



SECTION 07 32 00
ROOF TILES

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PART 1 GENERAL

1.1 SECTION INCLUDES

- A. Concrete tile roofing.
- B. Vented roof deck construction for tile roofing.

1.2 RELATED SECTIONS

- A. Section 06 10 00 - Rough Carpentry.
- B. Section 07 22 16 - Roof Board Insulation.
- C. Section 07 60 00 - Flashing and Sheet Metal.
- D. Section 07 72 63 - Waste Containment Assemblies.

1.3 REFERENCES

- A. ASTM International (ASTM):
 - 1. ASTM A 641 - Standard Specification for Zinc-Coated (Galvanized) Carbon Steel Wire.
 - 2. ASTM C 1492 - Standard Specification for Concrete Roof Tile.
 - 3. ASTM D 226 - Standard Specification for Asphalt-Saturated Organic Felt Used in Roofing and Waterproofing; 1997a.
 - 4. ASTM D 249 - Standard Specification for Asphalt Roll roofing (Organic Felt) Surfaced with Mineral Granules: 1989 (reapproved 1996).
 - 5. ASTM D 1970 - Standard Specification for Self-Adhering Polymer Modified Bituminous Sheet Materials Used as Steep Roofing Underlayment for Ice Dam Protection.
 - 6. ASTM D 2626 - Standard Specification for Asphalt-Saturated and Coated Organic Felt Base Sheet Used in Roofing; 1997b.
 - 7. ASTM D 4798 - Standard Practice for Accelerated Weathering Test Conditions and Procedures for Bituminous Materials (Xenon-Arc Method).
 - 8. ASTM D 4869 - Standard Specification for Asphalt-Saturated Organic Felt Underlayment Used in Steep Slope Roofing.
- B. CAN/CSA-A220. 1-Series-06 Concrete Roof Tiles.
- C. City of Los Angeles Research Report - LA RR 25021.

- D. FRSA/TRI - Concrete and Clay Roof Tile Installation Manual Fifth Edition Revised (For Outside HVHZ Wind Zones).
- E. High Wind Applications: Florida Refer RAS 118, 119, 120.
- F. IAPMO ER 1900.
- G. IAPMO ER 2015 Concrete and Clay Roof Tile Installation Manual.
- H. ICC AC 180 - Acceptance Criteria for Clay and Concrete Roof Tiles. August 2007.
- I. ICC ER ESR 1787 Flex Seal, Flex Flash, Flex Vent.
- J. Concrete and Clay Roof Tile Installation Manual (TRI) - Concrete and Clay Design Criteria for Cold and Snow Regions.

1.4 DESIGN REQUIREMENTS

- A. Roofing tile materials and installation shall conform to the requirements of IAPMO ER 1900 and LA RR 25021, and the 2015 Concrete and Clay Roof Tile Installation Manual.
- B. Roofing tile materials and installation shall conform to the requirements of Miami Dade County Notice of Acceptance.
- C. Roofing tile materials and installation shall conform to the, International Building code for one and Two Family Dwelling and the Florida Building Code 5th Edition.
- D. Roofing tile materials and installation shall conform to the requirements of the Applicable Building Code.

1.5 SUBMITTALS

- A. Submit under provisions of Section 01 30 00 - Administrative Requirements.
- B. Product Data: Manufacturer's data for 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.
- D. Selection Samples: For each finish product specified, submit samples indicating manufacturer's full range of available colors and patterns.
- E. Verification Samples: Submit two representative samples of each material specified indicating visual characteristics and finish. Include range samples if variation of finish is anticipated.
- F. Certificates of Compliance: Submit to certify compliance with referenced standards.

1.6 QUALITY ASSURANCE

- A. Manufacturer Qualifications: Member of the Tile Roofing Institute.
- B. Installer Qualifications: License by the local/state authority, and have the proper insurance to operate in your area.
- C. Installation: Refer to the Concrete and Clay Roof Tile Installation Manual ER 2015,

FRSA/TRI Concrete and Clay Roof Tile Installation Manual Fifth Edition Revised, TAS 101 and RAS 118,119,120 for High Wind Zones (HVHZ).

