SECTION 07200 - INSULATION

PART 1 - GENERAL

RELATED DOCUMENTS:

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

DESCRIPTION OF WORK:

Extent of insulation work is shown on drawings and indicated by provisions of this section.

Applications of insulation specified in this section include the following:

Blanket-type building thermal/sound attenuation insulation.
Loose-fill building insulation.

Foam plastic board insulation is specified in Division 7

QUALITY ASSURANCE:

Thermal Resistivity: Where thermal resistivity properties of insulation materials are designated by r-values they represent the rate of heat flow through a homogenous material exactly 1" thick, measured by test method included in referenced material standard or otherwise indicated. They are expressed by the temperature difference in degrees F between the two exposed faces required to cause one BTU to flow through one square foot per hour at mean temperatures indicated.

Fire Performance Characteristics: Provide insulation materials which are identical to those whose fire performance characteristics, as listed for each material or assembly of which insulation is a part, have been determined by testing, per methods indicated below, by UL or other testing and inspecting agency acceptable to authorities having jurisdiction.

Surface Burning Characteristics: ASTM E 84.
Fire Resistance Ratings: ASTM E 119.
Combustion Characteristics: ASTM E 136.

Maximum Allowable Asbestos Content of Inorganic Insulations: Provide insulations composed of mineral fibers or mineral ores which contain less than 0.25% by weight of asbestos of any type or mixture of types occurring naturally as impurities as determined by polarized light microscopy test per Appendix A of 40 CFR 763.

SUBMITTALS:

Product Data: Submit manufacturer's product literature and installation instructions for each type of insulation and vapor retarder material required.

Certified Test Reports: With product data, submit copies of certified test reports showing compliance with specified performance values, including r-values (aged values for plastic insulations), densities, compression strengths, fire performance characteristics, perm ratings, water absorption ratings and similar properties.

DELIVERY, STORAGE, AND HANDLING:

General Protection: Protect insulations from physical damage and from becoming wet, soiled, or covered with ice or snow. Comply with manufacturer's recommendations for handling, storage and protection during installation.

Protection for Plastic Insulation:

Do not expose to sunlight, except to extent necessary for period of installation and concealment.

Protect against ignition at all times. Do not deliver plastic insulating materials to project site ahead of installation time.

Complete installation and concealment of plastic materials as rapidly as possible in each area of work.

PART 2 - PRODUCTS

ACCEPTABLE MANUFACTURERS:

Available Manufacturers: Subject to compliance with requirements, provide products of one of the following:

Manufacturers of Extruded Polystyrene Board Insulation:

Amoco Foam Products Co.
Dow Chemical U.S.A.
Minnesota Diversified Products, Inc.
UC Industries.

Manufacturers of Glass Fiber Insulation:

CertainTeed Corp.
Knauf Fiber Glass GbmH.
Manville Corp.
Owens-Corning Fiberglass Corp.

Manufacturers of Semi-Refractory Fiber Insulation:

Manville Corp.
United States Gypsum Co.

INSULATING MATERIALS:

General: Provide insulating materials which comply with requirements indicated for materials, compliance with referenced standards, and other characteristics.

Preformed Units: Sizes to fit applications indicated, selected from manufacturer's standard thicknesses, widths and lengths.

Extruded Polystyrene Board Insulation: Rigid, cellular thermal insulation with closed-cells and integral high density skin, formed by the expansion of polystyrene base resin in an extrusion process to comply with ASTM C 578 for Type indicated; with 5-year aged r-values of 5.4 and 5 at 40 and 75 deg. F (4.4 and 23.9 deg.C), respectively; and as follows:

Type IV, 1.6 lb./cu. ft. min. density, unless otherwise indicated.

Surface Burning Characteristics: Maximum flame spread and smoke developed values of 5 and 165, respectively.

Unfaced Mineral Fiber Blanket/Batt Insulation: Thermal/sound attenuation insulation produced by combining mineral fibers of type described below with thermosetting resins to comply with ASTM C 665 for Type I (blankets without membrane facing); and as follows:

Mineral Fiber Type: Fibers manufactured from glass.

Combustion Characteristics: Passes ASTM E 136 test.

Surface Burning Characteristics: Maximum flame spread and smoke developed values of 25 and 50, respectively.

Loose Glass Fiber Insulation: Glass fibers processed to comply with ASTM C 764 for Type (method of application) indicated below; passing ASTM E 136 for combustion characteristics; maximum flame spread and smoke developed values of 5 and 5, respectively, and as follows:

Type 1 for pneumatic application.

AUXILIARY INSULATING MATERIALS:

Polyethylene Vapor Retarder: 6-mil polyethylene film, with laboratory-tested vapor transmission rating of 0.2 perms, natural color.

Metal Foil/Paper Vapor Retarder: 0.3-mil reflective aluminum foil laminated with scrim reinforcing to plastic-coated Kraft paper; laboratory-tested vapor transmission rating of 0.03 perms.

Adhesive for Bonding Insulation: Type recommended by insulation manufacturer, and complying with requirements for fire performance characteristics.

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

PART 3 - EXECUTION

INSPECTION AND PREPARATION:

Require Installer to examine substrates and conditions under which insulation work is to be performed. A satisfactory substrate is one that complies with requirements of the section in which substrate and related work is specified. Obtain Installer's written report listing conditions detrimental to performance of work in this section. Do not proceed with installation of insulation until unsatisfactory conditions have been corrected.

Clean substrates of substances harmful to insulations or vapor retarders, including removal of projections which might puncture vapor retarders.

INSTALLATION, GENERAL:

Comply with manufacturer's instructions for particular conditions of installation in each case. If printed instructions are not available or do not apply to project conditions, consult manufacturer's technical representative for specific recommendations before proceeding with work.

Extend insulation full thickness as shown over entire area to be insulated. Cut and fit tightly around obstructions, and fill voids with insulation. Remove projections which interfere with placement.

Apply a single layer of insulation of required thickness, unless otherwise shown or required to make up total thickness.

INSTALLATION OF PERIMETER INSULATION:

On vertical surfaces, set units in adhesive applied in accordance with manufacturer's instructions. Use type of adhesive recommended by manufacturer of insulation.

INSTALLATION OF GENERAL BUILDING INSULATION:

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

Place loose glass insulation into spaces and onto surfaces as shown, either by pouring or by machine-blowing. Level horizontal applications to uniform thickness as indicated, lightly settled to uniform density, but not excessively compacted.

Stuff loose glass fiber insulation into miscellaneous voids and cavity spaces where shown. Compact to approximately 40% of normal maximum volume (to a density of approximately 2.5 lbs. per cu. ft.)

INSTALLATION OF VAPOR RETARDERS:

General: Extend vapor retarder to extremities of areas to be protected from vapor transmission. Secure in place with adhesives or other anchorage system as indicated. Extend vapor retarder to cover miscellaneous voids in insulated substrates, including those which have been stuffed with loose fiber-type insulation.

