

Evaluation Report "Spanish Tile with Berridge Deep Vee Panel" Metal Roof Assembly

Manufacturer:
Berridge Manufacturing Company
1720 Maury Road
Houston, TX 77026
(800) 231-8127

for

Florida Product Approval
FL 11422.4 R8
Florida Building Code 8th Edition (2023)

Method: 1 - D
Category: Roofing
Sub - Category: Metal Roofing

Product: Spanish Tile with Berridge Deep Vee Panel
Material: Steel
Panel Thickness: 24 gauge
Panel Width: 16"
Support: Wood Deck

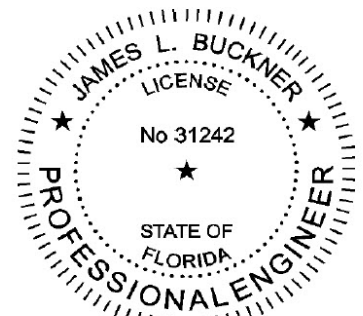
Prepared by:

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Florida Evaluation ANE ID: 1916
Project Manager: Diana Galloway
Report No. 23-542-STDV-S4W-ER
(Revises 20-227-STDV-S4W-ER, FL11422.6 R7)
Date: 09/26/2023

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This item has been digitally signed and sealed by James L. Buckner, P.E., on this date below. Printed copies of this document are not considered signed and sealed, and the signature must be verified on any electronic copies.



James L. Buckner, P.E.
FL31242

Date: 2023.09.26 15:25:27
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Manufacturer:	Berridge Manufacturing Company 1720 Maury Road Houston, TX 77026 (800) 231-8127 www.berridge.com
Product Name:	“Spanish Tile with Berridge Deep Vee Panel”
Product Category:	Roofing
Product Sub-Category	Metal Roofing
Compliance Method:	State Product Approval Rule 61G20-3.005 (1) (d)
Product/System Description:	“Spanish Tile with Berridge Deep Vee Panel” 24 gauge Steel roof panel assembly attached to Plywood Deck with screws.
Product Assembly as Evaluated:	Refer to Page 4 of this report for product assembly components/materials & standards: <ol style="list-style-type: none">1. Spanish Tile Roof Panel2. Deep Vee Roof Panel3. Fasteners4. Underlayment5. Insulation (Optional)
Support:	Type: Wood Deck (Design of support and its attachment to support framing is outside the scope of this evaluation.) Description: <ul style="list-style-type: none">• 15/32 (min.) or greater plywood,• or Wood plank (min. specific gravity of 0.42)
Slope:	2 : 12 to 12 : 12 Minimum slope shall be in compliance with FBC Chapter 15 based on the type of roof covering, applicable code sections and in accordance with manufacturer’s recommendations.
Performance:	Wind Uplift Resistance: <ul style="list-style-type: none">• Design Uplift Pressure: - 131 PSF (Refer to attachment details herein)

- Performance Standards:** The product described herein has demonstrated compliance with:
- UL580-06 – *Test for Uplift Resistance of Roof Assemblies*
 - UL 1897-15 – *Uplift test for roof covering systems*
 - TAS 125-03 – *Standard Requirements for Metal Roofing Systems*
 - TAS 102-95 - *Test Procedure for Static Uplift Resistance of Mechanically Attached Tile Systems*
- Standards Equivalency:** The UL 580-94 & UL 1897-98 standard version used to test the evaluated product assembly is equivalent with the prescribed standards in UL 580-06 & UL 1897-15 adopted by the Florida Building Code 8th Edition (2023).
- Code Compliance:** The product described herein has demonstrated compliance with Florida Building Code 8th Edition (2023), Section 1504.3.2.
- Evaluation Report Scope:** This product evaluation is limited to compliance with the structural requirements of the Florida Building Code, as related to the scope section to Florida Product Approval Rule 61G20-3.001.
- Limitations and Conditions of Use:**
- Refer to engineering data limits of use on page 7 of this report.
 - Scope of “Limitations and Conditions of Use” for this evaluation:
This evaluation report for “Optional Statewide Approval” contains technical documentation, specifications and installation method(s) which include “Limitations and Conditions of Use” throughout the report in accordance with Rule 61G20-3.005. Per Rule 61G20-3.004, the Florida Building Commission is the authority to approve products under “Optional Statewide Approval”.
 - Option for application outside “Limitations and Conditions of Use”
Rule 61G20-3.005(1)(e) allows engineering analysis for “project specific approval by the local authorities having jurisdiction in accordance with the alternate methods and materials authorized in the Code”. Any modification of the product as evaluated in this report and approved by the Florida Building Commission is outside the scope of this evaluation and will be the responsibility of others.
 - This report is a building code product evaluation per FLPE rule (FAC) 61G15-36 to comply with Florida product approval rule (FAC) 61G20-3. This evaluation report is part of the Florida Building Commission approval for the listed code related criteria. This report by James Buckner, P.E. and CBUG Engineering is not a design certification of code compliance construction submittal documentation, per FBC section 107, for any individual structure, site specific or permit design.
 - All metal components and fasteners shall be corrosion resistant in accordance with applicable sections of FBC, including but limited to Sections 1504.3.2, 1506.6 and 1507.4.4.
 - Design of support system is outside the scope of this report.
 - Fire Classification is outside the scope of Rule 61G20-3, and is therefore not included in this evaluation.
 - This evaluation report does not evaluate the use of this product for use in the High Velocity Hurricane Zone code section. (Dade & Broward Counties).

