SECTION 072100: THERMAL INSULATION
PART 1: GENERAL

1.1 SUMMARY

A. The following section includes
   1. Cavity Wall and Masonry Cell Insulation
   2. Perimeter insulation under slabs-on-grade.
   3. Perimeter wall insulation (supporting backfill).
   4. Cavity-wall insulation.
   5. Concealed building insulation.

1.2 REFERENCES

A. American Society of Testing and Materials (ASTM)
   1. C549 Specification for Perlite Loose Fill Insulation
   2. C665 Specification for Mineral Fiber Blanket Thermal Insulation for Light Frame Construction and Manufactured Housing E84 Test Method for Surface Burning Characteristics of Building Materials
   3. E119 Test Method for Fire Tests of Building Construction and Materials
   4. E136 Test Method for Behavior of Material in A Vertical Tube Furnace At 750 Degrees C

B. California South Coast Air Quality Management District (AQMD) Rule 1168: Adhesive and Sealant Applications (www.aqmd.gov/rules/html/r1168.html)

C. Underwriter's Laboratories, Inc. (UL)

D. Fire Resistance Directory

1.3 DEFINITIONS

A. Thermal Resistivity (r-value): Temperature difference in degrees F (degrees C) between the two (2) surfaces of a material exactly one (1) inch (25 mm) thick, required to make one (1) BTU of energy flow through one (1) square foot (0.1 square meter) of the material in one (1) hour

1.4 SUBMITTALS

A. General: Submit the following in accordance with conditions of Contract

B. Manufacturer's Certifications: Submit manufacturer's representative certification that the proposed products comply with specified requirements, and are compatible with each other and substrates for the intended applications

C. Product Data Sheet: Submit manufacturer's catalog data and application instructions for each material proposed for use

D. Recycle Content: Submit manufacturer's documentation of recycled content for glass fiber insulation

E. Material Safety Data Sheets (MSDS): Submit MSDS for each adhesive product

1.5 QUALITY ASSURANCE

A. Single-Source Responsibility for Insulation Products: Obtain each type of building insulation from a single source with resources to provide products complying with requirements without delaying progress of the work

B. Installer Qualifications: Engage an experienced installer, with not less than two (2) years experience and certification by the manufacturer as an approved installer, who has completed building insulation applications similar in material, design and extent to that indicated for projects that have resulted in construction with a record of successful in-service performance

C. Fire-Test-Response Characteristics: Provide insulation and related materials with fire-test-response characteristics indicated on Contract documents, or specified elsewhere in this Section; to be determined by testing identical products per test method indicated below by UL or another testing and inspecting agency acceptable to authorities having jurisdiction. Identify materials with appropriate markings of applicable testing and inspecting agency

1. Surface Burning Characteristics: ASTM E84

2. Fire-Resistance Ratings: ASTM E119

3. Combustion Characteristics: ASTM E136

1.6 DELIVERY, STORAGE, AND HANDLING

A. Deliver and store packaged materials in manufacturer's original unopened packaging fully labeled and intact until time of use. Store materials off ground and under cover to prevent damage or contamination to materials by water, foreign matter or other causes. Promptly remove from site any materials which show evidence of damage and immediately make all replacements necessary

1.7 PROJECT CONDITIONS

A. Environmental Conditions: Do not proceed with installation of insulation under the following conditions: When ambient and substrate temperature conditions are outside the limits permitted by insulation manufacturer. When insulation is or is likely to become wet due to rain, frost, condensation or other causes

PART 2: PRODUCTS

2.1 MANUFACTURERS

Manufacturers: Subject to compliance with requirements, products by manufacturers that may be incorporated in the work include, but are not limited to the following. However, it is the Contractor's responsibility to provide only products compatible with the adjacent materials in the assembly

A. Glass-Fiber Blanket/Batt Insulation:

1. CertainTeed Corp
2. Knauf Fiberglass GmbH
3. Owens-Corning Fiberglass Corporation
4. Johns, Manville

B. Loose-Fill Insulation:

1. Producer members of Perlite Institute, Inc
2. Thermo-Rock West, Inc
3. Persolite Products, Inc

C. In other Part 2 articles where titles below introduce lists, the following requirements apply to product selection:

1. Available Products: Subject to compliance with requirements, products that may be incorporated into the Work include, but are not limited to, products specified.
2. Available Manufacturers: Subject to compliance with requirements, products that may be incorporated into the Work include, but are not limited to, one of the manufacturers specified.

2.2 FRAME WALL AND CEILING INSULATION

A. Faced Glass Fiber Blanket/Batt Insulation

B. Kraft-Faced: Provide thermal insulation produced by combining glass fibers with thermosetting resins to comply with ASTM C665, Type II, Class C (blankets with a nonreflective vapor-retarder membrane covering one principal face and not rated for flame propagation resistance - for use in nonexposed applications only)

C. Recycled Content: Maximum 25 percent. Comply with ASTM D535

2.3 CAVITY WALL AND MASONRY-CELL INSULATION

Perlite Loose-Fill Insulation: Provide expanded perlite to comply with ASTM C549, Type II (surface treated for water repellency and limited moisture absorption) or IV (surface treated for water repellency and limited moisture absorption), r-values of 3.3 - 2.8 for densities of 4.1 - 7.4 pcf at 75 degrees F (24 degrees C)

2.4 FOAM-PLASTIC BOARD INSULATION

A. Extruded-Polystyrene Board Insulation: ASTM C 578, Type VII, 2.20 lb/cu. ft., with maximum flame-spread and smoke-developed indexes of 75 and 450, respectively:

1. Available Manufacturers:
   a. Dow Chemical Company.
   b. Owens Corning.

2.5 AUXILIARY INSULATING MATERIALS

A. Adhesive for Bonding Insulation: Product with demonstrated capability to bond insulation securely to substrates indicated without damaging insulation and substrates.

PART 3: EXECUTION

3.1 EXAMINATION

A. Verify that conditions comply with requirements of Contract documents

B. Verify that related work to be performed before installation of insulation within indicated spaces has been completed

C. Verify that substrates are in satisfactory condition to receive insulation

1. Masonry substrates: Verify that masonry materials have dried sufficiently and have attained optimum moisture content

D. Do not proceed with installation of insulation until all unsatisfactory conditions have been corrected

3.2 PREPARATION

A. Clean substrates of substances harmful to insulations or vapor retarders, including removal of projections that might puncture vapor retarders, or interfere with insulation attachment

B. Close off openings in cavities receiving poured-in-place insulation to prevent the escape of insulation. Provide screens where openings must be maintained for drainage or ventilation

3.3 INSTALLATION, GENERAL

A. Comply with insulation manufacturer's instructions applicable to products and application indicated. If printed instructions are not available or do not apply to project conditions, consult manufacturer's technical representative for specific recommendations before proceeding with installation of insulation

B. Extend insulation full thickness as indicated to envelop entire area to be insulated. Cut and fit tightly around obstructions, and fill voids with insulation. Remove projections that interfere with placement

C. Do not install insulation which is damaged, wet, soiled, or which has been covered at any time with ice or snow

D. Locate vapor retarders on the warm side of assembly, unless indicated otherwise on Contract documents or manufacturer's data sheets

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

3.4 INSTALLATION OF FRAME WALL AND CEILING INSULATION

A. Install per manufacturer's recommendations and installation sequence. Provide permanent placement and support of insulation

B. Use blanket widths and lengths that fill cavities formed by framing members. Where more than one (1) length is required to fill cavity, provide lengths that will produce snug fit at ends

C. Cut installation neatly as required to fit tightly around obstructions

D. Place insulation with facing oriented toward warm side of construction, unless otherwise indicated. Tape seals all penetrations in facing with manufacturer recommended tape

E. Fasten insulation continuously tight against framing members to completely fill all spaces. Do not install on top or within 4 inches (102 mm) of recessed light fixtures

F. Seal tight all joints and gaps, with tape to ensure airtight installation. Install in a manner to prevent sagging

G. Any insulation that does not fill the cavity width shall have support in the form of metal clips or wire bracing

3.5 INSTALLATION OF CAVITY WALL AND MASONRY CELL INSULATION

A. Seal holes and openings in cavities as necessary to prevent loss of insulation during construction

B. Install suitable screens inside cavities to maintain openings at drainage or ventilation openings

C. Remove any obstructions which might interfere with free flow of insulation to intended spaces during pouring. Completely fill indicated cavities and spaces. Leave no gaps or voids

D. During placement, do not allow insulation to fall a distance greater than one story, or 20 feet (6 m), whichever is less

E. Rod insulation frequently during installation to eliminate formation of air pockets

3.6 INSTALLATION OF PERIMETER AND UNDER-SLAB INSULATION

A. On vertical surfaces, set insulation units in adhesive applied according to manufacturer's written instructions. Use adhesive recommended by insulation manufacturer.If not otherwise indicated, extend insulation a minimum of 24 inches below exterior grade line.

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

3.7 INSTALLATION OF CAVITY-WALL INSULATION

B. On units of foam-plastic board insulation, install pads of adhesive spaced approximately 24 inches o.c. both ways on inside face, and as recommended by manufacturer. Fit courses of insulation between wall ties and other obstructions, with edges butted tightly in both directions. Press units firmly against inside substrates indicated.

3.8 INSTALLATION OF GENERAL BUILDING INSULATION

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

B. Seal joints between foam-plastic insulation units by applying adhesive, mastic, or sealant to edges of each unit to form a tight seal as units are shoved into place. Fill voids in completed installation with adhesive, mastic, or sealant as recommended by insulation manufacturer.

C. Install board insulation on concrete substrates by adhesively attached, spindle-type insulation anchors as follows:

1. Fasten insulation anchors to concrete substrates with insulation anchor adhesive according to anchor manufacturer's written instructions. Space anchors according to insulation manufacturer's written instructions for insulation type, thickness, and application indicated.
2. After adhesive has dried, install board insulation by pressing insulation into position over spindles and securing it tightly in place with insulation-retaining washers, taking care not to compress insulation below indicated thickness.
3. Where insulation will not be covered by other building materials, apply capped washers to tips of spindles.

