



Farabaugh Engineering and Testing Inc.

Project No. T133-17

Report Date: February 28, 2017

No. Pages: 10 (inclusive)

PERFORMANCE TEST REPORT

ASTM E330-02 UNIFORM LOAD STRUCTURAL TEST

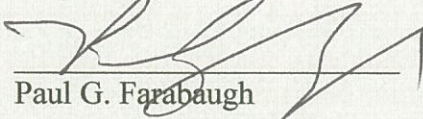
ON

**HIGHLINE SERIES S1
(12" WALL PANEL)**

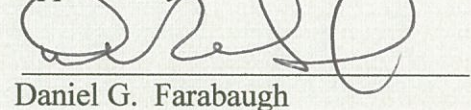
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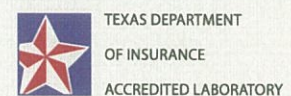
**PETERSEN ALUMINUM CORP.
10551 PAC ROAD
TYLER, TX. 75707**

Prepared by:


Paul G. Farabaugh

Approved by:


Daniel G. Farabaugh



Project No. T133-17

Purpose

The purpose of this test is to establish structural loading on the referenced test specimen in accordance with ASTM E-330-02, "Structural Performance of Exterior Windows, Doors, Skylights and Curtain Walls by Uniform Static Air Pressure Difference "and as provided herein.

Test Completion Date

2/28/17

Test Specimen

Customer: Petersen Aluminum
10551 PAC Rd.
Tyler, TX. 75707

Panel Series: Highline S2 Series

Panel Tested: S1 Wall Panel, 11.356" (Coverage) Width x 0.032" Alum. & 24 Ga. Steel with clip end (**HLS1C Panel**) or screw leg end (**HLS1 Panel**).

Panel Clip 20 ga. x 2.5" wide clip

Test Apparatus

A test chamber was used with two static pressure taps located at diagonally opposite corners. A controlled blower provided a uniform pressure load the specimen mock-up. Calibrated manometers were used to measure the pressure at each pressure tap. The uniform load pressure was performed in the negative direction on the panel specimen mock-up. Calibrated deflectometers were attached to monitor panel deformation as shown.

Test Assembly

- The mock-up was 8'-0" wide X 8'- 0" high and consisted of a 8 panel wide mock up with 16 ga. horizontal studs spaced at 24" o.c. The specimen was surrounded by a 2 X 12 wood framed perimeter.
- The panels were attached to the 16ga. steel supports using #14 - 13 x 1-1/2" long self drill, flat head, Concealor fasteners. Test #1 & #3 used clip leg with clips using two fasteners per clip and Test #2 & 4 had a screw leg using one screw at each support. The starter panel was also face fastened with (2) 1/4 - 14 x 2" long tek fasteners at each support. The last panel was face fastened with (2) 1/4 - 14 x 2" long tek fasteners.
- 4 mil Plastic Sheeting was placed between the structural steel and the exterior metal face panel.
- See attached drawing showing test set-up and assembly details.

Test Procedure

The tests were conducted in accordance with ASTM E-330-02, "Structural Performance of Exterior Windows, Doors, Skylights and Curtain Walls by Uniform Static Air Pressure Difference "and as provided herein.

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ASTM E330 UNIFORM LOAD TEST - NEGATIVE PRESSURE
TEST #1

Panel Tested: **HLS1C Wall Panel**, 12"(nominal) Panel Width, **0.032" Aluminum**

Test Condition: 2 Fasteners per clip at clip leg into supports spaced @ 2' -0" o.c..

LOAD * (PSF)	DEFLECTION READING D-1 (in)
0.6	0.000
11.0	0.186
0.6	0.016
21.4	0.341
0.6	0.024
31.8	0.476
0.6	0.038
42.2	0.633
0.6	0.068
52.6	0.783
0.6	0.129
63.0	0.921
0.6	0.230
73.5	1.109
0.6	0.326
83.9	1.300
0.6	0.446
94.3	1.476
0.6	0.561
104.7	1.637
0.6	0.686
115.1	1.766
0.6	0.794
125.5	1.932
0.6	0.991
135.9	2.010
0.6	1.021
146.3	2.105
0.6	1.082
156.7	2.212
0.6	1.171
167.1	2.306
0.6	1.256
177.5	2.403
0.6	1.329
187.9	2.490
0.6	1.425
198.4	2.562
0.6	1.505
208.8	2.648
0.6	1.619
219.2	2.779
0.6	1.715

RESULTS

Failure Load = 220.6 psf* . Panel disengagement.

