INDEX TO

SECTION 07 21 00 – THERMAL INSULATION

SECTION 07 21 00

THERMAL INSULATION

PART 1 – GENERAL

1.01 SUMMARY

A. Section Includes:

1. Extruded polystyrene foam-plastic board.
2. Glass-fiber batts.
3. Closed cell spray foam insulation.

1.01 REFERENCES

A. The following is a list of standards which may be referenced in this section:

1. ASTM International (ASTM):

a. C578, Standard Specification for Rigid, Cellular Polystyrene Thermal Insulation.
b. C665, Standard Specification for Mineral-Fiber Blanket Thermal Insulation for Light Frame Construction and Manufactured Housing.
c. E84, Standard Test Method for Surface Burning Characteristics of Building Materials.
d. E96, Standard Test Methods for Water Vapor Transmission of Materials.

1.02 DELIVERY, STORAGE, AND HANDLING

A. On packaging clearly identify manufacturer, contents, brand name, applicable standard, and R-value.

B. Store materials off ground and keep them dry at all times. Protect against weather, condensation, and damage.

PART 2 – PRODUCTS

2.01 EXTRUDED POLYSTYRENE FOAM-PLASTIC BOARD

A. Extruded Polystyrene Board, Type IV: ASTM C 578, Type IV, 25-psi minimum compressive strength; unfaced; maximum flame-spread and smoke-developed indexes of 25 and 450, respectively, per ASTM E 84.

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

1. DiversiFoam Products.

2. Dow Chemical Company.
3. Owens Corning.
4. Pactiv.

2.02 GLASS FIBER BLANKET INSULATION

A. Unfaced, Glass-Fiber Blanket Insulation: ASTM C 665, Type I; with maximum flame-spread and smoke-developed indexes of 25 and 50, respectively, per ASTM E 84; passing ASTM E 136 for combustion characteristics.

B. Manufacturers:

1. CertainTeed Corporation.
2. Johns Manville.
3. Owens Corning.

2.03 SPRAY FOAM INSULATION

A. Closed-Cell Polyurethane Foam Insulation: ASTM C 1029, Type II, with maximum flame-spread and smoke-developed indexes of 75 and 450, respectively, per ASTM E 84.

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

a. BASF Corporation.
b. BaySystems NorthAmerica, LLC.
c. Henry Company.
d. NCFI; Division of Barnhardt Mfg. Co.
e. Icynene, Inc.

2. Minimum density of 1.5 lb/cu. ft., thermal resistivity of 6.2 deg F x h x sq. ft./Btu x in. at 75 deg F.

B. Thermal Barrier for Exposed Spray Foam Insulation: Provide spray applied mineral wool thermal barrier complying with NFPA 275 "Standard Method of Fire Test for the Evaluation of Thermal Barriers Used Over Foam Plastic Insulation." Provide 1-1/2 inch thickness, unless otherwise indicated.

1. Basis-of-Design Product: Firestop TB by Amerrock Products.

C. Ignition Barrier for Exposed Spray Foam Insulation: Provide the following in accordance with applicable code:

1. Ignition Barrier Protective Coating: Aldocoat 757 by Aldo Products Company, Inc.; 7.5-mil minimum dry mil thickness.
2. or other code approved material consistent with type of construction.

PART 3 – EXECUTION

3.01 EXTRUDED POLYSTYRENE FOAM-PLASTIC BOARD INSULATION

A. Install board insulation over concrete or concrete masonry units using Z-shaped furring as specified in Section 09 22 16. Install according to manufacturer's written instructions.

3.02 GLASS-FIBER BLANKET INSULATION

A. Comply with insulation manufacturer's written instructions applicable to products and application indicated. Extend insulation in thickness indicated to envelop entire area to be insulated. Cut and fit tightly around obstructions and fill voids with insulation. Remove projections that interfere with placement.

B. Install glass-fiber blankets in cavities formed by framing members according to the following requirements:

1. Use blanket widths and lengths that fill the cavities formed by framing members. If more than one length is required to fill cavity, provide lengths that will produce a snug fit between ends.
2. Place blankets in cavities formed by framing members to produce a friction fit between edges of insulation and adjoining framing members.
3. For metal-framed wall cavities where cavity heights exceed 96 inches, support unfaced blankets mechanically.

3.03 SPRAY FOAM INSULATION

A. Spray Foam Insulation: Apply spray foam insulation to underside of floor and roof decks, as indicated and according to manufacturer's written instructions.

1. Apply spray foam insulation to thickness or R-value as indicated on Drawings (R-30 at roof).
2. Apply thermal barrier or ignition barrier over exposed spray foam insulation as required for code compliance.

END OF SECTION

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SECTION 07 41 13

METAL ROOF PANELS

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. This Section includes the following:

1. Standing-seam metal roof panels.
2. Metal soffit panels.
3. Self-adhering roof underlayment.
4. Flashing and trim.

1.3 PERFORMANCE REQUIREMENTS

A. General: Provide metal roof panel assemblies that comply with performance requirements specified as determined by testing manufacturers' standard assemblies similar to those indicated for this Project, by a qualified testing and inspecting agency.

B. Air Infiltration: Air leakage of not more than 0.003 cfm/sq. ft. when tested according to ASTM E 1680 at the following test-pressure difference:

1. Test-Pressure Difference: 6.24 lbf/sq. ft.

C. Water Penetration under Static Pressure: No water penetration when tested according to ASTM E 1646 at the following test-pressure difference:

1. Test-Pressure Difference: 8.00 lbf/sq. ft.

D. Wind-Uplift Resistance: Provide metal roof panel assemblies that comply with UL 580 for wind-uplift resistance class indicated.

E. Uniform Wind Load Capacity: Design, size and install components to withstand positive and negative wind loading pressures in accordance with applicable Code, as verified by Structural Engineer.

F. Structural Performance: Provide metal roof panel assemblies capable of withstanding the effects of gravity loads and wind loads as indicated on Structural Drawings, based on testing according to ASTM E 1592.

G. Thermal Movements: Provide metal roof panel assemblies that allow for thermal movements resulting from the following maximum change (range) in ambient and surface temperatures by preventing buckling, opening of joints, overstressing

of components, failure of joint sealants, failure of connections, and other detrimental effects. Base engineering calculation on surface temperatures of materials due to both solar heat gain and nighttime-sky heat loss.

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

1.4 SUBMITTALS

A. Product Data: Include construction details, material descriptions, dimensions of individual components and profiles, and finishes for each type of metal roof panel and accessory.

1. Provide information for roll-forming equipment and certified operator.

B. Shop Drawings: Show fabrication and installation layouts of metal roof panels; details of edge conditions, joints, panel profiles, corners, anchorages, trim, flashings, closures, and accessories; and special details. Distinguish between factory- and field-assembled work.

1. For installed products indicated to comply with design loads, include structural analysis data signed and sealed by the qualified professional engineer responsible for their preparation.
2. Provide calculations of potential expansion and contraction of panels and indicate details to accommodate movement.

C. Coordination Drawings: Roof plans drawn to scale and coordinating penetrations and roof-mounted items. Show the following:

1. Roof panels and attachments.
2. Roof-mounted items.

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

1. Metal Roof and Soffit Panels: 12 inches long by actual panel width. Include fasteners, clips, fascias, closures, and other metal roof panel accessories at roof edge.
2. Trim and Closures: 12 inches long. Include fasteners and other exposed accessories.
3. Accessories: 12-inch- long Samples for each type of accessory.

