EXTERIOR RESEARCH & DESIGN, LLC.
Certificate of Authorization #9503
353 CHRISTIAN STREET, UNIT #13
OXFORD, CT 06478
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EVALUATION REPORT

Entegra Roof Tile, Inc.
1289 NE 9th Avenue
Okeechobee, FL 34972

Evaluation Report E39310.11.11-1-R1
FL7804-R7
Date of Issuance: 11/02/2011
Revision 1: 06/22/2012

SCOPE:
This Evaluation Report is issued under Rule 9N-3 and the applicable rules and regulations governing the use of construction materials in the State of Florida. The documentation submitted has been reviewed by Robert Nieminen, P.E. for use of the product under the Florida Building Code and Florida Building Code, Residential Volume. The products described herein have been designed to comply with the 2010 Florida Building Code (HVHZ) sections noted herein.

DESCRIPTION: Entegra Concrete Roof Tiles (HVHZ jurisdictions)

LABELING: Each unit shall bear labeling in accordance with the requirements the Accredited Quality Assurance Agency noted herein.

CONTINUED COMPLIANCE: This Evaluation Report is valid until such time as the named product(s) changes, the referenced Quality Assurance documentation changes, or provisions of the Code that relate to the product change. Acceptance of this Evaluation Report by the named client constitutes agreement to notify Robert Nieminen, P.E. if the product changes or the referenced Quality Assurance documentation changes. Trinity|ERD requires a complete review of this Evaluation Report relative to updated Code requirements with each Code Cycle.

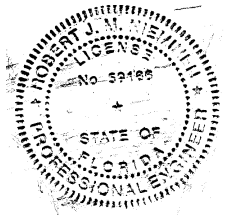
ADVERTISEMENT: The Evaluation Report number preceded by the words "Trinity|ERD Evaluated" may be displayed in advertising literature. If any portion of the Evaluation Report is displayed, then it shall be done in its entirety.

INSPECTION: Upon request, a copy of this entire Evaluation Report 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 Evaluation Report consists of pages 1 through 7.

Prepared by:

Robert J.M. Nieminen, P.E.
Florida Registration No. 59166, Florida DCA ANE1983



The facsimile seal appearing was authorized by Robert Nieminen, P.E. on 06/22/2012
This does not serve as an electronically signed document. Signed, sealed hardcopies have been transmitted to the Product Approval Administrator and to the named client

CERTIFICATION OF INDEPENDENCE:
1. Trinity|ERD does not have, nor does it intend to acquire or will it acquire, a financial interest in any company manufacturing or distributing products it evaluates.
2. Trinity|ERD is not owned, operated or controlled by any company manufacturing or distributing products it evaluates.
3. Robert Nieminen, P.E. does not have nor will acquire, a financial interest in any company manufacturing or distributing products for which the evaluation reports are being issued.
4. Robert Nieminen, P.E. does not have, nor will acquire, a financial interest in any other entity involved in the approval process of the product.

ROOFING SYSTEM EVALUATION:

1. SCOPE:

Product Category: Roofing
Sub-Category: Roofing Tiles
Compliance Statement: Entegra Concrete Roof Tiles, as produced by Entegra Roof Tile, Inc., have demonstrated compliance with the following sections of the Florida Building Code through testing in accordance with the following Standards. Compliance is subject to the Installation Requirements and Limitations / Conditions of Use set forth herein.

