DEPARTMENT OF REGULATORY AND ECONOMIC RESOURCES (RER)
BOARD AND CODE ADMINISTRATION DIVISION

MIAMI-DADE COUNTY
PRODUCT CONTROL SECTION
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NOTICE OF ACCEPTANCE (NOA)

Boral Roofing LLC.
7575 Irvine Center Drive, Suite 100
Irvine, CA 92618

SCOPE:

This NOA is being issued under the applicable rules and regulations governing the use of construction materials. The documentation submitted has been reviewed and accepted by Miami-Dade County RER -Product Control Section to be used in Miami-Dade County and other areas where allowed by the Authority Having Jurisdiction (AHJ).

This NOA shall not be valid after the expiration date stated below. The Miami-Dade County Product Control Section (in Miami-Dade County) and/or the AHJ (in areas other than Miami-Dade County) reserve the right to have this product or material tested for quality assurance purposes. If this product or material fails to perform in the accepted manner, the manufacturer will incur the expense of such testing and the AHJ may immediately revoke, modify, or suspend the use of such product or material within their jurisdiction. RER reserves the right to revoke this acceptance, if it is determined by Miami-Dade County Product Control Section that this product or material fails to meet the requirements of the applicable building code.

This product is approved as described herein, and has been designed to comply with the Florida Building Code including the High Velocity Hurricane Zone of the Florida Building Code.

DESCRIPTION: Madera 900 Concrete Roof Tile

LABELING: Each unit shall bear a permanent label with the manufacturer's name or logo, city, state and following statement: "Miami-Dade County Product Control Approved", unless otherwise noted herein.

RENEWAL of this NOA shall be considered after a renewal application has been filed and there has been no change in the applicable building code negatively affecting the performance of this product.

TERMINATION of this NOA will occur after the expiration date or if there has been a revision or change in the materials, use, and/or manufacture of the product or process. Misuse of this NOA as an endorsement of any product, for sales, advertising or any other purposes shall automatically terminate this NOA. Failure to comply with any section of this NOA shall be cause for termination and removal of NOA.

ADVERTISEMENT: The NOA number preceded by the words Miami-Dade County, Florida, and followed by the expiration date may be displayed in advertising literature. If any portion of the NOA is displayed, then it shall be done in its entirety.

INSPECTION: A copy of this entire NOA shall be provided to the user by the manufacturer or its distributors and shall be available for inspection at the job site at the request of the Building Official.

This NOA revises NOA #14-0416.09 and consists of pages 1 through 7.
The submitted documentation was reviewed by Gaspar J Rodriguez.

ROOFING ASSEMBLY APPROVAL

Category: Roofing
Sub-Category: Roofing Tiles
Material: Concrete

1. SCOPE

This approves a system using **Madera 900 Concrete Roof Tile,** manufactured by **Boral Roofing LLC**, in Stockton, CA, as described in this Notice of Acceptance. This NOA is for locations where the pressure requirements, as determined by applicable Building Code, do not exceed the design pressure values obtained by calculations in compliance with RAS 127 using the values listed in the installation section herein. The attachment calculations shall be done as a moment based system.

2. PRODUCT DESCRIPTION

Manufactured by Applicant	Dimensions	Test Specifications	Product Description
Madera 900 Concrete Roof Tile	L = 13.50" W = 13.00" ½" thick	TAS 112	Flat, interlocking, high pressure extruded concrete roof tile equipped with two nail holes. For direct deck or battened nail-on, mortar or adhesive set applications.
Trim Pieces	L = varies W = varies varying thickness	TAS 112	Accessory trim, concrete roof pieces for use at hips, rakes, ridges and valley terminations. Manufactured for each tile profile.

