DIVISION 07

THERMAL AND MOISTURE PROTECTION

SECTION 07175 - WATER REPELLENTS

PART 1 - GENERAL

1.01 RELATED DOCUMENTS

A. Drawings and general provisions of Contract, including General and Supplementary Conditions and Division-1 Specification sections, apply to work of this section.

1.02 DESCRIPTION OF WORK

A. Extent of surfaces to receive water repellant includes new exterior exposed brick masonry.

1.03 QUALITY ASSURANCE

A. Application: A firm with not less than 3 years of successful experience in application of water repellents of types required on substrates similar to those of this project.

1.04 SUBMITTALS

A. Product Data: Submit manufacturer's specifications, installation instructions, and general recommendations for water repellents. Include data substantiating that materials are recommended by manufacturer for applications indicated and comply with requirements.

1.05 JOB CONDITIONS

A. Weather and Substrate Conditions: Do not proceed with application of water repellant (except with written recommendation of manufacturer), when ambient temperature is less than 50 deg. F (10 deg. C); when substrate surfaces have cured for less than a period of 2 months; when rain or temperatures below 40 deg. F (4 deg. C), are predicted for a period of 24 hours, or earlier than 3 days after surfaces became wet; when substrate is frozen; at surface temperature of less than 40 deg. F (4 deg. C).

PART 2 - PRODUCTS

2.01 WEATHER SEAL SILOXANE

A. Provide manufacturer's standard "winter-clear" breathing, water repellant coating based on oligomeric alkyl-alkoxy siloxane. The water repellant shall not alter the appearance of the masonry.

B. Provide medium compound 5.0% to 6.7% solids content.

C. Manufacturer: Subject to compliance with requirements, provide products of one of the following:

1. ProSo Co., Inc. Sure Klean Weather Seal Siloxane
2. Pecora International Corp. Clear Seal 908SX
3. Harry S. Peterson Co. Iso-Flex 620 Siloxane Sealer
4. Tamms Industries Co. Hay'Di HOS

PART 3 - EXECUTION

3.01 PREPARATION

A. Test Application: Prior to performance of water repellant work, including bulk purchase/delivery of products, prepare a small application in an unobtrusive location and in a manner acceptable to Engineer, for purpose of demonstrating final effect (visual and physical/chemical) of planned installation. Proceed with work only after Engineer's acceptance of test application, or as otherwise directed.

B. Clean substrate of substances which might interfere with penetration/adhesion of water repellents. Test for moisture content, in accordance with repellant manufacturer's instructions, to ensure that surface is sufficiently dry.

C. Coordination with Sealants: Where feasible, delay application of water repellents until installation of sealants has been completed in joints adjoining surfaces to be coated with repellant.

D. Protect adjoining work, including sealant bond surfaces, from spillage or blow-over of water repellant. Cover adjoining and nearby surfaces of aluminum and glass where there is possibility of water repellant being deposited on surfaces. Cover live plant materials with drop cloths. Clean water repellant from adjoining surfaces immediately after spillage. Comply with manufacturer's recommendations for cleaning.

3.02 INSTALLATION

A. Apply a heavy saturation spray coating of water repellant on surfaces indicated for treatment using low pressure spray equipment. Comply with manufacturer's instructions and recommendations, using airless spraying procedure unless otherwise indicated.

B. Apply a second saturation spray coating, repeating first application. Comply with manufacturer's instructions for limitations on drying time between coats and after rainstorm wetting of surfaces between coats. Consult manufacturer's technical representative if printed recommendations are not applicable to project conditions.

END OF SECTION

SECTION 07210 - BUILDING INSULATION

PART 1 - GENERAL

1.01 SUMMARY

A. Section Includes:

1. Under slabs-on-grade insulation.
2. Foundation edge insulation.
3. Foam-plastic board insulation.
4. Glass-fiber blanket insulation.
5. Loose-fill insulation.
6. Spray polyurethane foam insulation.
7. Vapor retarders.

1.02 ACTION SUBMITTALS

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

1.03 INFORMATIONAL SUBMITTALS

A. Product test reports.

B. Research/evaluation reports.

PART 2 - PRODUCTS

2.01 FOAM-PLASTIC BOARD INSULATION

A. Extruded-Polystyrene Board Insulation: ASTM C 578, with maximum flame-spread and smoke-developed indexes of 75 and 450, respectively, per ASTM E 84. For foundation edge and under slab-on-grade insulation – 2 inches thick, unless indicated otherwise.

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. DiversiFoam Products.
    b. Dow Chemical Company (The).
    c. Owens Corning.
    d. Pactiv Building Products.
2. Type IV, 25 psi (173 kPa), unless otherwise indicated.

2.02 POLYISOCRYANUARATE BOARD INSULATION

A. Rigid Polyisocyanurate Board Insulation: Cellular themal insulation with glass fiber-reinforced Polyisocyanurate closed-cell foam core and aluminum foil facing laminated to both sides: complying with FS HH-I-1972/1, Class 2; aged r-values of 7.2 and 8 at 40 and 75 degrees F (4.4 and 23.9 degrees C), respectively, and as follows:

1. Surface Burning Characteristics: Maximum values for flame spread and smoke developed of 20 and 150, respectively.

2.03 GLASS-FIBER BLANKET INSULATION

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. CertainTeed Corporation.

2. Guardian Building Products, Inc.

3. Johns Manville.

4. Knauf Insulation.

5. Owens Corning.

B. 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.

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

2.04 SPRAY POLYURETHANE 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, available manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following:

a. BASF Corporation.

b. BaySystems NorthAmerica, LLC.

c. Dow Chemical Company (The).

d. ERSystems, Inc.

e. Gaco Western Inc.

f. Henry Company.

g. NCFI; Division of Barnhardt Mfg. Co.

h. SWD Urethane Company.

i. Volatile Free, Inc.

2. Minimum density of 1.5 lb/cu. ft. (24 kg/cu. m), thermal resistivity of 6.2 deg F x h x sq. ft./Btu x in. at 75 deg F (43 K x m/W at 24 deg C).

2.05 VAPOR RETARDERS

A. Polyethylene Vapor Retarders: ASTM D 4397, 10 mils (0.25 mm) thick, with maximum permeance rating of 0.13 perm (7.5 ng/Pa x s x sq. m).

B. Vapor-Retarder Tape: Pressure-sensitive tape of type recommended by vapor-retarder manufacturer for sealing joints and penetrations in vapor retarder.

PART 3 - EXECUTION

3.01 INSTALLATION, GENERAL

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

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

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

D. Provide sizes to fit applications indicated and selected from manufacturer's standard thicknesses, widths, and lengths. Apply single layer of insulation units to produce thickness indicated unless multiple layers are otherwise shown or required to make up total thickness.

3.02 INSTALLATION OF BELOW-GRADE INSULATION

A. On vertical surfaces, set insulation units in adhesive applied according to manufacturer's written instructions. Use adhesive recommended by insulation manufacturer.

1. If not otherwise indicated, extend insulation a minimum of 24 inches (610 mm) below exterior grade line.

B. On horizontal surfaces, loosely lay insulation units according to manufacturer's written instructions. Stagger end joints and tightly abut insulation units.

1. If not otherwise indicated, extend insulation full thickness a minimum of 4’-0” in from the outside edge of slab-on-grade. Cut and fit tightly around obstructions and fill voids with insulation.