3.9 PROTECTION

A. General: Protect installed insulation and vapor retarder from damage due to harmful weather exposures and from construction damage. Provide temporary coverings or enclosures where insulation will be subject to abuse and cannot be concealed and protected by permanent construction immediately after installation

3.10 CLEANING

A. Remove all excess materials from the job site and leave the areas insulated ready for other trades

B. Prevent disposal of insulation scraps by reuse in ceiling and wall areas or other locations out of view

C. Remove all unusable excess materials from the job site and leave the areas insulated ready for other trades

END OF SECTION

SECTION 073113: ASPHALT SHINGLES

PART 1: GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 1 Specification Sections, apply to this Section.

1.2 SUMMARY

A. This Section includes the following:

1. Asphalt shingles
2. Felt underlayment
3. Self-adhering sheet underlayment
4. Ridge vents

B. Related Sections include the following:

1. Division 6 Section "Rough Carpentry" for roof deck wood structural panels.
2. Division 7 Section "Sheet Metal Flashing and Trim" for metal roof penetration flashings and counterflashings not part of this Section.
3. Division 7 Section "Roof Accessories" for ridge vents.

1.3 DEFINITIONS

A. Roofing Terminology: Refer to ASTM D 1079 and glossary of NRCA's "The NRCA Roofing and Waterproofing Manual" for definitions of terms related to roofing work in this Section.

1.4 SUBMITTALS

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

B. Manufacturer’s Literature for Initial Selection: For each type of asphalt shingle, ridge and hip cap shingle, ridge vent and exposed valley lining indicated.

1. Include similar literature of trim and accessories involving color selection.

C. Qualification Data: For Installer**,** including certificate signed by asphalt shingle manufacturer stating that Installer is approved, authorized, or licensed to install roofing system indicated.

D. Product Test Reports: Based on evaluation of comprehensive tests performed by a qualified testing agency or by manufacturer and witnessed by a qualified testing agency, for asphalt shingles.

E. Research/Evaluation Reports: For asphalt shingles.

F. Maintenance Data: For asphalt shingles to include in maintenance manuals.

G. Warranties: Special warranties specified in this Section.

1.5 QUALITY ASSURANCE

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

1. Installer must have a minimum of three (3) years experience installing the roof system specified.
2. Job Site Superintendent must have a minimum of 5 years experience in roofing.

B. Source Limitations: Obtain ridge and hip cap shingles, ridge vents felt underlayment and self-adhering sheet underlayment through one source from a single asphalt shingle manufacturer.

C. Fire-Test-Response Characteristics: Provide asphalt shingle and related roofing materials with the fire-test-response characteristics indicated, as determined by testing identical products per test method below by UL or another testing and inspecting agency acceptable to authorities having jurisdiction. Identify materials with appropriate markings of applicable testing and inspecting agency.

1. Exterior Fire-Test Exposure: Class A; ASTM E 108 or UL 790, for application and roof slopes indicated.

D. Preinstallation Conference: Conduct conference at Project site. Comply with requirements in Division 1 Section "Project Management and Coordination." Review methods and procedures related to roofing system including, but not limited to, the following:

1. Meet with Owner, Architect, Owner, roofing Installer, roofing, deck Installer, and installers whose work interfaces with or affects roofing including installers of roof accessories and roof-mounted equipment.
2. Review methods and procedures related to roofing installation, including manufacturer's written instructions.
3. Review and finalize construction schedule and verify availability of materials, Installer's personnel, equipment, and facilities needed to make progress and avoid delays.
4. Examine deck substrate conditions and finishes for compliance with requirements, including flatness and fastening.
5. Review structural loading limitations of roof deck during and after roofing.
6. Review base flashings, special roofing details, roof drainage, roof penetrations and condition of other construction that will affect roofing system.
7. Review governing regulations and requirements for insurance and certificates if applicable.
8. Review temporary protection requirements for roofing system during and after installation.
9. Review roof observation and repair procedures after roofing installation.

1.6 DELIVERY, STORAGE, AND HANDLING

A. Store roofing materials in a dry, well-ventilated, weathertight location according to asphalt shingle manufacturer's written instructions. Store underlayment rolls on end on pallets or other raised surfaces. Do not double-stack rolls.

1. Handle, store, and place roofing materials in a manner to avoid significant or permanent damage to roof deck or structural supporting members.

B. Protect unused underlayment from weather, sunlight, and moisture when left overnight or when roofing work is not in progress.

1.7 PROJECT CONDITIONS

Weather Limitations: Proceed with installation only when existing and forecasted weather conditions permit asphalt shingle roofing to be performed according to manufacturer's written instructions and warranty requirements. Install self-adhering sheet underlayment within the range of ambient and substrate temperatures recommended by manufacturer.

1.8 WARRANTY

A. Special Warranty: Manufacturer's standard form in which manufacturer agrees to repair or replace asphalt shingles that fail in materials within specified warranty period. Materials failures include manufacturing defects and failure of asphalt shingles to self-seal after a reasonable time.

1. Material Warranty Period: 30 years from date of Substantial Completion, nonprorated.
2. Wind-Speed Warranty Period: Asphalt shingles will resist blow-off or damage caused by wind speeds up to 70 mph (33 m/s) for 10 years from date of Substantial Completion.
3. Algae-Discoloration Warranty Period: Asphalt shingles will not discolor 10 years from date of Substantial Completion.
4. Workmanship Warranty Period: 5 years from date of Substantial Completion.

B. Installers Warranty: Submit roofing Installer's warranty, on warranty form at end of this Section, signed by Installer, covering Work of this Section, including all components of roofing system for the following warranty period:

1. The liability of the Surety Company under the installer warranty provisions of this contract is limited to correcting defective workmanship and materials for a period of two years from the substantial completion date of the project. Any warranty beyond the first two years is an agreement between the owner and the contractor and falls outside the performance bond obligation.
2. Warranty Period: Five (5) years from date of Substantial Completion.

1.9 EXTRA MATERIALS

A. Furnish extra materials described below that match products installed and that are packaged with protective covering for storage and identified with labels describing contents.

1. Asphalt Shingles: 100 sq. ft (9.3 sq. m) of each type, in unbroken bundles.

PART 2: PRODUCTS

2.1 MANUFACTURERS

A. In other Part 2 articles where titles below introduce lists, the following requirements apply to product selection:

1. Available Products: Subject to compliance with requirements, products that may be incorporated into the Work include, but are not limited to, products specified.
2. Products: Subject to compliance with requirements, provide one of the products specified.

2.2 GLASS-FIBER-REINFORCED ASPHALT SHINGLES

A. Laminated-Strip Asphalt Shingles: ASTM D 3462, laminated, multi-ply overlay construction, glass-fiber reinforced, mineral-granule surfaced, and self-sealing. Basis of Design - Timberline HD Shingle as produced by GAF Materials Corp. or a comparable product by one of the following:

1. Products:
   a. GAF Materials Corporation; Timberline 30
   b. Atlas Roofing Corporation; Pinnacle 35
   c. CertainTeed Corporation; Landmark 30
   d. Owens Corning; Oakridge Pro 30
   e. TAMKO Roofing Products, Inc.; Heritage 30
2. Strip Size: Manufacturer's standard.
3. Algae Resistance: Granules treated to resist algae discoloration.
4. Color and Blends: As selected by Architect from manufacturer's full range.

B. Hip and Ridge Shingles: Manufacturer's standard units to match asphalt shingles.

2.3 UNDERLAYMENT MATERIALS

A. Felts: No. 30 roofing felt, ASTM D 226 or ASTM D 4869, Type II, asphalt-saturated organic felts, nonperforated.

B. Self-Adhering Sheet Underlayment, Granular Surfaced: ASTM D 1970, minimum of 55-mil-(1.4-mm-) thick sheet; glass-fiber-mat-reinforced, SBS-modified asphalt; mineral-granule surfaced; with release paper backing; cold applied.

1. Products:
   a. GAF Materials Corporation; Weather Watch.
   b. Atlas Roofing Corporation; StormMaster DG.
   c. CertainTeed Corporation; WinterGuard.
   d. Henry Company; Eaveguard.
   e. Owens Corning; WeatherLock G.

2.4 RIDGE VENTS

A. Rigid Ridge Vent: Manufacturer's standard rigid section high-density polypropylene or other UV-stabilized plastic ridge vent; for use under ridge shingles.

1. Products:
   a. GAF Materials Corporation; Cobra Rigid Vent II.
   b. Air Vent Inc., a CertainTeed Company; ShingleVent II.
   c. Cor-A-Vent, Inc.; V-Series.
   d. Lomanco, Inc.; OR-4.
   e. Owens Corning; VentSure Ridge Vent.

2.5 ACCESSORIES

A. Asphalt Roofing Cement: ASTM D 4586, Type II, asbestos free.

B. Roofing Nails: ASTM F 1667; aluminum, stainless-steel, copper, or hot-dip galvanized steel wire shingle nails, minimum 0.120-inch- (3-mm-) diameter, shank, sharp-pointed, with a minimum 3/8-inch- (9.5-mm-) diameter flat head and of sufficient length to penetrate 3/4 inch (19 mm) into solid wood decking or extend at least 1/8 inch (3 mm) through OSB or plywood sheathing.
1. Where nails are in contact with metal flashing, use nails made from same metal as flashing.

C. Felt Underlayment Nails: Aluminum, stainless-steel, or hot-dip galvanized steel wire with low profile capped heads or disc caps, 1-inch (25-mm) minimum diameter.

2.6 METAL FLASHING AND TRIM

A. Sheet Metal Flashing and Trim: Comply with requirements in Division 7 Section "Sheet Metal Flashing and Trim."

1. Sheet Metal: Coil-coated G90 (galvanized) steel.

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

1. Apron Flashings: Fabricate with lower flange a minimum of 5 inches (125 mm) over and 4 inches (100 mm) beyond each side of downslope asphalt shingles and 6 inches (150 mm) up the vertical surface.
2. Step Flashings: Fabricate with a headlap of 2 inches (50 mm) and a minimum extension of 4 inches (100 mm) over the underlying asphalt shingle and up the vertical surface.
3. Cricket or Backer Flashings: Fabricate with concealed flange extending a minimum 24 inches (600 mm) beneath upslope asphalt shingles and[6 inches (150 mm)] beyond each side of chimney or skylight and 6 inches (150 mm) above the roof plane.