Seal vertical joints in vapor retarders over framing by lapping not less than 2 wall studs. Fasten vapor retarders to framing at top, end and bottom edges, at perimeter of wall openings and at lap joints; space fasteners 16" o.c.

Seal joints caused by pipes, conduits, electrical boxes and similar items penetrating vapor retarders with cloth or aluminized tape of type recommended by vapor retarder manufacturer to create an air-tight seal between penetrating objects and vapor retarder.

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

PROTECTION:

General: Protect installed insulation and vapor retarders from harmful weather exposures and from possible physical abuses, where possible by nondelayed installation of concealing work or, where that is not possible, by temporary covering or enclosure.

END OF SECTION 07200

SECTION 07240 - EXTERIOR INSULATION FINISH SYSTEM

PART 1 - GENERAL

RELATED DOCUMENTS:

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

DESCRIPTION OF WORK:

Section includes exterior insulation and finish system for certain walls and soffit locations, including insulation, standard mesh, base and finish coats, including a spray applied quartz aggregate finish, and other items as shown on the drawings and as specified herein. Included are standard, continuous walls, soffits, and special shapes.

RELATED WORK:

Section 04200, Masonry.
Section 07600, Flashing.
Section 07900, Sealants.

QUALITY ASSURANCE:

1. Manufacturer shall have a minimum of five years of satisfactory experience at manufacturing and marketing exterior insulation and finish system.

2. Installer shall have a minimum of five years successful experience installing exterior insulation and finish systems and shall be approved by and licensed by manufacturer of system materials.

3. Single Source Responsibility: Provide all components of exterior insulation and finish system as manufactured by single supplier.

4. Pre-construction meeting: Contractor shall organize and schedule pre-construction meeting on exterior insulation finish system work to include EIFS contractor, flashing subcontractor, Owner, Architect and any other related trades, prior to the start of the work. Contractor shall take meeting minutes and distribute them to all attending parties.

SUBMITTALS:

1. Shop Drawings: Submit complete shop drawings indicating wall layout, all details, profiles, connections, expansion joints, finish system, and installation sequence.

2. Samples: Submit two 12" x 12" samples for selection of color for texture of finish selected.

3. Mock-up: Prepare up to four job site mock-up panels, minimum 4' x 8' size in locations as directed by Architect. Protect approved mock-ups for judging quality standard for remainder of work. Mock-ups may be initial panels of actual wall system and may remain in the Project if approved by Architect.

DELIVERY, STORAGE, AND HANDLING:

Deliver system materials to job site in original containers with labels intact.

Store materials in cool, dry location out of sunlight, protected from sunlight and from temperatures below 40°F.

Handle all materials according to label directions and manufacturer's printed recommendations. Handle system components supplied by other according to those manufacturer's directions.

JOB CONDITIONS:

Inspection: Inspect site conditions before beginning work. Report any unsatisfactory conditions to the contractor and Architect in writing prior to starting work. Thoroughly examine the existing hard coat finish system in place. Advise Architect in writing if any problems or difficulties are expected, based on the following specification.

Environmental Conditions: Do not begin installation unless ambient temperature is at least 40°F. and rising, and is expected to remain so for at least 24 hours. Do not apply system materials to frozen or frost covered substrates.

WARRANTY:

Provide written warranty, signed by the manufacturer and the installer, warranting the performance of the Exterior Insulation Finish System for a period of three years from substantial completion. Warranty shall cover materials and workmanship, as well as specified performance criteria including thermal performance.

PART 2 - PRODUCTS

MANUFACTURERS:

Subject to compliance with requirements provide systems from the following manufacturer. Other manufacturers shall be considered if the proper submittal form is submitted to the Architect within the time allowed; a list of projects of similar type are submitted, and sample panels are submitted to the Architect.

Dryvit; Dryvit System, Inc.
R-Wall, Sto Industries, Inc.
Senerthik or Senerflex; Senergy, Inc.
Approved Equal

MATERIALS:

Adhesive: Acrylic-based product with the following minimum bond strengths over listed substrates when tested in accordance with ASTM D 897:

Concrete Block: 160 psi.
Gypsum Sheathing: 39 psi.

Insulation Board: Expanded or extruded plastic, mineral, or figerglass rigid insulation board produced by a manufacturer approved by system manufacturer, complying with FS HH-I- 524C, Type 1; density 1.0 pcf., maximum flame

spread and smoke developed of 25 and 450 respectively when tested in accordance with ASTM E 84, k-value of .25 at 75°F., and complying with other requirements of system manufacturer. Provide all custom shapes and sizes shown on the drawings, extruded or premade in the factory.

NO INSULATION CONTAINING STYRENE OR PRODUCED WITH CHLORO-FLORO-CARBONS ARE PERMITTED

Provide 2" thick boards minimum where insulation is required or shown.

Provide built-up sections of expanded polystyrene to conform to the profiles and special shapes as shown on the drawings.

Reinforcing Mesh: Treated, balanced, open weave, glass fiber type supplied by or approved by system manufacturer.

Metal Lath: Provide self-furring, expanded metal lath as approved by the manufacturer of the EIFS.

Finish: Acrylic based binder, factory mixed coating having integral color and texture.

Surface texture shall be "Quartzputz", as selected by Architect from the manufacturer's standard colors. Material shall be ceramically colored quartz aggregate finish. Provide the following colors, referencing Elevation Drawings, for keynotes which indicate the locations for each EIFS color application:

EIFS Color #1 - Color as Selected by Architect.
EIFS Color #2 - Color as Selected by Architect.

Cement: Portland cement, Type I or III, meeting ASTM C 150.

Water: Clear and potable.

Sealant: Specified in Section 07900, and complying with manufacturer's recommendations.

SYSTEM PERFORMANCE:

Finish system shall have been tested for moisture resistance, rain resistance, absorption-freeze, accelerated weathering, mildew resistance, salt spray resistance, chemical resistance, abrasion resistance.

System shall have been tested for impact resistance and structural load capacity in accordance with ASTM E 72 and E 330.

System shall have been tested for the following fire tests:

Modified ASTM E 108
ULC S 101
Factory Mutual Corner Test
Multi-story Fire Test with 15' x 10' x 10' room and 1500 lb. wood crib.
Multi-story Fire Test with 15' x 15' x 12' room and 1285 lb., wood crib.

PART 3 - EXECUTION:

INSPECTION:

Inspect substrate prior to application of insulation and finish system for compliance with Contract Documents and system manufacturer's requirements. Notify the Contractor and Architect in writing of any unsatisfactory conditions prior to beginning work.

Do not begin applying insulation boards until infill concrete bearing walls and mortar has fully cured. At existing concrete that adhesive/primus will bond to existing surfaces, apply primer or remove existing materials until bond is achieved.

INSTALLATION:

At existing surfaces, remove any obstructions that interfere with new system. Provide metal lath where required to achieve a workable and durable surface. Ensure that surface is plumb, true and smooth: ready for adhesion of insulation.

