

ICC-ES Evaluation Report

ESR-1900*

Reissued February 2014

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**DIVISION: 07 00 00—THERMAL AND MOISTURE
PROTECTION**
Section: 07 32 16—Concrete Roof Tiles
REPORT HOLDER:

**EAGLE ROOFING PRODUCTS, A DIVISION OF
BURLINGAME INDUSTRIES, INC.**
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EVALUATION SUBJECT:

**EAGLE® AND EAGLELITE® INTERLOCKING CONCRETE
ROOFING TILES: CAPISTRANO, MALIBU, BEL AIR
ESTATE, DOUBLE EAGLE BEL AIR, PONDEROSA,
DOUBLE EAGLE PONDEROSA, GOLDEN EAGLE,
ARTISAN AND TAPERED ARTISAN**

1.0 EVALUATION SCOPE
Compliance with the following codes:

- 2012 and 2009 *International Building Code*® (IBC)
- 2012 and 2009 *International Residential Code*® (IRC)

Properties evaluated:

- Fire classification
- Weather resistance
- Wind-uplift resistance

2.0 USES

The Eagle® and Eaglelite® concrete roof tiles installed over solid sheathing are used as Class A roof coverings in accordance with IBC Section 1505.2 and IRC Section R902.1.

3.0 DESCRIPTION
3.1 Eagle® Tiles:

These roof tiles are interlocking extruded concrete roof tiles composed of Type II portland cement, washed sand, and proprietary additives and comply with ASTM C1492. Mineral coloring oxides are mixed with the portland cement and water for through-color or for surface application following extrusion. All roof tiles are cured to reach required strength before shipment. Tiles are manufactured with 3/4-inch-wide (19 mm) interlocking sidelaps designed to resist surface water penetration and maintain proper alignment. All tiles have protruding head lugs on the

underside, which provide for mechanical attachment over battens, or provide a stable foundation for nail attachment to solid decking. Two nail holes are provided for low profile tiles. Three nail holes are provided for medium and high profile tiles.

Product designations, dimensions and installed dry weights are indicated in Table 1. Roof tile profiles are illustrated in Figure 1.

3.2 Eaglelite® Tiles:

Eaglelite® tiles are produced in the same size, manner and shapes as the conventional-weight Eagle® tiles described in Section 3.1, except for substitution of lightweight aggregates and additives for sand. Product designations, dimensions and installed dry weights are indicated in Table 1. Roof tile profiles are illustrated in Figure 1.

4.0 INSTALLATION
4.1 General:

Installation of the Eagle® and Eaglelite® concrete roof tiles must be in accordance with the Concrete and Clay Roof Tile Installation Manual for Moderate Climate Regions, dated March 2010, published by the Tile Roofing Institute and Western States Roofing Contractors Association (hereinafter referred to as the TRI/WSRCA installation manual), and recognized in ICC-ES [ESR-2015P](#), except as otherwise noted in this report. This report and the TRI/WSRCA installation manual must be available at the jobsite at all times during installation. The minimum roof slope on which the roof tiles are installed must be 2¹/₂:12 (20.83%). Care must be taken during field installation to ensure that horizontal joints are kept parallel to the eave and vertical joints are at right angles to the eave in order to ensure uniform contact between the tiles and proper fit. All cracked and broken roof tiles must be replaced. Underlayment must comply with and be installed in accordance with IBC Section 1507.3.3 or IRC Section R905.3.3, as applicable.

4.2 Adhesive Set Systems:

The roof tiles may be installed with roof tile adhesives that are recognized in a current ICC-ES evaluation report for use in concrete roofing tile applications. Installation of tiles using these adhesive set systems must be in accordance with the adhesive manufacturer's ICC-ES evaluation report.

4.3 Fire Classification:

When installed in accordance with this report, the Eagle® and Eaglelite® concrete roof tiles are Class A roof coverings in accordance with IBC Section 1505.2 and IRC

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Section R902.1. When roof tiles are installed with a roof tile adhesive, installation must be in accordance with [ESR-1709](#).

4.4 Wind Resistance:

4.4.1 2012 IBC: For ultimate design wind speeds (V_{ult}) of 130 mph (209 km/h) or less and mean roof heights of 60 feet (18.3 m) or less, tiles must be installed in accordance with the prescriptive parameters of Table 1507.3.7 of the IBC. For applications beyond these prescriptive parameters, the tiles and the fastening systems must be designed in accordance with Figure 1 of [ESR-2015P](#), Design Considerations for High Wind Applications Under the 2012 IBC and IRC (ASCE 7-10).