E. Qualification Data: For Installer.

F. Field quality-control inspection reports.

G. Product Test Reports: Based on evaluation of comprehensive tests performed by a qualified testing agency, for the following:

1. Metal Roof Panels: Include reports for air infiltration, water penetration, and structural performance.

H. Maintenance Data: For metal roof panels to include in maintenance manuals.

I. Warranties: Special warranties specified in this Section.

1.5 QUALITY ASSURANCE

A. Installer Qualifications: An employer or workers trained and certified by the manufacturer of standing seam roof systems. Installer must provide certification and proof of formal training and certification by the manufacturer who requires same training and certification for issuance of specified warranties.

1. Installer's responsibilities include fabricating and installing metal roof panel assemblies and providing professional engineering services needed to assume engineering responsibility.
2. Engineering Responsibility: Preparation of data for metal roof panels, including Shop Drawings, based on testing and engineering analysis of manufacturer's standard units in assemblies similar to those indicated for this Project.

B. Sole Source Responsibility for Roofing: A single Roofing Contractor shall be responsible for providing, coordinating and installing all types of roofing required for project.

C. UL-Certified, Portable Roll-forming Equipment: UL-certified, portable roll-forming equipment capable of producing metal panels warranted by manufacturer to be the same as factory-formed products. Maintain UL certification of portable roll-forming equipment for duration of work. Portable roll-forming equipment must have a minimum of 16 stands and must be operated by a factory trained technician. On-site roll-forming by the roofing contractor is not acceptable.

D. Pre-installation Conference: Conduct conference at Project site to comply with requirements in 01 00 01 and 01 33 00." Review methods and procedures related to metal roof panel assemblies including, but not limited to, the following:

1. Meet with Owner, Architect, Owner's insurer if applicable, testing and inspecting agency representative, metal roof panel Installer, metal roof panel manufacturer's representative, deck Installer, and installers whose work interfaces with or affects metal roof panels including installers of roof accessories.
2. Review and finalize construction schedule and verify availability of materials, Installer's personnel, equipment, and facilities needed to make progress and avoid delays. Ensure that metal roof panel installation schedule will prevent water intrusion which could promote mold growth.
3. Review methods and procedures related to metal roof panel installation, including manufacturer's written instructions.
4. Examine deck substrate conditions for compliance with requirements, including flatness and attachment to structural members.
5. Review structural loading limitations of deck during and after roofing.
6. Review flashings, special roof details, roof drainage, roof penetrations, and condition of other construction that will affect metal roof panels.
7. Review governing regulations and requirements for insurance, certificates, and testing and inspecting if applicable.

8. Review temporary protection requirements for metal roof panel assembly during and after installation.
9. Review roof observation and repair procedures after metal roof panel installation.
10. Document proceedings, including corrective measures and actions required, and furnish copy of record to each participant.

1.6 DELIVERY, STORAGE, AND HANDLING

A. Deliver components, sheets, metal roof panels, and other manufactured items so as not to be damaged or deformed. Package metal roof panels for protection during transportation and handling.

B. Unload, store, and erect metal roof panels in a manner to prevent bending, warping, twisting, and surface damage.

C. Stack metal roof panels on platforms or pallets, covered with suitable weathertight and ventilated covering. Store metal roof panels to ensure dryness. Do not store metal roof panels in contact with other materials that might cause staining, denting, or other surface damage.

D. Protect strippable protective covering on metal roof panels from exposure to sunlight and high humidity, except to extent necessary for period of metal roof panel installation.

1.7 PROJECT CONDITIONS

A. Weather Limitations: Proceed with installation only when existing and forecasted weather conditions permit assembly of metal roof panels to be performed according to manufacturers' written instructions and warranty requirements.

B. Field Measurements: Verify locations of roof framing and roof opening dimensions by field measurements before metal roof panel fabrication and indicate measurements on Shop Drawings.

1.8 COORDINATION

A. Coordinate installation of roof curbs and roof penetrations.

B. Coordinate metal panel roof assemblies with rain drainage work, flashing, trim, and construction of decks, parapets, walls, and other adjoining work to provide a leakproof, secure, and noncorrosive installation.

1.9 WARRANTY

A. Special Warranty: Manufacturer's standard form in which manufacturer agrees to repair or replace components of metal roof panel assemblies that fail in materials or workmanship within specified warranty period. No Dollar Limit of Liability.

1. Failures include, but are not limited to, the following:
   a. Structural failures, including rupturing, cracking, or puncturing.

b. Deterioration of metals, metal finishes, and other materials beyond normal weathering.

2. Warranty Period: Ten years from date of Substantial Completion.

B. Special Warranty on Panel Finishes: Manufacturer's standard form in which manufacturer agrees to repair finish or replace metal roof panels that show evidence of deterioration of factory-applied finishes within specified warranty period.

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

PART 2 – PRODUCTS

2.1 PANEL MATERIALS

A. Metallic-Coated Steel Sheet Pre-painted with Coil Coating: 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. Aluminum-Zinc Alloy-Coated Steel Sheet: ASTM A 792/A 792M, Class AZ50 coating designation, Grade 40; structural quality.
2. Concealed Finish: Apply pretreatment and manufacturer's standard acrylic or polyester backer finish, consisting of prime coat and wash coat with a minimum total dry film thickness of 0.5 mil.
3. Surface: Smooth, striated finish.

2.2 MISCELLANEOUS MATERIALS

A. Fasteners: Self-tapping screws, bolts, nuts, self-locking rivets and bolts, end-welded studs, and other suitable fasteners designed to withstand design loads. Provide exposed fasteners with heads matching color of metal roof panels by means of plastic caps or factory-applied coating.

1. Fasteners for Roof Panels: Self-drilling or self-tapping 410 stainless or zinc-alloy steel hex washer head, with EPDM or PVC washer under heads of fasteners bearing on weather side of metal roof panels.
2. Fasteners for Flashing and Trim: Blind fasteners or self-drilling screws with hex washer head.
3. Blind Fasteners: High-strength aluminum or stainless-steel rivets.

B. Bituminous Coating: Cold-applied asphalt mastic, SSPC-Paint 12, compounded for 15-mil dry film thickness per coat. Provide inert-type noncorrosive compound free of asbestos fibers, sulfur components, and other deleterious impurities.

2.3 STANDING-SEAM METAL ROOF PANELS

A. General: Provide factory-formed metal roof panels designed to be field assembled by lapping and interconnecting raised side edges of adjacent panels with joint type indicated and mechanically attaching panels to supports using

concealed clips in side laps. Include clips, cleats, pressure plates, and accessories required for weathertight installation.

B. Vertical-Rib, Snap-Joint, Standing-Seam Metal Roof Panels: Formed with vertical ribs at panel edges and a striated pan between ribs; designed for sequential installation by mechanically attaching panels to supports using concealed clips located under one side of panels, engaging opposite edge of adjacent panels, and snapping panels together with narrow batten.

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

   a. AEP-Span.
   b. McElroy Metal, Inc. – "Medallion I" (Basis of Design).
   c. Metal Sales Manufacturing Corporation.
   d. Petersen Aluminum Corporation.
   e. Tremco.

2. Material: Aluminum-zinc alloy-coated steel sheet, 0.028-inch-thick (24 gage).

   a. Exterior Finish for Roof Panels: "Galvalume Plus" or equal.

3. Clips: One-piece fixed to accommodate thermal movement.

   a. Material: 0.028-inch- thick, zinc-coated (galvanized) or aluminum-zinc alloy-coated steel sheet.

