# PART 1 - GENERAL

## 1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 1 and 01 Specification Sections, apply to this Section.

## 1.2 SUMMARY

A. Section Includes:
1. Clay roof tiles.
2. Deck guard rail infill.
3. Underlayment.

B. Related Sections:
1. Section 018113 “Sustainable Design Requirements.”
2. Section 061600 “Sheathing” for roof sheathing under roof tiles.
3. Section 076200 “Sheet Metal Flashing and Trim” for associated flashing installations.

## 1.3 DEFINITIONS

A. Roofing Terminology: See ASTM D 1079, glossaries in TRI/WSRCA's "Concrete and Clay Roof Tile Design Criteria Installation Manual for Moderate Climate Regions," and NRCA's "NRCA Roofing and Waterproofing Manual" for definitions of terms related to roofing work in this Section.

## 1.4 PREINSTALLATION MEETINGS

A. Preinstallation Conference: Conduct conference at Project site.

## 1.5 ACTION SUBMITTALS

A. Product Data: For each type of product.

B. LEED Submittals: Credits MRc4, MRc5, and EQc4.1. Refer to Section 018113 "Sustainable Design Requirements" for additional submittal requirements.

C. Shop Drawings: Show locations and extent of roofing and details.
1. Include all details required for complete installation.

D. Samples: For each exposed product and for each color and texture specified.
1. Clay Roof Tiles: Full size, showing full range of values and blends.
2. Accessory Tiles: Full size.

## 1.6 INFORMATIONAL SUBMITTALS

A. Material Test Reports: For each type of clay roof tile, based on evaluation of comprehensive tests performed by a qualified testing agency.

B. Evaluation Reports: From ICC-ES or other testing and inspecting agency acceptable to authorities having jurisdiction, indicating that product is suitable for intended use under applicable building codes for the following:
   1. Clay roof tiles, fasteners, and attachment systems.
   2. Synthetic underlayment.
   3. High-temperature self-adhering underlayment.

C. Sample Warranties: For special warranties.

1.7 CLOSEOUT SUBMITTALS

A. Maintenance Data: For roofing to include in maintenance manuals.

1.8 MAINTENANCE MATERIAL SUBMITTALS

A. Furnish extra materials, from the same product run, that match products installed and that are packaged with protective covering for storage and identified with labels describing contents.
   1. Clay Roof Tile: 100 sq. ft. of full-size units for each type indicated and 10 of each type of prefabricated accessories.

1.9 QUALITY ASSURANCE

A. Mockups: Build mockups to verify selections made under Sample submittals, to demonstrate aesthetic effects, and to set quality standards for materials and execution.
   1. Include clay roof tiles and underlayment as indicated on Drawings as part of integrated exterior mockup per Section 14000 “Quality Requirements.”
   2. Build mockups for clay roof tiles including related roofing materials.
      a. Size: 48 inches long by 48 inches wide, minimum.
   3. Approval of mockups does not constitute approval of deviations from the Contract Documents contained in mockups unless Architect specifically approves such deviations in writing.

1.10 DELIVERY, STORAGE, AND HANDLING

A. Store underlayment rolls in a dry, well-ventilated location protected from weather, sunlight, and moisture according to manufacturer's written instructions.
   1. Store on end, on pallets or other raised surfaces. Do not double stack rolls.

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

C. Handle, store, and place roofing materials in a manner to prevent damage to roof deck or structural supporting members.

1.11 FIELD CONDITIONS

A. Environmental Limitations: Proceed with installation only when existing and forecasted weather conditions permit roofing to be installed 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.

1.12 WARRANTY

A. Materials Warranty: Manufacturer agrees to repair or replace clay roof tiles that fail in materials within specified warranty period.
   1. Warranty Period: 50 years from date of Substantial Completion.

B. Roofing Installer's Warranty: On warranty form at end of this Section, signed by Installer, in which Installer agrees to repair or replace components of clay-tile roofing that fail in materials or workmanship within specified warranty period.
   1. Warranty Period: Five years from date of Substantial Completion.

PART 2 - PRODUCTS

2.1 PERFORMANCE REQUIREMENTS

A. Exterior Fire-Test Exposure: Provide clay roof tiles and related roofing materials identical to those of assemblies tested for Class A fire resistance according to ASTM E 108 or UL 790 by Underwriters Laboratories, Inc. or another testing and inspecting agency acceptable to authorities having jurisdiction. Identify products with appropriate markings of applicable testing agency.