4.4.2 2012 IRC: For basic wind speeds of 100 mph (161 km/h) or less and mean roof heights of 40 feet (12.2 m) or less, tiles must be installed in accordance with the prescriptive parameters of Section R905.3.7 of the IRC. For applications beyond these prescriptive parameters, the tiles and the fastening systems must be designed in accordance with Figure 1 of [ESR-2015P](#), Design Considerations for High Wind Applications Under the 2012 IBC and IRC (ASCE 7-10).

4.4.3 2009 IBC and IRC: For basic wind speeds (3-second gust) of 100 mph (161 km/h) or less and mean roof heights of 60 feet (18 288 mm) or less for the IBC or 40 feet (12 192 mm) or less for the IRC, tiles must be installed in accordance with the prescriptive parameters of Table 1507.3.7 of the IBC or Section R905.3.7 of the IRC, as applicable. For applications beyond these prescriptive parameters, the tiles and the fastening systems must be designed to withstand the aerodynamic wind uplift moment in accordance with the section on Design Considerations for High Wind Applications in Appendix B of the TRI/WSRCA installation manual ([ESR-2015P](#)). The generic required aerodynamic uplift moment, determined in accordance with Tables 5A through 6D of the TRI/WSRCA installation manual, must be multiplied by the tile factor ratio in Table 2 of this report to obtain the required aerodynamic uplift moment for the specific roof tile being installed. The *allowable* aerodynamic uplift moment for the roof tile fastening system selected from Table 7A of the TRI/WSRCA installation manual, must be equal to or greater than the required aerodynamic uplift moment for the specific roof tile being installed.

4.5 Reroofing:

Eagle® and Eaglelite® tiles may be installed over existing asphalt shingles, provided the requirements set forth in IBC Section 1510 or IRC Section R907, as applicable, are met. Damaged or rusted flashing must be replaced. Existing framing must be adequate for the additional load. Structural data verifying adequacy must be submitted to the code official. The existing roof must be inspected in accordance with the requirements of the applicable code. The roof classification is as noted in Section 4.3.

When reroofing wood shake roofs, existing shakes must be removed and solid decking and tile must be installed,

as with new construction. When installation is over existing spaced sheathing boards, underlayment complying with the requirements of the applicable code or an underlayment recognized specifically for this type of use in an ICC-ES evaluation report, installed with or without battens, may be used. One layer of ASTM D226, Type II (No. 30) felt or approved equivalent underlayment must be installed on the roof prior to application of tile. Details not covered under this section are identical to those described in Section 4.1.

5.0 CONDITIONS OF USE

The Eagle® and Eaglelite® concrete roof tiles described in this report comply with, or are suitable alternatives to what is specified in, those codes listed in Section 1.0 of this report, subject to the following conditions:

5.1 The roof tiles must be installed in accordance with this report, the applicable code and the TRI/WSRCA installation manual ([ESR-2015P](#)). In case of a conflict between the installation manual and this report, this report governs.

5.2 The roof decking and roof framing system must be designed for the appropriate loads determined in accordance with the applicable code.

5.3 The tiles are limited to installation on roofs with a slope of 60 degrees or less from horizontal.

Exception: Installation on roof slopes exceeding 60 degrees from the horizontal require an approved wind clip on the bottom edge of each tile in addition to two fasteners per tile.

5.4 The Eagle® and Eaglelite® concrete tiles are produced at the manufacturing facilities specified in Table 1 under a quality control program with inspections by ICC-ES.

6.0 EVIDENCE SUBMITTED

Data in accordance with the ICC-ES Acceptance Criteria for Clay and Concrete Roof Tiles (AC180), dated February 2012.

7.0 IDENTIFICATION

Each Eagle field tile is imprinted with the EAGLE logo (see Figure 2). Tiles produced at the Sumterville, Florida, plant have the EAGLE logo and "FLORIDA" (see Figure 3) imprinted on each field tile. Each Eaglelite tile is identified by the product name "Eaglelite" on a tag and a light-colored strip across the headlap area. Each shipping pallet must have a label bearing the Eagle Roofing Products name; the tile designation; manufacturing location and address; color; quantity of tiles per pallet; production date; installed weight; and the evaluation report number (ESR-1900).

