



Farabaugh Engineering and Testing Inc.

Project No. T302-22

Report Date: October 27, 2022

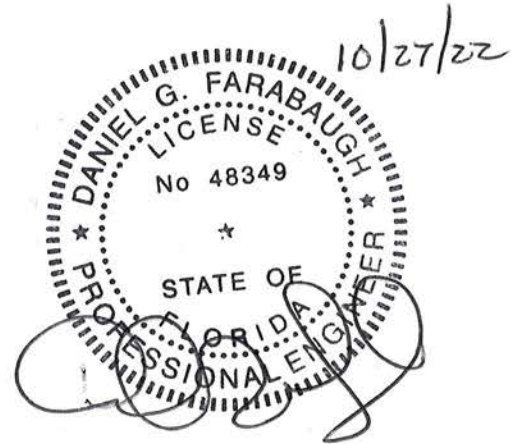
No. Pages: 15 (inclusive)

ASTM E1592
STANDARD TEST METHOD FOR
STRUCTURAL PERFORMANCE OF SHEET METAL ROOF AND SIDING SYSTEMS BY
UNIFORM STATIC AIR PRESSURE DIFFERENCE

7.2 PANEL
36" WIDE X 0.050" ALUMINUM

FOR

PETERSEN ALUMINUM CORP.
10551 PAC RD.
TYLER, TX 75707



Prepared by:

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ASTM E1592-05(2012)
STANDARD TEST METHOD FOR
STRUCTURAL PERFORMANCE OF SHEET METAL ROOF AND SIDING SYSTEMS BY
UNIFORM STATIC AIR PRESSURE DIFFERENCE

Purpose

This test method covers the evaluation of the structural performance of Sheet Metal Panels and Anchor to Panel Attachments for roof or siding systems under uniform static air pressure difference.

Test Completion Date

10/12/22

Test Specimen

Manufacturer: Petersen Aluminum Corp.
10551 PAC Rd.
Tyler, TX 75707

Specimen: 7.2 Panel, 36" wide (Coverage) X 0.050" aluminum

Testing Apparatus

A vacuum test chamber was used with two static pressure taps located at diagonally opposite corners. A controlled blower provided a vacuum to uniformly 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 to monitor wind uplift on the panel specimen mock-up. Calibrated deflectometers were attached to monitor panel deformation as shown.

Installation

- The panels were installed on to 16 ga supports with ¼"-14 X 1-1/2" long, hex head, self-drill fasteners with 1-1/8" diameter metal/rubber sealing washers at every low cell of the panel. The panel sidejoints were a lap seam. The panel fixed ends used the same fasteners and washers in the low cells of the panel into the 16 ga. supports. A ¼"-14 x 7/8" long, self-drilling, hex washer head, lap fastening screws, with sealer washer was used at lap joint spaced at 18" o.c. See test setup for installation of panels.
- Plastic (4 mil thick) was employed loosely between the panels and subgirts and in the side joints to create a vacuum seal.

Procedure

- The specimen was checked for proper adjustment and all vents closed in the pressure measuring lines.
- The required deflection measuring apparatus were installed at their specified locations.
- A nominal initial pressure was applied equal to at least four times but not more than ten times the dead weight of the specimen. This nominal pressure was used as the reference zero and initial deflection readings were recorded.
- At each load increment, pressure was maintained for a period of not less than 60 seconds and until the deflection gages indicated no further increase in deflections.
- Successive increments were achieved as above until failure or ultimate load was reached.
- Plastic (4 mil thick) was employed loosely between the panels and subgirts and in the side joints to create a vacuum seal.

The test was conducted according to the procedure in ASTM E-1592-05(2012) and as noted herein. In our opinion the tape and plastic had no influence on the results of the test.

TEST #1

Test Specimen: 7.2 Panel, 36" wide (Coverage) x 0.050" aluminum

Support Spacing: 2 SPANS @ 10' o/c

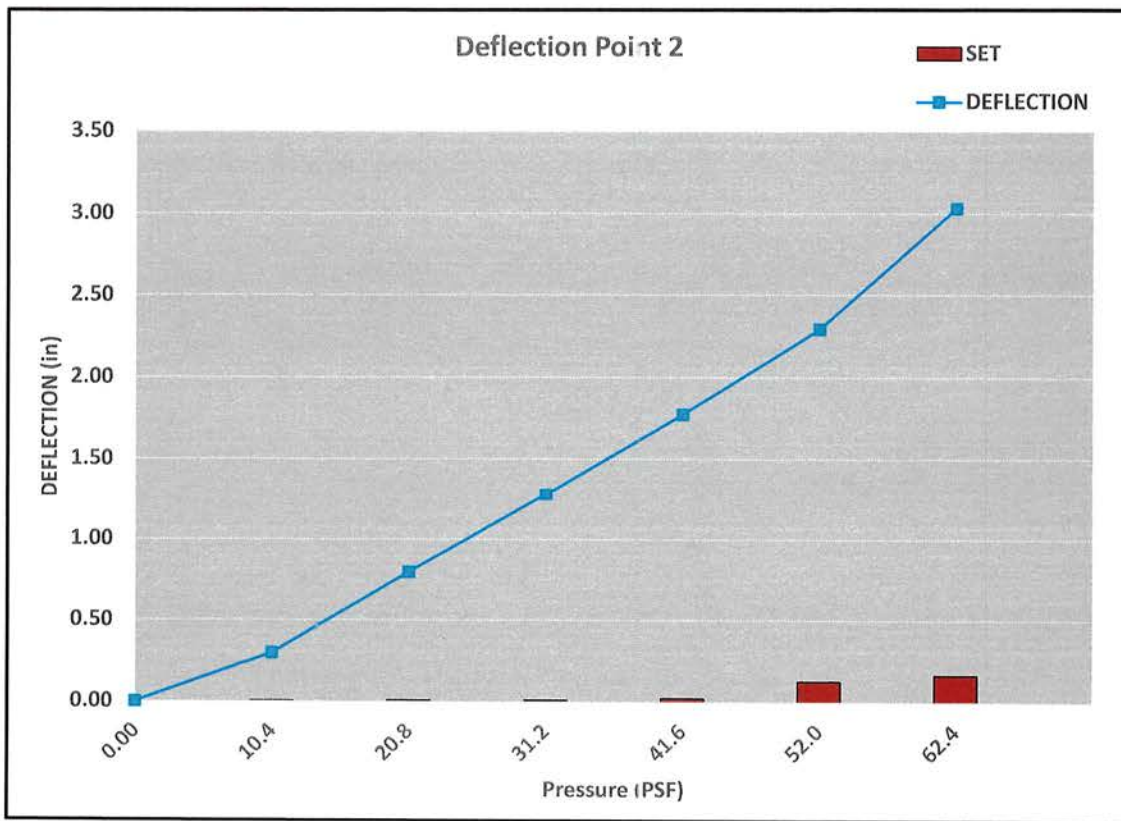
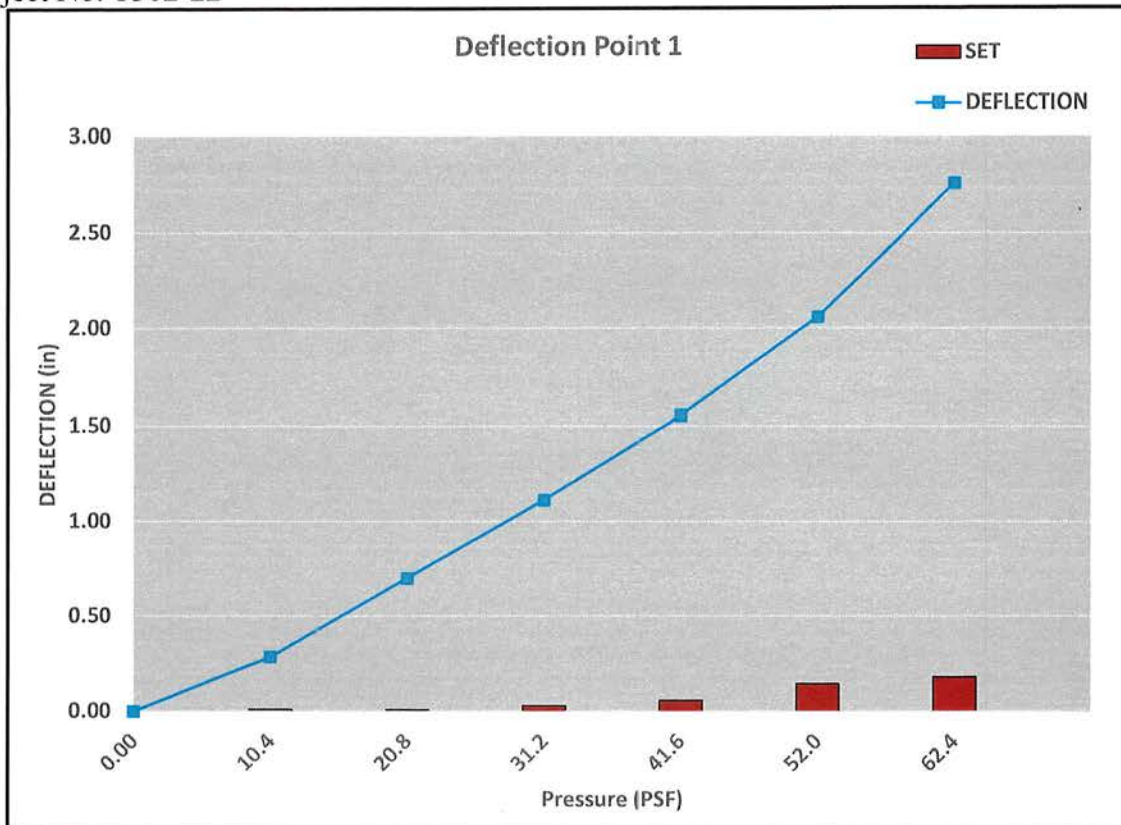
NEGATIVE (UPLIFT) TEST PRESSURE