2.1. MANUFACTURING LOCATION

1. Stockton, CA

2.2. EVIDENCE SUBMITTED

Test Agency	Test Identifier	Test Name/Report	Date
Redland Technologies	7161-03 Appendix III	Static Uplift Testing PA 102 & PA 102(A)	Dec. 1991
The Center for Applied Engineering, Inc.	94-084	Static Uplift Testing PA 101 (Mortar Set)	May 1994
The Center for Applied Engineering, Inc.	94-060A	Static Uplift Testing PA 101 (Adhesive Set)	March, 1994
The Center for Applied Engineering, Inc.	25-7094-2	Static Uplift Testing PA 102 (4" Headlap, Nails, Direct Deck, New Construction)	Oct. 1994
The Center for Applied Engineering, Inc.	25-7094-8	Static Uplift Testing PA 102 (4" Headlap, Nails, Battens)	Oct. 1994

The Center for Applied Engineering, Inc.	25-7094-5	Static Uplift Testing PA 102 (4" Headlap, Nails, Direct Deck, Recover/Reroof)	Oct. 1994
The Center for Applied Engineering, Inc.	25-7183-6	Static Uplift Testing PA 102 (2 Quik-Drive Screws, Direct Deck)	Feb. 1995
The Center for Applied Engineering, Inc.	25-7183-5	Static Uplift Testing PA 102 (2 Quik-Drive Screws, Battens)	Feb. 1995
The Center for Applied Engineering, Inc.	25-7214-1	Static Uplift Testing PA 102 (1 Quik-Drive Screw, Direct Deck)	March, 1995
The Center for Applied Engineering, Inc.	25-7214-5	Static Uplift Testing PA 102 (1 Quik-Drive Screw, Battens)	March, 1995
Redland Technologies	7161-03 Appendix II	Wind Tunnel Testing PA 108 (Nail-On)	Dec. 1991
Redland Technologies	Letter Dated Aug. 1, 1994	Wind Tunnel Testing PA 108 (Nail-On)	Aug. 1994
Redland Technologies	P0631-01	Wind Tunnel Testing PA 108 (Mortar Set)	July 1994
Redland Technologies	P0402	Withdrawal Resistance Testing of screw vs. smooth shank nails	Sept. 1993
The Center for Applied Engineering, Inc.	Project No. 307025 Test #MDC-77	Wind Driven Rain PA 100	Oct. 1994
Atlanta Testing & Engineering, Inc.	R1.894 R2.894 R3.894	Physical Properties PA 112	Aug. 1994
Professional Service Industries, Inc.	395-40011-1	Physical Properties PA 112	February 2004
Celotex Corporation Testing Service	520109-1 520111-4	Static Uplift Testing PA 101	Dec. 1998
Celotex Corporation Testing Service	520191-1	Static Uplift Testing PA 101	March 1999
Walker Engineering, Inc.	Calculations	Aerodynamic Multiplier	March 2004
Walker Engineering, Inc.	Evaluation Calculations	25-7094	February 1996
Walker Engineering, Inc.	Evaluation Calculations	25-7496	April 1996
Walker Engineering, Inc.	Evaluation Calculations	25-7584 25-7804b-8 25-7804-4 & 5 25-7848-6	December 1996
Walker Engineering, Inc.	Evaluation Calculations	25-7183	March 1995
Walker Engineering, Inc.	Evaluation Calculations	Restoring Moment, Mg	March 2004
Walker Engineering, Inc.	Calculations	Two Patty Adhesive Set System	April 1999
Nutting Engineers	13343.1	TAS 112	05/06/08
American Test Lab of South Florida	RT0130.05-14	TAS 112	02/05/14

3. LIMITATIONS

3.1 Fire classification is not part of this acceptance.

3.2 For mortar or adhesive set tile applications, a static field uplift test shall be performed in accordance with TAS 106.

3.3 Applicant shall retain the services of a Miami-Dade County Certified Laboratory to perform quarterly test in accordance with TAS 112, appendix 'A'. Such testing shall be submitted to the Miami-Dade Product Control office for review.

3.4 Minimum underlayment shall be in compliance with the applicable Roofing Applications Standards listed section 4.1 herein.

3.5 30/90 hot mopped underlayment applications may be installed perpendicular to the roof slope unless stated otherwise by the underlayment material manufacturers published literature.

