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Evaluation Report

of

Berridge Manufacturing Company

“Spanish Tile”

With Berridge “Deep-Vee” Panel

Metal Roof Assembly

for

Florida Product Approval

FL 11422.12

Florida Building Code 2007

Per Rule 9B-72

Method: 1 - D

Category: Roofing

Sub - Category: Metal Roofing

Product: “Spanish Tile” Assembly

Material: Steel

Panel Thickness: 24 Gauge

Support Type: Wood Deck

Prepared for:

Berridge Manufacturing Company

1720 Maury Road

Houston, TX 77026

Prepared by:

James L. Buckner, P.E.

Florida Professional Engineer # 31242

Florida Evaluation ANE ID: 1916

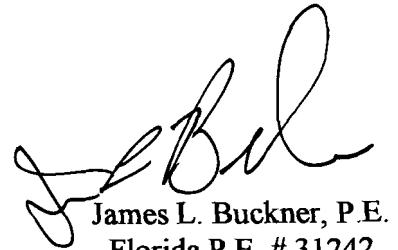
Project Manager: Diana Galloway

Report No. 08-136-SpanishTile-S4W-ER

Date: 9 / 1 / 08

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James L. Buckner, P.E.
Florida P.E. # 31242
9/17/08

CBUCK, Inc.

1334 S. Killian Drive, Suite 4, West Palm Beach, Florida 33403

Phone: (561)491-9927 Fax: (561)491-9928 Email: cbuck@cbuckinc.net

C-BUCK Engineering

Specialty Structural Engineering

CBUCK, Inc. Florida Certificate of Authorization # 8064

Manufacturer:	Berridge Manufacturing Company
Product Name:	“Spanish Tile” Assembly
Product Category:	Roofing
Product Sub-Category	Metal Roofing
Compliance Method:	State Product Approval Rule 9B-72.070 (1) (d)
Product Description:	“Spanish Tile” Steel, Roof Panel Assembly attached to Wood Deck.
Panel Components Description / Material / Standards:	“Spanish Tile” Roof Panel Panel Type: Discontinuous Material: Steel Thickness: 24 gauge minimum Yield Strength: 40 ksi minimum Dimensions: 8-1/2” (wide) x 16” (long) – Net Coverage Area Corrosion Resistance: Material shall comply with the Florida Building Code (FBC), 2007 Section 1507.5.4. “Deep-Vee” Roof Panel (Primary Roof Membrane) Panel Type: Continuous Material: Steel Thickness: 24 gauge minimum Yield Strength: 40 ksi minimum Dimensions: Width: 9” (Maximum net coverage) Rib Height: 1-1/2” Corrosion Resistance: Material shall comply with the Florida Building Code (FBC), 2007 Section 1507.5.4.
Support Type:	Wood Deck (Design of support system is not included in this evaluation)
Support Description:	<ul style="list-style-type: none">• 15/32” or greater plywood, or• Wood plank
Slope Range:	2 : 12 to 12 : 12 Minimum slope shall comply with FBC 2007, including Sections 1507.4.2, 1504.7 and in accordance with the Manufacturers recommendations.
Underlayment:	Underlayment shall comply with FBC Section 1507.5.3 and per manufacturer’s guidelines as required in FBC Section 1507.5.2.1.
Insulation:	(Optional) Rigid Insulation Board, 3” maximum thickness and with a density of 2.25 pcf (lbs/ft ³) minimum or a compressive strength of 25 psi minimum.
Fire Classification:	Fire Classification is outside the scope of Rule 9B-72, and is therefore not included in this evaluation. Additional approved substrates may be added for Fire Classification purposes.

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Attachment Component Description:

Roof Panel Fasteners:

“Deep-Vee” Fasteners

Size: #9 - 15 x 1-1/2”

Type: Hex-head wood screws

Corrosion Resistance: Per FBC Section 1506.6 and 1507.4.4

Standard: Per ANSI/ASME B18.6.1

“Spanish Tile” Fasteners

Size(s): 1. #8 x 5/8” (Tile Head)

2. #10 x 1-1/2” (Tile Nose)

Type: Hex-head Self-drilling sheet metal screws

Corrosion Resistance: Per FBC Section 1506.6 and 1507.4.4

Standard: Per SAE J78-1979

Installation:

Berridge “Spanish Tile” Assembly to Wood Deck:

Berridge “Deep-Vee” Roof Panel to Wood Deck

- **Row Spacing: 24” o.c.** maximum
- **Fastener Spacing: One** fastener, 1-1/2” from each rib centerline (in the flats of each panel, spaced 1-1/2” away from each rib centerline and nominally within 3” from all ends)

Minimum fastener penetration or embedment into deck, 3/16”.

