PRI Construction Materials Technologies LLC

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Laboratory Test Report

Report for:	Jeff Hock Sheffield Metals International 5467 Evergreen Parkway Sheffield Village, OH 44054
Product Name:	0.029" Al SMI 1.5 MS
Project No.:	1802T0007
Dates Tested:	Dec. 02, 2024 - Jan. 07, 2025
Test Methods:	TAS 125-03 UL 580-06 UL 1897-12
Results Summary:	Specimen No. 1: 16" o.c. w/#10s, 15/32 plywood: -127psf, UL 580 Class 90 Specimen No. 2: 16" o.c. w/#10s, 15/32 plywood: -142psf, UL 580 Class 90 Specimen No. 3: 8" o.c. w/#10s w/ Sealant, 15/32 plywood: -247psf, UL 580 Class 90

Purpose: Determine the uplift resistance in accordance with **Florida Building Code Test Protocols for the High Velocity Hurricane Zone (HVHZ) Testing Application Standard (TAS) 125-03: Standard Requirements for Metal Roofing Systems, Section 8: UL 580 (as modified for the *Florida Building Code, Building*), UL 580-06 *Test for Uplift Resistance of Roof Assemblies*** and **UL 1897-12 *Uplift Tests for Roof Covering* Systems**.

Test Methods: Testing was completed as described in Florida Building Code Test Protocols for the High Velocity Hurricane Zone (HVHZ) Testing Application Standard (TAS) 125-03: Standard Requirements for Metal Roofing Systems, Section 8: UL 580 (as modified for the *Florida Building Code, Building*), UL 580-06 *Test for Uplift Resistance of Roof Assemblies* and UL 1897-12 *Uplift Tests for Roof Covering* Systems. Specimens were tested to the loading schedule as described in UL 580, and where applicable, incrementally loaded in accordance with UL 1897 until failure.

Sampling: The following materials were received by PRI.

Product	Source	Date	Sampling
0.029" Al SMI 1.5 MS	Clearwater, FL	Nov. 15, 2024	Metal Roofing Systems
26ga. galvanized steel clip	Clearwater, FL	Nov. 15, 2024	Metal Roofing Systems
#10-13 x 1" PH Screw	Pinellas Park, FL	Nov. 01, 2024	Metal Roofing Systems

All other roofing components were procured by PRI Construction Materials Technologies LLC through local distribution.

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Product Description:	0.029" AL SMI 1.5 MS:	0.029" 3105 H24 aluminum; 1.5" rib; 16" wide coverage.
	#10-13 x 1 screws:	#10-13 x 1" GP Concealor Pancake Head screw; Gimlet point.
	26ga. Clip:	26ga 2in. long galvanized steel clip.
	Novaflex Sealant:	ASTM C957 translucent sealant. Only for specimen 3.
Deck Description:	Underlayment:	ASTM D 226 Type II felt
	Deck 1 & 2:	CAT 15/32 PS 1-19 APA span rated, CDX 4-ply plywood sheathing installed over No. 2 lumber supports spaced 24" o.c. Decking attached with 0.113" x 2-3/8" ring shank nails spaced 6" o.c. along the perimeter and intermediate supports.
	Deck 3:	CAT 15/32 PS 1-19 APA span rated, CDX 4-ply plywood sheathing installed over No. 2 lumber supports spaced 24" o.c. Decking attached with 0.113" x 2-3/8" ring shank nails spaced **3" o.c.** along the perimeter and intermediate supports.
	Specimen Sealing:	Polyethylene film placed under the metal roof panels; tape[1]

[1]It is the judgment of the test engineer that the film and tape used to seal the specimen against air leakage did not influence the results of the test.

Results: Test data are contained in Appendix A. Photographs after testing are shown in Appendix C.

Table 1. Summary of Test Results

Specimen No.	Panel	Attachment	Passing Uplift Pressure (psf)	Failure Mode
1	0.029" Al SMI 1.5 MS	26ga 1-5/8" galvanized clip placed at 16" o.c down the length of the male rib and fastened using #10-13 X 1" GP Concealor pancake screw into the 2 pre alotted slots. Panels bent to 90 degrees.	127	Panel disengaged
2	0.029" Al SMI 1.5 MS	26ga 1-5/8" galvanized clip placed at 16" o.c down the length of the male rib and fastened using #10-13 X 1" GP Concealor pancake screw into the 2 pre alotted slots. Panels bent to 90 degrees.	142	Panel disengaged
3	0.029" Al SMI 1.5 MS	26ga 1-5/8" galvanized clip placed at 8" o.c down the length of the male rib and fastened using #10-13 X 1" GP Concealor pancake screw into the 2 pre alotted slots. Panels bent to 90 degrees and 3/8" bead of Novaflex sealant placed down the female rib of the panel.	247	Panel disengaged

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Classification:
Specimen Nos. 1-3 installed as described herein meet ***Class 90*** requirements.