2. Protect top surfaces of horizontal insulation (from damage during concrete work) by application of protection board.

3.03 INSTALLATION OF INSULATION FOR FRAMED CONSTRUCTION

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

B. Spray-Applied Insulation: Apply spray-applied insulation according to manufacturer's written instructions. Do not apply insulation until installation of pipes, ducts, conduits, wiring, and electrical outlets in walls is completed and windows, electrical boxes, and other items not indicated to receive insulation are masked.

C. Miscellaneous Voids: Install insulation in miscellaneous voids and cavity spaces where required to prevent gaps in insulation using the following materials:

1. Spray Polyurethane Insulation: Apply according to manufacturer's written instructions.

3.04 INSTALLATION OF VAPOR RETARDERS

A. Place vapor retarders on side of construction indicated on Drawings. Extend vapor retarders to extremities of areas to protect from vapor transmission. Secure vapor retarders in place with adhesives or other anchorage system as indicated. Extend vapor retarders to cover miscellaneous voids in insulated substrates, including those filled with loose-fiber insulation.

B. Seal vertical joints in vapor retarders over framing by lapping no fewer than two studs.
1. Fasten vapor retarders to wood framing at top, end, and bottom edges; at perimeter of wall openings; and at lap joints. Space fasteners 16 inches (406 mm) o.c.
2. Before installing vapor retarders, apply urethane sealant to flanges of metal framing including runner tracks, metal studs, and framing around door and window openings. Seal overlapping joints in vapor retarders with vapor-retarder tape according to vapor-retarder manufacturer's written instructions. Seal butt joints with vapor-retarder tape. Locate all joints over framing members or other solid substrates.
3. Firmly attach vapor retarders to metal framing and solid substrates with vapor-retarder fasteners as recommended by vapor-retarder manufacturer.

C. Seal joints caused by pipes, conduits, electrical boxes, and similar items penetrating vapor retarders with vapor-retarder tape to create an airtight seal between penetrating objects and vapor retarders.

D. Repair tears or punctures in vapor retarders immediately before concealment by other work. Cover with vapor-retarder tape or another layer of vapor retarders.

END OF SECTION

SECTION 07271 - MODIFIED BITUMINOUS SHEET AIR BARRIERS

PART 1 - GENERAL

1.01 SUMMARY

A. Section includes self-adhering, vapor-retarding, modified bituminous sheet air barriers.

1.02 PREINSTALLATION MEETINGS

A. Preinstallation Conference: Conduct conference at Project site .

1.03 ACTION SUBMITTALS

A. Product Data: For each type of product.

B. Shop Drawings: For air-barrier assemblies.

1. Include details for substrate joints and cracks, counterflashing strips, penetrations, inside and outside corners, terminations, and tie-ins with adjoining construction.

1.04 INFORMATIONAL SUBMITTALS

A. Product certificates.

B. Product test reports.

1.05 QUALITY ASSURANCE

A. Installer Qualifications: An entity that employs installers and supervisors who are trained and approved by manufacturer.
   a.

PART 2 - PRODUCTS

2.01 MATERIALS, GENERAL

A. VOC Content: 250 g/L or less when calculated according to 40 CFR 59, Subpart D (EPA Method 24) and complying with VOC content limits of authorities having jurisdiction.

B. Low-Emitting Materials: Air barriers shall comply with the testing and product requirements of the California Department of Health Services' "Standard Practice for the Testing of Volatile Organic Emissions from Various Sources Using Small-Scale Environmental Chambers."

2.02 PERFORMANCE REQUIREMENTS

A. General: Air barrier shall be capable of performing as a continuous vapor-retarding air barrier. Air-barrier assemblies shall be capable of accommodating substrate movement and of sealing substrate expansion and control joints, construction material changes, penetrations, and transitions at perimeter conditions without deterioration and air leakage exceeding specified limits.

2.03 SELF-ADHERING SHEET AIR BARRIER

A. Modified Bituminous Sheet: 40-mil- (1.0-mm-) thick, self-adhering sheet consisting of 36 mils (0.9 mm) of rubberized asphalt laminated to a 4-mil- (0.1-mm-) thick, cross-laminated polyethylene film with release liner on adhesive side and formulated for application with primer that complies with VOC limits of authorities having jurisdiction.

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

    a. Carlisle Coatings & Waterproofing Inc.; CCW-705.
    b. Grace, W. R. & Co. - Conn.; Perm-A-Barrier Wall Membrane.
    c. Henry Company; Blueskin SA LT - Basis of Design Product.
    d. Meadows, W. R., Inc.; SealTight Air-Shield.

2. Physical and Performance Properties:

    a. Air Permeance: Maximum 0.004 cfm/sq. ft. of surface area at 1.57-lbf/sq. ft. (0.02 L/s x sq. m of surface area at 75-Pa) pressure difference; ASTM E 2178.
    b. Tensile Strength: Minimum 250 psi (1.7 MPa) ; ASTM D 412, Die C.
    c. Ultimate Elongation: Minimum 200 percent; ASTM D 412, Die C.
    d. Puncture Resistance: Minimum 40 lbf (180 N) ; ASTM E 154.
    e. Water Absorption: Maximum 0.15 percent weight gain after 48-hour immersion at 70 deg F (21 deg C); ASTM D 570.
    f. Vapor Permeance: Maximum 0.05 perm (2.9 ng/Pa x s x sq. m) ; ASTM E 96/E 96M, Water Method.

2.04 ACCESSORY MATERIALS

A. General: Accessory materials recommended by air-barrier manufacturer to produce a complete air-barrier assembly and compatible with primary air-barrier membrane.

B. Termination Mastic: Air-barrier manufacturer's standard cold fluid-applied elastomeric liquid; trowel grade.

C. Sprayed Polyurethane Foam Sealant: One- or two-component, foamed-in-place, polyurethane foam sealant, 1.5- to 2.0-lb/cu. ft. (24- to 32-kg/cu. m) density; flame-spread index of 25 or less according to ASTM E 162; with primer and noncorrosive substrate cleaner recommended by foam sealant manufacturer.

PART 3 - EXECUTION

3.05 SURFACE PREPARATION

A. Mask off adjoining surfaces not covered by air barrier to prevent spillage and overspray affecting other construction.

B. Remove fins, ridges, mortar, and other projections and fill honeycomb, aggregate pockets, holes, and other voids in concrete with substrate-patching membrane.

C. Remove excess mortar from masonry ties, shelf angles, and other obstructions.

D. Prepare, fill, prime, and treat joints and cracks in substrates. Remove dust and dirt from joints and cracks according to ASTM D 4258.

E. At changes in substrate plane, apply sealant or termination mastic beads at sharp corners and edges to form a smooth transition from one plane to another.

3.06 INSTALLATION

A. General: Install modified bituminous sheets and accessory materials according to air-barrier manufacturer's written instructions and according to recommendations in ASTM D 6135.

1. When ambient and substrate temperatures range between 25 and 40 deg F (minus 4 and plus 5 deg C), install self-adhering, modified bituminous air-barrier sheet produced for low-temperature application. Do not install low-temperature sheet if ambient or substrate temperature is higher than 60 deg F (16 deg C).

B. Apply primer to substrates at required rate and allow it to dry. Limit priming to areas that will be covered by air-barrier sheet on same day. Reprime areas exposed for more than 24 hours.

