ICC-ES Evaluation Report

ESR-2144

Reissued August 1, 2011
This report is subject to renewal in one year.

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DIVISION: 07 00 00—THERMAL AND MOISTURE PROTECTION
Section: 07 32 13—Clay Roof Tiles

REPORT HOLDER:

MARUHACHI CERAMICS OF AMERICA, INC.,
dba MCA CLAY ROOF TILE
1985 SAMPSON AVENUE
CORONA, CALIFORNIA 92879
(951) 736-9590
www.mcatile.com

EVALUATION SUBJECT:

MCA CLAY ROOF TILES: ONE-PIECE MISSION, 10-INCH STRAIGHT BARREL MISSION, 8-INCH STRAIGHT BARREL MISSION, CORONA TAPERED MISSION, CLASSIC TAPERED MISSION, ROMAN PAN, MF108 INTERLOCKING FLAT, IMPROVED-S, ORIENTAL AND CLASSIC "S" MISSION TILES

1.0 EVALUATION SCOPE

Compliance with the following codes:

- 2009 and 2006 *International Building Code®* (IBC)
- 2009 and 2006 *International Residential Code®* (IRC)
- Other Codes (see Section 8.0)

Properties evaluated:

- Weather resistance
- Fire classification
- Wind uplift resistance

2.0 USES

MCA clay roof tiles, installed in accordance with this report, are roof covering materials complying with Chapter 15 of the IBC and Chapter 9 of the IRC, and may be used where Class A, B or C roof assemblies are required.

3.0 DESCRIPTION

3.1 General:

The roof tiles are machine-formed from natural clay and fired to various degrees to obtain the required strength. The tiles have a natural, glazed or spray-flash finish. The surface of the glazed tiles receives an acrylic glaze prior to vitrification. The spray-flash finish consists of a sprayed-on mixture of natural clay materials, which is then baked on the surface of the tile. Accessory tiles such as ridge, gable, hip, birdstop and turret tiles are also available. See Figure 1 for tile profiles.

3.2 Roof Tiles:

3.2.1 One-Piece Mission Tile: The One-Piece Mission tiles are S-shaped, 19 inches (483 mm) long, $14^1/_2$ inches (368 mm) wide, and an average of $^1/_2$ inch (12.7 mm) thick. The tiles weigh 7.8 pounds per square foot (38.0 kg/m^2) when installed with a 3-inch (76 mm) headlap and $2^3/_4$-inch (70 mm) sidelap. The tiles have two nail holes in the pan and one nail hole in the cover side. The tiles are Type I, Grade 1, in accordance with ASTM C 1167.

3.2.2 10-Inch Straight Barrel Mission Tile: The 10-inch Straight Barrel Mission tile consists of a pan and cover unit. The tiles are 19 inches (483 mm) long and 10 inches (254 mm) wide, and have a thickness of $^1/_2$ inch (12.7 mm) at the center tapering to $^7/_{16}$ inch (11.1 mm) at the sides. The tiles weigh 10.2 pounds per square foot (49.8 kg/m^2) when installed with a 3-inch (76 mm) headlap and $13^1/_2$-inch (343 mm) center-to-center side spacing of pan units. One nail hole is provided at the top of each tile. The tiles are Type I, Grade 1, in accordance with ASTM C 1167.

3.2.3 8-Inch Straight Barrel Mission Tile: The 8-inch Straight Barrel Mission tile consists of a pan and cover unit. The tiles are 19 inches (483 mm) long, 8 inches (203 mm) wide and approximately $^1/_2$ inch (12.7 mm) thick. The tiles weigh 10.7 pounds per square foot (52.2 kg/m^2) when installed with a 3-inch (76 mm) headlap and 11-inch (279 mm) center-to-center side spacing of pan units. One nail hole is provided at the top of each tile. The tiles are Type I, Grade 1, in accordance with ASTM C 1167.

3.2.4 Corona Tapered Mission Tile: The tile consists of a pan and cover unit measuring approximately $8^3/_4$ inches (222 mm) wide at the nose and 6 inches (152 mm) wide at the head of each tile. The tiles are 19 inches (483 mm) long and approximately $^1/_2$ inch (12.7 mm) thick. The tiles weigh 10.7 pounds per square foot (52.2 kg/m^2) when installed with a 3-inch (76 mm) headlap and 12-inch (305 mm) center-to-center side spacing of pan units. One nail hole is provided at the top of each tile. The tiles are Type I, Grade 1, in accordance with ASTM C 1167.