Berridge “Spanish Tile” Roof Panel to Deep-Vee Roof Panel

- Fit “Spanish Tile” panel over “Deep-Vee” panel ribs.
- Attach **One** head screw. (through factory pre-drilled hole located 1/2” from tile head)
- Attach **One** nose screw. (through “Spanish Tile” panel and “Deep-Vee” panel, centered and 1” from nose)
- Tiles shall be separated by 1” across the width.

Install the system in compliance with the attached installation method.

Refer to manufacturer’s installation instructions as a supplemental guide for attachment.

Design Uplift Pressure:

Refer to Page 5 of this Evaluation Report.

Missile Impact Resistance:

Meets criteria for small missile impact resistance per FBC Section 1504.7. (Based on material thickness)

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- Quality Assurance:** The manufacturer has demonstrated compliance of roof panel products in accordance with the Florida Building Code and Rule 9B-72.070 (3) for manufacturing under a quality assurance program audited by an approved quality assurance entity through **Underwriter's Laboratories, Inc.** (FBC Organization #: QUA 1743)
- Performance Standards:** The product described herein has demonstrated compliance with:
- **TAS 125-03** – *Standard Requirements for Metal Roofing Systems*
 - **UL580-94** – *Test for Uplift Resistance of Roof Assemblies—with Revisions through February 1998*
 - **UL 1897-98** – *Uplift test for roof covering systems*
 - **TAS 102-95** - *Test Procedure for Static Uplift Resistance of Mechanically Attached Tile Systems*
- Code Compliance:** The product described herein has demonstrated compliance with the Florida Building Code 2007, Section 1507.4.
- Evaluation Report Scope:** This product evaluation is limited to compliance with the structural wind load requirements of the Florida Building Code, as related to Rule 9B-72.
- System Limitations:** The required design wind loads shall be determined for each project per FBC, 2007, Section 1609. The installation method described herein is limited to the design criteria listed in Table 1.0. Any rational analysis computations shall be prepared by a qualified design professional and in compliance with FBC 2007, Sections 104, 105, 106. This report does not evaluate use of this product in the High Velocity Hurricane Zone.
- Referenced Data:**
1. TAS 125 (Per UL580 & UL 1897)
By Hurricane Test Laboratory, Inc. (FBC Organization #TST ID: 1527)
Report # 0307-0126-04, Date: 3/9/04
“Spanish Tile” Assembly
 2. TAS 102-95 Test
PRI Asphalt Technologies, Inc.(FBC Organization #TST ID: 1556)
Report No.: BMC-003-02-01, Date: 5/24/05
“Spanish Tile” (Discontinuous Component)
 3. Quality Assurance
Underwriters Laboratories, Inc. (FBC Organization #QUA ID:1743)
 4. Certification of Independence
By James L. Buckner, P.E. @ CBUCK Engineering
(FBC Organization# ANE ID: 1916)

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Engineering Data Berridge Manufacturing Company “Spanish Tile” Roof Assembly Attached to Wood Deck

“Spanish Tile” Roof Assembly LIMITS OF USE

DESIGN PARAMETERS	
Roof Zones 1, 2, 3 (Overhang Zones 2, 3 NOT Included)	
Maximum Roof Mean Height:	40 ft.
Slope Range:	2:12 to 12:12
Maximum Wind Velocity:	146 MPH
Exposure:	“B” or “C”
Importance Factor:	1.0
Enclosure Class:	Partially Enclosed
Topographical Factor:	1.0
Directional Factor:	0.85

Table 1.0

“Deep-Vee Panel” (Continuous Component)

ALLOWABLE DESIGN UPLIFT PRESSURE BASED ON UL 580 TEST		
Fasteners	Fastening Pattern	Design Pressure (2:1 Safety Factor)
#9 Hex-Washer Head Screws	Fastener Spacing: 1-1/2” from each rib centerline Row Spacing: 24” o.c.	131 PSF

Table 2.0

“Spanish Tile” (Discontinuous Component) ALLOWABLE UPLIFT DESIGN VALUES PER TAS 102-95

Areodynamic Multipliers - λ (ft ³)	
Tile Profile	λ Direct Deck Application
Spanish Tile	0.218