Apply exterior insulation and finish system in strict compliance with approved shop drawings and manufacturer's printed recommendations and instructions.

Locate "V" shaped control and totally separated expansion joints at locations occurring in the insulation substrate, as shown on the drawings and as recommended by system manufacturer. Provide drips joints where material is extended down to soffits and horizontal surfaces.

Apply insulation boards to back-up surface material as recommended by the manufacturer. Carefully plane and sand insulation boards so that joints at panels and variations of substrates do not telegraph through the final finish coat.

Accurately and precisely cut reveals and recesses into insulation boards to create pattern and design shown on the drawings.

Carefully plane and sand down surfaces especially at all butted intersections so that final surface appears to be one monolithic surface.

Cover insulation with reinforcing fabric mesh. Install panzer mesh where shown on the drawings or as specified.

Completely cover mesh with base coat at all locations, paying close attention to corners, joints and curves. Do not continue to apply additional coats until all fabric is covered. Apply subsequent coats in a similar manner, ensuring adequate coverage.

Cut standard control joints using a "V" shaped bit in locations indicated on Drawings. Limit panel areas to no greater than 100 square feet between control joints, or as recommended by the installer.

Provide separated joints for sealant and rod stock where expansion joints are shown on the drawing. At expansion joints, do not allow aggregate surfacing material to extend into joint.

Allow base coat to cure one full day prior to finish coats.

AGGREGATE COATING SYSTEM:

Apply composite aggregate and finish coating to walls at locations shown on the drawings, (identical to finishes, colors, and textures of approved job-site mock-ups).

Apply colored primer a minimum of four hours prior to the application of aggregate surface.

When mixing finish coat system, use power equipment as recommended by the manufacturer to obtain a uniformly mixed coating just prior to application.

Apply aggregate finish system by trained mechanics, in a uniform manner, in two coats. The first coat shall be horizontal, and the second coat vertically applied. Allow drying time between coats as recommended by the manufacturer.

Complete each coat and calibrate the work to the closest control joint at the end of each work day, using the vertical and horizontal control joints as a stopping points in the work. Do not discontinue coats, or stop work, in the middle of a panel at the end of each work day. Panels which are not fully covered within each work day will be rejected by the Architect.

CLEANING AND PROTECTION

At end of work, clean area, remove all materials, equipment and trash from site.

Instruct Contractor in procedures for protecting completed finish panels. Erect temporary protection as necessary to protect bases of walls, projections, ledges and fascia from soiling and damage from splashed mud or dirt, or staining from run-off of construction procedures.

END OF SECTION 07240

SECTION 07530 - SINGLE PLY MEMBRANE ROOFING SYSTEM

PART 1 - GENERAL

RELATED DOCUMENTS:

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

DESCRIPTION OF WORK:

Section includes fully adhered and ballasted single ply membrane roofing systems including all labor, materials, equipment and accessories necessary to complete all the work identified on the drawings. System shall include loose stone ballast, E.P.D.M. sheet membrane, roof insulation, tapered units, protection board, elastic sheet base flashing, non-slip walkway pads, roofing construction joints, molded pipe flashing, adhesives, sealants, mastic, cement and fasteners required for a complete installation.

RELATED WORK:

Section 05500, Metal Fabrications.
Section 06100, Rough Carpentry.
Section 07200, Insulation.
Section 07600, Standing Seam Metal Roofing.
Section 07900, Joint Sealers.

QUALITY ASSURANCE:

1. Manufacturer: Obtain primary flexible sheet roofing from a single manufacturer. Provide secondary materials as required by manufacturer of primary materials.

2. Installer: A firm with not less than 5 years of successful experience in installation of roofing systems similar to those required for this project and which is acceptable to or licensed by manufacturer of primary roofing materials. Contractor shall provide evidence that he has performed work on at least 3 projects similar in size and scope to this project.

3. Certification: Installer shall be a certified contractor of one of the approved manufacturers. Letter or certification shall be required prior to roof conference.

4. Pre-Roofing Conference: Prior to installation of roofing and associated work, meet at project site, or other mutually agreed location, with installer, roofing manufacturer, installers of related work, and other entities concerned with roofing performance, including Owner's agent, Architect, and Owner. Contractor shall record discussions and agreements, and furnish copy to each participant. Provide at least 72 hours advance notice to participants prior to convening pre-roofing conference. The roof conference shall take place after or during deck installation, and must be held prior to any roof work being performed.

5. Insurance Certification: Assist Owner in preparation and submittal of roof installation acceptance certification necessary in connection with fire and extended coverage insurance on roofing and associated work.

6. Roof System shall be Class A, equivalent to a an FM 60 rating.

7. Same Subcontractor shall provide all roofing and sheet metal work for all of Sections 07530 and 07600.

SUBMITTALS:

1. Product Data: Submit specifications, installation instructions and general recommendations of manufacturer.

2. Samples: Submit 12" sq. samples of each required insulation, membrane, and flashing. Submit 12" sq. samples of vapor barrier which demonstrates self sealing capabilities.

3. Shop Drawings: Submit complete shop drawings showing roof configuration and sheet layout, details at perimeter, and special conditions. Provide data specs on roof hatch and walkway pads.

4. Insulation System R-value: Provide diagram and calculations showing 20.0 R-value for complete roof assembly of insulation materials at new construction, including back-up documentation of manufacturers published data sheets.

JOB CONDITIONS:

Weather: Proceed with roofing work when existing and forecasted weather conditions permit work to be performed in accordance with manufacturers' recommendations and warranty requirements.

Protect and safeguard all materials and in-place construction at the end of each working day. Protect existing office and warehouse space from inclement weather during construction.

PRODUCT DELIVERY, STORAGE AND HANDLING

Deliver products in original unopened packaging with manufacturer's identification.

Store materials in a neat and safe manner, in a dry area, and in accordance with manufacturer's instructions. Do not exceed allowable live-load of any storage area. All flamable materials shall be labeled and stored as required.

SPECIAL PROJECT WARRANTY:

Roofing systems manufacturer to provide written warranty for a period of ten (10) years for all roofs, commencing on date roofing system is inspected and accepted by manufacturer. Warranty shall cover all labor and materials associated with the repair or replacement of roofing leaks, defects or any other systems failure resulting from defective roofing materials (i.e., flashing, membrane, insulation, vapor barrier, etc.), or installation, and shall not be limited to the original installed cost to the Owner.

PART 2 - PRODUCTS

GENERAL:

Compatibility: Provide products which are required by manufacturers to be fully compatible with indicated substrates, or provide separation materials as required to eliminate contact between incompatible materials.

MANUFACTURERS:

Subject to compliance with requirements, provide products from one of the following systems manufacturers for the new roof work:

Carlisle Syntec Systems.
Firestone Building Products.

