

## Evaluation Report

**“Perma-Lock”**

**Aluminum Shingle**

**Metal Roof Assembly**

**Manufacturer:**

**The Aluminum Shingle Company**

**102 S. Ellison St.**

**Layton, Utah 84041**

**(877) 319-7999**

*for*

**Florida Product Approval**

**# FL 14667.1 R2**

**Florida Building Code 5th Edition (2014)**

**Method: 1 - D**

**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:**

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Florida Evaluation ANE ID: 1916

Project Manager: Diana Galloway

Report No. 15-157-PL-A19W-ER

*(Revises 11-204-PL-A19W-ER)*

Date: 4 / 13 / 15

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A handwritten signature in black ink, appearing to read "James L. Buckner".

Digitally Signed by: James L. Buckner, P.E.

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<b>Manufacturer:</b>	<b>The Aluminum Shingle Company</b>	
<b>Product Name:</b>	<b>“Perma-Lock”</b>	
<b>Product Category:</b>	Roofing	
<b>Product Sub-Category</b>	Metal Roofing	
<b>Compliance Method:</b>	State Product Approval Rule 61G20-3.005 (1) (d)	
<b>Product/System Description:</b>	“Perma-Lock” Aluminum Shingle Roof Panel 9-1/4” x 18”, 0.019” thick Aluminum shingle roof panel attached to Plywood Deck	
<b>Product Assembly as Evaluated:</b>	Refer to Page 4 of this report for product assembly components/materials & standards:  <ol style="list-style-type: none"><li>1. Roof Panel</li><li>2. Panel Clip</li><li>3. Fasteners</li><li>4. Underlayment</li></ol>	
<b>Support Deck:</b>	<b>Type:</b> Wood Deck (Design of wood deck and its attachment to support framing is outside the scope of this evaluation.)	
	<b>Description:</b> <ul style="list-style-type: none"><li>• 19/32” or greater Plywood , or</li><li>• Wood plank deck (based on minimum density/specific gravity of 0.42)</li></ul>	
<b>Slope:</b>	3 : 12 or greater In compliance with FBC Chapter 15 Section 1507.4.2, applicable code sections and in accordance with manufacturer’s recommendations.	
<b>Performance:</b>	<b>Wind Uplift Resistance:</b> Design Uplift Pressure(s): (Refer to “Table A” attachment details herein)	<b>METHOD 1:</b> - 22.5 PSF <b>METHOD 2:</b> - 60 PSF
	<b>Wind Driven Rain:</b> Method 1 Tested:	<b>Results:</b> PASS

- Performance Standards:** The product described herein has demonstrated compliance with:
- **UL580-06** – *Test for Uplift Resistance of Roof Assemblies—with Revisions through February 1998*
  - **UL 1897-04** – *Uplift test for roof covering systems*
  - **TAS 100-95** – *Test Procedure for Wind and Wind Driven Rain Resistance of Discontinuous Roof 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 1897-04 adopted by the Florida Building Code 5th Edition (2014).
- Code Compliance:** The product installed as described herein demonstrates compliance with the Florida Building Code 5th Edition (2014), Section 1504.3.2.
- Evaluation Report Scope:** This product evaluation demonstrates compliance of this product with the structural wind load requirements of the Florida Building Code as related to the scope section of 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”.
  - 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.
  - 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:**  
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

**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

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

**Underlayment:**

One of the following per FBC 5th Edition (2014), Sections 1507.5.3 & 1507.5.3.2. Installation shall comply with FBC Section 1507.4.5.2, applicable code sections and in accordance with manufacturer's recommendations.

- Double layer, compliant with one of the following:
  - ASTM D 226, Type I or Type II
  - ASTM D 4869 Type I or Type IV
  - ASTM D 6757
- Single layer, compliant with one of the following:
  - ASTM D 226, Type II
  - ASTM D 4869 Type IV
  - ASTM D 6757
- Single layer, self-adhering compliant with ASTM D 1970 or other approved self-adhering synthetic underlayment complying with manufacturer's recommendations.

**Installation:**

**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.

<b>TABLE "A"</b>		
<b>ALLOWABLE LOADS</b>		
	<b>METHOD 1:</b>	<b>METHOD 2:</b>
<b>Design Pressure:</b>	<b>- 22.5 PSF</b>	<b>- 60 PSF</b>
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"> <li>• Allowable design pressure(s) for allowable stress design (ASD).</li> </ul>		