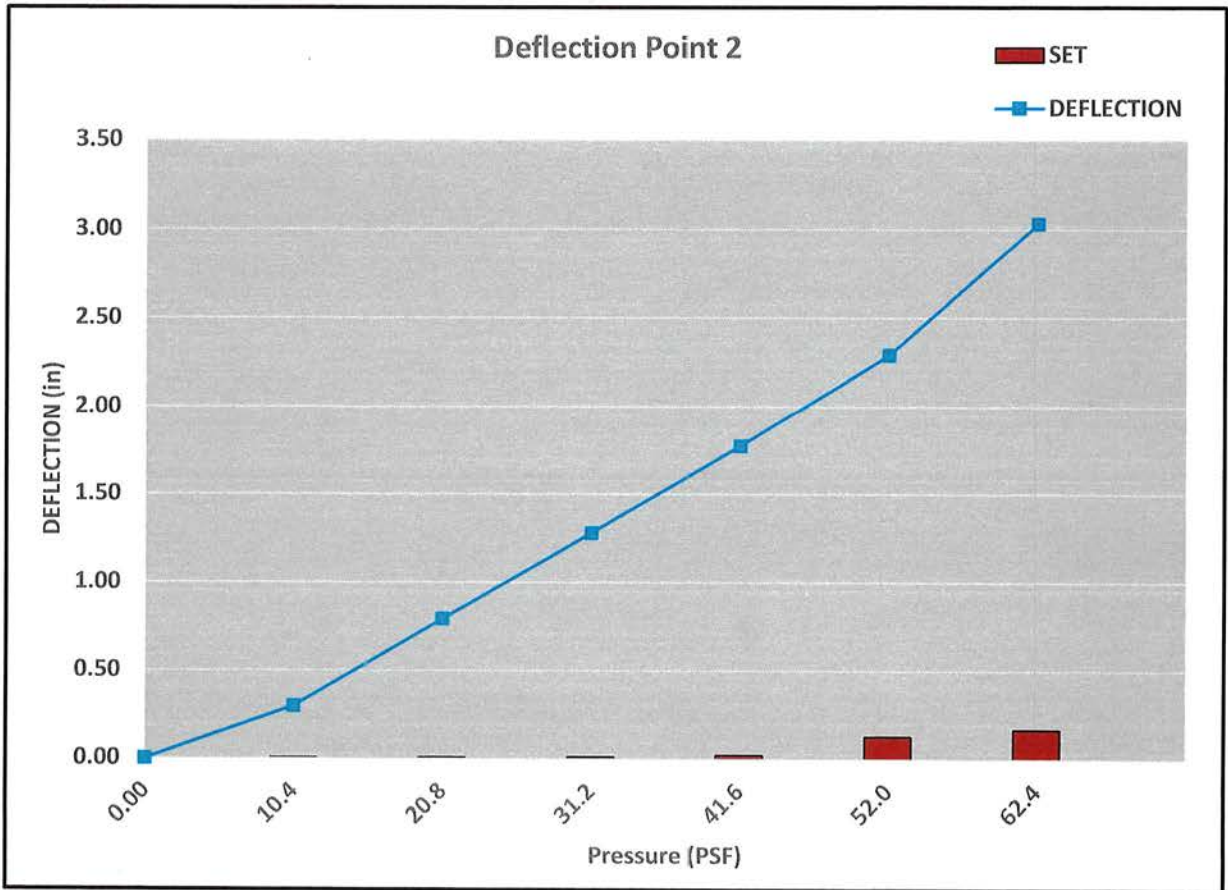
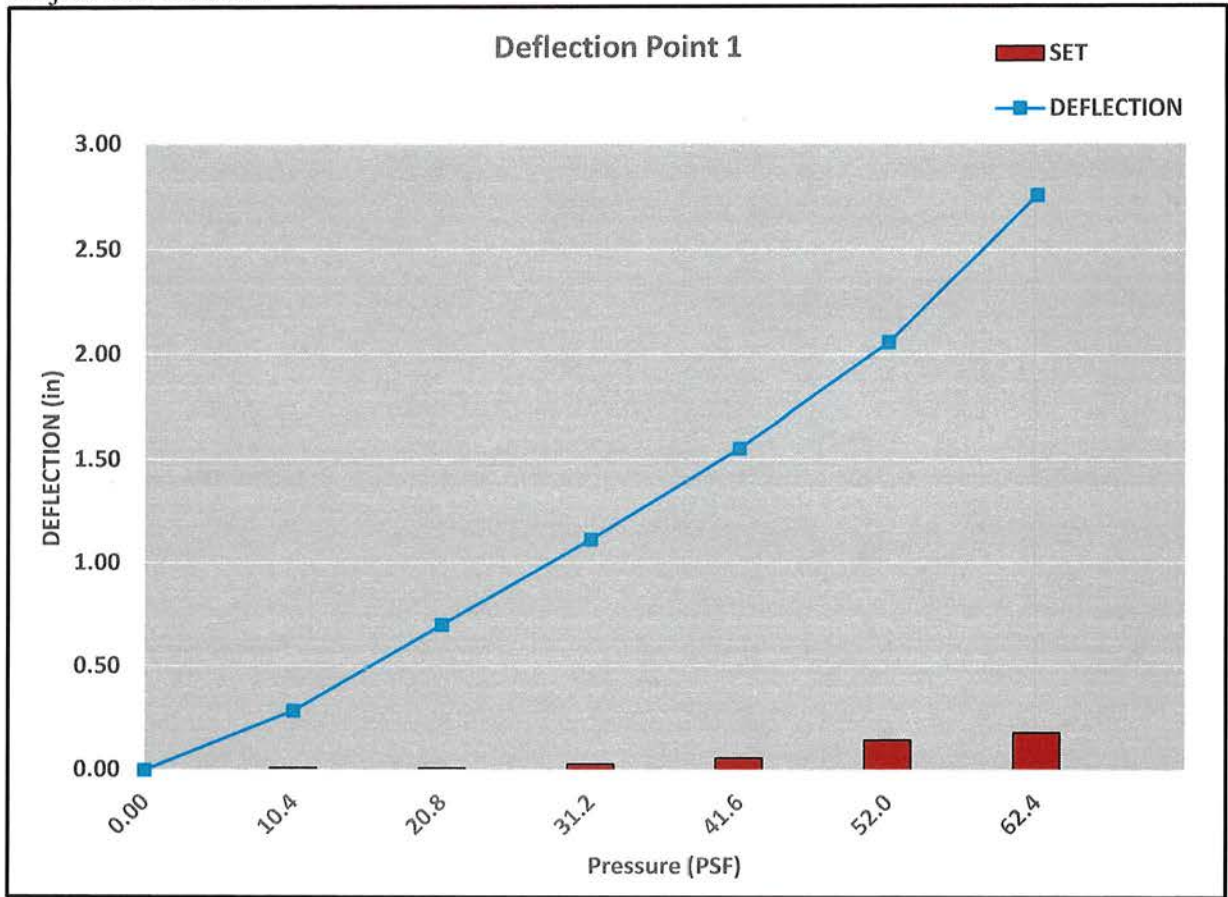
Load Pressure (in-h20)	Load Pressure (psf)	Deflection #1 (in)	Deflection #2 (in)	Deflection #3 (in)	Deflection #4 (in)	Deflection #5 (in)	Deflection #6 (in)
0	0.0	0.000	0.000	0.000	0.000	0.000	0.000
2	10.4	0.287	0.301	0.281	0.293	0.059	0.063
0	0.0	0.009	0.004	0.008	0.003	0.018	0.020
4	20.8	0.702	0.797	0.701	0.769	0.148	0.150
0	0.0	0.007	0.007	0.007	0.007	0.025	0.025
6	31.2	1.115	1.281	1.124	1.233	0.250	0.248
0	0.0	0.028	0.010	0.028	0.010	0.051	0.049
8	41.6	1.555	1.776	1.574	1.717	0.360	0.351
0	0.0	0.055	0.020	0.056	0.024	0.086	0.076
10	52.0	2.062	2.297	2.018	2.181	0.461	0.448
0	0.0	0.144	0.127	0.140	0.098	0.127	0.102
12	62.4	2.757	3.032	2.682	2.839	0.585	0.559
0	0.0	0.178	0.167	0.170	0.148	0.187	0.176