Statement of Attestation:

Testing was conducted in accordance with **Florida Building Code Test Protocols for the High Velocity Hurricane Zone (HVHZ) Testing Application Standard (TAS) 125-03: Standard Requirements for Metal Roofing Systems, Section 8: UL 580 (as modified for the *Florida Building Code, Building*), UL 580-06 *Test for Uplift Resistance of Roof Assemblies* and UL 1897-12 *Uplift Tests for Roof Covering Systems*.** The test results and interpretations presented herein are representative of the materials supplied by the client.

Signed: _____
Bill Hinkle
Manager

Signed: _____
Zachary R. Priest
Florida Registered Professional Engineer
P.E. Number 74021

Date: Feb. 05, 2025

Date: 02/07/2025

ZACHARY R. PRIEST
LICENSE
No 74021
STATE OF
FLORIDA
PROFESSIONAL ENGINEER

Report Issue History:

Issue #	Date	Pages	Revision Description (if applicable)
Original	Feb. 05, 2025	11	NA

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Specimen No. 1 (UL 580 Load Schedule)

Class 30 Loading Sequence (UL 580)							
Duration (min)	Positive Pressure (psf)	Negative Pressure (psf)	Max Deflection Under Load (in.)				Result
			1	2	3	4	
5	0.0	16.2	0.303	0.404	0.303	0.353	Pass
5	13.8	16.2	0.555	0.555	0.454	0.505	Pass
60	13.8	8.1-27.7[1]	0.706	0.757	0.606	0.606	Pass
5	0.0	24.2	0.505	0.606	0.454	0.505	Pass
5	20.8	24.2	0.757	0.807	0.656	0.656	Pass
		Permanent Set	0.050	0.050	0.050	0.050	Pass

Class 60 Loading Sequence (UL 580)							
Duration (min)	Positive Pressure (psf)	Negative Pressure (psf)	Max Deflection Under Load (in.)				Result
			1	2	3	4	
5	0.0	32.3	0.606	0.656	0.505	0.555	Pass
5	27.7	32.3	0.908	0.959	0.807	0.807	Pass
60	27.7	16.2-55.4[1]	1.161	1.463	1.161	1.060	Pass
5	0.0	40.4	0.858	1.060	0.858	0.757	Pass
5	34.6	40.4	1.110	1.262	1.110	1.009	Pass
		Permanent Set	0.050	0.151	0.101	0.101	Pass

Class 90 Loading Sequence (UL 580)							
Duration (min)	Positive Pressure (psf)	Negative Pressure (psf)	Max Deflection Under Load (in.)				Result
			1	2	3	4	
5	0.0	48.5	0.858	1.009	0.908	0.807	Pass
5	41.5	48.5	1.211	1.362	1.262	1.110	Pass
60	41.5	24.2-48.5[1]	1.211	1.615	1.312	1.161	Pass
5	0.0	56.5	1.009	1.262	1.009	0.908	Pass
5	48.5	56.5	1.362	1.665	1.413	1.262	Pass
		Permanent Set	0.101	0.202	0.151	0.151	Pass

Notes: 1) Oscillation frequency is 10±2 sec per cycle

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Specimen No. 1 (UL 1897 Load Schedule)

Ultimate Loading Sequence (UL 1897)						
Duration (min)	Combined Test Pressure (psf)	Max Deflection Under Load (in.)				Result
		1	2	3	4	
1	112	1.463	1.766	1.514	1.312	Pass
1	127	1.716	1.918	1.716	1.463	Pass
0s	142	-	-	-	-	Fail

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Specimen No. 2 (UL 580 Load Schedule)