Table 3.1

Restoring Moments Due To Gravity - M_g (ft-lbf)						
Tile Profile	2:12	3:12	4:12	5:12	6:12	7:12
Spanish Tile	0.82	0.81	0.79	0.77	0.73	0.69

Table 3.2

Attachment Resistance Expressed as a Moment - M_f (ft-lbf)		
Tile Profile	Fastener	Attachment Resistance
Spanish Tile	Head: ONE #8 Screw Nose: ONE #10 Screw	128.50

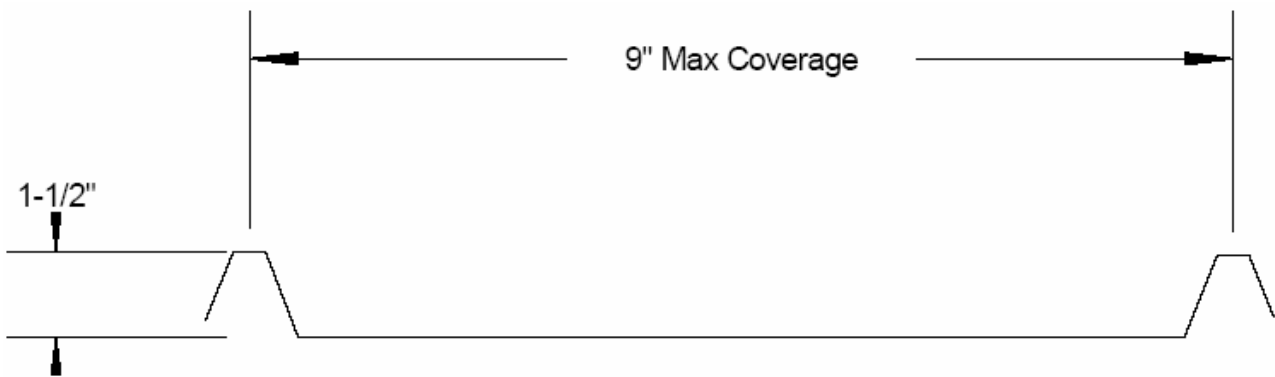
Table 3.3

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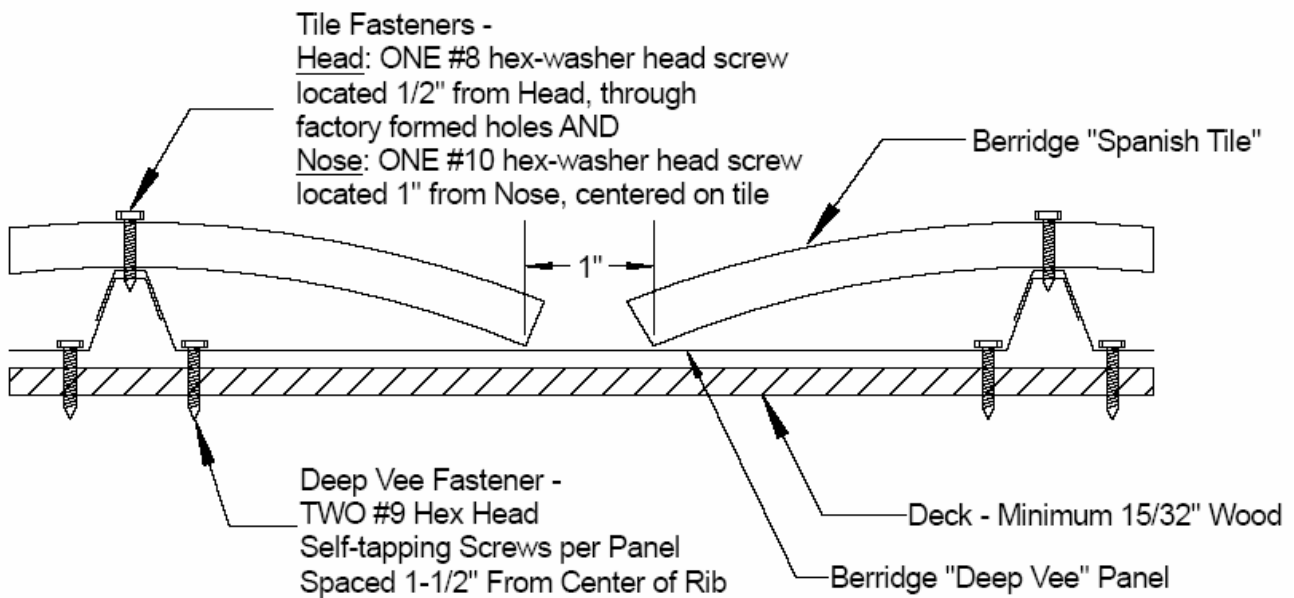
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Installation Method Berridge Manufacturing Company "Spanish Tile" Roof Assembly Attached to Wood Deck