2. STANDARDS:

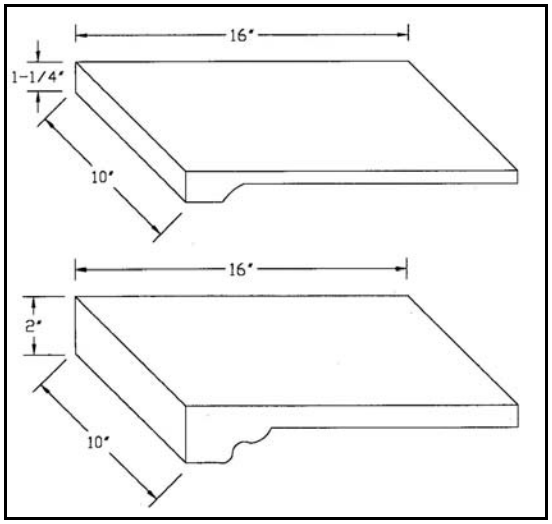
Code	Section	Property	Standard	Year
2007	1523.6.5.2	Physical Properties	TAS 112	1995
2007	1523.6.5.2	Wind Driven Rain	TAS 100	1995
2007	1523.6.5.2.2	Static Uplift Resistance	TAS 101	1995
2007	1523.6.5.2.3	Static Uplift Resistance	TAS 102	1995
2007	1523.6.5.2.3	Static Uplift Resistance	TAS 102(A)	1995
2010	1523.6.5.2	Physical Properties	TAS 112	2011
2010	1523.6.5.2	Wind Driven Rain	TAS 100	2011
2010	1523.6.5.2.2	Static Uplift Resistance	TAS 101	2011
2010	1523.6.5.2.3	Static Uplift Resistance	TAS 102	2011
2010	1523.6.5.2.3	Static Uplift Resistance	TAS 102(A)	2011

3. REFERENCES:

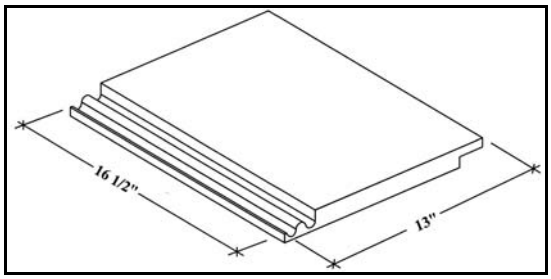
Entity	Examination	Reference	Date
ATL (TST3782)	TAS 112	RT0615.01-11	06/28/2011
ATL (TST3782)	TAS 112	RT0615.02-11	06/28/2011
ATL (TST3782)	TAS 112	RT0615.03-11	06/28/2011
ATL (TST3782)	TAS 112	RT0615.04-11	06/28/2011
ATL (TST3782)	TAS 112	RT0615.05-11	06/28/2011
Tile Roof Institute	TAS 100, TAS 101, 102, 102(A)	Membership Confirmation	Current
PRI (QUA9110)	Quality Assurance	Service Confirmation	11/02/2011

4. PRODUCT DESCRIPTION:

4.1 **BERMUDA FLAT** and **PLANTATION FLAT** are TAS 112, Type 3a (flat-profile) concrete roof tiles.

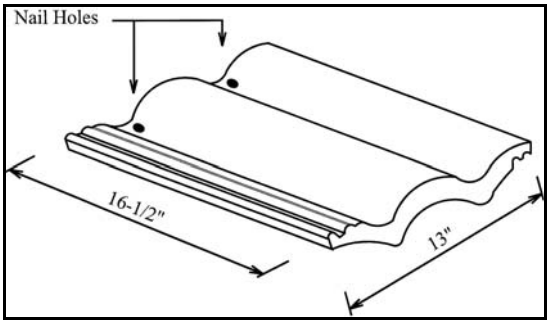


Bermuda Flat

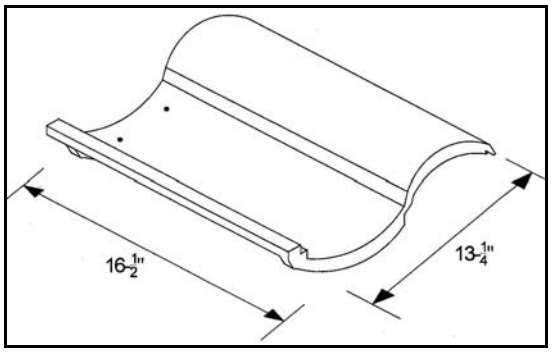


Plantation Flat

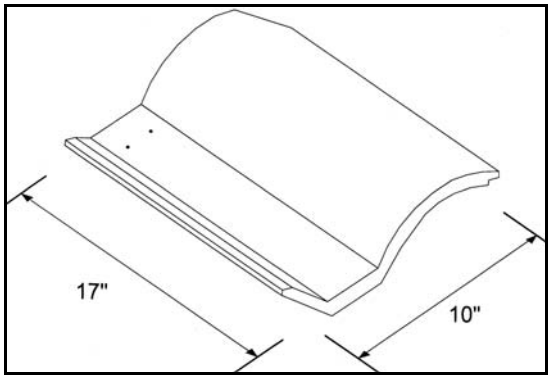
4.2 **ESTATE "S"** are TAS 112, Type 1b (interlocking, low-profile) concrete roof tiles.