3.6 This acceptance is for wood deck applications. Minimum deck requirements shall be in compliance with applicable building code.

3.7 All products listed herein shall have a quality assurance audit in accordance with the Florida Building Code and Rule 61G20-3 of the Florida Administrative Code.

4. INSTALLATION

4.1 Madera 900 Concrete Roof Tile and its components shall be installed in strict compliance with Roofing Application Standard RAS 118, RAS 119, and RAS 120.

4.2 Data For Attachment Calculations

Table 1: Average Weight (W) and Dimensions (l x w)

Tile Profile	Weight-W (lbf)	Length-l (ft)	Width-w (ft)
Madera 900 Concrete Roof Tile	8.64	1.125	1.08

Table 2: Aerodynamic Multipliers - λ (ft^3)

Tile Profile	λ (ft^3) Batten Application	λ (ft^3) Direct Deck Application
Madera 900 Concrete Roof Tile	0.185	0.200

Table 3: Restoring Moments due to Gravity - M_g (ft-lbf)

Tile Profile	2:12		3:12		4:12		5:12		6:12		7:12 or greater	
Madera 900 Concrete Roof Tile	Battens	Direct Deck	Battens	Direct Deck	Battens	Direct Deck	Battens	Direct Deck	Battens	Direct Deck	Battens	Direct Deck
	N/A	N/A	4.62	4.62	4.55	4.55	4.55	4.45	4.34	4.34	4.23	4.23

Table 4: Attachment Resistance Expressed as a Moment - M_f (ft-lbf) for Mechanically Attached Systems				
Tile Profile	**Fastener Type**	**Direct Deck (min 15/32" plywood)**	**Direct Deck (min. 19/32" plywood)**	**Battens**
Madera 900 Concrete Roof Tile	2-10d Ring Shank Nails	30.9	38.1	17.2
	1-10d Smooth or Screw Shank Nail	7.3	9.8	4.9
	2-10d Smooth or Screw Shank Nails	14.0	18.8	7.4
	1 #8 Screw	30.8	30.8	18.2
	2 #8 Screw	51.7	51.7	24.4
	1-10d Smooth or Screw Shank Nail (Field Clip)	24.3	24.3	24.2
	1-10d Smooth or Screw Shank Nail (Eave Clip)	19.0	19.0	22.1
	2-10d Smooth or Screw Shank Nails (Field Clip)	35.5	35.5	34.8
	2-10d Smooth or Screw Shank Nails (Eave Clip)	31.9	31.9	32.2
	2-10d Ring Shank Nails [1]	50.3	65.5	48.3
1 Installation with a 4" tile headlap and fasteners are located a min. of 2 ½" from head of tile.				

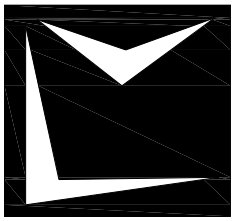
Table 5: Attachment Resistance Expressed as a Moment M_f (ft-lbf) for Two Patty Adhesive Set Systems		
Tile Profile	**Tile Application**	**Minimum Attachment Resistance**
Madera 900 Concrete Roof Tile	Adhesive [2]	31.3 [3]
2 See manufacturer's component approval for installation requirements.		
3 Flexible Products Company TileBond Average weight per patty 13.9 grams. 3M™ 2-Component Foam Roof Tile Adhesive AH-160 Average weight per patty 8 grams.		

Table 6: Attachment Resistance Expressed as a Moment - M_f (ft-lbf) for Single Patty Adhesive Set Systems		
Tile Profile	**Tile Application**	**Minimum Attachment Resistance**
Madera 900 Concrete Roof Tile	3M™ 2-Component Foam Roof Tile Adhesive AH-160	118.9 [4]
	3M™ 2-Component Foam Roof Tile Adhesive AH-160	40.4 [5]
4 Large paddy placement of 45 grams of 3M™ 2-Component Foam Roof Tile Adhesive AH-160.		
5 Medium paddy placement of 24 grams of 3M™ 2-Component Foam Roof Tile Adhesive AH-160.		