3. Panel Coverage: 16 inches.

4. Panel Height: 1 inch.

5. Uplift Rating: UL 120, or as otherwise required to withstand positive and negative wind loading pressures in accordance with International Building Code for applicable mph wind speed, as verified by structural engineer.

2.4 METAL SOFFIT PANELS

A. General: Provide metal soffit panels designed to be installed by lapping and interconnecting side edges of adjacent panels and mechanically attaching through panel to supports using concealed fasteners in side laps. Include accessories required for weathertight installation.

B. Flush-Profile Metal Soffit Panels: Solid panels formed with vertical panel edges and intermediate stiffening ribs symmetrically spaced between edges, with flush joint between panels. Soffit panel to be equal to Marquee-Lok by McElroy Metal.

1. Basis-of-Design Product: Subject to compliance with requirements, provide Marquee-Lok by McElroy Metal or Architect approved comparable product.
2. Material: Same material as metal roof panels.

a. Nominal Thickness: 0.028 inch.
b. Exterior Finish: Two-coat fluoropolymer.
c. Color: As selected by Architect from manufacturer's full range.

3. Panel Coverage: 12 inches.

4. Panel Height: 1.0 inch.

2.5 UNDERLAYMENT MATERIALS

A. Self-Adhering, High-Temperature Sheet: 30 to 40 mils thick minimum, 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: Stable after testing at 240 deg F; ASTM D 1970.
2. Low-Temperature Flexibility: Passes after testing at minus 20 deg F; ASTM D 1970.
3. Products: Subject to compliance with requirements, provide one of the following:

a. Carlisle Coatings & Waterproofing Inc., Div. of Carlisle Companies Inc.; CCW WIP 300HT.
b. Cetco; Strongseal.
c. Henry Company; Blueskin High Temp.

2.6 ACCESSORIES

A. Miscellaneous Metal Sub-framing and Furring: ASTM C 645, cold-formed, metallic-coated steel sheet, ASTM A 653/A 653M, G90 coating designation or ASTM A 792/A 792M, Class AZ50 aluminum-zinc-alloy coating designation unless otherwise indicated. Provide manufacturer's standard sections as required for support and alignment of metal panel system.

B. Roof Panel Accessories: Provide components required for a complete metal roof panel assembly including trim, copings, fasciae, corner units, ridge closures, clips, flashings, sealants, gaskets, fillers, closure strips, and similar items. Match material and finish of metal roof panels, unless otherwise indicated.

1. Closures: Provide closures at eaves and ridges, fabricated of same metal as metal roof panels.
2. Backing Plates: Provide metal backing plates at panel end splices, fabricated from material recommended by manufacturer.
3. Closure Strips: Closed-cell, expanded, cellular, rubber or crosslinked, polyolefin-foam or closed-cell laminated polyethylene; minimum 1-inch-thick, flexible closure strips; cut or pre-molded to match metal roof panel profile. Provide closure strips where indicated or necessary to ensure weathertight construction.

C. Flashing and Trim: Formed from minimum 0.024-inch- thick, aluminum-zinc alloy-coated steel sheet. Provide flashing and trim as required to seal against weather

and to provide finished appearance. Locations include, but are not limited to, eaves, rakes, corners, bases, framed openings, ridges, fasciae, and fillers. Finish flashing and trim with same finish system as adjacent metal roof panels.

1. Color: To match roof panels, unless indicated otherwise.

D. Pipe Flashing: Pre-molded, EPDM pipe collar with flexible aluminum ring bonded to base.

2.7 FABRICATION

A. General: Fabricate and finish metal roof panels and accessories at the factory to greatest extent possible, by manufacturer's standard procedures and processes, as necessary to fulfill indicated performance requirements demonstrated by laboratory testing. Comply with indicated profiles and with dimensional and structural requirements.

B. Where indicated, fabricate metal roof panel joints with factory-installed captive gaskets or separator strips that provide a tight seal and prevent metal-to-metal contact, in a manner that will minimize noise from movements within panel assembly.

C. Sheet Metal Accessories: Fabricate flashing and trim to comply with recommendations in SMACNA's "Architectural Sheet Metal Manual" that apply to the design, dimensions, metal, and other characteristics of item indicated.

1. Form exposed sheet metal accessories that are without excessive oil canning, buckling, and tool marks and that are true to line and levels indicated, with exposed edges folded back to form hems.
2. Seams: Fabricate nonmoving seams in accessories with flat-lock seams. Tin edges to be seamed, form seams, and solder.
3. Sealed Joints: Form non-expansion but movable joints in metal to accommodate elastomeric sealant to comply with SMACNA standards.
4. Conceal fasteners and expansion provisions where possible. Exposed fasteners are not allowed on faces of accessories exposed to view.
5. Fabricate cleats and attachment devices from same material as accessory being anchored or from compatible, noncorrosive metal recommended by metal roof panel manufacturer.

    a. Size: As recommended by SMACNA's "Architectural Sheet Metal Manual" or metal roof panel manufacturer for application but not less than thickness of metal being secured.

2.8 FINISHES, GENERAL

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

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

the range of approved Samples and are assembled or installed to minimize contrast.

PART 3 – EXECUTION

3.1 EXAMINATION

A. Examine substrates, areas, and conditions, with Installer present, for compliance with requirements for installation tolerances, metal roof panel supports, and other conditions affecting performance of work.

1. Examine roof framing to verify that rafters and other structural panel support members and anchorages have been installed within alignment tolerances required by metal roof panel manufacturer.
2. For the record, prepare written report, endorsed by Installer, listing conditions detrimental to performance of work.

B. Examine roughing-in for components and systems penetrating metal roof panels to verify actual locations of penetrations relative to seam locations of metal roof panels before metal roof panel installation.

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

3.2 PREPARATION

A. Miscellaneous Supports: Install sub-framing, furring, and other miscellaneous panel support members and anchorages according to ASTM C 754 and metal panel manufacturer's written recommendations.

1. Soffit Framing: Wire tie or clip furring channels to supports, as required to comply with requirements for assemblies indicated.

3.3 UNDERLAYMENT INSTALLATION

A. Self-Adhering Sheet Underlayment: Install self-adhering sheet underlayment, wrinkle free, on roof sheathing under metal roof panels. Apply primer if required by manufacturer. Comply with temperature restrictions of underlayment manufacturer for installation; use primer rather than nails for installing underlayment at low temperatures. Apply over entire roof area, in shingle fashion to shed water, with end laps of not less than 6 inches staggered 24 inches between courses. Overlap side edges not less than 3-1/2 inches. Roll laps with roller. Cover underlayment within 14 days.

3.4 METAL ROOF PANEL INSTALLATION

A. General: Install metal roof panels according to manufacturer's written instructions in orientation, sizes, and locations indicated. Install panels perpendicular to supports unless otherwise indicated. Anchor metal roof panels and other

components of the Work securely in place, with provisions for thermal and structural movement.

1. Shim or otherwise plumb substrates receiving metal roof panels.
2. Flash and seal metal roof panels at perimeter of all openings. Fasten with self-tapping screws. Do not begin installation until air- or water-resistive barriers and flashings that will be concealed by metal roof panels are installed.
3. Install screw fasteners in predrilled holes.
4. Locate and space fastenings in uniform vertical and horizontal alignment.
5. Install flashing and trim as metal panel work proceeds.
6. Locate panel splices over, but not attached to, structural supports. Stagger panel splices and end laps to avoid a four-panel lap splice condition.
7. Align bottoms of metal roof panels and fasten with blind rivets, bolts, or self-tapping screws. Fasten flashings and trim around openings and similar elements with self-tapping screws.
8. Provide weathertight escutcheons for pipe- and conduit-penetrating panels.

