

CSI ARCHITECTURAL METAL, INC. TEST REPORT

SCOPE OF WORK

TAS 125 UPLIFT RESISTANCE TESTING OF 1/8" ALUMUINUM 1100 ROOF PANEL

REPORT NUMBER

Q6264.01-450-18 R1

TEST DATE(S)

06/24/24 – 06/26/24

ISSUE DATE

09/19/24

REVISION DATE

10/01/24

MIAMI-DADE COUNTY NOTIFICATION NO.

ATIWPB 23227

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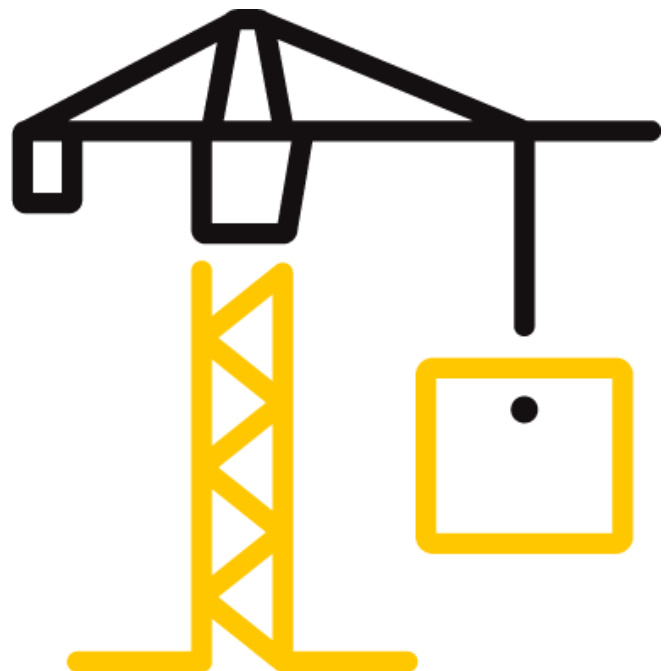
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TEST REPORT FOR CSI ARCHITECTURAL METAL, INC.

Report No.: Q6264.01-450-18 R1

Date: 09/19/24

Revision Date: 10/01/24

REPORT ISSUED TO

CSI ARCHITECTURAL METAL, INC.

1505 S. Oxnard Blvd.

Oxnard, CA 93030

SECTION 1

SCOPE

Architectural Testing, Inc. (an Intertek company) dba Intertek Building & Construction (B&C) was contracted by CSI Architectural Metal, Inc. to perform testing in accordance with TAS 125, *Standard Requirements for Metal Roofing Systems*, on their 1/8" Aluminum 1100 Roof Panel. Results obtained are tested values and were secured by using the designated test method(s). Uplift testing was conducted at the Intertek B&C test facility in West Palm Beach, FL. Tensile testing was conducted at Intertek B&C test facility in Lithia Springs, GA.

This report does not constitute certification of this product nor an opinion or endorsement by this laboratory. Intertek B&C will service this report for the entire test record retention period. The test record retention period ends ten years after the test date. Test records, such as detailed drawings, datasheets, representative samples of test specimens, or other pertinent project documentation, will be retained for the entire test record retention period.

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For INTERTEK B&C:

COMPLETED BY:	Melissa Nuttall, FMPC
TITLE:	Senior Project Manager
SIGNATURE:	
DATE:	10/01/24

MN:te

REVIEWED BY:	Tanya Dolby, P.E.
TITLE:	Engineering Manager – Engineering Services
SIGNATURE:	
DATE:	10/01/24

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SECTION 2

SUMMARY OF TEST RESULTS

Product Type: Roof Panel System

Series/Model: 1/8" Aluminum 1100

Specimen 1 - Ultimate Test Load Achieved: -187 psf

Specimen 2 - Ultimate Test Load Achieved: -217 psf

Specimen 3 - Ultimate Test Load Achieved: -262 psf

SECTION 3

TEST METHOD(S)

The specimens were evaluated in accordance with the following:

TAS 125-03, *Standard Requirements for Metal Roofing Systems* **Section 8**, UL 580 (as modified for the Florida Building Code, Building)

ASTM E8/E8M-22, *Standard Test Methods for Tension Testing of Metallic Materials*

SECTION 4

MATERIAL SOURCE/INSTALLATION

Test specimens were provided by the client. Installation of the tested product was performed by the client.