Deep Vee Panel Profile



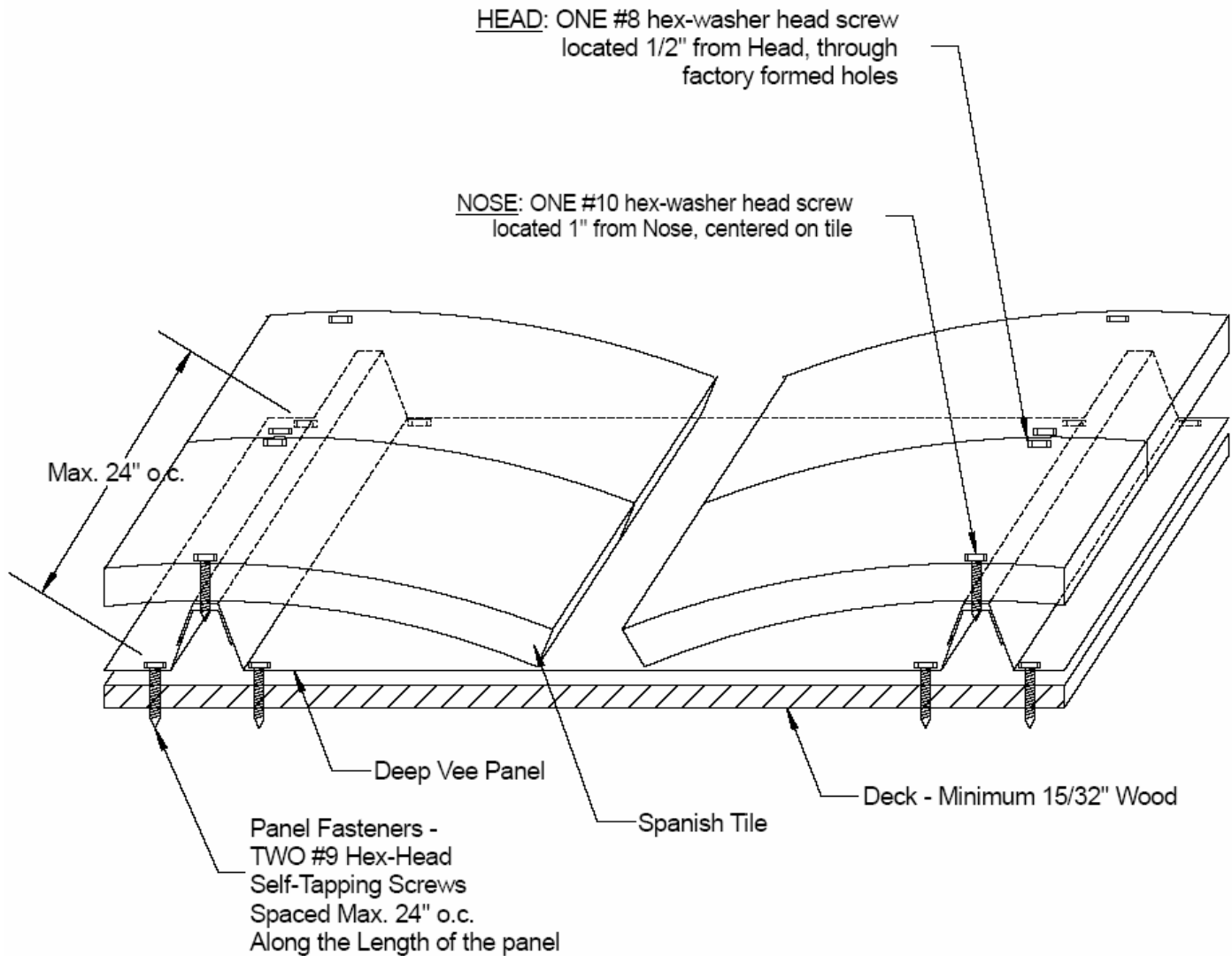
Assembly Profile

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Installation Method Berridge Manufacturing Company "Spanish Tile" Roof Assembly Attached to Wood Deck



Assembly Isometric View