B. Fasteners:

1. Steel Panels: Use stainless-steel fasteners for surfaces exposed to the exterior; use galvanized-steel fasteners for surfaces exposed to the interior.

B. Anchor Clips: Anchor metal roof panels and other components of the Work securely in place, using manufacturer's approved fasteners according to manufacturers' written instructions.

C. Metal Protection: Where dissimilar metals contact each other or corrosive substrates, protect against galvanic action as recommended in writing by metal panel manufacturer.

D. Standing-Seam Metal Roof Panel Installation: Fasten metal roof panels to supports with concealed clips at each standing-seam joint at location, spacing, and with fasteners recommended in writing by manufacturer.

1. Install clips to supports with self-tapping fasteners.
2. Install pressure plates at locations indicated in manufacturer's written installation instructions.
3. Snap Joint: Nest standing seams and fasten together by interlocking and completely engaging factory-applied sealant.
4. Watertight Installation:

    a. Apply a continuous ribbon of sealant or tape to seal joints of metal panels, using sealant or tape as recommend in writing by manufacturer as needed to make panels watertight.
    b. Provide sealant or tape between panels and protruding equipment, vents, and accessories.
    c. At panel splices, nest panels with minimum 6-inch end lap, sealed with sealant and fastened together by interlocking clamping plates.

3.5 METAL SOFFIT PANEL INSTALLATION

A. General: Install metal soffit panels according to manufacturer's written instructions in orientation, sizes, and locations indicated. Install panels perpendicular to supports unless otherwise indicated. Anchor metal soffit panels and other components of the Work securely in place, with provisions for thermal and structural movement.

1. Shim or otherwise plumb substrates receiving metal soffit panels.
2. Flash and seal metal soffit panels at perimeter of all openings. Fasten with self-tapping screws. Do not begin installation until air- or water-resistive barriers and flashings that will be concealed by metal soffit panels are installed.
3. Install screw fasteners in predrilled holes.
4. Locate and space fastenings in uniform vertical and horizontal alignment.
5. Install flashing and trim as metal soffit panel work proceeds.
6. Locate panel splices over, but not attached to, structural supports. Stagger panel splices and end laps to avoid a four-panel lap splice condition.
7. Provide weathertight escutcheons for pipe- and conduit-penetrating panels.

B. Fasteners:

1. Steel Panels: Use stainless-steel fasteners for surfaces exposed to the exterior; use galvanized-steel fasteners for surfaces exposed to the interior.

C. Metal Protection: Where dissimilar metals contact each other or corrosive substrates, protect against galvanic action as recommended in writing by metal soffit panel manufacturer.

D. Lap-Seam Metal Soffit Panels: Fasten metal soffit panels to supports with fasteners at each lapped joint at location and spacing recommended by manufacturer.

1. Apply panels and associated items true to line for neat and weathertight enclosure.
2. Provide metal-backed washers under heads of exposed fasteners bearing on weather side of metal soffit panels.
3. Locate and space exposed fasteners in uniform vertical and horizontal alignment. Use proper tools to obtain controlled uniform compression for positive seal without rupture of washer.
4. Install screw fasteners with power tools having controlled torque adjusted to compress washer tightly without damage to washer, screw threads, or panels. Install screws in predrilled holes.

E. Watertight Installation:

1. Apply a continuous ribbon of sealant or tape to seal lapped joints of metal soffit panels, using sealant or tape as recommend by manufacturer on side laps of nesting-type panels and elsewhere as needed to make panels watertight.

2. Provide sealant or tape between panels and protruding equipment, vents, and accessories.
3. At panel splices, nest panels with minimum 6-inch end lap, sealed with sealant and fastened together by interlocking clamping plates.

3.6 ACCESSORY INSTALLATION

A. General: Install accessories with positive anchorage to building and weathertight mounting and provide for thermal expansion. Coordinate installation with flashings and other components.

1. Install components required for a complete metal roof panel assembly including trim, copings, ridge closures, seam covers, flashings, sealants, gaskets, fillers, closure strips, and similar items.

B. Flashing and Trim: Comply with performance requirements, manufacturer's written installation instructions, and SMACNA's "Architectural Sheet Metal Manual." Provide concealed fasteners where possible, and set units true to line and level as indicated. Install work with laps, joints, and seams that will be permanently watertight and weather resistant.

1. Install exposed flashing and trim that is without excessive oil canning, buckling, and tool marks and that is true to line and levels indicated, with exposed edges folded back to form hems. Install sheet metal flashing and trim to fit substrates and to result in waterproof and weather-resistant performance.
2. Expansion Provisions: Provide for thermal expansion of exposed flashing and trim. Space movement joints at a maximum of 10 feet with no joints allowed within 24 inches of corner or intersection. Where lapped or bayonet-type expansion provisions cannot be used or would not be sufficiently weather resistant and waterproof, form expansion joints of intermeshing hooked flanges, not less than 1 inch deep, filled with mastic sealant (concealed within joints).

C. Pipe Flashing: Form flashing around pipe penetration and metal panels. Fasten and seal to panel as recommended by manufacturer.

3.7 ERECTION TOLERANCES

A. Installation Tolerances: Shim and align metal roof panel units within installed tolerance of 1/4 inch in 20 feet on slope and location lines as indicated and within 1/8-inch offset of adjoining faces and of alignment of matching profiles.

3.8 FIELD QUALITY CONTROL

A. Manufacturer's Field Service: Engage a factory-authorized service representative to inspect completed metal roof panel installation, including accessories. Report results in writing.

B. Remove and replace applications of metal roof panels where inspections indicate that they do not comply with specified requirements.

C. Additional inspections, at Contractor's expense, will be performed to determine compliance of replaced or additional work with specified requirements.

3.9 CLEANING AND PROTECTION

A. Remove temporary protective coverings and strippable films, if any, as metal roof panels are installed. On completion of metal roof panel installation, clean finished surfaces as recommended by metal roof panel manufacturer. Maintain in a clean condition during construction.

B. Replace metal roof panels that have been damaged or have deteriorated beyond successful repair by finish touchup or similar minor repair procedures.

END OF SECTION

INDEX TO

SECTION 07 46 46 – FIBER–CEMENT TRIM

SECTION 07 46 46

FIBER-CEMENT 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. This Section includes the following:

1. Fiber-cement trim.

1.3 SUBMITTALS

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

1.4 PERFORMANCE REQUIREMENTS

A. Uniform Wind Load Capacity: Design, size and install components to withstand positive and negative wind loading pressures in accordance with International Building Code, as determined by Structural Engineer.

1.5 DELIVERY, STORAGE, AND HANDLING

A. Store materials in a dry, well-ventilated, weathertight place.

1.6 PROJECT CONDITIONS

A. Weather Limitations: Proceed with installation only if substrate is completely dry and if existing and forecasted weather conditions permit siding to be installed according to manufacturer's written instructions.

1.7 SEQUENCING

A. Coordinate installation with flashings and other adjoining construction to ensure proper sequencing.

1.8 WARRANTY

A. Special Warranty: Manufacturer's standard form in which manufacturer agrees to repair or replace trim that does not comply with requirements or that fails within specified warranty period. Failures include, but are not limited to, cracking, deforming, or otherwise deteriorating beyond normal weathering.

