Farabaugh Engineering and Testing Inc.

Project No. T234-11

Report Date: June 30, 2011

Total Pages (inclusive): 12

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.
1005 TONNE RD.
ELK GROVE VILLAGE, IL 60007

Report Prepared By:

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Reviewed and Approved By:

Daniel G. Farabaugh

Project No. T234-11

ASTM E1592-01
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 Date

June 30, 2011

Test Specimen

Manufacturer: Petersen Aluminum Corp.
1005 Tonne Rd.
Elk Grove Village, IL 60007

Panel: 7.2 Panel, 36" wide (coverage), 0.050" Aluminum (nominal)

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 using ¼"-14 X 1-1/4" long hex head self drill fasteners with 9/16" integral seal washer (1 fastener located at every low cell of the panel at each support). The panel side-joints were overlapping using #12-14 X 1" long hex head self drill fasteners with 9/16" integral seal washer located at 12" o.c.
  .

- 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.

The test was conducted according to the procedure in ASTM E-1592-01 and as noted herein. In our opinion the tape and plastic had no influence on the results of the test.

Project No. T234-11

TEST DATA

Specimen: 7.2 Panel 36" wide, 0.050" aluminum

Support Spacing: 1 ft o/c

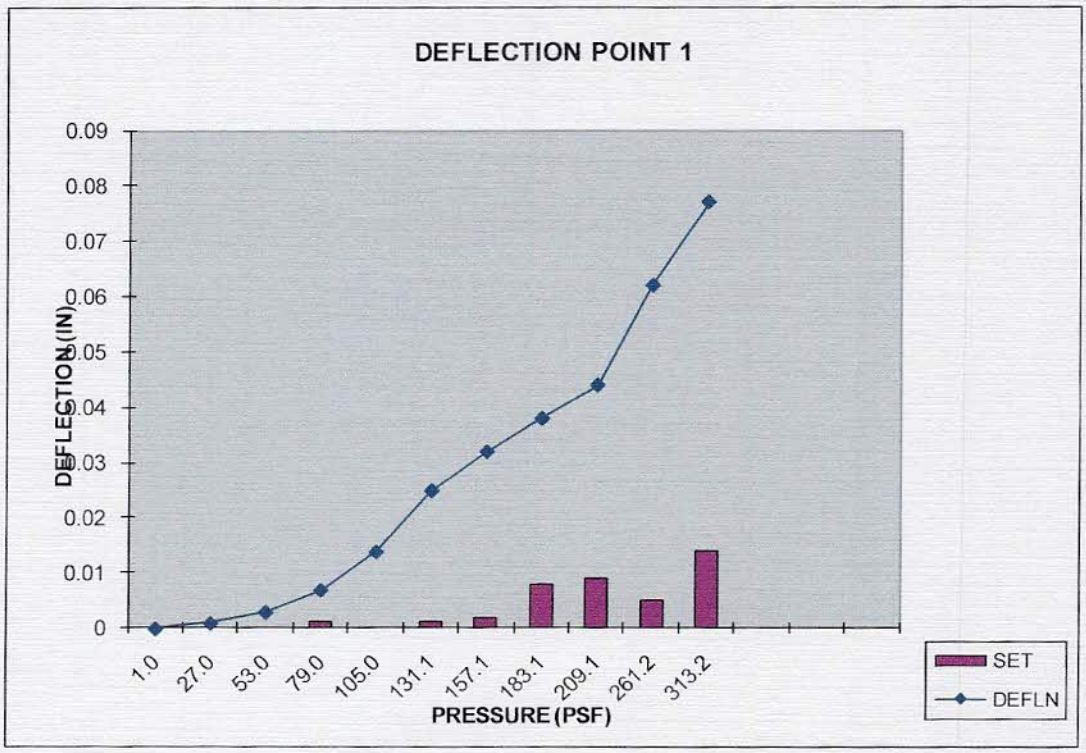
