

# ICC-ES Evaluation Report

**ESR-2111**

Reissued July 1, 2009

This report is subject to re-examination in two years.

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**DIVISION: 07—THERMAL AND MOISTURE PROTECTION**  
**Section: 07320—Roof Tiles**
**REPORT HOLDER:**
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**EVALUATION SUBJECT:**
**MISSION 50, MISSION 40N, MISSION 40W, TB-10, TB-12  
 AND TB-S CLAY ROOF TILES**
**1.0 EVALUATION SCOPE**
**Compliance with the following codes:**

- 2006 *International Building Code*® (IBC)
- 2006 *International Residential Code*® (IRC)

**Properties evaluated:**

- Roof covering
- Fire classification
- Wind resistance

**2.0 USES**

The clay tiles, when installed in accordance with this report, are a Class A roof covering.

**3.0 DESCRIPTION**
**3.1 General:**

The clay tiles, classified as Type I (high profile), Grade 1, are in compliance with ASTM C 1167.

**3.2 Mission 50:**

The Mission 50 is a clay barrel tile 19<sup>3</sup>/<sub>4</sub> inches long (502 mm) with a width tapering from 8<sup>1</sup>/<sub>4</sub> inches to 6 inches (210 mm to 152 mm), a nominal thickness of 1/2 inch (12.7 mm) and a weight of approximately 5.3 pounds (2.4 kg) each. The tiles have an installed weight of approximately 8.2 pounds per square foot (39.8 kg/m<sup>2</sup>) when installed with a 3-inch (76 mm) headlap. See Figure 1 for additional details.

**3.3 Mission 40N:**

The Mission 40N is a clay barrel tile 16 inches long (406 mm) with a width tapering from 6 inches to 4<sup>3</sup>/<sub>8</sub> inches (152 mm to 117 mm), a nominal thickness of 1/2 inch (12.7 mm)

and a weight of approximately 3.0 pounds (1.4 kg) each. The tiles have an installed weight of approximately 8.3 pounds per square foot (40.6 kg/m<sup>2</sup>) when installed with a 3-inch (76 mm) headlap. See Figure 1 for additional details.

**3.4 Mission 40W:**

The Mission 40W is a clay barrel tile 16 inches long (406 mm) with a width tapering from 7<sup>1</sup>/<sub>2</sub> inches to 5<sup>1</sup>/<sub>2</sub> inches (191 mm to 140 mm), a nominal thickness of 1/2 inch (12.7 mm) and a weight of approximately 3.5 pounds (1.6 kg) each. The tiles have an installed weight of approximately 7.8 pounds per square foot (38.1 kg/m<sup>2</sup>) when installed with a 3-inch (76 mm) headlap. See Figure 1 for additional details.

**3.5 TB-10:**

The TB-10 is a clay high-profile Spanish “S” tile 18<sup>1</sup>/<sub>2</sub> inches long (470 mm) with a width of 10<sup>1</sup>/<sub>2</sub> inches (267 mm), an exposed width of 9 inches (229 mm), a nominal thickness of 1/2 inch (12.7 mm) and a weight of approximately 9.3 pounds (4.2 kg) each. The tiles have an installed weight of approximately 8.9 pounds per square foot (43.4 kg/m<sup>2</sup>) when installed with a 3-inch (76 mm) headlap. See Figure 1 for additional details.

**3.6 TB-12:**

The TB-12 is an interlocking clay high-profile Spanish “S” tile 17<sup>1</sup>/<sub>4</sub> inches long (438 mm) with a width of 10<sup>1</sup>/<sub>4</sub> inches (260 mm), an exposed width of 8 inches (203 mm), a nominal thickness of 3/4 inch (19.1 mm) and a weight of approximately 5.3 pounds (2.4 kg) each. The tiles have an installed weight of approximately 7.9 pounds per square foot (38.5 kg/m<sup>2</sup>) when installed with a 2<sup>1</sup>/<sub>2</sub>-inch (64 mm) headlap. See Figure 1 for additional details.