1. Warranty Period: 30 years from date of Substantial Completion.

PART 2 - PRODUCTS

2.1 FIBER-CEMENT TRIM

A. Fiber Cement Trim: Made from fiber-cement board that does not contain asbestos fibers; complies with ASTM C 1186, Type A, Grade II; classified as noncombustible when tested according to ASTM E 136.

1. Size: As indicated on drawings.

2. Texture: Smooth.

3. Thickness: As indicated.

4. Finish: Factory prime painted.

B. Elastomeric Joint Sealant: Single-component nonsag urethane joint sealant.

1. Caulk all joints between fiber cement trim pieces.

C. Fasteners: Stainless steel.

1. Stainless steel.

PART 3 - EXECUTION

3.1 PREPARATION

A. Examine substrates for compliance with requirements for installation tolerances and other conditions affecting performance of trim. Proceed with installation only after unsatisfactory conditions have been corrected.

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

3.2 INSTALLATION

A. Fiber Cement Trim: Comply with manufacturer's written installation instructions applicable to products and applications indicated, unless more stringent requirements apply.

1. Install flashing around all wall openings.

2. Fasten through trim into structural framing or code complying sheathing. Fasteners must penetrate minimum 3/4 inch or full thickness of sheathing. Additional fasteners may be required to ensure adequate security.

3. Place fasteners no closer than 3/4 inch and no further than 2 inches from side edge of trim board and no closer than 1 inch from end. Fasten maximum 16 inches on center.

4. Maintain clearance between trim and adjacent finished grade.

5. Trim inside corner with a single board trim both side of corner.

6. Outside Corner Board Attach Trim on both sides of corner with 16 gage corrosion resistant finish nail 1/2 inch from edge spaced 16 inches apart, weather cut each end spaced minimum 12 inches apart.

7. Allow 1/8-inch gap between trim and adjacent cladding. Seal gap with high quality, paint-able caulk.

3.3 ADJUSTING AND CLEANING

A. Remove damaged, improperly installed, or otherwise defective materials and replace with new materials complying with specified requirements.

B. Clean finished surfaces according to manufacturer's written instructions and maintain in a clean condition during construction.

END OF SECTION

INDEX TO

SECTION 07 62 00 – SHEET METAL FLASHING AND TRIM

SECTION 07 62 00

SHEET METAL FLASHING AND TRIM

PART 1 – GENERAL

1.01 REFERENCES

A. The following is a list of standards which may be referenced in this section:

1. ASTM International (ASTM):

a. B209, Standard Specification for Aluminum and Aluminum-Alloy Sheet and Plate.
b. C920, Standard Specification for Elastomeric Joint Sealants.
c. C 1311, Standard Specification for Solvent Release Sealants.
d. D1187, Standard Specification for Asphalt-Base Emulsions for Use as Protective Coatings for Metal.
e. D4586, Standard Specification for Asphalt Roof Cement, Asbestos-Free.
fi. Sheet Metal and Air Conditioning Contractors National Association (SMACNA): Architectural Sheet Metal Manual, 5th Edition.

1.02 PERFORMANCE REQUIREMENTS

A. General: Sheet metal flashing and trim shall withstand wind loads, structural movement, thermally induced movement, and exposure to weather without failing, rattling, leaking, and fastener disengagement.

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

C. Wind Pressure: Provide anchorage for sheet metal flashing and trim that resists wind pressures as shown on Structural Drawings.

D. Thermal Movements:

1. Provide sheet metal flashing and trim that allows for thermal movements resulting from the following maximum change (range) in ambient and surface temperatures by preventing buckling, opening of joints, hole elongation, overstressing of components, failure of joint sealants, failure of connections, and other detrimental effects.
2. Provide clips that resist rotation and avoid shear stress as a result of sheet metal and trim thermal movements.
3. Temperature Change (Range): 120 degrees F, ambient; 180 degrees F, material surfaces.

E. Water Infiltration: Provide sheet metal flashing and trim that does not allow water infiltration to building interior.

1.03 QUALITY ASSURANCE

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

1.04 SUBMITTALS

A. Action Submittals:

1. Shop Drawings:

a. Show joints, types and location of fasteners, and special shapes.
b. Catalog data for stock manufactured items.

2. Samples: Color Samples for items to be factory finished.

1.05 DELIVERY, HANDLING, AND STORAGE

A. Inspect for damage, dampness, and wet storage stains upon delivery to Work Site.

B. Remove and replace damaged or permanently stained materials that cannot be restored to like-new condition.

C. Carefully handle to avoid damage to surfaces, edges, and ends.

D. Do not open packages until ready for use.

E. Store materials in dry, weathertight, ventilated areas until immediately before installation.

PART 2 – PRODUCTS

2.01 METALS

A. Prefinished Aluminum Sheet: ASTM B209, alloy and temper as required for application and finish: 0.032-inch thick; mill finish; shop pre-coated with fluoropolymer coating (Kynar polyvinylidene fluoride resin) coating; color as selected by Architect.

B. Stainless-Steel Sheet: ASTM A 240/A 240M or ASTM A 666, Type 316, dead soft, fully annealed; with smooth, flat surface; 0.016-inch-thick unless otherwise indicated; 2D finish.

2.02 TYPICAL FLASHING AND TRIM

A. Stainless steel sheet.

2.03 GUTTERS AND DOWNSPOUTS

A. Prefinished aluminum sheet.

2.04 ANCILLARY MATERIALS

A. Sealing Tape: Polyisobutylene sealing tape.

B. Isolation Tape: Butyl or polyisobutylene, internally reinforced, or 20-mil thick minimum polyester.

C. Plastic Roof Cement: ASTM D4586, Type II.

D. Elastomeric Sealant: ASTM C920, elastomeric silicone polymer sealant; of type, grade, class, and use classifications required to seal joints in sheet metal flashing and trim and remain watertight.

E. Solder for Stainless Steel: ASTM B 32, Grade Sn60, with acid flux of type recommended by stainless-steel sheet manufacturer.

F. Butyl Sealant: ASTM C1311, single-component, solvent-release butyl rubber sealant, polyisobutylene plasticized, heavy bodied for hooked-type expansion joints with limited movement.

G. Fasteners:

1. For Stainless Steel: Stainless steel.
2. For Aluminum: Stainless steel or aluminum; reglet fasteners may be galvanized or cadmium-plated steel.

2.05 FABRICATION OF FLASHING

A. Field measure prior to fabrication.

B. Fabricate in accordance with SMACNA Architectural Sheet Metal Manual that apply to design, dimensions, metal, and other characteristics of item indicated.

C. 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.

D. Fabricate 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.

E. Seams for Stainless Steel: Fabricate nonmoving seams with flat-lock seams. Tin edges to be seamed, form seams, and solder.

F. Seams for Aluminum: Fabricate nonmoving seams with flat-lock seams. Form seams and seal with epoxy seam sealer. Rivet joints for additional strength.

G. Reinforcements and Supports: Provide same material as flashing, unless other material is shown. Steel, where shown or required, shall be galvanized or stainless.

H. Rigid Joints and Seams: Make mechanically strong. Seal aluminum joints with sealant.

I. Sealed Joints: Form non–expansion but movable joints in metal to accommodate elastomeric sealant to comply with SMACNA recommendations.

J. Expansion Provisions: Where lapped or bayonet-type expansion provisions in the Work cannot be used, form expansion joints of intermeshing hooked flanges, not less than I-inch deep, filled with butyl sealant concealed within joints.

K. Fabricate sheet metal in 10-foot maximum lengths, unless otherwise indicated.

L. Conceal fasteners and expansion provisions where possible on exposed-to-view sheet metal flashing and trim, unless otherwise indicated.