4.3 **BELLA HIGH "S"** are TAS 112, Type 1a (interlocking, high-profile) concrete roof tiles.



4.3 **GALENA SPANISH "S"** are TAS 112, Type 2a (non-interlocking, high-profile) concrete roof tiles.



5. LIMITATIONS:

5.1 This Evaluation Report is for use in FBC HVHZ jurisdictions or other jurisdictions adopting FBC HVHZ requirements.

5.2 Fire classification is not part of this evaluation; refer to FBC Section 1516 or current Approved Roofing Materials Directory for fire rating of this product.

5.3 Reference is made to FBC Section 1512.4.2.4 regarding field testing of completed tile roof installations.

5.4 Applicant shall retain the services of an FBC listed, accredited laboratory to perform quarterly tests in accordance with TAS 112, Appendix 'A'. Such testing shall be submitted to Trinity|ERD for review.

5.5 Minimum underlayment shall comply with the RAS 118, RAS 119 or RAS 120, as applicable. Underlayment products shall hold Florida Statewide Product Approval or Local Approval for use in tile roof assemblies in HVHZ jurisdictions.

5.6 Minimum roof deck requirements shall be in accordance with applicable FBC HVHZ requirements.

5.8 All products in the roof assembly shall have quality assurance audit in accordance with the Florida Building Code and F.A.C. Rule 9N-3.

6. INSTALLATION:

6.1 Entegra Concrete Roof Tiles may be mechanically fastened, mortar-set or adhesive-set. Installation shall comply with manufacturer's current published instructions, but not less than the requirements of RAS 118, RAS 119 or RAS 120, as applicable.

6.2 Attachment Calculations: Entegra Concrete Roof Tile shall be evaluated as a 'Moment-Based System' in accordance with RAS 127-95 (for 2007 Code) or RAS 127-11 (for 2010 Code) using the data outlined herein.

Table 1: Aerodynamic Multipliers – λ (ft^3)

Tile	Batten Application	Direct-Deck Application
Bermuda Flat	0.189	0.205
Plantation Flat	0.267	0.289
Bella High "S"	0.349	0.378
Estate "S"	0.267	0.289
Galena Spanish "S"	N/A	0.235

Table 2: Restoring Moment due to Gravity – M_g (ft-lbf)

Tile	Roof Slope (θ)											
	2:12 ≤ θ < 3:12		3:12 ≤ θ < 4:12		4:12 ≤ θ < 5:12		5:12 ≤ θ < 6:12		6:12 ≤ θ < 7:12		θ ≥ 7:12	
	Battens	Direct	Battens	Direct	Battens	Direct	Battens	Direct	Battens	Direct	Battens	Direct
Bermuda Flat	5.22	6.43	5.17	6.37	5.09	6.27	4.98	6.15	4.86	6.00	4.72	5.83
Plantation Flat	7.22	7.91	6.85	7.79	6.75	7.67	6.61	7.52	6.44	7.32	6.26	7.04
Bella High "S"	6.19	6.89	6.11	6.80	5.99	6.67	5.85	6.51	5.68	6.33	5.50	6.13
Estate "S"	6.14	6.84	5.91	6.74	5.82	6.64	5.70	6.50	5.56	6.33	5.40	6.14
Galena Spanish "S"	N/A	6.20	N/A	6.13	N/A	6.03	N/A	5.89	N/A	5.74	N/A	5.57