Note: *- Panel weight included

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ASTM E330 UNIFORM LOAD TEST - NEGATIVE PRESSURE
TEST #2

Panel Tested: **HLS1 Wall Panel**, 12”(nominal) Panel Width, **0.032" Aluminum**

Test Condition: 1 Fastener thru screw leg into supports spaced at 2'- 0" o.c..

LOAD * (PSF)	DEFLECTION READING D-1 (in)
0.6	0.000
11.0	0.115
0.6	0.012
21.4	0.304
0.6	0.023
31.8	0.485
0.6	0.035
42.2	0.630
0.6	0.076
52.6	0.855
0.6	0.126
63.0	1.054
0.6	0.204
73.5	1.275
0.6	0.308
83.9	1.465
0.6	0.434
94.3	1.645
0.6	0.565
104.7	1.815
0.6	0.665

RESULTS

Failure Load = 108.9 psf* . Panel disengagement.

Note: *- Panel weight included

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ASTM E330 UNIFORM LOAD TEST
TEST #3

Panel Tested: **HLS1C Wall Panel**, 12”(nominal) Panel Width, **24 ga. steel**

Test Condition: 2 Fasteners per clip at clip leg into supports spaced @ 2' -0" o.c..

POSITIVE PRESSURE

LOAD (PSF)	DEFLECTION READINGS
	D-1 (IN)
0.0	0
26.0	0.334
0.0	0.059
52.0	0.68
0.0	0.118
78.1	1.034
0.0	0.168
104.1	1.325
0.0	0.211
124.9	1.533
0.0	0.267

NEGATIVE PRESSURE

LOAD * (PSF)	DEFLECTION READING
	D-1 (IN)
1.2	0
27.3	0.243
1.2	0.029
53.3	0.506
1.2	0.063
79.3	0.803
1.2	0.128
105.3	1.097
1.2	0.227
126.1	1.327
1.2	0.313

RESULTS

Upon completion of the testing at the positive and negative pressures noted above there were no noticeable failures of the specimen. Note: *- Panel weight included

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ASTM E330 UNIFORM LOAD TEST - NEGATIVE PRESSURE
TEST #4

Panel Tested: **HLS1 Wall Panel**, 12”(nominal) Panel Width, **24 ga. steel**

Test Condition: 1 Fastener thru screw leg into supports spaced at 2'- 0" o.c..

