

SECTION 07200 - INSULATION

PART 1 - GENERAL

1.01 RELATED DOCUMENTS

- A. Drawings and General Provisions of Contract, including General Conditions and Division 1 Specification Sections, apply to work of this Section.

1.02 DESCRIPTION OF WORK

- A. Kraft faced Batt Fiberglass blanket insulation (vapor barrier) of exterior walls, ceilings, roofs, or floors.
- B. Unfaced Batt Fiberglass blanket insulation in all interior partitions and above restroom ceilings to provide sound privacy.
- C. Flame resistant foil faced fire insulation blankets at fire-rated roof/ceiling assembly and fire safety installations

1.03 QUALITY ASSURANCE

- A. **Thermal Conductivity:** Thickness' indicated are for thermal conductivity (k-value at 75 degrees F.) specified for each material. Provide adjusted thicknesses as directed for equivalent use of material having a different thermal conductivity. Where insulation is identified by "R" value, provide thickness required achieving indicated value. Thermal performance determined by A.S.T.M. C653 and A.S.T.M. C518.
- B. **Fire and Insurance Ratings:** Comply with fire resistance, flammability and insurance ratings indicated, and comply with regulations as interpreted by governing authorities.
- C. All Insulation materials including facings, such as vapor barriers or breather papers, installed within floor ceiling assemblies, roof ceiling assemblies, walls or attics shall have maximum fire resistive ratings **unless the facing is installed in substantial contact** with the unexposed surface of the ceiling, floor, or wall finish:
 - 1. A flame spread rating not to exceed 25 and smoke density not to exceed 450 when tested in accordance with U.B.C. Standard No. 8-1.
- D. When such materials are installed in concealed spaces of Types III, IV, and V construction, the flame spread and smoke developed limitations do not apply to facings, provided that the facing is installed in substantial contact with the unexposed surface of the ceiling, floor or wall finish.
- E. **Federal Specifications:** Where compliance with F.S. standard is indicated, specified requirements for marking individual boards / batts / blankets are waived, provided packages of units are labeled to show compliances.
- F. **Sound Attenuation:** Insulation is indicated by nominal thickness dimensions.

1.04 SUBMITTALS

- A. **Product Data:** Submit manufacturer's specifications and installation instructions for each type of insulation required.
- B. **Certified Tests:** With product data, submit copies of certified test report showing compliance with specified performance values, including k-values (aged values for

plastic insulation), densities, compression strengths, burning characteristics, perm ratings, water absorption ratings and similar properties.

1.05 PRODUCT HANDLING

- A. **General Protection:** Do not allow insulation materials to become wet, soiled, or covered with ice or snow. Comply with manufacturer's recommendations for handling, storage and protection during installation.

PART 2 - PRODUCTS

2.01 MATERIALS

- A. **Manufacturers:** Subject to compliance with requirements, provide products of by the following manufacturer. The Architect as delineated in Division O Bid and Agreement Documents shall review other manufacturers.
1. Manville Bldg. Materials Corp.
 2. Owens-Corning Fiberglas Corp.
 3. Certain Teed Corp.
 4. United States Gypsum
- B. **Kraft-faced Glass Fiber Blanket / Batt Insulation:** Inorganic (nonasbestos) fibers formed with binders into resilient flexible blankets or semirigid batts; F.S. HH-I-521, Type as indicated, densities of not less than 0.5 lb. per cubic feet for glass fiber units and not less than 2.5 lb. per cubic feet for mineral wool units, k-value of 0.27; manufacturer's standard lengths and widths as required to coordinate with spaces to be insulated; types as follows:
1. Batt insulation shall be installed for the complete building envelope including walls and attics
 2. Additional unfaced blanket insulation shall be installed between manufactured trusses per detail 1/FS.01
- C. **Faced Mineral Fiber Blanket Batt / Insulation:** Thermal insulation produced by combining mineral fibers of type described below with thermosetting resins to comply with A.S.T.M. C 665 for Type II, Class C (blankets with vapor retarder membrane facing black kraft paper) and as follows:
1. **Flame resistant foil faced fire insulation blankets at fire-rated roof/ceiling assemblies,** fire safety installations (fire assembly intersections) and as required by C.B.C. when facing is exposed to the attic. Insulation shall have spread of 25 maximum. Insulation shall have reinforced foil laminate facing on one side.
- D. **Mineral Fiber Type:** Fibers manufactured from glass.
- E. **Unfaced-Mineral Fiber Blanket / Batt Insulation as sound control batts:** Thermal insulation produced by combining mineral fibers of type described below with thermosetting resins to comply with A.S.T.M. C 665 for Type I (Blankets without membrane facing); 1 lb./cubic foot density minimum, and as follows:
1. At all interior walls: Provide unfaced batt insulation the full thickness of the wall as follows: 6" studs - R-19, 6-1/4" thick; 4" studs - R-11, 3-1/2" thick.

2. At all restroom ceilings: Provide R-11 (3-1/2" thick) unfaced batts.
3. At other designated ceiling areas: Provide R-11 (3-1/2" thick) unfaced batts.
4. Additional unfaced blanket insulation shall be installed in exterior attics classified as "unaccessible" per sheet FS.01 and FS.02
5. **Mineral Fiber Type:** Fibers manufactured from glass.
6. **Combustion Characteristics:** Passes A.S.T.M. E-136 test as required per quality assurance requirements.

F. Applicable Standards:

1. A.S.T.M. C665-84 Type 1A and 1B
2. Surface Burning Characteristics: A.S.T.M. E84
 - a. Flame Spread: 20
 - b. Smoke Developed: 20
3. A.S.T.M. C-612-93 Mineral Fiber Block and Board Thermal Insulation

2.02 Fire Safing Batt:

- A. **Manufacturers:** Subject to compliance with requirements, provide products of by the following manufacturer. The Architect as delineated in Division O Bid and Agreement Documents shall review other manufacturers.

1. Owens-Corning Fiberglass
2. Certainteed
3. Manville
4. Roxul, Inc.

B. Applicable Standards:

1. A.S.T.M. C612.
2. A.S.T.M. E96.
3. A.S.T.M. C665-84 Type 1A and 1B
4. Surface Burning Characteristics: A.S.T.M. E84
 - a. Flame Spread: 20
 - b. Smoke Developed: 20
5. Density: 2.25 pcf

PART 3 - EXECUTION

3.01 INSPECTION AND PREPARATION

- A. Installer must examine substrates and conditions under which insulation work is to be performed, and must notify Contractor in writing of unsatisfactory conditions. Do not proceed with insulation work until unsatisfactory conditions have been corrected in manner acceptable to Installer.
- B. Clean substrates of substances harmful to insulations or vapor barriers, including removal of projections, which might puncture vapor barriers.

3.02 INSTALLATION

A. General:

1. 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 with manufacturer's technical representative for specific recommendations before proceeding with work.
2. 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.
3. Apply a single layer of insulation of required thickness.
4. Ceiling sound installation shall overlap stud partition by 6" minimum.

B. General Building Insulation:

1. 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.
2. **Between studs:** Fiberglass Insulation should be fit between the studs with the flanges stapled to either the face or the side of the stud every 8" to 12" to prevent gaps or "fish-mouthing" of the vapor barrier. Unfaced insulation can be friction fit between studs. Install string wire spaced 24" on center across or threaded through the studs if necessary to retain insulation in place.
3. Set vapor barrier faced units with vapor barrier to warm side of construction, except as otherwise shown. Do not obstruct ventilation spaces, except for fire stopping.
4. Set reflective foil faced units accurately with air space in front of foil as shown. Provide not less than 0.75" air space where possible.
5. 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 cubic feet).
6. Unfaced fiberglass sound barrier batts may be friction fit in place until the interior finish is applied. In areas where Sound Barrier Batt insulation will be applied in heights over 8', supplementary support can be provided to hold the product in place until the interior finish is applied.
7. **Insulation installed between wood joists/rafters/trusses** shall have a zigzag 18-gage taut wire system for support at the bottom of the supporting member. Wire shall be 18 gage. Wire shall be installed 24" o/c with diagonal wires at 45° to the other wires. The diagonal wire pattern shall be attached at the same point as the wires at 24" o/c. Wires shall be attached with galvanized roofing staples.
8. Set fire safety blankets in fire rated wall / ceiling assemblies at the intersection of the stud and ceiling joists the full depth of the ceiling joist, friction fit between studs.

