

Evaluation Report

"Zee-Lock Panel"

With Continous Zee-Rib Clip

Metal Roof Assembly

Manufactured by

Berridge Manufacturing Company

1720 Maury Road

Houston, TX 77026

(800) 231-8127

for

Florida Product Approval

FL 15471.2 R5

Florida Building Code 8th Edition (2023)

Method: 1 - D

Category: Roofing

Sub - Category: Metal Roofing

Product: Zee-Lock" Roof Panel

Material: Steel

Panel Thickness: 24 gauge

Panel Width: 16"

Support: Insulated Steel Deck

Prepared by:

James L. Buckner, P.E., S.E.C.B.

Florida Professional Engineer # 31242

Florida Evaluation ANE ID: 1916

Project Manager: Diana Galloway

Report No. 23-542-ZL-S4IS-HVHZ-ER

(Revises 20-227-ZL- S4IS-HVHZ -ER, FL15471.2 R4)

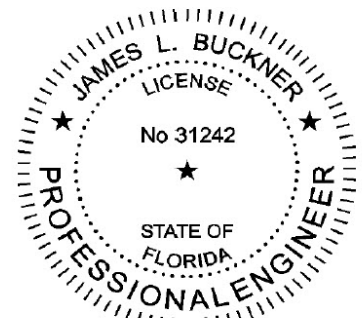
Date: 09/26/2023

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Evaluation Report

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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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CBUCK, Inc. dba CBUCK Engineering

Phone: (561) 491-9927 · Email: cbuck@cbuckinc.net · Website: www.cbuckinc.net

Business: 1374 Community Dr., Jupiter, FL 33458

Manufacturer:	Berridge Manufacturing Company 1720 Maury Road Houston, TX 77026 (800) 231-8127 www.berridge.com														
Product Name:	“Zee-Lock”														
Product Category:	Roofing														
Product Sub-Category	Metal Roofing														
Compliance Method:	State Product Approval Rule 61G20-3.005 (1) (d)														
Product/System Description:	“Zee-Lock” Double Lock Standing Seam Roof Panel 2” Rib Height, 16” wide, 24 gauge Steel roof panel restrained by continuous “Zee-Rib” continuous panel clips, fastened through optional rigid insulation into 22 gauge Steel Deck.														
Product Assembly as Evaluated:	Refer to Page 4 of this report for product assembly components/materials & standards: <table><tr><td>1. Roof Panel:</td><td>“Zee-Lock”</td></tr><tr><td>2. Panel Clip:</td><td>“Zee-Rib” continuous clip</td></tr><tr><td>3. Fasteners:</td><td>#14</td></tr><tr><td>4. Underlayment:</td><td>Per manufacturer’s guidelines</td></tr><tr><td>5. Fire Barrier:</td><td>Approved Fire Barrier Board</td></tr><tr><td>6. Insulation (Optional):</td><td>Rigid Insulation Board (4” - 6” thick)</td></tr></table>			1. Roof Panel:	“Zee-Lock”	2. Panel Clip:	“Zee-Rib” continuous clip	3. Fasteners:	#14	4. Underlayment:	Per manufacturer’s guidelines	5. Fire Barrier:	Approved Fire Barrier Board	6. Insulation (Optional):	Rigid Insulation Board (4” - 6” thick)
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6. Insulation (Optional):	Rigid Insulation Board (4” - 6” thick)														
Support Deck:	Type: Steel Deck (Design of steel deck and its attachment to support framing is outside the scope of this evaluation.) Description: <ul style="list-style-type: none">• Steel Deck• 22 Gauge minimum														
Slope:	2 : 12 or greater Minimum slope shall comply with FBC 8th Edition (2023), HVHZ Section 1515.2.2 and in accordance with the manufacturer’s recommendations.														
Performance:	Wind Uplift Resistance: Design Uplift Pressure(s): (Refer to “Table A” attachment details herein) Wind Driven Rain: Coated Metal Panel Testing <table><tr><td>Accelerated Testing of Coating, 2000 hrs:</td><td>Results:</td><td>PASS</td></tr><tr><td>Salt Spray Testing of Coating, 1000 hrs:</td><td>Results:</td><td>PASS</td></tr></table>			Accelerated Testing of Coating, 2000 hrs:	Results:	PASS	Salt Spray Testing of Coating, 1000 hrs:	Results:	PASS						
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	METHOD 1:	- 168.5 PSF													
	METHOD 2:	- 176 PSF													
	Results:	PASS													