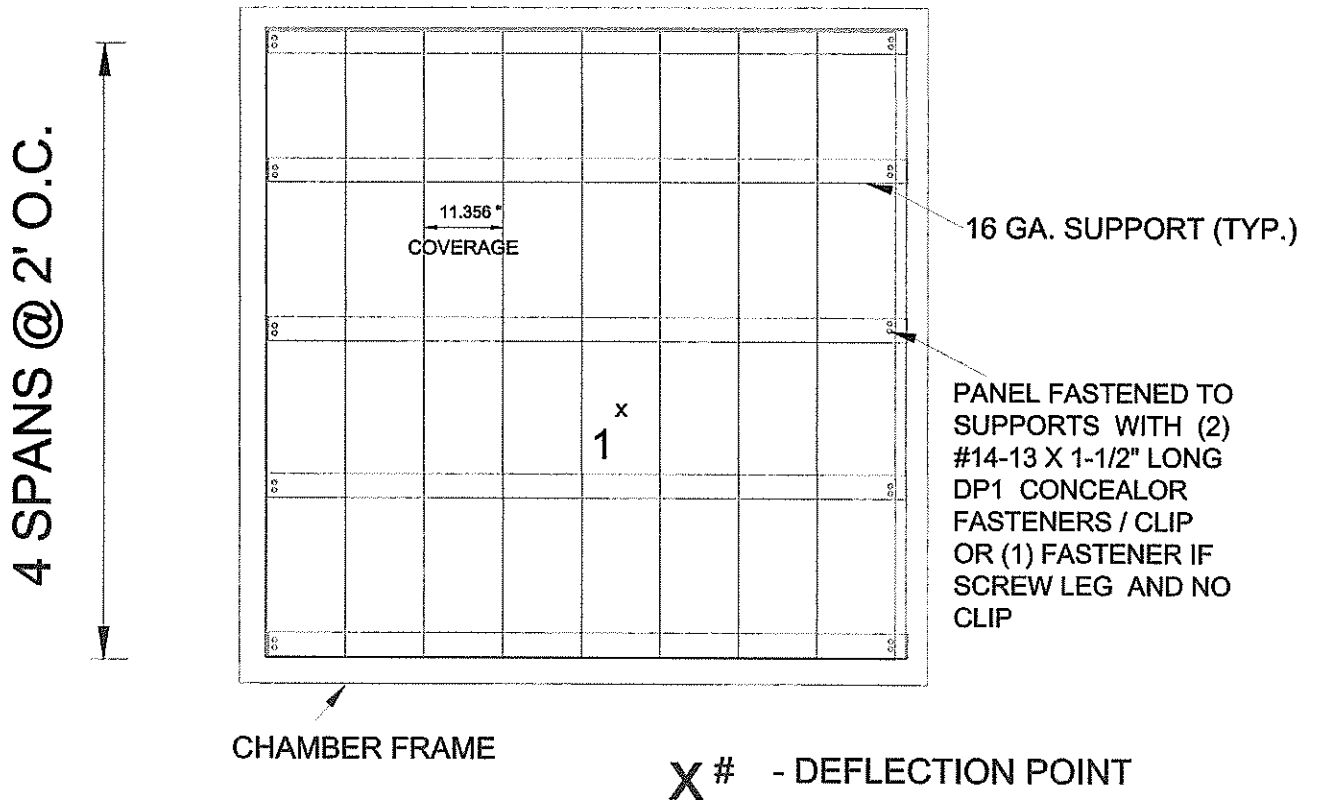
LOAD * (PSF)	DEFLECTION READING D-1 (in)
1.2	0.000
11.6	0.085
1.2	0.006
22.1	0.256
1.2	0.010
32.5	0.423
1.2	0.013
42.9	0.583
1.2	0.020
53.3	0.745
1.2	0.03
63.7	0.897
1.2	0.061
74.1	1.049
1.2	0.109
84.5	1.189
1.2	0.178
94.9	1.328
1.2	0.246
105.3	1.461
1.2	0.336
115.7	1.581
1.2	0.417
126.1	1.696
1.2	0.501
136.5	1.813
1.2	0.596
147.0	1.922
1.2	0.686