TABLE 1—TILE DIMENSIONS, INSTALLED WEIGHTS AND MANUFACTURING FACILITIES

TILE DESIGNATION	PROFILE	DIMENSIONS ² (inch)		INSTALLED DRY WEIGHT ¹ (psf)		MANUFACTURING FACILITY
		LENGTH	WIDTH	Eagle [®]	Eaglelite [®]	
Capistrano	High	17	12 ³ / ₈	8.8	---	Sumterville, Florida
				9.0	5.7	Rialto & Stockton, California
				9.0	---	Phoenix, Arizona
Malibu	Medium			7.7	---	Sumterville, Florida
				9.03	5.5	Rialto & Stockton, California
				9.03	---	Phoenix, Arizona
Bel Air, Estate, Double Eagle Bel Air, Ponderosa, Double Eagle Ponderosa, Golden Eagle, Artisan and Tapered Artisan	Flat (Low)	9.7	---	Phoenix, Arizona & Sumterville, Florida		
		9.7	7.2	Rialto & Stockton, California		

For **SI**: 1 inch = 25.4 mm, 1 psf = 4.88 kg/m².

¹Installed dry weight is based on a 3-inch headlap.

²All dimensions are nominal.

TABLE 2—TILE FACTORS AND TILE FACTOR RATIOS

TILE DESIGNATION	TILE FACTOR (ft ³)	TILE FACTOR RATIO ¹
Capistrano	1.463	1.040
Malibu	1.486	1.056
Bel Air, Estate, Double Eagle Bel Air, Ponderosa, Double Eagle Ponderosa, Golden Eagle, Artisan, Tapered Artisan	1.468	1.043

For **SI**: 1 inch = 25.4 mm

¹Tile factor ratio = Tile factor / Base tile factor of 1.407 ft³. See Section 4.4.3 of this report and Appendix B of the TRI/WSRCA installation manual for additional details.