4. Open Valley Flashings: Fabricate in lengths not exceeding 10 feet (3 m) with 1-inch- (25-mm-) high inverted-V profile at center of valley and equal flange widths of 12 inches (300 mm).
5. Drip Edges: Fabricate in lengths not exceeding 10 feet (3 m) with 2-inch (50-mm) roof deck flange and 1-1/2-inch (38-mm) fascia flange with 3/8-inch (9.6-mm) drip at lower edge.

C. Vent Pipe Flashings: ASTM B 749, Type L51121, at least 1/16 inch (1.6 mm) thick. Provide lead sleeve sized to slip over and turn down into pipe, soldered to skirt at slope of roof and extending at least 4 inches (100 mm) from pipe onto roof.

PART 3: EXECUTION

3.1 EXAMINATION

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

1. Examine roof sheathing to verify that sheathing joints are supported by framing and blocking or metal clips and that installation is within flatness tolerances.
2. Verify that substrate is sound, dry, smooth, clean, sloped for drainage, and completely anchored; and that provision has been made for flashings and penetrations through asphalt shingles.
3. For the record, prepare written report, endorsed by Installer, listing conditions detrimental to performance of work.

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

3.2 UNDERLAYMENT INSTALLATION

A. Single-Layer Felt Underlayment: Install single layer of felt underlayment on roof deck perpendicular to roof slope in parallel courses. Lap sides a minimum of 2 inches (50 mm) over underlying course. Lap ends a minimum of 4 inches (100 mm). Stagger end laps between succeeding courses at least 72 inches (1830 mm). Fasten with roofing nails.

1. Install felt underlayment on roof deck not covered by self-adhering sheet underlayment. Lap sides of felt over self-adhering sheet underlayment not less than 3 inches (75 mm) in direction to shed water. Lap ends of felt not less than 6 inches (150 mm) over self-adhering sheet underlayment.

B. Self-Adhering Sheet Underlayment: Install self-adhering sheet underlayment, wrinkle free, on roof deck. Comply with low-temperature installation restrictions of underlayment manufacturer if applicable. Install at locations indicated on Drawings, lapped in direction to shed water. Lap sides not less than 3-1/2 inches (89 mm). Lap ends not less than 6 inches (150 mm) staggered 24 inches (600 mm) between courses. Roll laps with roller. Cover underlayment within seven days.
1. Eaves: Extend from edges of eaves 36 inches (914 mm) beyond interior face of exterior wall.

2. Rakes: Extend from edges of rake 36 inches (914 mm) beyond interior face of exterior wall.
3. Valleys: Extend from lowest to highest point 18 inches (450 mm).
4. Hips: Extend 18 inches (450 mm) on each side.
5. Ridges: Extend 36 inches (914 mm) on each side without obstructing continuous ridge vent slot.
6. Sidewalls: Extend beyond sidewall 18 inches (450 mm) and return vertically against sidewall not less than 4 inches (100 mm).
7. Roof Slope Transitions: Extend 18 inches (450 mm) on each roof slope.

C. Metal-Flashed Open Valley Underlayment: Install two layers of 36-inch- (914-mm-) wide felt underlayment centered in valley. Stagger end laps between layers at least 72 inches (1830 mm). Lap ends of each layer at least 12 inches (300 mm) in direction to shed water, and seal with asphalt roofing cement. Fasten each layer to roof deck with roofing nails.

1. Lap roof deck felt underlayment over first layer of valley felt underlayment at least 6 inches (150 mm).

3.3 METAL FLASHING INSTALLATION

A. General: Install metal flashings and other sheet metal to comply with requirements in Division 7 Section "Sheet Metal Flashing and Trim."

1. Install metal flashings in accordance with asphalt shingle recommendations in NRCA's "The NRCA Roofing and Waterproofing Manual."

B. Apron Flashings: Extend lower flange over and beyond each side of downslope asphalt shingles and up the vertical surface.

C. Step Flashings: Install with a headlap of 2 inches (50 mm) and extend over the underlying asphalt shingle and up the vertical surface. Fasten to roof deck only.

D. Cricket or Backer Flashings: Install against the roof-penetrating element extending concealed flange beneath upslope asphalt shingles and beyond each side.

E. Open Valley Flashings: Install centrally in valleys, lapping ends at least 8 inches (200 mm) in direction to shed water. Fasten upper end of each length to roof deck beneath overlap.

1. Secure hemmed flange edges into metal cleats spaced 12 inches (300 mm) apart and fastened to roof deck.

F. Rake Drip Edges: Install rake drip edge flashings over underlayment and fasten to roof deck.

G. Eave Drip Edges: Install eave drip edge flashings below underlayment and fasten to roof sheathing.

H. Pipe Flashings: Form flashing around pipe penetrations and asphalt shingles. Fasten and seal to asphalt shingles as recommended by manufacturer.

3.4 ASPHALT SHINGLE INSTALLATION

A. Install asphalt shingles according to manufacturer's written instructions and recommendations in asphalt shingle NRCA's "The NRCA Roofing and Waterproofing Manual."

B. Install starter strip along lowest roof edge, consisting of an asphalt shingle strip at least 7 inches (175 mm) wide with self-sealing strip face up at roof edge.

1. Do not extend asphalt shingles over fascia at eaves and rakes, unless prescribed by manfacturer’s application guide.
2. Install starter strip along rake edge.

C. Install first and remaining courses of asphalt shingles stair-stepping diagonally across roof deck with manufacturer's recommended offset pattern at succeeding courses, maintaining uniform exposure.

D. Install first and remaining courses of asphalt shingles stair-stepping diagonally across roof deck with manufacturer's recommended offset pattern at succeeding courses, maintaining uniform exposure.

E. Install asphalt shingles by single-strip column or racking method, maintaining uniform exposure. Install full length first course followed by cut second course, repeating alternating pattern in succeeding courses.

F. Fasten asphalt shingle strips with a minimum of four roofing nails located according to manufacturer's written instructions.

1. Where roof slope exceeds 12:12, seal asphalt shingles with asphalt roofing cement spots after fastening with additional roofing nails located according to manufacturer’s written instructions.
2. Where roof slope is less than 4:12, seal asphalt shingles with asphalt roofing cement spots.
3. Do not install shingles when ambient temperatures are below manufacturer’s recommended application temperature.

G. Open Valleys: Cut and fit asphalt shingles at open valleys, trimming upper concealed corners of shingle strips. Maintain uniform width of exposed open valley from highest to lowest point.

1. Do not nail asphalt shingles to metal open valley flashings.

H. Ridge Vents: Install continuous ridge vents over asphalt shingles according to manufacturer's written instructions. Fasten with roofing nails of sufficient length to penetrate sheathing.

I. Ridge and Hip Cap Shingles: Maintain same exposure of cap shingles as roofing shingle exposure. Lap cap shingles at ridges to shed water away from direction of prevailing winds. Fasten with roofing nails of sufficient length to penetrate sheathing.

1. Fasten ridge cap asphalt shingles to cover ridge vent without obstructing airflow.

END OF SECTION

SECTION 074600- FIBER CEMENT FASCIA

PART 1 GENERAL

1.1 SECTION INCLUDES

A. Fiber cement fascia, moulding and accessories.

1.2 SUBMITTALS

A. Submit under provisions of Section 01300.

B. Product Data: Manufacturer's data sheets on each product to be used, including:
   1. Preparation instructions and recommendations.
   2. Storage and handling requirements and recommendations.
   3. Installation methods.

C. Shop Drawings: Provide detailed drawings of atypical non-standard applications of cementitious siding materials which are outside the scope of the standard details and specifications provided by the manufacturer.

D. Selection Samples: For each finish product specified, two complete sets of color chips representing manufacturer's full range of available colors and patterns.

E. Verification Samples: For each finish product specified, two samples, minimum size 4 by 6 inches (100 by 150 mm), representing actual product, color, and patterns.

1.3 QUALITY ASSURANCE

A. Installer Qualifications: Minimum of 2 years experience with installation of similar products.

B. Mock-Up: Provide a mock-up for evaluation of surface preparation techniques and application workmanship.
   1. Finish areas designated by Architect.
   2. Do not proceed with remaining work until workmanship, color, and sheen are approved by Architect.
   3. Refinish mock-up area as required to produce acceptable work.

1.4 DELIVERY, STORAGE, AND HANDLING

A. Store products in manufacturer's unopened packaging until ready for installation.

B. Store siding on edge or lay flat on a smooth level surface. Protect edges and corners from chipping. Store sheets under cover and keep dry prior to installing.

C. Store and dispose of solvent-based materials, and materials used with solvent-based materials, in accordance with requirements of local authorities having jurisdiction.

1.5 PROJECT CONDITIONS

A. Maintain environmental conditions (temperature, humidity, and ventilation) within limits recommended by manufacturer for optimum results. Do not install products under environmental conditions outside manufacturer's absolute limits.

1.6 WARRANTY

A. Product Warranty: Limited product warranty against manufacturing defects.
   1. HardieTrim for 10 years.

B. Workmanship Warranty: Application limited warranty for 2 years.

PART 2 PRODUCTS

2.1 MANUFACTURERS

A. Acceptable Manufacturer: James Hardie Building Products, Inc; 26300 La Alameda, Suite 250, Mission Viejo, CA 92691. ASD. Toll Free Residential: (888) J-HARDIE. Toll Free Commercial: (866) 274-3464. Tel: (949) 348-1800. Fax: (949) 367-0185. Email: info@JamesHardie.com. Web - Residential: http://www.jameshardie.com. Web - Commercial: http://www.jameshardiecommercial.com. Or approved equal.

2.2 FASCIA

A. Trim: Hardietrim Fascia and Moulding as manufactured by James Hardie Building Products, Inc.

2.3 FASTENERS

A. Wood Framing Fasteners:
   1. Wood framing: 4d common corrosion resistant nails.
   2. Wood framing: 6d common corrosion resistant nails.
   3. Wood framing: 0.089 inch (2.2 mm) shank by 0.221 inch (5.6 mm) head by 2 inches (51 mm) corrosion resistant siding nails.
   4. Wood framing: 0.093 inch (2.4 mm) shank by 0.222 inch (5.6 mm) head by 2 inches (51 mm) corrosion resistant siding nails.
   5. Wood framing: 0.091 inch (2.3 mm) shank by 0.221 inch (5.6 mm) head by I-1/2 inches (38 mm) corrosion resistant siding nails.
   6. Wood framing: 0.091 inch (2.3 mm) shank by 0.225 inch (5.7 mm) head by 1-1/2 inches (38 mm) corrosion resistant siding nails.
   7. Wood framing: 0.121 inch (3 mm) shank by 0.371 inch (9.4 mm) head by 1-1/4 inches (32 mm) corrosion resistant roofing nails.
   8. Wood framing: 1-1/4 inches (32 mm) corrosion resistant roofing nails.
   9. Wood framing: 1-1/2 inches (38 mm) corrosion resistant roofing nails.

