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CLAY ROOF TILES

CSI Section:

07 32 13 Clay Roof Tiles

1.0 RECOGNITION

Westlake Royal Roofing USTile (USTile) Clay Roof Tiles recognized in this report have been evaluated for use as roof covering material. The weather resistance, wind uplift resistance, and fire classification properties have been evaluated and comply with the intent of the provisions of the following codes and regulations:

- 2021, 2018, 2015, 2012, and 2009 International Building Code® (IBC)
- 2021, 2018, 2015, 2012, and 2009 International Residential Code® (IRC)
- 2022 California Building Code (CBC) – see attached Supplement
- 2022 California Residential Code (CRC) – see attached Supplement
- 2023 and 2020 Florida Building Code, Building (FBC, Building) – see attached Supplement
- 2023 and 2020 Florida Building Code, Residential (FBC, Residential)

2.0 LIMITATIONS

Use of the Clay Roof Tiles recognized in this report is subject to the following limitations:

2.1 The roof tiles shall be manufactured, identified, and installed in accordance with this report, the applicable code, and the Roof Tile Installation Manual.

2.2 Roof sheathing and roof framing shall be designed for the design loads determined in accordance with the applicable code.

2.3 USTile Clay Roof Tiles are manufactured in the facilities specified in [Table 2](#) of this report.

3.0 PRODUCT USE

3.1 General: The USTile Clay Roof Tiles described in this report are used as 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, when installed in accordance with Table 4 of this report.

3.2 Design General: USTile Roofing clay roof tiles shall be installed in accordance with Section 3.4 of this report. Where conflicts between this report and the installation instructions occur, the more restrictive shall govern.

3.2.1 Sheathing: Solid sheathing shall be 7/16-inch-thick (11.1 mm) or greater oriented strand board complying with DOC PS2 or 15/32-inch-thick (11.9 mm) or greater wood structural panels complying with DOC PS1.

3.2.2 Fasteners: Nails shall be minimum No. 11 gage [0.1196-inch (3.03 mm)] with a 7/16-inch-diameter (11.1 mm) head for use with Claylite and Claymax tiles and 5/16-inch-diameter (7.9 mm) head for use with all other tiles. Screws shall be minimum No. 8 flat head, coarse-thread wood screws, 2½-inch-long (64 mm), with minimum 0.341-inch-diameter (7.98 mm) head. Nails shall be long enough to penetrate into the sheathing ¾-inch (19 mm) or through the thickness of the sheathing, whichever is less.

3.3 Adhesively Attached Systems: The USTile Clay Roof Tiles may be installed with roof tile adhesives that are recognized in an approved evaluation report for use in clay roof tile applications. Installations, including underlayment, shall be in accordance with the adhesive manufacturer’s approved evaluation report.

3.4 Installation When the 2015, 2012, or 2009 IBC or IRC is Applicable: Clay roof tiles shall be installed under the 2015, 2012, or 2009 IBC or IRC, as applicable, and the Concrete and Clay Roof Tile Installation Manual, dated July 2015, published by the Tile Roofing Institute. The TRI manual is available for download attached to ER-2015 from the UES website at www.uniform-es.org

3.4.1 High Wind Applications – One-Piece “S”, Mission and Roman Pan Tiles: For installations under the 2015, 2012, and 2009 IBC and IRC other than prescriptive in accordance with Table 1507.3.7 of the IBC, or Section R905.3.7 of the IRC, of the One-Piece “S”, Mission and Roman Pan tiles, the fastening systems shall be determined to withstand the aerodynamic uplift moment in accordance with the Design Considerations for High Wind Applications, in Appendix B or C of the Roof Tile Installation Manual, as applicable, using the Tile Factor Ratio from [Table 1](#) of this report.

The product described in this Uniform Evaluation Service (UES) Report has been evaluated as an alternative material, design or method of construction in order to satisfy and comply with the intent of the provision of the code, as noted in this report, and for at least equivalence to that prescribed in the code in quality, strength, effectiveness, fire resistance, durability and safety, as applicable, in accordance with IBC Section 104.11. This document shall only be reproduced in its entirety.

