Architectural Testing

TEST REPORT

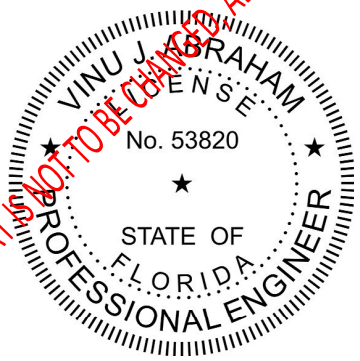
Report No.: C7678.01-450-44

Rendered to:

SHEFFIELD METALS INTERNATIONAL
Sheffield Village, Ohio

PRODUCT TYPE: Flush Wall Panel (24 Gauge Galvalume®)
SERIES/MODEL: SMI 150 FWP 1" Seam Height x 12" Coverage

SPECIFICATION: ASTM E 1592, *Standard Test Method for Structural Performance of Sheet Metal Roof and Siding Systems by Uniform Static Air Pressure Difference*



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Test Dates:	05/08/13
Through:	05/10/13
Report Date:	06/07/13
Test Record Retention Date:	06/07/17

1.0 Report Issued To: Sheffield Metals International
5467 Evergreen Parkway
Sheffield Village, Ohio 44054
1-800-283-5262

2.0 Test Laboratory: Architectural Testing, Inc.
2658 Electronics Way
West Palm Beach, Florida 33407
561-881-0020

3.0 Project Summary:

3.1 Product Type: Flush Wall Panel (24 Gauge Galvalume®)

3.2 Series/Model: SMI 1.0 FWP 1" Seam Height x 12" Coverage

3.3 Compliance Statement: Results obtained are tested values and were secured by using the designated test method(s). The test specimens were tested in accordance with ASTM E 1592 and achieved the following:

Test Specimen	Test Frame Construction	Maximum Negative Test Load	Ultimate Negative Load
#1	1' steel girt spacing	-130.0 psf	-135.0 psf
#2	4' steel girt spacing	-85.0 psf	-90.0 psf

3.4 Test Dates: 05/08/2013 – 05/10/13

3.5 Test Location: Architectural Testing, Inc. test facility in West Palm Beach, Florida.

3.6 Test Sample Source: The test specimens were provided by the client. Representative samples of the test specimens will be retained by Architectural Testing for a minimum of four years from the report completion date.

3.7 Test Specimen Installation: The test specimens were installed by representatives from Sheffield Metals International.

3.8 Drawing Reference: The wall panel drawings have been reviewed by Architectural Testing and are representative of the test specimens reported herein. Test specimen construction was verified by Architectural Testing per the drawings located in Appendix F. Any deviations are documented herein or on the drawings.

3.0 Project Summary: (Continued)

3.9 List of Official Observers:

Name	Company
John Spallina	Architectural Testing, Inc.
Kristin Nolan, E.I.	Architectural Testing, Inc.
Jeff McGovern	Architectural Testing, Inc.

4.0 Test Specification(s):

ASTM E 1592-05, *Standard Test Method for Structural Performance of Sheet Metal Roof and Siding Systems by Uniform Static Air Pressure Difference*

ASTM E8/E8M-08, *Standard Test Methods for Tension Testing of Metallic Materials*

5.0 Test Specimen Description:

5.1 Product Sizes:

Specimen #	Location	Width (in.)	Length (in.)	Overall Area
1	Overall size	144	132	132.0 ft²
	Panel size	12	132	
2	Overall size	144	288	288.0 ft²
	Panel size	12	288	

5.2 Test Deck Construction: The 12' 0" wide by 24' 0" long by 1' 0" deep test frame was fabricated from C12 steel channels. The purlins were run the 12' width and were located 24" from each end and spaced 48" on center (5 spans) on Specimen #1. The purlins were run the 12' width and were located 6" from the B-deck end and 6" from the test frame end and spaced 12" on center (10 spans) on Specimen #2. The purlins were constructed from W4 I-beam steel which was welded to the test frame, and recessed 1" down from the top of the frame. A 16 gauge Hi Hat channel was mechanically attached to each W4 I-beam using a double row of #10 x 1-1/4" HH Dril Flex screws spaced at 12" on center. The perimeter of the panels were overlapped onto the C12 perimeter channels by 2" and then sandwiched between the test frame and the upper test chamber apparatus.

5.0 Test Specimen Description: (Continued)

5.3 Roof System Construction:

Test Specimen #1:

Component	Details	Attachment Method
1" x 12" SMI 1.0 FWP	The panels were constructed from 24 Gauge Galvalume® and were 12" wide. Twelve full width panels and one partial width panel were utilized.	The female interlock leg of each panel was mechanically attached to the test frame using one #12 x 1" SD Pancake Head screw per purlin. The male interlock was slid into the female interlock and the seams were stitched using a single row of #12 x 1" SD Pancake Head screws spaced 13-1/2" from the B-deck end, 11" from the test frame end and at 24" on center thereafter. 3/32" x 1/2" butyl tape was used in between the panel seams. The perimeter of the wall panels utilized a 2" overlap onto the steel test chamber. All panels were run in the 24' direction.