9. Cut and fit insulation materials around pipes, conduits, and outlet boxes, as necessary, to maintain the integrity of the insulation.
10. Where pipes are located in stud spaces to receive insulation, place insulation between exterior wall and the pipe, compressing insulation if necessary.

3.03 PROTECTION

- A. **General:** Protect installed insulation and vapor barriers 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. Installer shall advise Contractor of exposure hazards, including possible sources of deterioration and fire hazards.

END OF SECTION – 07200

06/26/08 rg

SECTION 07400 - FACTORY FOAMED INSULATED WALL AND ROOF PANELS

PART 1 - GENERAL

1.01 WORK INCLUDED

- A. All Factory assembled panels with insulating foam cores for the exterior walls and/or roofs as shown on the contract drawings.
- B. All trim, accessories, fasteners and sealants indicated on the contract drawings as part of this section.

1.02 SHOP DRAWINGS

- A. Furnish detailed drawings showing profile, gauge or thickness of interior and exterior sheets, location and type of fasteners, location, gauges, shapes and method of attachment of all trim, location and type of sealants and any other details as may be required for a weathertight installation.

1.03 SUBSTITUTIONS

- A. This specification is written with Metecno-API panels as a basis of acceptable performance. Substitution requests must include the name of the materials for which it is to be substituted and a complete description of the proposed substitute, including drawings, cut-sheets, mock-ups, performance and test data, a list of projects similar in scope and photographs of existing installations and any other information necessary for evaluation. After evaluation, approval will be issued via addendum. No verbal approval will be given.

1.04 PERFORMANCE TESTING

- A. Structural Tests: Structural designs shall have been derived using recognized engineering calculations based upon witnessed tests of the physical properties of the panels including ASTM E-72. A deflection limit of L/240 shall apply to roofs and L/180 shall apply to walls.
- B. Thermal Properties: When tested per ASTM C-236 panels shall provide a minimum R value of 8.0 per inch at 40° F mean temperature.
- C. Air Infiltration: When tested per ASTM E-283 at a uniform static pressure of 20.0 psf, air infiltration shall not exceed .01 cfm per sq. ft. of wall area.
- D. Water Penetration: When tested per ASTM E-331 at a uniform static pressure of 20.0 psf there shall be no uncontrolled water penetration through the panel joints.
- E. Fatigue Test: There shall be no evidence of metal/insulation interface delamination when the panel is tested by simulated wind loads of 20 psf (positive and negative loads), when applied for two million alternate cycles.
- F. Code Compliance: Panels shall be in compliance with 1997 Uniform Building Code as well as the 2000 International Building Code as evidenced by a current ICBO-ES evaluation report. The urethane composite panel shall be qualified by the following fire tests and approvals:

FACTORY FOAMED INSULATED WALL AND ROOF PANELS

1. ICBO-ES Approval Report #PFC-5396
2. UL Canada S-101, 102, 126 and 127
3. FMRC Standard 4880 "50' Full Scale Corner Test"
4. UBC Standard 26-1 "Combustible Content"
5. UBC Standard 26-3 "Room Corner Test"
6. UBC Standard 26-9 "Multistory Evaluation" (up to 3" thickness)
7. Composite panels shall not exceed the following parameters when tested per ASTM E-84 (UBC Standard 8-1):
 - a. Flame Spread: <25
 - b. Smoke Density: <450
8. City of Los Angeles Research Report (RR 25351)

PART 2 - PRODUCTS

2.01 ACCEPTABLE MANUFACTURERS

- A. Factory fabricated panel units shall consist of roll formed exterior and interior sheets bonded by foaming in place the urethane insulation core.
- B. Roof Panels shall be 4" thick AP900 or approved equal.
- C. Wall Panels shall be 2.5" thick AP200 or approved equal.
- D. The longitudinal tongue and groove panel edges shall be formed to allow anchor clips and fasteners to be used as shown on the contract drawings.

2.02 MATERIALS

- A. Metal face sheet shall be minimum 26 gauge galvanized steel conforming to ASTM A-653 Grade C or better, hot dipped Commercial quality, Galvanized coating, designation G-90, with a profile as shown on the contract drawings.
- B. Metal liner sheet shall be 26 gauge G-90 galvanized steel.
- C. The foam core of the panel shall be rigid urethane with a minimum 95% closed cell structure and shall have the following minimum physical properties:
 1. Density (in place): 2.3 – 2.6 pcf
 2. Compressive Strength: 26 – 34 psi
 3. Tensile Strength: 34 – 42 psi
 4. Shear Stress: 20 – 25 psi
 5. Moisture Vapor Transmission: 2.0 – 3.0 perms/inch
- D. The core shall withstand humidity-aging at 158° F and 100% relative humidity for a period of 7 days with a volume increase of not more than 3% in accordance with ASTM D-2126.

- E. The core shall withstand heating-aging at 200° F for a period of 7 days with a volume increase of not more than 2% in accordance with ASTM D-2126.
- F. The core shall withstand cold-aging at -20° F for a period of 7 days with a loss in volume not greater than 0.0% in accordance with ASTM D-2126.
- G. Trim shall be furnished by the panel contractor to match the gauge and finish on the panels.

2.03 FINISHES

- A. Coatings shall be factory applied to coil before forming or embossing.

2.04 METAL FACINGS

- A. Metecno-API panels are formed from steel conforming to ASTM A-653, Grade C or better, substrate coating to be G-90, or Zincalume conforming to ASTM A-792. The Zincalume coating is 1.9 mils thick and is comprised of a 45% zinc, 55% aluminum alloy by weight.

2.05 PAINT FINISHES

- A. Plastisol
 - 1. For use in high humidity and corrosive environments including USDA applications.
 - 2. Technical Data:
 - a. Interior PVC based paint finish includes a baked-on base primer (0.2 mil) and a baked-on platisol finish coat totaling a nominal 4.0 mil dry film thickness.
 - 1) Accelerated Weathering Test – No cracking, peeling, crazing or adhesion loss of external coating system after 2000 hours of accelerated weathering testing per ASTM D 4587-86, Method B.
 - 2) Salt Spray Resistance – No more than 1/16" creepage from scribe and no blistering in unscribed areas (rating of 7, Table 1; rating of 10, Table 2) of diagonally scored panels subjected to 1,000 hrs of 5% neutral salt solution spray per ASTM B117. Panels rated per ASTM D 1654-79a (1984).
 - 3) Humidity Resistance – No blistering, cracking, creepage, peeling, loss of gloss or softening of the finish after 3,000 hours of exposure to 100% humidity at 100° F ± 5° F per Federal Test Method 141, Method 6201 or ASTM D 2247-87. Color change shall be less than 5 NBS units in accordance with ASTM D 968-84, Method A.
 - 4) Chemical Resistance – No effect on physical properties after 500 hours exposure to either 10% sulfuric acid or 10% hydrochloric acid solution per ASTM D 1308-87, Procedure 6.2 (spot test).
 - 5) Kesternich Test – No blistering, slight edge creepage (maximum 3/16") after 30 cycles in an SO₂ chamber (Kesternich Cabinet or equivalent), per DIN 50018-1960.

