
SECTION 07 21 00
THERMAL INSULATION**PART 1 – GENERAL**

1.1 DESCRIPTION

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

1.2 SUBMITTALS

- A. Product data: submit manufacturer's product literature and installation instructions for each type of insulation and vapor retarder material required.

1.3 DELIVERY, STORAGE AND HANDLING

- A. General protection: protect insulation from physical damage and from becoming wet, soiled or exposed to exterior elements, comply with manufacturer's recommendations for handling, storage and protection during installation.

PART 2 – PRODUCTS

2.1 ACCEPTABLE MANUFACTURES

- A. Owens Corning
- B. Johns Manville
- C. Certain Teed

2.2 INSULATING MATERIAL

- A. General: provide insulation materials which comply with requirements indicated for materials, compliance with referenced preformed units: sizes to fit applications indicated, selected from manufacturer's standard thickness, widths and lengths.
 - 1. Combustion characteristics: unfaced blanket/batt passes ASTM e 136 test.
 - 2. Surface burning characteristics: maximum flame spread of 25 and smoke developed values of 50.

2.3 BATT INSULATION

- A. Insulation shall be mineral wool with vapor retarder facing.
 - 1. Kraft faced insulation shall comply with ASTM c 665, type ii, class c.
 - 2. Foil-faced insulation shall comply with ASTM c 665, type iii, class b. Minimum thickness: 6"
- B. Rigid insulation board: insulation board shall be Polyiso insulation complying with federal specificationhh-1-1972/2 class 1 and factory mutual (FM) standard 4450/4470 class 1-90 windstorm classification.

2.4 AUXILARY INSULATING MATERIALS

- A. Adhesive for bonding insulation: type recommended by insulation manufacturer, and complying with requirements for fire performance characteristics.
- B. Mechanical anchors: type and size indicated or, if not indicated as recommended by insulation manufacturer for type of application and condition of substrate.
- C. Mastic sealer: type recommended by insulation manufacturer for bonding edge joints between units and filling voids in work.

PART 3 – EXECUTION

3.1 INSPECTION AND PREPARATION

- A. Require installer to examine substrates and conditions under which is to be performed. A satisfactory substrate is one that complies with requirements of the section in which substrate and related work is specified. Obtain installer's written report listing conditions detrimental to performance of work in this section. Do not proceed with installation of insulation until satisfactory conditions have been corrected.
- B. Clean substrates of substances harmful to insulations or vapor retarders, including removal of projections which might puncture vapor retarders.

3.2 INSTALLATION

- A. Comply with manufacturer's instructions for particular conditions of installation in each case. If printed instructions are not available or do not apply to project conditions, consult manufacturer's technical representative for specific recommendations before proceeding with work. Require installer to examine substrate and conditions under which insulation work is to be performed. Do not proceed with insulation until unsatisfactory conditions have been corrected.
- B. Extend insulation full thickness as shown over entire area to be insulated. Cut and fit tightly around obstructions and fill voids with insulation. Remove projections, which interfere with placement.
- C. Apply a single layer of insulation of required thickness, unless otherwise shown or required to make up total thickness.

3.3 PROTECTION

- A. General: protect installed insulation and vapor retarders from harmful weather exposures and from possible physical abuses, where possible by non-delayed installation of concealed work or, where that is not possible, by temporary covering or enclosure.

3.4 SITE ENVIRONMENTAL PROCEDURES

- A. Waste management: as specified in Section 01 74 00 - Construction Waste Management and as follows:
 - 1. Coordinate with manufacturer and/or local recycler for recycling. Set aside scrap to be returned to manufacturer for recycling into new product.

END OF SECTION

SECTION 07 25 00
WEATHER BARRIERS**PART 1 - GENERAL****1.1 RELATED DOCUMENTS**

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

- A. Section Includes:
 - 1. Commercial weather barrier assemblies.
 - 2. Flexible flashing.
 - 3. Weather barrier flashing.
 - 4. Weather barrier accessories.

1.3 DEFINITIONS

- A. Weather Barrier: A combination of materials and accessories that do the following:
 - 1. Prevents the accumulation of water as a water-resistive barrier.
 - 2. Minimizes the air leakage into or out of the building envelope as a continuous air barrier.
 - 3. Provides sufficient water vapor transmission to enable drying as a vapor-permeable membrane.

1.4 ACTION SUBMITTALS

- A. Product Data: For each type of product.
 - 1. For weather barrier, include data on air and water-vapor permeance based on testing in accordance with referenced standards.
- B. Installer's weather barrier manufacturer-training certificate.

1.5 QUALITY ASSURANCE

- A. Installer Qualifications: A qualified firm that is certified by weather barrier system manufacturer to install manufacturer's product.

1.6 DELIVERY, STORAGE, AND HANDLING

- A. Do not store near heat source or open flame.

1.7 WARRANTY

- A. Manufacturer's Product Warranty: To repair or replace weather barrier product that fails in materials within specified warranty period.

