

Evaluation Report "Perma-Lock" Aluminum Shingle Metal Roof Assembly

Manufacturer:
The Aluminum Shingle Company
524 N. Kays Drive
Kaysville, Utah 84037
for

Florida Product Approval
FL 14667.1 R5
Florida Building Code 8th Edition (2023)

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

Product: "Perma-Lock" Roof Shingle Panel
Material: Aluminum
Panel Thickness: 0.019"
Panel Width: 18"
Support: Plywood Deck

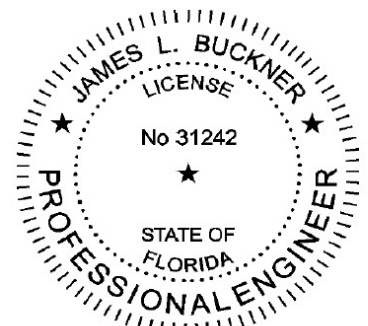
Prepared by:

James L. Buckner, P.E., S.E.C.B.
Florida Professional Engineer # 31242
Florida Evaluation ANE ID: 1916
Project Manager: Diana Galloway
Report No. 23-560-PL-A19W-ER
(Revises 20-243-PL-A19W-ER, FL14667.1 R4)
Date: 08/02/2023

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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: 2023.08.21
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Manufacturer:	The Aluminum Shingle Company 524 N. Kays Drive Kaysville, Utah 84037 (877) 319-7999 www.permalockroofing.com	
Product Name:	“Perma-Lock”	
Product Category:	Roofing	
Product Sub-Category:	Metal Roofing	
Compliance Method:	State Product Approval Rule 61G20-3.005	
Product/System Description:	“Perma-Lock” Aluminum Shingle Roof Panel 9-1/4” x 18”, 0.019” thick Aluminum shingle roof panel attached to Plywood Deck	
Product Assembly as Evaluated:	Refer to Page 4 of this report for product assembly components/materials & standards: <ol style="list-style-type: none">1. Roof Panel2. Panel Clip3. Fasteners4. Underlayment5. Barrier Board (optional)	
Support Deck:	Type: Wood Deck (Design of wood deck and its attachment to support framing is outside the scope of this evaluation.) Description: <ul style="list-style-type: none">• 19/32” or greater Plywood , or• Wood plank deck (based on minimum density/specific gravity of 0.42)	
Slope:	3 : 12 or greater 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: Design Uplift Pressure(s): (Refer to “Table A” attachment details herein) Wind Driven Rain: Method 1 Tested:	METHOD 1: - 22.5 PSF METHOD 2: - 60 PSF Results: PASS

- Performance Standards:** The product described herein has demonstrated compliance with:
- **ASTM D3161-16a** – *Test Method for Wind Resistance of Steep Slope Roofing Products*
 - **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*
- Standards Equivalency:** The UL 580-94, UL 1897-98 & TAS 100-95 standard version used to test the evaluated product assembly is equivalent with the prescribed standards in UL 580-06, UL 1897-15 & TAS 100-23 adopted by the Florida Building Code 8th Edition (2023).
- Code Compliance:** The product(s) described herein have demonstrated compliance with the performance standards listed above as referenced in the Florida Building Code 8th Edition (2023).
- 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:**
- 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”.
 - 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.
 - 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)
 - 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.

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: "Perma-Lock"
Material: Aluminum
Thickness: 0.019" (min.)
Panel Dimensions: 9-1/4" x 18"
Alloy Type: 3105-H24 (in compliance with ASTM B 209)
Yield Strength: 18 ksi min.
Corrosion Resistance: In compliance with FBC Section 1507.4.3

Panel Clips:
Manufactured By: AMSI Supply
Product Model: Two-Hole, Stainless Steel Bermuda Clip
Part #: BC-2H-22-S
Type: One-piece, fixed clip
Material: Stainless Steel, Type 304
Thickness: 22 Gauge
Dimensions: 2.5"(tall) x 1.875"(wide) x 0.125" (thick)
Yield Strength: 40 ksi min.
Corrosion Resistance: Per FBC Section 1506.7 and 1507.4.4

Fasteners:
Type: Ring shank nail
Material: Aluminum
Size: 9 gauge, 1-1/4" (long)
Corrosion Resistance: Per FBC Section 1506.5
Standard: Per ASTM F 1667

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.