FACTORY FOAMED INSULATED WALL AND ROOF PANELS

- 6) Filiform Corrosion Resistance - Coating System shall not sustain filiform corrosion per ASTM D 2803-82.
- B. SMP (Silicone Modified Polyester)
1. A high quality paint system that combines durability and flexibility with excellent value. Imperial White finish is USDA accepted.
 2. Technical Data:
 - a. Exterior paint finish includes a baked-on epoxy base primer (0.2 mil) and a baked-on silicone modified polyester finish coat (0.8 mil) totaling a nominal 1.0 dry film thickness.
 - 1) Exterior Exposure - After 5 yrs. @ 90 F South Florida exposure color change shall not exceed 8 NBS units when tested in accordance with ASTM D-2244 and chalking will not exceed a #6 rating when tested in accordance with ASTM D-4214.
 - 2) Salt Spray Resistance - After 1,000 hours of testing in accordance with ASTM B-117, there will be no loss of adhesion greater than 1/8" from the scored line when tested with #610 Scotch Brand tape. No more than 20% of exposed area shall contain no more than a few blisters larger than #8 according to ASTM D-714.
 - 3) Humidity Resistance - In accordance with ASTM D-2247 after 1,000 hours exposure, no more than 10% of exposed area shall contain no more than a few #8 blisters. According to ASTM D-714 after 4 hours recovery, there shall be no loss of adhesion.
 - 4) Abrasion Resistance - Coating system shall withstand a minimum of 590 liters of falling sand before appearance of base metal per ASTM D-968.
 - 5) Formability Test - When subjected to a 180° bend over 1/8" diameter mandrel, in accordance with ASTM D-522, exterior coating film shall show only slight checking of the exterior film and there shall be no loss of adhesion.
- C. PVF² (Polyvinylidene Fluoride)
1. Metecno-API's premium paint system, produced with 70% Kynar* 500 resins, provides the ultimate resistance to color change and chalking. The PVF² also offers excellent resistance to weathering, abrasion and most chemicals and solvents. Regal White finish is USDA accepted.
 2. Technical Data:
 - a. Exterior paint finish includes a baked-on epoxy primer (0.2 mil) and a baked on PVF² finish coat (0.8) mil totaling a nominal 1.0 mil dry film thickness. A "High Build" finishes are available with up to a 3.0-mil thick base primer and/or an exterior clear coat over the color coat.

- 1) Weathering - No checking, blistering or adhesion loss when tested for 2,000 hours in accordance with ASTM G-23.
- 2) Chalking - Will not chalk greater than #10 rating when tested in accordance with ASTM D-4214.
- 3) Fading - Color change will not exceed 5 NBS units when tested in accordance with ASTM D-2244.
- 4) Humidity Resistance - Shall be no more than 5% of #10 blisters when tested for 2,000 hours in 100% humidity at 100° F in accordance with ASTM D-2247.
- 5) Salt Spray - No more than 1/16" creep or tape off from scribe and less than 5% #8 blisters when tested for 1,000 hours in 5% salt fog at 95° F in accordance with ASTM B-117.
- 6) Hardness - Will meet F-2 pencil hardness when tested in accordance with ASTM D-3363.
- 7) Formability Test - When subjected to a 180° bend over 1/8" diameter mandrel in accordance with ASTM D-1737 exterior coating film shall be flexible to the point of metal rupture without separation of the coating from the substrate.
- 8) Abrasion Resistance - Standard coating systems shall withstand a minimum of 100 liters of falling sand before appearance of base metal per ASTM D-968. "High Build" coating systems shall withstand a minimum of 75 liters per mil of thickness.

2.06 WARRANTY

- A. Warranties regarding chalking, fading and film integrity are available depending upon paint type. Specific warranty information should be obtained from your Metecno-API representative.
 1. *Kynar is a registered trademark of Pennwalt Corporation.

PART 3 - EXECUTION

3.01 INSPECTION

- A. Examine alignment of the structural steel and/or panel support system prior to installation and do not proceed until any defects are corrected by the responsible contractor.
- B. Building tolerances shall not exceed maximums as defined by AISC specifications.

3.02 INSTALLATION

- A. Install panels, fasteners, trim and related sealants in accordance with approved shop drawings and as may be required for a weathertight installation.
- B. Provide dry wipe-down cleaning of panels as they are erected.

FACTORY FOAMED INSULATED WALL AND ROOF PANELS

3.03 ON-SITE STORAGE AND HANDLING

- A. Manufacturer shall provide panel contractor with printed instructions for recommended product and trim to the satisfaction of the architect and/or owner.

3.04 MATERIAL WARRANTY

- A. Material warranted for one year from the date of installation provided such installation occurs within three (3) months from the date of shipment from the manufacturer.

END OF SECTION - 07400

08/28/08 rg

SECTION 07600 - FLASHING AND SHEET METAL

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. Flashing and sheet metal work, including coping flashing, fascias, roof flashings, counter flashing, roof joint corner flashing, metal wall flashing and expansion joints, pitch pockets with related counterflashing, metal drip flashing, galvanized sheet metal countertops, miscellaneous sheet metal accessories and miscellaneous sheet metal not specified under other Sections.

1.03 RELATED SECTIONS

- A. Refer to another Division 7 Section for flashing reglets.
- B. All sheet metal work in relation to roofing is the Roofing Contractors responsibility. This sheet metal work includes but is not limited to counter flashing, gutters, eave and rake flashing, pitch pockets, all reglets, all cap flashing, gutter shrouds, scuppers, flashing at metal decking, and flashing at skylights.

1.04 QUALITY ASSURANCE

- A. **Applicator:** Company specializing in sheet metal flashing work with five years minimum experience.
- B. **Codes and Standards:** In addition to complying with pertinent codes and regulations, comply with pertinent recommendations contained in current edition of "Architectural Sheet Metal Manual" published by the Sheet Metal and Air Conditioning Contractors Association (S.M.A.C.N.A.). S.M.A.C.N.A. details shall be minimum standards, unless Drawings detailed otherwise.
- C. Standard commercial items may be used for flashing, trim, reglets, and similar purposes provided such items meet or exceed the quality standards specified.

1.05 SUBMITTALS

- A. **Product Data:** Manufacturer's product specifications, installation instructions and general recommendations for each specified sheet material and fabricated product.
- B. **Shop Drawings:** Submit shop drawings showing material profile, jointing pattern, jointing details, fastening method and installation details.
- C. **Samples:** Provide 2 - 12" samples of each sheet metal material showing the pattern, finish, color, and thickness.

1.06 STORAGE AND HANDLING

- A. Stack preformed and prefinished material to prevent twisting, bending, or abrasion, and to provide ventilation.
- B. Prevent contact with materials during storage which may cause discoloration, staining, or damage.

- C. Use all means necessary to protect flashing and sheet metal materials before, during, and after installation and the installed work and materials of other trades.
- D. In the event of damage, immediately make all repairs and replacements necessary.

1.07 GUARANTEES

- A. Furnish an approved written unconditional guarantee to the Owner that the entire installation is watertight and that no defects will occur for **2 years from the Notice of Completion** of the building.