NEGATIVE (UPLIFT) TEST PRESSURE

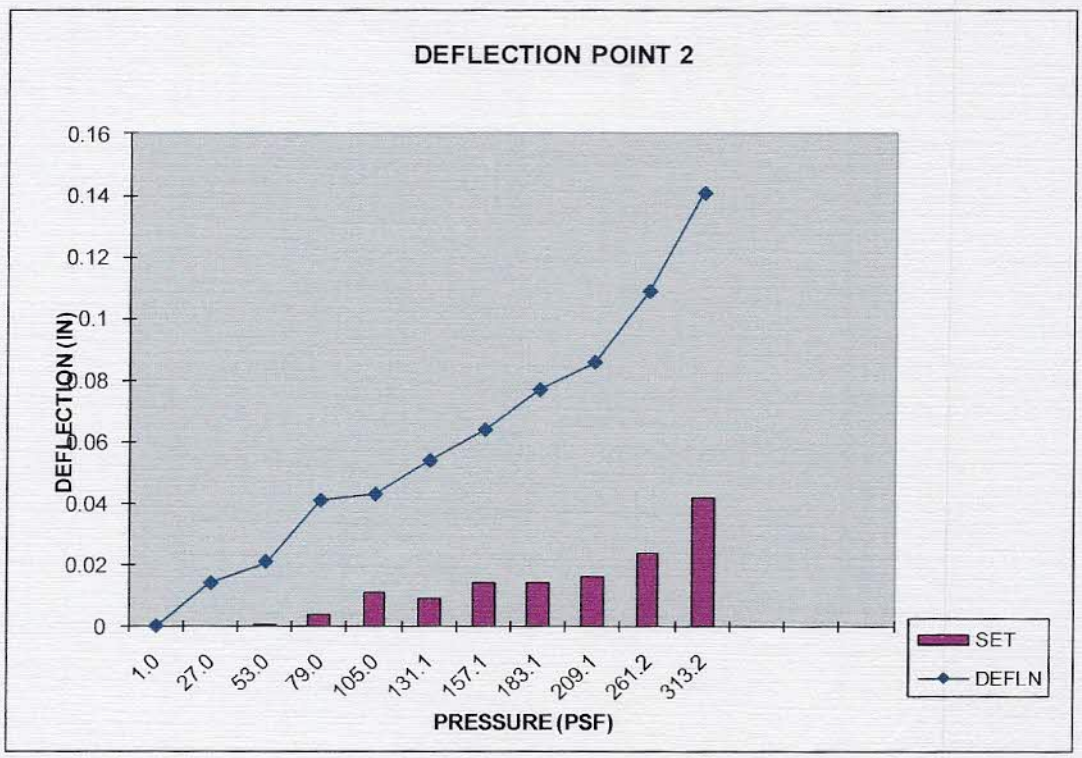
	DEFLECTION DIAL READINGS (INCHES)								
LOAD (PSF)	D-1	D-2	D-3	D-4	D-5	D-6	D-7	D-8	REMARKS
1.0	0	0	0	0	0	0	0	0	PANEL WT.
27.0	0.001	0.014	0.001	0.006	0.002	0.003	0.006	0.008	
1.0	0	0	0	0.004	0	0.001	0.003	0.002	PANEL WT.
53.0	0.003	0.021	0.009	0.019	0.005	0.005	0.013	0.019	
1.0	0	0.001	0	0.004	0.002	0.002	0.003	0.003	PANEL WT.
79.0	0.007	0.041	0.024	0.036	0.011	0.009	0.022	0.036	
1.0	0.001	0.004	-0.001	0.006	0.005	0.004	0.008	0.006	PANEL WT.
105.0	0.014	0.043	0.028	0.038	0.022	0.019	0.04	0.044	
1.0	0	0.011	0.001	0.005	0.005	0.004	0.009	0.01	PANEL WT.
131.1	0.025	0.054	0.036	0.045	0.024	0.028	0.046	0.055	
1.0	0.001	0.009	0.002	0.011	0.022	0.004	0.016	0.014	PANEL WT.
157.1	0.032	0.064	0.058	0.057	0.034	0.034	0.047	0.067	
1.0	0.002	0.014	-0.001	0.012	0.021	0.007	0.02	0.018	PANEL WT.
183.1	0.038	0.077	0.067	0.073	0.037	0.042	0.054	0.074	
1.0	0.008	0.014	-0.001	0.012	0.034	0.007	0.02	0.021	PANEL WT.
209.1	0.044	0.086	0.069	0.076	0.04	0.054	0.061	0.085	
1.0	0.009	0.016	-0.001	0.014	0.034	0.008	0.021	0.027	PANEL WT.
261.2	0.062	0.109	0.091	0.101	0.059	0.078	0.077	0.105	
1.0	0.005	0.024	0.003	0.021	0.035	0.015	0.029	0.037	PANEL WT.
313.2	0.077	0.141	0.116	0.127	0.081	0.11	0.095	0.129	
1.0	0.014	0.042	0.012	0.024	0.038	0.032	0.036	0.052	PANEL WT.