- D. Compliance Reports for Eagle Roofing Products, Florida Department of Community Affairs Approved Application #FL7473, Miami Dade NOA's:
 - 1. IAPMO ER 1900.
 - 2. IBC 2015.
 - 3. IRC 2015.
 - 4. Fire Classifications.
 - 5. Weather Resistance.
 - 6. Wind-uplift Resistance.
 - 7. NOA 16-0314.07 Malibu.
 - 8. NOA 16-0314.08 Capistrano.
 - 9. NOA 16-0314.06 Flat.

- E. Product Requirements:
 - 1. Comply with governing codes and regulations. Provide products of acceptable manufacturers, which have been in satisfactory use in similar service for three years.

- F. Mock-Up:
 - 1. Provide mock-up as required to demonstrate quality of workmanship.
 - 2. Finish areas designated by Architect.
 - 3. Do not proceed with remaining work until material and workmanship are approved by Architect.
 - 4. Modify mock-up area as required to produce acceptable work.

1.7 DELIVERY, STORAGE, AND HANDLING

- A. Deliver, handle, and store materials in accordance with manufacturer's instructions.
 - 1. Refer to the FRSA TRI 07320/8-05 Concrete and Clay Roof Tile Installation Manual Fifth Edition Revised section #1.04.
 - 2. Refer to roof loading guide MC-09 of the Concrete and Clay Roof Tile Installation Manual IAPMO ER 2015.

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

- C. Maintain dry storage area for products of this section until installation of products.

1.8 PROJECT CONDITIONS

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

1.9 WARRANTY

- A. Manufacturer shall warrant the products against manufacturing defects and shall include material and labor to repair or replace defective materials as specified in manufacturer's warranty.
 - 1. Warranty Period - Concrete Roof Tile: Lifetime Transferable Limited Product Warranty for concrete roof tile.

PART 2 PRODUCTS

2.1 MANUFACTURERS

- A. Acceptable Manufacturer:

1. Eagle Roofing Products - Rialto: 2352 N. Locust Ave., Rialto, CA 92377. ASD. Tel: (800) 400-3245. Fax: (909) 822-5940. Website: www.eagleroofing.com.
2. Eagle Roofing Products - Stockton: 4555 S. McKinley, Stockton, CA 95206. ASD. Tel: (800) 998-3245. Fax: (209) 234-4366. Website: www.eagleroofing.com.
3. Eagle Roofing Products - Phoenix: 4602 W. Elwood, Phoenix, AZ 85043. ASD. Tel: (800) 346-5260. Fax: (602) 442-8841. Website: www.eagleroofing.com.
4. Eagle Roofing Products Florida LLC - Sumterville: 1575 E. C R 470, Sumterville, FL 33585. ASD. Tel: (877) 300-3245. Fax: (877) 300-3248. Website: www.eagleroofing.com.

B. Substitutions: Not permitted.

C. Requests for substitutions will be considered in accordance with provisions of Section 01 60 00 - Product Requirements.