SECTION 5

EQUIPMENT

Cycling and Static Load Mechanism: Computer controlled centrifugal blowers with electronic pressure measuring device

Deflection Measuring Device: Linear Transducers

SECTION 6

LIST OF OFFICIAL OBSERVERS

NAME	COMPANY
Daniel Schmidt	CSI Architectural Metal, Inc.
Seth Allen	Intertek B&C

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SECTION 7
TEST PROCEDURE

This test evaluates the comparative resistance of roof assemblies to positive and negative pressures by simulating the effects of wind gusts by use of oscillating exterior pressure and constant interior pressures. Three assemblies were tested per TAS 125 at each class rating. (Reference Chart No. 1 for test pressures and load durations.) The measurements were taken via linear transducers.

		NEGATIVE PRESSURE		POSITIVE PRESSURE	
TEST PHASE	DURATION minutes	POUNDS PER SQUARE FOOT psf (kPa)	INCHES OF WATER inches (mm)	POUNDS PER SQUARE FOOT psf (kPa)	INCHES OF WATER inches (mm)
Class 30					
1	5	16.2 (0.79)	3.1 (79)	0.0 (0.00)	0.0 (0)
2	5	16.2 (0.79)	3.1 (79)	13.8 (0.66)	2.7 (69)
3	60	8.1 - 27.7 (0.39 - 1.33)	1.5 - 5.3 (38 - 135)	13.8 (0.66)	2.7 (69)
4	5	24.2 (1.16)	4.7 (119)	0.0 (0.00)	0.0 (0)
5	5	24.2 (1.16)	4.7 (119)	20.8 (1.00)	4.0 (102)
Class 60					
1	5	32.3 (1.55)	6.2 (157)	0.0 (0.00)	0.0 (0)
2	5	32.3 (1.55)	6.2 (157)	27.7 (1.33)	5.3 (135)
3	60	16.2 - 55.4 (0.79 - 2.66)	3.1 - 10.7 (79 - 272)	27.7 (1.33)	5.3 (135)
4	5	40.4 (1.94)	7.8 (198)	0.0 (0.00)	0.0 (0)
5	5	40.4 (1.94)	7.8 (198)	34.6 (1.66)	6.7 (170)
Class 90 (maximum combined uplift pressure of 105 psf)					
1	5	48.5 (2.33)	9.3 (236)	0.0 (0.00)	0.0 (0)
2	5	48.5 (2.33)	9.3 (236)	41.5 (1.99)	8.0 (203)
3	60	24.2 - 48.5 (1.16 - 2.33)	4.7 - 9.3 (119 - 236)	41.5 (1.99)	8.0 (203)
4	5	56.5 (2.71)	10.9 (277)	0.0 (0.00)	0.0 (0)
5	5	56.5 (2.71)	10.9 (277)	48.5 (2.33)	9.3 (236)

Chart No. 1
TAS 125 Load Table Test Pressures

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SECTION 8

TEST SPECIMEN DESCRIPTION

Product Type: Roof Panel System

Series/Model: 1/8" Aluminum 1100

Product Size(s):

All Test Specimens

OVERALL AREA:	WIDTH		HEIGHT	
	millimeters	inches	millimeters	inches
9.3 m ² (100.0 ft ²)				
Overall Size	3048	120	3048	120
Panel Size	1219	48	3048	120

The following description applies to all specimens.

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 nominal 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 an 8" long, 2" by 4" by 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 nominal lumber was utilized as cross members at the midspan of the joists. The cross members were secured to the joists using #8 X 3" long Torx flat head screws at each end. The deck was sheathed with 5/8" thick 4-Ply CDX plywood. The plywood was secured using 8d coated ring shank nails spaced 6" on center.