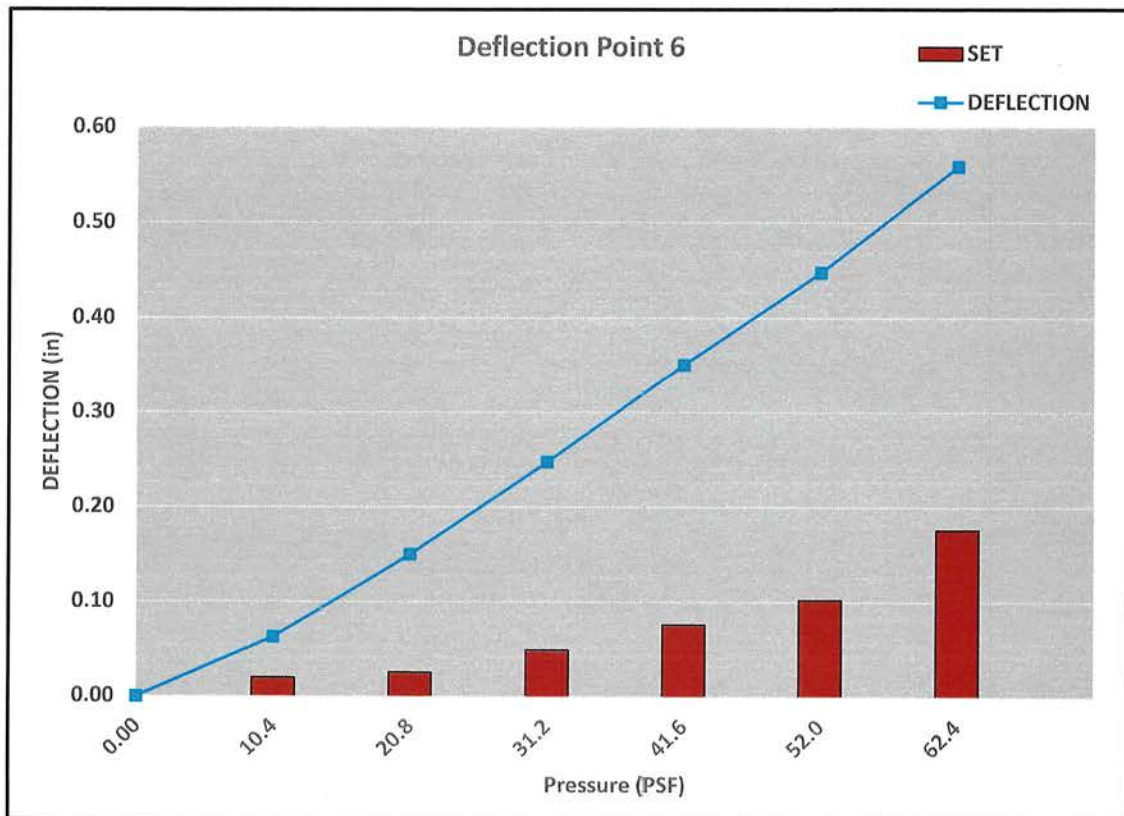
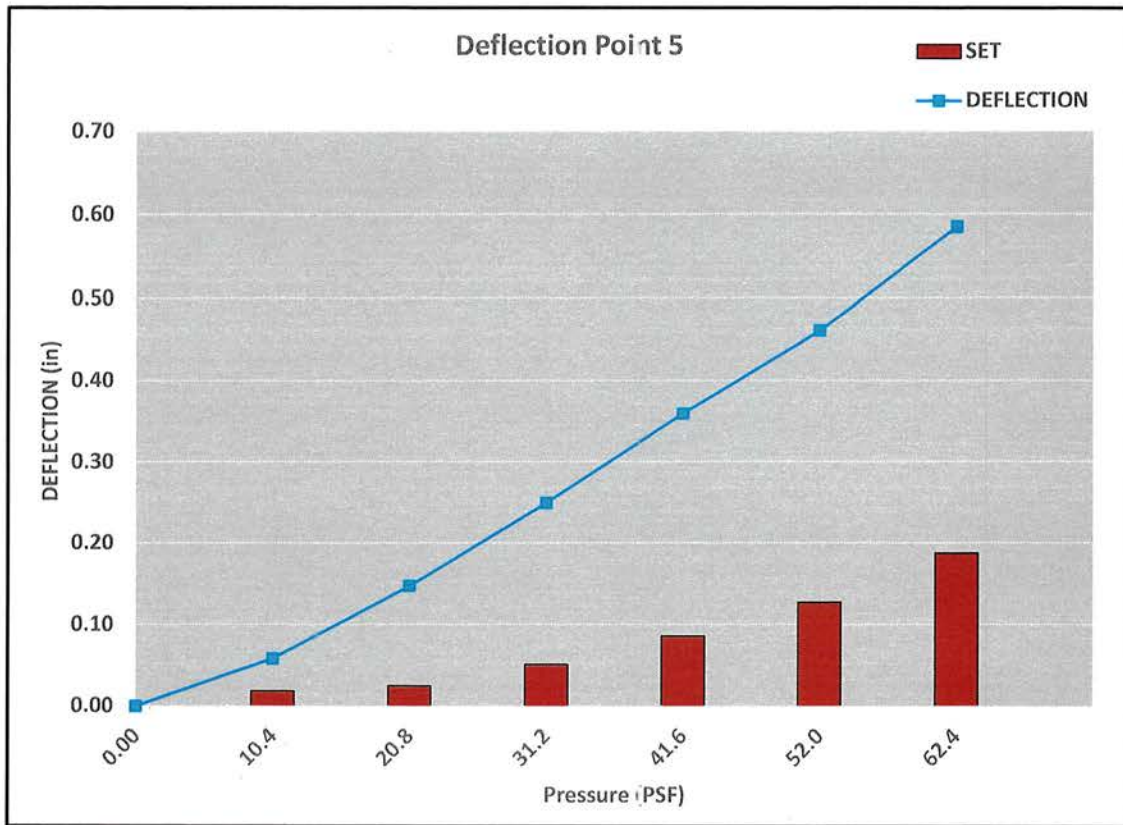
RESULTS:

Load held for 1 minute = 62.4 psf

Maximum Test Load = 63.4 psf (Panel buckled over interior support.)







TEST #2

Test Specimen: 7.2 Panel, 36" wide (Coverage) x 0.050" aluminum

Support Spacing: 3 SPANS @ 7' o/c

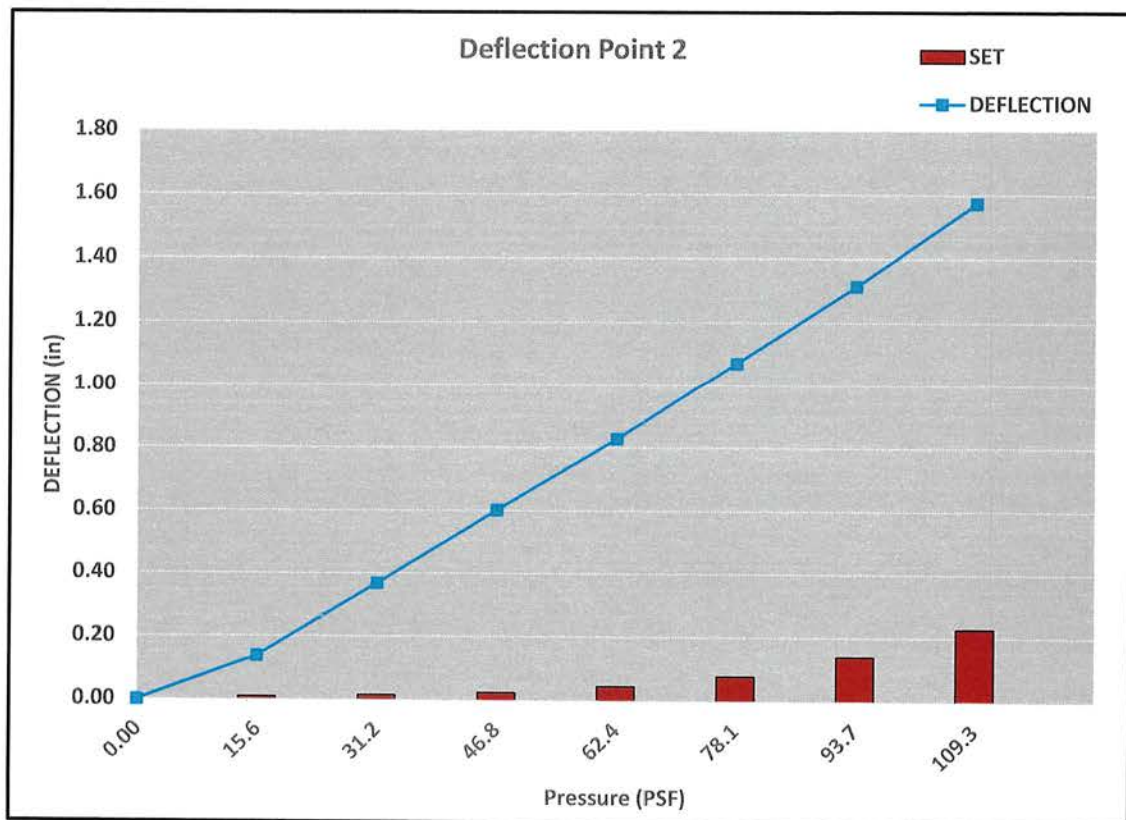
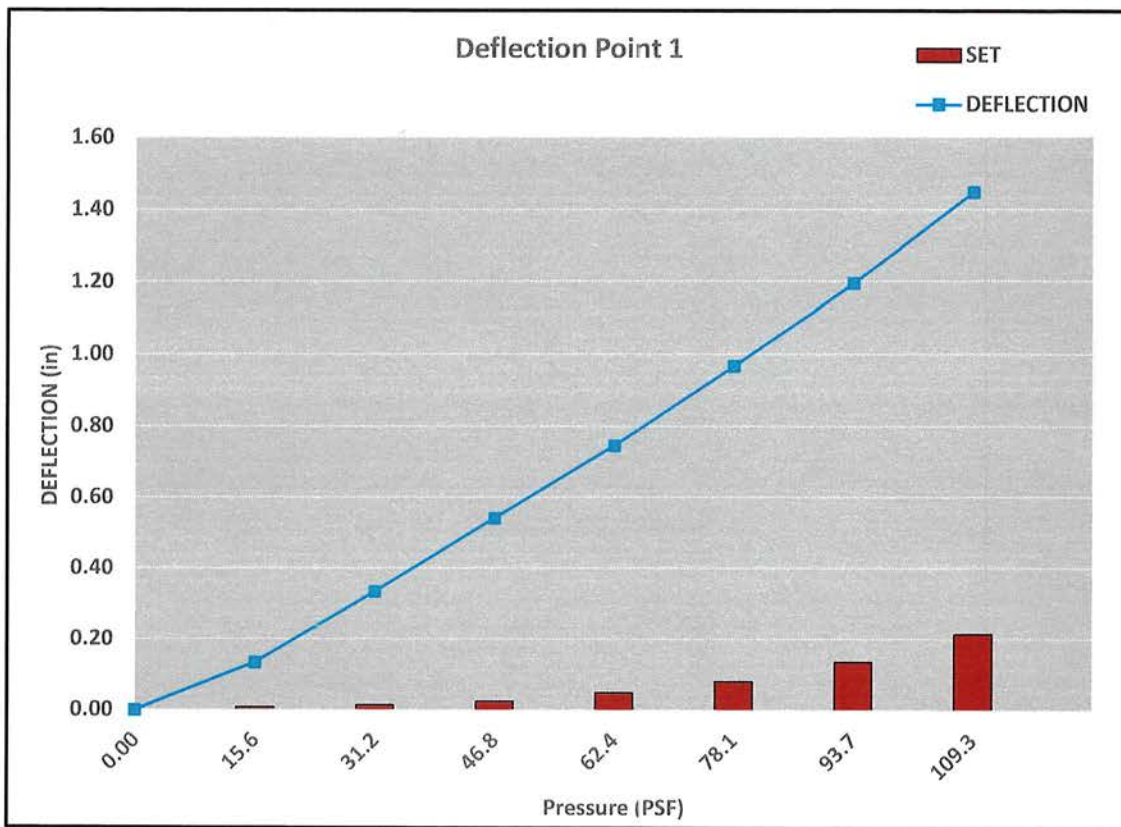
NEGATIVE (UPLIFT) TEST PRESSURE