1. Prime glass-fiber-surfaced gypsum sheathing with number of prime coats needed to achieve required bond, with adequate drying time between coats.

C. Apply and firmly adhere modified bituminous sheets horizontally over area to receive air barrier. Accurately align sheets and maintain uniform 2-1/2-inch- (64-mm-) minimum lap widths and end laps. Overlap and seal seams, and stagger end laps to ensure airtight installation.

1. Apply sheets in a shingled manner to shed water without interception by any exposed sheet edges.

2. Roll sheets firmly to enhance adhesion to substrate.

D. Seal top of through-wall flashings to air-barrier sheet.

E. Seal exposed edges of sheet at seams, cuts, penetrations, and terminations not concealed by metal counterflashings or ending in reglets with termination mastic.

F. Install air-barrier sheet and accessory materials to form a seal with adjacent construction and to maintain a continuous air barrier.

G. Connect and seal exterior wall air-barrier membrane continuously to roofing-membrane air barrier, concrete below-grade structures, floor-to-floor construction, exterior glazing and window systems, glazed curtain-wall systems, storefront systems, exterior louvers, exterior door framing, and other construction used in exterior wall openings, using accessory materials.

H. Wall Openings: Prime concealed, perimeter frame surfaces of windows, curtain walls, storefronts, and doors. Apply transitions and flashing so that a minimum of 3 inches (75 mm) of coverage is achieved over each substrate. Maintain 3 inches (75 mm) of full contact over firm bearing to perimeter frames with not less than 1 inch (25 mm) of full contact.

I. Fill gaps in perimeter frame surfaces of windows, curtain walls, storefronts, doors, and miscellaneous penetrations of air-barrier membrane with foam sealant.

J. At end of each working day, seal top edge of air-barrier material to substrate with termination mastic.

K. Repair punctures, voids, and deficient lapped seams in air barrier. Slit and flatten fishmouths and blisters. Patch with air-barrier sheet extending 6 inches (150 mm) beyond repaired areas in all directions.

L. Do not cover air barrier until it has been tested and inspected by Owner's testing agency.

M. Correct deficiencies in or remove air barrier that does not comply with requirements; repair substrates and reapply air-barrier components.

3.07 FIELD QUALITY CONTROL

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

B. Inspections: Air-barrier materials, accessories, and installation are subject to inspection for compliance with requirements.

C. Tests: As determined by Owner's testing agency from among the following tests:

1. Qualitative Air-Leakage Testing: Air-barrier assemblies will be tested for evidence of air leakage according to ASTM E 1186, smoke pencil with pressurization or depressurization .

2. Quantitative Air-Leakage Testing: Air-barrier assemblies will be tested for air leakage according to ASTM E 783 .

3. Adhesion Testing: Air-barrier assemblies will be tested for minimum air-barrier adhesion of 16 lbf/sq. in. (110 kPa) according to ASTM D 4541 for each 600 sq. ft. (56 sq. m) of installed air barrier or part thereof.

D. Air barriers will be considered defective if they do not pass tests and inspections.

1. Apply additional air-barrier material, according to manufacturer's written instructions, where inspection results indicate insufficient thickness.

2. Remove and replace deficient air-barrier components for retesting as specified above.

E. Repair damage to air barriers caused by testing; follow manufacturer's written instructions.

F. Protect air-barrier system from damage during application and remainder of construction period, according to manufacturer's written instructions.

1. Protect air barrier from exposure to UV light and harmful weather exposure as required by manufacturer. If exposed to these conditions for more than 30 days, remove and replace air barrier or install additional, full-thickness, air-barrier application after repairing and preparing the overexposed membrane according to air-barrier manufacturer's written instructions.

2. Protect air barrier from contact with incompatible materials and sealants not approved by air-barrier manufacturer.

END OF SECTION

SECTION 07415 - STANDING SEAM METAL ROOFING

PART 1 - GENERAL

1.01 REQUIREMENTS

A. Furnish labor, materials, equipment and appliances required for complete execution of work shown on Drawings and specified herein.

B. Work includes: Standing seam metal roofing, trim, flashing and accessories associated with a complete and weathertight roofing system and as indicated on the Drawings.

1.02 RELATED WORK SPECIFIED ELSEWHERE

A. Section 05120 – Structural Steel

B. Section 07600 - Flashing and Sheet Metal

C. Section 07700 - Roof Specialties and Accessories

D. Section 07900 – Joint Sealers

1.03 SUBMITTALS

A. In accordance with the procedures and requirements set forth in Section 01300, Submittals, submit the following:

1. Drawings of proposed work, including fastener type and spacing, roof panels, support framing, flashing, snow retention system, and accessory details.

2. Manufacturer's product data, specifications and installation instructions.

3. Submit calculations signed by a professional engineer indicating loads, uplifts, spacing of clips, fasteners, snow retention system, and accessories. Calculations shall be project specific in accordance with ASCE 7.

4. Submit certification that installer is authorized by manufacturer.

5. Structural design data and calculations.

6. Drawing showing spacing of fasteners and supports.

7. Letter verifying that panels are factory roll formed.

8. Sample warranties.

9. Copy of 30-year Manufacturer’s warranty.

1.04 DESIGN CRITERIA

A. Use the following standards and criteria where applicable in the structural design of the roof support system:

1. Kentucky Building Code

2. “Steel Construction Manual”, American Institute of Steel Construction

3. “Cold Formed Steel Design Manual”, American Iron and Steel Institute

4. ASCE 7 - Minimum Design Loads for Buildings and Other Structures

B. Design Loads

1. Design loads include live, snow, wind, earthquake and dead loads.

2. Loads and combination of loads shall be as prescribed and recommended in the standards and codes listed above.

3. Design roof to withstand 100 mph winds.

4. Thermal expansion and contraction expected for this location.

1.05 WARRANTY

A. Roof Panels

1. Exterior finish shall be warranted by the manufacturer for twenty years against blistering, peeling, cracking, flaking, checking and chipping.

2. Color change and chalking shall be warranted for twenty years. Color change shall not exceed 5 NBS units per ASTM D 224. Chalking shall be not less than a rating of 8 per ASTM D 659.

B. Weathertightness

1. Warrant roof system, roof panels, fascia, trim flashing, penetrations, and other materials integral to the roof system, against leaks for a period of twenty years.

2. Liability will be limited to cost of installed roof system.

C. Provide all materials required by roofing manufacturer to obtain specified warranty whether or not specifically indicated.

1.06 QUALITY ASSURANCE

A. Manufacturer shall have been regularly engaged in the fabrication of metal standing seam roof systems for at least ten years.

B. Installer shall be authorized by the Manufacturer as trained and qualified to erect the Manufacturer's product.

C. Conduct a preroofing conference with the following attendees; Contractor, metal-roofing Contractor, metal roofing systems manufacturer's representative, all sub-Contractors whose work penetrates the roof, the Owner and Engineer.

D. Metal roofing system manufacturer’s representative will observe the installation of the roof system at the start of the project and as required by the manufacturer to ensure warranty provisions are adhered to. The manufacturer’s representative will produce a report based on observations of the roofing system that indicates that the roofing system, trim, accessories have been installed in accordance with all requirements of the manufacturer. If any deficiencies in materials or installation are found during this inspection the deficiencies shall be corrected.