B. Metal Framing:

1. Metal framing: 1-1/4 inches (32 mm) No. 8-18 by 0.375 inch (9.5 mm) head self-drilling, corrosion resistant S-12 ribbed buglehead screws.
2. Metal framing: 1-5/8 inches (41 mm) No. 8-18 by 0.323 inch (8.2 mm) head self-drilling, corrosion resistant S-12 ribbed buglehead screws.
3. Metal framing: 1 inch (25 mm) No. 8-18 by 0.323 inch (8.2 mm) head self-drilling, corrosion resistant ribbed buglehead screws.
4. Metal framing: 1 inch (25 mm) No. 8-18 by 0.311 inch (7.9 mm) head self-drilling, corrosion resistant S-12 ribbed buglehead screws.
5. Metal framing: 1.5 inch (38mm) [AGS-100] .100 inches by 25 inches (2540 mm by 635 mm) ET&F Pin or equivalent pneumatic fastener.
6. Concrete Walls: Erica Stud Nail, ET&F ASM No.-144-125, 0.14 inch (3.6 mm) shank by 0.30 inch (7.6 mm) head by 2 inches (51 mm) corrosion resistant nail.

2.4 FINISHES

A. Factory Finish Color for Trim, Soffit and Siding Colors: Match Existing.

PART 3 EXECUTION

3.1 EXAMINATION

A. Do not begin installation until substrates have been properly prepared.

B. If framing preparation is the responsibility of another installer, notify Architect of unsatisfactory preparation before proceeding.

C. Nominal 2 inch by 4 inch (51 m by 102 mm) wood framing selected for minimal shrinkage and complying with local building codes, including the use of water-resistive barriers or vapor barriers where required. Minimum 1-1/2 inches (38 mm) face and straight, true, of uniform dimensions and properly aligned.
   1. Install water-resistive barriers and claddings to dry surfaces.
   2. Repair any punctures or tears in the water-resistive barrier prior to the installation of the siding.
   3. Protect siding from other trades.

3.2 PREPARATION

A. Clean surfaces thoroughly prior to installation.

B. Prepare surfaces using the methods recommended by the manufacturer for achieving the best result for the substrate under the project conditions.

3.3 INSTALLATION - HARDIETRIM FASCIA AND MOULDING

A. Install materials in strict accordance with manufacturer's installation instructions. Install flashing around all wall openings.

B. Fasten through trim into structural framing or code complying sheathing. Fasteners must penetrate minimum 3/4 inch (19 mm) or full thickness of sheathing. Additional fasteners may be required to ensure adequate security.

C. Place fasteners no closer than 3/4 inch (19 mm) and no further than 2 inches (51 mm) from side edge of trim board and no closer than 1 inch (25 mm) from end. Fasten maximum 16 inches (406 mm) on center.

D. Install Hardietrim fascia over structural subfascia.

E. Fasten through overlapping boards. Do not nail between lap joints.

F. Overlay siding with single board of outside corner board then align second corner board to outside edge of first corner board. Do not fasten Hardietrim boards to Hardietrim boards.

3.4 PROTECTION

A. Protect installed products until completion of project.

B. Touch-up, repair or replace damaged products before Substantial Completion.

END OF SECTION 074600

SECTION 075323: ETHYLENE – PROPYLENE – DIENE – MONOMER (EPDM) ROOFING

PART 1: GENERAL

1.1 SUMMARY

A. This Section includes Fully Adhered EPDM membrane roofing system complete with roof insulation, vapor retarder, and flashing.

B. The project consists of installing Carlisle's Sure-Seal (black) Fully-Adhered Roofing System or approved equal as outlined below:

1. Apply the Fully-Adhered EPDM Roofing System in conjunction with cover board after tear off of the existing roofing for verification of suitable substrate as specified in this specification. Vapor retarder and fire rated gypsum cover board are to mechanically fasten to the roof deck and the EPDM membrane is to be fully adhered to the cover board with Adhesive.
2. System is to be complete including vapor retarder, insulation, flashing, and accessories as required.

C. The completed roofing system must have a “Class A” fire rating on any slope.

D. The completed roofing system must be provided with a manufacturer’s all inclusive 20 year warranty with no dollar limit.

1.2 WORK SPECIFIED ELSEWHERE

A. Removal of existing system: Section 01732 - Selective Demolition

B. Preparation for Reroofing: Section 07591 - Preparation for Reroofing

C. Metal Flashing and Trim: Section 07620 - Sheet Metal Flashing and Trim

1.3 SUBMITTALS

A. Product Data: For each product indicated. Each product must be approved in writing by the membrane manufacturer as acceptable for the “Class A” fire rating and their warranty, prior to submittal.

B. Fire Rating Certification: Membrane manufacturer to provide certification by a testing laboratory, acceptable to the State of NY Education Department, that the proposed roofing system provides a “Class A” fire rating with no limit as to the slope.

C. Shop Drawings: Include plans, layout, elevations, sections, details, walkway layout, and attachments to other Work. Shop drawings must be approved in writing by roofing membrane manufacturer as acceptable for their warranty, prior to submittal.

D. Samples: For each product included in membrane roofing system.

E. Sample of the manufacturer's Membrane System Warranty.

F. Maintenance data.

G. Upon completion of the installed work, submit copies of the manufacturer's final inspection to the specifier prior to the issuance of the manufacturer's warranty.

1.4 QUALITY ASSURANCE

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

B. Source Limitations: Obtain components for membrane roofing system from same manufacturer as roofing membrane or as approved in writing by the membrane manufacturer as acceptable for the "Class A" fire rating and the manufacturer's warranty.

C. Fire-Test-Response Characteristics: Provide membrane roofing materials with the fire-test-response characteristics indicated as determined by testing identical products per test method below by UL, FMG, or another testing and inspecting agency acceptable to authorities having jurisdiction.

1. Exterior Fire-Test Exposure: Class A; ASTM E 108, for application and roof slopes indicated.

D. Preinstallation Conference: Conduct conference at Project site. A representative of the roofing membrane manufacturer shall be in attendance and shall review warranty requirements.

1.5 PROJECT CONDITIONS

A. Weather Limitations: Proceed with installation only when existing and forecasted weather conditions permit roofing system to be installed according to manufacturer's written instructions and warranty requirements.

1.6 WARRANTY

A. Special Warranty: Carlisle SynTec "Golden Seal Total System Warranty", without monetary limitation, in which manufacturer agrees to repair or replace components of the complete membrane roofing system, including vapor retarder, roof insulation, flashing, accessories, etc., that fail in materials or workmanship within specified warranty period or an equivalent warranty by the Firestone Building Products Company, if a Firestone assembly is used. Failure includes roof leaks.

1. Warranty Period: 20 years from date of Substantial Completion.
2. Extended Wind Speed: Provide Carlisle SynTec "Extended Wind Speed" endorsement for wind peak gusts of 90 mph.

PART 2: PRODUCTS

2.1 EPDM ROOFING MEMBRANE

A. Basis of Design: Carlisle's Sure-Seal EPDM (black) Fully-Adhered Roofing System as manufactured by Carlisle SynTec Incorporated system. Subject to compliance with requirements, provide the named product or a comparable product by one of the following:

1. Carlisle SynTec Incorporated.
2. Firestone Building Products Company.
3. Johns Manville.

B. EPDM Roofing Membrane: ASTM D 4637, Type I, nonreinforced, flexible sheet made from EPDM, and as follows:

1. Thickness: 60 mils, nominal.
2. Exposed Face Color: Black.

2.2 AUXILIARY MATERIALS

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

1. Sheet Flashing: 60-mil- thick EPDM, partially cured or cured, according to application.
2. Bonding Adhesive: Manufacturer's standard bonding adhesive.
3. Seaming Material: Sure-Seal EP-95 Splicing Cement and Sure-Seal SecurTAPE and HP-Primer.
4. Cleaning Solvent: Sure-Seal Splice Cleaner.
5. Internal Seam Sealant: Sure-Seal In-Seam Sealant (used with adhesive splices only)
6. External Seam Sealant: Sure-Seal Lap Sealant.
7. Fasteners: Factory-coated steel fasteners and metal or plastic plates meeting corrosion-resistance provisions in FMG 4470, designed for fastening membrane to substrate, and acceptable to membrane roofing system manufacturer.
8. Miscellaneous Accessories: Provide lap sealant, water cutoff mastic, metal termination bars, metal battens, pourable sealers, preformed cone and vent sheet flashings, preformed inside and outside corner sheet flashings, T-joint covers, in-seam sealants, termination reglets, cover strips, and other accessories as recommended by the membrane manufacturer.

2.3 ROOF INSULATION

A. Faced Glass Fiber Blanket/Batt Insulation

B. Kraft-Faced: Provide thermal insulation produced by combining glass fibers with thermosetting resins to comply with ASTM C665, Type II, Class C (blankets with a nonreflective vapor-retarder membrane covering one principal face and not rated for flame propagation resistance - for use in nonexposed applications only).

C. Recycled Content: Maximum 25 percent. Comply with ASTM D535

D. Provide written certification from the roofing membrane manufacturer that the roof insulation is acceptable for inclusion in roofing system.

E. Tapered Insulation: Provide factory-tapered insulation boards fabricated to slope as indicated.

F. Fabricate to slopes required.

2.4 INSULATION ACCESSORIES

A. Fasteners: Factory-coated steel fasteners and metal or plastic plates complying with corrosion-resistance provisions in FMG 4470, designed for fastening substrate panels to roof deck.

B. Cover Board: ASTM C 1177/C 1177M, glass-mat, water-resistant gypsum substrate, 5/8 inch thick and is acceptable to the roofing the membrane manufacturer for the warranty.