PART 2 - PRODUCTS

2.01 FLASHING AND SHEET METAL MATERIALS

- A. **Sheet Metal Flashing / Trim:** Zinc Coated Steel, Commercial quality with 0.020% copper, A.S.T.M.
- B. A 525 except A.S.T.M. A 527 for lock forming, G90 hot dip galvanized, mill phosphatized where indicated for painting; 0.0359" thick (20 gauge) except as otherwise indicated.
- C. **Extruded Aluminum:** Manufacturer's standard extrusions of sizes and profiles indicated, 6063-T52, AA-C22A41 clear anodized finish; 0.08" minimum thickness for primary legs of extrusions.
- D. **Miscellaneous Materials and Accessories:**
 - 1. **Solder:** For use with steel or copper, provide 50-50 tin / lead solder (A.S.T.M. B 323), with rosin flux.
 - 2. **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.
 - 3. **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.
 - 4. **Mastic Sealant:** Polyisobutylene: nonhardening, nonskinning, nondrying, nonmigrating sealant.
 - 5. **Elastomeric Sealant:** Single component polyurethane base recommended by manufacturer of metal and fabricator of components being sealed; comply with TT-S-001543.
 - 6. **Epoxy Seam Sealer:** 2-part noncorrosive metal seam cementing compound, recommended by manufacturer for exterior/interior nonmoving joints including riveted joints.
 - 7. **Adhesives:** Type recommended by flashing sheet manufacturer for waterproof / weather resistant seaming and adhesive application of flashing sheet.
 - 8. **Paper Slip Sheet:** 5-lb. rosin-sized building paper.
 - 9. **Polyethylene Underlayment:** 6-mil carbonated polyethylene film; FS-L-P-512.

10. **Metal accessories:** Provide sheet metal clips, straps, anchoring devices and similar accessory units as required, matching or compatible with material being installed, noncorrosive, size and gauge required for performance.

2.02 FABRICATED UNITS

A. General Metal Fabrication:

1. Shop fabricate work to greatest extent possible.
2. Comply with details shown, and with applicable requirements of S.M.A.C.N.A. "Architectural Sheet Metal Manual" and other recognized industry practices.
3. Fabricate for waterproof and weather resistant performance; with expansion provisions for running work; sufficient to permanently prevent leakage, damage or deterioration of the work.
4. Form work to fit substrates.
5. Comply with material manufacturer instructions and recommendations.
6. Form exposed sheet metal 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. **Seams:** Fabricate nonmoving seams in sheet metal with flat lock seams. For metal other than aluminum, tin edges to be seamed, form seams, and solder. Form aluminum seals with epoxy seam sealer; rivet joints for additional strength where required.

- C. **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).

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

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

- F. **Aluminum Extrusion Units:** Fabricate extruded aluminum running units with formed or extruded aluminum joint covers, for installation behind main members where possible. Fabricate mitered and welded corner units.

- G. **Ceiling / Wall Expansion Joint Units:** Provide either M/M Systems series FX expansion joint covers in the sizes and configurations shown on drawings or accepted substitution.

- H. **Pitch pockets:** Pitch pockets are to be fabricated from zinc-coated steel. The bottom of the pitch pocket is to be ½" larger than the roof penetration member. The vertical leg of the pitch pocket shall be 4" high. The assembly shall be fully soldered.

PART 3 - EXECUTION

3.01 INSPECTION

- A. Verify that substrates are smooth and clean to extent required for sheet metal work.
- B. Verify roof openings, curbs, pipes, sleeves, ducts, or vents through roof are solidly set, cant strips and reglets in place, and nailing strips located.
- C. Verify membrane termination and base flashings are in place, sealed, and secure.

3.02 INSTALLATION

A. General

- 1. Install work watertight, without waves, warps, buckles, fastening stresses or distortion, allowing for expansion and contraction and shrinkage of wood construction.
- 2. Hem exposed edges $\frac{1}{2}$ ".
- 3. Weatherproofing
- 4. Finish watertight and weathertight.
- 5. Make all lock seam work flat and true to line, and sweated full of solder.
- 6. Make all lock seams and lap seams, when soldered, at least $\frac{1}{2}$ " wide.
- 7. Where lap seams are not soldered, lap according to pitch but in no case less than three inches.
- 8. Make all seams flat and lap in direction of flow.

B. Joints

- 1. Join parts with rivets or sheet metal screws where necessary for strength or stiffness.
- 2. Provide suitable watertight expansion joints for all runs of more than 60' except where closer spacing is indicated on the Drawings or required for proper installation.

C. Nailing

- 1. Whenever possible, secure metal by means of clips or cleats without nailing through the metal, especially at long runs where expansion joints will be required. Where concealed provide $\frac{1}{2}$ " long slots for expansion.
- 2. In general, space all nails, rivets, and screws not more than eight inches apart and, where exposed to the weather, use lead washers, or stainless steel screws with protected neoprene washers.
- 3. For nailing into wood, use barbed roofing nails 1-1/4" long by 11 gauge.
- 4. For nailing into concrete, use drilled plugholes and plugs, or power driven fasteners only as approved by the Architect.

3.03 EMBEDMENT

- A. Embed all metal in connection with roofs in a solid bed of sealant, using materials and methods described in Section 07900 of these Specifications or other materials and methods approved in advance by the Architect.

3.04 SOLDERING

- A. Thoroughly clean and tin all joint materials prior to soldering.
- B. Perform all soldering slowly with a well heated copper in order to heat the seams thoroughly and to completely fill them with solder.
- C. Perform all soldering with a heavy soldering copper of blunt design, properly tinned for use.
- D. Make all exposed soldering on finished surfaces neat, full flowing and smooth.

3.05 CLEANING

- A. As work progresses, neutralize excess flux with 5% to 10% washing soda solution, and thoroughly rinse.
- B. Leave work clean and free of stains, scrap, and debris.

3.06 GALVANIC ISOLATION

- A. Between dissimilar metals install a strip of adhesive backed Seal strip, as manufactured by the Standard Products Company, 1/8" thick across the full width of the metals being isolated.

3.07 FLASHINGS

- A. Furnish and install roof base and cap flashing, vent collars, pitch pockets, gravel stops, splash pans, scuppers, and leaders formed to details of the Drawings. Standard length sheets of galvanized steel.
- B. Furnish and install all flashing, reglets, valleys, crickets, and counter flashings as required to obtain a thoroughly waterproof job.
- C. Provide for expansion and contraction. Lap all nonsoldered seams 3" minimum and set in plastic cement.
- D. Backprime underside or unexposed side of all flashing prior to installation, except surfaces in contact with the roofing materials, with an approved rust inhibitive paint.
- E. Miter and seam corners, and seal.

3.08 FASCIAS AND GRAVEL STOPS

- A. Extruded aluminum, stock profile indicated with fabricated corners and matching cover plates.
- B. Install with heat treated aluminum screws in accordance with manufacturer's directions.

3.09 GUTTERS

- A. Fabricate to a 4" square profile of galvanized steel.
- B. Hangers, reinforcement and bracing of compatible metal, assembled as detailed or to S.M.A.C.C..A. standards.

Section 07600 – Page 6 of 6
FLASHING AND SHEET METAL

- C. Provide loose locked expansion joints midway between outlets, ½" expansion space where gutters abut walls.
- D. Secure to adjacent construction with screws of proper type.

3.10 SCUPPERS

- A. Construct in accordance with S.M.A.C.N.A. standards or as detailed on the Drawings of 24 gauge galvanized steel.
- B. Incorporate back flange into roofing; make watertight.

3.11 STRAINERS

- A. Removable basket type, same material as gutter, ¼" mesh, No. 14 wire.
- B. Install in each drain outlet in gutters.

3.12 WATER STOPS (FOR EXPANSION AND EARTHQUAKE JOINTS)

- A. Form to S.M.A.C.N.A. standards or as detailed on the Drawings in standard lengths of galvanized steel.
- B. Lap joints at vertical edges in direction of flow.
- C. Secure to adjacent construction.

3.13 TESTS

- A. Upon completion of flashing and sheet metal, as a condition of acceptance by the Architect, demonstrate by hose or standing water that the flashing and sheet metal are completely watertight.

END OF SECTION – 07600

06/26/08 rg

SECTION 07700 - ROOF SPECIALTIES AND ACCESSORIES

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. Prefabricated roof hatches
- B. Roof hatch access ladders
- C. Safety post at all roof hatches

1.03 QUALITY ASSURANCE

- A. S.M.A.C.N.A. " Architectural Sheet Metal Manual " details for flashing.
- B. N.R.C.A. " Roofing and Waterproofing Manual " details for unit installation.