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Roof System:

COMPONENTS	DETAILS	ATTACHMENT METHOD
30# Asphalt saturated organic felt paper	A single layer was used with a 5" overlap between adjacent sheets.	The felt was secured with #10x 1" pancake head screws with 32 GA tin caps at each corner
Clips	The 1/4" high x 1-1/4" long x 1-1/4 wide clips were constructed from 1/8 Aluminium.	The clips were spaced 6" on center and attached using two #12 x 1-1/2" pan screws.
Starter Panel	The panel was constructed from 1/8" aluminium and had a 12" coverage width. One panel was used.	The male leg of the panel was secured with clips spaced 6" on center. The female leg of the panel was secured with the perimeter screws, #12 x 2-1/2" HWH head SS screws spaced 4" on center in two staggered rows through the top of the panels.
Roof Panel	The panels were constructed from 1/8" aluminium and had a 48" coverage width. Two full and one partial width panels were used. Support ribs were spaced 6" from each side and 12" on center thereafter and attached using #10 x 5/8" nut and bolts welded to the panel 6" on center.	The male leg of the panels were secured with clips spaced 6" on center. The female leg of the panels was placed over the male leg of the panel and slid under the clips. The perimeter was secured with #12 x 2-1/2" HWH head SS screws spaced 4" on center in two staggered rows through the top of the panels.

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SECTION 9
UPLIFT TEST RESULTS

The temperature during testing was 85°F. The results are tabulated as follows.

Test Specimen #1

TEST TITLE	OBSERVATIONS	DEFLECTION MEASUREMENTS	RESULTS
Class 30, Phases 1-5	No visible damage to system	Reference Table No. 1	PASSED
Class 60, Phases 1-5	No visible damage to system	Reference Table No. 1	PASSED
Class 90, Phases 1-5	No visible damage to system	Reference Table No. 1	PASSED
Supplemental Loads -112 psf to -187 psf	No visible damage to system	Reference Table No. 2	PASSED
Supplemental Loads -202 psf	Plywood pulled away from 2x12	Reference Table No. 2	FAILED

Test Specimen #2

TEST TITLE	OBSERVATIONS	DEFLECTION MEASUREMENTS	RESULTS
Class 30, Phases 1-5	No visible damage to system	Reference Table No. 3	PASSED
Class 60, Phases 1-5	No visible damage to system	Reference Table No. 3	PASSED
Class 90, Phases 1-5	No visible damage to system	Reference Table No. 3	PASSED
Supplemental Loads -112 psf to -217 psf	No visible damage to system	Reference Table No. 4	PASSED
Supplemental Loads -232 psf	Plywood pulled away from 2x12	Reference Table No. 4	FAILED

Test Specimen #3

TEST TITLE	OBSERVATIONS	DEFLECTION MEASUREMENTS	RESULTS
Class 30, Phases 1-5	No visible damage to system	Reference Table No. 5	PASSED
Class 60, Phases 1-5	No visible damage to system	Reference Table No. 5	PASSED
Class 90, Phases 1-5	No visible damage to system	Reference Table No. 5	PASSED
Supplemental Loads -112 psf to -262 psf	No visible damage to system	Reference Table No. 6	PASSED
Supplemental Loads -277 psf	Plywood pulled away from 2x12	Reference Table No. 6	FAILED

Notes:

Reference Chart No. 1 for test pressures and load durations.

Reference Sketch No. 1 for location of deflection measurement devices.

A loose fitting, pleated 4-mil plastic film was utilized to assist in obtaining uniform pressure on the roof system. The plastic film was located between the moisture barrier and the roof panels to facilitate testing. In our opinion, this did not influence test results.

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SECTION 10

TENSILE TEST RESULTS

The test specimens were evaluated in accordance with the most recent revision of ASTM E8, *Standard Test Methods for Tensile Testing of Metallic Materials*. The tensile coupons were machined from the metal members to the dimensions of the sheet-type 0.5" wide specimen given in Figure 1 of ASTM E8. Elongation was measured at fracture.

Test Method:	ASTM E8/E8M-22				
Orientation:	Longitudinal				
Specimen No.	Thickness (in)	Yield Strength @ 0.2% Offset (psi)	Yield Point Elongation (%)	Tensile Strength (psi)	Elongation in 2" (%)
1	0.116	19733.32	7.83	19734.36	16.50
2	0.115	20294.59	10.20	20298.45	15.50
3	0.115	20183.83	9.51	20189.71	15.00
Average		20070.58	9.18	20074.17	15.67

SECTION 11

CONCLUSION

The 1/8" Aluminum 1100 Roof Panel tested per TAS 125 achieved an ultimate test load of:

Specimen 1: -187 psf

Specimen 2: -217 psf

Specimen 3: -262 psf

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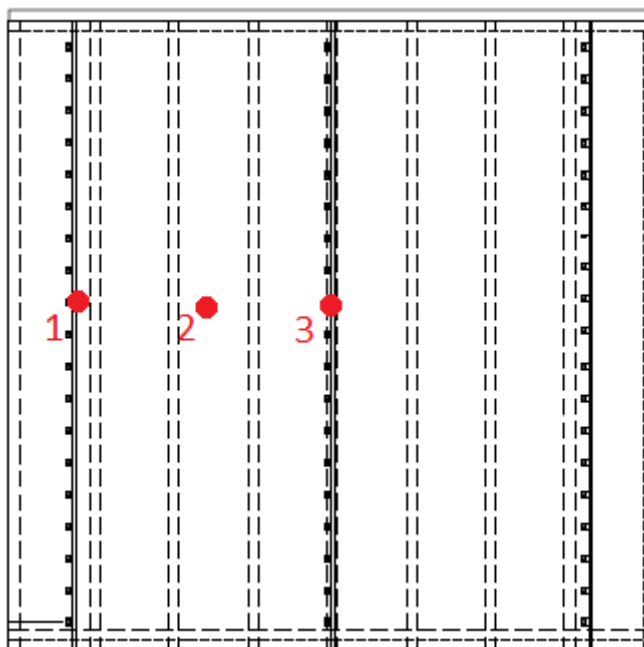
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SECTION 12

SKETCH



Sketch No. 1
Indicator Locations

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SECTION 13
TABLES

CLASS	PHASE	DEFLECTION MEASUREMENTS (inches)		
		INDICATOR		
		#1	#2	#3
30	1	0.09	0.89	0.05
	2	0.04	0.66	0.06
	3 Minimum	0.04	0.62	0.05
	3 Maximum	0.08	0.82	0.09
	4	0.06	0.97	0.06
	5	0.12	1.17	0.12
	Final (0.0 psf)	0.01	0.03	0.02
60	1	0.10	1.13	0.09
	2	0.16	1.34	0.16
	3 Minimum	0.17	1.28	0.19
	3 Maximum	0.24	1.58	0.24
	4	0.16	1.29	0.16
	5	0.22	1.52	0.22
	Final (0.0 psf)	0.04	0.09	0.06
90	1	0.18	1.41	0.18
	2	0.28	1.69	0.28
	3 Minimum	0.24	1.51	0.26
	3 Maximum	0.28	1.67	0.29
	4	0.16	1.42	0.15
	5	0.27	1.72	0.27
	Final (0.0 psf)	0.01	0.03	0.01

Table No. 1
Deflection Measurements – Test Specimen #1

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VACUUM (psf)	UPLIFT (psf)	LOAD (psf)	SUPPLEMENTAL DEFLECTION MEASUREMENTS (inches)		
			INDICATOR		
			#1	#2	#3
-63.5	-48.5	-112.0	0.28	1.78	0.28
-78.5	-48.5	-127.0	0.34	1.93	0.34
-93.5	-48.5	-142.0	0.40	2.06	0.47
-108.5	-48.5	-157.0	0.48	2.12	0.51
-123.5	-48.5	-172.0	0.59	2.39	0.61
-138.5	-48.5	-187.0	0.67	2.54	0.70
-153.5	-48.5	-202.0	Failed		

Table No. 2

Supplemental Deflection Measurements – Test Specimen #1

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CLASS	PHASE	DEFLECTION MEASUREMENTS (inches)		
		INDICATOR		
		#1	#2	#3
30	1	0.05	0.64	0.02
	2	0.06	0.79	0.02
	3 Minimum	0.06	0.74	0.03
	3 Maximum	0.09	0.97	0.04
	4	0.08	0.88	0.05
	5	0.10	1.06	0.05
	Final (0.0 psf)	0.04	0.08	0.03
60	1	0.10	1.02	0.05
	2	0.12	1.22	0.06
	3 Minimum	0.12	1.15	0.08
	3 Maximum	0.18	1.47	0.10
	4	0.14	1.24	0.09
	5	0.18	1.44	0.11
	Final (0.0 psf)	0.06	0.13	0.05
90	1	0.16	1.34	0.11
	2	0.21	1.56	0.12
	3 Minimum	0.18	1.39	0.12
	3 Maximum	0.22	1.55	0.13
	4	0.22	1.48	0.13
	5	0.27	1.71	0.16
	Final (0.0 psf)	0.10	0.19	0.11