1. Warranty Period: 10 years from date of purchase.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

- A. Source Limitations: Obtain weather barrier assembly components, including weather barrier flashing.

2.2 PERFORMANCE REQUIREMENTS

- A. General Performance: Installed weather barrier and accessories shall withstand s

2.3 WEATHER BARRIER

- A. Commercial Building Wrap: ASTM E 2357 passed, ABAA (Air Barrier Association of America) evaluated air barrier assembly, and assembly water resistance per ASTM E 331; with flame-spread and smoke-developed indexes of less than 25 and 450, respectively, when tested in accordance with ASTM E 84; UV stabilized for nine-month exposure; and acceptable to authorities having jurisdiction.

1. Basis-of-Design Product:

- a. Subject to compliance with requirements, provide products by one of the following manufacturers, or approved equal:

- 1) DuPont Safety & Construction: E. I. du Pont de Nemours and Company; Tyvek® CommercialWrap®
- 2) Owens Corning
- 3) Carlisle Coatings & Waterproofing, Inc.

2. System Description, single-layer weather barrier, including flashing and sealing of penetrations and seams..

3. Air Permeance, Product: Not more than 0.001 cfm/sq. ft. at 1.57 lbf/sq. ft. when tested in accordance with ASTM E 2178.

4. Air Permeance, Assembly: Not more than 0.04 cfm/sq. ft. at 1.57 lbf/sq. ft. when tested in accordance with ASTM E 2357 and evaluated by ABAA.

5. Water Penetration Resistance, Product: Hydrostatic head resistance greater than 7.7 feet in accordance with AATTC 127.

6. Weather barrier system to have a VOC content of 30 g/L or less.

2.4 WEATHER BARRIER FLASHING

- A. Conformable Weather Barrier Flashing: Composite flashing material composed of micro-creped, polyethylene laminate with a 100 percent butyl-based adhesive layer; AAMA 711 Class A (no primer), Level 3 thermal exposure, 176 deg F (80 deg C) for 7 days.

1. Basis-of-Design Product: Subject to compliance with requirements, provide DuPont Safety & Construction: E. I. du Pont de Nemours and Company; FlexWrap™ NF or comparable product by equal manufacturer:

2. Conformability: Able to create a seamless sill pan extending up the jambs without cuts, patches, or fasteners.
3. Water Penetration: No leakage at 15 psf per ASTM E 331.
4. Low Temperature Adhesion: Exceeds minimum value of 1.5 lb./in. at 25 degrees F as Class A.
5. Adhesion After Water Immersion: Exceeds minimum value of 1.5 lb./in., after AAMA 800, Sections 2.4.1.3.1/2.4.1.4.3, Test B.

- B. Strip Flashing: Composite flashing material composed of spunbonded polyethylene laminate with 100 percent butyl-based, dual-sided, adhesive layer; AAMA 711, Class A (no primer), Level 3 thermal exposure, 176 deg F for 7 days.

1. Water Penetration: No leakage at 15 psf per ASTM E 331.
2. Low Temperature Adhesion: Exceeds minimum value of 1.5 lb./in. at 25 deg F as Class A without primer use.
3. Adhesion After Water Immersion: Exceeds minimum value of 1.5 lb./in., after AAMA 800, Sections 2.4.1.3.1/2.4.1.4.3, Test B.

2.5 WEATHER BARRIER ACCESSORIES

- A. Building-Wrap Tape: Pressure-sensitive plastic tape recommended by weather barrier manufacturer for sealing joints and penetrations in commercial building wrap.
- B. Fasteners with Self-Gasketing Washers: Commercial building wrap manufacturer's recommended pneumatically or hand-applied fasteners with 1-inch diameter, high-density polyethylene cap washers with UV inhibitors.
- C. Primer for Flashings: Synthetic rubber-based product; spray applied. Strengthen adhesive bond at low temperature applications between weather products such as self-adhered flashing products, commercial building wraps, and common building sheathing materials.
1. Peel Adhesion Test: Passes in accordance with ASTM D 3330, Test Method F, for the following.
 - a. Peel Angles: 0, 25, 72, and 180 degrees.
 - b. Substrates: Concrete masonry units (CMU), exterior gypsum sheathing, oriented strand board (OSB), aluminum, and vinyl.
 2. Chemical Compatibility: Pass; AAMA 713.
 3. Flame Spread Index: 5; ASTM E 84.
 4. Smoke Development Index: 0; ASTM E 84.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Examine substrates, with Installer present, for compliance with requirements.
- B. Verify that substrate and surface conditions are in accordance with commercial weather barrier manufacturer recommendations prior to installation.
1. Verify that rough sill framing for doors and windows is sloped downwards towards the exterior and is level across width of the opening.
- C. Verify that surfaces to receive weather barrier flashing are clean, dry, and free of frost.
- D. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 PREPARATION

- A. Direct water onto an acceptable weather barrier drainage plane with an unobstructed path to exterior of wall.
 - 1. Provide a drainage path for water intrusion through window and door attachment system that collects at window and door sills and directs water to the exterior or weather barrier.