Performance Standards:

The product described herein has demonstrated compliance with:

- **TAS 125-03** – *Standard Requirements for Metal Roofing Systems*
 - **UL580-06** – *Test for Uplift Resistance of Roof Assemblies—with Revisions through February 1998*
 - **UL 1897-15** – *Uplift test for roof covering systems*
- **TAS 100-23** – *Test Procedure for Wind and Wind Driven Rain Resistance of Discontinuous Roof Systems*
- **ASTM G 23** – *Accelerated Testing of coating, 2000 hours*
- **ASTM B 117** – *Salt Spray Testing of coating, 1000 hours*

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 installed as described herein demonstrates compliance with the Florida Building Code 8th Edition (2023), Sections 1504.3.2 and 1518.9.1.

Evaluation Report Scope:

This product evaluation demonstrates compliance of this product with the physical properties & structural wind load requirements of the Florida Building Code, as related to Florida Product Approval Rule 61G20-3.005.

Limitations and Conditions of Use:

- 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 CBUCK 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. All roofing accessories shall comply with FBC Section 1517.6.
- All insulation fasteners, membrane fasteners and stress plates shall comply with FBC Section 1520.4.
- The design pressures listed herein is applicable to all roof pressure zones. Rational analysis or extrapolation to enhance pressure is not permitted.
- Maximum panel lengths, valleys & panel accessories shall comply with Roofing Application Standard RAS 133 as applicable in HVHZ areas.

- Support framing shall comply with the design provisions of the FBC 8th Edition (2023), Chapter 22 for steel and Chapter 16 for structural loading.
- Fire Classification is outside the scope of Rule 61G20-3, and is therefore not included in this evaluation.
- All panels shall be permanently labeled with the manufacturer's name and/or logo. All clips shall be permanently labeled with the manufacturer's name and/or logo, and/or model.
- This evaluation report approves the product assembly as described in this report for use in the High Velocity Hurricane Zone (HVHZ) 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
& Standards:
(by Manufacturer):**

Roof Panel:	"Zee-Lock"
Material:	Steel
Thickness:	24 Gauge (0.0245")
Panel Width:	16" (max.) Coverage
Rib Height:	2"
Yield Strength:	51.9 ksi (As tested)
Steel Grade:	40
Corrosion Resistance:	In compliance with FBC Section s 1518.9 & 1507.4.3: <ul style="list-style-type: none">• ASTM A792 coated, or• ASTM A653 G90 galvanized steel
Panel Clips:	"Zee-Rib"
Type:	One-Piece, continuous fixed clip
Material:	Steel
Thickness:	24 Gauge
Dimensions:	2"(tall) x 1-3/8"(wide) x continuous (w/panel length)
Yield Strength:	40 ksi (min.)
Corrosion Resistance:	Per FBC Sections 1517.6 & 1506.7
Fasteners:	
Type:	Low profile Screw
Size :	#14 – 13 x 9" (or length to meet min. penetration)
Penetration thru Deck:	1/2" min. thru bottom flute of steel deck
Corrosion Resistance:	Per FBC Section 1506.6 and 1507.4.4
Standard:	HVHZ Approved

Underlayment: Non-HVHZ Areas:

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

Underlayment: HVHZ Areas:

One of the following per FBC 8th Edition (2023), Section 1518.4. Installation shall comply with FBC including Sections 1518.2, Section 1518.3 when applicable and in accordance with roof manufacturer's recommendations:

- Any HVHZ approved underlayment, installed in compliance with roof assembly approval and underlayment approval
- Or one of the following as a minimum:
(all with minimum 6" endlaps)
 - Double layer - Compliant with ASTM D 226, Type I with a 19" headlap
 - Single layer - Compliant with ASTM D 226, Type II with a 4" headlap
 - Single layer - Compliant with ASTM D 2626 with a 4" headlap

Fire Barrier Board (Optional):

Any approved fire barrier with current HVHZ approval.

(Fire classification is outside the scope of this evaluation. Refer to current fire listings for installation of fire barrier & fire rating of this system.)

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

Insulation (Optional): (HVHZ Approved)

Insulation shall be attached with approved fasteners and plates with a fastening density in accordance with RAS 117.