B. Products and installation shall comply with TRI and NRCA recommendations.

2.2 CLAY ROOF TILES

A. Clay Roof Tiles: ASTM C 1167, molded- or extruded-clay roof tile units of shape and configuration indicated, kiln fired, and free of surface imperfections. Provide with fastening holes pre-punched at factory before firing.
   1. Manufacturers: Subject to compliance with requirements, provide products by the following:
      a. MCA Clay Roof Tiles (Campus Standard)
   2. Series: Corona Tapered Mission Tile at roof and 8-inch Straight Barrel Mission Tile at deck guard rail.
   3. Durability: Grade 1.
   4. Accessory Tiles: As required for complete installation.
   5. Provide mitered corners as required at hip installations.
   6. Solar Reflectance Index: Comply with current code requirements.
   7. Finish and Texture: Matte, smooth.
   8. Colors: Santa Maria Blend

B. LEED Material Credits MRc4, MRc5, and EQc4.1: Refer to Section 018113 “Sustainable Design Requirements” for additional product requirements.

2.3 UNDERLAYMENT AND FLASHING MATERIALS

A. Self-Adhering Sheet Underlayment and Flashing, High Temperature: Minimum of 40-mil-thick; with slip-resisting, polymer-film-reinforced or glass-reinforced top surface laminated to layer of 100-percent butyl rubber with adhesive; with release backing; cold applied; and evaluated and documented to be suitable for use for intended purpose under applicable codes by a testing and inspecting agency acceptable to authorities having jurisdiction. ~~Provide primer according to written recommendations of underlayment manufacturer.~~ 395 R1
   1. ~~Products: Subject to compliance with requirements, provide the following:~~
      a. ~~Grace Construction Products; Ultra (No Known Equal)~~
   2. ~~Thermal Stability: Stable after testing at 300 deg F according to ASTM D 1970/D 1970M.~~
   3. Low-Temperature Flexibility: Passes after testing at minus 20 deg F according to ASTM D 1970/D 1970M.

B. LEED Materials: Credits MRc4, MRc5, and EQc4.1. Refer to Section 018113 "Sustainable Design Requirements" for additional product requirements.

2.4 ACCESSORIES

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

B. Butyl Sealant: ASTM C 1311, single-component, solvent-release butyl rubber sealant; polyisobutylene plasticized; heavy bodied.

C. Roofing Asphalt: ASTM D 312, Type IV.

D. 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.

E. Eave Closure: Manufacturer's standard eave closure formed to shape of tile with weep holes.

F. Wind Lock Nose Hook: Hot-dip galvanized-steel, 0.1-inch-diameter wire device designed to secure butt edges of overlaid clay roof tiles. For hip and ridge trim tiles.

G. Storm Clips: Hot-dip galvanized-steel strap-type, 0.04-by-1/2-inch, L-shaped retainer clips designed to secure side edges of concrete roof tiles. Provide with two fastener holes in base flange. For first course of tile.

H. Wormgear Clamps: Type 316 Stainless steel.

I. LEED Materials: Credits MRc4, MRc5, and EQc4.1. Refer to Section 018113 "Sustainable Design Requirements" for additional product requirements.

2.5 FASTENERS

A. Twisted-Wire-Tie System: Continuously twisted two-wire unit with loops formed at 6 inches apart, minimum 0.083-inch-diameter stainless-steel wire and 0.037-inch-diameter

stainless-steel tie wires, with matching-metal folding clip anchors. All components, including fasteners shall be stainless steel.

1. Products: Subject to compliance with requirements, provide the following:
   a. Newport Tool & Fastener Co., Inc., Tyle-Tye Fasteners and Fastening System.
   b. Wire Works, Inc. (The); Twisted Wire Works System.
   c. Or Equal.

B. LEED Materials: Refer to Section 018113 “Sustainable Design Requirements” for additional product requirements.

2.6 METAL FLASHING AND TRIM

A. General: Comply with requirements in Section 076200 "Sheet Metal Flashing and Trim."
   1. Sheet Metal: Copper.

B. Fabricate sheet metal flashing and trim to comply with recommendations in SMACNA's "Architectural Sheet Metal Manual" for design, dimensions, metal, and other characteristics of the item.
   1. Apron Flashings: Fabricate with lower flange extending a minimum of 6 inches over and 4 inches beyond each side of downslope tile roofing and 6 inches up the vertical surface.
   2. Step Flashings: Fabricate with a head lap of 3 inches and a minimum extension of 4 inches both horizontally and vertically.
   3. Channel Flashings: Fabricate with vertical surface extending a minimum of 4 inches above the clay roof tile and 6 inches beneath the tile roofing, with a 1-inch high vertical return to form a runoff channel.
   4. Rake Pan Flashings: Fabricate with vertical surface extending over fasciae and 6 inches beneath the tile roofing, with a 1-inch high vertical return to form a runoff channel.
   5. Cricket and Backer Flashings: Fabricate with concealed flange extending a minimum of 24 inches beneath upslope tile roofing, 6 inches beyond each side of penetrations, and 6 inches above the roof plane.
   6. Open-Valley Flashings: Fabricate in lengths not exceeding 10 feet with 1-inch high, inverted-V-profile water diverter at center of valley and equal flange widths of 12 inches.
   7. Drip Edges: Fabricate in lengths not exceeding 10 feet, with 2-inch roof-deck flange and 1-1/2-inch fascia flange with 3/8-inch drip at lower edge.