3.3 COMMERCIAL BUILDING WRAP INSTALLATION

- A. General: Comply with weather barrier manufacturer's written instructions and warranty requirements.
- B. Cover exposed exterior surface of sheathing with weather barrier securely fastened to framing immediately after sheathing is installed.
 - 1. Maintain continuity of air and water barrier assemblies.
 - 2. Start weather barrier installation at a building corner, leaving 12 inches of weather barrier extended beyond corner to overlap.
 - 3. Install weather barrier horizontally starting at lower portion of wall surface.
 - 4. Provide minimum 6 inches overlap at horizontal- and vertical-wrap seams in a shingle manner to maintain continuous downward drainage plane and air and water barrier.
- C. Seams: Seal seams with building wrap tape per manufacturer's recommended installation instructions.
 - 1. Shiplap horizontal seams in weather barrier to facilitate proper drainage.
- D. Fasteners: Use weather barrier manufacturer's recommended fasteners to secure weather barrier and install fasteners according weather barrier manufacturer's installation guidelines.
 - 1. Do not use temporary fasteners to permanently attach weather barrier.
 - 2. Do not place fasteners with gasketing washers where weather barrier flashing will be installed.
 - 3. Install fasteners with gasketing washers through flashing where recommended by manufacturer.
- E. Openings: Completely cover openings with weather barrier, then cut weather barrier membrane to openings according to weather barrier manufacturer's installation guidelines.
 - 1. Provide head and jamb flaps and seam overlaps to maintain continuous drainage.
 - 2. Repair damage to weather barrier using method recommended by weather barrier manufacturer.
 - 3. Install flashing according to weather barrier manufacturer's installation guidelines.

3.4 WEATHER BARRIER FLASHING INSTALLATION

- A. Installation: Remove wrinkles and bubbles, reposition weather barrier as necessary to produce a uniform, smooth surface.
 - 1. Ensure that ambient and substrate surface temperatures are acceptable in accordance with manufacturer instructions and recommendations.
 - 2. Wipe surfaces to remove moisture, dirt, grease and other debris that could interfere with adhesion.
 - 3. Apply weather barrier manufacturer's recommended primer over concrete, masonry, and glass-mat gypsum wall sheathing substrates to receive weather barrier flashing.
 - 4. Lap weather barrier flashing a minimum of 2 inches (50 mm) onto weather barrier.

5. Apply pressure over entire surface using roller or firm hand pressure

B. Rough Openings: Shiplap flashing with weather barrier in a shingle manner to maintain a continuous downward drainage plane and air and water barrier in accordance with manufacturer's written instructions.

1. Apply 6-inch-wide conformable weather barrier flashing at door and window sills.
2. Ensure that sill flashing does not slope to the interior.
3. Install backer rod in joint between frame of opening product and flashed rough opening on the interior.
4. Apply sealant or closed-cell polyurethane foam insulation around entire opening/fenestration product to create air seal around interior perimeter of window openings in accordance with weather barrier manufacturer's instructions.
5. Around door and window openings, apply butyl-based flashing to flaps of weather barrier.
6. Use strip flashing with wrap cap screws to secure head flap of the windows.

C. Penetrations: Apply weather barrier manufacturer's recommended weather barrier flashing patches behind fastening plates, such as brick-tie base plates, metal-flashing clips, and metal channels.

1. Seal weather barrier around each penetration with weather barrier manufacturer's recommended self-adhered flashing product or sealant. Integrate products with flanges into the weather barrier.

D. Terminations: Provide minimum 2 inches overlap using strip flashing on adjoining roof and base of wall systems to maintain continuous downward drainage plane.

1. Secure weather barrier with fasteners and weather-barrier flashing.

3.5 PROTECTION

A. Protect installed weather barrier from the following:

1. Damage from cladding, structure, or a component of the structure (e.g., window, door, or wall system).
2. Contamination from building site chemicals, premature deterioration of building materials, or nonstandard use or application of products.
3. Foreign objects or agents, including the use of materials incompatible with weather barrier products.
4. UV exposure in excess of products' stated limits.

END OF SECTION

SECTION 07 31 13
ASPHALT SHINGLES**PART 1 - GENERAL****1.1 SUMMARY**

- A. Extent of shingles is indicated on drawings and is hereby defined to include moisture shedding underlayment, eave, valley and ridge protection, and associated protective flashing.

1.2 SUBMITTALS

- A. Submit colors, product information, and details.