E. System shall be tested in accordance with UL 580 or ASTM E 1592.

1.07 PERFORMANCE REQUIREMENTS

A. General: Provide complete sheet metal roofing system, including, but not limited to, metal roof panels, cleats, clips, anchors and fasteners, sheet metal flashing and drainage components related to sheet metal roofing, fascia panels, trim, underlayment, and accessories as indicated and as required for a weather-tight installation.

B. Wind-Uplift Resistance: Provide portable roll-forming equipment capable of producing sheet metal roofing assemblies that comply with UL 580 for Class 90 wind-uplift resistance.

1. Maintain UL certification of portable roll-forming equipment for duration of sheet metal roofing work.

2. Refer to Component and Cladding Schedule on Structural Drawings.

C. Thermal Movements: Provide sheet metal roofing 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. Provide clips that resist rotation and avoid sheer stress as a result of sheet metal roofing thermal movements. 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.

D. Water Infiltration: Provide sheet metal roofing that does not allow water infiltration to building interior, with metal flashing and connections of sheet metal roofing lapped to allow moisture to run over and off the material.

E. Provide complete system comprising of standing seam roof, fascia, gutters, downspouts, vented ridge and soffits as indicated, tested and warranteed as specified.

PART 2 - PRODUCTS

2.01 ACCEPTABLE MANUFACTURERS

A. Subject to compliance with the Specifications provide products from one of the following:

1. IMETCO, Series 300

2. Centria, SRS 3

3. The Garland Company, R MER SPAN

4. Basis of Design: Firestone Building Products, Una-Clad UC-6 HD Double-Lock Standing Seam Metal Roofing, with SRS 0.040 aluminum panel with concealed clip.

B. Self-adhering Underlayment

1. Ice and Water Shield, Grace Construction

2. Polyken 640 Underlayment Membrane, Polyken Technologies.

3. Polyguard Deck Guard, Polyguard Products, Inc.

4. Ice Guard Membrane No. 108-AG, Royston Laboratories, Inc.

2.02 PRODUCTS

A. Standing Seam Roof Panels

1. Smooth finished 0.040 Aluminum sheets factory finished with two coat, baked-on full-strength (70% resin) fluorocarbon coating system. Color shall be selected by the Owner.

2. Panels shall be 16” or 18” wide by length required to cover roof to minimize end laps.

B. Roof System

1. Structural standing seam incorporating with continuous “T” batten and secured to concealed anchor clips allowing unlimited thermal movement, and of configurations that will prevent entrance or passage of water.

2. Roof system shall comply with UL90 classification.

3. Fastening system shall allow the roof covering to move independently of any differential thermal movement by the framing system.

4. Provide interlocking batten cap with a plant applied, and non-hardening sealant. Mechanically lock or crimp seams during installation.

5. Seal panel termination and perimeter flashing with sealant approved by manufacturer.

6. Provide metal closures matching roof profile at ridge, headwall, rake, jamb and hip conditions.

7. Panels length shall be full length from factory. Field formed panels will not be allowed.

8. Coordinate structural support locations for roof panels. Provide additional structural support, if required by panel manufacturer to resist required design loads.

9. Roof panels shall be furnished in continuous lengths from ridge to eave of top of wall to bottom of wall panel.

10. Seam height will be a minimum of 2 3/8”.

C. Trim System

1. Design trim to provide for expected movement of roof panels due to thermal expansion.

2. Use manufacturer's standard trim pieces, except where field formed pieces are recommended by the manufacturer.

3. Use .032 or.040 Aluminum trim with factory finish to match roof panels.

4. Concealed fasteners shall be used to the greatest extent possible. Where exposed fasteners are used, they shall be installed neatly and aligned with other fasteners in straight rows and lines and finished to match roof panels.

D. Roof Accessories

1. Use EPDM roof jacks with aluminum sealing ring for openings 12 inches in diameter or less. Do not use roof jacks where ribs are altered.

5. Snow Retention System: Provide clamp type two bar snow fences or angle that attach to standing seams without penetrating the roof system. Snow retention system shall include ice flags to retain snow and shall extend within ½” of roof surface. Snow retention system shall be specifically manufactured for profile of standing seam metal roofing. Snow retention system manufacturer shall design system for local conditions and provide multiple rows as required by the design. Snow retention system shall be approved for use by standing seam roofing system manufacturer and not void or limit warranty.

2.03 SOFFIT PANELS (WHERE INDICATED)

A. Basis of Design: Exterior soffit panel profile shall be IW-10A as manufactured by CENTRIA. Exterior surface shall have flush pane and soffit vents with min. 12 inch of free area per square foot.

1. Exterior wall panel side laps shall have tongue and groove joinery with factory applied sealant and no exposed fasteners.

2. Exterior metal panels shall be fabricated from .040 inch aluminum.

3. Finish and color to match roof panels.

PART 3 - EXECUTION

3.01 INSPECTION

A. Manufacturer shall inspect conditions of structural system and work below. Verify that work is complete to a point where this work can commence and installation can be performed in accordance with the manufacturer's recommendations and instructions.

3.02 INSTALLATION

A. Install components in accordance with manufacturer's instructions and approved shop drawings.

B. Replace damaged or defective items.

3.03 UNDERLAYMENT INSTALLATION

A. Self-adhering Underlayment: Install self-adhering sheet underlayment, wrinkle-free, on roof sheathing under metal roofing. 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 endlaps of not less than 6 inches staggered 24 inches between courses. Overlap side edges not less than 3-1/3 inches. Extend underlayment into gutter troughs. Roll laps with roller. Cover underlayment within 14 days.

1. Roof perimeter for a distance up from eaves 24 inches beyond interior wall line.

2. Valleys, from lowest point to highest point, for a distance on each side of 18 inches. Overlap ends of sheets not less than 6 inches.

3. Rake edges for a distance of 18 inches.

4. Hips and ridges for a distance on each side of 12 inches.

B. Install flashings to cover underlayment to comply with requirements.

C. Apply slip sheet over underlayment before installing sheet metal roofing.

3.04 CLEANING AND PROTECTION

A. Remove protective film (if any) from exposed surfaces of metal roofing promptly upon installation. Strip with care to avoid damage to finishes.

B. Clean exposed metal surfaces of substances which would interfere with uniform oxidation and weathering.

C. Provide final protection in a manner acceptable to installer, which ensures metal roofing being without damage or deterioration at time of Substantial Completion.

END OF SECTION

SECTION 07543 - THERMOPLASTIC POLYOLEFIN (TPO) ROOFING SYSTEM

PART 1 - GENERAL

1.01 SUMMARY

A. Section Includes:

1. Adhered thermoplastic polyolefin (TPO) roofing system.

2. Roof insulation.

1.02 DEFINITIONS

A. Roofing Terminology: Definitions in ASTM D 1079 and glossary in NRCA's "The NRCA Roofing and Waterproofing Manual" apply to work of this Section.

1.03 PREINSTALLATION MEETINGS

A. Pre-installation Roofing Conference: Conduct conference at Project site .

1.04 ACTION SUBMITTALS

A. Product Data: For each type of product.

B. Shop Drawings: For roofing system. Include plans, elevations, sections, details, and attachments to other work.

C. Samples for Verification: For the following products:

1. Sheet roofing, of color required.

2. Walkway pads or rolls, of color required.

1.05 INFORMATIONAL SUBMITTALS

A. Research/Evaluation Reports: For components of roofing system, from ICC-ES.

B. Sample Warranties: For manufacturer's special warranties.

1.06 CLOSEOUT SUBMITTALS

A. Maintenance Data: For roofing system to include in maintenance manuals.

1.07 QUALITY ASSURANCE

A. Installer Qualifications: A qualified firm that is approved, authorized, or licensed by roofing system manufacturer to install manufacturer's product and that is eligible to receive manufacturer's special warranty.