2.2 TILE

A. Concrete Roof Tile: As manufactured by Eagle Roofing Products.

B. Standard Concrete Tile:

1. Malibu Low Profile Tile:
 - a. Weight: Standard Weight.
 - b. Weight: Lightweight.
 - c. Product Number/Name: _____.
 - d. Cool Roof Color / Number: _____.
 - e. Trim Tile: Barrel type.
 - f. Trim Tile Color: _____.
 - g. Hip Starters: Barrel.
 - h. Hip Starters Color: _____.
 - i. Boosted Cap Color: _____.
2. Capistrano High Profile Tile:
 - a. Weight: Standard Weight.
 - b. Weight: Lightweight
 - c. Product Number/Name: _____.
 - d. Cool Roof Color / Number: _____.
 - e. Trim Tile: Barrel type.
 - f. Trim Tile Color: _____.
 - g. Hip Starters: Barrel.
 - h. Hip Starters Color: _____.
 - i. Boosted Cap Color: _____.
3. Bel Air Flat Profile Tile:
 - a. Weight: Standard Weight.
 - b. Weight: Lightweight.
 - c. Product Number/Name: _____.
 - d. Cool Roof Color/Number: _____.
 - e. Trim Tile: Flat type.
 - f. Trim Tile Color: _____.
 - g. Hip Starters: Flat smooth.
 - h. Hip Starters Color: _____
4. Estate Flat Profile Tile:
 - a. Weight: Standard Weight.
 - b. Weight: Lightweight.
 - c. Product Number / Name: _____.
 - d. Cool Roof Color / Number: _____.
 - e. Trim Tile: Rake/Ridge Type.
 - f. Trim Tile Color: _____.
 - g. Hip Starters: Flat smooth

- h. Hip Starters Color: _____.
- 5. Ponderosa Flat Profile Tile:
 - a. Weight: Standard Weight.
 - b. Weight: Lightweight.
 - c. Product Number / Name: _____.
 - d. Cool Roof Color / Number: _____.
 - e. Trim Tile: Rake/Ridge Type.
 - f. Trim Tile Color: _____.
 - g. Hip Starters: Flat brushed.
 - h. Hip Starters Color: _____.
- 6. Golden Eagle Flat Profile Tile:
 - a. Weight: Standard Weight.
 - b. Weight: Lightweight.
 - c. Profile Name / Number: _____.
 - d. Cool Roof Color / Number: _____.
 - e. Trim Tile: Rake/Ridge Type.
 - f. Trim Tile Color: _____.
 - g. Hip Starters: Flat brushed.
 - h. Hip Starters Color: _____.
- 7. Double Eagle Bel Air Flat Profile Tile:
 - a. Weight: Standard weight.
 - b. Profile Name / Number: _____.
 - c. Cool Roof Color / Number: _____.
 - d. Trim Tile: Flat type.
 - e. Trim Tile Color: _____.
 - f. Hip Starters: Flat smooth.
 - g. Hip Starters Color: _____.
- 8. Double Eagle Ponderosa Tile:
 - a. Weight: Standard weight.
 - b. Weight: Light weight.
 - c. Shape: Flat profile.
 - d. Color and Finish: _____.
 - e. Trim Tile: Rake/Ridge Type.
 - f. Trim Tile Color: _____.
 - g. Hip Starters: Flat brushed.
 - h. Hip Starters Color: _____.

2.3 RELATED Material's

- A. Eagle Ventilated Roof:
 - 1. Eave Ventilation: Eagle Roofing Products, Ventilated Bird Stop/Eave Riser.
 - 2. Bird Stop for Low Profile Tiles:
 - a. Color: Black.
 - b. Color: Brown.
 - c. Color: White (special order).
 - 3. Bird Stop for High Profile Tiles:
 - a. Color: Black.
 - b. Color: Terracotta.
 - c. Color: White (special order).
 - 4. Eave Riser for Flat Profile Tiles:
 - a. Color: Black.
 - b. Color: Terracotta.
 - c. Color: White (special order).
 - 5. Arched Battens Type: 1 by 1-3/16 inch wood.
 - 6. Batten Type: Counter Batten System.
 - 7. Ridge Ventilation: Eagle Roofing Products, Flex Vent.