1.3 QUALITY ASSURANCE

- A. Fire-test-response classification: where products with a fire-test-response classification are specified, provide asphalt shingles identical to those tested according to ASTM e108 or UL 790 and listed by UL or another testing and inspecting agency acceptable to authorities having jurisdiction. Identify each bundle of asphalt shingles with appropriate markings indicating fire-test-response classification of applicable testing and inspecting agency.
- B. Wind-resistance-test characteristics: where wind-resistant asphalt shingles are required by local or state codes, provide products identical to those tested according to ASTM d3161 or UL 997 and passed. Identify each bundle of asphalt shingles with appropriate markings of applicable testing and inspecting agency.
- C. Delivery, storage and handling
 - 1. Deliver materials in manufacturers unopened bundles or containers with labels intact.
 - 2. Handle and store materials at project site to prevent water damage, staining, or other physical damage. Store roll goods on end. Comply with manufacturer's recommendations for job-site storage, handling, and protection.

1.4 PROJECT CONDITIONS

- A. Substrate: proceed with shingle work only after substrate construction and penetrating work have been completed.
- B. Weather conditions: proceed with shingle work only when existing and forecasted weather conditions are in compliance with manufacturer's recommendations and when substrate is completely dry.
- C. Application of perimeter underlayment permitted only when air temperature is 40 degrees f. And above.

1.5 WARRANTY

- A. Roofing Contractor's workmanship warranty – five (5) years after date of final acceptance.
- B. Manufacturer's Warranty – twenty-five (25) years after date of final acceptance.

PART 2 – PRODUCTS

2.1 ASPHALT SHINGLES MATERIALS

- A. Fiberglass shingles: mineral-granule surfaced, self-sealing, minimum 240 lb/sq fiberglass-based, multi-tab, fungus resistant, strip asphalt shingles, complying with both ASTM d3018, type I, and ASTM d3462, square type tab. Provide shingles with a class a fire-test-response classification that pass the wind-resistance-test requirements of ASTM d3161.

2.2 ACCEPTABLE MANUFACTURER'S

- A. Avendra, LLC preferred manufacturers:
- B. Prestique II raised profile"; elk corporation
- C. Timberline; GAF Materials Corp.

2.3 ACCESSORIES

- A. Felt underlayment: 2 layers, type I, 36" wide, asphalt-saturated organic felt, complying with ASTM d226 (no. 15) or ASTM D4869, 36" WIDE.
 - 1. Asphalt plastic cement: non-asbestos, fibrated asphalt cement complying with ASTM d4586, designed for trowel application.
 - 2. Nails: aluminum or hot-dip galvanized 0.120-inch diameter barbed shank, sharp-pointed, conventional roofing nails, minimum 3/8" diameter head, and of sufficient length to penetrate 3/4" into solid decking or to penetrate at least 1/8" through plywood sheathing. Material of nails in contact with flashing shall match materials selected for flashing to prevent galvanic action. Staples are not permitted.
 - 3. Metal drip edge: minimum .024" aluminum sheet, brake-formed to provide 3" roof deck flange, and 1-1/2" fascia flange with 3/8" drip at lower edge. Furnish in 8' or 10' lengths. Color to be brown.

2.4 FLASHING

- A. Sheet metal materials: furnish the sheet metal materials as specified in section 07 62 00.
- B. Vent pipe flashing: lead conforming to ASTM b749, type 151121, at least 1/16 inch (1.6 mm) thick, unless otherwise indicated. Provide lead sleeve sized to slip over and turn down into pipe, soldered to skirt at slope of roof extending at least 4 inches (100 mm) from pipe onto roof.
- C. Vent pipe cap: provide at all vent pipes. Color as selected from standard finishes.
- D. Prefabricated roof louvers: provide units with a round, low profile weather cap to keep rain and moisture from entering. Minimum unit size, 150 square inches of free air. Fabricate units of aluminum with a 14" round opening and a 24" x 24" flashing base. Fabricate with 8 x 8 aluminum mesh screen.
- E. Prefabricated ridge vents: fabricated with internal baffles, configured to roof slope, self-flashed with matching end closures, providing minimum of 12 square inches minimum of free air per linear foot.

PART 3 – EXECUTION

3.1. GENERAL

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- A. Comply with manufacturer's instructions and recommendations, but not less than those recommended by ARMA residential asphalt roofing manual" or "the NRCA steep roofing manual".

3.2 EXAMINATION

- A. Examine substrate and conditions under which shingling work is to be performed and must notify contractor in writing of unsatisfactory conditions. Do not proceed with shingling work until unsatisfactory conditions have been corrected.

3.3 PREPARATION

- A. Clean substrate of any projections and substances detrimental to shingling work. Cover knotholes or other minor voids in substrate with sheet metal flashing secured with roofing nails.
- B. Coordinate installation of shingles with flashing and other adjoining work to insure proper sequencing. Do not install shingle roofing until all vent stacks and other penetrations through roofing have been installed and are securely fastened against movement.

