



BORAL ROOFING

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CLAY ROOF TILES

CSI Section:

07 32 13 Clay Roof Tiles

1.0 RECOGNITION

Boral Roofing Clay Roof Tiles recognized in this report has 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:

- 2018, 2015, 2012, and 2009 International Building Code® (IBC)
- 2018, 2015, 2012, and 2009 International Residential Code® (IRC)
- 2019 California Building Code (CBC) and 2019 California Residential Code (CRC) – see attached Supplement
- 2020 Florida Building Code, Building (FBC, Building) and 2020 Florida Building Code, Residential (FBC, Residential) – see attached Supplement

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 Boral Roofing Clay Roof Tiles are manufactured in the facilities specified in [Table 2](#) of this report, under a quality control program administered by an approved inspection agency.

3.0 PRODUCT USE

3.1 General: The Boral Roofing 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.

3.2 Design General: Boral 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, 2 1/2-inch-long (64 mm), with minimum 0.341-inch-diameter (7.98 mm) head. Nails shall be long enough to penetrate into the sheathing 3/4-inch (19 mm) or through the thickness of the sheathing, whichever is less.

3.3 Adhesively Attached Systems: The Boral Roofing 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.





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 1¾ 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 2018 IBC or IRC: Boral Clay Roof Tiles shall be installed in accordance with 2018 IBC Section 1507.3.7 and 1609.5 or 2018 IRC Section R905.3, as applicable. Underlayment shall conform to 2018 IBC Section 1507.1.1 or 2018 IRC Section R905.1.1, as applicable.

3.6 Fire Classification: Boral Roofing Clay Roof Tiles, installed in accordance with this evaluation report have the fire classification noted in 4Table 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: Boral Roofing Clay Roof 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: Boral Roofing Clay Roof Tiles may be installed over existing roofs provided the requirements of Section 1511 of the 2018 and 2015 IBC (Section 1510 of the 2012 and 2009 IBC) and Section R908 of the 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 manufacturers approved instructions and this report. Roof classifications are as noted in Section 3.6 of this report.

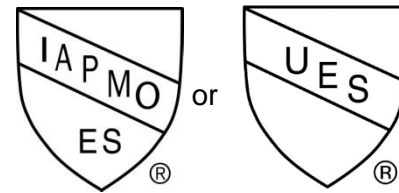
4.0 PRODUCT DESCRIPTION

Boral Roofing 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 (Boral Roofing), manufacturing address, product name, installed weight, approved inspection agency, the UES Mark of conformity and evaluation report number (ER-411). The name Boral, Boral Roofing LLC, or “U.S.T.” is embossed on the underside of the tile, near the nail hole. Either Mark of Conformity may be used as shown below:



IAPMO ER-411

6.0 SUBSTANTIATING DATA

Data in accordance with ICC-ES AC180, dated February 2012 (editorially revised March 2018), 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 Boral Roofing 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



Table 2 – Tile Weights, Dimensions, Manufacturing Location

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.

**Table 3 – Maximum Wind Speeds (mph) – Claylite Tiles and Claymax Tiles
One Nail Installation^{1, 2, 3}**

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.

Table 4 – Roof Assembly Fire Classifications^{1, 2}

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

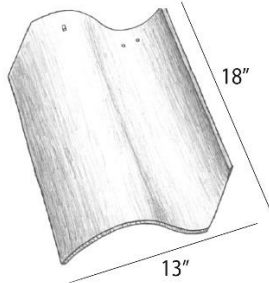
¹ Maximum roof slope is unlimited.

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

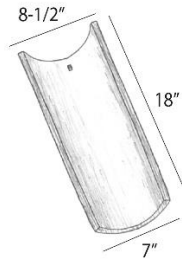
³ Underlayment shall be ASTM D226, Type II (No. 30) or recognized in a valid and approved evaluation report.



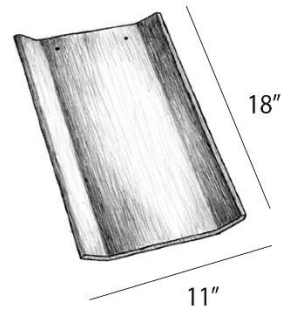
Figure 1 – Tile Profiles



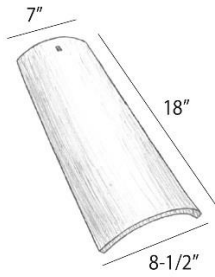
1-PIECE "S" TILE AND CLAYLITE®



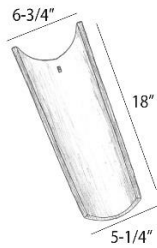
2-PIECE MISSION - PAN



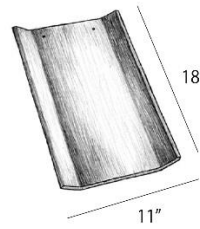
ROMANO PAN



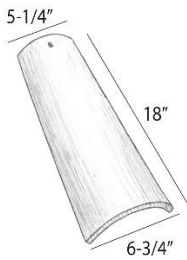
2-PIECE MISSION - TOP



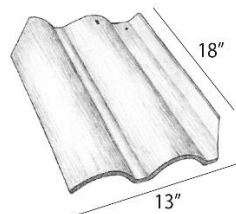
2-PIECE MONARCH - PAN



ROMANO PAN



2-PIECE MONARCH - TOP



CLAYMAX®



CALIFORNIA SUPPLEMENT

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CLAY ROOF TILES

CSI Section:

07 32 13 Clay Roof Tiles

1.0 RECOGNITION

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

- 2019 California Building Code (CBC)
- 2019 California Residential Code (CRC)

2.0 LIMITATIONS

2.1 The Boral Roofing Clay Roof Tiles described in IAPMO UES ER-411 comply with the CBC and the CRC. The design and installation of the Boral Roofing Clay Roof Tiles shall be in accordance with Sections 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.

The Boral Roofing Clay Roof Tiles may be used as a Class A roof covering complying with Section 1505.1.1 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.

Boral Roofing 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 and 705A of the CBC or Sections 337.1.3.1 and 337.5 of the CRC, as applicable.

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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1.0 RECOGNITION

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

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

2.0 LIMITATIONS

The Boral Roofing 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 Boral Roofing Clay Roof Tiles shall be in accordance with the 2018 International Building Code and the 2018 International Residential Code, as applicable, as noted in ER-411. The Boral Roofing 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*, Sixth Edition (December 31, 2020), 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.

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.

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.

Design wind loads shall be in accordance with Section 1609.5 of the 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 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.

For products falling under Florida Rule 61G20-2.008 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.

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