8. Ridge Ventilation: Eagle Roofing Products, Ridge Riser. Provide 2 inches by 2 inches (51 mm by 51 mm) ridge board.
- B. Decking: Comply with FRSA/TRI 07320/8.05 Concrete and Clay Roof Tile Installation Manual.
 - C. Underlayment: Comply with FRSA/TRI Manual Fifth Edition Revised 07320/8-05, Concrete and Clay Roof Tile Installation Manual.
 - D. Arched Battens:
 1. Nominal 1 inch by 1-3/16 inches complying with IBC Chapter 23, section 2302.
 2. Comply with Section #3.11 pages #16-#17 and #82 of the FRSA/TRI 07320/8-05 Concrete and Clay Roof Tile Installation Manual Fifth Edition Revised.
 3. The Arched Batten as manufactured by Eagle Roofing Products. Product for elevating battens off of the roof deck.
 - E. Eave Closure/Riser/Bird Stop: Comply with MC 10, MC-10A, 10B, 10C & or 10D (Concrete and Clay Roof Tile Installation Manual Installation Guide IAPMO ER 2015). Refer to drawings.
 1. Bird Stop for Low Profile Tiles:
 - a. Color: Black.
 - b. Color: Terracotta.
 - c. Color: White (special order).
 2. Bird Stop for High Profile Tiles:
 - a. Color: Black.
 - b. Color: Terracotta.
 - c. Color: White (special order).
 3. Eave Riser for Flat Profile Tiles:
 - a. Color: Black.
 - b. Color: Brown.
 - c. Color: White (special order).
 - F. Eave Closure/Riser/Bird Stop:
 1. Comply with Section # 2.09 and #2.10 (FRSA TRI 07320/8-05 Fifth Edition Revised installation Guide IAPMO ER 2015). Refer to drawings.
 2. Eagle Roofing Products Eave Riser/Flat Profile:
 - a. Color: Black.
 - b. Color: Brown.
 - c. Color: Gray.
 - d. Color: Red.
 - e. Color: Tan.
 - f. Color: White.
 3. Eagle Roofing Products Bird Stop Malibu/Low Profile:
 - a. Color: Black.
 - b. Color: Brown.
 - c. Color: Red.
 - d. Color: Tan.
 - e. Color: Terracotta.
 - f. Color: White.
 4. Eagle Roofing Products Bird Stop Capistrano/High Profile:
 - a. Color: Black.
 - b. Color: Brown.
 - c. Color: Red.
 - d. Color: Tan.
 - e. Color: Terracotta.
 - f. Color: White.

- G. Rake and Ridge Flashing: Flashing shall be a minimum No. 26 gauge Galvanized steel G90 or equal.
 - 1. Standard Metal Rake for Low Profile Tiles:
 - a. Color: Black.
 - b. Color: Brown.
 - 2. Standard Metal Rake for Flat Profile Tiles:
 - a. Color: Black.
 - b. Color: Brown.
 - 3. Raised Metal Rake Trim for All Profiles, 1-1/2 inches (38 mm):
 - a. Color: Black.
 - b. Color: Brown.
 - 4. Ridge Weather Block for High Profile Tiles:
 - a. Color: Black.
 - b. Color: Terracotta.

- H. Gable Treatment
 - 1. Underlayment Wrapped Gable:
 - a. Extend underlayment beyond rake/gable end. Fold down onto fascia or barge board, minimum of 1 inch (25 mm). Secure with nails and tin tags, round cap nails or other fasteners 6 inches (152 mm) on center.
 - b. Trim underlayment at fascia or barge board. Install a peel and stick underlayment extending underlayment beyond rake/gable end. Fold down and seal onto fascia or barge board.

- I. Rake/Gable Finish:
 - 1. Rake Gable Tile:
 - a. Install first rake tile the exposed length of first course of field tile with factory finish of rake tile towards the eave.
 - b. Fasten rake tile with a minimum two 10D nails and /or of sufficient length to penetrate the framing a minimum of 3/4 inch (19 mm).
 - c. About each succeeding rake tile to the nose of the field tile above and maintain a constant head lap.
 - 2. Mortar Finish:
 - a. Place mortar bed along roof edge.
 - b. Point smooth to a straight edge finish.

- J. Valley Flashings:
 - 1. No. 26 Gauge (G90) Galvanized 24 inches (610 mm) Flashing.
 - 2. Comply with Tile Roofing Institute Moderate Climate Installation Guide MC 12B.
 - 3. Comply with FRSA/TRI 07320/8-05 Fifth Edition Revised Installation Guide.