1. Product: Subject to compliance with requirements, provided "Dens-Deck" manufactured by Georgia-Pacific Corporation or equal.

2.5 VAPOR RETARDER

A. Polyethylene Vapor Retarder: ASTM D 4397, 6 mils (0.15 mm) thick, minimum, with maximum permeance rating of 0.13 perm.

1. Tape: Pressure-sensitive tape of type recommended by vapor-retarder manufacturer for sealing joints and penetrations in vapor retarder.
2. Adhesive: Manufacturer's standard lap adhesive, FMG approved for vapor-retarder application.

PART 3: EXECUTION

3.1 DAILY SEAL

A. When the completion of flashings and terminations is not achieved by the end of the work day, a daily seal must be performed to temporarily close the membrane to prevent water infiltration.

3.2 VAPOR-RETARDER INSTALLATION

A. Loosely lay polyethylene-film vapor retarder in a single layer over area to receive vapor retarder, side and end lapping each sheet a minimum of 2 inches and 6 inches, respectively.

1. Seal side and end laps with tape.

3.3 FULLY ADHERERD ROOFING MEMBRANE INSTALLATION

A. Install roofing membrane over area to receive roofing according to roofing system manufacturer's written instructions. Unroll roofing membrane and allow to relax before installing.

B. Start installation of roofing membrane in presence of roofing system manufacturer's technical personnel.

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

D. Adhesively and mechanically fasten roofing membrane securely at terminations and perimeter of roofing.

D. Adhesive Seam Installation: Clean both faces of splice areas, apply splicing cement, and firmly roll side and end laps of overlapping roofing membranes according to manufacturer's written instructions to ensure a watertight seam installation. Apply lap sealant and seal exposed edges of roofing membrane terminations.

E. Tape Seam Installation: Clean and prime both faces of splice areas, apply splice tape, and firmly roll side and end laps of overlapping roofing membranes according to manufacturer's written instructions to ensure a watertight seam installation. Apply lap sealant and seal exposed edges of roofing membrane terminations.

F. Repair tears, voids, and lapped seams in roofing that does not meet requirements.

3.4 BASE FLASHING INSTALLATION

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

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

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

D. Clean splice areas, apply splicing cement, and firmly roll side and end laps of overlapping sheets to ensure a watertight seam installation. Apply lap sealant and seal exposed edges of sheet flashing terminations.

E. Terminate and seal top of sheet flashings and mechanically anchor to substrate through termination bars.

3.5 FIELD QUALITY CONTROL

A. Pre-installation inspection: After completion of the removal of existing roofing and insulation, the roof deck shall be inspected and approved by a representative of the membrane manufacturer as acceptable for their warranty.

B. Final Roof Inspection: Arrange for roofing system manufacturer's technical personnel to inspect roofing installation on completion and submit report to Architect.

C. Repair or remove and replace components of membrane roofing system where test results or inspections indicate that they do not comply with specified requirements.

3.6 CLEAN UP

A. Perform daily clean-up to collect all wrappings, empty containers, paper, and other debris from the project site. Upon completion, all debris must be disposed of in a legally acceptable manner.

B. Prior to the manufacturer’s inspection for warranty, the applicator must perform a pre-inspection to review all work and to verify all flashing has been completed as well as the application of all caulking.

END OF SECTION

SECTION 076200: SHEET METAL FLASHING AND TRIM

PART 1: GENERAL

1.1 SUMMARY

A. This Section includes the following:

1. Formed wall flashing and trim.
2. Manufactured reglets and counter-flashing
3. Formed roof drainage sheet metal fabrications.
4. Formed steep slope roof sheet metal fabrications.
5. Formed wall sheet metal fabrications.
6. Fascias, Roof Edges, and scuppers
7. Roof flashing, vent caps, and counterflashings over base flashings at roof mounted mechanical equipment and vent stacks

1.2 SUBMITTALS

A. Product Data: For each product indicated. Indicating performance and physical characteristics of rolled products and accessories proposed for use.

B. Shop Drawings: Show installation layouts of sheet metal flashing and trim, including plans, elevations, expansion-joint locations, and keyed details. Distinguish between shop- and field-assembled work.

1. Include details for forming, joining, supporting, and securing sheet metal flashing and trim, including pattern of seams, termination points, fixed points, expansion joints, expansion-joint covers, edge conditions, special conditions, and connections to adjoining work.
2. Indicate each type and configuration of flashing and trim work in profile including jointing pattern and details, fastening methods and frequency, locations of expansion and control joints, thickness of materials and finishes.

C. Samples: For each exposed product and for each finish specified.

D. Color Charts: Manufacturer's standard pre-finished product charts showing actual physical coating.

E. Maintenance data and manufacturer's Instructions: Printed manufacturer's installation instructions.

F. Provide 6” sized sample of metal flashing illustrating typical seam, external corner, internal corner, edge flashing, material, and finish.

G. Warranty: Sample of special warranty. Two copies of watertightness warranty, and finish coating warranty on pre-finished products.

1.3 QUALITY ASSURANCE

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

B. Mockups: Build mockups to demonstrate aesthetic effects and set quality standards for fabrication and installation.

1. Build mockup of typical coping at top of EIFS wall, flashing at bottom of EIFS connection to brick wall and roof eave, including fascia and fascia trim, each approximately 48 inches long, including supporting construction cleats, seams, attachments and accessories.
2. Approved mockups may become part of the completed Work if undisturbed at time of Substantial Completion.

C. Preinstallation Conference: Conduct conference at Project site.

D. Installer Qualifications: Company specializing in sheet metal flashing work with three years minimum experience in similar sized installations.

1.4 FIELD SAMPLES

A. Provide one section of each profile, installed in place, including at least one joint. Leave sample in place as standard of workmanship for all remaining work.

1.5 DELIVERY, STORAGE AND HANDLING

A. Stack pre-formed material to prevent twisting, bending, and abrasions, and to provide ventilation.

B. Prevent contact with materials which may cause discoloration or staining.

1.6 WARRANTY

A. Special Warranty on Finishes: manufacturer's standard form in which manufacturer agrees to repair finish or replace sheet metal flashing and trim that shows evidence of deterioration of factory-applied finishes within 20 years from date of Substantial completion.

PART 2: PRODUCTS

2.1 MANUFACTURERS

A. In other Part 2 articles where titles below introduce lists, the following requirements apply to product selection:

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

2. Lead-Coated Copper: ASTM B 101, cold rolled copper sheet, weight as shown on drawings or if not shown, not less than 20.0 oz/s.f. plus 1.0 oz/s.f. of hot dipped lead deposited on each face (total weight of 22.0 oz. /s.f.). Revere "Freedom Gray" Z-T Alloy coated copper, as manufactured by Revere Copper and Brass, Inc., Rome, NY, is approved as an equal.

3. Lead Sheet: ASTM B 749, Type L51121, copper-bearing lead sheet, with a minimum thickness of 0.0625 inch, except not less than 0.0937 inch, where burning is involved.

2.2 SHEET METALS

A. Aluminum Sheet: ASTM B 209, Alloy 3003, 3004, 3105, or 5005, Temper suitable for forming and structural performance required, but not less than H14, finished as follows:

1. High-Performance Organic Finish: Three-coat, thermocured system containing not less than 70 percent polyvinylidene fluoride resin by weight; complying with AAMA 2604.

a. Colors: As selected by Architect from manufacturer's full range (different colors may be selected for different applications).

2.3 MISCELLANEOUS MATERIALS

A. General: Provide materials and types of fasteners, solder, welding rods, protective coatings, separators, sealants, and other miscellaneous items as required for complete sheet metal flashing and trim installation.

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

C. Fasteners: Wood screws, annular threaded nails, self-tapping screws, self-locking rivets and bolts, and other suitable fasteners designed to withstand design loads.

1. Exposed Fasteners: Heads matching color of sheet metal by means of plastic caps or factory-applied coating.
2. Fasteners for Flashing and Trim: Blind fasteners or self-drilling screws, gasketed, with hex washer head.
3. Blind Fasteners: High-strength aluminum or stainless-steel rivets.

D. Sealing Tape: Pressure-sensitive, 100 percent solids, polyisobutylene compound sealing tape with release-paper backing. Provide permanently elastic, non sag, nontoxic, nonstaining tape.

E. Elastomeric Sealant: ASTM C 920, elastomeric silicone polymer sealant; of type, grade, class, and use classifications required to seal joints in sheet metal flashing and trim and remain watertight.

F. Butyl Sealant: ASTM C 1311, single-component, solvent-release butyl rubber sealant, and polyisobutylene plasticized, heavy bodied for hooked-type expansion joints with limited movement.

G. Epoxy Seam Sealer: Two-part, noncorrosive, aluminum seam-cementing compound.

H. Bituminous Coating: Cold-applied asphalt mastic, SSPC-Paint 12, compounded for 15-mil dry film thickness per coat.

2.4 REGLETS/ COUNTERFLASHING

A. Reglets: Units of type, material and profile indicated, formed to provide secure interlocking of separate reglet and counter-flashing pieces, and compatible with flashing indicated.

1. Manufacturer: Fry Reglet Corporation or approved equal.
2. Material: Aluminum, 0.024 inch (0.61 mm) thick>

2.5 FABRICATION, GENERAL

A. General: Custom fabricate sheet metal flashing and trim to comply with recommendations in SMACNA's "Architectural Sheet Metal Manual" that apply to design, dimensions, metal, and other characteristics of item indicated. Shop fabricates items where practicable. Obtain field measurements for accurate fit before shop fabrication.

B. Fabricate sheet metal flashing and trim without excessive oil canning, buckling, and tool marks and true to line and levels indicated, with exposed edges folded back to form hems.

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

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

D. Expansion Provisions: Where lapped or bayonet-type expansion provisions in the Work cannot be used, form expansion joints of intermeshing hooked flanges, not less than 1 inch deep, filled with elastomeric sealant concealed within joints.

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

F. Fabricate cleats and attachment devices from same material as accessory being anchored or from compatible, noncorrosive metal, and in thickness not less than that of metal being secured.

G. Fabricate exposed trim, gravel stops, fasciae, and copings from lead coated copper sheet.

H. Form sections true to shape, accurate in size, square, free from distortion and defects, to profiles indicated in accordance with SMACNA Architectural Sheet Metal Manual.