1.08 WARRANTY

A. Special Warranty: Manufacturer agrees to repair or replace components of roofing system that fail in materials or workmanship within specified warranty period.

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

PART 2 - PRODUCTS

2.01 MANUFACTURERS

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

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

1. Carlisle SynTec Incorporated.

2. Cooley Engineered Membranes.

3. Firestone Building Products.

4. GAF Materials Corporation.

5. GenFlex Roofing Systems.

6. Johns Manville.

7. Versico Incorporated.

C. Source Limitations: Obtain components including roof insulation fasteners for roofing system from same manufacturer as membrane roofing or manufacturer approved by membrane roofing manufacturer.

2.02 PERFORMANCE REQUIREMENTS

A. Accelerated Weathering: Roofing system shall withstand 2000 hours of exposure when tested according to ASTM G 152, ASTM G 154, or ASTM G 155.

B. Impact Resistance: Roofing system shall resist impact damage when tested according to ASTM D 3746 or ASTM D 4272.

C. Roofing System Design: Tested by a qualified testing agency to resist the following uplift pressures: Refer to Component and Cladding Schedule on Structural Drawings.

D. Solar Reflectance Index: Not less than 78 when calculated according to ASTM E 1980, based on testing identical products by a qualified testing agency.

E. Energy Star Listing: Roofing system shall be listed on the DOE's ENERGY STAR "Roof Products Qualified Product List" for low -slope roof products.

F. Energy Performance: Roofing system shall have an initial solar reflectance index of not less than 0.70 and an emissivity of not less than 0.75 when tested according to CRRC-1.

G. Exterior Fire-Test Exposure: ASTM E 108 or UL 790, Class A ; for application and roof slopes indicated; testing by a qualified testing agency. Identify products with appropriate markings of applicable testing agency.

H. Fire-Resistance Ratings: Comply with fire-resistance-rated assembly designs indicated. Identify products with appropriate markings of applicable testing agency.

2.03 TPO ROOFING

A. Fabric-Reinforced TPO Sheet: ASTM D 6878, internally fabric- or scrim-reinforced, uniform, flexible fabric-backed TPO sheet.

1. Thickness: 60 mils (1.5 mm), nominal.

2. Exposed Face Color: White.

2.04 AUXILIARY ROOFING MATERIALS

A. General: Auxiliary materials recommended by roofing system manufacturer for intended use and compatible with roofing.

1. Liquid-type auxiliary materials shall comply with VOC limits of authorities having jurisdiction.

2. Adhesives and sealants that are not on the exterior side of weather barrier shall comply with the following limits for VOC content:

a. Plastic Foam Adhesives: 50 g/L.

b. Gypsum Board and Panel Adhesives: 50 g/L.

c. Multipurpose Construction Adhesives: 70 g/L.

d. Fiberglass Adhesives: 80 g/L.

e. Single-Ply Roof Membrane Adhesives: 250 g/L.

f. Single-Ply Roof Membrane Sealants: 450 g/L.

g. Nonmembrane Roof Sealants: 300 g/L.

h. Sealant Primers for Nonporous Substrates: 250 g/L.

i. Sealant Primers for Porous Substrates: 775 g/L.

j. Other Adhesives and Sealants: 250 g/L.

3. Adhesives and sealants that are not on the exterior side of weather barrier shall comply with the testing and product requirements of the California Department of Public Health's (formerly, the California Department of Health Services') "Standard Method for the Testing and Evaluation of Volatile Organic Chemical Emissions from Indoor Sources Using Environmental Chambers."

B. Sheet Flashing: Manufacturer's standard unreinforced TPO sheet flashing, 55 mils (1.4 mm) thick, minimum, of same color as TPO sheet.

C. Bonding Adhesive: Manufacturer's standard, water based.

D. Slip Sheet: Manufacturer's standard, of thickness required for application.

E. Fasteners: Factory-coated steel fasteners and metal or plastic plates complying with corrosion-resistance provisions in FM Global 4470, designed for fastening roofing to substrate, and acceptable to roofing system manufacturer.

F. Miscellaneous Accessories: Provide metal termination bars, metal battens, pourable sealers, preformed cone and vent sheet flashings, preformed inside and outside corner sheet flashings, T-joint covers, lap sealants, termination reglets, and other accessories.

2.05 ROOF INSULATION

A. Polyisocyanurate Board Insulation: ASTM C 1289, Type II, Class 1, Grade 2 , felt or glass-fiber mat facer on both major surfaces.

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

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

a. Atlas Roofing Corporation.

b. Carlisle SynTec Incorporated.

c. Dyplast Products.

d. Firestone Building Products.

e. GAF Materials Corporation.

f. Hunter Panels.

g. Insulfoam LLC; a Carlisle company.

h. Johns Manville.

i. Rmax, Inc.

B. Tapered Insulation: Provide factory-tapered insulation boards fabricated to slope of 1/4 inch per 12 inches (1:48) unless otherwise indicated.

C. Provide preformed saddles, crickets, tapered edge strips, and other insulation shapes where indicated for sloping to drain. Fabricate to slopes indicated.

2.06 INSULATION ACCESSORIES

A. Fasteners: Factory-coated steel fasteners and metal or plastic plates complying with corrosion-resistance provisions in FM Global 4470, designed for fastening roof insulation and cover boards to substrate, and acceptable to roofing system manufacturer.

B. Insulation Adhesive: Insulation manufacturer's recommended adhesive formulated to attach roof insulation to substrate or to another insulation layer.

C. Cover Board: ASTM C 1177/C 1177M, glass-mat, water-resistant gypsum substrate, 5/8 inch (16 mm) thick, factory primed.

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

a. CertainTeed Corporation; GlasRoc Sheathing Type X.

b. Georgia-Pacific Corporation; Dens Deck Prime.

c. National Gypsum Company; Gold Bond eXP Extended Exposure Sheathing.

d. Temple-Inland, Inc.; GreenGlass Exterior Sheathing.

e. USG Corporation; Securock Glass Mat Roof Board.

PART 3 - EXECUTION

3.01 ROOFING INSTALLATION, GENERAL

A. Install roofing system according to roofing system manufacturer's written instructions.

B. Complete terminations and base flashings and provide temporary seals to prevent water from entering completed sections of roofing system at the end of the workday or when rain is forecast. Remove and discard temporary seals before beginning work on adjoining roofing.

C. Install roofing and auxiliary materials to tie in to existing roofing to maintain weathertightness of transition.

3.02 INSULATION INSTALLATION

A. Coordinate installing roofing system components so insulation is not exposed to precipitation or left exposed at the end of the workday.

B. Install tapered insulation under area of roofing to conform to slopes indicated.

C. Install insulation under area of roofing to achieve required thickness. Where overall insulation thickness is 2.7 inches (68 mm) or greater, install two or more layers with joints of each succeeding layer staggered from joints of previous layer a minimum of 6 inches (150 mm) in each direction.