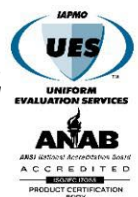




TABLE 1 - Tile Factor Ratio

Tile	Tile Factor (ft ³)	Tile Factor Ratio ¹
One-Piece "S"	1.568	1.114
Tapered 2-Piece Mission	1.10	0.78
Monarch 2-Piece Mission	0.86	0.61
Claylite	1.568	1.114
Claymax	1.568	1.114
Romano Pan	1.140	0.810

¹Tile Factor Ratio = Tile Factor (ft³) / Base Tile Factor of 1.407 ft³

3.4.2 Claylite and Claymax Tiles: Under the 2015, 2012, and 2009 IBC and IRC, Claylite and Claymax tiles shall be fastened to the sheathing with two nails per tile. Alternatively, a single nail through the fastener hole located in the pan side of the tile 1¼ inch (44.3 mm) from the head of the tile may be used provided the maximum allowable wind speed and roof height are as shown in [Table 3](#) of this report.

3.5 Installation When Installed in Accordance with the Requirements of the 2021 or 2018 IBC or IRC: USTile Clay Roof Tiles shall be installed in accordance with IBC Sections 1507.3.7 and 1609.5, or IRC Section R905.3, as applicable. Underlayment shall conform to IBC Section 1507.1.1 or IRC Section R905.1.1, as applicable.

3.6 Fire Classification: USTile Clay Roof Tiles, installed in accordance with this evaluation report have the fire classification noted in Table 4 of this report. Roof classifications for adhesively attached systems shall be in accordance with the adhesive manufacturer’s approved evaluation report.

3.7 Roof Slope Limitations: USTile Tiles, shall be installed on roof slopes of 2½ units vertical in 12 units horizontal, 2½:12 (21-percent slope) or greater.

3.8 Reroofing Applications: USTile Clay Roof Tiles may be installed over existing roofs provided the requirements of Section 1512 of the 2021 IBC, Section 1511 of the 2018 and 2015 IBC (Section 1510 of the 2012 and 2009 IBC) and Section R908 of the 2021, 2018, and 2015 IRC (Section R907 of the 2012 and 2009 IRC), as applicable, are met. The new roof covering application is installed in accordance with the roof covering manufacturer’s approved instructions and this report. Roof classifications are as noted in Section 3.6 of this report.

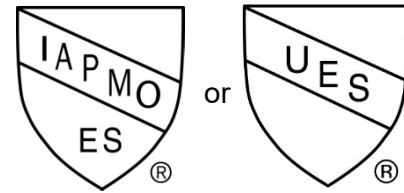
4.0 PRODUCT DESCRIPTION

USTile Clay Roof Tiles are vitrified clay roof tiles complying with ASTM C1167. All tiles, except for the Monarch 2-Piece Mission tiles, are Grade 1 in accordance ASTM C1167. Monarch 2-Piece Mission tiles are Grade 3 in accordance with ASTM C1167. See [Table 2](#) of this report for product

designations, dimensions, and weights. See [Figure 1](#) of this report for roof tile profiles.

5.0 IDENTIFICATION

Shipping pallets are identified with the report holder’s name (Westlake Royal Roofing), manufacturing address, product name, installed weight, approved inspection agency, and evaluation report number (ER-411). The name Westlake, Westlake Royal Roofing LLC, BORAL, or “U.S.T.” is embossed on the underside of the tile, near the nail hole. Either IAPMO UES Mark of Conformity may also be used as shown below:



IAPMO ER-411

6.0 SUBSTANTIATING DATA

Data in accordance with ICC-ES AC180, manufacturer’s descriptive literature and installation instructions. Test reports are from laboratories in compliance with ISO/IEC 17025.

7.0 STATEMENT OF RECOGNITION

This evaluation report describes the results of research completed by IAPMO Uniform Evaluation Service on Westlake Royal Roofing USTile Clay Roof Tiles to assess conformance to the codes shown in Section 1.0 of this report and serves as documentation of the product certification. Products are manufactured at locations noted in Section 2.3 of this report under a quality control program with periodic inspections under the surveillance of IAPMO UES.

For additional information about this evaluation report, please visit www.uniform-es.org or email us at info@uniform-es.org



Tile	Installed Dry Weight (psf)	Dimensions ¹ (In)			Head Lap, minimum (in.)	Side Lap ¹ (in.)	Tile Spacing (in.)	Manufacturing Location
		Length	Width Butt	Width Small				
One-Piece “S”	8	18	13	13	3	2	11	Corona
Tapered 2-Piece Mission	9.6	18	8½	7	3	--	11	Corona
Monarch 2-Piece Mission	10.7	18	6¾	5¼	3	--	9	Corona
Claylite	5.9	18	13	13	3	2	11	Corona
Claymax	5.8	18	13	13	3	2	11	Corona
Romano Pan	9.9	18	11	11	3	3	13	Corona

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

¹ All dimensions are nominal unless specified differently.