Quality Assurance: The manufacturer has demonstrated compliance of roof panel products in accordance with the Florida Building Code and Rule 61G20-3.0005 (3) for manufacturing under a quality assurance program audited by an approved quality assurance entity through **UL, LLC (FBC Organization #: QUA 9625)**.

**Components/Materials
(by Manufacturer):**

Roof Panel: (Top Panel) Berridge "Spanish Tile"
Panel Type: Discontinuous
Material: Steel
Thickness: 24 gauge (min.)
Panel Dimensions: 8-1/2" (wide) x 16" (long) Coverage
Yield Strength: 40 ksi min.
Steel Grade: 40
Corrosion Resistance: In compliance with FBC Section 1507.4.3:

- ASTM A792 coated, or
- ASTM A653 G90 galvanized steel

Roof Panel: (Bottom Panel) Berridge "Deep Vee Panel"
Panel Type: Continuous
Material: Steel
Thickness: 24 gauge (min.)
Panel Width: 9" (max.) Coverage
Rib Height: 1-1/2"
Yield Strength: 40 ksi min.
Steel Grade: 40
Corrosion Resistance: In compliance with FBC Section 1507.4.3:

- ASTM A792 coated, or
- ASTM A653 G90 galvanized steel

Fasteners:

FASTENER 1:

For: Attaching Deep Vee Panel to Wood Deck
Type: Hex-Head Wood Screw
Size : **#9 - 15 x 1-1/2"**
Corrosion Resistance: Per FBC Section 1506.6 and 1507.4.4
Standard: Per ANSI/ASME B18.6.1

FASTENER 2:

For: Attaching Spanish Tile Head to Deep Vee Panel
Type: Hex-Head Self-Drilling Sheet Metal Screw
Size : **#8 x 5/8"**
Corrosion Resistance: Per FBC Section 1506.6 and 1507.4.4
Standard: Per ANSI/ASME B18.6.1

FASTENER 3:

For: Attaching Spanish Tile Nose to Deep Vee Panel
Type: Hex-Head Self-Drilling Sheet Metal Screw
Size : **#10 x 1-1/2"**
Corrosion Resistance: Per FBC Section 1506.6 and 1507.4.4
Standard: Per ANSI/ASME B18.6.1

Underlayment:

Material and application shall be in compliance with FBC Section 1507.1.1 and in accordance with applicable code sections and manufacturer's recommendations.

**Components & Materials:
(by Others)**

Insulation (Optional):

Type:	Rigid Insulation Board
Thickness:	3" (max.)
Properties:	
Density:	2.25 pcf (lbs/ft ³) min.
Or Compressive Strength:	20 psi min.

Insulation shall comply with FBC Section 1508. When insulation is incorporated, fastener length shall conform to penetrate thru bottom of support a minimum of 3/16".

Installation:

Installation Method:

(Refer to drawings in the back of this report.)

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)
- Minimum fastener penetration thru bottom of support, 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.

For panel construction at the end of panels, refer to manufacturer's instructions and any site specific design.

Install the "Spanish Tile with Berridge Deep Vee Panel" roof panel assembly in compliance with the installation method listed in this report and applicable code sections of FBC 8th Edition (2023). The installation method described herein is in accordance with the scope of this evaluation report. Refer to manufacturer's installation instructions as a supplemental guide for attachment.