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

1. Thickness: As recommended by SMACNA's "Architectural Sheet Metal Manual" and FMG Loss Prevention Data Sheet 1-49 for application, but not less than thickness of metal being secured.

2.06 FABRICATION OF GUTTER AND DOWNSPOUTS

A. Gutters and Downspouts: Manufactured formed gutter in uniform section lengths not exceeding 12 feet, with mitered and welded or soldered corner units, end caps, outlet tubes, and other accessories. Elevate back edge at least 1 inch above front gutter rim. Furnish with flat-stock gutter straps and gutter support brackets and expansion joints and expansion-joint covers fabricated from same metal as gutters.

1. Fabricate gutter from aluminum sheet, 0.032 inch thick.
2. Gutter Style: As indicated, according to SMACNA's "Architectural Sheet Metal Manual."
3. Downspouts: Rectangular with mitered elbows, manufactured from formed aluminum, 0.032 inch thick. Furnish wall brackets, from same material and finish as downspouts, with anchors.

PART 3 – EXECUTION

3.01 EXAMINATION

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

B. Verify that substrate is sound, dry, smooth, clean, sloped for drainage, and securely anchored.

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

3.02 INSTALLATION

A. Flashing:

1. General: Install sheet metal roof flashing and trim to comply with performance requirements and SMACNA's "Architectural Sheet Metal Manual." Provide concealed fasteners where possible, set units true to line, and level as indicated. Install work with laps, joints, and seams that will be permanently watertight.
2. Isolate metal from wood and concrete and from dissimilar metal with isolation tape or two coats of isolation paint.
3. Use only stainless-steel fasteners to connect isolated dissimilar metals.
4. Joints: 10-foot maximum spacing and 2-1/2 feet from corners, butted with 3/16-inch space centered over matching 8-inch-long backing plate with sealing tape in laps.
5. Set flanges of flashings and roof accessories on continuous sealer tape or in plastic roof cement on top of envelope ply of roofing. Nail flanges through sealing tape and at 3-inch maximum spacing. Touch up isolation paint on flanges.
6. Joints, Fastenings, Reinforcements, and Supports: Sized and located as required to preclude distortion or displacement due to thermal expansion and contraction.
7. Provide continuous hold–down clips at counter flashing and gravel stops.
8. Conceal fastenings wherever possible.
9. Set flashing and sheet metal to straight, true lines with exposed faces aligned in proper plane without bulges or waves.

B. Prefabricated Metal Systems:

1. Follow system manufacturer's printed instructions.
2. Place color variations in pieces so no extremes are next to each other.

3.03 GUTTERS AND DOWNSPOUTS

A. General: Install sheet metal roof drainage items to produce complete roof drainage system according to SMACNA recommendations and as indicated. Coordinate installation of roof perimeter flashing with installation of roof drainage system.

B. Hanging Gutters: Join sections with riveted and soldered joints or with lapped joints sealed with sealant. Provide for thermal expansion. Attach gutters at eave or fascia to firmly anchored gutter brackets spaced not more than 36 inches apart. Provide end closures and seal watertight with sealant. Slope to downspouts.

1. Fasten gutter spacers to front and back of gutter.

2. Anchor and loosely lock back edge of gutter to continuous cleat.
3. Install gutter with expansion joints at locations indicated, but not exceeding, 50 feet apart. Install expansion-joint caps.

C. Downspouts: Join sections with 1-1/2-inch telescoping joints.

1. Provide hangers with fasteners designed to hold downspouts securely to walls. Locate hangers at top and bottom and at approximately 60 inches o.c. in between.

3.04 FINISH

A. Exposed Surfaces of Flashing and Sheet Metalwork: Free of dents, scratches, abrasions, or other visible defects, and clean and ready for painting where applicable.

3.05 CLEANING AND PROTECTION

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

B. Remove temporary protective coverings and strippable films as sheet metal flashing and trim are installed. On completion of installation, clean finished surfaces, including removing unused fasteners, metal filings, pop rivet stems, and pieces of flashing. Maintain in a clean condition during construction.

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

END OF SECTION

INDEX TO

SECTION 07 84 00 – FIRESTOPPING

SECTION 07 84 00

FIRESTOPPING

PART 1 – GENERAL

1.01 REFERENCES

A. The following is a list of standards that may be referenced in this section:

1. ASTM International (ASTM):

a. E814, Test Method for Fire Tests of Through-Penetration Firestops.

2. Underwriters Laboratory, Inc. (UL):

a. 1479, Fire Tests of Through-Penetration Firestops.
b. 2079, Tests for Fire Resistance of Building Joint Systems.

1.02 SYSTEM DESCRIPTION

A. Provide systems of material or combination of materials used to fill openings around penetrating items to prevent the spread of fire and retain integrity of fire rated construction by maintaining an effective barrier against spread of flame, smoke, water, and hot gases through penetrations in fire rated wall and floor assemblies.

B. Provide Fire Safing:

1. At slot gaps between edge of floor slabs and exterior walls.
2. Gaps between top of walls and structure above.
3. Expansion joints in walls, floors, and ceilings.

C. Performance Requirements: Provide firestop systems with materials that have been manufactured and installed to maintain performance criteria stated by manufacturer without defects, damage, or failure.

D. Regulatory Requirements:

1. Firestop Systems: Meet requirements of ASTM E814, UL 1479, or UL 2079 tested assemblies that provide a fire rating equal to that of construction being penetrated.
2. Proposed Firestop Materials and Methods: Conform to applicable governing codes having local jurisdiction.
3. Meet F and T ratings of ASTM E814 for a period equal to construction penetrated.
4. Underwriters Laboratories classified as fill, void, or cavity materials under UL 1479.

1.03 SUBMITTALS

A. Action Submittals:

1. Shop Drawings: Show layout, profiles, and product components; include UL Systems Number on Shop Drawings and diagram of UL approved assembly.
2. Product Data: Include manufacturer's SPEC-DATA® product sheet for products selected for use.

B. Informational Submittals:

1. Manufacturer's installation instructions.

2. Test Reports: Certified test reports showing compliance with specified performance characteristics and physical properties.

3. Certificates:

   a. Product certificates signed by manufacturer certifying that materials comply with specified performance characteristics and physical requirements.
   b. Certificate indicating installer qualifications.
   c. Certificate of Proper Installation.

4. Special Guarantee documents specified below.

1.04 QUALITY ASSURANCE

A. Installer Qualifications: Experienced in performing Work of this section and specialized in the installation of work similar to that required for this Project.

B. Pre-installation Meetings: Conduct pre-installation meeting to identify where seals are required and verify Project requirements, substrate conditions, manufacturer's installation instructions, and manufacturer's warranty requirements.

1.05 DELIVERY, STORAGE, AND HANDLING

A. Coordinate delivery of materials with scheduled installation date to allow minimum storage time at Project Site.

B. Deliver materials in manufacturer's original, unopened, undamaged containers with identification and UL listing mark intact.

C. Store materials under cover and protect from weather and damage in compliance with manufacturer's requirements.

D. Follow recommended procedures, precautions, or remedies described in Material Safety Data Sheets as applicable.

1.06 SEQUENCING AND SCHEDULING

A. Firestopping requirements may be created by mechanical and electrical portions of the Work:

1. Identify locations requiring firestopping.
2. Schedule installation of firestopping after completion of penetrating item installation but prior to covering or concealing of openings.