Building Height (ft.)	7° ≤ Roof Angle ≤ 27°		27° ≤ Roof Angle ≤ 45°	
	Zone 3	Zone 2	Zone 3	Zone 2
CLAYLITE TILES				
Exposure B				
20	117	160	177	177
40	112	153	170	170
60	NA	144	160	160
Exposure C				
20	NA	141	156	156
40	NA	132	144	144
60	NA	125	141	141
CLAYMAX TILES				
Exposure B				
20	135	183	202	202
40	129	175	195	195
60	122	166	183	183
Exposure C				
20	119	161	179	179
40	111	151	166	166
60	NA	144	160	160

SI: 1 mph = 1.61 km/h; 1 ft. = 305 mm

¹ See Figures 30.4.2B, 2C and 5B of ASCE 7-10 or Figure 6-3 of ASCE 7-05, as applicable.

² Calculations are based on a Risk Factor of II for ASCE 7-10 and an Importance Factor of 1.0 for ASCE 7-05, as applicable.

³ For applications under the 2009 IBC divide the table wind speeds by 1.29.

Assembly No.	Roof Class	Cover Board	Underlayment ³	Wood Battens	Roof Tile
1	A	none	ASTM D226, Type II (No. 30)	none	One-Piece “S”, Tapered and Monarch 2-Piece Mission, Romano Pan, Claylite and Claymax

SI: 1 inch = 25.4 mm

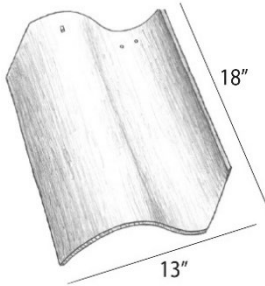
¹ Maximum roof slope is unlimited.

² All assemblies are over solid sheathing as described in Section 3.2.1 of this report.

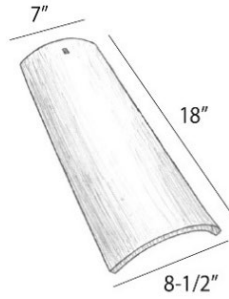
³ Underlayment shall be ASTM D226, Type II (No. 30) or recognized in a valid and approved evaluation report.



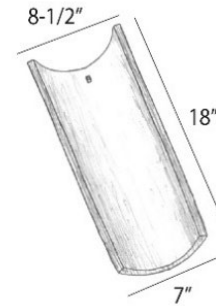
FIGURE 1 – Tile Profiles



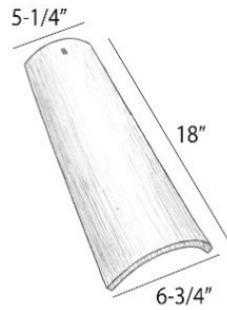
1-PIECE "S" TILE AND CLAYLITE®



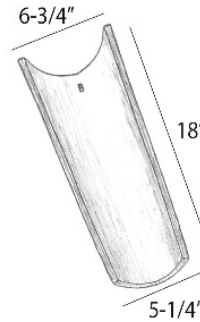
2-PIECE MISSION - TOP



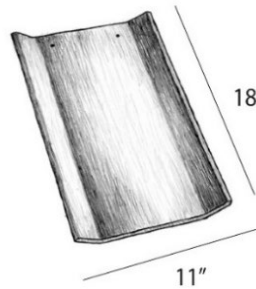
2-PIECE MISSION - PAN



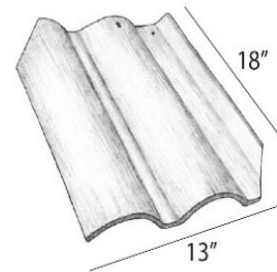
2-PIECE MONARCH - TOP



2-PIECE MONARCH - PAN



ROMANO PAN



CLAYMAX®



CALIFORNIA SUPPLEMENT

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1.0 RECOGNITION

The Westlake Royal Roofing USTile (USTile) Clay Roof Tiles, as evaluated and represented in IAPMO UES Evaluation Report ER-411 and with changes as noted in this supplement, are a satisfactory alternative for use in buildings built under the following codes (and regulations):

- 2022 California Building Code (CBC) – see attached Supplement
- 2022 California Residential Code (CRC) – see attached Supplement

2.0 LIMITATIONS

Use of the Clay Roof Tiles recognized in this report supplement is subject to the following limitations:

2.1 The USTile Clay Roof Tiles described in IAPMO UES ER-411 shall comply with the 2021 IBC or IRC for use under the 2022 CBC or 2022 CRC. The design and installation of the USTile Roofing Clay Roof Tiles shall be in accordance with Section 1507.3.10 of the CBC, and Section 1513 of the CBC or Section R905.3 of the CRC, as applicable, and ER-411.