- Rigid Insulation Board:
- 4" – 6" thick
 - 25 psi (min.) compressive strength

Installation:

Installation Method:

(Refer to "TABLE A" below and drawings at the end of this report.)

- Fastener Spacing Along Continuous Clip: **Refer to "TABLE A" Below**
(along the length of the continuous clips and nominally within 3" from all ends)
- One (1) fastener at spacing below
(through rigid insulation and through bottom flute of steel deck)
- Rib Interlock: Mechanically seamed 180° (DOUBLE-LOCK)
(Panel ribs shall be mechanically seamed to form a double-lock.)
- Minimum fastener penetration thru bottom of support, 3/4".
- For panel construction at the end of panels, refer to manufacturer's instructions and any site specific design.

TABLE "A" ALLOWABLE LOADS			
	Clip Fastener Spacing:	Panel Seam	Design Pressure
METHOD 1	16"	Double Lock	- 168.5 PSF
METHOD 2	8"	Double Lock	- 176 PSF
<ul style="list-style-type: none">• Allowable design pressure(s) for allowable stress design (ASD).• Rational analysis or extrapolation to enhance pressure is not permitted.			

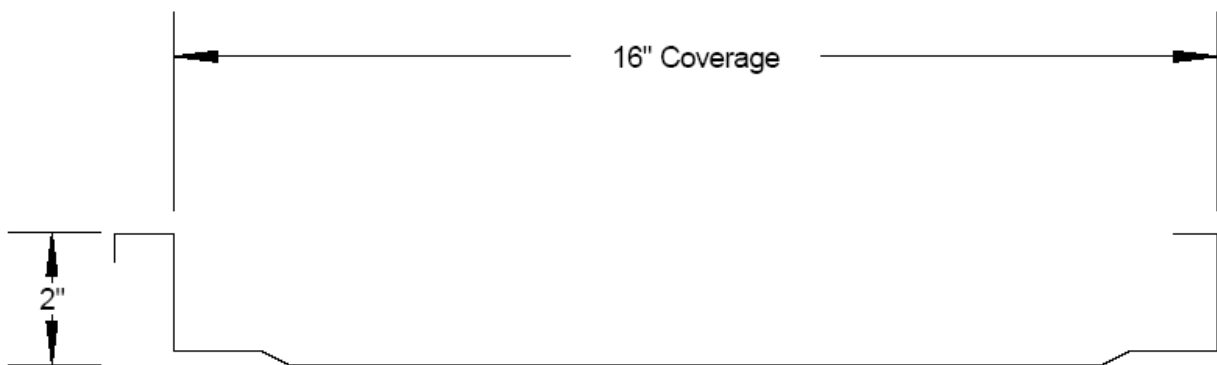
Install the Berridge "Zee-Lock" roof panel assembly in compliance with the installation methods listed in this report, RAS 133 and applicable code sections of FBC 8th Edition (2023). The installation methods described herein is in accordance with the scope of this evaluation report. Refer to manufacturer's installation instructions as a supplemental guide for attachment.

Referenced Data:

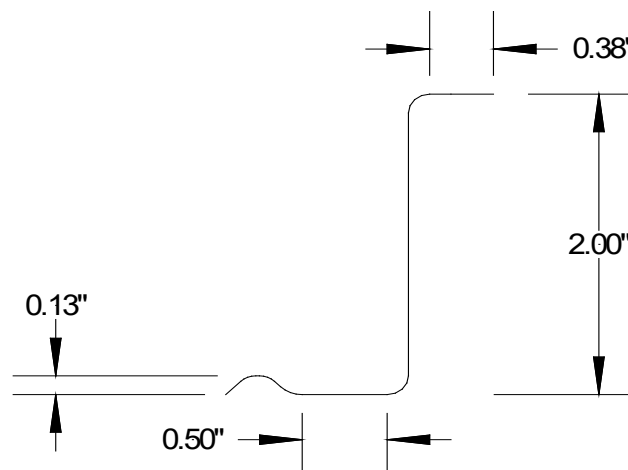
1. TAS 125-03 Uplift Test
By Force Engineering & Testing Inc. (FBC Organization ID# TST 5328)
Report # 49-0395T-09C, D, Dated 5/4/10
2. TAS 125-03 Uplift Test
By Force Engineering & Testing Inc. (FBC Organization ID# TST 5328)
Report # 49-0160T-10B, Dated 7/29/10
3. TAS 100-95 Wind Driven Rain Test
By PRI Construction Materials Technologies, LLC.
(FBC Organization ID #TST: 5878)
Report #BMC-009-02-01, Dated 9/11/09
4. ASTM G 23 Accelerated Weathering
By Valspar Corporation
Certified Laboratory Test Report, Dated 5/19/07
5. ASTM B 117 Salt Spray
By Valspar Corporation
Certified Laboratory Test Report, Dated 5/19/07
6. Quality Assurance
By UL, LLC. (FBC Organization ID# QUA 9625)
7. Certification of Independence
By James L. Buckner, P.E. @ CBUCK Engineering
(FBC Organization # ANE 1916)
8. Engineering Analysis
By CBUCK Engineering