MATERIALS:

EPDM type membrane: Ethylene propylene diene monomers formed into uniform, flexible sheets, complying with the following:

Tensile Strength (ASTM D 412): 1400 psi minimum.
Ultimate Elongation (ASTM D 412): 300% minimum.
Brittleness Temperature (ASTM D 746): -49 deg.F (-45 deg.C).
Tear Resistance (ASTM D 624): 125 lbs. per lin. inch min.
Resistance to Ozone Aging (ASTM D 1149): No cracks.
Resistance to Heat Aging (ASTM D 573): 8.3 MPa; tensile mini
mum to be 1200 psi.
Thickness: 45 and 60 mils nominal thickness (Refer to Description of the Work)
Exposed Face Color: Medium or Light Grey.
Reinforcing: Where membrane is adhered to substrate.

MISCELLANEOUS MATERIALS:

Elastic sheet base flashing: 0.060 inches thick uncured EPDM as required by the manufacturer.

Sheet Seaming System: Manufacturer's seam slice tape especially designed, tested and manufactured for use between EPDM membranes, 2-1/2" wide by 1/4" thick, continuous. At special conditions provide standard splice adhesive, including edge sealer to cover exposed spliced edges as required by manufacturer of roofing system.

Cant Strips, Tapered Edge Strips and Flashing Accessories: Types required by manufacturer of membrane material, provided at locations indicated and at locations required by mfr., including adhesive tapes, flashing cements, and sealants.

Primers and cleaners: As required by the membrane manufacturer.

Molded Pipe Flashing: Furnished and used as required by membrane manufacturer. Provided premolded pipe flashing at pipe penetrations as well as round pipe column structural supports for metal panel "false" parapet conditions.

Membrane Tape, Adhesive and Sealant: As required by membrane manufacturer for particular substrate and project conditions, formulated to withstand min, 60 psf uplift force (I-60), and 90 psf uplift force (I-90) at the Arena roof as shown and indicated.

All typical seams to be spliced and bonded through the use of membrane tape. At areas where tape is not possible or recommended, a brush application (not roller) is to be used.

Aggregate Surface Ballast: Washed, rounded, riverbed gravel or other acceptable smooth faced stone ranging in size from 3/4" to 1- 1/2" in diameter, which will withstand weather exposure and uplift without significant deterioration (ASTM C 33). Ballast shall be approved by the manufacturer of the roof system. Provide additional ballast at roof perimeter to withstand uplift forces in accordance with the manufacturer's data sheets and NRCA recommendations.

INSULATING MATERIALS:

General: Provide insulating materials and tapered insulation to comply with requirements indicated and with referenced standards; in sizes to fit applications indicated, selected from manufacturer's standard thicknesses, widths and lengths.

Typically provide layer of 1/2" HD wood fiberboard on two layers of required thickness polystyrene boards, on 5/8" perlite board, on deck.

Note: total system average of insulation materials shall be an average R-value of 38.0.

Insulation Materials: At Contractor's option, provide one of the following:

Expanded Polystyrene Board Insulation: Rigid, cellular thermal insulation of expanded polystyrene resin beads or granules complying with ASTM C 578. Provide Type VIII, 1.15 PCF min. density, with aged R-value of 4.2.

Manufacturer of polystyrene beads: Provide beads for the manufacture of polystyrene from Huntsman, Arco or BASF.

Perlite/Polyisocyanurate Composite Board Roof Insulation: Rigid thermal composite insulation with polyisocyanurate closed cell foam core with rigid perlite board laminated to one side and manufacturer's standard facing laminated to the other side; complying with FS HH-I-1972/3, Class 1.

Polyisocyanurate Board Roof Insulation: Rigid thermal composite insulation with polyisocyanurate closed cell foam core and manufacturer's standard facing laminated to both sides; complying with FS HH-I-1972/2, Class 1.

Provide tapered boards where indicated for sloping to drain; fabricate with taper of 1/4" per ft.

Perlite: Provide rigid boards of expanded perlite fibers and binders, complying with ASTM C 728, and an R-value of 2.78. Maximum thickness shall be 3/4".

Wood Fiberboard: 1/2" thickness, high density wood fiber board as recommended by the primary roofing materials manufacturer.

R-Value: Provide the following aged R-value for complete roof insulation system: minimum R-20.0 average for insulation system materials throughout the roof. Contractor shall provide the Architect with written evidence of conformance to the values required.

MISCELLANEOUS INSULATION MATERIALS:

Adhesive for Bonding Insulation: Type recommended by insulation manufacturer and complying with fire resistance requirements.

Mastic Sealer: Type recommended by insulation manufacturer for bonding edge joints and filling voids.

Walkway Protection Pavers: Provide 24" square slip resistant reinforced EPDM (22 lbs./sq. ft.), units made by, or approved by, the manufacturer of membrane systems at areas shown on the drawings and as specified herein. Units shall be suitable for use without cracking or breaking on fully adhered and ballasted membrane roof surfaces.
Fasteners: As required by the Manufacturer.

PART 3 - EXECUTION

PREPARATION OF SUBSTRATE:

General: Comply with manufacturer's instructions for preparation of substrate to receive roofing system.

Clean substrate of dust, debris, and other substances detrimental to roof system work. Remove sharp projections.

Install cant strips, flashings, and accessory items as shown, and as required by manufacturer where or shown or not. Indicate on the shop drawings as required.

Prime substrate where recommended by manufacturer of materials being installed.

Prevent compounds from entering and clogging drains and conductors, and from spilling or migrating onto surfaces of other work.

Do not install roofing system if deck or installation conditions are not in compliance with manufacturer's recommendations. Installation shall constitute acceptance of roof deck.

Fully adhere base flashing membrane to masonry substrate at roof parapets in accordance with manufacturer's recommendations. If flashing is in contact with fire retardant plywood, roofing manufacturer and installer to certify that membrane flashings and fire retardant plywood are compatible.

INSTALLATION:

General: Comply with manufacturer's detailed instructions, except where more stringent requirements are indicated.

Details as shown on drawings are typical for one manufacturer. If approved manufacturer's details differ, contractor shall install roof system in accordance with manufacturer's instructions.

There shall be no added cost to the owner for compliance with manufacturer's standard details. Provide detail changes to Architect in accordance with "Submittals" process.

General: Extend insulation (including tapered sections) over entire surface to be tapered or insulated, cutting and fitting tightly around obstructions. There shall be a minimum of three layers of insulation, wood fiberboard or perlite at any point of new construction. Stagger all joints, including new boards over existing insulation. Form cant strips, crickets, saddles, and tapered areas with additional material as shown and as required for proper drainage of membrane.

Do not install more insulation each day than can be covered with membrane before end of day and before start of inclement weather. Provide waterproof tarps and polyethylene to seal off new insulation and membrane at the end of each work day.

Set units in adhesive, applied in accordance with requirements of applicable fire and insurance ratings.

Secure roof insulation to substrate as required for each system specified. Where applicable, use mechanical anchors of type and spacing indicated; but in no case provide less than one anchor per 4 square feet of surface area, or less anchorage than required by FM "Loss Prevention Data Sheet 1-28". Install roof insulation in a minimum of two layers with staggered joints.