3.4 INSTALLATION

- A. General: comply with instructions and recommendations of shingle manufacturer, except to extent more stringent requirements are indicated, but in no case less than recommended by the "NRCA steep roofing manual", and to meet the requirements of UL class A. Fasten asphalt shingles to roof sheathing with nails. No staples permitted.
- B. Felt underlayment: apply two layers of felt horizontally over entire surface, lapping succeeding courses a minimum of 2 inches, end laps a minimum of 4 inches, and hips and valleys a minimum of 6 inches. Fasten with sufficient number of nails to hold in place until shingle application. Stagger seams for each layer.
- C. Omit felt underlayment at areas of perimeter underlayment. Lap felt underlayment over perimeter underlayment as recommended by manufacturer, but not less than 2 inches.
- D. Perimeter underlayment: apply minimum 36" wide layer of perimeter underlayment at eaves, under valley flashing and other locations shown on drawings. Extend perimeter underlayment at eaves a minimum of 12" inside exterior wall line.
- E. Apply perimeter underlayment materials promptly at air temperatures of 40 degrees Fahrenheit and above.
- F. Underlayment at closed valleys: center a 36" wide felt underlayment in valley and secure with only enough nails to hold in place until asphalt shingles are installed. Lap roof underlayment over valley underlayment at least 6".
- H. Woven and closed-cut valleys: comply with ARMA and NRCA recommendations.
- I. Install asphalt shingles beginning at roof's lower edge, with a starter strip of roll roofing or inverted shingles with tabs removed. Fasten shingles in pattern, in desired weather exposure pattern; using a minimum of five, or number of fasteners per shingle as recommended by manufacturer. Use vertical and horizontal chalk lines or premarked underlayment to insure straight coursing.
- J. Cut and fit asphalt shingles at valleys, ridges, and edges to provide maximum weather protection. Provide same weather exposure at ridges as specified for roof. Lap shingles at ridges to shed water away from direction of prevailing wind. Fasteners at ridges shall be of sufficient length to penetrate sheathing as specified.
- K. Flashing: install metal flashing as indicated and in accordance with details and recommendations of the "asphalt roofing" section of "the NRCA steep roofing manual".

L. Ridge vents: install ridge vents in accordance with manufacturer's recommendations to produce watertight assembly.

M. Roof louvers: install louvers in accordance with manufacturers recommendations to produce watertight assembly.

3.5 ADJUSTING

A. Replace any damaged materials installed under this section with new materials meeting specified requirements.

END OF SECTION

SECTION 07 46 46
FIBER-CEMENT SIDING**PART 1- GENERAL****1.1 RELATED DOCUMENTS**

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

- A. Section includes fiber-cement trim and soffit

1.3 COORDINATION

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

1.4 ACTION SUBMITTALS

- A. Product Data: For each type of product. Include construction details, material descriptions, dimensions of individual components and profiles, and finishes.
- B. Samples for Initial Selection: For fiber-cement trim and soffit including related accessories.
 - 1. 12-inch- (300-mm-) long-by-actual-width Sample of trim.
 - 2. 12-inch- (300-mm-) long-by-actual-width Sample of soffit.
 - 3. 12-inch- (300-mm-) long-by-actual-width Samples of trim and accessories.

1.5 INFORMATIONAL SUBMITTALS

- A. Product Certificates: For each type of fiber-cement trim and soffit.
- B. Product Test Reports: Based on evaluation of comprehensive tests performed by a qualified testing agency, for fiber-cement siding.
- C. Sample Warranty: For standard warranty.

1.6 CLOSEOUT SUBMITTALS

- A. Maintenance Data: For each type of product, including related accessories, to include in maintenance manuals.

1.7 MAINTENANCE MATERIAL SUBMITTALS

- A. Furnish extra materials that match products installed and that are packaged with protective covering for storage and identified with labels describing contents.
 - 1. Furnish full lengths of fiber-cement trim and soffit including related accessories, in a quantity equal to 2 percent of amount installed.

1.8 DELIVERY, STORAGE, AND HANDLING

- A. Deliver and store packaged materials in original containers with labels intact until time of use.
- B. Store materials on elevated platforms, under cover, and in a dry location.

1.9 WARRANTY

- 1. Warranty Period: 25> years from date of Substantial Completion.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

- A. Source Limitations: Obtain products, including related accessories, from single source from single manufacturer.
 - 1. James Hardie
 - 2. GAF
 - 3. Nichiha
 - 4. Allura Plycry

2.2 FIBER-CEMENT Trim

- 2.3 General: ASTM C 1186, Type A, Grade II, fiber-cement board, noncombustible when tested according to ASTM E 136; with a flame-spread index of 25 or less when tested according to ASTM E 84.

- 1. Texture: Smooth.