- K. Wall Trays (Pans) Flashing:
 - 1. No. 26 Gauge (G90) Galvanized minimum 6 inches (152 mm) trough.
 - 2. Comply with Concrete and Clay Roof Tile Installation Manual MC 12B.
 - 3. Comply with FRSA/TRI 07320/8-08 Fifth Edition Revised Installation Guide.

- L. Roof to Wall Flashing: No. 26 Gauge (G90) Galvanized or flexible flashing to provide minimum 3 inches (76 mm) coverage.

- M. Pipe Flashing:
 - 1. No. 26 Gauge (G90) Galvanized deck flashing installed with underlayment.
 - 2. Flat tile flashing - No. 26 Gauge (G90) Galvanized.
 - 3. High/Low profile tile flashing - 2-1/2 lb. lead, dead soft aluminum or copper.

- N. In Wall Counter Flashing:
 - 1. No. 26 Gauge (G90) Galvanized Z-Bar flashing recommended or surface mount ringlet (pin) flashing for reroofing applications.

- O. Tile Fasteners:
 1. Corrosive resistant fastener meeting ASTM A641 Class I or approved equal. Number 11 gauge diameter and of sufficient length to penetrate 3/4 inch (19 mm) into or through the thickness of the deck or the batten. Comply with Concrete and Clay Roof Tile Installation Manual Table 1A and 1B.
 2. Comply with FRSA/TRI 07320/8-05 Fifth Edition Revised Installation Guide.
 3. Screw Fasteners:
 - a. Corrosion resistant meeting ASTM A641 Class 1 and/or corrosion resistance equal (according to ASTM B 117). Screws shall be 2-1/2 inches (64 mm) in length or penetrate a minimum 3/4 inch (19 mm) into the deck or batten. ASTM A641 Class 1 is a nail specification that can be converted to screw fasteners through performance testing (ASTM B 117). Each fastener manufacturer is responsible for supplying this support this data. Minimum #8 course thread.
 4. High Wind Areas:
 - a. Eagle Roofing Products Wind Clips - Low profile, 2-7/8 inches (73 mm).
 - b. Eagle Roofing Products Wind Clips - High profile, 3-3/8 inches (86 mm).
 - c. Eagle Roofing Products Wind Clips - Flat profile, 2-1/4 inches (57 mm).
 - d. Eagle Roofing Products Wind Clips - Flat fascia, 3/4 inch (19 mm).
 5. Special Application: Boosted Capistrano Installations.
 - a. Wire Ties: Bronze.
 - b. Wire Ties: Stainless Steel.

- P. Adhesive/Sealant: Tile adhesive formulated for use with concrete roof tile.

- Q. Ventilation: Per local building code requirement.

PART 3 EXECUTION

3.1 EXAMINATION

- A. Examine areas to receive tile to verify conditions. Do not commence tile installation until unsatisfactory conditions are corrected.

3.2 TILE INSTALLATION

- A. Install in accordance with manufacturer's instructions and the following standards as applicable to the location of the project:
 1. Concrete and Clay Roof Tile Installation Manual IAPMO ER 2015 (TRI Guide).
 2. TRI/WSRCA Standard Installation Guides for Concrete and Clay Tile in Cold Weather Applications.
 3. FRSA/TRI 07320/8-05 Fifth Edition Revised Installation Guide IAPMO ER 2015.
 4. Florida High Wind Applications. RAS 118, 119,120.
 5. CAN/CSA-A220. 1-Series-06 Concrete Roof Tiles.
 6. FRSA/TRI 07320/8-05 Fifth Edition Revised Installation Guide.

- B. Roof Layout: Layout according to TRI Guide MC 07, MC 08, MC 08A, MC 09. Roof Layout: Layout according to FRSA/TRI 07320/8-05 Fifth Edition Revised. Refer to section # (3.08, 3.12).