1.04 REGULATORY REQUIREMENTS

- A. Underwriters Laboratories Inc. (U.L.), Factory Mutual (F.M.) requirements as applicable to fire rated roof hatches and smoke vents, and California State Fire Marshal listing number.
- B. Fire Resistance of Lids: U.L. Class "A".

1.05 SUBMITTALS

- A. **Product Data:** Manufacturer's product specifications, rough-in diagrams, details, installation instructions, jointing methods, anchorage methods, and general product recommendations.
- B. **Shop Drawings:** Complete dimensional data and other information needed for installation coordination.

1.06 WARRANTY

- A. Provide **5-years** warranty from Notice of Completion from defects in workmanship and materials. Provide parts and labor during 2 years at no cost to Owner.

PART 2 - PRODUCTS

- 2.01 **Manufacturers:** Subject to compliance with requirements, provide products of by the following manufacturer. The Architect as delineated in Division O Bid and Agreement Documents shall review other manufacturers.

- A. Alaco (ladder manufacturer)
- B. Babcock-Davis Hatchways, Inc. (Easy Access) U.L. #R7380(N).
- C. Bilco Co. CA SFM 4475-107:1 U.L. #R6174(N).
- D. Bristolite model SVAM; U.L. #R14504 and F.M. #J.I. 0W0A.5AC.
- E. Dur-Red (Red Plastic Co. Inc.) ICBO #1563 CA SFM #A4475-042:1
- F. Milcor U.L. #R6208(N)

Section 07700 - Page 2 of 4
ROOF SPECIALTIES AND ACCESSORIES

- G. Naturalite / EPI. Inc. U.L. #R5955
- H. O'Keefes Inc. CA SFM #4350-035:4 ICBO #3710
- I. Rohm & Haas SFM #A2560-007

2.02 MATERIALS - GENERAL

- A. **Zinc Coated Steel:** Commercial quality with 0.20% cooper, A.S.T.M. A 525, G90 hot dip galvanized, mill phosphatized.
- B. **Stainless Steel:** A.I.S.I. TYPE 302/304, A.S.T.M. A167, 2D annealed finish except as otherwise indicated, temper as required for forming and performance.
- C. **Insulation:** Manufacturer's standard rigid or semirigid board of glass fiber of thickness indicated.
- D. **Wood Nailers:** Softwood lumber, pressure treated with water borne preservatives for above ground use, complying with AWPB LP-2; not less than 1-1/2" thick.
- E. **Fasteners:** Same metal as metals being fastened, or nonmagnetic stainless steel or other noncorrosive metal as recommended by manufacturer. Match finish of exposed fasteners with finish of material being fastened.
- F. Where removal of exterior exposed fasteners affords access to building, provide nonremovable fastener heads.
- G. **Bituminous Coating:** FS TT-C-494A or SSPC-Paint 12, solvent type bituminous mastic, nominally free of sulfur, compounded for 15-mil dry film thickness per coating.
- H. **Mastic Sealant:** Polyisobutylene: nonhardening, nonskinning, nondrying, nonmigrating sealant.
- I. **Elastomeric Sealant:** Generic type recommended by unit manufacturer, which is compatible with joint surfaces; comply with FS TT-S-00227E, TT-S-00230C, or TT-S-001543A.
- J. **Roofing Cement:** A.S.T.M. D2822, asphaltic.

2.03 ROOF HATCHES

- A. **General:** Fabricate roof hatches with insulated double-walled ligs and insulated single-walled curb frame with integral deck mounting flange and lid frame counterflashing. Fabricate with welded or mechanically fastened and sealed corner units. Provide continuous weathertight perimeter gasketing and equip with corrosion-resistant or hot-dipped galvanized hardware.
 - 1. **Loads:** Fabricate roof hatches to withstand 40-lbs/sq.ft. external load and 20-lbs/sq.ft. internal load.
 - 2. **Type and Size:** Single-leaf lid, **48" x 48" nominal**.
 - 3. **Curb and Lid Material:** 14 gauge prime painted galvanized steel with minimum 3-1/2" flange with predrilled holes for mounting to roof deck.
 - 4. **Frame** shall be a minimum 12" high with integral counterflashing.
 - 5. **Finish:** Prime painted.
 - 6. **Insulation at Lid:** Minimum 1" glass fiber insulation.

7. Insulation at Curb: 1" rigid fiberboard.
8. Interior Lid Liner: Metal liner minimum 22 gauge prime painted galvanized steel.
9. Sloping Roofs: Where roof deck slopes more than $\frac{1}{4}$ " per foot, provide tapered curb heights to result in level top of unit.
10. Hardware: Galvanized steel spring-latch with turn handles, butt- or pintle hinge system and padlock hasps inside and outside. Provide two-point latch on covers larger than 7'-0".
 - a. Ladder Safety Post: Refer to requirements noted within these specifications for ladder safety post.

2.04 LADDERS

- A. The types of ladders required for this project are as follows:
 1. Roof hatch access ladder with safety cage and security panel
- B. **Ladder**
 1. Verify finish floor height to roof hatch curb height dimension or finish floor height to second floor height.
 2. Rungs shall be no less than 1-1/4" in section and 18-3/8" long, formed from tubular aluminum alloy extrusions, alloy 6061-T6, and shall be squared and deeply serrated on all sides to provide maximum grip and foot traction. Rungs shall be 3" wide flat steps with nonslip ridges.
 3. Rungs shall be able to withstand a 1,000 pound loading without failure.
 4. Detail top rung 3" below under surface of roof hatch or evenly spaced rungs maximum 12" on center vertically for standard ladders.
 5. Space rungs 12" on center vertically and weld to side rails. Provide bottom rung maximum 12" from finish floor. Side rails shall have non-marking solid rubber feet.
 6. Wire brush completed welds.
 7. Grind exposed welds smooth.
 8. Apply primer to steel anchorage surfaces which will remain exposed after concrete is placed.
- C. **Attachment:** Provide floor anchorage at bottom of side rails per Architect's requirements.
- D. Unless specified otherwise, attach ladder with 2 - $\frac{1}{2}$ " diameter lag bolts at mid-height and top to solid blocking. Attach ladder to concrete with 5/8" Hilti Kwik-Bolt III with minimum 2-3/4" embed.
- E. **Finish:** Mill finish.
- F. **Ladder Safety Cage:** The cage shall consist of $\frac{1}{4}$ " x 2" hoops and seven 3/16" x 1-1/2" vertical bars with solid riveted connections. All ladders over 20' in height shall have cages.

2.05 SAFETY POST

- A. **General:** The purpose of the safety post is to provide a safe method of climbing off and onto the fixed ladder access. Safety post shall meet A.N.S.I A 14.3 and O.H.S.A. requirements. Safety post shall be retractable and shall be extendable with one hand. A latch shall maintain the post at any height and shall be easily released for retracting the post. Safety features shall include a square post and ring for fall arrest attachment at the top.

PART 3 - EXECUTION

3.01 INSTALLATION OF ROOF HATCH

- A. **General:** Comply with manufacturer's instructions and recommendations.
- B. Coordinate with installation of roof deck and other substrates to receive accessory units, and with vapor barriers, roof insulation, roofing and flashing; as required to ensure that each element of the work performs properly, and that combined elements are water proof and weathertight. Anchor units securely to supporting structural substrates, adequate to withstand lateral and thermal stresses as well as inward and outward loading pressures.
- C. **Isolation:** Where metal surfaces of units are to be installed in contact with incompatible metal or corrosive substrates, including wood, apply bituminous coating on concealed metal surfaces, or provide other permanent separation.
- D. **Flange Seals:** Except as otherwise indicated, set flanges of accessory units in a thick bed of roofing cement, to form a seal.
- E. **Cap Flashing:** Where cap flashing is required as component of accessory, install to provide adequate waterproof overlap with roofing or roof flashing (as counter flashing). Seal with thick bead of mastic sealant, except where overlap is indicated to be left open for ventilation.