1.07 SPECIAL GUARANTEE

A. Provide manufacturer's extended guarantee or warranty, with Owner named as beneficiary, in writing, as special guarantee. Special guarantee shall provide for correction of equipment found defective during a period of 2 years after the date of Substantial Completion. Duties and obligations for correction or removal and replacement of defective Work shall be as specified in the General Conditions.

PART 2 – PRODUCTS

2.01 GENERAL

A. Furnish firestop system products from a single manufacturer.

2.02 MANUFACTURERS

A. 3M Corp.; Firestopping Products.

B. Hilti Construction Chemicals; High Performance Firestop Systems.

C. International Protective Coatings Corp. (IPC); Flamesafe Firestop Products.

D. Isolatek International (Cafco); TPS.

E. Specified Technologies; Inc. (STI).

2.03 MIXES

A. For those products requiring mixing prior to application, follow firestopping manufacturer's directions for accurate proportioning of materials, water (if required), type of mixing equipment, selection of mixer speeds, mixing containers, mixing time, and other procedures needed to produce firestopping products of uniform quality with optimum performance characteristics for application indicated.

PART 3 – EXECUTION

3.01 EXAMINATION

A. With manufacturer's representative, examine substrates and conditions for compliance with requirements for opening configurations, penetrating items, substrates, and other conditions affecting performance of firestopping. Do not proceed with installation until unsatisfactory conditions have been corrected.

3.02 PREPARATION

A. Surface Cleaning: Clean openings and joints immediately prior to installing firestopping in accordance with firestop manufacturer recommendations and the following requirements:

1. Remove foreign materials from surfaces of opening and joint substrates and from penetrating items that could interfere with adhesion of firestopping.
2. Clean opening and joint substrates and penetrating items to produce clean, sound surfaces capable of developing optimum bond with firestopping. Remove loose particles remaining from cleaning operation.
3. Remove laitance and form release agents from concrete.

B. Priming: Prime substrates where recommended by firestopping manufacturer using that manufacturer's recommended products and methods. Confine primers to areas of bond; do not allow spillage and migration onto exposed surfaces.

C. Masking Tape: Use masking tape to prevent firestopping from contacting adjoining surfaces that will remain exposed upon completion of Work and that would otherwise be permanently stained or damaged by such contact or by cleaning methods used to remove smears from firestopping materials. Remove tape as soon as it is possible to do so without disturbing firestopping seal with substrates.

3.03 INSTALLATION

A. Manufacturer's Instructions: Follow manufacturer's instructions for installation of through-penetration systems selected for use.

1. Seal holes or voids made by penetrations for pipes, conduits, and ducts through fire-rated floors, walls, and roofs and to ensure air and water-resistant seals.
2. Receive Engineer's approval prior to installation of UL firestop systems that might hamper the performance of fire dampers as it pertains to duct work.

B. Fire Safing: Install, following manufacturer's instructions, to completely fill gaps between tops of fire-rated walls and floor or roof deck above, between edge of floors and walls, and other locations indicated on Drawings.

C. Meet Underwriters Laboratories and Factory Mutual requirements.

3.04 FIELD QUALITY CONTROL

A. Examine sealed penetration areas to ensure proper installation before concealing or enclosing areas.

B. Keep areas of Work accessible until inspection by applicable code authorities.

C. Perform patching and repairing of firestopping caused by cutting or penetrating existing firestop systems.

3.05 MANUFACTURER'S SERVICES

A. Provide manufacturer's representative at Site, for installation assistance, inspection, and certification of proper installation, and training of installer's personnel in proper installation procedures.

3.06 PROTECTION

A. Protect installed product from contact with contaminating substances and from damage during construction.

END OF SECTION

INDEX TO

SECTION 07 92 00 – JOINT SEALANTS

SECTION 07 92 00

JOINT SEALANTS

PART 1 – GENERAL

1.01 REFERENCES

A. The following is a list of standards, which may be referenced in this section:

1. ASTM International (ASTM):

a. C661, Standard Test Method for Indentation Hardness of Elastomeric Type Sealants by Means of a Durometer.
b. C834, Standard Specification for Latex Sealants.
c. C920, Standard Specification for Elastomeric Joint Sealants.
d. C1193, Standard Guide for Use of Joint Sealants.

1.02 SUBMITTALS

A. Action Submittals:

1. Shop Drawings: Surface preparation instructions. Indicate where each product is proposed to be used.
2. Samples: Material proposed for use showing color range available.

B. Informational Submittals:

1. Installation instructions.
2. Documentation showing applicator qualifications.
3. Manufacturer's Certificate of Compliance.
4. Special guarantee.

1.03 QUALITY ASSURANCE

A. Applicator Qualifications: Minimum of 5 years' experience installing sealants in projects of similar scope.

1.04 ENVIRONMENTAL REQUIREMENTS

A. Ambient Temperature: Between 40 degrees F and 80 degrees F when sealant is applied. Consult manufacturer when sealant cannot be applied within these temperature ranges.

1.05 SPECIAL GUARANTEE

A. Product: Furnish manufacturer's extended guarantee or warranty, with Owner named as beneficiary, in writing, as special guarantee. Special guarantee shall provide for correction of equipment found defective during a period of 5 years after the date of Substantial Completion. Duties and obligations for correction or

removal and replacement of defective Work shall be as specified in the General Conditions.

B. Conditions: No adhesive or cohesive failure of sealant.

C. Sealed Joints: Watertight and weather-tight with normal usage.

PART 2 – PRODUCTS

2.01 SEALANT MATERIALS

A. Characteristics:

1. Uniform, homogeneous.
2. Free from lumps, skins, and coarse particles when mixed.
3. Non-staining, non-bleeding.
4. Hardness of 15 minimum and 50 maximum, measured by ASTM C661 method.
5. Immersible may be substituted for non-immersible.

B. Color: Unless specifically noted, match color of the principal wall material adjoining area of application.

C. Type I-Silicone, Non-sag, Non-immersible:

1. Silicone base, single-component, moisture curing; ASTM C920, Type S, Grade NS, Class 25.
2. Capable of withstanding movement up to 50 percent of joint width.
3. Manufacturers and Products:

    a. Dow Coming Corp.; No. 790.
    b. General Electric; Silpruf.
    c. BASF; Sonneborn, Omniseal-50.

D. Type 2-Multipart Polyurethane, Self-leveling, Immersible:

1. Polyurethane base, multi component, chemical curing; ASTM C920, Type M, Grade P, Class 25.
2. Capable of being continuously immersed in water.
3. Manufacturers and Products:

    a. BASF; Sonneborn, SL-2.
    b. Pecora Corp.; Urexspan NR-200.
    c. Tremco; THC-900/901.
    d. Sika Chemical Corp.; Sikaflex 2c SL.

E. Type 4-Multipart Polyurethane, Nonsag, Immersible:

1. Polyurethane base, multi component, chemical curing; ASTM C920, Type M, Grade NS, Class 25.
2. Manufacturers and Products:

a. Pecora; DynaTrol II.
b. Tremco; Dymeric 240.
c. BASF; Sonneborn NP-2.
d. Sika Chemical Corp.; Sikaflex 2c NS.

F. Type 5-One-part Polyurethane, Immersible:

1. Polyurethane base, single-component, moisture curing; ASTM C920, Type S, Grade NS or P, Class 25.
2. Capable of being continuously immersed in water.
3. Manufacturers and Products for Non-sag:

a. Sika Chemical Corp.; Sikaflex-la.
b. Tremco; Vulkem 116.