1. Where installing composite and noncomposite insulation in two or more layers, install noncomposite board insulation for bottom layer and intermediate layers, if applicable, and install composite board insulation for top layer.

D. Adhered Insulation: Install each layer of insulation and adhere to substrate as follows:

1. Prime surface of concrete deck with asphalt primer at rate of 3/4 gal./100 sq. ft. (0.3 L/sq. m), and allow primer to dry.

2. Set each layer of insulation in a solid mopping of hot roofing asphalt, applied within plus or minus 25 deg F (14 deg C) of equiviscous temperature.

3. Set each layer of insulation in insulation adhesive, firmly pressing and maintaining insulation in place.

E. Install cover boards over insulation with long joints in continuous straight lines with end joints staggered between rows. Offset joints of insulation below a minimum of 6 inches (150 mm) in each direction. Loosely butt cover boards together.

1. Fasten cover boards to resist uplift pressure at corners, perimeter, and field of roof.

F. Install slip sheet over cover board and immediately beneath roofing.

3.03 ADHERED ROOFING INSTALLATION

A. Adhere roofing over area to receive roofing according to roofing system manufacturer's written instructions. Unroll roofing and allow to relax before retaining.

B. Accurately align roofing, and maintain uniform side and end laps of minimum dimensions required by manufacturer. Stagger end laps.

C. Bonding Adhesive: Apply to substrate and underside of roofing at rate required by manufacturer, and allow to partially dry before installing roofing. Do not apply to splice area of roofing.

D. In addition to adhering, mechanically fasten roofing securely at terminations, penetrations, and perimeter of roofing.

E. Seams: Clean seam areas, overlap roofing, and hot-air weld side and end laps of roofing and sheet flashings according to manufacturer's written instructions, to ensure a watertight seam installation.

1. Test lap edges with probe to verify seam weld continuity. Apply lap sealant to seal cut edges of sheet.

2. Verify field strength of seams a minimum of twice daily, and repair seam sample areas.

3. Repair tears, voids, and lapped seams in roofing that do not comply with requirements.

F. Spread sealant bed over deck-drain flange at roof drains, and securely seal roofing in place with clamping ring.

3.04 BASE FLASHING INSTALLATION

A. Install sheet flashings and preformed flashing accessories, and adhere to substrates according to roofing system manufacturer's written instructions.

B. Apply bonding adhesive to substrate and underside of sheet flashing at required rate, and allow to partially dry. Do not apply to seam area of flashing.

C. Flash penetrations and field-formed inside and outside corners with cured or uncured sheet flashing.

D. Clean seam areas, overlap, and firmly roll sheet flashings into the adhesive. Hot-air weld side and end laps to ensure a watertight seam installation.

E. Terminate and seal top of sheet flashings.

3.05 WALKWAY INSTALLATION

A. Flexible Walkways: Install walkway products in locations indicated. Heat weld to substrate or adhere walkway products to substrate with compatible adhesive according to roofing system manufacturer's written instructions.

3.06 PROTECTING AND CLEANING

A. Protect roofing system from damage and wear during remainder of construction period. When remaining construction does not affect or endanger roofing, inspect roofing for deterioration and damage, describing its nature and extent in a written report, with copies to Engineer and Owner.

B. Correct deficiencies in or remove roofing system that does not comply with requirements, repair substrates, and repair or reinstall roofing system to a condition free of damage and deterioration at time of Substantial Completion and according to warranty requirements.

C. Clean overspray and spillage from adjacent construction using cleaning agents and procedures recommended by manufacturer of affected construction.

END OF SECTION

SECTION 07600 - FLASHING AND SHEET METAL

PART 1 - GENERAL

1.01 REQUIREMENTS

A. Furnish labor, materials, equipment and appliances required for complete execution of Work shown on Drawings and specified herein.

1.02 RELATED WORK SPECIFIED ELSEWHERE

A. Section 04200 – Unit Masonry

B. Section 07700 – Roof Specialties and Accessories

C. Section 07900 – Joint Sealers

1.03 REFERENCES SPECIFICATIONS, CODES AND STANDARDS

A. Without limiting the generality of these specifications Work shall conform to the applicable requirements of the following documents:

1. OF-506C Flux, Soldering, Paste, and Liquid
2. ASTM A176 Stainless and Heat-Resisting Chromium Steel Plate, Sheet and Strip
3. ASTM B32 Specifications for Solder Metal
4. ASTM D1187 Test Method for Asphalt-Base Emulsions for use as Protective Coatings for Metal
5. "Architectural Sheet Metal Manual" by Sheet Metal and Air Conditioning Contractors National Association.

1.04 SUBMITTALS

A. In accordance with the procedures and requirements set forth in Section 01300 - Submittals, submit the following:

1. Manufacturer's literature and installation instructions.
2. Complete layout and installation Drawings and schedules with clearly indicated dimensions.
3. Color samples.

1.05 DELIVERY, STORAGE, AND HANDLING

A. Store materials in a clean dry protected area in such manner to preclude damage by denting, warping, or other distortion.

PART 2 - MATERIALS

2.01 MATERIALS

A. Metal Flashing

1. Exposed to View: Provide prefinished 0.050 inches aluminum. Provide a full-strength Kynar 500 baked-on paint finish with a 20 year warranty.

2. Concealed from View: Provide a minimum of 22 ga. galvanized steel sheet, stainless steel sheet, or mill-finished aluminum sheet.

B. Nails, screws, rivets, bolts and other fasteners: same material as sheet metal being attached. Nails shall be 18 gauge diameter shank, 1/4 inch diameter flat head, annular-thread, diamond point, long enough to penetrate backing by at least 1 inch. Nails shall be spaced 3 inches on center unless other spacing is indicated. Exposed fasteners shall match finish of metal being fastened.

C. Reglets shall be formed of 304 series stainless steel, minimum of 0.020 inch. Reglets shall be Model CO for insertion in concrete, MA-4 for insertion in masonry as manufactured by FRY Reglet Corporation. Corners shall be factory made, mitered and sealed. Furnish reglets to proper trade in sufficient time to be incorporated into the masonry or concrete work.

D. Plastic cement shall conform to ASTM D2822.

E. Sealants shall be silicone type.

F. Sealer tape shall be polyisobutylene tape specifically manufactured for setting flanges on bituminous roofing such as Morrison and Company CL-50.

PART 3 - EXECUTION

3.01 FABRICATION

A. Shop fabricate Work to greatest extent possible. Comply with details shown and applicable requirements of SMACNA "Architectural Sheet Metal Manual" and other recognized industry standards. Fabricate for waterproof and weather resistant performance; with expansion provisions for running work, sufficient to permanently prevent leakage, and damage or deterioration of the work. Comply with material manufacturer's instructions and recommendations for forming material. Form exposed work without excessive oil-canning, buckling and tool marks, true to line and levels as indicated, with exposed edges folded back to form hems.

B. Roof penetration sheet metal work shall be provided and coordinated with the roofing system. The design and details shall conform to SMACNA "Architectural Sheet Metal Manual". Sheet metal items shall be built into roofing in strict accordance with the instructions of the roofing manufacturer.

END OF SECTION

SECTION 07700 - ROOF SPECIALTIES AND ACCESSORIES

PART 1 - GENERAL

1.01 REQUIREMENTS

A. Furnish all labor, materials, equipment and appliances required for the complete execution of Work shown on Drawings and specified herein.