Table 3A-1: Attachment Resistance Expressed as a Moment – Mf (ft-lbf) Flat Profile Tiles, Mechanically Attached Systems								
Tile	Fastener					Direct-Deck (min. 15/32" plywood)	Direct-Deck (min. 19/32" plywood)	Battens
	Type	#	Size	Shank	Clip			
Bermuda Flat or Plantation Flat	Nail	One (1)	10d	Smooth or Screw	N/A	7.3	9.8	4.9
	Nail	Two (2)	10d	Smooth or Screw	N/A	14.0	18.8	7.4
	Nail	One (1)	10d	Smooth or Screw	Eave	19.0	19.0	22.1
	Nail	One (1)	10d	Smooth or Screw	Field	24.3	24.3	24.2
	Nail	Two (2)	10d	Smooth or Screw	Eave	31.9	31.9	32.2
	Nail	Two (2)	10d	Smooth or Screw	Field	35.5	35.5	34.8
	Nail	Two (2)	10d	Ring	N/A	30.9	38.1	17.2
	Nail[1]	Two (2)[1]	10d[1]	Ring[1]	N/A	50.3[1]	65.5[1]	48.3[1]
	Screw	One (1)	#8	N/A	N/A	30.8	30.8	18.2
	Screw	Two (2)	#8	N/A	N/A	51.7	51.7	24.4
	[1] Installation with a 4-inch tile headlap and fasteners located min. 2½-inch from head of tile.							

Table 3A-2: Attachment Resistance Expressed as a Moment – Mf (ft-lbf) Flat Profile Tiles, Adhesive-Set Systems							
Tile	Application	Adhesive	Size (inch)		Weight (g)		Mf (ft-lbf)
			To Substrate	To Tile	To Substrate	To Tile	
Bermuda Flat or Plantation Flat	Inter-Dependent	TILE BOND™	1 x 6	1 x 6	10.4	10.4	40.6
		Touch 'n Seal™ StormBond	1.25 x 10	1.25 x 8	8.3	10.2	73.2
		3M Foam Roof Tile Adhesive RTA-1 (formerly Polyset® One)	4 x 8	4 x 8	12	12	51.8
		3M 2-Component Foam Roof Tile Adhesive AH-160 (formerly PolyPro® AH160)	4 x 4	2 x 4	16	8	31.3
	Independent	3M 2-Component Foam Roof Tile Adhesive AH-160 (formerly PolyPro® AH160)	2 x 7	N/A	24	N/A	40.4
			2 x 10	N/A	45	N/A	118.9

Table 3B-1: Attachment Resistance Expressed as a Moment – Mf (ft-lbf) Low Profile Tiles, Mechanically Attached Systems								
Tile	Fastener					Direct-Deck (min. 15/32" plywood)	Direct-Deck (min. 19/32" plywood)	Battens
	Type	#	Size	Shank	Clip			
Estate "S"	Nail	One (1)[2]	10d	Smooth or Screw	N/A	8.8[2]	11.8[2]	4.1[2]
	Nail	Two (2)	10d	Smooth or Screw	N/A	16.4	21.9	7.1
	Nail	One (1)[2]	10d	Smooth or Screw	Eave	19.0[2]	19.0[2]	22.1[2]
	Nail	One (1)[2]	10d	Smooth or Screw	Field	24.3[2]	24.3[2]	24.2[2]
	Nail	Two (2)	10d	Smooth or Screw	Eave	31.9	31.9	32.2
	Nail	Two (2)	10d	Smooth or Screw	Field	35.5	35.5	34.8
	Nail	Two (2)	10d	Ring	N/A	27.8	37.4	28.8
	Nail[1]	Two (2)[1]	10d[1]	Ring[1]	N/A	43.0[1]	67.5[1]	50.9[1]
	Screw	One (1)[2]	#8	N/A	N/A	25.8[2]	25.8[2]	22.9[2]
	Screw	Two (2)	#8	N/A	N/A	47.1	47.1	49.1
	[1] Installation with a 4-inch tile headlap and fasteners located min. 2½-inch from head of tile.							
	[2] For one (1) fastener installations, utilize hole that is approximately 4¾-inch from the interlocking edge.							