3.2.5 Classic Tapered Mission Tile: The tile consists of a pan and cover unit measuring $7^1/_4$ inches (184 mm) wide at the nose and $6^1/_4$ inches (159 mm) at the head of the tile. The tiles are 19 inches (483 mm) long and approximately $^1/_2$ inch (12.7 mm) thick. The tiles weigh 10.4 pounds per square foot (50.8 kg/m^2) when installed with a 3-inch (76 mm) headlap and 10-inch (254 mm) center-to-center side spacing of pan units. One nail hole is provided at the top of each tile. The tiles are Type I, Grade 1, in accordance with ASTM C 1167.

3.2.6 Roman Pan Tile: The Roman Pan tile is 19 inches (483 mm) long, 10 inches (254 mm) wide and approximately $^1/_2$ inch (12.7 mm) thick. The tiles are Type III, Grade 1, in accordance with ASTM C 1167. Two nail holes are provided at the top of each tile.

The Roman Pan tiles use either Classic or Corona Tapered Mission tiles as cover units. When used with Classic Tapered Mission tile covers, the tiles weigh 10.4 pounds per square foot (50.8 kg/m^2), installed with a 3-inch (76 mm) headlap and 12-inch (305 mm) center-to-center side spacing of pan units. When used with the Corona Tapered Mission tile covers, the tiles weigh 10.4 pounds per square foot (50.8 kg/m^2), installed with a 3-inch (76 mm) headlap and 13-inch (330 mm) center-to-center side spacing of pan units.

3.2.7 MF108 Interlocking Flat Tile: The tiles are interlocking flat tiles that are $13^5/_8$ inches (345 mm) long, $13^3/_4$ inches (348 mm) wide and $1^1/_2$ inches (38 mm) thick. The tiles weigh 8.9 pounds per square foot (43.5 kg/m^2) when installed with a $2^1/_4$-inch (57 mm) head lap and a $1^5/_8$-inch (41 mm) side lap. Two nail holes are provided at the top of each tile. The tiles are Type III, Grade 1, in accordance with ASTM C 1167.

3.2.8 Improved-S Tile: Improved-S are Spanish-style interlocking tiles, $12^3/_8$ inches (314 mm) long and $12^3/_8$ inches (314 mm) wide, and having an approximate thickness of $^5/_8$ inch (15.9 mm). The tiles weigh 10.8 pounds per square foot (52.7 kg/m^2) when installed with a 2-inch (51 mm) headlap. Two nail holes are provided in the pan portion of the tile and two lugs are provided on the back. The tiles are Type II, Grade 1, in accordance with ASTM C 1167.

3.2.9 Oriental Tile: Oriental tiles are interlocking tiles that are 12 inches (305 mm) long and 12 inches (305 mm) wide, and have an approximate thickness of $^5/_8$ inch (15.9 mm). The tiles weigh 8.4 pounds per square foot (41.0 kg/m^2) when installed with a $2^3/_8$-inch (60 mm) headlap. A nail hole is provided in the pan portion and two lugs are provided on the back. The tiles are Type II, Grade 1, in accordance with ASTM C 1167.

3.2.10 Classic "S" Mission Tile: The Classic "S" Mission tiles are S-shaped, 19 inches (483 mm) long, 11 inches (279 mm) wide, and an average of $^1/_2$ inch (127 mm) thick. The tiles weigh 7.9 pounds per square foot (38.5 kg/m^2) when installed with a 3-inch (76 mm) headlap and $2^3/_4$-inch (70 mm) sidelap. The tiles have two nail holes in the pan tile and one hole in the cover tile. The tiles are Type 1, Grade 1, in accordance with ASTM C 1167.

4.0 INSTALLATION

4.1 General:

The tiles must be installed 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 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 Adhesively Attached Systems:

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

4.3 Roof Slope Limitations:

The tiles are installed at a minimum roof slope of $2^1/_2$:12 (21 percent) except for the MF108 Interlocking Flat, the Improved-S and the Oriental tiles, which must be installed at a minimum roof slope of 4:12 (33.3 percent).

4.4 Underlayment:

For adhesively attached systems, underlayment must be in accordance with the adhesive manufacturer's ICC-ES evaluation report.

4.5 Fire Classification:

Under the 2009 IBC and IRC, the MCA clay roof tiles, installed in accordance with this report, are Class A roof coverings in accordance with IBC Section 1505.2 and IRC Section R902.1. When roof tiles are installed with a roof tile adhesive, installation must be in accordance with ESR-1709.