END OF SECTION - 07700

06/26/08 rg

SECTION 07900 - JOINT SEALERS

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. Preparation of sealant substrates and sealant applications throughout the Work where shown on the Drawings and elsewhere as required to provide a positive barrier against passage of moisture and air, including, but not necessarily limited to the following applications:
- B. Caulking of opening and joints, and joints between dissimilar materials.
- C. Intumescent fire stopping.
- D. Caulking of wall openings for all accessories in toilets, including, but not limited to grab bars, towel bars, dispensers, soap dishes, receptacles, etc.
- E. Coordination and establishing standard of quality for caulking required under other Sections.

1.03 QUALITY ASSURANCE

- A. **Manufacturer:** Company specializing in manufacturing of products specified in this Section with minimum 10 years experience. Manufacturers printed technical data and instructions are considered the standard for establishing proper procedure for preparation, use and application of materials.
- B. **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.
- C. **Single Source Responsibility for Joint Sealer Materials:** Obtain joint sealer materials from a single manufacturer for each different product required.
- D. **Preinstallation Conference:** Conduct conference at Project site to comply with requirements of Section 01040 of these Specifications.
- E. Verify that materials are suitable for intended applications, will provide long-term adhesion and are compatible when materials of different manufacturers intersect or contact one another. No claims for additional costs will be allowed because of changes of sealants required to comply with the provisions of this paragraph.
- F. **Intumescent Fire Stopping:** Intumescent joint sealers must be installed per specified U.L. Through-Penetration Firestop System. Specified systems are within construction documents and Specification book Volume 4 Fire Assemblies.
- G. **Manufacturer's inspection and supervision:**
 - 1. The manufacturer shall provide inspection of the work prior to start of application of each sealant type and issue instructions at the start of the work in order to ensure that any physical conditions which would result in defective work; and that proper procedures are being followed. Report all unsatisfactory

conditions in writing to the Architect for correction before proceeding with the work.

2. Notify manufacturer at least 72 hours prior to the time inspection is required.
3. Failure or refusal of the manufacturer to provide the inspection and supervision as required by this article shall constitute grounds for nonacceptance of other materials of the manufacturer even though such materials, have been specified and/or approved.

1.04 PERFORMANCE

- A. Provide joint sealers that have been produced and installed to establish a positive barrier to air and moisture penetration and maintain watertight and air tight continuous seals.
- B. Sealants will normally be applied under the work of various Sections of these Specifications but applied in strict accordance with provisions of this Section.

1.05 SUBMITTALS

- A. Product Data from manufacturers for each joint sealer product required indicating chemical characteristics, performance criteria, limitations and color availability and instructions for joint preparation and joint sealer application.
- B. Test Reports: Submit test reports for fire-rated installation to indicate compliance with specified requirements.
- C. **Samples for Initial Selection Purposes:** Manufacturer's standard bead samples consisting of strips of actual products showing full range of colors available, for each product exposed to view. Architect may select non-standard colors or more than one color at no increase in cost.
- D. Samples for verification purposes of each type and color of joint sealer required. Install joint sealer samples in field in locations approved by Architect to assure proper color and application.
- E. Letter from material manufacturers recommending primers / sealants (based on A.S.T.M. C-794 adhesion test procedures) for actual job site materials and that their products comply with specification requirements and are suitable for the use indicated.
- F. Qualification data complying with requirements specified in "Quality Assurance" article. Include list of completed projects with project name, addresses, names of Architects and Owners, plus other information specified.
- G. Certificate from sealant manufacturer that any materials contacting structural silicone are compatible with the sealant after a 24 day exposure to 2000 microwatts per sq. cm. UV light intensity. Structural mullion spaces shall not bleed any discoloration into light colored silicone sealants.

1.06 DELIVERY, STORAGE, AND HANDLING

- A. Deliver materials to Project site in original unopened container 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 in compliance with manufacturers' recommendations to prevent their deterioration or damage due to moisture, high or low temperatures, contaminants, or other causes. Do not use materials stored beyond their recommended maximum shelf life.

1.07 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 manufacturers.
 - 2. When ambient and substrate temperature conditions are outside the limits permitted by joint sealer manufacturer or below 40 degrees F. (4.4 degrees C.).
 - 3. When joint substrates are wet due to rain, frost, condensation, or other causes.
 - 4. When installation of solvent curing sealants is in an enclosed building space.
- B. **Joint Width Conditions:** Do not proceed with installation of joint sealers where joint widths are less than allowed by joint sealer manufacturer for application indicated.
- C. **Joint Substrate Conditions:** Do not proceed with installation of joint sealers until contaminants capable of interfering with their adhesion are removed from joint substrates.

1.08 SEQUENCING AND SCHEDULING

- A. Sequence Installation of joint sealers to occur not less than 21 nor more than 30 days after completion of water proofing, unless otherwise indicated.

1.09 WARRANTY

- A. **5-year warranty from Notice of Completion** signed jointly by Supplier and Installer against defects in materials and coverage of installed sealants and accessories which fail to achieve air tight and watertight seal, exhibit loss of adhesion or cohesion, or do not cure. In addition, warrant that material has been installed according to manufacturer's written specifications.
- B. Any failures that may occur within this warranty period, due to defective application and/or materials shall, upon written notification of such failure, be repaired or replaced with proper materials and/or labor as approved by the Architect, at no additional cost to the Owner.

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 sealant manufacturer based on testing and field experience.
- B. **Colors:** Provide color of exposed joint sealers to match adjacent surface except as noted below from manufacturer's standard colors. If standard colors are not compatible as determined by the Architect per Division 1 Standards of visual matching selection, provide nonstandard formulated color, at no additional cost to Owner.

- C. **Colors:** Provide colors of exposed joint sealers to match Architect's samples of exterior insulation and finish system when interfacing with other material and to match precast columns and bases.
- D. **Color:** Provide manufacturer's standard and custom colors to match ceramic tile grout when interfacing with plumbing fixtures.
- E. **Color:** In concealed locations, use standard gray or black.

2.02 SEALANT TYPES

- A. Use sealants selected from the following types as called for on Drawings and as appropriate to the joint being sealed. Approved manufacturers are listed under each numerical sealant type:
 - 1. Type 1: One-part moisture cured polyurethane sealant. Comply with A.S.T.M. C920, Type S, Grade NS, Class 25.
 - a. Tremco Dymonic
 - b. Pecora Dynatrol 1
 - c. Sikaflex 1-A
 - d. Sonneborn Sonolastic NP-1
 - e. Vulkem 921
 - f. Bostik Chem-Calk 900
 - g. PRC Permapol RC-1
 - 2. Type 2: Multi-part Polyurethane Base: Comply with A.S.T.M. C920, Type M, Grade NS, Class 25.
 - a. Tremco Dymeric
 - b. Pecora Dynatrol II
 - c. Sonneborn Sonolastic NP-2
 - d. Sikaflex 2-CNS
 - e. Bostik Chem-Calk 500
 - f. PRC Permapol RC-2
 - g. Mameco Vulkem 922
 - 3. Type 3: Multi-part Polyurethane Base: Comply with A.S.T.M. C920, Types M, Grade P or NS, Class 25. Shore hardness 40 minimum.
 - a. Tremco H.P.L. Sealant
 - b. Pecora Dynatred
 - c. PRC Permapol RC-2SL
 - d. Sika 2C/SL
 - 4. Type 4: Multi-part Polyurethane or PolySulfide Base Sealant for continuous submergence in water. Comply with A.S.T.M. C920, Type M, Grade P or NS, Class 25.
 - a. PRC Permapol RC-2

