



Andalusa “Barrel”

SECTION 07321

PART 1 GENERAL

1.1 SECTION INCLUDES

- A. Natural Clay roof tiles and roof system components.
- B. Metal roof flashing.
- C. Underlayments and self-adhered membrane.
- D. Related roof accessories.

1.2 RELATED SECTIONS

- A. Section 06100 - Rough Carpentry; Roof sheathing and nailers.
- B. Section 07220 - Roof and Deck Insulation.
- C. Section 07600 - Flashing and Sheet Metal.
- D. Section 07710 - Roof Specialties; Roof gutters and downspouts.
- E. Section 07720 - Roof Accessories.
- F. Section 08600 - Skylights.
- G. Division 15 - Mechanical: Mechanical work projecting through roof.
- H. Division 16: - Electrical: Electrical work projecting through roof.

1.3 REFERENCES

- A. ASTM A 90 - Standard Test Method for Weight (Mass) of Coating on Iron and Steel Articles with Zinc or Zinc-Alloy Coatings; 2001.
- B. ASTM A 525 - Standard Specification for General Requirements for Steel Sheet, Zinc-Coated (Galvanized) by the Hot-Dip Process; 1993.
- C. ASTM A 641 - Standard Specification for Zinc-Coated (Galvanized) Carbon Steel Wire; 1998.
- D. ASTM A 653/A 653M - Standard Specification for Steel Sheet, Zinc-Coated (Galvanized) or Zinc-Iron Alloy-Coated (Galvannealed) by the Hot-Dip Process.
- E. ASTM C 1167 Standard Specification for Clay Roof Tile.
- F. ASTM D 226 - Standard Specification for Asphalt-Saturated Organic Felt Used in Roofing and Waterproofing; 1997a.

- G. ASTM D 249 - Standard Specification for Asphalt Roll Roofing (Organic Felt) Surfaced with Mineral Granules; 1989 (reapproved 1996).
- H. ASTM D 2626 - Standard Specification for Asphalt-Saturated and Coated Organic Felt Base Sheet Used in Roofing; 1997b.
- I. AWWA C2 - Lumber, Timber, Bridge Ties and Mine Ties -- Preservative Treatment by Pressure Processes; 2001.
- J. Tile Roofing Institute (TRI) - Concrete and Clay Design Criteria for Cold and Snow Regions.
- K. FRSA/TRI - Concrete and Clay Roof Tile Installation Manual Fourth Edition (For Florida High Wind Applications).
- L. ICC ESR 1647 (ICC-ES) - International Code Council Evaluation Services.
- M. ICC AC 180 - Acceptance Criteria for Clay and Concrete Roof Tiles. August, 2007.
- N. Florida Building Code, Product Approval.
- O. ICC AC 188 for underlayments.
- P. AC 48 for underlayments in severe climates.

1.4 DESIGN REQUIREMENTS

- A. Roofing tile materials and installation shall conform to the requirements of ICC ESR 1647 and LA RR 23700.
- B. Roofing tile materials and installation shall conform to the requirements of Miami Dade County Notice of Acceptance (NOA) as follows:
 - 1. NOA 12-1203.04 Andalusia Barrel.
- C. Roofing tile materials and installation shall conform to the Florida Building Code (FBC) High Velocity Hurricane Zone (HVHZ).
 - 1. RAS 120
- D. Roofing tile materials and installation shall conform to the requirements of the applicable building code.

1.5 SUBMITTALS

- A. Submit under provisions of the contract documents.
- 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: Indicate metal flashing profiles, joint locations, fastening locations, and installation details. Indicate tile layout with location of cut and special shaped tiles identified.
RAS
- D. Verification Samples: For each finish product specified, two full size samples representing actual product, color, and patterns. This is a natural clay product and certain variations are

normal, see ASTM C 1167 for acceptance criteria.

- E. Certificates of Compliance: Submit to certify compliance with referenced standards.

1.6 QUALITY ASSURANCE

- A. Manufacturer Qualifications: Minimum five years documented experience producing natural clay roof tile.
- B. Installer Qualifications: Minimum five years documented experience installing products specified in this section and/or supervision by a manufacturers authorized installation representative.
- C. Mock-Up: (if required) provide a mock-up for evaluation of surface preparation techniques and application workmanship.
 - 1. Finish areas designated by Architect.
 - 2. Mock-up shall be a minimum of a 10 foot (3.05 M) by 10 foot (3.05 M) area and include the edge, ridge, valley and other typical transition conditions anticipated.
 - 3. Do not proceed with remaining work until installation workmanship and appearance is approved by Architect.
 - 4. As determined by Architect, Mock-up may remain as part of Work.

PROJECT CONDITIONS

- D. 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.
- E. Do not overload the roof. Distribute stacks of tile uniformly on roof at not greater than 12 inches (305 mm) in height.