- C. Battens: Install according to TRI Guide Table 1, Table 2, Table 3, MC 04 or MC-05, MC 06, MC 06A. FRSA/TRI 073020/8-05 Fifth Edition Revised. Refer to section #3.11 pages 16-17 and 82.

- D. Underlayment: Install according to TRI Guide MC 01A, MC 01B and manufacturer's instructions. FRSA/TRI 07320/8-05 Fifth Edition Revised. Quick Reference charts on pages 2, 23, 45, 67 and manufacturer's instructions.

- E. Vent Pipes: Install according to TRI Guide MC 02. FRSA/TRI Fifth Edition Revised. See drawings 11,12,12,14 and 11-b, 12-b, and 14-b.
- F. Eave/Gable: Install according to MC 10, MC 10A, MC 10B, MC 20, MC 20A. FRSA/TRI 07320/8-05 Fifth Edition Revised. Refer to section 3.03 for eave and refer to sections 3.05, 3.15 and 4.09 for gable.
- G. Venting: Install according to TRI Guide MC 21, manufacturer's instructions and local code requirements.
- H. Hip and Ridge: Install according to TRI Guide MC 18, MC 18A, MC 18B. FRSA/TRI 07320/8-05 Fifth Edition Revised.
- I. Rake: Install according to TRI Guide MC 19, MC 19A, MC 19B. FRSA/TRI 07320/8-05 Fifth Edition Revised, refer to sections 4.09, 3.14 and 3.18.
- J. Valleys: Install according to TRI Guide MC 03, MC 03A, MC 17, MC 17A, MC 17B, MC 17C, MC 17D. FRSA/TRI 07320/8-05 Fifth Edition Revised, refer to sections 3.05 and 3.04 drawings 3, 4, 5 and 3b, 4b, 5b.
- K. Side Wall Flashing: Install according to TRI Guide MC 12, MC 12A, MC 13, MC 13A. FRSA/TRI 07320/8-05 Fifth Edition Revised drawing 7.
- L. Head and Apron Flashing: Install according to TRI Guide MC 11, MC 11A. FRSA/TRI 07320/8-05 Fifth Edition Revised drawings 8, 9, and 10.
- M. Chimneys: Install according to TRI Guide MC 14, MC 14A, MC 15, MC 15A.
- N. Skylights: Install according to TRI Guide MC 16, MC 16A, MC 16B. Florida. Install in compliance with regular flashing installation procedures. For self-curbing or prefabricated skylights, refer to skylight manufacturer's installation instructions.
- O. Gutters: Install according to TRI Guide MC 23. Florida installs according to manufacturer's instructions and local code requirements.

3.3 SPECIAL APPLICATIONS

- A. Slope changes - Refer to TRI Guide MC 22.
- B. Pre-Engineered Roof - Metal Deck - Refer to TRI Guide MC 25, MC 25A, MC 25B, MC 25C.
- C. Pre-Engineered Roof - Concrete Deck - Refer to TRI Guide MC 26, MC 26A.
- D. Spaced Sheathing - Refer to TRI Guide Appendix B.
- E. Adhesive Fastening - Refer to TRI Guide Appendix B.
- F. Adhesive Fastening Set Tile Guidelines;
 - 1. FRSA/TRI 07320/8-05 Fifth Edition Revised. System four underlayment Option "A". And system Four Underlayment Option "B".
- G. Mortar Set Tile Guidelines:
 - 1. Refer to FRSA/TRI 07320/8-05 System Three.
- H. Design for High Wind - Refer to TRI Guide Appendix B. RAS 118, 199,120.

3.4 CLEAN-UP

- A. Remove all debris, including any cut dust, from roof daily.

3.5 REPAIR AND REPLACEMENT

- A. Comply with requirements of TRI Guide MC 24.

3.6 PROTECTION

- A. Protect material and take precautions to prevent other trades from damaging roof materials during and after installation.

END OF SECTION