I. Fabricate cleats and starter strips of same material as sheet, interlockable with sheet.

J. Form pieces in longest practical lengths.

K. Hem exposed flashings on underside 1/2 inch; miter and seam corners.

L. Form materials which are typically concealed from view by the public with lap seams. On exposed seams, use butt- seam/back-up plate type unless noted or detailed otherwise.

M. Solder and seal metal joints except those indicated or required to be expansive type joints. After soldering, remove flux. Wipe and wash solder joints clean.

N. Fabricate corners from one place with minimum 18 inch long legs; solder for rigidity; seal with sealant

O. Fabricate vertical faces with bottom edge formed outward 1/4 inch and hemmed to form drip.

P. Fabricate flashings to allow toe to extend minimum 2 inches over wall surfaces.

Q. Fabricate as much as possible in shop with machinery to eliminate as much hand tooling on the job as possible. Shop fabricates to allow for adjustments in the field for proper anchoring and joining.

2.6 ROOF DRAINAGE SHEET METAL FABRICATIONS

A. Hanging Gutters: Fabricate to cross section indicated, complete with end pieces, outlet tubes, and other accessories as required. Fabricate in minimum 96-inch- (2400-mm-) long sections. Furnish flat-stock gutter spacers and gutter brackets fabricated from same metal as gutters, of size recommended by SMACNA but not less than twice the gutter thickness. Fabricate

expansion joints, expansion-joint covers, gutter bead reinforcing bars, and gutter accessories from same metal gutters.

1. Accessories: Continuous removable leaf screen with sheet metal frame and hardware cloth screen.

B. Built-in Gutters: Fabricate to cross section indicated, with riveted and soldered joints, complete with end pieces, outlet tubes, and other special accessories as required. Fabricate in minimum 96-inch- (2400)-mm-) long sections. Fabricate expansion joints and accessories from same metal as gutters unless otherwise indicated.

1. Accessories: Continuous removable leaf screen with sheet metal frame and hardware cloth screen.

2. Fabricate from the following materials:

a. Stainless Steel: 0.016 inch (0.40 mm) thick.

C. Downspouts: Fabricate downspouts as indicated complete with mitered elbows. Furnish with metal hangers from same material as downspouts, and anchors.

1. Fabricate from the following materials:

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

2.7 LOW-SLOPE ROOF SHEET METAL FABRICATION

A. Base Flashing: Fabricate from the following material:

1. Aluminum: 0.040 inch thick.

B. Counter-flashing and Flashing Receivers: Fabricate from the following material:

1. Aluminum: 0.0320 inch thick.

C. Roof-Edge Flashing (Gravel Stop) and Fascia Cap: Fabricate in minimum 95-inch- (2400-mm-) long but not exceeding 10-foot- (3-m-) long, sections. Furnish with 6-inch-(150-mm-) wide. Joint cover plates. Fabricate from the following materials:

1. Aluminum-Zinc Alloy-Coated Steel: 0.02 inch (0.71 mm) thick.

D. Copings: Fabricate in minimum 96-inch- (2400-mm-) long, but not exceeding 10-foot- (3-m-) long sections. Fabricate joint plates of same thickness as copings. Furnish with continuous cleats to support edge of external leg and drill elongated holes for fasteners on interior leg. Miter corners, seal and solder or weld watertight. Fabricate from the following materials:

1. Aluminum-Zinc Alloy-Coated Steel: 0.02 inch (0.71 mm) thick.

E. Roof-Penetration Flashing: Fabricate from the following materials:

1. Aluminum-Zinc Alloy-Coated Steel: 0.02 inch (0.71 mm) thick.

2.8 STEEP-SLOPE ROOF SHEET METAL FABRICATIONS:

A. Apron, Step, Cricket, and Backer Flashing: Fabricate from the following materials:

1. Aluminum 0.040" thick.

B. Valley Flashing: Fabricate from the following materials:

1. Aluminum 0.040" thick.

C. Drip Edges: Fabricate from the following materials:

1. Aluminum 0.040" thick.

D. Eave, Rake, Ridge, and Hip Flashing: Fabricate from the following materials.

1. Aluminum 0.040" thick.

2.9 WALL SHEET METAL FABRICATIONS

A. Opening Flashing in Frame Construction: Fabricate head, sill, and similar flashings to extend 4 inches beyond wall openings. Form head and sill flashing with 2-inch- high end dams. Fabricate from the following material:

1. Aluminum: 0.0320 inch thick.

B. Wall Expansion- Joint Cover: Fabricate from the following materials:

1. Aluminum

2.10 ACCESSORIES

A. Fasteners

1. Nails: Copper or brass for fastening copper, lead coated copper, and terne coated steel; AISI Series 300 for stainless and galvanized steel; aluminum for aluminum sheets. Use annular ring shank type, No. 12 gage or larger to suit application, of sufficient length to penetrate backing material at least 7/8 inch.

2. Screws and Bolts: Copper or brass for fastening copper, lead coated copper and terne coated steel; AISI Series 300 for stainless and galvanized steel; and aluminum for aluminum sheets; of sufficient size and length to sustain imposed stresses.

B. Solder Materials

1. Flux: Type as recommended by sheet material manufacturer; not detrimental to base material. Use resin type flux for terne metal.

2. Solder: ASTM B 32 type, 50% tin/50% lead for plain copper, galvanized steel and terne metal. Use 60% tin/40% lead for stainless steel and lead copper.

C. Underlayment: ASTM D 266, 30 lb/100 s.f. weights felt containing no additives corrosive to sheet metals. Rosin sized building paper.

D. Slip Sheet: Rosin sized building paper.

E. Protective Back Paint: Bituminous.

F. Sealants: Silicone, non-sagging, building sealant as specified in Section 07900.

G. Reglets: Type SM Spring-lok flashing reglet as made by Fry Reglet, Norcross, GA.

H. Plastic Cement: FS SS-C-153, Bituminous plastic cement.

2.11 FINISHES

A. Aluminum, factory painted to match existing color.

B. Lead Coated Copper & Lead: Natural finish.

PART 3: EXECUTION

3.1 EXAMINATION

A. Verify that surfaces and conditions are ready to receive work of this section. Notify Architect of any existing conditions which will adversely affect execution. Beginning of execution will constitute acceptance of existing conditions.

B. Verify roof openings, curbs, pipes, sleeves, ducts, and 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.

3.2 PREPARATION

A. Field measure site conditions prior to fabricating work.

B. Install starter and edge strips, and cleats before starting installation.

C. Install surface mounted reglets true to lines and levels. Seal top of reglets with sealant.

D. Install one layer of underlayment prior to installing copings and parapet caps.

3.3 INSTALLATION

A. Install using skilled workmen in accordance with manufacturer's printed instruction and recommendations.

B. Conform to drawing details included in manuals published by SMACNA.

C. Insert flashings into reglets to form tight fit. Secure in place with wedges at maximum 12 inches on center. Seal flashings into reglets with sealant.

D. Secure flashings in place using concealed fasteners. Use exposed fasteners only in locations approved by Architect.

E. Lap seam flashings and other work not normally exposed to view. Use butt joint with drive cleat joint method for all exposed flashings, coping caps, and guards. Seal all joints.

F. Apply plastic cement compound between metal flashings and felt flashings.

G. Fit flashings tight in place. Make corners square, surfaces true and straight in planes, and lines accurate to profiles.

H. Seal metal joints watertight.

I. Provide electrolytic separation between dissimilar metals with protective back paint.

J. On soldered metal joints, make watertight for full metal surface contact. After soldering, wash metal clean with neutralizing solution and rinse with water.

K. Install expansion joints at frequency as recommended in SMACNA Architectural Sheet Metal Manual. Do not fasten seams such that movement is restricted. Coordinate expansion joint locations with joints in adjacent materials.

3.4 FIELD QUALITY CONTROL

A. Install surfaces flat such that from normal viewing distances, no waviness or oil canning is visible.

3.5 INSTALLATION, GENERAL

A. General: Anchor sheet metal flashing and trim and other components of the Work securely in place, with provisions for thermal and structural movement. Use fasteners, solder, welding rods, protective coatings, separators, sealants, and other miscellaneous items as required to complete sheet metal flashing and trim system.

1. Torch cutting of sheet metal flashing and trim is not permitted.

B. Metal Protection:

Where dissimilar metals will contact each other or corrosive substrates, protect against galvanic action by painting contact surfaces with bituminous coating or by other permanent separation as recommended by fabricator or manufacturers of dissimilar metals.

3.6 ROOF FLASHING INSTALLATION

A. General: install sheet metal flashing and trim to comply with performance requirements, sheet metal manufacturer's written installation instructions, and SMACNAS's "Architectural Sheet Metal Manual>" Provide concealed fasteners where possible, set units true to line, and level as indicated. Install work with laps, joints, and seams that will be permanently watertight and weather resistant.

B. Roof Edge Flashing: Anchor to resist uplift and outward forces according to recommendations in SMACNA's "Architectural Sheet Metal Manual" and as indicated. Interlock bottom edge of roof edge flashing with continuous cleat anchored to substrate at staggered 3-inch (75mm) enters.

C. Copings: Anchor to resist uplift and outward forces according to recommendations in SMACNA's "Architectural Sheet Metal Manual" and as indicated.

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

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

D. Pipe or Post Counter-flashing: Install counter-flashing umbrella with closed-fitting collar with top edge flared for elastomeric sealant, extending a minimum of 4 inches (100 mm) over base flashing. Install stainless-steel draw band and tighten.

E. Counter-flashing: Coordinate installation of counter-flashing with installation of base flashing. Insert counter-flashing in reglets or receivers and fit tightly to base flashing. Extend counter-flashing 4 inches (100 mm) and bed with sealant.

F. Roof-Penetration Flashing: Coordinate installation of roof-penetration flashing with installation of roofing and other items penetrating roof. Seal with sealant and clamp flashing to pipes that penetrate roof.

3.7 CLEANING AND PROTECTION

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

B. Clean off excess sealants.

C. Remove temporary protective coverings and strippable films as sheet metal flashing and trim are installed unless otherwise indicated in manufacturer's written installation instructions.