1.7 WARRANTY

- A. Roof Tile: Andalusia Barrel produced by Sulacer S.A.de CV 50 year Limited Warranty, Fully Transferable, Non-Prorated Product Warranty against defects in roof tile.
- B. Installation Warranty: Warrants products of this section, as installed, to be in accord with the Contract Documents and free from faults and defects in materials and workmanship for a period of ____ years after substantial completion.

1.8 EXTRA MATERIALS

- A. Provide an additional ____ percent of installed roof tiles, as stipulated in the contract documents, for Owner's use in roof maintenance.

1.9 MANUFACTURERS

- A. Acceptable Manufacturer: Altusa by SAS USA located at 6801 N.W. 77th Ave. Suite 302, Miami, Florida 33166-2832. Tel: (855) 428-0200, Fax: (305) 428-0201, Email: info@sas-inc.us, webpage: <http://www.sas-inc.us>.

1.10 NATURAL CLAY ROOF TILE:

- A. Andalusia Barrel
 - Nominal overall size L: 18.5 in. x W: 7.1 in.
 - Pieces per roofing square 170

Installed weight per roofing square	731 lbs
Headlap	Nominal 2.5 in.
Minimum Slope	2:12, or per Authority Having Jurisdiction

1.11 ACCESSORY MATERIALS - FLORIDA

- A. Underlayment: one the following options in accordance with the FBC HVHZ,
 - 1. Hot Mop 30/90, Hot Mop 43/90.
 - 2. Hot Applied Product Approved Underlayment System.
 - 3. Cold Applied Product Approved Underlayment System.
 - 4. Product Approved Anchor/Base Sheet/Self-Adhered Underlayment System.
 - 5. Self-Adhered Underlayment (Single Ply).

- B. Tile Fasteners: Sized to penetrate deck minimum 3/4 inch (19 mm) or through thickness of deck or batten.
 - 1. Quik Drive Screws, Roofing Specific, Miami Dade County Approved.
 - 2. Any product control approved roof tile fastener.

- C. Flashings:
 - 1. Ribbed Tile Pan, 26 gauge Galvanized Sheet Steel sidewall flashing.
 - 2. Plumbing Stacks and Other Pipes.

- D. Metal Accessories:
 - 1. Metal accessories for roofs shall be not less than 26 gage galvanized, 28 gage stainless steel, 16-ounce copper, 0.024-inch (.61 mm) thick aluminum, lead sheet with a minimum 2.5 pound per square foot (psf) or equivalent noncorrosive lead metal alloys or composite materials manufactured for use as roof termination. All composite and nonmetallic flashing materials shall have Product Approval.
 - 2. Metal accessories may be of a manufactured, shop fabricated or field fabricated type, provided the materials and fasteners are in compliance with the minimum requirement of the FBC HVHZ and installed in accordance with RAS 111.

- E. Adhesive: Code approved adhesive suitable to bond to clay roof tile.

- F. Eave Closures: Provide to match tile profile.
 - 1. Prefabricated EPDM synthetic rubber conforming to ASTM D 1056.
 - 2. Prefabricated metal eave closure containing a minimum $\frac{3}{8}$ in. diameter weepholes, spaced 12 in. apart, flush with the underlayment.
 - 3. Prefabricated clay eave closure.
 - 4. Mortar (color optional).
 - 5. Antiponding drip edge.

- G. Hip & Ridge
 - 1. Ridge Riser: Elevates ridge board to proper height. For all profiles.

- H. Rake & Gable End
 - 1. Rake and Ridge tile. Choose to match tile profile and color.

PART 2 EXECUTION

2.1 EXAMINATION

- A. Do not begin installation until substrates have been properly prepared.
- B. Verify surfaces are uniform, smooth, clean and dry

- C. If substrate preparation is the responsibility of another installer, notify Architect of unsatisfactory preparation before proceeding.

2.2 PREPARATION

- A. Clean surfaces thoroughly prior to installation.
- B. Prepare surfaces as required by applicable building code.

2.3 INSTALLATION - GENERAL

- A. Install in accordance with the FBC, HVHZ and applicable product control approval. manufacturer's instructions and the following:
 - 1. FBC-HVHZ, RAS 120
 - 2. ICBO ESR-2015P Concrete and Clay Roof Tile Installation Manual for Moderate Climate Regions.
 - 3. TRI/WSRCA Standard Installation Guides for Concrete and Clay Roof Tile in Cold Weather Applications.
 - 4. FRSA/TRI Concrete and Clay Roof Tile Installation Manual Fourth Edition (For Florida High Wind Applications).