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
UL, LLC (FBC Organization #: QUA 9625)
4. Equivalency of Test Standard Certification
By James L. Buckner, P.E. @ CBUCK Engineering
(FBC Organization # ANE 1916)
5. Certification of Independence
By James L. Buckner, P.E. @ CBUCK Engineering
(FBC Organization # ANE 1916)

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

SUPPLEMENTAL ENGINEERING DATA

**"Deep-Vee Panel"
 (Continuous Component)**

TABLE 1.0		
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

- Allowable design pressure(s) for allowable stress design (ASD).

**"Spanish Tile"
 (Discontinuous Component)**

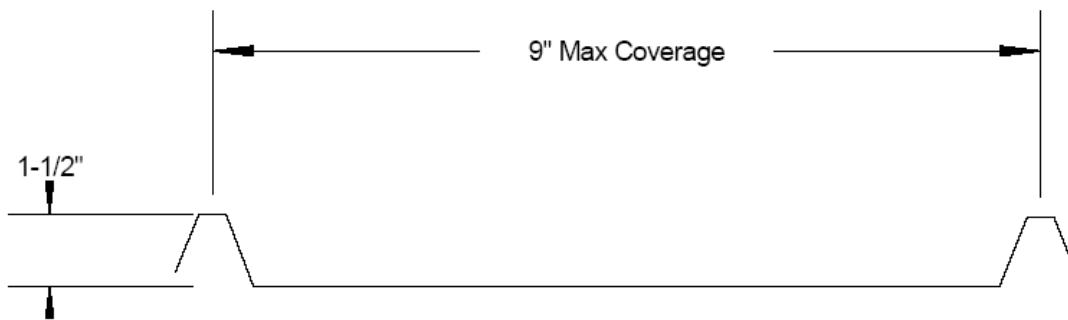
TABLE 2.1	
ALLOWABLE UPLIFT DESIGN VALUES PER TAS 102-95 TEST	
Areodynamic Multipliers - λ (ft ³)	
Tile Profile	λ Direct Deck Application
Spanish Tile	0.218

TABLE 2.2						
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

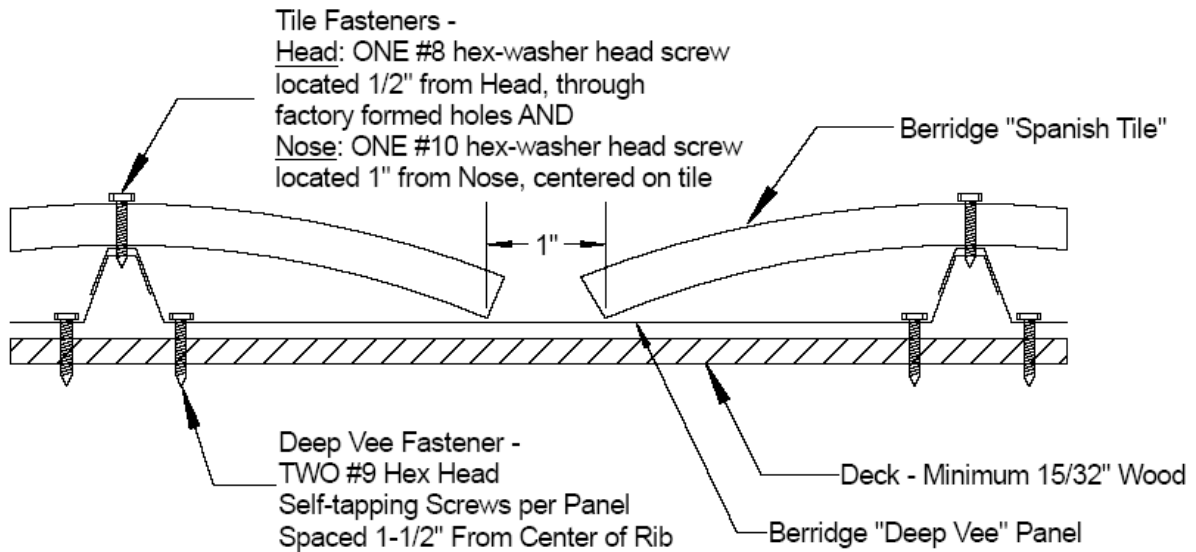
TABLE 2.3		
Attachment Resistance Expressed as a Moment - M_f (ft-lbf)		
Tile Profile	Fastener	Attachment Resistance
Spanish Tile	Head: ONE #8 Screw Nose: ONE #10 Screw	128.50