Under the 2006 IBC and IRC, MCA clay roof tiles, installed in accordance with this report, are Class A roof assemblies in accordance with the exception to IBC Section 1505.2 and IRC Section R902.1.

4.6 Wind Resistance:

4.6.1 Mechanically Fastened Systems: For applications beyond the prescriptive parameters of IBC Table 1507.3.7 and IRC Section R905.3.7, the fastening systems must be determined to withstand the aerodynamic uplift moment in accordance with the Design Considerations for High Wind Applications in Appendix B of the TRI/WSRCA installation manual.

4.6.2 Adhesively Attached Systems: See the adhesive manufacturer's ICC-ES evaluation report.

4.7 Reroofing Applications:

The tiles may 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 4.5.

5.0 CONDITIONS OF USE

The MCA clay 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 tiles must be manufactured, identified and installed in compliance with this report, the applicable code and the TRI/WSRCA installation manual. The instructions within this report govern if there are any conflicts between the TRI/WSRCA installation manual and this report.

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

5.3 The tiles are manufactured in Corona, California, Hyogo, Japan, and Handa, Aichi, Japan, under an inspection program administered by RI Ogawa & Associates, Inc. (AA-705).

6.0 EVIDENCE SUBMITTED

Data in accordance with the ICC-ES Acceptance Criteria for Clay and Concrete Roof Tiles (AC180), dated June 2009.

7.0 IDENTIFICATION

A tag including the report holder's name (MCA Clay Roof Tile) and address, the product name, the installed weight, the name of the inspection agency (RI Ogawa & Associates, Inc. (AA-705)) and the evaluation report number (ESR-2144), is attached to each shipping pallet. Each Improved-S and Oriental tile is marked with "KTH" or "MTK"; each MF108 tile is marked with the letter "D," and all other tiles manufactured at the Corona facility are marked with "MCA."

8.0 OTHER CODES

In addition to the codes referenced in Section 1.0, the products in this report were evaluated for compliance with the requirements of the following:

- 1999 *Standard Building Code*® (SBC)
- 1997 *Uniform Building Code*™ (UBC)

8.1 Uses:

The MCA clay roof tiles, when installed in accordance with this report, are used as a roof covering material where Class A, B or C roofing assemblies are required.

8.2 Description:

See Section 3.0.

8.3 Installation:

8.3.1 General: In jurisdictions enforcing the SBC, the tiles must be installed in accordance with SBC Sections 1503.2, 1506.5 and 1507.4, as applicable.

For jurisdictions enforcing the UBC, see Section 4.1.

8.3.2 Adhesively Attached Systems: See Section 4.2.

8.3.3 Roof Slope Limitations: See Section 4.3.

8.3.4 Underlayment: See Section 4.4.

8.3.5 Fire Classification:

8.3.5.1 SBC: MCA clay roof tiles installed in accordance with this report are Class A roof coverings in accordance with the exception to SBC Section 1505.2.

8.3.5.2 UBC: MCA clay roof tiles installed in accordance with this report are noncombustible roof coverings in accordance with UBC Section 1504.2.

8.3.6 Wind Resistance:

8.3.6.1 Mechanically Fastened Systems:

8.3.6.1.1 SBC: Installation must comply with SBC Table 1507.4.7 for buildings having a maximum mean roof height of 60 feet (18.3 m) under the SBC, exposed to a maximum basic wind speed (fastest mile) of 80 mph (161 km/h).

8.3.6.1.2 UBC: Installation must comply with the prescriptive parameters of UBC Tables 15-D-1 and 15-D-2. Beyond those limits, the fastening systems must be determined to withstand aerodynamic uplift moment in accordance with the Design Considerations for High Wind Applications in Appendix B of the TRI/WSRCA installation manual.

8.3.6.2 Adhesively Attached Systems: Installation must be in accordance with the adhesive manufacturer's ICC-ES evaluation report.

8.3.7 Reroofing Applications: The tiles may be installed over existing roofs, provided the requirements of SBC Section 1510 or the Appendix to UBC Chapter 15, as applicable, are met. The roof classification is as noted in Section 8.3.5.1 (SBC) or Section 8.3.5.2 (UBC).

8.4 Conditions of Use:

The MCA clay roof tiles described in this report comply with, or are suitable alternatives to what is specified in, those codes listed in Section 8.0 of this report, subject to the following conditions:

8.4.1 The tiles must be manufactured, identified and installed in compliance with this report, the applicable code and the TRI/WSRCA installation manual (UBC only). The instructions within this report govern if there are any conflicts between the TRI/WSRCA installation manual and this report.