Loose-Laid and Ballasted roofing Systems: Install membrane by unrolling over prepared substrate, nailing only at perimeter and at roofing penetrations. Lap adjoining sheets as recommended by FSR manufacturer and bond as recommended by manufacturer, covering top edges of each sheet at seams with uniform fillet or sealant if recommended by manufacturer.

Allow membrane to relax 30 minutes before attachment. Ensure that membrane does not stretch or wrinkle

during splicing. Inspect all field splices that there is no separation, air entrapment, or failure in installation.

Fully Adhered Roofing System: Install membrane by unrolling over prepared substrate, allowing membrane to relax. In accordance with manufacturer's instructions, fully adhere membrane to the substrate. Lap adjoining sheets as recommended by FSR manufacturer and bond as recommended by manufacturer, covering top edges of each sheet at seams with uniform fillet of sealant if recommended by manufacturer.

Allow membrane to relax 30 minutes before attachment. Ensure that membrane does not stretch or wrinkle during splicing. Inspect all field splices that there is no separation, air entrapment, or failure in installation.

FLASHING INSTALLATION:

Install all flashings in accordance with manufacturer's standard instructions and details. Use the longest pieces of material possible. Extend flashing a minimum of 8" or as shown on drawings.

Properly bond base flashing to roof membrane allowing the bonding adhesive to dry per manufacturer's instructions. Don not allow any flashing to wrinkle or create a gap. After installation of flashing to vertical surface, fasten with fasteners as approved by manufacturer prior to installation of sheet metal flashing.

The manufacturer's name shall not be exposed or visible on the face of flashing.

Obtain roof drain and cover from mechanical contractor, and install within roof valleys, at the absolute low points. Secure drain and make sure that installation is watertight.

Install walkway units at areas shown on the drawings.

Walkway Protection: Install paver units at locations shown and where required for access to roof-mounted equipment, per the manufacturer's instructions.

Provide roofing construction joints at high point locations of the roof as shown on the drawings, or as recommended by the manufacturer.

END OF SECTION 07530

SECTION 07600 - FLASHING AND SHEET METAL

PART 1 - GENERAL

RELATED DOCUMENTS:

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

DESCRIPTION OF WORK:

Section includes prefinished flashing, counterflashing, and related sheet metal and flashing materials as shown on the drawings and specified herein.

Materials supplied by contractor of this section shall be identical with materials supplied by standing seam metal roof contractor, as specified in Section 07630, although a different color may be selected.

RELATED WORK:

Section 07530, Single Ply Membrane Roofing System.
Section 07630, Standing Seam Metal Roof.
Section 07900, Joint Sealers.

SUBMITTALS:

1. Samples: Manufacturer's color charts and samples of each exposed type of metal sheet for verification.

2. Shop Drawings: Indicate layout, joining, profiles, and anchorages of fabricated work, trim/fascia, scuppers and expansion joint systems.

JOB CONDITIONS:

Coordinate work of this section with interfacing and adjoining work, and perform work under best possible weather conditions.

PART 2 - PRODUCTS

MATERIALS:

Zinc-Coated Steel: Commercial quality with 0.20% copper, ASTM A 525 (ASTM A 527 lock-forming, G90 hot-dip galvanized, 20 gage).

Prefinished Steel: Commercial quality 24 gage hot dipped galvanized steel (G-90), smooth primed and finished one side with Kynar based flouropolymer coating of 1.0 ($\pm$0.1) mil total dry film thickness. Color shall be selected by Architect from a complete list of manufacturer's colors.

Elastic Sheet: 50-65 mil elastic non-reinforced EPDM rubber.

Solder: For use with steel or copper, provide 50 - 50 tin/lead solder (ASTM B 32), with rosin flux.

Fasteners: Same metal as flashing/sheet metal or, other noncorrosive metal as recommended by sheet manufacturer. Match finish of exposed heads with material being fastened.

Bituminous Coating: FS TT-C-494 or SSPC - Paint 12, solvent type bituminous mastic, nominally free of sulfur, compounded for 15- mil dry film thickness per coat.

Mastic Sealant: Polyisobutylene; nonhardening, nonskinning, nondrying, nonmigrating sealant.

Elastomeric Sealant: Generic type recommended by manufacturer of metal and fabricator of components being sealed; comply with FS TT-S-0027, TT-S-00230, or TT-S-001543.

Epoxy Seam Sealer: 2-part noncorrosive metal seam cementing compound, recommended by metal manufacturer for exterior/interior nonmoving joints including riveted joints.

Paper Slip Sheet: 5-lb rosin-sized building paper.

Reglets: Metal or plastic units of the type and profile indicated, compatible with flashing indicated, noncorrosive.

Metal Accessories: Provide sheet metal clips, straps, anchoring devices and similar accessory units as required for installation of work, matching or compatible with material being installed, noncorrosive, size and gage required for performance.

Roofing Cement: ASTM D 2822, asphaltic.

Refer to Section 07900, for sealants.

MANUFACTURERS:

Subject to compliance with requirements, provide materials from one of the following manufacturers:

Prefinished metal:

Pac-Clad: Peterson Metals Corp.
Colorklad; Vincent Brass.
Lok-Seam; MBCI
BHP Steel Building Products USA, Inc.

FABRICATION:

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

Seams: Fabricate nonmoving seams in sheet metal with flat-lock seams. Seams are to be formed and soldered.

Expansion Provisions: Where lapped or bayonet-type expansion provisions in work cannot be used, or would not be sufficiently water/weatherproof, form expansion joints of intermeshing hooked flanges, not less than 1" deep, filled with mastic sealant (concealed within joints).

At downspouts, gutters and scuppers metal shall be fabricated so that the selected color is exposed at all visible areas. Provide two-piece assemblies at open downspouts and as required.

Sealant Joints: Where movable, non-expansion type joints are indicated or required for proper performance of work, form metal to provide for proper installation of elastomeric sealant, in compliance with SMACNA standards.

Separations: Provide for separation of metal from noncompatible metal or corrosive substrates by coating concealed surfaces at locations of contact, with bituminous coating or other permanent separation as recommended by manufacturer/fabricator.

Elastic Expansion Joint Fabrication:

General: Provide manufacturer's standard units of size and type indicated, complete with prefabricated corner and intersection units and splicing materials; with elastic sheet flashing forming the primary joint membrane, in a supported bellows arrangement to be secured to both sides of expansion joints; with bellows insulated from below with adhesively applied, flexible, closed- cell rubber or plastic not less than 3/8" thick.

PART 3 - EXECUTION

INSTALLATION:

General: Comply with SMACNA "Architectural Sheet Metal Manual".

Underlayment: Install slip sheet of red rosin paper and a course of polyethylene underlayment where required and specified.

Bed flanges of work in a thick coat of bituminous roofing cement where required for waterproof performance.