4. Manufacturers and Products for Self-leveling:

a. BASF; Sonneborn, SL-I.
b. Tremco; Vulkem 45.
c. Sika Chemical Corp.; Sikaflex Ic SL.
d. two-part.

G. Type 8-0ne-Part Polysulfide, Non-sag, Non-immersible:

1. Polysulfide base, single-component, moisture curing; ASTM C920, Type S, Grade NS, Class 12-1/2.
2. Capable of withstanding movement up to 20 percent of joint width.
3. Manufacturer and Product: W. R. Meadows; Deck-O-Seal, one-part.

H. Type 10 Sanitary Sealant:

1. Silicone sealant similar to Type I, above, formulated to resist mold growth and repeated exposure to high humidity while retaining adhesion, flexibility, and color.

2. Manufacturers and Products:

a. Dow Corning; 786.
b. General Electric; Sanitary Sealant SCS 1700.

I. Type 11-Fire Penetration Seal:

1. Manufacturers and Products:

a. 3M Corp.; Fire Barrier Caulk CP25 and Putty 303.
b. General Electric; Pensil Sealant or Foam.
c. Unifrax Corporation; Fyre Putty.
d. Hilti USA; CP 604.

J. Type 12-One-Part Polycarbonate, Immersible:

1. Polycarbonate base, single-component, moisture curing; ASTM C920, Type S, Grade NS, Class 25.

2. Capable of being continuously immersed in water.
3. Manufacturer and Product: Pro-Seal Products, Inc.; Pro-Seal 34.

K. Type 13-Tape Sealant:

1. Compressible polyurethane foam impregnated with polybutylene or polymer-modified asphalt.
2. Color: Black.
3. Size: 3/4-inch-wide by length required by expanded thickness recommended by manufacturer for particular application.
4. Manufacturers and Products:

   a. Emseal Joint Systems, Ltd.; AST-High Acrylic.
   b. Dayton Superior; Polytite Standard.
   c. PARR Technologies; PARR Sealant EP-7212-T.

2.02 BACKUP MATERIAL

A. Non-gassing, extruded, closed-cell round polyurethane foam or polyethylene foam rod, compatible with sealant used, and as recommended by sealant manufacturer.

B. Size: As shown or as recommended by sealant material manufacturer. Provide for joints greater than 3/16 inch wide.

C. Manufacturers and Products:

1. Sonneborn; Sonolastic Closed-cell Backing Rod.
2. Tremco; Closed-cell Backing Rod.
3. Pecora Corporation; Green Rod.

2.03 ANCILLARY MATERIALS

A. Bond Breaker: Pressure sensitive tape as recommended by sealant manufacturer to suit application.

B. Joint Cleaner: Noncorrosive and non-staining type, recommended by sealant manufacturer; compatible with joint forming materials.

C. Primer: Non-staining type recommended by sealant manufacturer to suit application.

2.04 PREFORMED SEALS

A. Preformed Compressible Joint Seals:

1. Widths Up to 5 Inches:

   a. BASF, Watson Bowman Acme Div.; Wabo Weatherseal II.

b. Emseal Joint Systems Limited; Colorseal.
c. LymTal International; Iso-flex Joint System.

2. Other Widths: Series or model recommended by seal manufacturer.

PART 3 – EXECUTION

3.01 GENERAL

A. Use of more than one material for the same joint is not allowed unless approved by sealant manufacturer.

B. Install joint sealants in accordance with ASTM C1193.

C. Horizontal and Sloping Joints up to 1 Percent Maximum Slope: Use self-leveling (Grade P) joint sealant.

D. Steeper Sloped Joints, Vertical Joints, and Overhead Joints: Use non-sag (Grade NS) joint sealant.

E. Use joint sealant as required for the applicable application and as follows:

Joint Size	Sealant Type
Less than 1"	1, 2, 3, 4, 5, 6, 7, 8, 9,10, or 12
Less than 2"	1, 2, 3, 4, or 7
Over 2"	Follow manufacturer's recommendation

3.02 PREPARATION

A. Verify that joint dimensions, and physical and environmental conditions, are acceptable to receive sealant.

B. Surfaces to be sealed shall be clean, dry, sound, and free of dust, loose mortar, oil, and other foreign materials.

1. Mask adjacent surfaces where necessary to maintain neat edge.
2. Starting of work will be construed as acceptance of sub-surfaces.
3. Apply primer to dry surfaces as recommended by sealant manufacturer.

C. Verify joint shaping materials and release tapes are compatible with sealant.

D. Examine joint dimensions and size materials to achieve required width/depth ratios.

E. Follow manufacturer's instructions for mixing multi-component products.

3.03 INSTALLATION

A. Use joint filler to achieve required joint depths, to allow sealants to perform intended function.

1. Install backup material as recommended by sealant manufacturer.
2. Where possible, provide full length sections without splices; minimize number of splices.
3. Tape sealant may be used as joint filler if approved by sealant manufacturer.

B. Use bond breaker where recommended by sealant manufacturer.

C. Seal joints around window, door and louver frames, expansion joints, control joints, and elsewhere as indicated.

D. Joint Sealant Materials: Follow manufacturer's recommendation and instructions, filling joint completely from back to top, without voids.

E. Joints: Tool slightly concave after sealant is installed.

1. When tooling white or light color sealant, use water wet tool.
2. Finish joints free of air pockets, foreign embedded matter, ridges, and sags.

F. Tape Sealant: Compress to 50 percent of expanded thickness and install in accordance with manufacturer's instructions.

3.04 PREFORMED SEALS

A. Prepare joint surfaces clean and dry, free from oil, rust, laitance, and other foreign material.

B. Construct joints straight and parallel to each other and at proper width and depth.

C. Apply joint sealant manufacturer's approved primer and adhesive in accordance with manufacturer's instructions.

D. Install seal in accordance with manufacturer's instructions.

3.05 CLEANING

A. Clean surfaces next to the sealed joints of smears or other soiling resultant of sealing application.

B. Replace damaged surfaces resulting from joint sealing or cleaning activities.

3.06 JOINT SEALANT SCHEDULE

A. This schedule lists the sealant types acceptable for each joint location. Use as few different sealant types as possible to meet the requirements of Project.

Joint Locations	Sealant Type(s)
Expansion/Contraction and Control Joints At:	
Concrete Walls (except water-holding) and below-grade portions of structures	1, 5, 12
Concrete Floor Slabs (except for water-holding Structures	2, 5
Slabs Subject to Vehicle and Pedestrian Traffic	2, 5
Masonry Walls	1, 4, 5, 12, 13
Exterior Insulation and Finish System	4
Ceramic Tile Floors	1, 2, 5, 10
Ceramic Tile Walls	1, 5, 10
Pre-cast Concrete Wall Panels	4, 5, 12, 13
Materials Joint At:	
Metal Door, Window, and Louver Frames (Exterior)	1, 5, 8, 12
Metal Door, Window, and Louver Frames (Interior)	1, 5, 8
Wall Penetrations (Exterior)	1, 5, 8, 12
Wall Penetrations (Interior)	1, 5, 6, 8
Floor Penetrations	5
Ceiling Penetrations	1, 4, 5
Roof Penetrations	5
Sheet Metal Flashings	5, 13
Sheet Metal Roofing and Siding	5, 13
Glazed Concrete Masonry Unit Joints	1
Other Joints	
Threshold Sealant Bed	5
Between Counter Tops and Backsplashes	10
Around Plumbing Fixtures	10
Opening Around Pipes, Conduits, and Ducts Through Fire-Rated Construction	11
Concrete Form Snap-Tie Holes	1, 4, 5

END OF SECTION