**3.7 TB-S:**

The TB-S is an interlocking clay high-profile Spanish “S” tile 18<sup>1</sup>/<sub>2</sub> inches long (470 mm) with a width of 10<sup>1</sup>/<sub>8</sub> inches (257 mm), an exposed width of 8 inches (203 mm), a nominal thickness of 1/2 inch (12.7 mm) and a weight of approximately 7.7 pounds (3.5 kg) each. The tiles have an installed weight of approximately 9.7 pounds per square foot (42.5 kg/m<sup>2</sup>) when installed with a 2<sup>1</sup>/<sub>2</sub>-inch (64 mm) headlap. See Figure 1 for additional details.

**4.0 INSTALLATION**
**4.1 General:**

Installation of the roof tiles must be in accordance with the Concrete and Clay Roof Tile Installation Manual for Moderate Climate Regions, dated July 2006, published by the Tile Roofing Institute Inc. and the Western States

Roofing Contractors Association (herein referred to as the TRI/WSRCA installation manual), and recognized in ICC-ES evaluation report [ESR-2015P](#), except as noted in this report. This report and the TRI/WSRCA installation manual must be available at the jobsite at all times during installation.

#### 4.2 Roof Slope Limitations:

Mission 40N, Mission 40W, Mission 50 and TB-10 tiles must be installed on roofs having a minimum roof slope of  $2\frac{1}{2}$  to 12 (20.83%) or greater in accordance with IBC Section 1507.3.2 and IRC Section R905.3.2.

TB-12 and TB-S tiles are interlocking tiles limiting the headlap to  $2\frac{1}{2}$  inches (64 mm) and must be installed on a minimum roof slope of 3 to 12 (33.3%) or greater.

#### 4.3 Underlayment:

Underlayment must comply with, and be installed in accordance with, IBC Section 1507.3.3 or IRC Section R905.3.3. In areas where the average daily temperature in January is 25°F (-4°C) or less, or where there is a possibility of ice forming along the eaves and causing a backup of water, an ice dam membrane that consists of at least two layers of underlayment, complying with ASTM D 226, cemented together with an approved cementing material, or of a self-adhering polymer modified bitumen sheet complying with ASTM D 1970 or recognized in a current ICC-ES evaluation report for applications as a roof underlayment for use in severe climate areas, must be used in lieu of normal underlayment. The underlayment must extend from the edge of the eave to a point at least 24 inches (610 mm) inside the exterior wall line of the building.

#### 4.4 Fire Classification:

**4.4.1 New Construction:** The clay roof tiles installed in accordance with this report are Class A roof coverings in accordance with the exception to IBC Section 1505.2 and IRC Section R902.1.

**4.4.2 Reroofing Applications:** The tiles are permitted to be installed over existing roofs, provided the requirements of IBC Section 1510 or IRC Section R907, as applicable, are met. The roof classification is as noted in Section 4.4.1.

#### 4.5 Tile Replacements:

Damaged tile must be completely removed. Existing fasteners must be removed and the resulting hole must be cleaned and patched with a sealant specified by the manufacturer. The replacement tile must be set into place maintaining the required head and side lap. The new tile must be secured using a roof tile adhesive recognized in a current ICC-ES evaluation report, applied to the bottom half of the replacement tile.

#### 4.6 Wind Uplift Resistance:

**4.6.1 IBC:** On buildings having a maximum mean roof height of 60 feet (18.3 m), exposed to a maximum basic wind speed (3-second gust) of 100 mph (161 km/h), installation must comply with IBC Table 1507.3.7.

**4.6.2 IRC:** On buildings having a maximum mean roof height of 40 feet (12.2 m), exposed to a maximum basic wind speed (3-second gust) of 100 mph (161 km/h), installation must comply with IRC Section R905.3.7.

**4.6.3 High Wind Applications:** For applications beyond the prescriptive parameters of IBC Table 1507.3.7 and IRC Section R905.3.7, the aerodynamic uplift moment must be determined as follows:

**4.6.3.1 Mission 40N, Mission 40W, TB-10, TB-12 or TB-S:** In accordance with the Design Considerations for High Wind Applications in Appendix B of the TRI/WSRCA installation manual.

**4.6.3.2 Mission 50:** In accordance with the Design Considerations for High Wind Applications in Appendix B of the TRI/WSRCA installation manual with a tile factor (adjusted to account for tile size; see Footnote 2 of the tables in Appendix B) of 1.415 for the Mission 50.