Class 30 Loading Sequence (UL 580)							
Duration (min)	Positive Pressure (psf)	Negative Pressure (psf)	Max Deflection Under Load (in.)				Result
			1	2	3	4	
5	0.0	16.2	0.252	0.252	0.252	0.151	Pass
5	13.8	16.2	0.353	0.353	0.353	0.252	Pass
60	13.8	8.1-27.7[1]	0.454	0.454	0.454	0.303	Pass
5	0.0	24.2	0.404	0.404	0.404	0.303	Pass
5	20.8	24.2	0.505	0.505	0.454	0.303	Pass
		Permanent Set	0.050	0.000	0.050	0.050	Pass

Class 60 Loading Sequence (UL 580)							
Duration (min)	Positive Pressure (psf)	Negative Pressure (psf)	Max Deflection Under Load (in.)				Result
			1	2	3	4	
5	0.0	32.3	0.303	0.050	0.303	0.202	Pass
5	27.7	32.3	0.454	0.050	0.454	0.353	Pass
60	27.7	16.2-55.4[1]	0.606	0.050	0.606	0.505	Pass
5	0.0	40.4	0.454	0.050	0.454	0.303	Pass
5	34.6	40.4	0.606	0.050	0.606	0.454	Pass
		Permanent Set	0.050	0.101	0.000	0.050	Pass

Class 90 Loading Sequence (UL 580)							
Duration (min)	Positive Pressure (psf)	Negative Pressure (psf)	Max Deflection Under Load (in.)				Result
			1	2	3	4	
5	0.0	48.5	0.454	0.050	0.454	0.303	Pass
5	41.5	48.5	0.656	0.050	0.656	0.505	Pass
60	41.5	24.2-48.5[1]	0.706	0.101	0.706	0.505	Pass
5	0.0	56.5	0.555	0.050	0.555	0.404	Pass
5	48.5	56.5	0.757	0.050	0.757	0.555	Pass
		Permanent Set	0.050	0.050	0.050	0.000	Pass

Notes: 1) Oscillation frequency is 10±2 sec per cycle

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Specimen No. 2 (UL 1897 Load Schedule)

Ultimate Loading Sequence (UL 1897)						
Duration (min)	Combined Test Pressure (psf)	Max Deflection Under Load (in.)				Result
		1	2	3	4	
1	112	0.807	0.050	0.807	0.606	Pass
1	127	0.959	0.050	0.959	0.757	Pass
1	142	1.161	0.000	1.362	0.858	Pass
0s	157	-	-	-	-	Fail

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Specimen No. 3 (UL 580 Load Schedule)

Class 30 Loading Sequence (UL 580)							
Duration (min)	Positive Pressure (psf)	Negative Pressure (psf)	Max Deflection Under Load (in.)				Result
			1	2	3	4	
5	0.0	16.2	0.252	0.151	0.101	0.202	Pass
5	13.8	16.2	0.303	0.202	0.202	0.252	Pass
60	13.8	8.1-27.7[1]	0.404	0.303	0.252	0.303	Pass
5	0.0	24.2	0.353	0.202	0.252	0.303	Pass
5	20.8	24.2	0.404	0.303	0.252	0.303	Pass
		Permanent Set	0.050	0.000	0.000	0.050	Pass

Class 60 Loading Sequence (UL 580)							
Duration (min)	Positive Pressure (psf)	Negative Pressure (psf)	Max Deflection Under Load (in.)				Result
			1	2	3	4	
5	0.0	32.3	0.353	0.252	0.202	0.252	Pass
5	27.7	32.3	0.505	0.404	0.353	0.404	Pass
60	27.7	16.2-55.4[1]	0.606	0.606	0.454	0.505	Pass
5	0.0	40.4	0.454	0.454	0.353	0.404	Pass
5	34.6	40.4	0.606	0.555	0.454	0.505	Pass
		Permanent Set	0.202	0.151	0.101	0.151	Pass

Class 90 Loading Sequence (UL 580)							
Duration (min)	Positive Pressure (psf)	Negative Pressure (psf)	Max Deflection Under Load (in.)				Result
			1	2	3	4	
5	0.0	48.5	0.303	0.353	0.151	0.252	Pass
5	41.5	48.5	0.454	0.555	0.303	0.353	Pass
60	41.5	24.2-48.5[1]	0.505	0.606	0.303	0.353	Pass
5	0.0	56.5	0.353	0.454	0.252	0.303	Pass
5	48.5	56.5	0.555	0.706	0.353	0.404	Pass
		Permanent Set	0.050	0.050	0.050	0.000	Pass