3.8 WALL FLASHING INSTALLATION

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

1. Install sealant tape where indicated.

B. Openings Flashing in Frame Construction: Install continuous head, sill, jamb, and similar flashings to extend 4 inches beyond wall openings.

1. Underlayment: Where installing metal flashing directly on cementitous or wood substrates, install a course of felt underlayment and cover with a slip sheet or install a course of polyethylene sheet.

3.9 ROOF DRAINAGE SYSTEM INSTALLATION

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

B. Hanging Gutters: Join sections with riveted and soldered joints or with lapped joints sealed with sealant. Provide for thermal expansion. Attach gutters at eave or fascia to firmly anchored gutter brackets or straps spaced not more than 36 inches (900 mm) apart. Provide end closures and seal water

1. Install gutter with expansion joints at locations indicated, but not exceeding, 50 feet (15.24m) apart. Install expansion-joint caps.

2. Install continuous gutter screens on gutters with noncorrosive fasteners, removable for cleaning gutters.

C. Join sections with riveted and soldered or lapped joints sealed with sealants. Provide for thermal expansion. Slope to downspouts. Provide end closures and seal watertight with sealant.

1. Install felt underlayment layer in built-in gutter rough and extend to drip edge at eaves and under felt underlayment on roof sheathing. Lap sides a minimum of 2 inches (50 mm) over underlying course. Lap ends a minimum of 4 inches (100 mm). Stagger end laps between succeeding courses at least 72 inches (1830 mm) Fasten with roofing nails. Install slip sheet over felt underlayment.

2. Install gutter with expansion joints at locations indicated, but not exceeding, 50 feet (15.24 m) apart. Install expansion-joint caps.

D. Downspouts: Join sections with 1-1/2-inch (38-mm) telescoping joints. Provide hangers with fasteners designed to hold downspouts securely to walls. Locate hangers at top and bottom and at approximately 60 inches (1500 mm) o.c. in between.

E. Splash Pans: Install where downspouts discharge on low-slope roofs. Set in adhesive material compatible with the roofing.

F. Scupper Boxes: Anchor securely to call below gutter discharge as indicated on drawing.

G. Expansion-Joint Covers: install expansion-joint covers at locations and of configuration indicated. Lap joints a minimum of 4 inches (100 mm) in direction of water flow.

END OF SECTION

SECTION 077123: GUTTERS AND DOWNSPOUTS

PART 1: GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 1 Specification Sections, apply to this Section.

1.2 SUMMARY

A. This Section includes
   1. Pre-finished galvanized steel gutters and downspouts.
   2. Finish must conform to the "Metal Construction Association Certified Premium Painted™" Standard.

1.3 REFERENCES

A. ASTM A653/A653M - Standard Specification for Steel Sheet, Zinc-Coated (Galvanized) or Zinc-Iron Alloy-Coated (Galvannealed) by the Hot-Dip Process; 2006a.

B. Sheet Metal and Air Conditioning Contractors' National Association (SMACNA) - Architectural Sheet Metal Manual (ASMM); 2003.

1.4 DESIGN REQUIREMENTS

A. Conform to SMACNA Architectural Sheet Metal Manual for sizing components for rainfall intensity determined by a storm occurrence of 1 in 5 years.

1.5 SUBMITTALS

A. See Section 013000 for submittal procedures.

B. Shop Drawings: Indicate locations, configurations, jointing methods, fastening methods, locations and installation details.

PART 2: PRODUCTS

2.1 GUTTERS AND DOWNSPOUTS

A. Basis-of-Design Product: By ATAS International, Inc., ATAS Headquarters, Allentown, Pennsylvania 18106; PH: 800-468-1441; FX: 610-395-9342; EM: info@atas.com. Subject to compliance with requirements, provide the named product or a comparable product by one of the following:
   1. MBCI
   2. Interlock Roofing Ltd.
   3. Englert Inc, Perth Amboy, NJ
   4. ATAS International, Inc.

B. Material: Galvalume-Plus(R): Bethlehem Steel Corporation cold-rolled steel sheet to which corrosion-resistant aluminum-zinc alloy coating, chromate pretreatment, and 70 Percent Kynar 500 (R) Coating (PermaColor 2000) acrylic coating is factory-applied.
   1. Color: To be selected from manufacturer's standard color palette to match metal roofing system.

2.2 COMPONENTS

A. Gutters: K-style profile.

B. Downspouts: Rectangular Profile.

C. Anchors and Supports: Profiled to suit gutters and downspouts.
   1. Gutter Supports: Brackets.
   2. Downspout Supports: Brackets.

D. Fasteners: Galvanized steel, with soft neoprene washers.

2.3 ACCESSORIES

A. Splash Pads: Precast concrete type, size and profiles indicated; minimum 3000 psi at 28 days, with minimum 5 percent air entrainment.

2.4 FABRICATION

A. Form gutter and downspouts of profiles and size indicated.

B. Fabricate with required connection pieces.

C. Form sections square true, and accurate in size, in maximum possible lengths, free of distortion or defects detrimental to appearance or performance.

D. Hem exposed edges of metal

E. Fabricate gutter and downspout accessories; seal watertight.

2.5 FACTORY FINISHING

A. Fluoropolymer Coating: High Performance Organic Finish, AAMA 2604; multiple coats, thermally cured fluoropolymer finish system; color as scheduled.

PART 3: EXECUTION

3.1 INSTALLATION

A. Install gutters, downspouts, and accessories in accordance with manufacturer's instructions.

B. Sheet Metal: Join lengths with formed seams sealed watertight. Flash and seal gutters to

downspouts and accessories.

C. Slope gutters 1/16 inch per foot to downspouts.

D. Set splash pans under down spouts or connect downspouts to stormwater system as indicated on drawings.

END OF SECTION 077123

SECTION 078413: PENETRATION FIRESTOPPING

PART 1: GENERAL

1.1 SUMMARY

A. This Section includes through-penetration firestop systems for penetrations through fire-resistance-rated constructions, including both empty openings and openings containing penetrating items.

1.2 PERFORMANCE REQUIREMENTS

A. General: For penetrations through fire-resistance-rated constructions, including both empty openings and openings containing penetrating items, provide through-penetration firestop systems that are produced and installed to resist spread of fire according to requirements indicated, resist passage of smoke and other gases, and maintain original fire-resistance rating of construction penetrated.

B. Rated Systems: Provide through-penetration firestop systems with the following ratings determined per ASTM E 814:

1. F-Rated Systems: Provide through-penetration firestop systems with F-ratings indicated, but not less than that equaling or exceeding fire-resistance rating of constructions penetrated.

C. For through-penetration firestop systems exposed to view, traffic, moisture, and physical damage, provides products that, after curing, do not deteriorate when exposed to these conditions both during and after construction.

1. For piping penetrations for plumbing and wet-pipe sprinkler systems, provide moisture-resistant through-penetration firestop systems.
2. For penetrations involving insulated piping, provide through-penetration firestop systems not requiring removal of insulation.

D. For through-penetration firestop systems exposed to view, provide products with flame-spread and smoke-developed indexes of less than 25 and 450, respectively, as determined per ASTM E 84.

1.3 SUBMITTALS

A. Schedule: Submit a schedule of through-penetrations, indicating type and rating of wall/partition, size of penetration, type of penetration and proposed type of fire-stop with UL rating, specific product and manufacturer.

B. Product Data: For each type of product proposed.

C. Shop Drawings: For each through-penetration firestop system, submit documentation, including illustrations, from a qualified testing and inspecting agency, showing each type of construction condition penetrated, relationships to adjoining construction, and type of penetrating item.

D. Qualification Data: For Installer.

1.4 QUALITY ASSURANCE

A. Installer Qualifications: A firm that has been approved by FMG according to FMG 4991, "Approval of Firestop Contractors."

B. Fire-Test-Response Characteristics: Provide through-penetration firestop systems that comply with the following requirements and those specified in Part 1 "Performance Requirements" Article:

1. Firestopping tests are performed by a qualified testing and inspecting agency. A qualified testing and inspecting agency is UL, or another agency performing testing and follow-up inspection services for firestop systems acceptable to authorities having jurisdiction.
2. Through-penetration firestop systems are identical to those tested per testing standard referenced in "Part 1 Performance Requirements" Article. Provide rated systems bearing classification marking of qualified testing and inspecting agency.

C. Coordinate construction of openings and penetrating items to ensure that through-penetration firestop systems are installed according to specified requirements.

D. Do not cover up through-penetration firestop system installations that will become concealed behind other construction until each installation has been examined by building inspector, if required by authorities having jurisdiction.

PART 2: PRODUCTS

2.1 MANUFACTURERS

A. Products: Subject to compliance with requirements, provide one of the through-penetration firestop systems indicated for each application that are produced by one of the following manufacturers:
1. Hilti, Inc.
2. Specified Technologies Inc.
3. 3M; Fire Protection Products Division.
4. Tremco; Sealant/Weatherproofing Division.
5. USG Corporation.

2.2 FIRESTOPPING

A. Compatibility: Provide through-penetration firestop systems that are compatible with one another; with the substrates forming openings; and with the items, if any, penetrating through-penetration firestop systems, under conditions of service and application, as demonstrated by through-penetration firestop system manufacturer based on testing and field experience.

B. Accessories: Provide components for each through-penetration firestop system that are needed to install fill materials and to comply with Part 1 "Performance Requirements" Article. Use only components specified by through-penetration firestop system manufacturer and approved by qualified testing and inspecting agency for firestop systems indicated.

PART 3: EXECUTION

3.1 THROUGH-PENETRATION FIRESTOP SYSTEM INSTALLATION

A. Fire Resistance Rating: All Through-Penetration Firestops shall be rated “2-hour fire-resistance.”

B. General: Install through-penetration firestop systems to comply with Part 1 "Performance Requirements" Article and with firestop system manufacturer's written installation instructions and published drawings for products and applications indicated.

C. Install forming/damming/backing materials and other accessories of types required to support fill materials during their application and in the position needed to produce cross-sectional shapes and depths required to achieve fire ratings indicated.

1. After installing fill materials and allowing them to fully cure, remove combustible forming materials and other accessories not indicated as permanent components of firestop systems.