Test Specimen #2:

Component	Details	Attachment Method
1" x 12" SMI 1.0 FWP	The panels were constructed from 24 Gauge Galvalume® and were 12" wide. Twelve full width panels and one partial width panel were utilized.	The female interlock leg of each panel was mechanically attached to the test frame using one #12 x 1" SD Pancake Head screw per purlin. The male interlock was slid into the female interlock and the seams were stitched using a single row of #12 x 1" SD Pancake Head screws spaced 3-1/2" from each end and at 24" on center thereafter. 3/32" x 1/2" butyl tape was used in between the panel seams. The perimeter of the wall panels utilized a 2" overlap onto the steel test chamber. All panels were run in the 24' direction.

6.0 ASTM E 1592 Wind Uplift Test Results:

Two assemblies were tested per ASTM E 1592. The following summarizes observations made during the test at each class rating. Reference Tables 1 and 2 for deflection and permanent set measurements.

Test Specimen #1:

Test Pressure	Observations	Results
130.0 psf	No visible damage	Passed
135.0 psf	While ramping up towards the 135 psf test load the test specimen failed when a wall panel unseamed	Failed

6.0 ASTM E 1592 Wind Uplift Test Results: (Continued)

Test Specimen #2:

Test Pressure	Observations	Results
80.0 psf	No visible damage	Passed
90.0 psf	After achieving the test load, a panel unseamed 3 seconds into the test.	Failed

Notes:

- *A zero load of 3.0 psf was used for all tests in accordance with ASTM E 1592.*
- *All test loads were held for a duration of 60 seconds.*
- *Reference Appendix B for Tables showing the deflection and permanent set recorded during testing.*
- *Reference Appendix C for Load-Deflection charts of recorded data.*
- *Reference Appendix D Sketches for location of deflection measurement devices.*
- *Reference Appendix F for Photographs of mode of failure.*

General Test Note: *A loose fitting, pleated 4-mil plastic film was utilized to assist in obtaining uniform static pressure on the roof assembly. The plastic film was located under the metal panels and on top of the steel purlins to facilitate testing of the metal panels. The plastic film incorporated pleats extended into every seam. In the opinion of the witnessing test lab, the plastic film did not influence the test results.*

7.0 ASTM E 8 Tensile Test Results:

Test Method: The test specimens were evaluated in accordance with ASTM E8/E8M-08, *Standard Test Methods for Tensile Testing of Metallic Materials*. The specimens were tested using the Instron 3369 Testing Machine with the 50kN load cell (ICN005740), at a crosshead speed of 0.2" per minute. Each test specimen measured 8" long x 1/2" wide (reduced section area).

Test Results: The test results for the flush wall panel are shown on the test logs in Appendix D and summarized in the following table.

Specimen #	Base Metal Thickness (in)	Peak Load (lbf)	Modulus of Elasticity (psi)	Tensile Strength (psi)	Yield Strength (psi)	Elongation (%)
1	0.022	722.7	28,261,197	65,336	61,754	20.9
2	0.022	729.0	27,452,831	65,044	60,463	20.0

Architectural Testing will service this report for the entire test record retention period. Test records that are retained such as detailed drawings, datasheets, representative samples of test specimens, or other pertinent project documentation will be retained by Architectural Testing, Inc. for the entire test record retention period.

This report does not constitute certification of this product nor an opinion or endorsement by this laboratory. It is the exclusive property of the client so named herein and relates only to the specimens tested. This report may not be reproduced, except in full, without the written approval of Architectural Testing, Inc.

For ARCHITECTURAL TESTING, Inc.

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Angela Abramczyk
Technical Writer

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Vinu J. Abraham, P.E.
Vice President – Southeast Region

AA: coc

Attachments (pages): This report is complete only when all attachments listed are included.
Appendix-A: Negative Design Loads Table (1)

Appendix A

Negative Design Loads

Span (ft.)	1592 Load (psf)	Design Load (psf)
1.00	130.00	65.00
1.50	121.67	60.84
2.00	113.33	56.67
2.50	105.00	52.50
3.00	96.67	48.34
3.50	88.34	44.17
4.00	80.00	40.00

Notes:

1) Panel Description: SMI 1.0 FWP, 24 Gauge Galvalume®, 12" Coverage, 1" Tall, one (1), #12 x 1" SD Pancake Head screw per purlin.
2) Stitch Panels together through the panel vertical ribs with #12 x 1" SD Pancake Head screws spaced at 24" on center.
3) The above loads were derived from uplift tests done in accordance with ASTM E-1592 Test Report # C7678.01-450-44.
4) All values are interpolated from tests performed at spans of 1'-0" and 4'-0".
5) Test results are highlighted.
6) Design Load contains a 2.00 factor of safety in accordance with AISI ' 2001.