Installation Method Berridge Manufacturing Company "Spanish Tile with Berridge Deep Vee Panel" attached to Wood Deck

Drawings

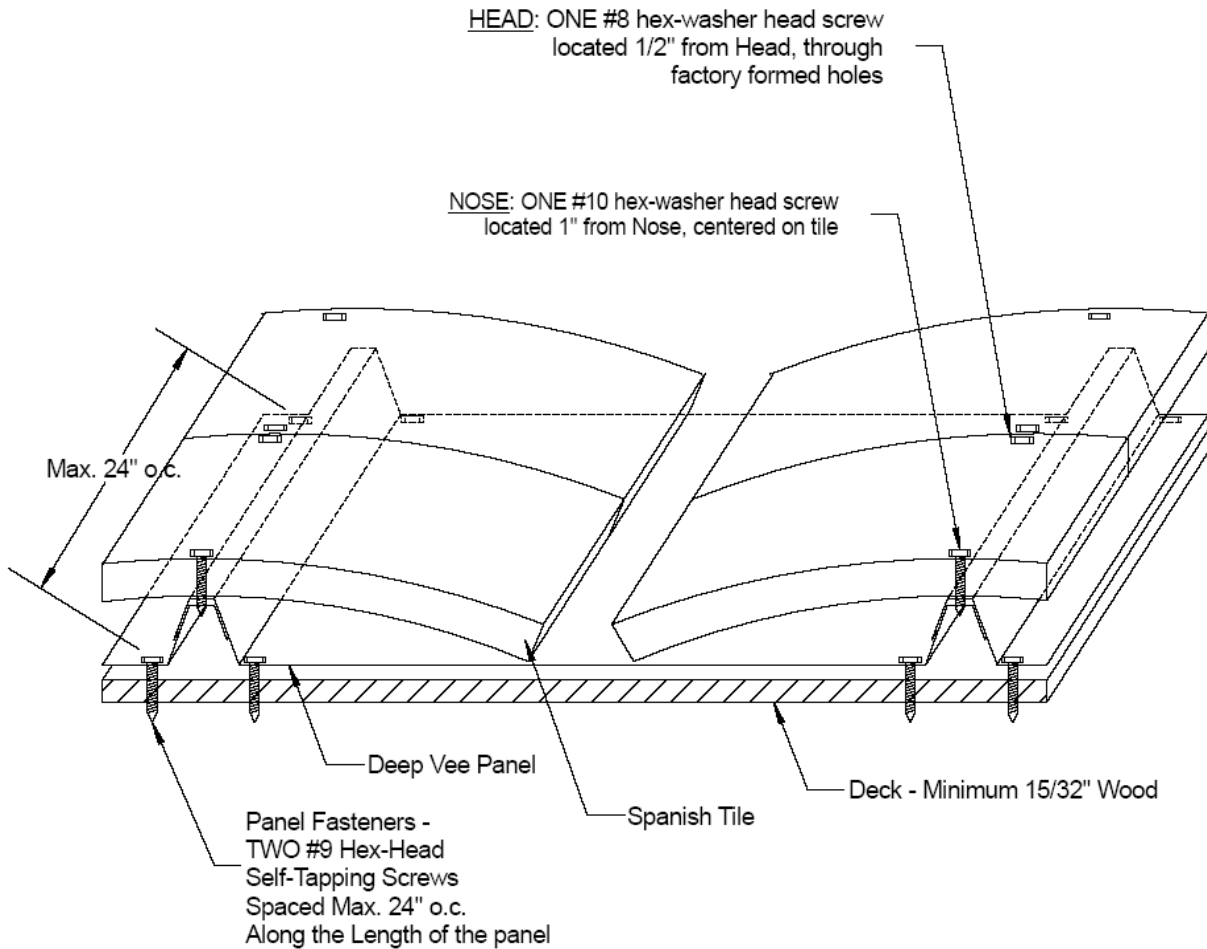


Typical Panel Profile



Typical Assembly Side Profile View

Installation Method
Berridge Manufacturing Company
“Spanish Tile with Berridge Deep Vee Panel” attached to Wood Deck



Typical Roof Assembly
Isometric View

(Optional) Rigid Insulation Board per Page 5 of this report.