- b. Pecora Synthacalk GC-2
- 5. Type 5: One-part Butyl Rubber Based Sealant: Comply with Federal Specification TT-S-001657, Type 1 (Gun Grade)
 - a. Tremco Butyl
 - b. PTI 707
 - c. ADCO B-100
 - d. Bostik Chem-Calk 300
 - e. PRC PR-200
- 6. Type 6: One-part Non-Drying Sealant: For concealed metal joints. Comply with A.A.M.A. Specification 809.2
 - a. Tremco Curtain Wall Sealant
 - b. PTI 404
- 7. Type 7: Preformed Tape Sealant: Comply with A.A.M.A. 804.1 Sealant shall be based on butyl-polyisobutylene and may require built-in continuous synthetic rubber shim.
 - a. Tremco 440 or pre-shimmed 440 Tape.
 - b. PTI 303 shimmed or un-shimmed Tape.
 - c. PRC 3-300 or Space -R-Tape
- 8. Type 8: Preformed Tape Sealant: Comply with A.A.M.A. 804.1 and 807.1 Sealant shall be based on butylmacropolyisobutylene and may require built-in continuous synthetic rubber shim.
 - a. Tremco SST-800 glazing Tape
 - b. PRC Poly-Lok Tape
- 9. Type 9: Acoustical Sealant: Resilient, nonstaining, nonshrinking, nonsagging, nondrying, nonhardening permanently flexible. Composed of a synthetic rubber base of a consistency confirming to A.S.T.M. D217.
 - a. Pecora BA-98
 - b. Tremco Acoustical Sealant
 - c. USG Acoustical Sealant
- 10. Type 10: One-part Silicone Sealant: Comply with A.S.T.M. C920 Type S. Grade NS, Class 25.
 - a. G.E. Slipruf
 - b. Dow Corning 790 or 795
 - c. Sonneborn Omniseal
 - d. Tremco Spectrem 1 or Spectrem 2
 - e. Bostik Chem-Calk 1000
- 11. Type 11: One or 2 part silicone for structural glazing: Comply with A.S.T.M. C920, Type S, Grade NS, Class 25.

Section 07900 – Page 6 of 12
JOINT SEALERS

- a. Dow Corning 795 or 983
 - b. G.E. 1200, Ultraglaze 4000 or Ultraglaze 4200
 - c. Tremco Proglaze or Spectrem 2
 - d. Bostik Chem-Calk 1000, 1200 (2 Sided Only)
12. Type 12: One-part silicone sealant: Comply with A.S.T.M. C920, Type S, Grade NS, Class 25 with mildew resistant additive.
- a. Dow Corning 786
 - b. G.E. 1700
 - c. Sonneborn Omni Plus
 - d. Bostik Chem-Calk 9700
13. Type 13: One or 2 part neutral cure structural Silicone Sealant. Comply with A.S.T.M. C920, Types S or M, Grade NS, Class 25.
- a. Dow Corning 795 or 983
 - b. Tremco Spectrem 2
 - c. G.E. Ultraglaze 4000 or Ultraglaze 4200
14. Type 14: One or 2-part Silicone Sealant: For application to nonporous surfaces. Comply with A.S.T.M. C920, Type S, Grade NS, Class 25.
- a. Tremco Proglaze or Spectrem 2
 - b. G.E. Silglaze N, Gesil N, 1200, 4000, 4200
 - c. Dow Corning 790, 795, or 983
 - d. Bostik Chem-Calk 1200
15. Type 15: An intumescent material capable of expanding up to 8 to 10 times when exposed to temperatures beginning at 250 degrees F. U.L. Classified and have L.A. City A.C.B.O., B.O.C.A.I., and S.B.C.C.I. (N.R.B. 243) approved ratings to 3 hours per A.S.T.M. E814 (U.L. Standard 1479).
- a. 3M Fire CP25WB+ Caulk, MPS-2+ putty, FB-3000 WT Sealant, Strip and Sheet forms – U.L. R9700. Rectorseal Corp. MC-150 Caulk, BF-150 Caulk– U.L. R14546.
 - b. Johns Manville International Inc. Firetemp CI or Firetemp CE sealant – U.L. R18889.
 - c. W.R. Grace – Conn Construction Products Division – F1900, FS1901, FS1905, FS1929 Sealant – U.L. R11636.
16. Type 16: A joint sealing system to prevent passage of flame or hot gasses and to stop transmission of heat beyond the desired fire endurance as determined by A.S.T.M. E119.
- a. Tremco Dymeric
 - b. Closed Cell Polyethylene backer rod
 - c. Tremco 4.0 p.c.f. density Cerablanket-FS

d. Rectorseal Corp. Metacaulk 950 (Interior Only) or 880.

2.03 COMPRESSION SEALS

- A. **Preformed Foam Sealant:** Manufacturer's standard preformed, precompressed, impregnated open cell foam sealant manufactured from high density urethane foam impregnated with a nondrying, water repellent agent; factory produced in precompressed sizes and in roll or stick form to fit joint widths indicated and to develop a watertight and airtight seal when compressed to the degree specified by manufacturer; and complying with the following requirements;
- B. **Properties:** Permanently elastic, mildew resistant, nonmigratory, nonstaining, compatible with joint substrates and other joint sealers.
1. Impregnating Agent: Manufacturer's Standard.
 2. Density: Manufacturer's Standard.
 3. Backing: Pressure sensitive adhesive, factory applied to one side, with protective wrapping.
 4. Products: Subject to compliance with requirements, provide one of the following:
 - a. "Emseal"; Emseal Corp.
 - b. "Emseal Greyflex"; Emseal Corp.
 - c. "Polytite R"; Sandell Manufacturing Co., Inc.
 - d. "Polytite Standard"; Sandell Manufacturing Co. Inc.
 - e. "Will-Seal 150"; Wil-Seal Construction Foams Div, Illbruck.
 - f. "Will-Seal 250"; Wil-Seal Construction Foams Div., Illbruck.
 - g. "York-Seal 100"; York Manufacturing, Inc.
 - h. "York-Seal 200"; York Manufacturing, Inc.

2.04 JOINT SEALANT BACKING

- A. **General:** Provide sealant backings of material and type which are nonstaining; are compatible with joint substrates, sealants, primers and other joint fillers; and are approved for applications indicated by sealant manufacturer based on field experience and laboratory testing.
- B. **Joint Backing A.N.S.I. / A.S.T.M. D1056:** Preformed compressible, resilient, nonwaxing, nonextruding, nonstaining strips, Polyethylene or urethane foam, or other as recommended by sealant manufacturer for preventing sealant from adhering to rigid, inflexible joint filler materials or joint surfaces at back of joint where such adhesion would result in sealant failure. Backing shall be of sizes and shapes to suit the various conditions and shall be compatible with sealant, primers, and substrates. Backer rods, etc., shall have flame / smoker rating as required by codes.

2.05 MISCELLANEOUS MATERIALS

- A. **Primer:** Provide type recommended by joint sealer manufacturer where required for adhesion of sealant to joint substrates indicated. Obtain knowledge of whether primer is staining or nonstaining prior to application.

- B. **Joint Cleaner:** Noncorrosive and nonstaining type as recommended by sealant manufacturer.
- C. **Masking Tape:** Provide nonstaining, nonabsorbent type compatible with joint sealants and which will effectively prevent application of sealant on surfaces not scheduled to receive it, and which is removable without damage to surrounding surfaces.