D. Install fill materials for firestop systems by proven techniques to produce the following results:

1. Fill voids and cavities formed by openings, forming materials, accessories, and penetrating items as required achieving fire-resistance ratings indicated.
2. Apply materials so they contact and adhere to substrates formed by openings and penetrating items.
3. For fill materials that will remain exposed after completing Work, finish to produce smooth, uniform surfaces that are flush with adjoining finishes.

END OF SECTION

SECTION 079200: JOINT SEALANTS

PART 1: GENERAL

1.1 SUMMARY

A. This Section includes joint sealants for the following applications, including those specified by reference to this Section:

1. Elastomeric sealant for both exterior and interior general building applications.

2. Elastomeric sealant for use in food service and storage areas, including walk-in cooler.
3. Elastomeric sealant for use in toilet rooms.
4. Solvent release sealant for use as setting bed for exterior door saddles.
5. Latex joint sealant for use only with nonmoving interior joints
6. Acoustical sealant for use only with interior gypsum board partitions and ceiling...

B. See Division 7 Section "Through-Penetration Firestop Systems" for sealants at fire-rated construction.

1.2 PERFORMANCE REQUIREMENTS

A. Provide elastomeric joint sealants that establish and maintain watertight and airtight continuous joint seals without staining or deteriorating joint substrates.

1.3 SUBMITTALS

A. Product Data: For each joint-sealant product indicated.

B. Samples: For each type and color of joint sealant required, provide Samples with joint sealants in 1/2-inch- wide joints formed between two 6-inch- long strips of material matching the appearance of exposed surfaces adjacent to joint sealants.

C. Compatibility and adhesion test reports.

D. Product certificates.

1.4 QUALITY ASSURANCE

A. Preconstruction Compatibility and Adhesion Testing: Submit samples of materials that will contact or affect joint sealants to joint-sealant manufacturers for testing according to manufacturer's standard test method to determine whether priming and other specific joint preparation techniques are required to obtain rapid, optimum adhesion of joint sealants to joint substrates.

B. Preconstruction Field-Adhesion Testing: Before installing elastomeric sealants, field test their adhesion to Project joint substrates according to the method in ASTM C 1193 that is appropriate for the types of Project joints.

1.5 WARRANTY

A. Special Installer's Warranty: Installer's standard form in which Installer agrees to repair or replace elastomeric joint sealants that do not comply with performance and other requirements specified in this Section within specified warranty period.

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

B. Special Manufacturer's Warranty: Manufacturer's standard form in which elastomeric sealant manufacturer agrees to furnish elastomeric joint sealants to repair or replace those that do not comply with performance and other requirements specified in this Section within specified warranty period.

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

PART 2: PRODUCTS

2.1 MANUFACTURERS

A. Products: Subject to compliance with requirements, provide one of the products listed in other Part 2 articles.

2.2 MATERIALS, GENERAL

A. Compatibility: Provide joint sealants, backings, 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 of Exposed Joint Sealants: As selected by Architect from manufacturer's full range.

2.3 ELASTOMERIC JOINT SEALANTS

A. Elastomeric Sealants: Comply with ASTM C 920 and other requirements indicated for each liquid-applied chemically curing sealant specified, including those referencing ASTM C 920 classifications for type, grade, class, and uses related to exposure and joint substrates.

B. Stain-Test-Response Characteristics: Where elastomeric sealants are specified to be nonstaining to porous substrates, provide products that have undergone testing according to ASTM C 1248 and have not stained porous joint substrates indicated for Project.

C. Suitability for Contact with Food: Where elastomeric sealants are indicated for joints within food service or food storage areas, including the walk-in cooler, provide products that comply with 21 CFR 177.2600.

D. Single-Component Neutral-Curing Silicone Sealant **for both interior and exterior general building use, except food service areas**:

1. Products: Dow Corning Corporation; 795, Silicon Building Sealant, or an equivalent product by GE Silicones or Pecora Corporation.

2. Type and Grade: S (single component) and NS (nonsag).
3. Class: 50.
4. Use Related to Exposure: NT (nontraffic).
5. Uses Related to Joint Substrates: M, G, A, and, as applicable to joint substrates indicated, O.
6. Stain-Test-Response Characteristics: Nonstaining to porous substrates per ASTM C 1248.

E. Single-Component Neutral-Curing Silicone Sealant **for use in food service areas and all cooler applications**:
1. Products: Dow Corning 748, Noncorrosive Sealant, or an equivalent product by GE Silicones or Pecora Corporation.
2. Accepted by the FDA and NSF for use in contact with food.
3. Type and Grade: S (single component) and NS (nonsag).

F. Single-Component Mildew-Resistant Acid-Curing Silicone Sealant **for use in toilet rooms and janitorial closets**.

1. Products: Dow Corning Corporation, 786 Mildew Resistant; or an equivalent by GE Silicones Sanitary SCS1700; or Tremco, Tremsil 200.
2. Type and Grade: S (single component) and NS (nonsag).
3. Class: 25.
4. Use Related to Exposure: NT (nontraffic).
5. Uses Related to Joint Substrates: G, A, and, as applicable to joint substrates indicated, O.

2.4 SOLVENT-RELEASE JOINT SEALANTS

A. Butyl-Rubber-Based Solvent-Release Joint Sealant **for use as setting bed at exterior door saddles**: Comply with ASTM C 1085.

1. Products:

a. Bostik Findley; Bostik 300.
b. Fuller, H. B. Company; SC-0296.
c. Pecora Corporation; BC-158.
d. Polymeric Systems Inc.; PSI-301.
e. Sonneborn, Division of ChemRex Inc.; Sonneborn Multi-Purpose Sealant.
f. Tremco; Tremco Butyl Sealant.

2.5 LATEX JOINT SEALANTS LATEX JOINT SEALANTS

A. Latex Sealant **for use in interior non-moving joints only**: Comply with ASTM C 834, Type P, Grade NF.

B. Products:

1. Bostik Findley; Chem-Calk 600.
2. Pecora Corporation; AC-20+.

3. Schnee-Morehead, Inc.; SM 8200.
4. Sonneborn, Division of ChemRex Inc.; Sonolac.
5. Tremco; Tremflex 834.

2.6 ACOUSTICAL JOINT SEALANTS

A. Acoustical Sealant for Exposed and Concealed Joints **for use in conjunction with interior drywall partitions and ceilings only**.: Manufacturer's standard nonsag, paintable, nonstaining latex sealant complying with ASTM C 834 and the following:

1. Product effectively reduces airborne sound transmission through perimeter joints and openings in building construction as demonstrated by testing representative assemblies according to ASTM E 90.
2. Products:

    a. Pecora Corporation; AC-20 FTR Acoustical and Insulation Sealant.
    b. United States Gypsum Co.; SHEETROCK Acoustical Sealant.

2.7 JOINT-SEALANT BACKING

A. General: Provide sealant backings of material and type that 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. Cylindrical Sealant Backings: ASTM C 1330, Type C (closed-cell material with a surface skin), and of size and density to control sealant depth and otherwise contribute to producing optimum sealant performance:

C. Elastomeric Tubing Sealant Backings: Neoprene, butyl, EPDM, or silicone tubing complying with ASTM D 1056, nonabsorbent to water and gas, and capable of remaining resilient at temperatures down to minus 26 deg F. Provide products with low compression set and of size and shape to provide a secondary seal, to control sealant depth, and to otherwise contribute to optimum sealant performance.

D. Bond-Breaker Tape: Polyethylene tape or other plastic tape 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. Provide self-adhesive tape where applicable.

2.8 MISCELLANEOUS MATERIALS

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

B. Cleaners for Nonporous Surfaces: Chemical cleaners acceptable to manufacturers of sealants and sealant backing materials, free of oily residues or other substances capable of staining or

harming joint substrates and adjacent nonporous surfaces in any way, and formulated to promote optimum adhesion of sealants to joint substrates.

C. Masking Tape: Nonstaining, nonabsorbent material compatible with joint sealants and surfaces adjacent to joints.

PART 3: EXECUTION

3.1 PREPARATION

A. Surface Cleaning of Joints: Clean out joints immediately before installing joint sealants.

1. Remove all foreign material from joint substrates that could interfere with adhesion of joint sealant.

    a. Clean 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 sealants. Remove loose particles remaining after cleaning operations above by vacuuming or blowing out joints with oil-free compressed air.

2. Remove laitance and form-release agents from concrete.

    a. Clean nonporous surfaces with chemical cleaners or other means that do not stain, harm substrates, or leave residues capable of interfering with adhesion of joint sealants.

B. Joint Priming: Prime joint substrates based on preconstruction joint-sealant-substrate tests or prior experience. Apply primer to comply with joint-sealant manufacturer's written instructions. Confine primers to areas of joint-sealant bond; do not allow spillage or migration onto adjoining surfaces.

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

3.2 INSTALLATION

A. Sealant Installation Standard: Comply with recommendations in ASTM C 1193 for use of joint sealants as applicable to materials, applications, and conditions indicated.

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

C. Install sealant backings of type indicated to support sealants during application and at position required to produce cross-sectional shapes and depths of installed sealants relative to joint widths that allow optimum sealant movement capability.

1. Do not leave gaps between ends of sealant backings.
2. Do not stretch, twist, puncture, or tear sealant backings.
3. Remove absorbent sealant backings that have become wet before sealant application and replace them with dry materials.

D. Install bond-breaker tape behind sealants where sealant backings are not used between sealants and backs of joints.

E. Install sealants using proven techniques that comply with the following and at the same time backings are installed:

1. Place sealants so they directly contact and fully wet joint substrates.
2. Completely fill recesses in each joint configuration.
3. Produce uniform, cross-sectional shapes and depths relative to joint widths that allow optimum sealant movement capability.

F. Tooling of Nonsag Sealants: Immediately after sealant application and before skinning or curing begins, tool sealants according to requirements specified below to form smooth, uniform beads of configuration indicated; to eliminate air pockets; and to ensure contact and adhesion of sealant with sides of joint.

1. Remove excess sealant from surfaces adjacent to joints.
2. Use tooling agents that are approved in writing by sealant manufacturer and that do not discolor sealants or adjacent surfaces.
3. Provide concave joint configuration per Figure 5A in ASTM C 1193, unless otherwise indicated.

G. Clean off excess sealant or sealant smears adjacent to joints as the Work progresses by methods and with cleaning materials approved in writing by manufacturers of joint sealants and of products in which joints occur.

END OF SECTION