Barrier Board: (Optional)
Approved Barrier Board, up to 1/2" thick

Installation Method:

(Refer to drawings at the end of this evaluation report.)

Attach shingle to wood deck per **"TABLE A"** below and the following:

- Attach first row of shingles.
- Attach subsequent rows by interlocking adjacent shingles forming a lock.
- Attach shingles in a staggered pattern, offset subsequent courses by one-half shingle.
- Minimum fastener penetration thru bottom of support, 3/16".
- For panel construction at the end of panels, refer to manufacturer's instructions and any site specific design.

TABLE "A"		
ALLOWABLE LOADS		
	METHOD 1:	METHOD 2:
Design Pressure:	- 22.5 PSF	- 60 PSF
Fastener Spacing:	17-1/2"	17-1/2"
Attachment Type:	Preformed Nail Tabs	Panel Clip
# Nails Per Attachment:	1 Per Nail Tab	2 per Clip
Notes: <ul style="list-style-type: none">• Allowable design pressure(s) for allowable stress design (ASD).• Method 1 has been evaluated to meet Max. Basic Wind Speed of 110 mph per FBC Table 1504.3.3 per ASTM D3161.		

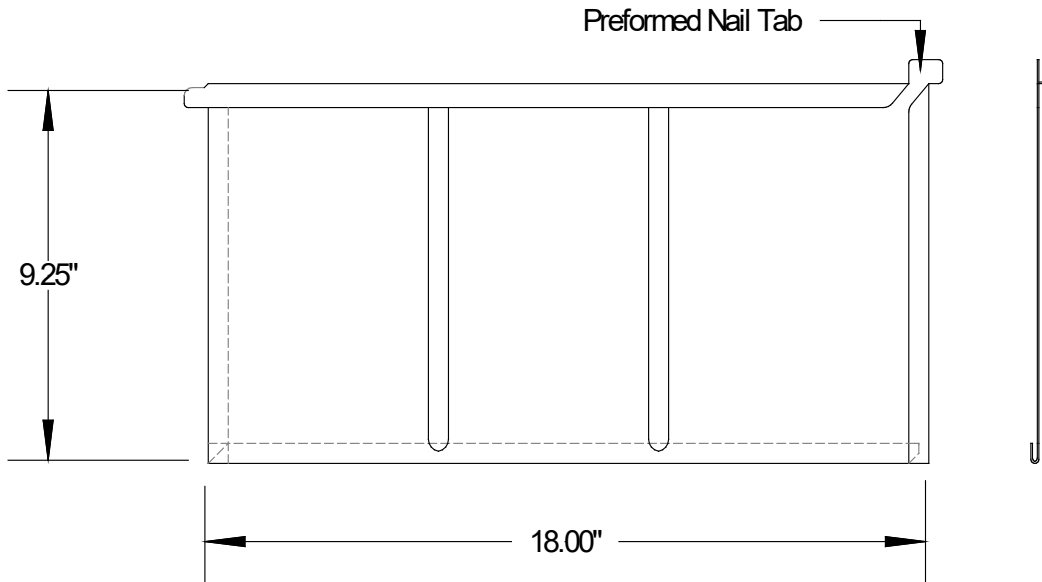
Install the roof panel assembly in compliance with the installation methods listed in this report and applicable code sections of FBC 8th Edition (2023). The installation methods described herein is in accordance with the scope of this evaluation report. Refer to manufacturer's installation instructions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

Referenced Data:

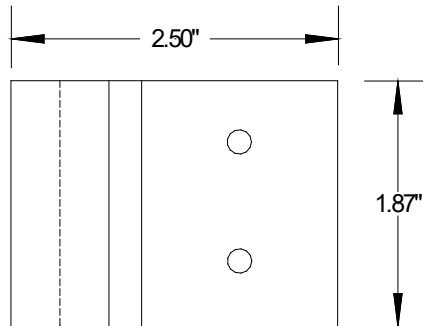
1. ASTM D3161 Certification
By UL, LLC, File R31972
2. UL 580-94/1897-98 Uplift Test
By PRI Construction Materials Technologies, LLC.
Report #ALSC-002-02-01.04, Dated 6/14/11
3. TAS 100-95
By PRI Construction Materials Technologies, LLC.
Report #ALSC-001-02-01, Dated 10/04/04
4. Quality Assurance
By UL, LLC
5. Equivalency of Test Standard Certification
By James L. Buckner, P.E. @ CBUGK Engineering
6. Certification of Independence
By James L. Buckner, P.E. @ CBUGK Engineering

**Installation Method
The Aluminum Shingle Company
"Perma-Lock" Roof Shingle Attached to Plywood Deck**

Profile Drawings



**"Perma-Lock" Shingle
Typical Profile View**



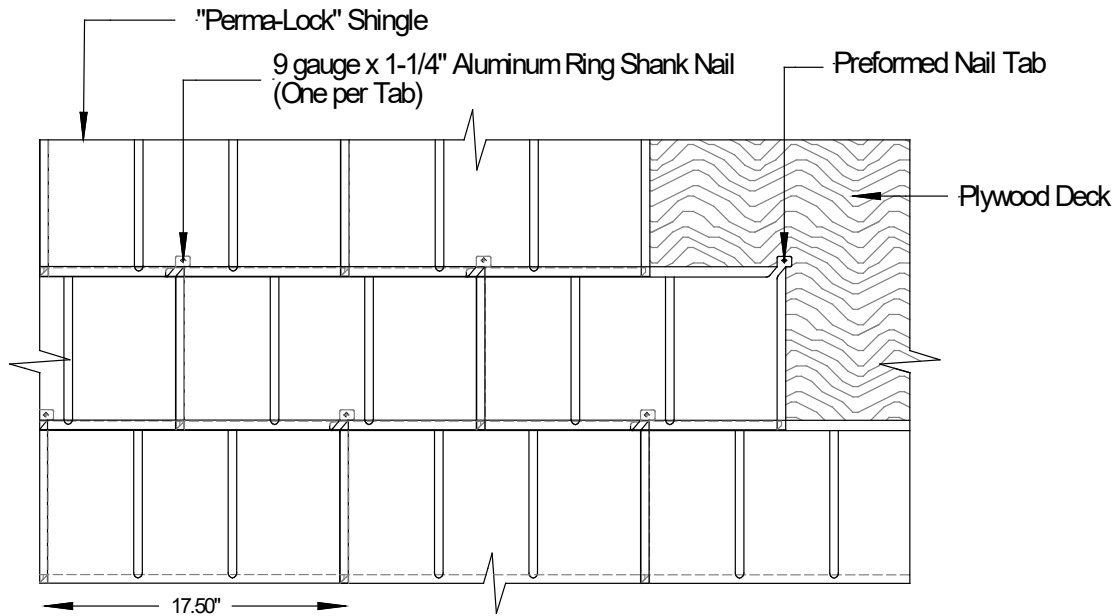
Typical Panel Clip Profile

Installation Method The Aluminum Shingle Company "Perma-Lock" Roof Shingle Attached to Plywood Deck