2.4 UNDERLAYMENT APPLICATION:

- A. Underlayment: one the following options in accordance with the FBC HVHZ.
 - 1. Hot Mop 30/90, Hot Mop 43/90: A No. 30 or No 43 anchor/base sheet ASTM D 226, Type II, or ASTM D 2626 mechanically fastened to the wood deck with approved fasteners plates. Anchor/base sheet end laps shall be a minimum of 6 in. and head laps shall be a minimum of 4 in. Extend anchor/base sheet a minimum of 4 inches up all adjacent vertical surfaces. Over installed anchor/base sheet, apply one layer of mineral surfaced #90 cap sheet ASTM D 6380M in full mopping of hot asphalt. Cap sheet end laps shall be a minimum of 6 in.; head laps shall be a minimum of 3 in. and back nailed 12 in. on center with approved nails through tincaps or with approved prefabricated fasteners in accordance with FBC, HVHZ. (*NOTE The above system may be upgraded by hot mopping an interply of ASTM listed fiberglass or perforated organic felt to the anchor sheet before applying the cap sheet. The above listed cap sheet can be upgraded by substituting it with any ASTM listed modified bitumen cap sheet.*)
 - 2. Hot Applied Product Approved Underlayment System: installed in accordance with the underlayment's product control approval.
 - 3. Cold Applied Product Approved Underlayment System: installed in accordance with the underlayment's product control approval.
 - 4. Product Approved Anchor/Base Sheet/Self-Adhered Underlayment System: installed in accordance with the underlayment's product control approval.
 - 5. Self-Adhered Underlayment (Single Ply): installed in accordance with the underlayment's product control approval.
- B. Install ridge vents; follow vent manufacturer's installation recommendations.
- C. Install nailer boards or ridge risers with minimum 2 inch by 2 inch (51 mm by 51 mm) nailer boards at hips and ridges. Install in accordance with FBC HVHZ.

2.5 FLASHING INSTALLATION

- A. Flashings General:
 - 1. Install in accordance with FBC, RAS 120
- B. Install flashings to shed water and prevent water penetration under tiles.

- C. Counter Flashing:
 1. Lap Top Flange of Base Flashing: 3 inches (76 mm), minimum.
 2. Lap Joints: 3 inches (76 mm), minimum.
- D. Install tiles so as not to inhibit water flow on flashings.
- E. Head and Apron Flashing:
 1. Install in accordance with FBC, RAS 120.
 2. Lap metal as required and seal laps with flashing cement. Seal wall junctions with flashing cement.
- F. Flashing at Curb Mounted Skylights and Other Items:
 1. Install curb high enough to exceed tile height. Curbing must be a minimum of 6 inches above finish tile surface to allow for proper flashing transition.
 2. Turn up underlayment a minimum of 4 inches (102 mm) at all sides of curbing.
 3. Install flashing as noted above for side wall.
- G. Flashing at Plumbing Stacks, Pipes, Turbines, Vents, Etc:
 1. Install in accordance with FBC, RAS 120.
 2. Install base flashing sealed or lapped by underlayment.
 3. Install second flashing interlaced with tile coursing.
 4. Seal with sealant if not self-sealing.
- H. Coatings: Apply color coordinated paint to all exposed metal flashings as required by applicable contract documents.

2.6 BATTEN INSTALLATION

- A. Not Applicable.

2.7 TILE INSTALLATION

- A. General:
 1. Install in accordance with FBC, RAS 120.
- B. Layout:
 1. Nominal 2.5 in headlap, see layup detail.
- C. Shade Blending:
 1. During the installation process, examine the installation at a distance from ground level, for unwanted patterns, straight true lines, shade variation and good color blend. Doing this at regular intervals will insure an acceptable and attractive installation. The blending of tiles from different pallets is very important to avoid streaks or hot spots. Shade variations are a natural occurrence due to the nature of clay.
- D. Drip Edge Metal: installed in accordance with applicable building code.
- E. Valleys: installed in accordance with applicable building code.
- F. Set perimeter tiles in mortar; apply sealer to exposed mortar.
- G. Secure field and perimeter tile in accordance with applicable building code.
- H. Cut field tile to form straight edge at center of hip, ridge and valley.
- I. Install eave closures.
 1. Install in accordance with FBC, RAS 120.

J. Storm clips: installed in accordance with the approved product control approval.

2.8 CLEANING

A. Remove and replace all broken tile, remove debris and excess tile from roof.

B. Sweep cut tiles clean.

2.9 REPAIR AND REPLACEMENT

A. Damaged Tile:

1. Break out damaged roof tile.
2. Repair torn underlayment.
3. Drive fastener flush.
4. Apply minimum 3/8 inch (10 mm) by 2 inch (51 mm) bead of approved adhesive on tile in course below replacement tile.
5. Immediately set replacement tile in position assuring proper contact.

B. Damaged Small Valley and Hip Cuts:

1. Apply a minimum of 3/8 inch (10 mm) by 2 inch (51 mm) bead of approved adhesive at head of cut tile.
2. Immediately set tile in course above in position assuring proper contact.

2.10 PROTECTION

A. Protect completed work as needed.

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

END OF SECTION