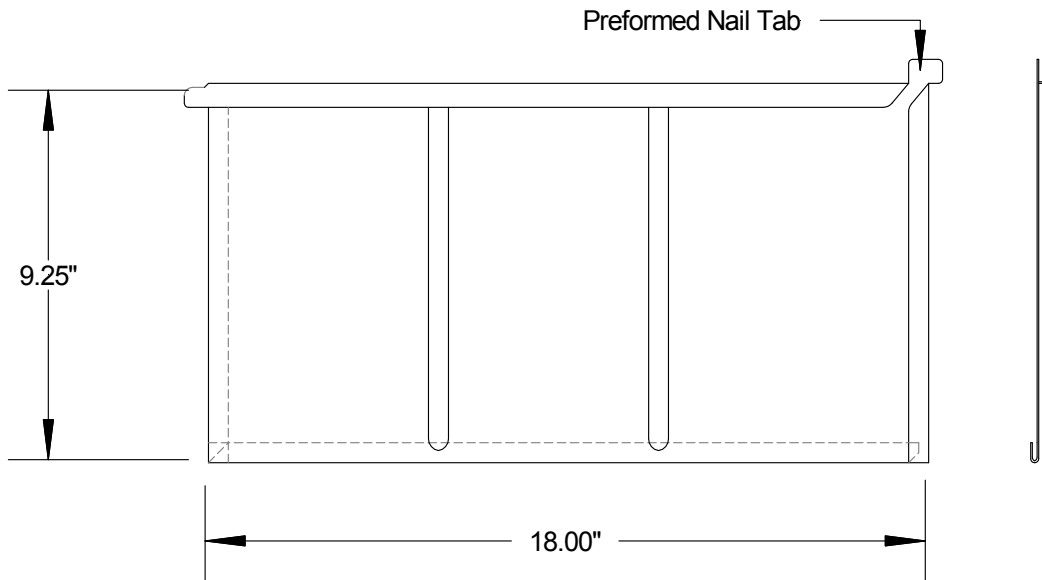
Install the roof panel assembly in compliance with the installation methods listed in this report and applicable code sections of FBC 5th Edition (2014). The installation methods described herein is in accordance with the scope of this evaluation report. Refer to manufacturer's installation instructions as a supplemental guide for attachment.

**Referenced Data:**

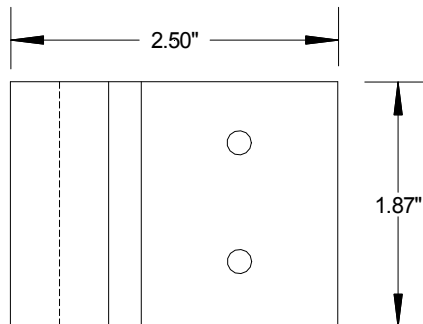
1. UL 580-94/1897-98 Uplift Test  
By PRI Construction Materials Technologies, LLC.  
(FBC Organization ID #TST: 5878)  
Report #ALSC-002-02-01.04, Dated 6/14/11
2. TAS 100-95 Wind Driven Rain Test  
By PRI Construction Materials Technologies, LLC.  
(FBC Organization ID #TST: 5878)  
Report #ALSC-001-02-01, Dated 10/04/04
3. Quality Assurance  
By Underwriter's Laboratories, Inc. (FBC Organization ID# QUA 1743)  
File R21972
4. Equivalency of Test Standard Certification  
By James L. Buckner, P.E. @ CBUCK Engineering
5. Certification of Independence  
By James L. Buckner, P.E. @ CBUCK 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**