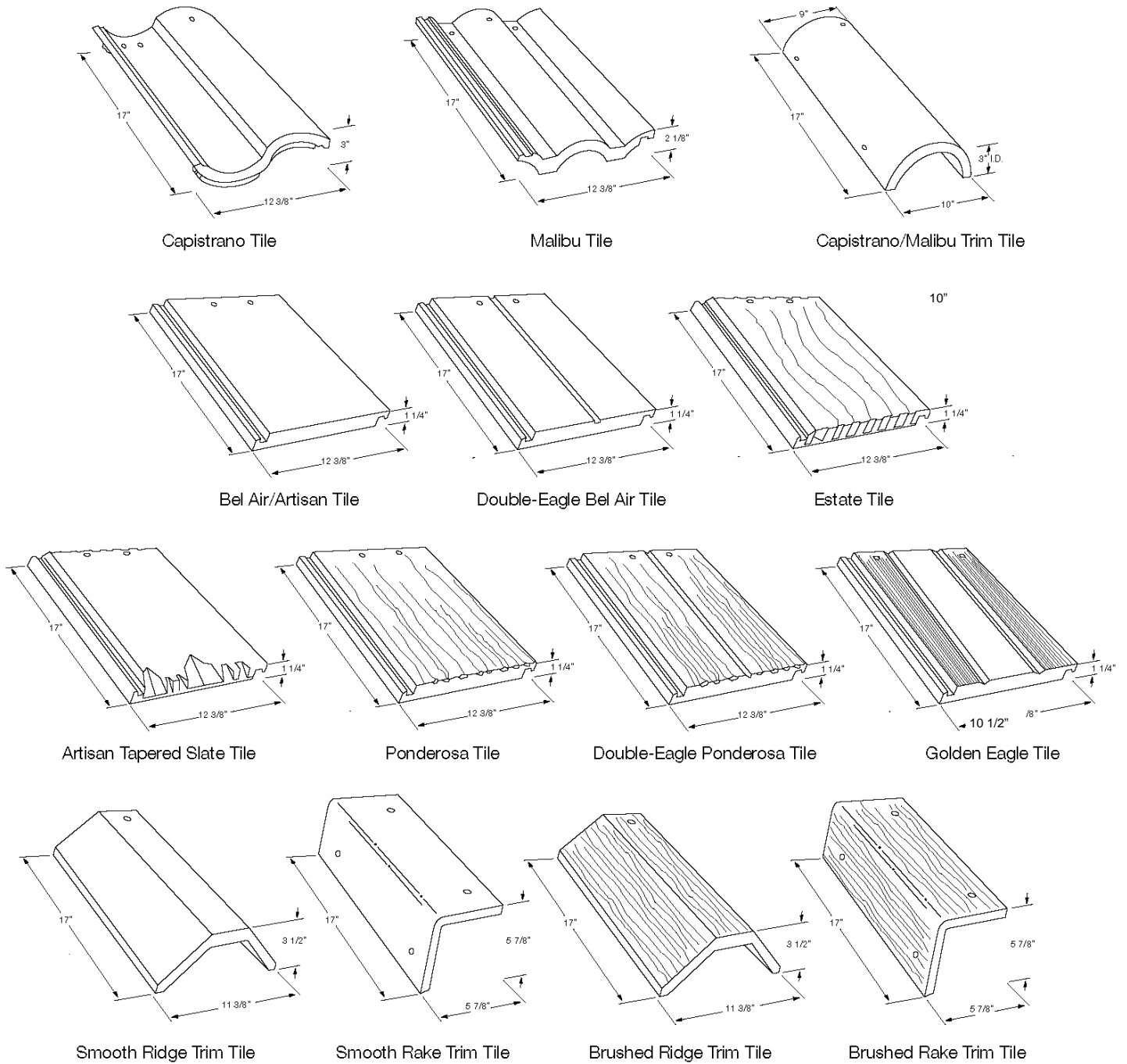


FIGURE 1 – FIELD TILE AND TRIM UNITS



FIGURE 2 – EAGLE ROOFING PRODUCTS LOGO



FIGURE 3 – FLORIDA LOGO

ICC-ES Evaluation Report**ESR-1900 CBC and CRC Supplement***

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The purpose of this evaluation report supplement is to indicate that the Eagle® and EagleLite® Interlocking Concrete Roof Tiles, recognized in ICC-ES master evaluation report ESR-1900, have also been evaluated for compliance with the codes noted below.

Applicable code editions:

- 2013 *California Building Code* (CBC)
- 2013 *California Residential Code* (CRC)

2.0 CONCLUSIONS**2.1 CBC:**

The Eagle® and EagleLite® Interlocking Concrete Roof Tiles described in the master report, ESR-1900, may be used where a Class A roof covering complying with CBC Section 1505.1.1, a Class B roof covering complying with CBC Section 1505.1.2, or a Class C roof covering complying with CBC Section 1505.1.3 is required, provided installation is in accordance with the master report and the additional requirements of CBC Sections 1507.3.10 and 1512.

The roof tiles may be used in the construction of new buildings located in a Fire Hazard Severity Zone within State Responsibility Areas or any Wildland-Urban Interface Fire Area, provided installation is in accordance with the master report and the additional requirements of CBC Sections 701A.3 and 705A.

2.2 CRC:

The Eagle® and EagleLite® Interlocking Concrete Roof Tiles described in the master report, ESR-1900, may be used where a Class A roof covering complying with CRC Section R902.1.1, a Class B roof covering complying with CRC Section R902.1.2, or a Class C roof covering complying with CRC Section R902.1.3 is required, provided installation is in accordance with the master report and the additional requirements of CRC Section R905.3.

The roof tiles may be used in the construction of new buildings located in any Fire Hazard Severity Zone within State Responsibility Areas or Wildland-Urban Interface Fire Area, provided installation is in accordance with the master report and the additional requirements of Sections R327.1.3.1 and R327.5 of the CRC.

The products recognized in this supplement have not been evaluated for compliance with the *International Wildland-Urban Interface Code*®.

This supplement expires concurrently with the master report reissued February 2014, revised June 2014.

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ICC-ES Evaluation Report**ESR-1900 FBC Supplement***

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Applicable code editions:

- 2010 *Florida Building Code—Building*
- 2010 *Florida Building Code—Residential*

2.0 CONCLUSIONS

The Eagle® and EagleLite® Interlocking Concrete Roof Tiles described in Sections 2.0 through 7.0 of in the master report ESR-1900 comply with the 2010 *Florida Building Code—Building* and the 2010 *Florida Building Code—Residential*, provided the design and installation are in accordance with the *International Building Code*® provisions noted in the master report, and the following condition applies:

The Eagle® and EagleLite® Interlocking concrete roof tiles must be installed in accordance with the recommendations of the FRSA/TRI 07320 Installation Manual with the nominal design wind speed (V_{asd}) determined in accordance with Section 1609.3 of the 2010 *Florida Building Code—Building*.

Use of the concrete roof tiles described in the master evaluation report for compliance with the High Velocity Hurricane Zone provisions of the 2010 *Florida Building Code—Building*, and the 2010 *Florida Building Code—Residential* has not been evaluated and is outside the scope of this supplement.

For products falling under Florida Rule 9N-3, verification that the report holder's quality assurance program is audited by a quality assurance entity approved by the Florida Building Commission for the type of inspections being conducted is the responsibility of an approved validation entity (or the code official when the report holder does not possess an approval by the Commission).

This supplement expires concurrently with the master report reissued February 2014, revised June 2014.

***Revised June 2014**