1.02 RELATED WORK SPECIFIED ELSEWHERE

A. Section 06100 – Rough Carpentry

B. Section 07600 - Flashing and Sheet Metal

C. Section 07900 - Joint Sealers

1.03 REFERENCE SPECIFICATIONS, CODES, AND STANDARDS

A. Without limiting the generality of these specifications Work shall conform to the applicable requirements of the following documents:

1. TT-P-641 (1) Primer Coating, Zinc Dust - Zinc Oxide (for galvanized surfaces

2. ASTM A 525 Specification for General Requirements for Steel Sheet, Zinc Coated (Galvanized) by the Hot-Dip Process.

3. ASTM A 526 Specification for Steel Sheet, Zinc Coated (Galvanized) by the Hot-Dip Process, Commercial Quality.

4. ASTM B 209 Specification for Aluminum and Aluminum-Alloy Sheet and Plate.

5. Sheet Metal and Air Conditioning Contractors National Association "Architectural Sheet Metal Manual" (ASMM).

6. The Aluminum Association "Specification for Aluminum Sheet Metal Work in Building Construction."

7. American Welding Society (AWS).

1.04 SUBMITTALS

A. In accordance with the procedures and requirements set forth in Section 01300, Submittals, submit the following:

1. Manufacturers literature and installation instructions.

2. Samples, of each material listed.

1.05 DELIVERY, STORAGE AND HANDLING

A. Deliver all materials in factory packed unopened cartons and crating bearing the manufacturer's labels.

B. Store materials in clean, dry protected area in such manner to preclude damage of any nature.

C. Handle all materials with proper care to avoid denting, marring, warping or other distortions during delivery, storage and handling.

PART 2 - PRODUCTS

2.01 MATERIALS

A. General: Provide roof specialties and accessories of design and construction compatible and approved for use with roofing manufacturer.

B. Fasteners: Provide all fasteners and attachments required to secure item to substrate and support loads required by applicable Building Code. Use only non-corrosive fasteners which are compatible with materials being joined.

C. Colors: Colors shall be selected by Owner.

2.02 GUTTERS AND DOWNSPOUTS

A. Material: 0.050 inch aluminum.

B. Design: Manufacture gutters tapered and notched to provide telescoping joint. Design gutters and downspouts to accommodate expected thermal movement.

C. Supports and Fasteners: Provide manufacturers' standard straps, brackets and fasteners. Place supports and fasteners at 36 inches on center or as recommended by the manufacturer. Finish of supports, brackets and fasteners shall match gutter and downspout.

D. Accessories: Provide end caps, flashing, trim, elbows, shoes, and other items required for a complete installation.

E. Connect downspouts to underground drainage system where indicated.

F. Finish: Baked on Kynar, with 20 year warranty.

2.03 ROOF CURBS

A. Roof Curbs: Internally reinforced roof-curb units capable of supporting superimposed live and dead loads, including equipment loads and other construction indicated on Drawings; with welded or mechanically fastened and sealed corner joints, integral metal cant, and integrally formed deck-mounting flange at perimeter bottom.

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. AES Industries, Inc.
b. Curbs Plus, Inc.
c. Custom Solution Roof and Metal Products.
d. Greenheck Fan Corporation.
e. LM Curbs.
f. Metallic Products Corp.
g. Milcor Inc.; Commercial Products Group of Hart & Cooley, Inc.
h. Pate Company (The).
i. Roof Products, Inc.

B. Material: Zinc-coated (galvanized) steel sheet, 0.052 inch (1.32 mm) thick.

1. Finish: Two-coat fluoropolymer.

2. Color: As selected by Architect from manufacturer's full range.

C. Material: Aluminum sheet, 0.090 inch (2.28 mm) thick.

1. Finish: Two-coat fluoropolymer.

2. Color: As selected by Architect from manufacturer's full range.

D. Construction:

1. Insulation: Factory insulated with 1-1/2-inch- (38-mm-) thick cellulosic or glass-fiber board insulation.

2. Liner: Same material as curb, of manufacturer's standard thickness and finish.

3. Factory-installed wood nailer at top of curb, continuous around curb perimeter.

4. On ribbed or fluted metal roofs, form deck-mounting flange at perimeter bottom to conform to roof profile.

5. Fabricate curbs to minimum height of 12 inches (300 mm) unless otherwise indicated.

6. Top Surface: Level around perimeter with roof slope accommodated by sloping the deck-mounting flange.

7. Security Grille: Provide where indicated.

PART 3 - EXECUTION

3.01 INSTALLATION - GENERAL

A. Install roof accessories and specialties in accordance with the manufacturer's instructions. Provide a complete watertight and weatherproof installation. Install with provision for expansion and contraction.

3.02 DAMAGED MATERIAL

A. Repair or replace materials damaged during installation.

3.03 ADJUSTING AND CLEANING

A. Check levels and adjust as necessary after roofing and flashing is complete.

B. Protect materials from damage by other trades. Remove protective coatings at completion of project.

END OF SECTION

SECTION 07900 - JOINT SEALERS

PART 1 - GENERAL

1.01 SCOPE OF WORK

A. Provide all labor, materials, equipment and services for furnishing and installing the joint sealers in accordance with the Drawings and as specified herein.

B. The extent of each form and type of joint sealer is indicated on the drawings and includes but is not limited to, the following general locations:

1. Exterior wall joints.

2. Paving and sidewalk joints.

3. Joints at penetrations of walls, decks, and floors by piping and other services and equipment.

4. Joints between items of equipment and other construction.

5. Joints at windows, doors and louvers.

1.02 RELATED DOCUMENTS SPECIFIED ELSEWHERE

A. Drawings and general provisions of Contract, including General and Supplementary Conditions and Division-1 Specification sections, apply to work of this section.

1.03 SUBMITTALS

Comply with the requirements of Section 01300 as well as the requirements specified herein.

A. Product Data: Submit manufacturer's technical data for each joint sealer product required, including instruction for joint preparation and joint sealer application.

B. Samples for Initial Selection Purposes: Submit manufacturer's standard bead samples consisting of strips of actual products showing full range of colors available, for each product exposed to view.

C. Certificates: Submit certificates from manufacturers of joint sealers attesting that their products comply with specification requirements and are suitable for the use indicated.

1.04 QUALITY ASSURANCE

A. Installer Qualifications: Engage an Installer who has successfully completed within the last 3 years at least 3 joint sealer applications similar in type and size to that of this project and who will assign mechanics from these earlier applications to this project of which one will serve as lead mechanic.

B. Single Source Responsibility for Joint Sealer Materials: Obtain joint sealer materials from a single manufacturer for each different product required.

C. System Performance: Provide joint sealers that have been produced and installed to establish and maintain watertight and airtight continuous seals.

1.05 DELIVERY, STORAGE, AND HANDLING

A. Deliver materials to project site in original unopened containers or bundles with labels informing about manufacturer, product name and designation, color, expiration period for use, pot life, curing time and mixing instructions for multi component materials.

B. Store and handle materials to prevent their deterioration or damage due to moisture, temperature changes, contaminants, or other causes.

1.06 PROJECT CONDITIONS

A. Environmental Conditions: Do not proceed with installation of joint sealers under the following conditions:

1. When ambient and substrate temperature conditions are outside the limits permitted by joint sealer manufacturer or below 40 degrees F. (4.4 degrees C).