2.2 Roof Tiles shall be installed in accordance with Sections 3 and 4 of ER-411 except, where the jurisdiction requires conformance to the CBC or CRC, the following shall apply:

2.2.1 Underlayment shall conform with CBC Section 1507.1.1 or CRC Section 905.1.1.

2.2.2 Attachment of the clay roof tiles shall be designed to resist wind loads according to CBC Sections 1507.3.7 and 1609.5 or CRC Section 905.3, as applicable.

USTile Clay Roof Tiles, when installed in accordance with Table 4 of this report, may be used as a Class A roof assembly complying with Section 1505.2 of the CBC or Section R902.1.1 of the CRC, or as a Class B roof covering complying with Section 1505.1.2 of the CBC or Section R902.1.2 of the CRC, or as a Class C roof covering complying with Section 1505.1.3 of the CBC or Section R902.1.3 of the CRC, as applicable.

USTile Clay Roof Tiles may be used in the construction of new buildings located in a Fire Hazard Severity Zone within State Responsibility Areas or a Wildland-Urban Interface Fire Area, provided installation is also in accordance with the IBC as presented in ER-411 and the requirements of Sections 701A.3, 705A, 1505.1.1, 1505.1.2, and 1505.1.3 of the CBC or Sections 337.1.3.1 and 337.5 of the CRC, as applicable.

2.3 This supplement expires concurrently with ER-411.

For additional information about this evaluation report please visit www.uniform-es.org or email us at info@uniform-es.org



FLORIDA SUPPLEMENT

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- 2023 and 2020 Florida Building Code, Building (FBC, Building)
- 2023 and 2020 Florida Building Code, Residential (FBC, Residential)

2.0 LIMITATIONS

Use of the Clay Roof Tiles recognized in this report supplement is subject to the following limitations:

2.1 The USTile Clay Roof Tiles described in IAPMO UES ER-411 complies with the 2020 FBC, Building, and the 2020 FBC, Residential. The design and installation of the USTile Roofing Clay Roof Tiles shall be in accordance with the 2021 and 2018 International Building Code and the 2021 and 2018 International Residential Code, as applicable, as noted in ER-411. The USTile Clay Roof Tiles shall be installed in accordance with the requirements of FBC, Building, Section 1507.3, and FBC, Residential, Section R905.3, as applicable, and the FRSA/TRI *Florida High Wind Concrete and Clay Roof Tile Installation Manual*, Seventh (December 31, 2023) or Sixth Edition (December 31, 2020), as applicable, where the V_{asd} is determined in accordance with FBC, Building, Section 1609.3.1; FBC, Residential, Section R301.2.1; or the recommendations of RAS 118, 119, or 120.

2.2 Nails, screws, and clips used to install the clay roof tiles shall be corrosion resistant in accordance with FBC, Building, Sections 1506.5, 1506.6, and 1506.7, as applicable.

2.3 Fire Classification for roofs in Florida HVHZ areas shall comply with Section 1516 of the FBC, Building. Fasteners for use in Florida's HVHZ areas shall be in accordance with FBC, Building, Section 1517.5. Installation in HVHZ areas shall comply with FBC, Building, Section 1518.8 when appropriate. Underlayment for use in Florida's HVHZ areas shall be in accordance with FBC, Building, Section 1518.2.

2.4 Design wind loads shall be in accordance with Section 1609.5 of the 2020 FBC, Building, and Section 1609.6 of the 2023 FBC, Building, or Section R301.2.1.1 of the FBC-Residential, as applicable. Load combinations shall be in accordance with Sections 1605.2 or 1605.3 of the 2020 FBC, Building, or Sections 1605.1 and 1605.2 of the 2023 FBC, Building, as applicable. Permits shall be applied for, and notifications shall be given in accordance with Sections 1524 and 1525 of the FBC, Building, for HVHZ installations.

2.5 For products falling under Section (5)(d) of Florida Rule 61G20-3.008 verification that the report holder's quality assurance program is audited by a quality assurance entity approved by the Florida Building Commission (or the building official when the report holder does not possess an approval by the Commission), to provide oversight and determine that the products are being manufactured as described in this evaluation report to establish continual product performance is required.

2.6 This supplement expires concurrently with ER-411.

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