Notes: 1) Oscillation frequency is 10±2 sec per cycle

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Specimen No. 3 (UL 1897 Load Schedule)

Ultimate Loading Sequence (UL 1897)						
Duration (min)	Combined Test Pressure (psf)	Max Deflection Under Load (in.)				Result
		1	2	3	4	
1	112	0.656	0.807	0.706	0.807	Pass
1	127	0.757	0.908	0.807	0.908	Pass
1	142	0.807	1.009	0.908	1.009	Pass
1	157	0.959	1.110	1.060	1.161	Pass
1	172	1.060	1.262	1.262	1.262	Pass
1	187	1.211	1.362	1.413	1.362	Pass
1	202	2.018	1.514	1.968	1.514	Pass
1	217	2.321	1.665	2.015	1.615	Pass
1	232	2.506	1.754	2.168	1.732	Pass
1	247	2.756	1.911	2.265	1.856	Pass
0s	262		-	-	-	Fail

ASTM B557 Tensile Properties of 0.029" aluminum

Specimen	Width (in)	Thickness (in)	Gage Length (in)	Yield Strength (ksi)	Tensile Strength (ksi)	Elongation at Break (%)
1	0.4970	0.0232	2	56.9	61.4	36.8
2	0.4980	0.0236	2	56.9	61.2	33.4
3	0.4990	0.0236	2	56.9	61.0	33.2
4	0.4990	0.0237	2	56.5	60.7	32.4
5	0.4980	0.0231	2	57.5	61.6	31.3
Average				**56.9**	**61.2**	**33.4**
St.Dev.				**0.4**	**0.3**	**2.0**

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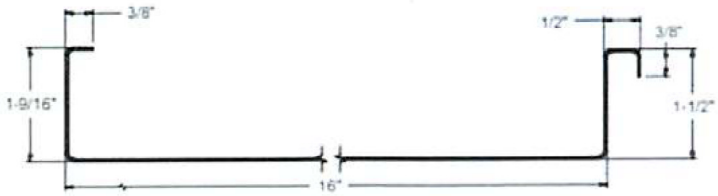
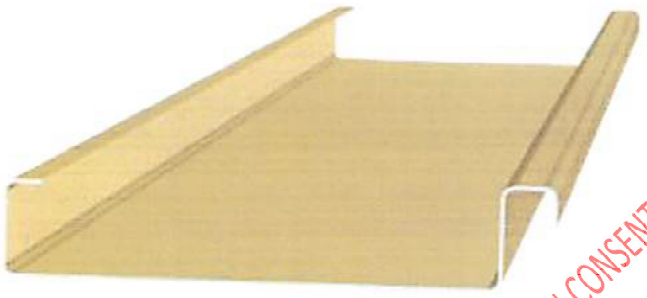
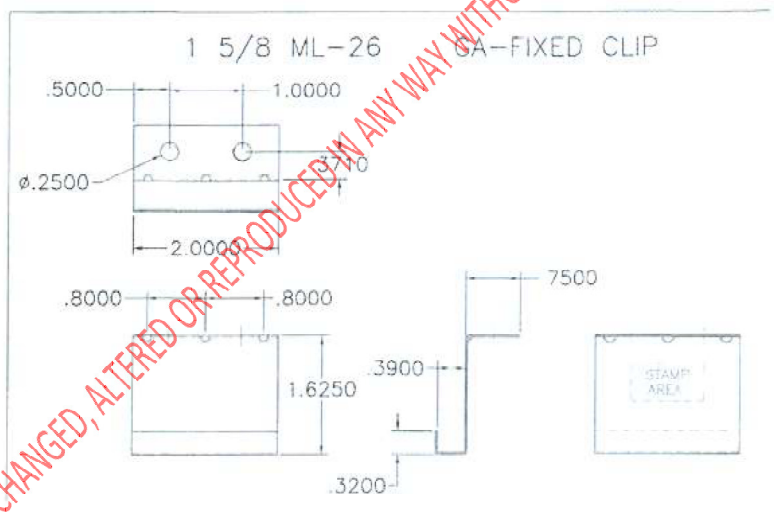




0.032" Al SMI 1.5 MS



26ga. Steel Clip

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Specimen No. 1 After Testing

Specimen No. 2 After Testing

Specimen No. 3 After Testing

END OF REPORT

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