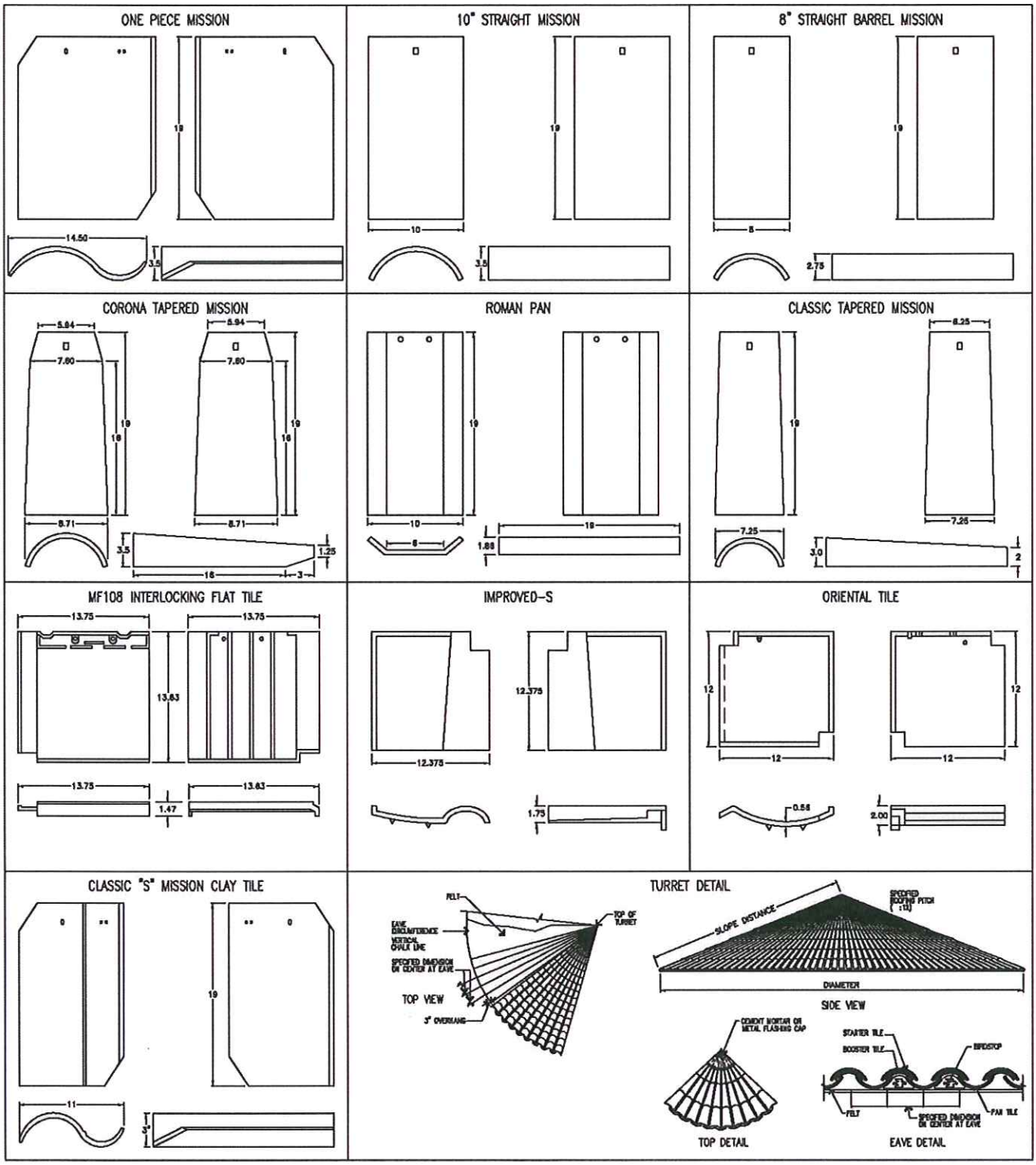
8.4.2 See Section 5.2.

8.5 Evidence Submitted:

See Section 6.0.

8.6 Identification:

See Section 7.0.



For **SI:** 1 inch - 25.4 mm.

FIGURE 1—TILE PROFILES

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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 Sections 2.0 through 7.0 of the master report ESR-2144 comply with the 2007 *Florida Building Code—Residential*, when designed and installed in accordance with the master evaluation report, 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-3, verification that the report holder's 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 August 1, 2011.