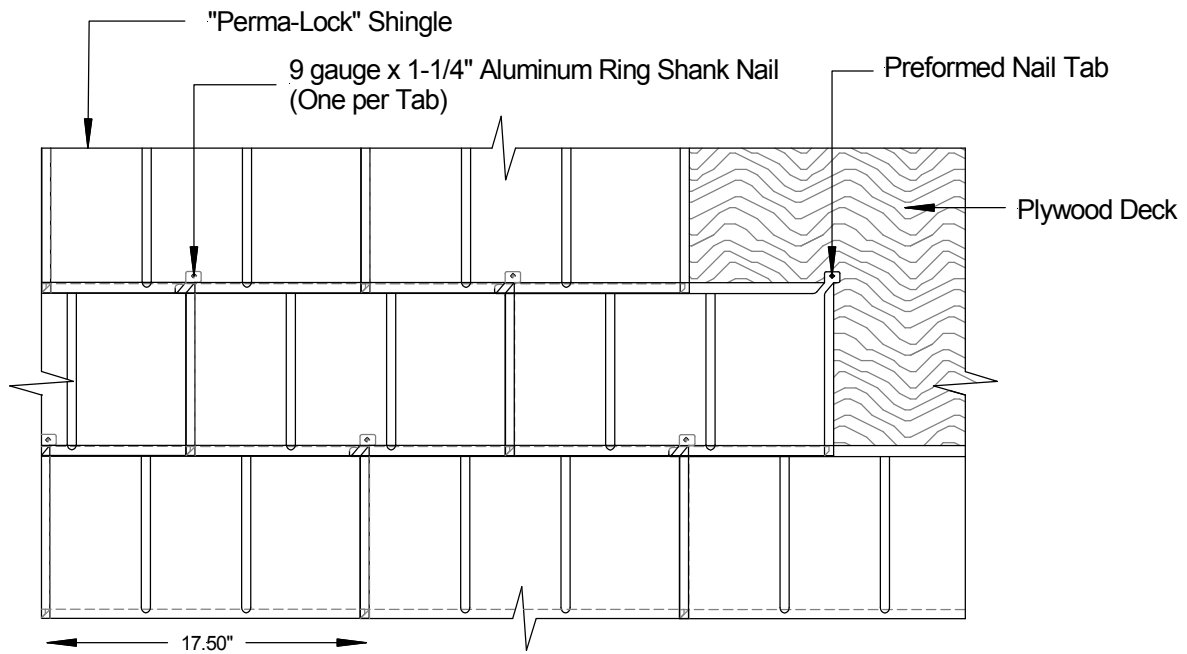
**Installation Method**

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

### METHOD 1



**Typical Assembly - Section View**



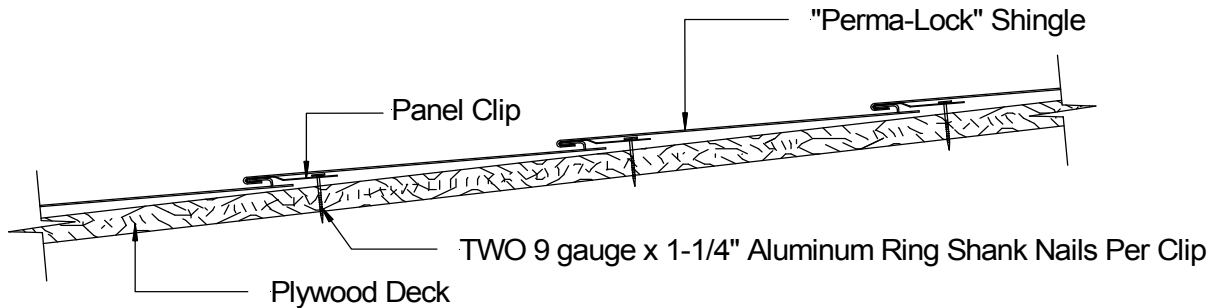
**Typical Roof Assembly - Plan View**

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

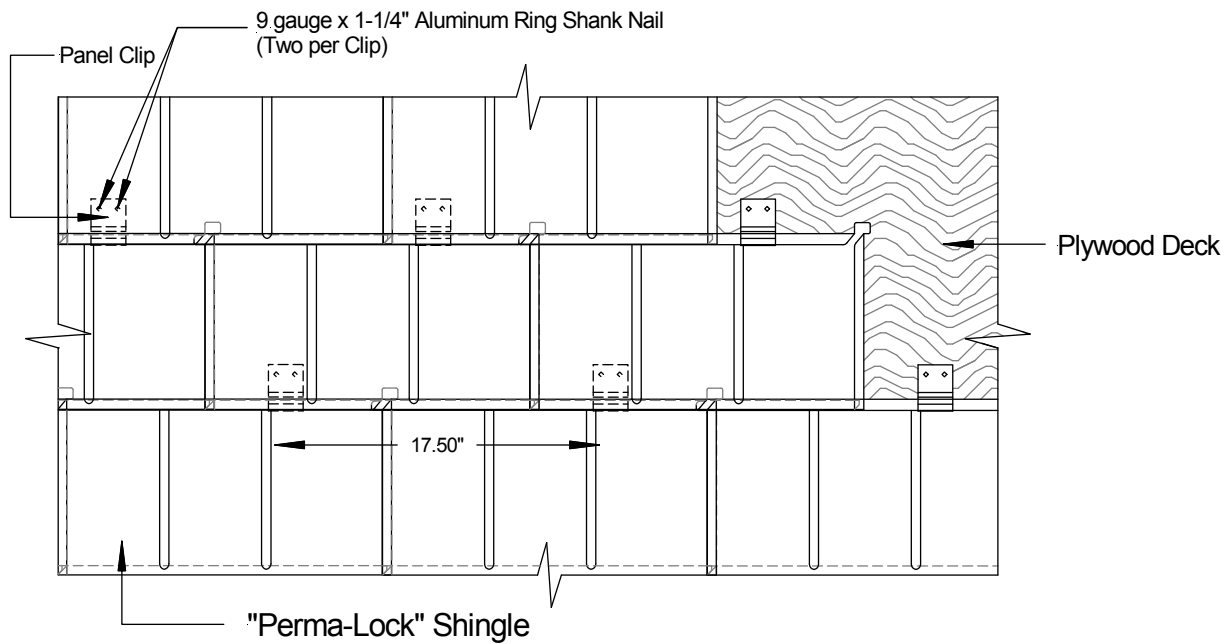
### Installation Method

## 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