

## SECTION 073216 - CONCRETE ROOF TILES

### PART 1 - GENERAL

#### 1.1 SUMMARY

A. Section Includes:

1. Concrete roof tiles.
2. Tile accessories.
3. Self-adhering underlayment.

#### 1.2 SYSTEM PERFORMANCE REQUIREMENTS

- A. Refer to Structural Drawings for Component and Cladding Zone Diagrams with design wind pressure requirements. Provide a roofing system that is identical to systems that have been successfully tested by a qualified testing and inspecting agency to resist uplift pressures noted and compliant with governing Building Codes and regulations as applicable to the project site location.

#### 1.3 SUBMITTALS

- A. Product Data: For each type of product indicated.
- B. Samples: Provide two full-size units for each type of concrete roof tile and accessory tile indicated.
- C. Shop Drawings: Indicate metal flashing profiles, joint locations, fastening locations, underlayment, wood nailers, battens, roof vents and installation details. Indicate tile layout with location of cut and special shaped tiles identified.
- D. Research/evaluation reports for concrete tiles, fasteners and fastener systems, from the ICC-ES evaluation reports.
- E. Product test reports: Florida product approval for concrete tile roofing for use in the Project site location and as approved by the authorities having jurisdiction.
- F. Maintenance Data: For roofing to include in closeout maintenance manuals.

#### 1.4 QUALITY ASSURANCE

- A. Fire-Test-Response Characteristics: Provide concrete roof tiles and related roofing materials with the fire-test-response characteristics indicated, as determined by testing identical products

per test method indicated below by UL or another testing and inspecting agency acceptable to authorities having jurisdiction.

1. Exterior Fire-Test Exposure: Class A; UL 790 or ASTM E 108, for application and roof slopes indicated.
- B. Weather Limitations: Proceed with installation only when existing and forecasted weather conditions permit roofing to be performed according to manufacturer's written instructions and warranty requirements.
  1. Install self-adhering sheet underlayment within the range of ambient and substrate temperatures recommended by manufacturer.

## 1.5 DELIVERY, STORAGE, AND HANDLING

- A. 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.

## 1.6 WARRANTY

- A. Roof Tile: Hanson Limited Lifetime, fully transferable, non-prorated product warranty against defects in roof tile for the life of the structure.
- B. Roofing Installer's Warranty, covering Work of this Section, in which roofing Installer agrees to repair or replace components of roofing that fail in materials or workmanship within the following warranty period: Three years from date of Substantial Completion.

## PART 2 - PRODUCTS

### 2.1 CONCRETE ROOF TILES

- A. Concrete Roof Tiles: ASTM C 1492, molded- or extruded-concrete roof tile units of shape and configuration indicated, with integral color, and free of surface imperfections. Provide with fastening holes prepunched at factory.
  1. Acceptable Manufacturer: Hanson, Inc.
  2. Substitutions: Must be approved by Owner.
  3. Concrete Roof Tile: Hanson, Regal or Hacienda profile, Blend to be determined. Substitute manufacturers will be reviewed by Owner and Architect.

- B. Include specially shaped, color-matched units as indicated or required for eaves, rakes, ridges, hips, valleys, and other conditions.

## 2.2 ACCESSORIES

- A. Asphalt Roofing Cement: ASTM D 4586, Type II, asbestos free.
- B. Cold-Applied Adhesive: Manufacturer's standard asphalt-based, one- or two-part, asbestos-free, cold-applied adhesive specially formulated for compatibility and use with underlayments.
- C. Foam Adhesive: Two-component, polyurethane expanding adhesive recommended for application by concrete roof tile manufacturer.
- D. Elastomeric Sealant: ASTM C 920, silicone-based joint sealant; of Type M or S, Grade NS, Class 25, Use NT related to exposure, and, as applicable to joint substrates indicated, Use O.
- E. Wood Nailers, Beveled Cant Strips and Wood Battens: Comply with requirements for pressure-preservative-treated wood in Section 061000 "Rough Carpentry."
- F. Roofing Fasteners: Stainless steel screws or roofing nails as recommended by roof tile manufacturer to resist specified wind pressures and of sufficient length to penetrate  $\frac{3}{4}$  inch into roof deck sheathing.
- G. Wood Batten Nails: ASTM F 1667; common or box, steel wire, flat head, and smooth shank.
- H. Wire Ties: Stainless steel, 0.083-inch (2.1-mm) minimum diameter.
- I. Storm Clips: Stainless-steel strap-type, 0.04-by-1/2-inch (1.0-by-13-mm), L-shaped retainer clips designed to secure side edges of concrete roof tiles. Provide with two fastener holes in base flange.