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 extending at least 4 inches from pipe onto roof.

D. LEED Materials: Credits MRc4, MRc5, and EQc4.1. Refer to Section 018113 “Sustainable Design Requirements” for additional product requirements.

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 the 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 roofing.

B. Prepare written report, endorsed by Installer, listing conditions detrimental to performance of the Work.

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

3.2 UNDERLAYMENT INSTALLATION

A. General: Comply with clay roof tile manufacturer's written instructions and with recommendations in NRCA's "NRCA Roofing Manual: Steep-Slope Roof Systems" unless more stringent requirements are indicated.

B. Double-Layer Self-Adhering Sheet Underlayment: Install wrinkle free; comply with low-temperature installation restrictions of underlayment manufacturer. Install on roof deck parallel with and starting at the eaves. Install a 19-inch wide starter course at eaves and completely cover with full-width second course. Install succeeding courses lapping previous courses 19 inches in shingle fashion. Lap ends a minimum of 6 inches. Stagger end laps between succeeding courses at least 72 inches. Fasten with felt underlayment nails. Roll laps with roller. Cover underlayment within seven days.
   1. Extend self-adhering sheet underlayment over entire roof deck.

C. Metal-Flashed, Open-Valley Underlayment: Install two layers of 36-inch wide self-adhering sheet underlayment centered in valley. Stagger end laps between layers at least 24 inches. Lap ends of each layer at least 12, in direction to shed water.

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 clay roof tile manufacturer's written instructions and recommendations in TRI/WSRCA's "Concrete and Clay Roof Tile Design Criteria Installation Manual for Moderate Climate Regions" and NRCA's "NRCA Roofing Manual: Steep-Slope Roof Systems."

3.4 CLAY ROOF TILE INSTALLATION

A. General: Install clay roof tiles according to manufacturer's written instructions and recommendations in TRI/WSRCA's "Concrete and Clay Roof Tile Design Criteria Installation Manual for Moderate Climate Regions" and NRCA's "NRCA Roofing Manual: Steep-Slope Roof Systems" unless more stringent requirements are indicated.
   1. Maintain uniform exposure and coursing of clay roof tiles throughout roof.

2. Extend tiles 2 inches over eave fasciae.
3. Wire-Tie Fastening: Install wire-tie systems and fasten clay roof tiles according to manufacturer's written instructions.
4. Tile Locks: Install to support and lock overlying tile butts to underlying tiles.
5. Cut and fit clay roof tiles neatly around roof vents, pipes, ventilators, and other projections through roof. Fill voids with mortar.
6. Install clay roof tiles with color blend approved by Architect.
7. Install storm clips to capture edges of longitudinal sides of first course of roof tiles and securely fasten to roof deck.
8. Hip and ridge tiles shall be installed with a nail and wind lock type nose clip. Also install a continuous bead of tile adhesive between overlapping area.

B. Flat Interlocking Clay Roof Tile Installation:
1. Provide minimum 3-inch lap between succeeding courses of clay roof tiles.
2. Offset joints by half the clay roof tile width in succeeding courses.
3. Install L-shaped rake tiles.
4. Install ridge tiles in V-ridge and mitered, where indicated, configuration with laps facing away from prevailing wind. Seal laps with butyl sealant.
5. Install hip tiles in V-ridge and mitered, where indicated, configurations. Seal laps with butyl sealant.

C. Open Valleys: Cut clay roof tiles at open valleys to form straight lines. Maintain uniform width of exposed open valley from highest to lowest point.
1. Drill or notch cut valley tiles and wire-tie to fastener placed clear of valley metal flashings.
2. Do not nail tiles to metal flashings.

D. Closed Valleys: Cut clay roof tiles at closed valleys to form straight lines, trimming upper concealed corners of tiles. Maintain uniform gap of 1/2 to 3/4-inch on either side of the water diverter at centerline of valley.
1. Drill or notch cut valley tiles and wire-tie to fastener placed clear of valley metal flashings.
2. Do not nail tiles to metal flashings.

## 3.5 ADJUSTING AND CLEANING

A. Remove and replace damaged or broken clay roof tiles.

B. Remove excess clay roof tiles and debris from Project site.

END OF SECTION