METHOD 1



Typical Assembly - Section View

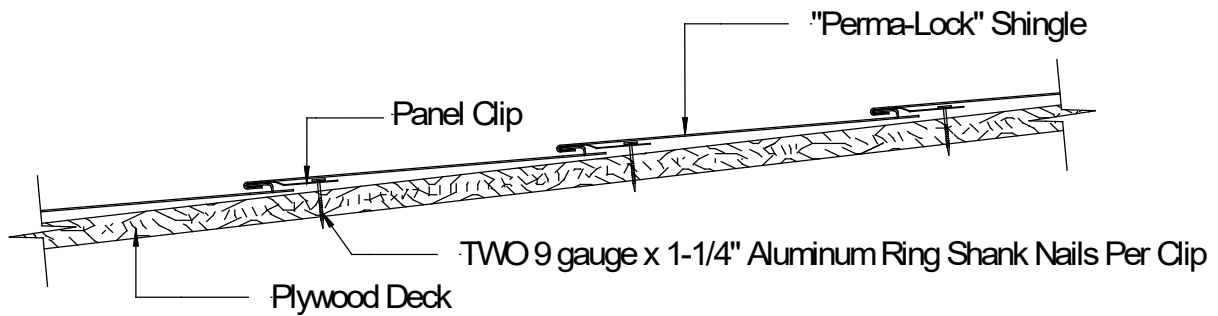


Typical Roof Assembly - Plan View

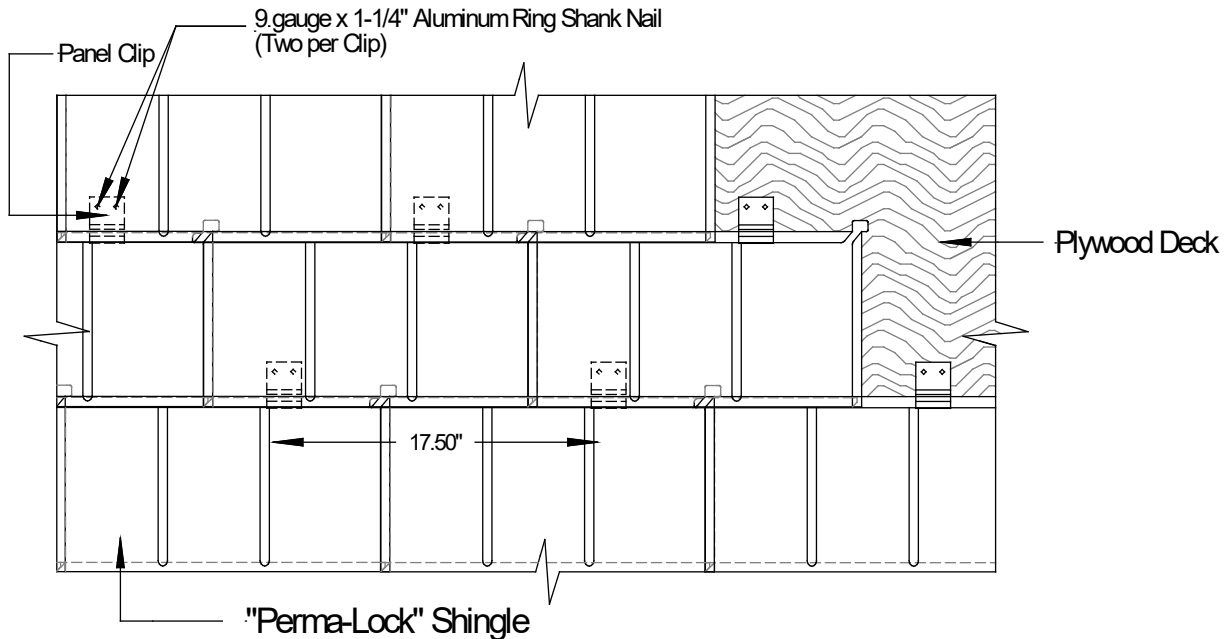
TABLE "A"		
	METHOD 1:	METHOD 2:
Design Pressure:	- 22.5 PSF	- 60 PSF
Fastener Spacing:	17-1/2"	17-1/2"
Attachment Type:	Preformed Nail Tabs	Panel Clip
# Nails Per Attachment:	1 Per Nail Tab	2 per Clip
Method 1 has been evaluated to meet Max. Basic Wind Speed of 110 mph per FBC Table 1504.3.3 per ASTM D3161.		

Installation Method The Aluminum Shingle Company "Perma-Lock" Roof Shingle Attached to Plywood Deck

METHOD 2



Typical Assembly - Section View



Typical Roof Assembly - Plan View

TABLE "A"		
	METHOD 1:	METHOD 2:
Design Pressure:	- 22.5 PSF	- 60 PSF
Fastener Spacing:	17-1/2"	17-1/2"
Attachment Type:	Preformed Nail Tabs	Panel Clip
# Nails Per Attachment:	1 Per Nail Tab	2 per Clip