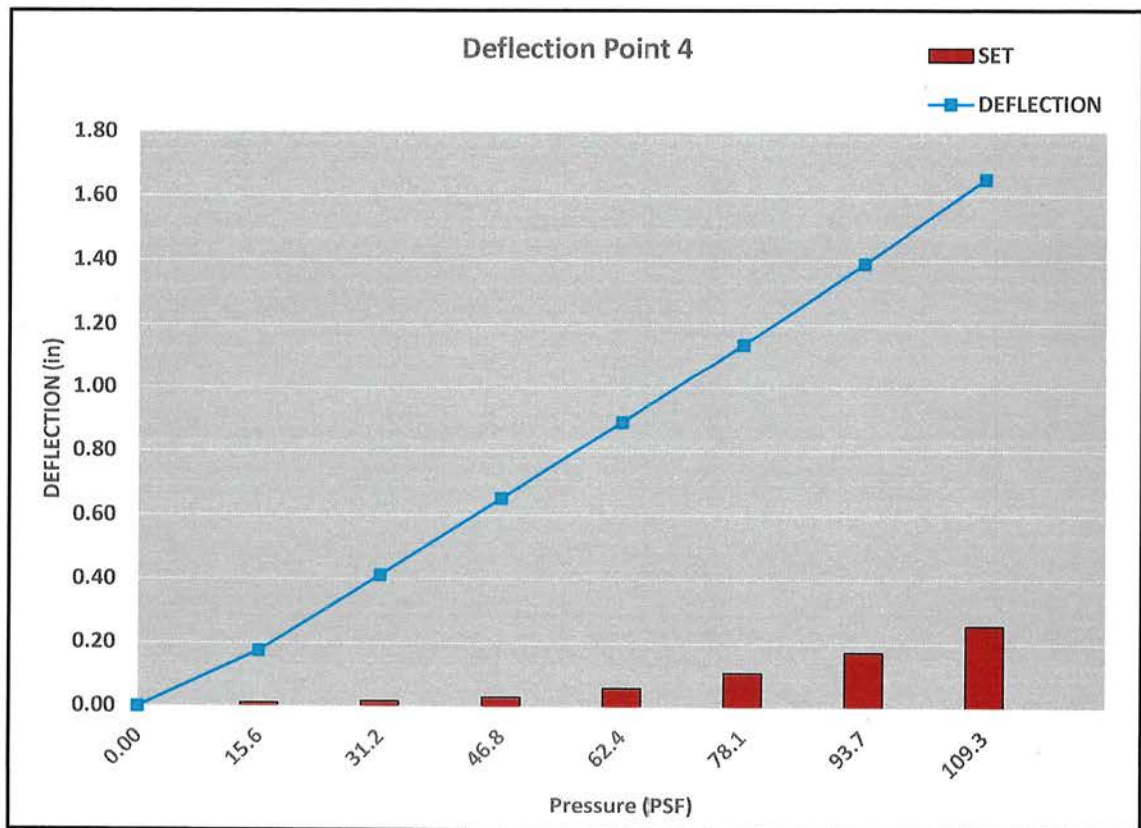
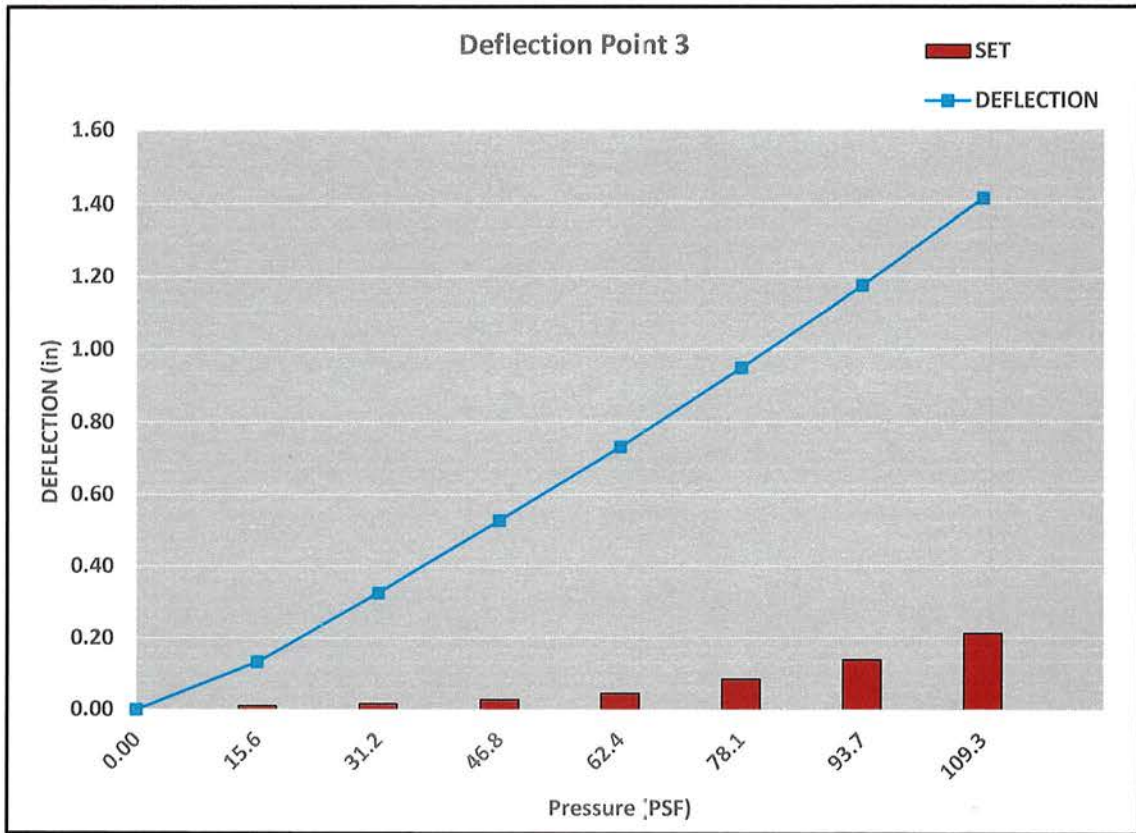
Load Pressure (in-h20)	Load Pressure (psf)	Deflection #1 (in)	Deflection #2 (in)	Deflection #3 (in)	Deflection #4 (in)	Deflection #5 (in)	Deflection #6 (in)
0	0.0	0.000	0.000	0.000	0.000	0.000	0.000
3	15.6	0.134	0.138	0.134	0.176	0.052	0.047
0	0.0	0.008	0.009	0.010	0.010	0.006	0.007
6	31.2	0.334	0.368	0.326	0.413	0.129	0.127
0	0.0	0.013	0.014	0.016	0.017	0.016	0.019
9	46.8	0.542	0.602	0.528	0.654	0.209	0.203
0	0.0	0.025	0.024	0.027	0.029	0.029	0.034
12	62.4	0.746	0.830	0.732	0.892	0.293	0.290
0	0.0	0.048	0.044	0.044	0.059	0.059	0.066
15	78.1	0.967	1.073	0.950	1.140	0.395	0.389
0	0.0	0.080	0.077	0.086	0.108	0.104	0.116
18	93.7	1.196	1.315	1.175	1.390	0.506	0.492
0	0.0	0.135	0.140	0.139	0.173	0.156	0.167
21	109.3	1.448	1.574	1.412	1.652	0.584	0.556
0	0.0	0.213	0.228	0.212	0.255	0.223	0.222