Table 7: Attachment Resistance Expressed as a Moment - M_f (ft-lbf) for Mortar Set Systems		
Tile Profile	**Tile Application**	**Attachment Resistance**
Madera 900 Concrete Roof Tile	Mortar Set [6]	43.9
6 See specific mortar manufacturer's Notice of Acceptance		

5. LABELING

All tiles shall bear the imprint or identifiable marking of the manufacturer's name or logo **(See Detail Below)**, or following statement: "Miami-Dade County Product Control Approved".

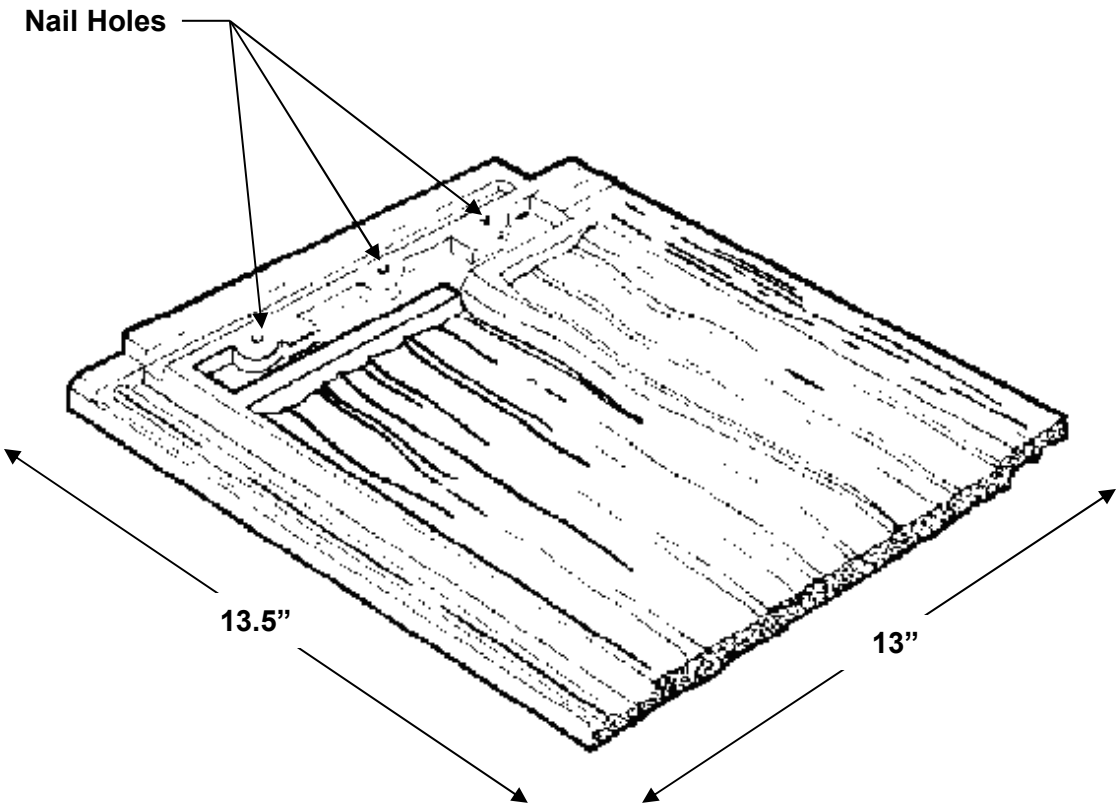


BORAL ROOFING LLC MADERA 900 CONCRETE ROOF TILE (STOCKTON, CA)
(LOCATED ON UNDERSIDE OF TILE)

6. BUILDING PERMIT REQUIREMENTS

As required by the Building Official or the applicable Building Code in order to properly evaluate the installation of this system. This Notice of Acceptance on its own cannot be used to obtain a building permit.

PROFILE DRAWINGS



MADERA 900 CONCRETE ROOF TILE (STOCKTON, CA)

END OF THIS ACCEPTANCE