Install reglets to receive counter-flashing in manner and by methods indicated. Where shown in concrete, furnish reglets to trades of concrete work for installation as work of Division 3 sections. Where shown in masonry, furnish reglets to trades of masonry work, for installation as work of Division-4 sections.

Shop form all sheet metal details including cap flashing, wall flashing, gutters, downspouts, decorative elements and any other items shown on the drawings, or otherwise required for a complete installation. Provide materials to the job site that are square, solid, clean and in relatively new condition. Protect all metal before, during and after installation as necessary.

CLEANING AND PROTECTION:

Clean exposed metal surfaces, removing substances which might cause corrosion of metal or deterioration of finishes.

Protection: Ensure that work is protected from damage or deterioration, other than natural weathering, at time of substantial completion.

END OF SECTION 07600

SECTION 07630 - STANDING SEAM METAL ROOFING

PART 1 - GENERAL

RELATED DOCUMENTS:

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

DESCRIPTION OF WORK:

Section includes prefinished, snap-on, standing seam metal roofing system, and membrane underlayment for sloped roof sections, soffits and fascias as indicated on the drawings and specified herein. Soffit panels shall be metal clad plywood sandwich panels structurally capable of spanning between supports spaced as indicated.

RELATED WORK:

Section 06100, "Rough Carpentry", for decking materials.
Section 07530, "Single Ply Membrane Roofing System".
Section 07600, "Flashing and Sheet Metal".

QUALITY ASSURANCE:

1. Industry Standard: Comply with applicable recommendations and details of "Architectural Sheet Metal Manual" by SMACNA. Conform to dimensions and profiles shown.

2. Same Sub-Contractor shall provide all roofing, siding and sheet metal work for all sections 07530 and 07600.

3. Field Measurements: Prior to fabrication take field measurements of structure or substrates to receive panel system. Allow for trimming panel units where final dimensions cannot be established prior to fabrication.

4. Reference Standard: Comply with "Architectural Sheet Metal Manual", published by Sheet Metal and Air Conditioning Contractors National Association.

5. Provide system and fasteners that achieve spacing and uplift resistance specified in UL-60.

6. Pre-construction meeting: Contractor shall organize a pre-construction meeting with the roof contractor, underlayment and sheet metal manufacturer, deck installer, Owner and Architect, along with any other allied construction persons. Cover all details, installations procedures, schedule and any other concerns. Contractor shall record minutes of the meeting and submit to all parties.

SUBMITTALS:

1. Product Data: Manufacturer's specifications, standard details, certified product test results, and installation instructions.

2. Samples: 2 samples 12" square, of each finish selected. Provide section of sandwich panel for acceptance.

3. Shop Drawings: Include layouts of panels, details, supports, anchorages, and trim.

PART 2 - PRODUCTS

MANUFACTURERS:

Subject to compliance with requirements, provide products from one of the following:

PAC-Clad.
Vincent Brass & Aluminum Co.
MBCI
BHP Steel Building Products USA, Inc.

Specification is based on BHP "Select Seam" system with 1-7/8" high seam and 17-1/2" standard panel width. at typical locations, and butyl based elastomeric membrane underlayment, along with sheet metal flashing and trim accessories as required for a complete installation.

MATERIALS:

Aluminum Sheet for Painting/Coating: Provide manufacturer's special 24 gauge galvanized steel sheet (G-90) of alloy, temper and mill finish as recommended by the manufacturer.

Provide manufacturer's standard continuous U-shaped sections, with 17-1/2" center to center width and 1-7/8" height and wide style batten; Soffit transitions, end sections, and other shapes as required and shown on the drawings.

Hold-down Clips: Manufacturer's standard stainless steel.

Underlayment: Butyl based elastomeric membrane, 40 mil thickness ("peel and stick" product): Polyken, Ice-And-Water Shield or approved equal.

Refer to Section 07900, Joint Sealers for backer rods and urethane sealant joint materials.

METAL FINISHES:

Flouropolymer Coating: Full-strength 70% "Kynar 500" coating baked-on for 15 minutes at 450°F (232°C), in a dry film thickness of 1.0 mils, 30% reflective gloss (ASTM D 523), over 0.3 mil epoxy primer.

Durability: Provide coating which has been field tested under normal range of weathering conditions for minimum of 20 years without significant peel, blister, flake, chip, crack or check in finish, and without chalking in excess of 8 (ASTM D 659), and without fading in excess of 5 NBS units.

Architect shall choose one color from complete list of at least 19 standard colors, excluding metallics. This may be a different color than used on the cap flashing and trim found in Section 07600.

MISCELLANEOUS MATERIALS:

Fasteners: Manufacturer's standard noncorrosive types.

Paper Slip Sheet: 5-lb. rosin-sized building paper.

Gaskets: Pigmented silicone sealant type to match panels, where required and exposed, as approved by the manufacturer.

PANEL FABRICATION; PERFORMANCES:

General: Fabricate and finish panels and accessories at the factory to greatest extent possible, by manufacturer's standard procedures and processes, and as required to fulfill indicated performance requirements which have been demonstrated by factory testing. Comply with indicated profiles and dimensional requirements, and with structural requirements.

Required Performances: Fabricate roofing systems that have no leakage at 15 lbs. per sq. ft. pressure with spray test.

Fabricate joints with captive gaskets or separator strips, which provide a tight seal and prevent metal-to-metal contact in a manner which will minimize noise from movements within panel system.

Fabricate units under quality controlled factory conditions, forming all units with sharp, crisp, consistent bends. Manufacturer panels so that there is no oil canning evident when viewed in sun or shade. All bends and formed metal sections shall be straight and true to line and form. Architect shall reject panels that do not conform to the following maximum tolerances:

Length and width: 1/8" in 10 feet.
Squareness: 1/4" across panel, in 10 feet, both ways.

PART 3 - EXECUTION

PREPARATION:

Coordinate work with insulation and decking work. Ensure that decking is securely fastened to the metal deck. The rate of fastening is one fastener for every 2 square feet. Deck should lay flat and smooth, with butt edges tight one to another. Do not proceed with the work until sub-surface work is satisfactory.

INSTALLATION:

General: Comply with panel fabricator's and material manufacturers' instructions and recommendations for installation, as applicable to project conditions and supporting substrates. Anchor panels and other components of the work securely in place, with provisions for thermal/structural movement.

Install panels with concealed fasteners so that no exposed fasteners are visible upon completion.

Install elastomeric waterproof membrane in conformance with the manufacturer's instructions and as agreed upon a pre-construction meeting. Provide largest lengths possible. Overlap seams a minimum of 6" or greater as required by the manufacturer.

Installation tolerances: Shim and align panel units within installed tolerance of 1/4" in 20'-0" on level/plumb/slope and

location/line as indicated, and within 1/8" offset of adjoining faces and of alignment of matching profiles.