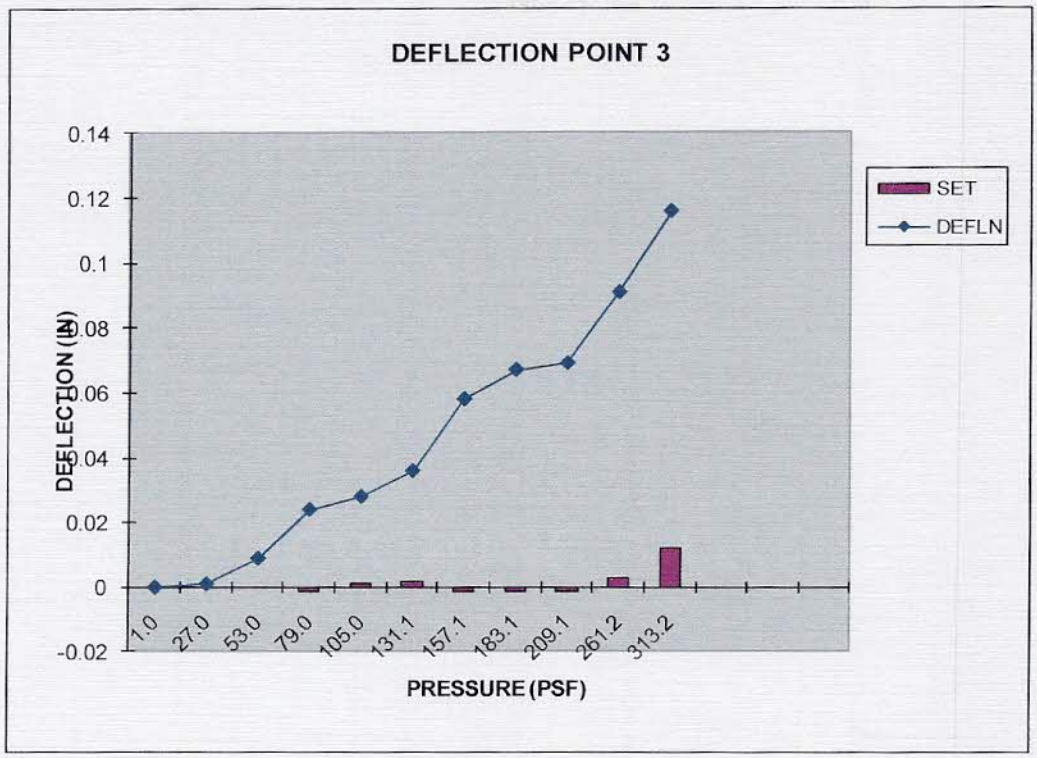
RESULTS:

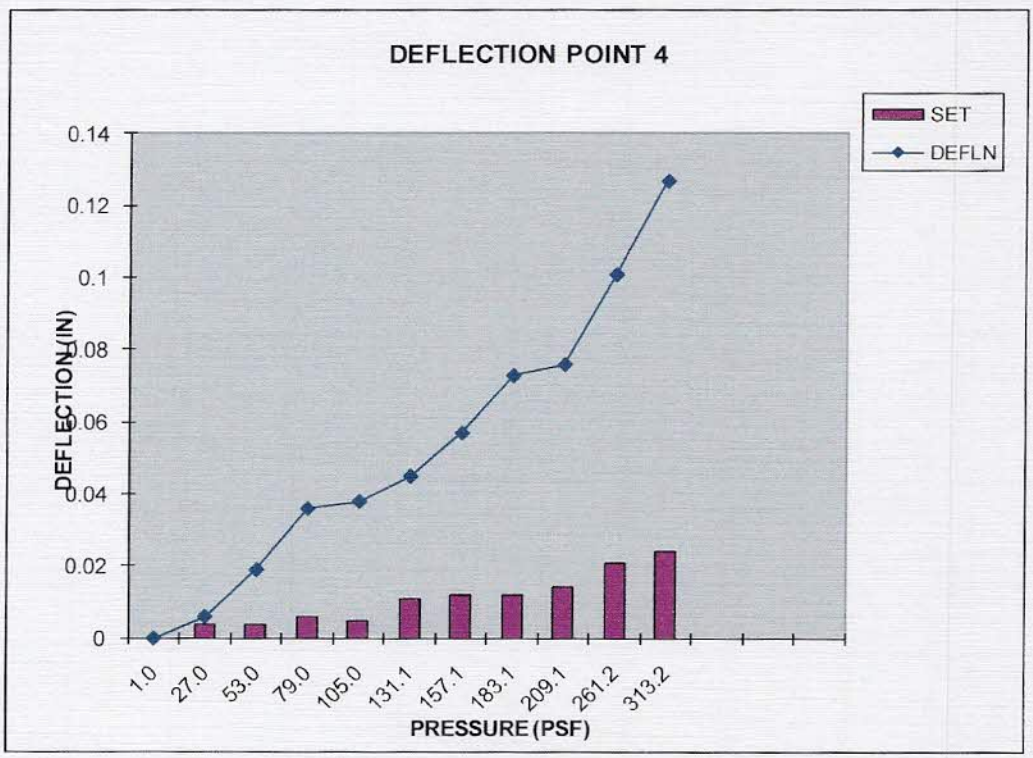
Maximum Test Load = 384.2 psf* (No Failures)

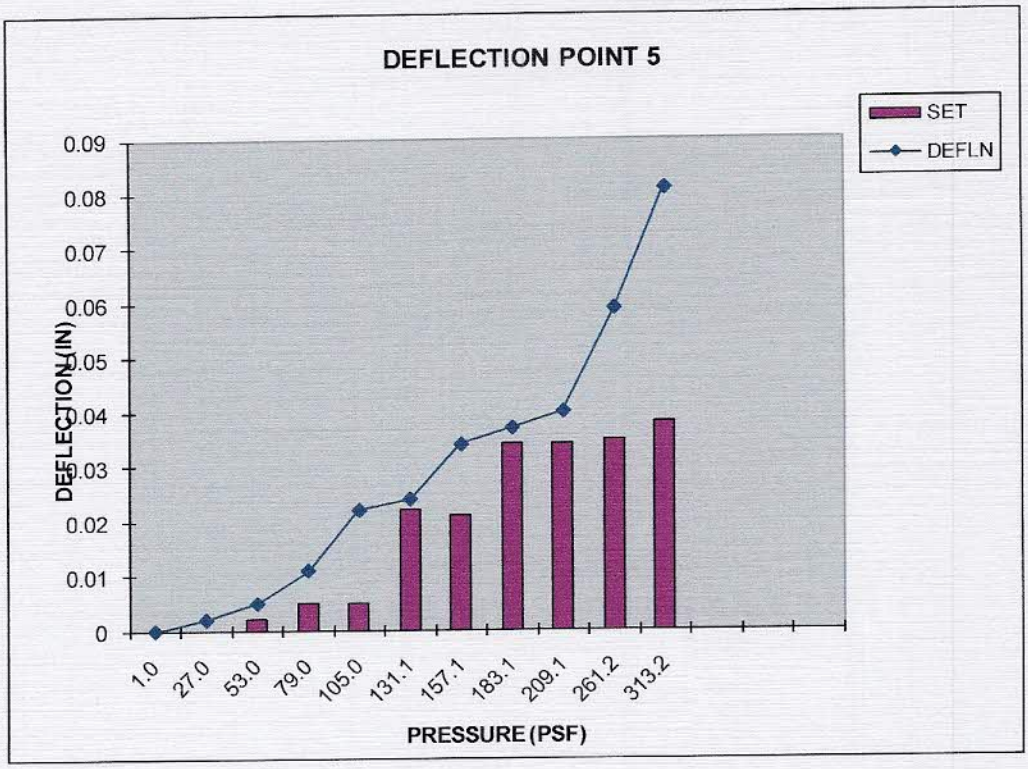
* Includes panel dead load.