2.4 FIBER-CEMENT SOFFIT

- A. General: ASTM C 1186, Type A, Grade II, fiber-cement board, noncombustible when tested according to ASTM E 136; with a flame-spread index of 25 or less when tested according to ASTM E 84.
- B. Nominal Thickness: Not less than ¼ inch.
- C. Ventilation: Provide perforated, smooth

2.5 ACCESSORIES

- A. Siding Accessories, General: Provide starter strips, edge trim, outside and inside corner caps, and other items as recommended by siding manufacturer for building configuration.
 - 1. Provide accessories matching color and texture of adjacent siding unless otherwise indicated.
 - 2. Corner posts.
 - 3. Fasciae.
 - 4. Moldings and trim.
- B. Fasteners:
 - 1. For fastening to metal, use ribbed bugle-head screws of sufficient length to penetrate a minimum of 1/4 inch (6 mm), or three screw-threads, into substrate.
 - 2. For fastening fiber cement, use hot-dip galvanized fasteners.
- C. Insect Screening for Soffit Vents: PVC-coated, glass-fiber fabric, 18 by-16
 - 1. Net-Free Area: 6 sq. in./linear ft. (420 sq. cm/m)]
 - 2. Finish: Mill finish.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Examine substrates for compliance with requirements for installation tolerances and other conditions affecting performance of fiber-cement trim and soffit and related accessories.
- B. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 PREPARATION

- A. Clean substrates of projections and substances detrimental to application.

3.3 INSTALLATION

- A. General: Comply with manufacturer's written installation instructions applicable to products and applications indicated unless more stringent requirements apply.
 - 1. Do not install damaged components.
 - 2. Install fasteners no more than 16 inches o.c.
- B. Install joint sealants as specified in Section 079200 "Joint Sealants" and to produce a weathertight installation.

3.4 ADJUSTING AND CLEANING

- A. Remove damaged, improperly installed, or otherwise defective materials and replace with new materials complying with specified requirements.
- B. Clean finished surfaces according to manufacturer's written instructions and maintain in a clean condition during construction.

END OF SECTION

SECTION 07 60 00
SHEET METAL FLASHING AND TRIM

PART 1 - GENERAL

- 1.1 Work Included: Includes the fabrication and installation of sheet metal and related accessories associated with counter flashings, and roof terminations.
- 1.2 Submittals: In accordance with Section 01 33 00 of this Specification
- 1.3 Environmental Conditions: Material installation shall proceed only when weather conditions are in compliance with the applicable manufacturer's recommendations for installation and no precipitation is imminent. Materials installed during adverse weather conditions shall be subject to removal and replacement with new materials at no additional cost to Owner.
- 1.4 Warranty: In accordance with Section 01 78 36 of this Specification.

PART 2 – PRODUCTS

- 2.1 Asphalt shingle rake and eave flashing - Shall be 24 gauge galvalume steel conforming to ASTM A-446 G-90; shall be prefinished with Kynar 500 Fluorocarbon coating with a top side total dry film thickness of 1.25 mil; bottom side shall be coated with a primer with a dry film thickness of 0.25 mil. Finish shall conform to all tests for adhesion, flexibility, fading, chalking, and longevity. Color shall be standard color selected by Owner.
- 2.2 Flashings:
 - 2.2.1 Galvalume: ASTM A-792, minimum 24 ga. Thickness.
 - 2.2.2 Kynar 500-based finish: Shall be factory-applied, oven-finish. Finish and primer shall be applied in strict accordance with the formulator's specifications and shall meet the performance criteria of AAMA 605.2-90 and ASTM A-653 G-90. Finish coat thickness shall be a minimum of 1.0 mil. Primer coat thickness shall be a minimum of 0.3 mil. Color to match the existing color to be selected by owner.
 - 2.2.3 Minimum Acceptable Weights:
 - 2.2.3.1 Cleat: 22 ga. galvalume steel (mill finish)
 - 2.2.3.2 Counter Flashing, drip edge, rake edge: 24 ga. galvalume steel (kynar coated)

PART 3 - EXECUTION

- 3.1 General Installation Requirements
 - 3.1.1 Inspect all surfaces to which metal is to be applied. Do not install metal unless surfaces are even, sound, clean, dry and free from defects which might affect the application.
 - 3.1.2 Follow recommendations of the Sheet Metal and Air Conditioning Contractors National Association Architectural Sheet Metal Manual (7th Edition) for fabricating in-shop and on-site, and for installation, unless otherwise specified herein.