Joint Sealers: Install gaskets, joint fillers and sealants where indicated and where required for weatherproof performance of panel systems. Provide types of gaskets and sealants/fillers indicated or, if not otherwise indicated, types required by panel manufacturer, in compliance with Section 07900.

Where fasteners penetrate through the membrane, use sealant at each location.

CLEANING AND PROTECTION:

Damaged Units: Replace panels and other components of the work which have been damaged or have deteriorated beyond successful repair.

Cleaning: Remove temporary protective coverings and strippable films (if any) as each panel is installed. Upon completion of panel installation, clean finished surfaces as recommended by panel manufacturer, and maintain in a clean condition during construction.

END OF SECTION 07630

SECTION 07900 - JOINT SEALERS

PART 1 - GENERAL

RELATED DOCUMENTS:

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

DESCRIPTION OF WORK:

Extent of each form and type of joint sealer is indicated on drawings or in schedules.

Refer to Division-8 sections for glazing requirements; not work of this section.

Refer to Division-15 and 16 sections for joint sealers in mechanical and electrical work; not work of this section.

SYSTEM PERFORMANCES:

Provide joints sealers that have been produced and installed to establish and maintain watertight and airtight continuous seals.

QUALITY ASSURANCE:

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.

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

Preconstruction Joint Sealer-Substrate Tests: Submit substrate materials representative of actual joint surfaces to be sealed to manufacturer of joint sealer products for laboratory testing of sealants for adhesion to primed and unprimed substrates and for compatibility with secondary seals, if required, as indicated below:

Use test methods standard with manufacturer to determine if priming and other specific joint preparation techniques are required to obtain rapid, optimum adhesion of joint sealers to joint substrates under environmental conditions that will exist during actual installation.

Testing will not be required when joint sealer manufacturer is able to submit joint preparation data required above which is acceptable to Architect and is based on previous testing of current sealant products for adhesion to, and compatibility with, joint substrates matching those submitted.

Preconstruction Field Tests: Prior to installation of joint sealants, field-test their adhesion to joint substrates as follows:

Install joint sealants in 5-foot joint lengths using same materials and methods required for completed work. Allow sealants to cure before testing. Test adhesion to joint substrates by manually trying to pull joint sealant out of joint.

Locate test joints where indicated or, if not indicated, as directed by Architect.

Perform field tests for each application indicated below:

Each type of elastomeric sealant and joint substrate application indicated.

Perform tests in Architect's presence.

SUBMITTALS:

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

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.

Samples for Verification Purposes: Submit samples of each type and color of joint sealer required. Install joint sealer samples in 1/2" wide joints formed between two 6" long strips of material matching the appearance of exposed surfaces adjacent to joint sealers in the work.

Test Reports: Submit the following test reports:

Preconstruction joint sealer-substrate test results including recommendations of joint sealer manufacturer for joint preparation and application of joint sealers applicable to project conditions.

Certified test reports for elastomeric sealants evidencing compliance with requirements specified based on comprehensive testing of current product formulations within a 24-month period preceding date of submission of test reports to Architect. Include test results for aged performance including hardness, stain resistance, adhesion and cohesion under cyclic movement, low-temperature flexibility, modulus of elasticity at 100% strain, effects of heat aging, and effects of accelerated weathering.

Provide test reports from an independent testing laboratory acceptable to Architect and experienced in the testing of elastomeric sealants.

Certified test reports for joint sealers of type indicated below evidencing compliance with specified requirements:

Foam-type filler-sealants.

Preconstruction field test results reported by Installer indicating which products and joint preparation methods demonstrated acceptable adhesion to joint substrates.

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

DELIVERY, STORAGE, AND HANDLING:

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 multicomponent materials.

Store and handle materials to prevent their deterioration or damage due to moisture, temperature change,

contaminants, or other causes.

PROJECT CONDITIONS:

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

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

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

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

MATERIALS, GENERAL:

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.

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

ELASTOMERIC JOINT SEALANTS:

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.

One-Part Acid-Curing Silicone Sealant: Type S; Grade NS; Class 25; Uses NT, G, A and, as applicable to joint substrates indicated, O.

One-Part Mildew-Resistant Silicone Sealant: Type S; Grade NS; Class 25; Uses NT, G, A, and, as applicable to nonporous joint substrates indicated, O; formulated with furgicide for sealing interior joints with nonporous substrates around ceramic tile, showers, sinks and plumbing fixtures.

Multi-Part Nonsag Urethane Sealant: Type M, Grade NS, Class 25, and complying with the following requirements for uses:

Uses NT, M, A and, as applicable to joint substrates indicated, O.

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

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

One-Part Acid-Curing Silicone Sealant:

"Chem-Calk 1200"; Bostik Construction Products Div.
"Dow Corning 999"; Dow Corning Corp.
"SCS 1200"; General Electric Co.
"863"; Pecora Corp.
"Rhodorsil 3B"; Rhone-Poulenc Inc.
"Omniglaze"; Sonneborn Building Products Div., Rexnord Chem. Prod. Inc.
"Proglaze"; Tremco, Inc.

One-Part Mildew-Resistant Silicone Sealant:

"Dow-Corning 786"; Dow Corning Corp.
"SCS 1702"; General Electric Co.
"863 #345 White"; Pecora Corp.
"Proglaze White"; Tremco Corp.

Multi-Part Nonsag Urethane Sealant for Uses NT, M, A, and O:

"Isoflex 2000"; The Harry S. Peterson Company.
"Vulkem 227"; Mameco International, Inc.
"Isoflex 881"; The Harry S. Peterson Company.
"Dymeric"; Tremco Inc.
"Dynatrol 11"; by Pecora Corp.

Two-Part, Pourable, Urethane Sealant:

"Chem-Calk 550"; Bostik Construction Products Div.
"Vulkem 245"; Mameco International, Inc.
"Pourthane"; W.R. Meadows, Inc.
"NR-200 Urexpan"; Pecora Corp.
"Isoflex 880 G.B."; The Harry S. Peterson Co.
"Sonolastic Paving Joint Sealant"; Sonneborne Building Products Div., Rexnord Chem. Prod. Inc.
"Dynatred"; Pecora Corp.

SOLVENT-RELEASE-CURING JOINT SEALANTS:

Butyl Sealant: Manufacturer's standard one part, nonsag, solvent- release-curing, polymerized butyl sealant complying with FS TT-S- 001657 for Type I and formulated with minimum of 75% solids to be nonstaining, paintable, and have a tack-free time of 24 hours or less.

Pigmented Small Joint Sealant: Manufacturer's standard, solvent release-curing, pigmented, synthetic rubber sealant formulated for sealing joints 3/16" or smaller in width.

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

Butyl Sealant:

"Chem-Calk 600"; Bostik Construction Products Div.
"BC-158"; Pecora Corp.
"PTI 767"; Protective Treatments Inc.
"Tremco Butyl Sealant"; Tremco Inc.

Pigmented Small Joint Sealant:

"PTI 200"; Protective Treatments, Inc.
"Tremco Seam Sealer"; Tremco Inc.