#### 5.0 CONDITIONS OF USE

The clay 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 are manufactured, identified and installed in accordance with this report, the TRI/WSRCA installation manual and the applicable code. If there is a conflict between this report and the installation manual, this report governs.
- 5.2** The roof sheathing and roof framing system must be designed for the appropriate loads determined in accordance with the applicable code, subject to the approval of the code official.
- 5.3** The TB-12 and TB-S tiles must be installed over solid sheathing, in accordance with the applicable code, with a minimum of one fastener per tile.

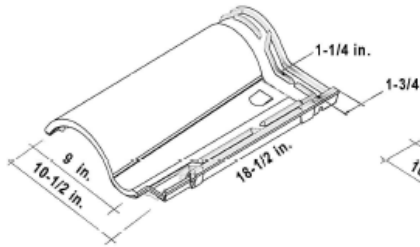
#### 6.0 EVIDENCE SUBMITTED

Data in accordance with the ICC-ES Acceptance Criteria for Clay and Concrete Tiles (AC180), dated August 2007.

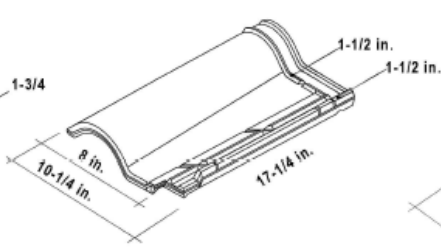
#### 7.0 IDENTIFICATION

Each clay tile is embossed with the words "Tejas Borja." In addition, each pallet or package is identified with the manufacturer's name (Tejas Borja), the product name, the manufacturing location (Valencia plant or Alicante plant), the installed weight and the evaluation report number (ESR-2111).

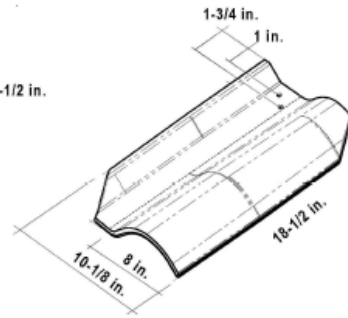
**TB-10**



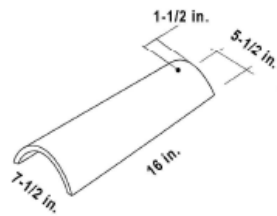
**TB-12**



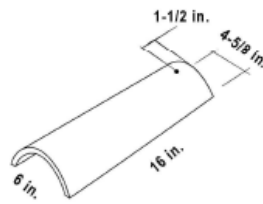
**TB-S**



**Mission 40W**



**Mission 40N**



**Mission 50**

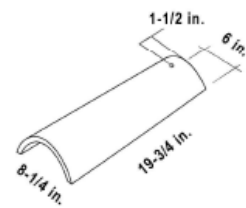


FIGURE 1—TILE ILLUSTRATIONS

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[www.tejasborja.com](http://www.tejasborja.com)**EVALUATION SUBJECT:****MISSION 50, MISSION 40N, MISSION 40W, TB-10, TB-12 AND TB-S CLAY ROOF TILES****PURPOSE OF THIS SUPPLEMENT****1.0 EVALUATION SCOPE****Compliance with the following codes:**

- 2007 *Florida Building Code—Building*
- 2007 *Florida Building Code—Residential*

**Properties evaluated:**

- Fire classification
- Roof covering
- Wind uplift resistance

**2.0 PURPOSE OF THIS SUPPLEMENT**

This supplement is issued to indicate that the clay roof tiles described in the master report comply with the 2007 *Florida Building Code—Building* and the 2007 *Florida Building Code—Residential*, when designed and installed in accordance with the master evaluation report, and with this additional condition: The clay roof tiles must be installed in accordance with the recommendations of the FRSA/TRI 07320 Installation Manual.

Use of the clay roof tiles described in the master evaluation report for compliance with the High Velocity Hurricane Zone provisions of the 2007 *Florida Building Code—Building*, and the 2007 *Florida Building Code—Residential* has not been evaluated, and is outside the scope of this supplement.

For products falling under Florida Rule 9B-72, 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 on July 1, 2009.