PART 3 - EXECUTION

3.01 EXAMINATION

- A. Examine joints indicated to receive joint sealers with Installer present, for compliance with requirements for joint configuration, installation tolerances and other conditions affecting joint sealer performance. Do not proceed with installation of joint sealers until unsatisfactory conditions have been corrected.
- B. Mix sealing compounds in strict accordance with manufacturer's written instructions.
- C. Keep copies of manufacturer's written instructions available on job site for reference at all times.
- D. Beginning of installation means installer accepts existing surfaces and substrate.

3.02 PREPARATION

- A. **Surface Cleaning Joints:** Clean out joints immediately before installing joint sealers to comply with recommendations of joint sealer manufacturers, and the following requirements:
- B. 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; old joint sealers; oil; grease; waterproofing; water repellents; water; surface dirt; and frost.
- C. Clean concrete, masonry, unglazed surfaces of ceramic tile and similar porous joint substrate surfaces, by brushing, grinding, blast cleaning, mechanical abrading, 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.
- D. Remove laitance and form release agents from concrete.
- E. Clean metal, glass, porcelain enamel, glazed surfaces of ceramic tile; and other nonporous surfaces by chemical cleaners or other means which are not harmful to substrates or leave residues capable of interfering with adhesion of joint sealers.
- F. **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 dry surfaces to comply with joint sealer manufacturer's recommendations.
- G. Confine primers to areas of joint sealer bond, do not allow spillage or migration onto adjoining surfaces. Apply primer prior to application of joint backing, bond breaker or sealants.

H. **Joint Backing:**

1. In joints where the depth of joint exceeds the required depth of the sealant, install joint backing to provide backing and uniform depth of sealant. Install joint backing with approximately 30 percent compression. Do not stretch, twist, puncture or tear joint backing. Butt joint backing at intersections. Use closed cell polyethylene backer rod in intersections. Use closed cell polyethylene backer rod in horizontal joints exposed to foot traffic and open cell polyurethane foam backer rod in vertical joints.
- I. **Installation tool:** For installation of backup material, provide a blunt-surfaced tool or wood or plastic, having shoulders designed to ride on the adjacent finished surface and a protrusion of the required dimensions to assure uniform depth of backup material below the sealant. Do not, under any circumstances, use a screw driver or similar tool for this purpose.
- J. **Bond Breaker Tape:** Install bond breaker tape smoothly at the back of joint where joint backing is not required or cannot be installed. (Sealant shall adhere only to the sides and not to the back of the joint so as to eliminate 3-sided adhesion).
- K. **Installation of Sealant Backings:** Install sealant backings to comply with the following requirements:
- L. 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.
- M. Do not leave gaps between ends of joint fillers.
- N. Do not stretch, twist, puncture, or tear joint fillers.
- O. Remove absorbent joint fillers which have become wet prior to sealant application and replace with dry material.
- P. Install bond breaker tape between sealants and joint fillers, compressions seals, or back of joints where adhesion of sealant to surfaces at back of joints would result in sealant failure.
- Q. Install compressible seals serving as sealant backings to comply with requirements indicated above for joint fillers.

3.03 **INSTALLATION OF JOINT SEALERS**

- A. **General:** Comply with joint sealer manufacturers' printed installation instructions applicable to products and applications indicated, except where more stringent requirements apply.
- B. **Elastomeric Sealant Installation Standard:** Comply with recommendations of A.S.T.M. C962 for use of joint sealants as applicable to materials, applications and conditions indicated.
- C. Apply sealant in accordance with manufacturer's application manual and instructions, using hand guns or pressure equipment, with proper nozzle size, on clean, dry, properly prepared substrates. Force sealant into joint and against sides of joint to

make uniform. Avoid pulling of the sealant from the sides. Fill sealant space completely with sealant.

- D. Tooling is required to ensure firm full contact with the interfaces of the joint. Tool joints to form smooth uniform beads with slightly concave surfaces.
- E. Finish joints shall be straight, uniform, smooth and neatly finished. Remove any excess sealant from adjacent surfaces of joint, with Xylol, Toluol, or approved cleaner, leaving the work in a neat, clean condition. Tooling agents may only be used if recommended by the sealant manufacturer.
- F. Where an irregular surface of sensitive joint border exists, apply masking tape at the edge of the joint to insure joint neatness and protection.
- G. Remove tape after sealant is applied.
- H. Set thresholds occurring at exterior doors in 2 continuous rows of sealant.
- I. **Acoustic Sealant:**
 - 1. Install edge moldings for acoustical ceilings within areas of type indicated at perimeter of acoustical ceiling area and at locations where necessary to conceal edges of acoustical units.
 - 2. Sealant Bed: Apply continuous ribbon of acoustical sealant, above vertical leg after installing moldings.

3.04 INTUMESCENT FIRE STOPPING INSTALLATION

- A. Installation shall be per the specified testing report.
- B. Penetration shall be free of debris and dirt.
- C. Dam the penetration (when required) with an acceptable material. Install wire mesh as required by forming wire mesh into cylinder and allowing mesh to spring back against hole. Install collar for PVC vented type systems as required.
- D. Apply material to the penetration. Use a caulking gun, putty knife or other normal trade tools. Trowel surface flush with wall.
- E. Use the specified allowable thickness per test report of caulking for 2-hour fire rating with metal pipe. Use the specified allowable thickness per test report of caulking for 3-hour fire rating with metal or insulated metal pipe.
- F. Material expands up to 9 to 10 times to fill voids when exposed to temperatures beginning at 250 degrees F.
- G. Drying time is approximately 7 days: however, the penetration seal is immediately functional. providing a cold smoke, water and fire seal.
- H. Remove damming materials where necessary after cure.
- I. Clean up with Xylene.

3.05 CLEANING

- A. 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.

3.06 PROTECTION

- 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.

3.07 SCHEDULE

A. **Exterior joints:**

1. Joints between metal frame, poured-in-place concrete or masonry. (Sealant #1, #2, #10).
2. Joints between polymer glassfiber reinforced grey cement forms and shapes: (Sealant #1, #2).
3. Joints between concrete and/or masonry and stone work. (Sealant #2, #10).
4. Vertical expansion and control joints. (Sealant #2, #10).
5. Cross joint in all copings and cross joints in all projecting stone work. (Sealant #2, #10).
6. Exterior sills, jambs, and heads of window frames, door frames, louvers and similar openings, and where metal, wood or other materials abut or join masonry, concrete or each other, shall have sealant applied around their perimeters. (Sealant #1, #2, #10).
7. Horizontal joints in sidewalks, terraces, decks, concrete floors, driveways. (Refer to specification section 02514 Portland Cement Paving for expansion joint material).
8. Joints subjected to continuous submerged conditions such as water features, fountains, and reflecting pools. (Sealant #4).
9. Structural glazing. (Sealant #11, #13).
10. Exterior sills, jambs and heads of window frames having insulating glass. (Sealant #13).
11. Other exterior joints. (Sealant #1, #2, #10, #14).

B. **Interior joints:**

1. Vertical expansion and control joints. (Sealant #1, #2, #10).
2. Joints between concrete and/or masonry and stone work. (Sealant #2, #10).
3. Horizontal expansion and control joints. (Sealant #3).
4. Other interior joints. (Sealant #1, #2, #10, #14).
5. Hidden metal-to-metal joints, curtain wall joints expected to undergo minimal movement. (Sealant #5, #8).
6. Expansion joint and splice plate joints in curtain wall. (Sealant #6).
7. All joint openings and areas that must meet Sound Transmission Class Values, in non-exposed areas. (Sealant #9).

JOINT SEALERS

8. Any glazing system to use preformed tapes. (Sealant #7).
9. Any glass glazing, cap beads (on glass), to surfaces made of a silica substance. (Sealant #10, #14).
10. For sink, tub or bath areas. (Sealant #12).
11. For sealing holes or voids in fire rated floors and walls. (Sealant #15).
12. For sealant joints in fire rated concrete walls. (Sealant System #16).

END OF SECTION - 07900

06/26/08 rg