Table 3B-2: Attachment Resistance Expressed as a Moment – Mf (ft-lbf) Low Profile Tiles, Mortar & Adhesive-Set Systems							
			Size (inch)		Weight (g)		
Tile	Application	Adhesive	To Substrate	To Tile	To Substrate	To Tile	Mf (ft-lbf)
Estate "S"	Inter-Dependent	TILE BOND™	1 x 6	1 x 6	10.4	10.4	43.8
		Touch 'n Seal™ StormBond	1.25 x 10	0.75 x 10	8.4	5.1	41.8
		3M Foam Roof Tile Adhesive RTA-1 (formerly Polyset® One)	4 x 8	4 x 8	12	12	44.0
		3M 2-Component Foam Roof Tile Adhesive AH-160 (formerly PolyPro® AH160)	4 x 4	2 x 4	16	8	31.3
	Independent	3M 2-Component Foam Roof Tile Adhesive AH-160 (formerly PolyPro® AH160)	2 x 7	N/A	24	N/A	45.5
			2 x 10	N/A	54	N/A	86.6
		Mortar	Per RAS 120 and Product Approval of Mortar Mfgr				20.6

Table 3C-1: Attachment Resistance Expressed as a Moment – Mf (ft-lbf) High Profile Tiles, Mechanically Attached Systems								
	Fastener					Direct-Deck (min. 15/32" plywood)	Direct-Deck (min. 19/32" plywood)	Battens
Tile	Type	#	Size	Shank	Clip			
Bella High "S" or Galena Spanish "S"	Nail	One (1)	10d	Smooth or Screw	N/A	5.1	6.8	2.8
	Nail	Two (2)	10d	Smooth or Screw	N/A	6.9	9.2	7.3
	Nail	One (1)	10d	Smooth or Screw	Field	23.1	23.1	19.0
	Nail	One (1)	10d	Smooth or Screw	Eave	29.3	29.3	24.0
	Nail	Two (2)	10d	Smooth or Screw	Field	27.6	27.6	38.6
	Nail	Two (2)	10d	Smooth or Screw	Eave	38.1	38.1	41.8
	Nail	Two (2)	10d	Ring	N/A	28.6	41.2	19.4
	Nail[1]	Two (2)[1]	10d[1]	Ring[1]	N/A	33.1[1]	48.1[1]	50.9[1]
	Screw	One (1)	#8	N/A	N/A	20.7	20.7	18.1
	Screw	Two (2)	#8	N/A	N/A	43.2	43.2	29.8
	[1] Installation with a 4-inch tile headlap and fasteners located min. 2½-inch from head of tile.							

Table 3C-2: Attachment Resistance Expressed as a Moment – Mf (ft-lbf) High Profile Tiles, Mortar & Adhesive-Set Systems							
			Size (inch)		Weight (g)		
Tile	Application	Adhesive	To Substrate	To Tile	To Substrate	To Tile	Mf (ft-lbf)
Bella High "S" or Galena Spanish "S"	Inter-Dependent	TILE BOND™	1 x 6	1 x 6	10.4	10.4	48.1
		Touch 'n Seal™ StormBond	1.25 x 10	0.75 x 8	8.4	3.9	51.6
		3M Foam Roof Tile Adhesive RTA-1 (formerly Polyset® One)	4 x 8	4 x 8	12	12	36.2
		3M 2-Component Foam Roof Tile Adhesive AH-160 (formerly PolyPro® AH160)	4 x 4	2 x 4	16	8	35.3
	Independent	3M 2-Component Foam Roof Tile Adhesive AH-160 (formerly PolyPro® AH160)	2 x 7	N/A	24	N/A	38.7
			2 x 10	N/A	63	N/A	66.5
		Mortar	Per RAS 120 and Product Approval of Mortar Mfgr				24.5

7. LABELING:

7.1 Each unit shall bear the imprint or identifiable marking of the manufacturer's name or logo, as detailed below. Tile lots shall be labeled in accordance with the requirements of the Accredited Quality Assurance Agency noted herein.

OR

8. BUILDING PERMIT REQUIREMENTS:

As required by the Building Official or Authority Having Jurisdiction in order to properly evaluate the installation of this product.

9. MANUFACTURING PLANTS:

Okeechobee, FL

10. QUALITY ASSURANCE ENTITY:

PRI Construction Materials Technologies, LLC. – QUA9110; (813) 621-5777

- END OF EVALUATION REPORT -