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- 3.1.3 Follow published instructions of the product manufacturer for installation of extruded or proprietary metal products, unless otherwise specified herein.
 - 3.1.4 Use nails, screws, bolts, cleats or other fasteners of the same material or of material chemically compatible with the contacted metal.
 - 3.1.5 Fabricate cleats to be a minimum of one gauge heavier than fascia or coping metal.
 - 3.1.6 Do not place dissimilar metals in direct contact or in positions where water sheds across both metals.
 - 3.1.7 Install metal to be water and weather tight with lines, arises and angles sharp and true and with paint surfaces free of waves and buckles.
 - 3.1.8 Install shop-formed metal flashings in 10 foot lengths maximum with a minimum number of pieces in each straight run.
 - 3.1.9 Shop form all metal shapes, which are to be formed of prefinished metal, with protective plastic film in place. Do not remove plastic film until just prior to (or, if possible, after) installation.
 - 3.1.10 At all corners, shop form corner pieces of fascia and drip edge flashing from a single section of metal with minimum 36 inch legs on either side of the corner.
 - 3.1.11 Apply a continuous bead of caulk between any lapped metal sections, with the exception of counter flashing lapped joints. The application of caulk after metal components have been lapped is unacceptable and will be grounds for rejection.
- 3.2 Asphalt Shingle Eave Flashing Installation
- 3.2.1 Form new eave flashing at eaves and rakes from 24 ga. galvanized steel with Kynar 500 finish or approved equal. The top flange shall be 5 inches long and extend past the vertical leg a minimum of 1 inch.
 - 3.2.1.1 The vertical leg at rakes and eaves (where gutters are not installed) shall be hemmed at the bottom and lap the existing substrate a minimum of 2 inches.
 - 3.2.1.2 The vertical leg at eaves at gutters shall lap the back side edge of gutter a minimum of 1 inch.
 - 3.2.2 Set the flange on top of the self-adhering underlayment in a solid application of black plastic flashing cement. Lap the top flange with felt underlayment.
 - 3.2.3 Lap sections a minimum of 3 inches. At rakes, laps shall be installed so that water flows over the lapped joint and not against it. Apply a thick application of black plastic flashing cement between lapped joints.
 - 3.2.4 Nail through horizontal flange near center. Space nails 3 inches on-center staggered 1/2 inch minimum.
 - 3.2.5 Provide 12" wide copper flashing fitted behind vent splices.

END OF SECTION

SECTION 07 92 00
JOINT SEALANTS**PART 1 - GENERAL**

- 1.1 Drawings and general provisions of the contract, including General Conditions of the Contract, Supplementary General Conditions, and other Division 1 specification sections apply to work of this section.
- 1.2 Work Included - Installation of backer rods and sealant.
- 1.3 Submittals
 - 1.3.1 Submit copies of manufacturer's literature for the following:
 - 1.3.1.1 Product Data consisting of sealant manufacturer's product information for components, materials, accessories, and equipment necessary to perform the work.
 - 1.3.1.2 Applicable detail and shop drawings for the work.
 - 1.3.1.3 Samples for initial selection purposes in form of manufacturer's color charts or chips showing full range of colors and textures.
 - 1.3.1.4 Installer certificates signed by sealant system manufacturer and written certification certifying that the installer complies with requirements included under the "Quality Assurance" section of the Specification.
 - 1.3.1.5 Operation and Maintenance Data as required by the warranty.
 - 1.3.1.6 Manufacturer's Certificates: Certify products meet or exceed specified requirements.
 - 1.3.2 Refer to Section 01 33 00 of Specification.
- 1.4 Environmental Conditions
 - 1.4.1 Material installation shall proceed only when weather conditions are in compliance with manufacturer's recommendations for installation and no precipitation is imminent. Materials installed during adverse weather conditions shall be subject to rejection including removal and replacement.
 - 1.4.2 Use 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.
- 1.5 Quality Assurance
 - 1.5.1 Contractor: Joint Sealant applicator must be approved, authorized, or licensed in writing by the approved sealant product manufacturer and have a minimum of five years' experience as an approved, authorized, or licensed applicator with that manufacturer and be approved at a level capable of providing the specified warranty. The applicator must supply the names, locations and client contact information of five projects of similar size and scope that the applicator has constructed using the manufacturer's sealant products submitted for this project within the previous three years.
 - 1.5.2 Contractor shall perform destructive adhesion test in accordance with the latest edition of ASTM C1521. Test shall be documented with photographs. Test results and photographs shall be composed into a report that shall be issued to the Owner and Designer within 24 hours of the test.

Adhesion test shall be performed by a North Carolina licensed third party firm with a minimum of 5 years experience in material testing. A minimum of 2 tests shall be performed (1 in a joint between EIFS and EIFS and 1 in a joint between brick and EIFS). Each test shall be performed on a minimum of 6 linear inches of sealant. Any repairs to sealant as a result of failure under this paragraph shall be performed by the Contractor at no additional cost to the Owner.

- 1.5.2.1 Make a transverse cut in the new sealant across the entire width of the sealant.
- 1.5.2.2 Make parallel cuts down the length of the joint starting at the transverse cut on either side of the sealant for a distance of 3 inches.
- 1.5.2.3 Pull the top of the cut sealant out tight to a 90 degree angle to the wall.
- 1.5.2.4 Make a mark that is 1 inch away from the wall down the length of the pulled out section.
- 1.5.2.5 Pull the sealant at this angle until the mark made at 1 inch is at 4 inches and no adhesive or cohesive failure has occurred.
- 1.5.2.6 This represents a 300% elongation and a successful test.
- 1.5.2.7 Document and record results.
- 1.5.2.8 All pull tests under this paragraph shall be repaired by the Contractor at no additional cost to the Owner.