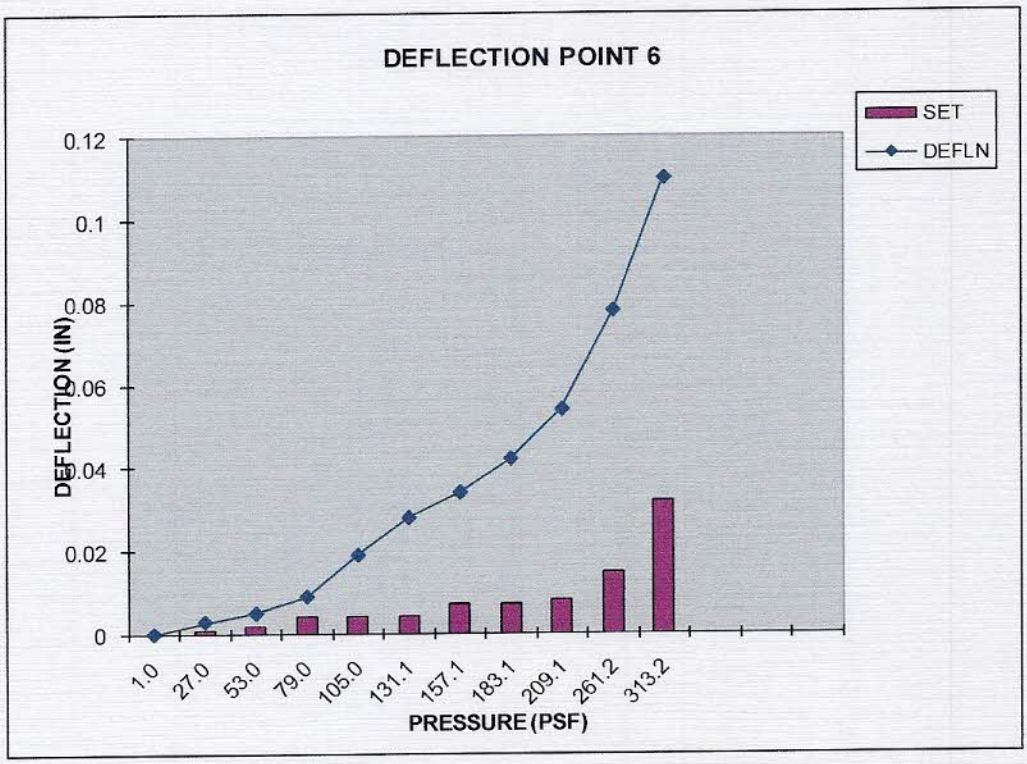

DEFLECTION POINT 1
0.09
0.08
0.07
0.06
0.05
0.04
0.03
0.02
0.01
0
DEFLECTION (IN)
1.0
27.0
53.0
79.0
105.0
131.1
157.1
183.1
209.1
261.2
313.2
PRESSURE (PSF)
SET
DEFLN