RESULTS

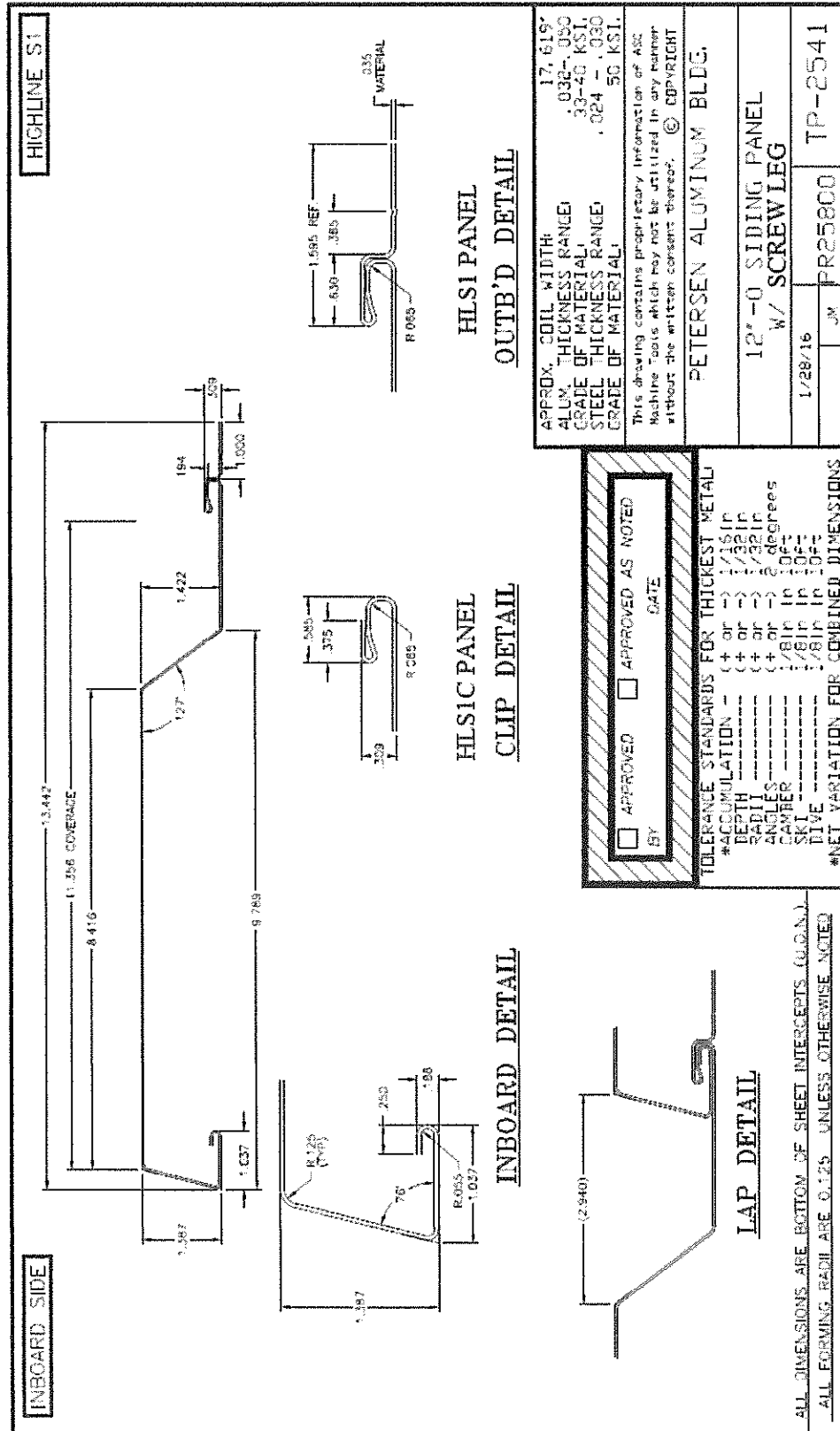
Failure Load = 148.2 psf *. Panel disengagement

Note: *- Panel weight included

TEST SETUP

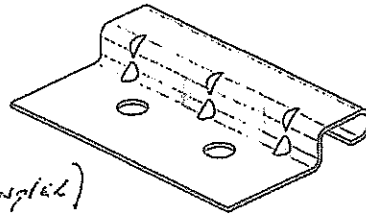


PLAN VIEW



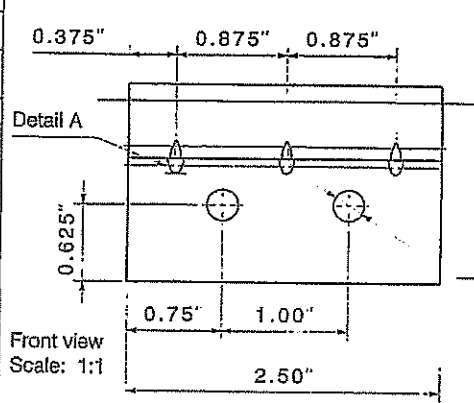
CUSTOMER APPROVAL:
 My signature on this print indicates approval of all the information shown (or as amended hereon) and that items made to these specifications will be accepted