LATEX JOINT SEALANTS:

Acrylic-Emulsion Sealant: Manufacturer's standard, one part, nonsag, acrylic, mildew-resistant, acrylic-emulsion sealant complying with ASTM C 834, formulated to be painted and recommended for exposed applications on interior and on protected exterior exposures involving negligable joint movement.

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

"Chem-Calk 600"; Bostik Construction Products Div.
"AC-20"; Pecora Corp.
"Sonolac"; Sonneborne Building Products Div.; Rexnord Chem. Prod., Inc.
"Tremco Acrylic Latex Caulk"; Tremco Inc.

MISCELLANEOUS JOINT SEALANTS:

Acoustical Sealant for Concealed Joints: Manufacturer's standard, nondrying, nonhardening, nonskinning, nonstaining, gunnable, synthetic rubber sealant recommended for sealing interior concealed joints to reduce transmission of airborne sound.

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

Acoustical Sealants For Concealed Joints:

"BA-98"; Pecora Corp.
"Tremco Acoustical Sealant"; Tremco Inc.

FIRE-RESISTANT JOINT SEALERS:

General: Provide manufacturer's standard sealant and accessory materials with fire-resistance rating indicated which are identical to those of assemblies whose fire endurance has been determined by testing per ASTM E 814 by Underwriters Laboratory, Inc. or other testing and inspecting agency acceptable to authorities having jurisdiction.

One-Part Fire-Stopping Sealant: One part elastomeric sealant formulated for use as part of a through-penetration fire-stop system for sealing openings around cables, conduit, pipes and similar penetrations through walls and floors.

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

One-Part Fire-Stopping Sealant:

"Dow Corning Fire Stop Sealant"; Dow Corning Corp.
"3M Fire Barrier Caulk CP-25"; Electrical Products Div./3M.

"Tremstop"; by Tremco Co.

JOINT FILLERS FOR CONCRETE PAVING:

General: Provide joint fillers of thickness and widths indicated.

Bituminous Fiber Joint Filler: Preformed strips of composition below, complying with ASTM D 1751:

Granulated cork with asphalt binder encased between 2 layers of saturated felt or glass fiber felt of width and thickness indicated.

JOINT SEALANT BACKING:

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.

Plastic Foam Joint Fillers: Preformed, compressible, resilient, non-waxing, non-extruding strips of plastic foam of material indicated below, and of size, shape and density to control sealant depth and otherwise contribute to producing optimum sealant performance.

Either flexible, open cell polyurethane foam or non-gassing, closed-cell polyethylene foam, unless otherwise indicated, subject to approval of sealant manufacturer.

Bond-Breaker Tape: Polyethlene tape or other plastic tape as recommended by sealant manufacturer for preventing bond between sealant and joint filler or other materials at back (3rd) surface of joint. Provide self-adhesive tape where applicable.

MISCELLANEOUS MATERIALS:

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.

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.

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

Accessory materials for Fire-Stopping Sealants: Provide forming, joint-fillers, packing and other accessory materials required for installation of fire-stopping sealants as applicable to installation conditions indicated.

PART 3 - EXECUTION

INSPECTION:

Require installer to inspect joints indicated to receive joint sealers for compliance with requirements for joint configurations, installation tolerances and other conditions affecting joint sealer performance. Obtain Installer's written report listing any conditions detrimental to performance of joint sealer work. Do not allow joint sealer to proceed until unsatisfactory conditions have been corrected.

PREPARATION:

Pre-Installation Meeting: At Contractor's directions, Installer, joint sealer manufacturers' representatives, and other trades whose work affects installation of joint sealers shall meet at project site to review procedures and time schedule proposed for installation of joint sealers which is coordinated with other, related work.

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

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.

Clean concrete,masonry, unglazed surfaces of ceramic tile 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.

Remove laitance and form release agents from concrete.

Clean metal, glass, porcelain enamel, glazed surfaces of ceramic tile 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.

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.

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.

INSTALLATION OF JOINT SEALERS:

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

Elastomeric Sealant Installation Standard: Comply with recommendations of ASTM C 962 for use of joint sealants

as applicable to materials, applications and conditions indicated.

Solvent-Release-Curing Sealant Installation Standard: Comply with requirements of ASTM C 804 for use of solvent-release-curing sealants.

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

Acoustical Sealant Application Standard: Comply with recommendations of ASTM C 919 for use of joint sealants in acoustical applications as applicable to materials, applications and conditions indicated.

Installation of Sealant Backings: Install sealant backings to comply with the following requirements:

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.

Install bond breaker tape between sealants and joint-fillers, compression seals or back of joints where required to prevent third-side adhesion of sealant to back of joint.

Install compressible seals serving as sealant backings to comply with requirements indicated above for joint fillers.

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.

Tooling of Nonsag Sealants: Immediately after sealant application and prior to time skinning or 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.

Concave joint configuration per Figure 6A in ASTM C 962, unless otherwise indicated.

Flush joint configuration per Figure 6B in ASTM C 962, where indicated.

Use masking tape to protect adjacent surfaces of recessed tooled joints.

Installation of Fire-Stopping Sealant: Install sealant, including forming, packing and other accessory materials to fill openings around mechanical and electrical services penetrating floors and walls to provide fire-stops with fire resistance ratings indicated for floor or wall assembly in which penetration occurs.

PROTECTION AND CLEANING:

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.

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.

SCHEDULE OF JOINT SEALERS:

Provide joint sealer types as listed below for substrates indicated. Ignore sealant types and substrates not applicable to the Work of this project.

Sealer Description	Description of location where typically applied.
One part acid-curing Silicone sealant.	Exposed joints within glazed curtainwall framing system, skylight framing system, and aluminum entrance framing system.
One-part mildew resistant Silicone sealant.	Interior joints in vertical surfaces of ceramic tile in toilet rooms, showers, and kitchens.
Multi-part Nonsag Urethane sealant.	Exterior and interior joints in vertical surfaces of concrete and masonry; between concrete, masonry or stone; between metal and concrete, mortar or stone; perimeters of metal frames in exterior walls; overhead or ceiling joints; and on interior of glazed curtain wall.
Two-part pourable Urethane sealant.	Exterior and interior joints in horizontal surfaces of concrete; between metal and concrete, mortar, stone and masonry.
Butyl Sealant.	Use for setting thresholds of exterior doors and entryways.
Pigmented small joint sealant.	Use to seal miscellaneous seams not exceeding 3/16" in width.
Acrylic-Emulsion Sealant.	All interior joints to be painted not listed otherwise; use to seal seams between meeting materials before painting.
Acoustical Sealant for Concealed Joints.	Use to seal all interior concealed joints to reduce transmission of airborne noise; use to seal seams in vapor membranes.
One-part fire stopping	Through penetrations in fire-resistance

Sealant.	rated floor and wall assemblies involving single and multiple pipes, conduits, etc.

END OF SECTION 07900