## 2.3 UNDERLAYMENT MATERIALS

- A. Self-Adhering Sheet Underlayment, Polyethylene Faced: ASTM D 1970, minimum of 60-mil- (1.0-mm-) thick, slip-resisting, polyethylene-film-reinforced top surface laminated to SBS-modified asphalt adhesive, with release paper backing; cold applied. Provide primer for adjoining concrete or masonry surfaces to receive underlayment as manufactured by
  1. Grace W.R. & Co; Grace Ice and Water Shield;
  2. Protecto Wrap Company; Rainproof TM or approved equal.

## 2.4 METAL FLASHING AND TRIM

- A. Comply with requirements in Section 076200 "Sheet Metal Flashing and Trim."
- B. Fabricate sheet metal flashing and trim to comply with recommendations in SMACNA's "Architectural Sheet Metal Manual" that apply in design, dimensions, metal, and other characteristics of item.

- C. Vent-Pipe Flashings: ASTM B 749, Type L51121, at least 1/16 inch thick. Provide lead sleeve sized to slip over and turn down into pipe, soldered to skirt at slope of roof and existing at least 4 inches 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 tolerance and other conditions affecting performance of work. Proceed with installation only after unsatisfactory conditions have been corrected.
  - 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 roof.

#### 3.2 UNDERLAYMENT INSTALLATION

- A. General: Comply with concrete roof tile manufacturer's written instructions and recommendations in NRCA's "The NRCA Roofing and Waterproofing Manual."
- B. Self-Adhering Sheet Underlayment: Install wrinkle free; comply with low-temperature installation restrictions of underlayment manufacturer if applicable. Install at locations indicated, lapped in direction to shed water. Lap sides not less than 3-1/2 inches (89 mm). Lap ends not less than 6 inches (152 mm), staggered 24 inches (610 mm) between succeeding courses. Roll laps with roller. Cover underlayment within seven days.
  - 1. Extend self-adhering sheet underlayment over entire roof deck.
- C. Metal-Flushed Open-Valley Underlayment: Install 2 layers of 36-inch- wide roof underlayment centered in valley. Stagger end laps between layers at least 72 inches. Lap ends of each layer at least 12 inches in direction to shed water, and seal with asphalt roofing cement.
  - 1. Lap roof-deck underlayment over first layer of valley underlayment at least 6 inches.

#### 3.3 METAL FLASHING INSTALLATION

- A. General: Install metal flashings and other sheet metal to comply with requirements in Section 076200 "Sheet Metal Flashing and Trim."
  - 1. Install metal flashings according to concrete roof tile manufacturer's written instructions and recommendations in NRCA's "The NRCA Roofing and Waterproofing Manual."

### 3.4 WOOD NAILERS AND BATTENS

- A. Install wood nailers at ridges hips rakes and securely fasten to roof deck.
- B. Install nominal 1-by-2-inch (25-by-50-mm) wood battens horizontally at spacing required by concrete roof tile manufacturer, and securely fasten to roof deck.

### 3.5 CONCRETE ROOF TILE INSTALLATION

- A. General: Install concrete roof tiles according to manufacturer's written instructions, to recommendations in TRI/WSRCA's "Concrete and Clay Roof Tile Design Criteria Installation Manual for Moderate Climate Regions," and to NRCA's "The NRCA Roofing and Waterproofing Manual."
  - 1. Maintain uniform exposure and coursing of concrete roof tiles throughout roof.
  - 2. Extend tiles 2 inches (50 mm) over eave fasciae.
  - 3. Nail Fastening: Drive nails to clear the concrete roof tile so the tile hangs from the nail and is not drawn up.
    - a. Install wire through nail holes of cut tiles that cannot be nailed directly to roof deck, and fasten to nails driven into deck.
  - 4. Wire-Tie Fastening: Install wire-tie systems and fasten concrete roof tiles according to manufacturer's written instructions.
  - 5. Foam-Adhesive Setting: Install concrete roof tiles according to TRI/FRSA's "Concrete and Clay Roof Tile Installation Manual."
  - 6. Install storm clips to capture edges of longitudinal sides of concrete roof tiles and securely fasten to roof deck.
  - 7. Install concrete roof tile locks to support and lock overlying tile butts to underlying tiles.
  - 8. Cut and fit concrete roof tiles neatly around roof vents, pipes, ventilators, and other projections through roof. Fill voids with mortar.
  - 9. Install concrete roof tiles with color blend approved by Owner.
- B. Remove and replace damaged or broken concrete roof tiles.

END OF SECTION 073216