NAME: [Signature] (T.A. [Signature])
 DATE: 8/12/11

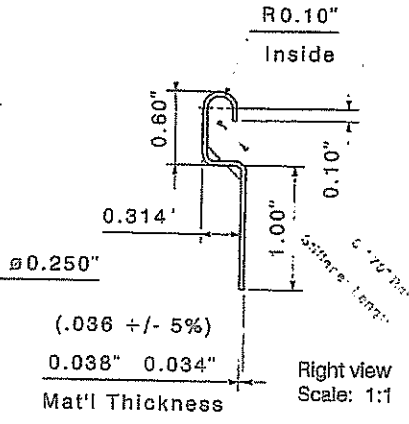


Isometric view
 Scale: 1:1

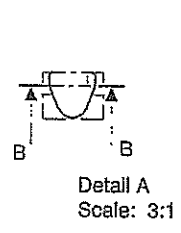
METRIC UNITS (mm) 1/16" 1/8" 3/16" 1/4" 5/16" 3/8" 7/16" 1/2" 5/8" 3/4" 7/8" 1"	
TOLERANCE 0.000 0.001 0.002 0.003 0.004 0.005 0.007 0.010 0.015 0.020 0.030 0.050 0.075 0.100	
ENGLISH UNITS (Inches) 1/16" 1/8" 3/16" 1/4" 5/16" 3/8" 7/16" 1/2" 5/8" 3/4" 7/8" 1"	
THIS DRAWING CONTAINS INFORMATION THAT IS THE PROPERTY OF SFS, INC., IN C. THIS DRAWING MAY NOT BE REPRODUCED, COPIED, OR REPRODUCED, NOR DISTRIBUTED TO THIRD PARTIES WITHOUT WRITTEN CONSENT.	



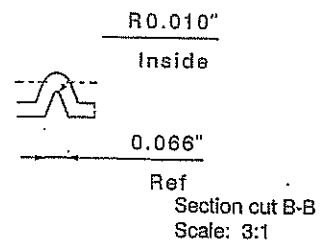
Front view
 Scale: 1:1



Right view
 Scale: 1:1



Detail A
 Scale: 3:1



Ref
 Section cut B-B
 Scale: 3:1

Material:	G-90 Galv	 P.O. Box 6326 Wyomissing, PA 19810 T. 610.376.5791 F. 610.376.9932	Description:	Petersen Horizontal Wall Panel Clip
Material Spec:	Commercial Quality		Drawing No.:	XP-1806
Surface Treatment:	-		Drawn By:	scda
Performance:	-		Date:	4/15/2011
Scale:	As Shown Above			

Project No. T133-17

TENSILE TEST REPORT

Client: Petersen Aluminum
10551 PAC Rd.
Tyler, TX. 75707

Test Date: 9/30/15 & 2/27/17

Test Method: ASTM A370-10- Steel
ASTM B557-10 - Aluminum

Material Description:

Sample #0039-17 - HLS1C Wall Panel, 16”(nominal) width x 0.032" Alum. with clip leg
Sample #0038-17 - HLS1 Wall Panel, 16”(nominal) width x 0.032" Alum. with screw leg
Sample #0093-15 - HLS1C Wall Panel, 16”(nominal) width x 24 Ga. Steel with clip leg
Sample #0036-17 - HLS1 Wall Panel, 16”(nominal) width x 24 Ga. Steel with screw leg

Sample No.	Width (in)	Thickness (in)	Yield Load (lb)	Max. Load (lb)	0.2% Offset Yield Strength (psi)	Tensile Strength (psi)	Elongation (% in 2 inches)
0039-17	0.504	0.029	385.5	406.5	26,378	27,815	10.8
0038-17	0.510	0.029	360.0	393.4	24,342	26,598	11.8
0093-15	0.502	0.023	641.3	743.9	55,546	64,430	25.6
0036-17	0.509	0.022	632.6	689.8	56,493	61,598	26.8

Equipment Used: Tensile Machine #QT7-061196-020
Caliper #1074379
Extensometer #10311744D
Micrometer #110596927