Coated fiberglass and polyester blend
   - Style: Basket weave
   - Color: To be determined _____
   - Material Openness Factor: 3 to 10%
   - UV Blockage Factor: 97 to 90%
   - Bottom Hem: Straight

**END OF SECTION**