2. When joint substrates are wet due to rain, frost, condensation or other causes.

B. Joint Width Conditions: Do not proceed with installation of joint sealers when joint widths are less than allowed by joint sealer manufacturer for application indicated.

PART 2 - PRODUCTS

2.01 MATERIALS, GENERAL

A. Compatibility: Provide joint sealers, joint fillers and other related materials that are compatible with one another and with joint substrates under conditions of service and application, as demonstrated by testing and field experience.

B. Colors: Provide color of exposed joint sealers indicated or, if not otherwise indicated, as selected by Owner from manufacturer's standard colors.

2.02 ELASTOMERIC JOINT SEALANTS

A. Elastomeric Sealant Standard: Provide manufacturer's standard chemically curing, elastomeric sealant of base polymer indicated which complies with ASTM C 920 requirements, including those for Type, Grade, Class, and Uses.

B. Two-Part Pourable Urethane Sealant: Type M; Grade NS; Class 25; Uses T, M, A, and as applicable to joint substrates indicated, O.

C. One-Part Nonsag Urethane Sealant: Type S; Grade NS; Class 25; Uses NT, M, A, and as applicable to joint substrates indicated, O.

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

1. Two Part, Pourable, Urethane Sealant:

"Chem-Calk 550"; Bostik Construction Product Division
"Pourthane"; W.R. Meadows, Inc.
"Sonolastic Paving Joint Sealant"; Sonneborn Building Products Division, Rexnord Chemical Products, Inc.

2. One-Part Nonsag Urethane Sealant:

"Chem-Calk 900"; Bostik Construction Products Division
"Vulkem 116"; Mameco International, Inc.

"Sonolastic NP 1"; Sonneborn Building Products Division, Rexnord Chemical Products, Inc.

2.03 LATEX JOINT SEALANTS

A. Acrylic-Emulsion Sealant: Manufacturer's standard, one part, nonsag, acrylic, mildew-resistant, acrylic-emulsion sealant complying with ASTM C 384, formulated to be paintable and recommended for exposed applications on interior and on protected exterior exposures involving joint movement of not more than + or - 7.5%.

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

"Chem-Calk 600"; Bostik Construction Products Division
"AC-20"; Pecora Corp.
"Sonolac"; Sonneborn Building Products Division; Rexnord Chemical Products, Inc.
"Tremco Acrylic Latex Caulk"; Tremco, Inc.

2.04 JOINT SEALANT BACKING

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

B. Plastic Foam Joint-Fillers: Preformed, compressible, resilient, non-waxing, non-extruding strips of plastic foam of material and size, shape and density to control sealant depth and otherwise contribute to producing optimum sealant performance. Provide either flexible, open cell polyurethane foam or non-gasing, closed-cell polyethylene foam, unless otherwise indicated, subject to approval of sealant manufacturer.

2.05 MISCELLANEOUS MATERIALS

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

B. Cleaners for Nonporous Surfaces: Provide non-staining, chemical cleaner of type acceptable to manufacturer of sealant and sealant backing materials which are not harmful to substrates and adjacent nonporous materials.

C. Masking Tape: Provide non-staining, non-absorbent type compatible with joint sealants and to surfaces adjacent to joints.

PART 3 - EXECUTION

3.01 INSPECTION

A. Require Installer to inspect joints indicated to receive joint sealers for compliance with requirements for joint configuration, installation tolerances and other conditions affecting joint sealer performance.

B. Obtain Installer's written report listing any conditions detrimental to performance of joint sealer work.

C. Do not allow joint sealer work to proceed until unsatisfactory conditions have been corrected.

3.02 PREPARATION

A. Surface Cleaning of Joints: Clean out joints immediately before installing joint sealers to comply with recommendations of joint sealer manufacturers and the following requirements:

1. Remove all foreign material from joint substrates which could interfere with adhesion of joint sealer, including dust; paints, except for permanent protective coatings tested and approved for sealant adhesion and compatibility by sealant manufacturer; oil; grease; waterproofing; water repellants; water; surface dirt and frost.

2. Clean concrete, masonry and similar porous joint substrate surfaces, by brushing, grinding, blast cleaning, mechanical abrading, acid washing or a combination of these methods to produce a clean, sound substrate capable of developing optimum bond with joint sealers. Remove loose particles remaining from above cleaning operations by vacuuming or blowing out joints with oil-free compressed air.

3. Remove latence and form release agents from concrete.

4. Clean metal and other non-porous surfaces by chemical cleaners or other means which are not harmful to substrates or leave residues capable of interfering with adhesion of joint sealers.

B. Joint Priming: Prime joint substrates where indicated or where recommended by joint sealer manufacturer based on preconstruction joint sealer-substrate tests or prior experience. Apply primer to comply with joint sealer manufacturer's recommendations. Confine primers to areas of joint sealer bond, do not allow spillage or migration onto adjoining surfaces.

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

3.03 INSTALLATION OF JOINT SEALERS

A. General: Comply with joint sealer manufacturer's printed installation instructions applicable to products and applications indicated, except where more stringent requirements apply.

B. Elastomeric Sealant Installation Standard: Comply with recommendations of ASTM C 962 for use of joint sealants as applicable to materials, applications and conditions indicated.

C. Latex Sealant Installation Standard: Comply with requirements of ASTM C 790 for use of latex sealants.

D. Installation of Sealant Backings: Install sealant backings to support sealants during application and at position required to produce optimum sealant movement capability.

1. Do not leave gaps between ends of sealant backings.

2. Do not stretch, twist, puncture, or tear sealant backings.

3. Remove absorbent sealant backings that have become wet before sealant application and replace them with dry materials.

E. Install joint-fillers of type indicated to provide support of sealants during application and at position required to produce the cross-sectional shapes and depths of installed sealants relative to joint widths which allow optimum sealant movement capability. Do not leave gaps between ends of joint-fillers. Do not stretch, twist, puncture or tear joint-fillers. Remove

absorbent joint-fillers which have become wet prior to sealant application and replace with dry material.

F. Installation of Sealants: Install sealants by proven techniques that result in sealants directly contacting and fully wetting joint substrates, completely filling recesses provided for each joint configuration and providing uniform, cross-sectional shapes and depths relative to joint widths which allow optimum sealant movement capability.

G. Tooling of Nonsag Sealants: Immediately after sealant application and prior to time skinning of curing begins, tool sealants to form smooth, uniform beads of configuration indicated, to eliminate air pockets and to ensure contact and adhesion of sealant with sides of joint. Remove excess sealants from surfaces adjacent to joint. Do not use tooling agents which discolor sealants or adjacent surfaces or are not approved by sealant manufacturer. Provide concave joint configuration per Figure 6A in ASTM C 962, unless otherwise indicated.

3.04 PROTECTION AND CLEANING

A. Protect joint sealers during and after curing period from contact with contaminating substances or from damage resulting from construction operations or other causes so that they are without deterioration or damage at time of substantial completion. If, despite such protection, damage or deterioration occurs, cut out and remove damaged or deteriorated joint sealers immediately and reseal joints with new materials to produce joint sealer installations with repaired areas indistinguishable from original work.

B. Clean off excess sealants or sealant smears adjacent to joints as work progresses by methods and with cleaning materials approved by manufacturers of joint sealers and of products in which joints occur.

END OF SECTION