- 1.5.3 Manufacturer: Manufacturer shall have a minimum of 10 years of continuous, concurrent experience providing specified materials including the current year.

- 1.6 Warranty - Refer to Section 01 78 36 of this specification.

PART 2 - PRODUCTS

2.1 Materials, General

- 2.1.1 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 joint-sealant manufacturer, based on testing and field experience.
- 2.1.2 Colors of Exposed Joint Sealants: To match existing wall finish as selected by Owner.

2.2 Joint Sealants

- 2.2.1 Silicone, non-sagging, non-staining, low modulus sealant; ASTM C 920, Type S or M, Grade NS, Class 100/50, for Use NT, M, A, and O:
 - 2.2.1.1 For use in joining stone, metal, and/or composite plastic at joints.
 - 2.2.1.2 Products: Subject to compliance with requirements. All listed manufacturers and products are provided as examples of the salient characteristics to be found in the submitted product. Any additional manufacturers not listed must meet the requirements set forth in this specification and be approved prior to bid in accordance with Section 01 60 00. Products that may be incorporated into the Work include, but are not limited to the following:
 - i Dow Corning Corporation; 790 Silicone Building Sealant
 - ii Sika Corporation; SikaSil 15LM
 - iii Tremco; Dymonic 100

2.3 Joint Sealant Backing

- 2.3.1 General: Provide sealant backings of material 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.
- 2.3.2 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. Approximately 1.25 – 1.33 times larger than the openings, unless manufacturer has more stringent requirements.
- 2.3.3 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. Provide self-adhesive tape where applicable.

2.4 Miscellaneous Materials

- 2.4.1 Primer: Material recommended by joint-sealant manufacturer where required for adhesion of sealant to joint substrates.
- 2.4.2 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.
- 2.4.3 Masking Tape: Nonstaining, nonabsorbent material compatible with joint sealants and surfaces adjacent to joints.

PART 3- EXECUTION

3.1 Examination

- 3.1.1 Sealant and backer rod installation shall be performed by a qualified and experienced installer having at least 5 years of experience in this type of work.
- 3.1.2 Contractor shall make every effort to match the new sealant with the existing wall panels.

3.2 Preparation

- 3.2.1 Surface Cleaning of Joints: Clean out joints immediately before installing joint sealants to comply with joint-sealant manufacturer's written instructions and the following requirements:
 - 3.2.1.1 Remove all foreign material from joint substrates that could interfere with adhesion of joint sealant, including dust, paints (except for permanent, protective coatings tested and approved for sealant adhesion and compatibility by sealant manufacturer), old joint sealants, oil, grease, waterproofing, water repellents, water, surface dirt, and frost.
 - 3.2.1.2 Clean porous joint substrate surfaces by brushing, grinding, 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. Ensure surface roughness inside joints is as necessary for sealant application in

accordance with joint sealant manufacturer written instructions.

- 3.2.1.3 Clean nonporous joint substrate surfaces with chemical cleaners or other means that do not stain, harm substrates, or leave residues capable of interfering with adhesion of joint sealants.
- 3.2.1.4 Joint Priming: Prime joint substrates where recommended by joint-sealant manufacturer. Apply primer to comply with joint-sealant manufacturer's written instructions. Confine primer to areas of joint-sealant bond; do not allow spillage or migration onto adjoining surfaces.
- 3.2.1.5 Masking Tape: Use masking tape where required to prevent contact of sealant or primer 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.

3.3 Installation of Joint Sealants

- 3.3.1 General: Comply with joint-sealant manufacturer's written installation instructions for products and applications indicated, unless more stringent requirements apply.
- 3.3.2 Sealant Installation Standard: Comply with recommendations in ASTM C 1193 for use of joint sealants as applicable to materials, applications, and conditions indicated.
- 3.3.3 Install sealant backings of kind 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:
 - 3.3.3.1 Do not leave gaps between ends of sealant backings.
 - 3.3.3.2 Do not stretch, twist, puncture, or tear sealant backings.
 - 3.3.3.3 Remove absorbent sealant backings that have become wet before sealant application and replace them with dry materials.
 - 3.3.3.4 Set depth of backing in accordance with manufacturer written instructions for optimal joint depth.
- 3.3.4 Install sealants using proven techniques that comply with the following and at the same time backings are installed:
 - 3.3.4.1 Place sealants so they directly contact and fully wet joint substrates.
 - 3.3.4.2 Completely fill recesses in each joint configuration.
 - 3.3.4.3 Produce uniform, cross-sectional shapes and depths relative to joint widths that allow optimum sealant adhesion and movement capability.
- 3.4 Cleaning - 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.
- 3.5 Protection - Protect joint sealants during and after curing period from contact with contaminating substances and from damage resulting from construction operations or other causes so sealants are without deterioration or damage at time of Substantial Completion. If, despite such protection, damage or

deterioration occurs, cut out and remove damaged or deteriorated joint sealants immediately so installations with repaired areas are indistinguishable from original work.

END OF SECTION