Installation Method
Berridge Manufacturing Company
“Zee-Lock” (24 Gauge) Roof Panel Attached to Insulated Steel Deck

ProfileDrawings

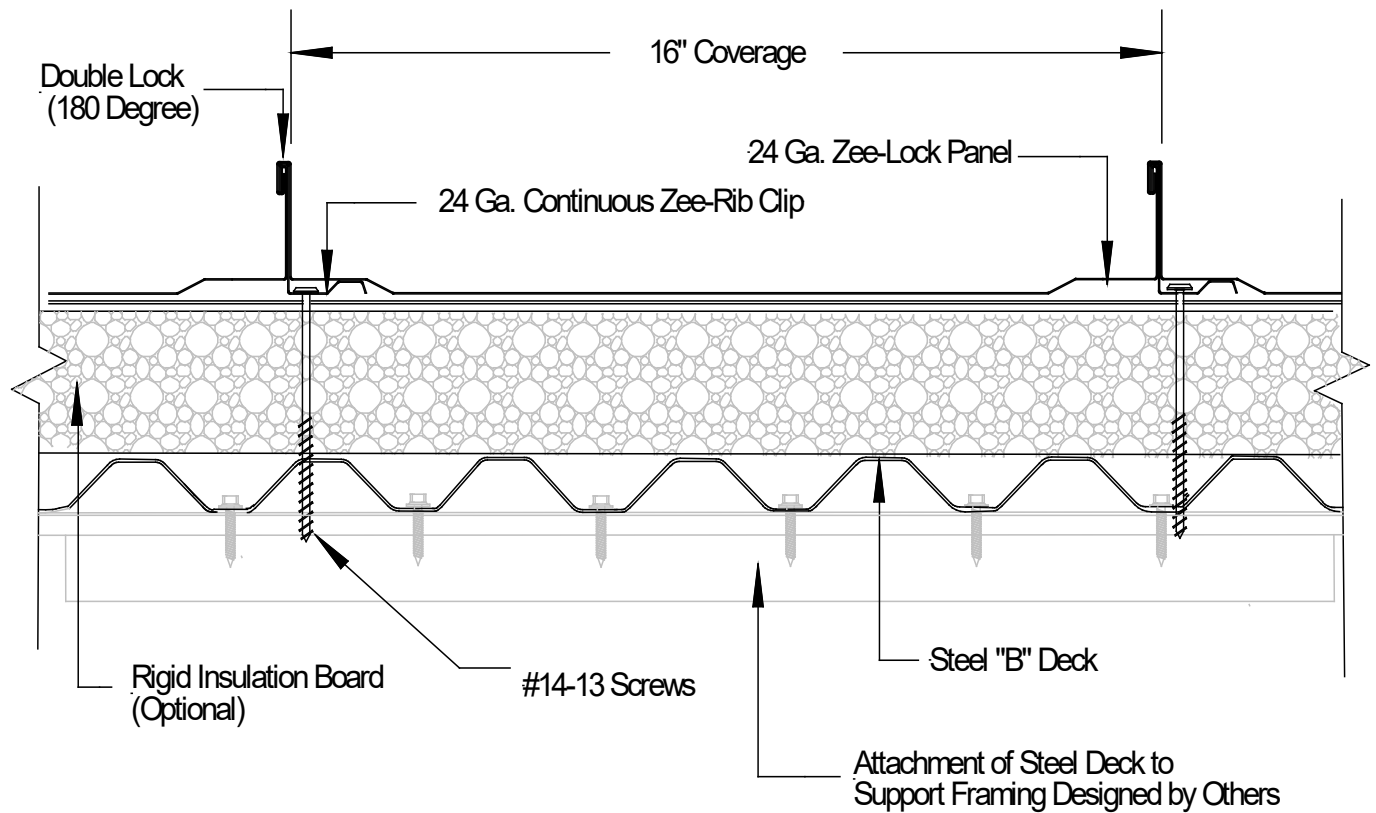


**Typical “Zee-Lock” Panel
Profile View**



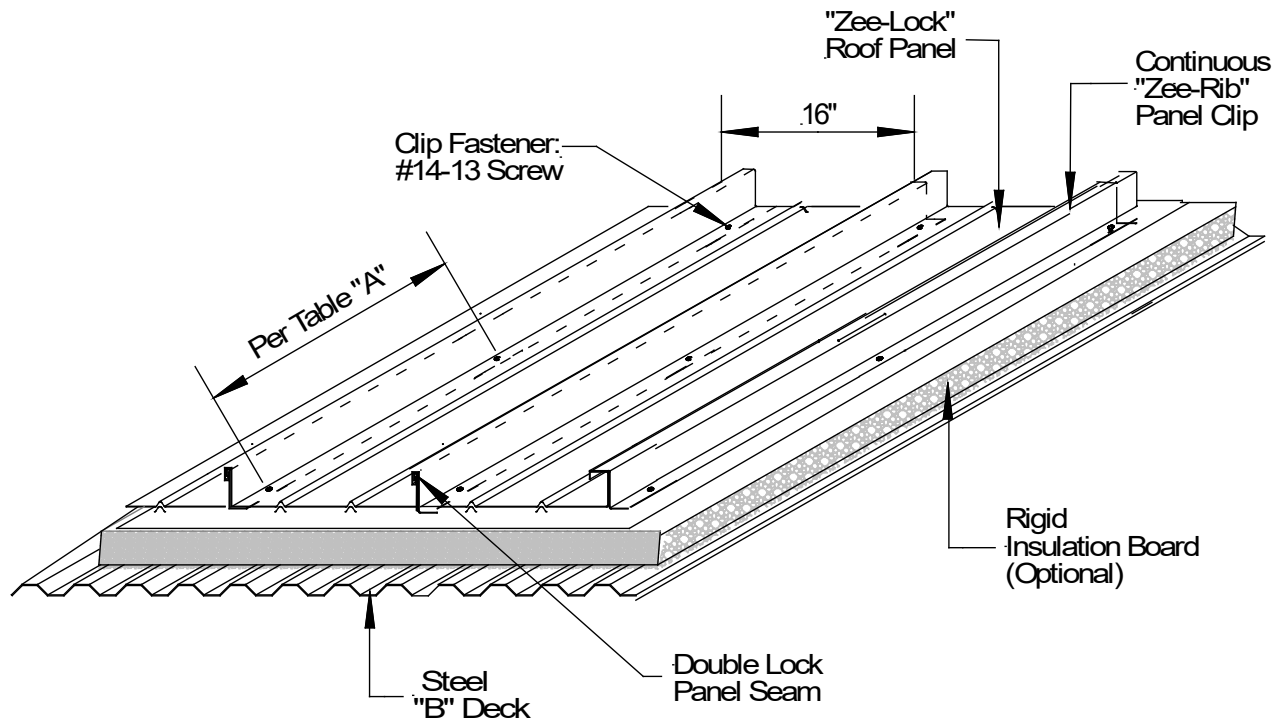
**Continuous “Zee-Rib” Panel Clip
Profile Side View**

Installation Method Berridge Manufacturing Company “Zee-Lock” (24 Gauge) Roof Panel Attached to Insulated Steel Deck



**“Zee-Lock” Panel attached to Steel Deck
Typical Assembly Side View**

Installation Method Berridge Manufacturing Company "Zee-Lock" (24 Gauge) Roof Panel Attached to Insulated Steel Deck



Typical Roof Assembly
Isometric View

TABLE "A"			
	Fastener Spacing	Panel Seam	Design Pressure
METHOD 1	16"	Double Lock	- 168.5 PSF
METHOD 2	8"	Double Lock	- 176 PSF
Rational analysis or extrapolation to enhance pressure is not permitted.			