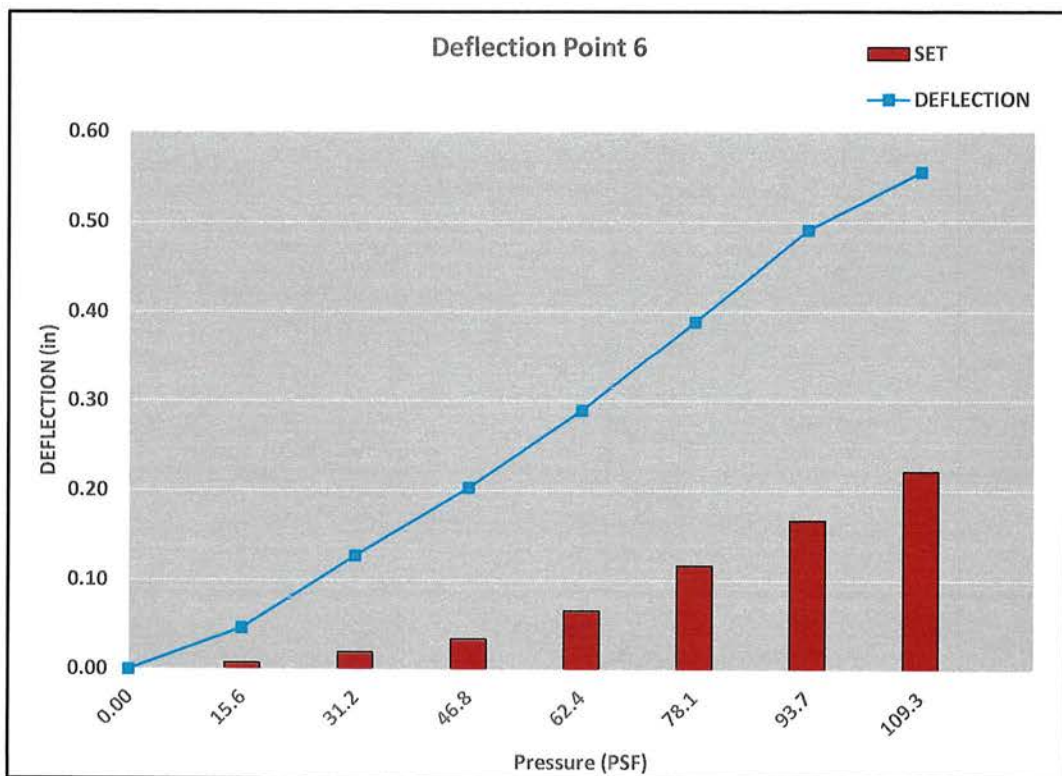
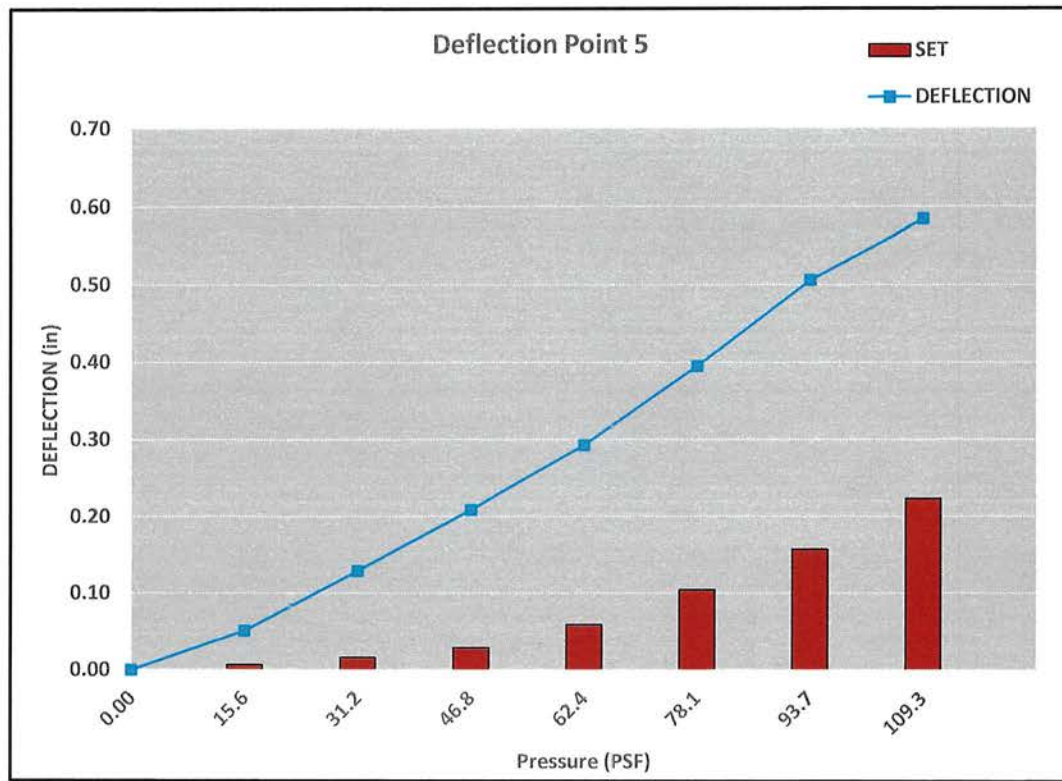
RESULTS:

Load held for 1 minute = 114.4 psf

Maximum Test Load = 119.1 psf (Panel clip fastener pulled out of support)

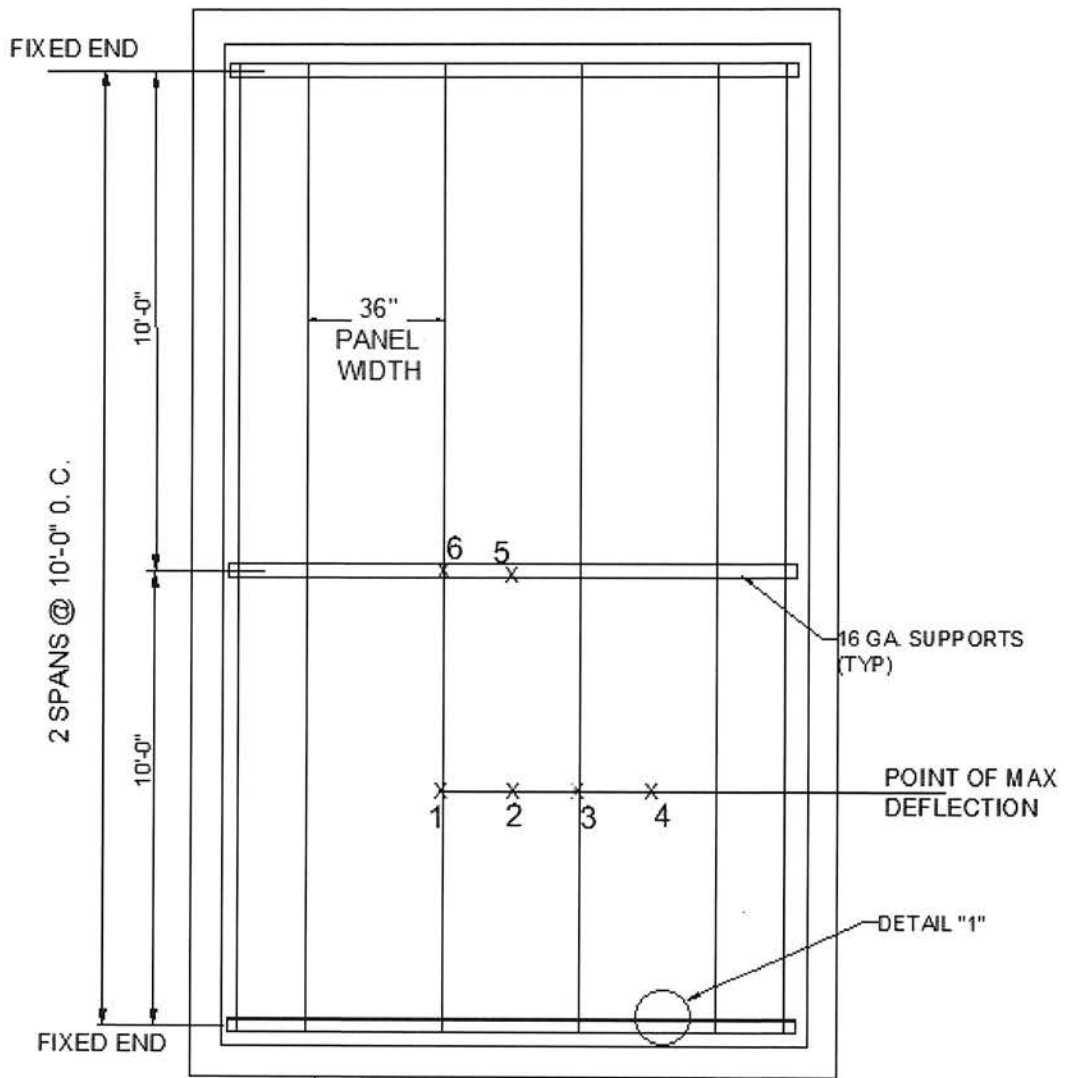






TEST #1

ASTM E1592 NEGATIVE UPLIFT LOAD TEST



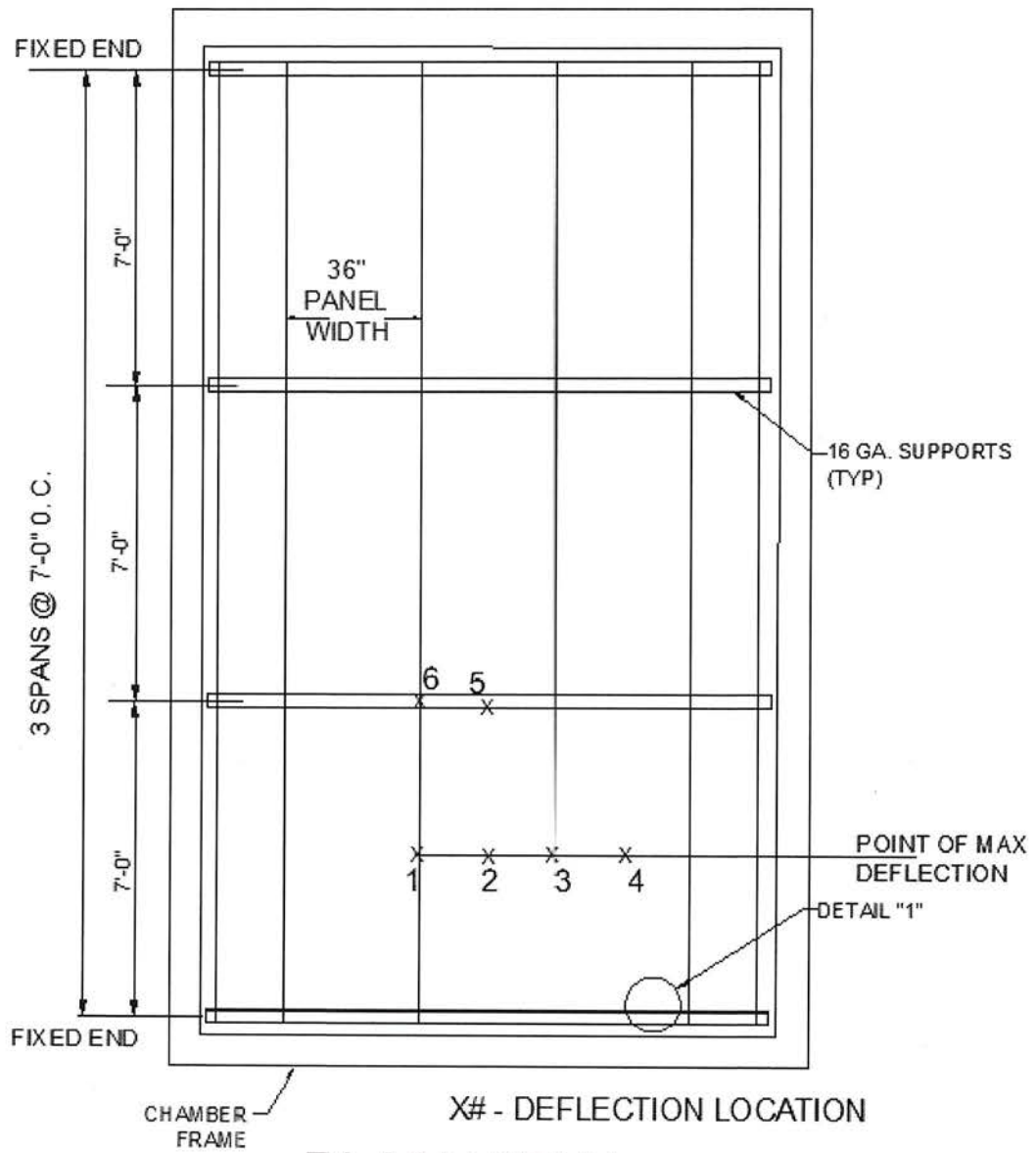
CHAMBER
FRAME

X# - DEFLECTION LOCATION

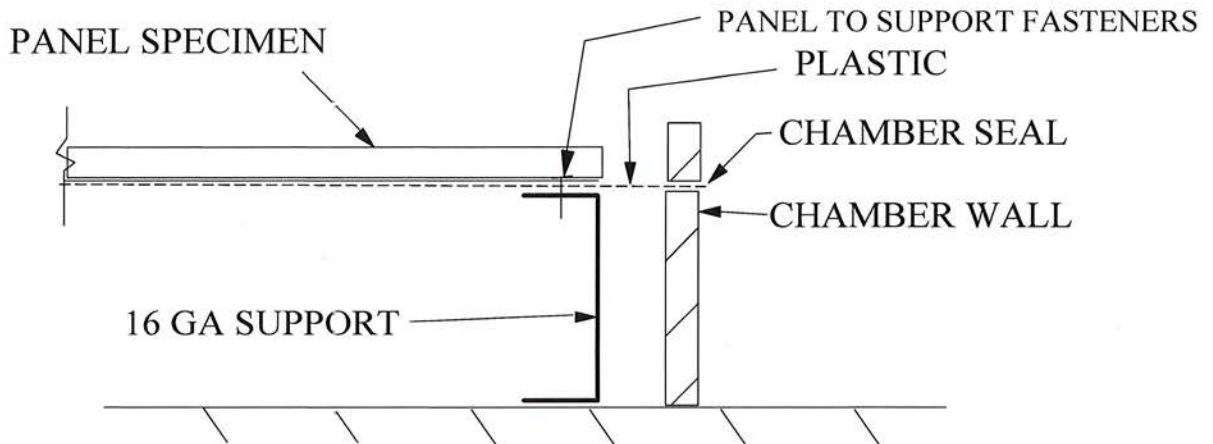
PLAN VIEW

TEST #2

ASTM E1592 NEGATIVE UPLIFT LOAD TEST



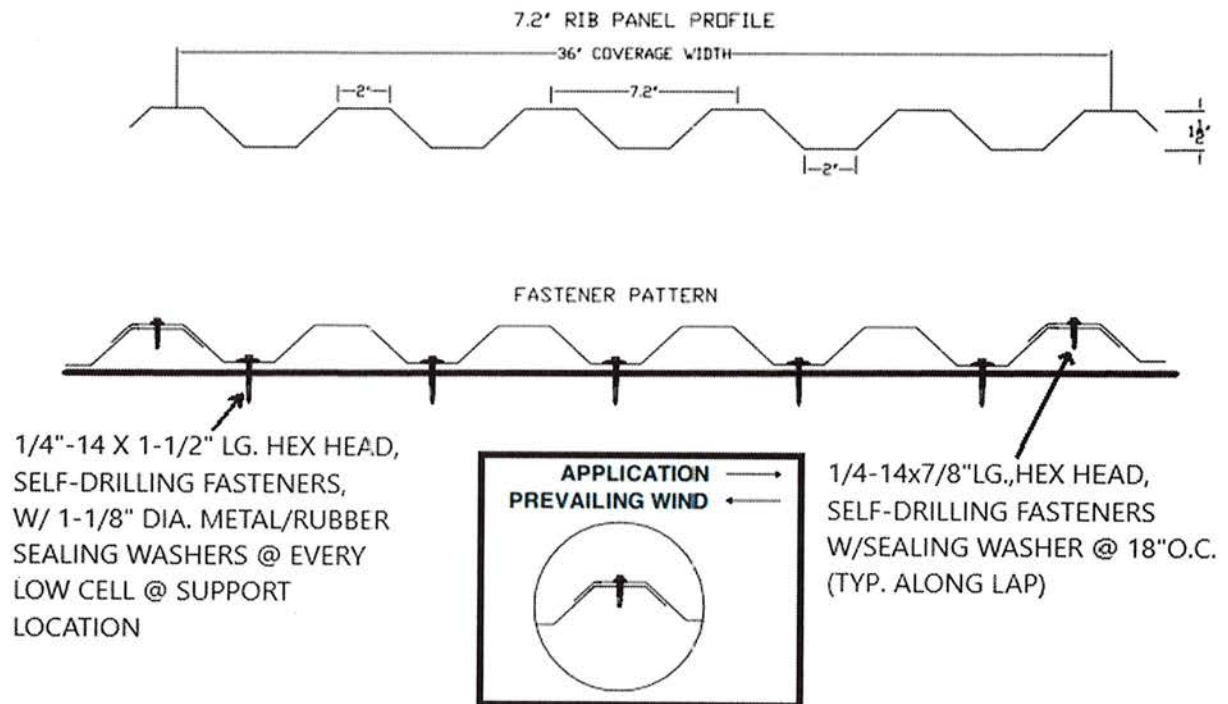
PLAN VIEW



DETAIL 1



7.2 PANEL PROFILE DETAIL



Spectrochemical Laboratories-Material Evaluation, Inc.

155 Prominence Drive, New Kensington, PA. 15068

Phone: (724) 334-4140 Fax: (724) 334-4143

Date: 27-Oct-22

Page No.: 1 of 1

Report of Tensile Testing

Client: Farabaugh Engineering & Testing (Ref PO #: Verbal - P. Farabaugh)

PIN #	Dimensions (in.) Width x Thickness	Area (sq. - in.)	Yield Point (lb.)	Tensile Strength (lb.)	Yield Strength (psi.)	Tensile Strength (psi.)	Elongation (% in 2 in.)	Fracture Location
Petersen Alum., 7.2" Rib Panel, 36" x 0.050" Alum	0.4961 x 0.0481	0.0239	480	601	20100	25200	10.6	M/2 Break

Test Method: Q2300.04 rev.14 (ASTM A370-21, E8-21, or E646-16 ; Yld. by 0.2% offset, Elong. after fracture)
Equipment Used: Instron 5900R60HVL (s/n: 1602) w/ Extensometer (s/n: E93054)
Performed By: T. Ault

Respectfully submitted,



Todd A. Ault

Laboratory Manager

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