Table No. 3
Deflection Measurements – Test Specimen #2

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VACUUM (psf)	UPLIFT (psf)	LOAD (psf)	SUPPLEMENTAL DEFLECTION MEASUREMENTS (inches)		
			INDICATOR		
			#1	#2	#3
-63.5	-48.5	-112.0	0.31	1.80	0.18
-78.5	-48.5	-127.0	0.37	1.92	0.22
-93.5	-48.5	-142.0	0.48	2.08	0.27
-108.5	-48.5	-157.0	0.55	2.22	0.31
-123.5	-48.5	-172.0	0.63	2.34	0.35
-138.5	-48.5	-187.0*	0.45	1.38	0.10
-153.5	-48.5	-202.0	0.64	1.41	0.12
-168.5	-48.5	-217.0	0.75	1.45	0.13
-183.5	-48.5	-232.0	Failed		

Table No. 4
Supplemental Deflection Measurements – Test Specimen #2

*Gauges Zeroed Before Load

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CLASS	PHASE	DEFLECTION MEASUREMENTS (inches)		
		INDICATOR		
		#1	#2	#3
30	1	0.05	0.72	0.02
	2	0.03	0.87	0.04
	3 Minimum	0.10	0.83	0.05
	3 Maximum	0.12	1.00	0.07
	4	0.09	0.91	0.06
	5	0.03	1.07	0.07
	Final (0.0 psf)	0.03	0.07	0.02
60	1	0.02	1.05	0.07
	2	0.09	1.22	0.11
	3 Minimum	0.11	1.15	0.11
	3 Maximum	0.18	1.43	0.15
	4	0.09	1.21	0.12
	5	0.18	1.40	0.15
	Final (0.0 psf)	0.09	0.12	0.06
90	1	0.11	1.31	0.13
	2	0.23	1.51	0.17
	3 Minimum	0.21	1.38	0.16
	3 Maximum	0.24	1.49	0.18
	4	0.18	1.43	0.15
	5	0.30	1.66	0.22
	Final (0.0 psf)	0.14	0.16	0.08

Table No. 5
Deflection Measurements – Test Specimen #3

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VACUUM (psf)	UPLIFT (psf)	LOAD (psf)	SUPPLEMENTAL DEFLECTION MEASUREMENTS (inches)		
			INDICATOR		
			#1	#2	#3
-63.5	-48.5	-112.0	0.36	1.76	0.23
-78.5	-48.5	-127.0	0.40	1.84	0.25
-93.5	-48.5	-142.0	0.46	1.96	0.27
-108.5	-48.5	-157.0	0.51	2.08	0.30
-123.5	-48.5	-172.0	0.58	2.18	0.32
-138.5	-48.5	-187.0	0.65	2.31	0.35
-153.5	-48.5	-202.0	0.73	2.43	0.37
-168.5	-48.5	-217.0	0.79	2.53	0.41
-183.5	-48.5	-232.0	0.86	2.65	0.44
-198.5	-48.5	-247.0	0.92	2.72	0.46
-213.5	-48.5	-262.0	1.02	2.92	0.49
-228.5	-48.5	-277.0	Failed		

Table No. 6
Supplemental Deflection Measurements – Test Specimen #3

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SECTION 14

PHOTOGRAPHS



Photo No. 1
Installed Panels – Side View

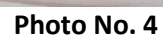


Photo No. 2
Installed Panels – End View

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Plywood Failure – Specimen #1



Plywood Failure – Specimen #2

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Photo No. 4
Plywood Failure – Specimen #3



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SECTION 15

DRAWINGS

The test specimen drawings have been reviewed by Intertek B&C and are representative of the test specimen(s) reported herein. Test specimen construction was verified by Intertek B&C per the drawings included in this report. Any deviations are documented herein or on the drawings.



PROJECT:

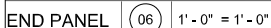
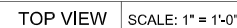
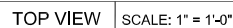
5800 NBR

R E V I S I O N S		DESCRIPTION
#	DATE	
1		
2		
3		
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10		

CS| TEST PLAN

CLIENT:	DOHUBAULT
LOCATION:	MIAMI, FLORIDA
SYSTEM:	WASP
STATUS:	NOT APPROVED
CHECKED BY:	CSH
SCALE:	AS SHOWN
PLOT DATE:	06/28/2024
NO.	

CSI01





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SECTION 16

REVISION LOG

REVISION #	DATE	PAGES	REVISION
0	09/19/24	N/A	Original Report Issue
1	10/01/24	2, 3, 8	Added tensile results