Architectural Testing

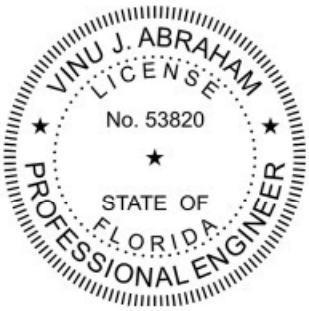
UL 580 & UL 1897
TEST REPORT

Report No.: C9079.01-450-44

Rendered to:

SHEFFIELD METALS INTERNATIONAL
Sheffield Village, Ohio

PRODUCT TYPE: Standing Seam Roof System (24 Ga. Steel)
SERIES/MODEL: SMI 2.0 SCH Mechanical Seam over Plywood



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Test Date: 12/13/13
Report Date: 02/11/14
Test Record Retention Date: 12/13/17

1.0 Report Issued To: Sheffield Metals International
5467 Evergreen Parkway
Sheffield Village, Ohio 44054
Voice: 904.413.7425
Contact: Jim Mitchell

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: Standing Seam Roof System

3.2 Series/Model: SMI 2.0 SCH Mechanical Seam Over Plywood

3.3 Compliance Statement: Results obtained are tested values and were secured by using the designated test methods. The test specimen was tested in accordance with UL 580 and UL 1897 and achieved an ultimate test load of -127 psf.

3.4 Test Date: 12/13/2013

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

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

3.7 Test Specimen Installation: The test specimen was installed by representatives from Sheffield Metals International.

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

3.9 List of Official Observers:

Name	Company
Vinu Abraham, P.E.	Architectural Testing, Inc.
Jeff McGovern	Architectural Testing, Inc.
John Spallina	Architectural Testing, Inc.
Alan Rule	Architectural Testing, Inc.

4.0 Test Specification(s):

UL 580, Underwriters Laboratories, Inc., *Standard for Safety, Tests for Uplift Resistance of Roof Assemblies, (Fifth Edition November 2, 2006, revised through July 9, 2009)*

UL 1897, Underwriters Laboratories, Inc., *UL Standard for Safety for Uplift Tests for Roof Covering Systems (Fifth Edition March 11, 2004, revised through May 22, 2008)*

The purpose of this test is to evaluate the comparative resistance of roof assemblies to positive and negative pressures. This test simulates the effects of wind gusts by use of oscillating exterior pressure and constant interior pressures.

5.0 Test Specimen Description:

5.1 Product Sizes:

Test Specimen #1:

Overall Area: 100.0 ft² (9.3m²)	**Width**		**Length**	
	inches	**millimeters**	**inches**	**millimeters**
Overall size	120	3048	120	3048
Panel Size	18 3/4	476	120	3048

5.2 Test Deck Construction: The 10' 0" wide by 10' 0" long by 1' 3" deep test frame was fabricated from C15 by 33.9 steel channels. The test frame utilized six joists constructed from Southern Yellow Pine 2 x 12 lumber located on two sides of the test frame and spaced 24" on center. The joists were secured to the test frame using two 1/2" x 3" long bolts with washers and nuts through a 8" long, 2" x 4" x 1/8" steel angle with pre-drilled fastener locations. The steel angles were welded to the test frame 24" on center. Southern Yellow Pine 2 x 12 lumber was utilized as cross members at the midspan of the joists. The cross members were secured to the joists using two #8 X 3" long Torx flat head screws at each end. 1/2" (15/32" min) thick 4–ply CDX plywood sheathing was utilized on the top of the test deck. The plywood was secured using 8d coat ring shank nails, spaced 6" on center in the field and 4" on center at the perimeter and seams.

5.0 Test Specimen Description: (Continued)

5.3 Roof System:

Test Specimen #1:

Components	Details	Attachment Method
30# Asphalt saturated organic paper (ASTM D 226) meeting type II requirements.	A single layer of felt paper, lapped 4 inches, attached to the plywood substrate.	The felt paper was secured using roofing nails with tin tabs spaced 16" on center at the seams and at the center of each sheet.
SMI 2.0 SCH Mechanical Seam roof panel	The panels were constructed from 24 Ga steel. Six full width panels measuring 18 3/4" wide by 120" long and two partial panels measuring 3" wide by 120" long were tested.	The roof panels were secured to the plywood utilizing 2" Float Clips. The panels overlapped each other and were seamed using a hand seamer to 90° (stage one) and then using a mechanical seamer to 180° (stage two). The perimeter of the roof deck was secured with #10 x 1" pancake screws. The screws were spaced 2" on center at the panel ends and 4" on center at the panel sides.
Clips	The G-90 galvanized 2" Float Clips measured 2.4" high by 4.3" wide and consisted of a 16 Ga. base and a 22 Ga. tab.	Each clip was attached using two #10 x 1" pancake screws. A clip was used at each panel end and 24" on center thereafter

6.0 Test Results: One assembly was tested per UL 580 and UL 1897. The following summarizes observations made during the test at each class rating.

Test Specimen #1:

Test Class	Test Phase	Results
Class 30 Phases 1-5	No visible damage to the system Reference Table #1 for deflection measurements	PASSED
Class 60 Phases 1-5	No visible damage to the system Reference Table #2 for deflection measurements	PASSED
Class 90 Phases 1-5	No visible damage to the system Reference Table #3 for deflection measurements	PASSED
Supplemental Loads -112 psf to -127 psf	No visible damage to the system Reference Table #4 for deflection measurements	PASSED
Supplemental Loads -142 psf	Clip fasteners pulled out of the plywood while increasing pressure to 142 psf.	FAILED

Notes:

- *Reference Chart #1 located in Appendix A for test pressures and load durations.*
- *Reference Sketch #1 in Appendix B for location of deflection measurement devices.*
- *Deflection measurements are included in Table #1 through Table#4 in Appendix C of this test report.*

General Test Note: *A loose fitting, pleated 2-mil plastic film was utilized to assist in obtaining uniform pressure on the roof system. The plastic film was located between the panels and the underlayment to facilitate testing of the panels. In our opinion, this did not influence test results.*

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.

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For ARCHITECTURAL TESTING, Inc.

Digitally Signed by: John Spallina

John Spallina
Technician

Digitally Signed by: Vinu Abraham

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