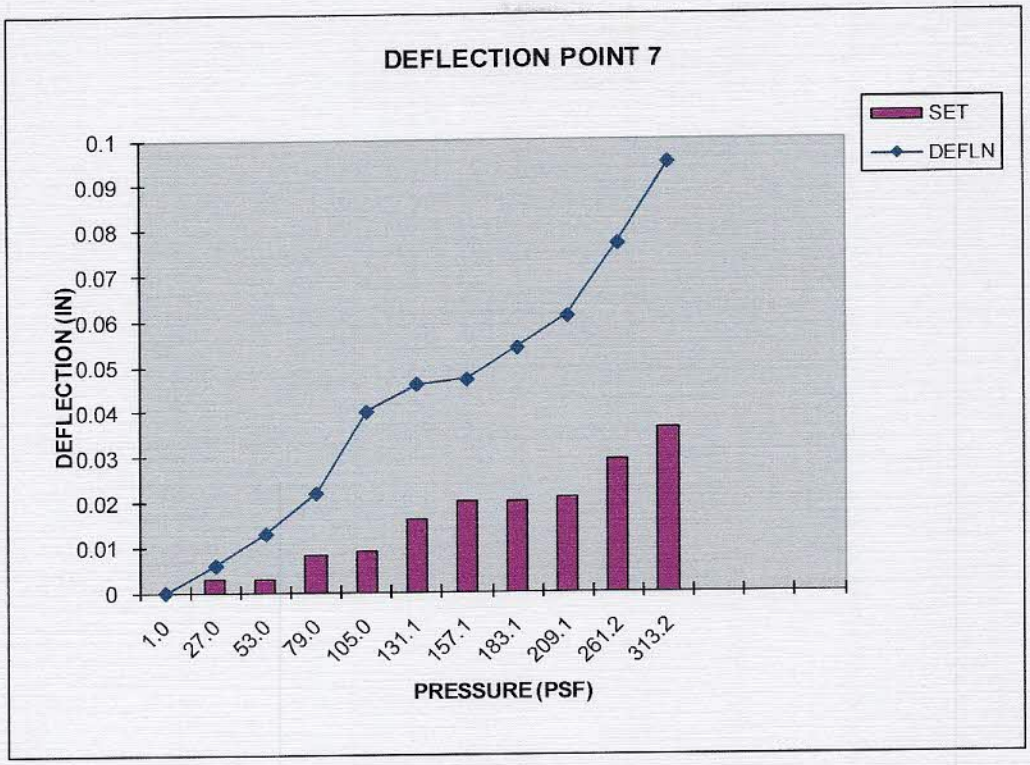

DEFLECTION POINT 2
0.16
0.14
0.12
0.1
0.08
0.06
0.04
0.02
0
DEFLECTION (IN)
1.0
27.0
53.0
79.0
105.0
131.1
157.1
183.1
209.1
261.2
313.2
PRESSURE (PSF)
SET
DEFLN

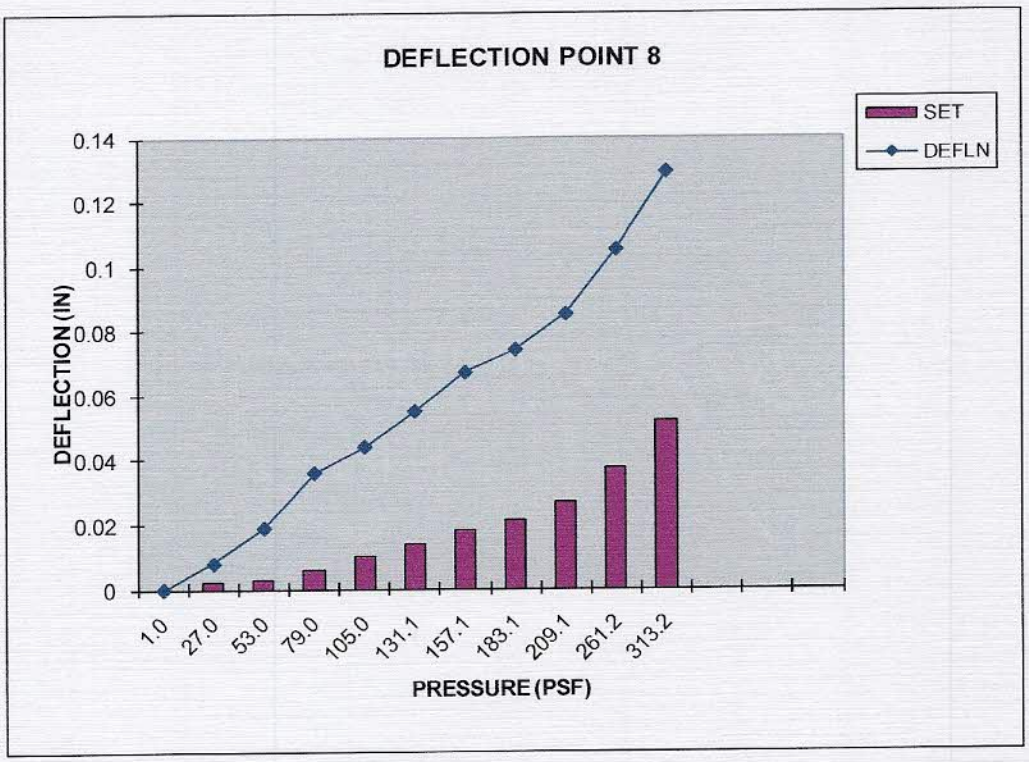

DEFLECTION POINT 3
0.14
0.12
0.1
0.08
0.06
0.04
0.02
0
-0.02
DEFLECTION (IN)
1.0
27.0
53.0
79.0
105.0
131.1
157.1
183.1
209.1
261.2
313.2
PRESSURE (PSF)
SET
DEFLN

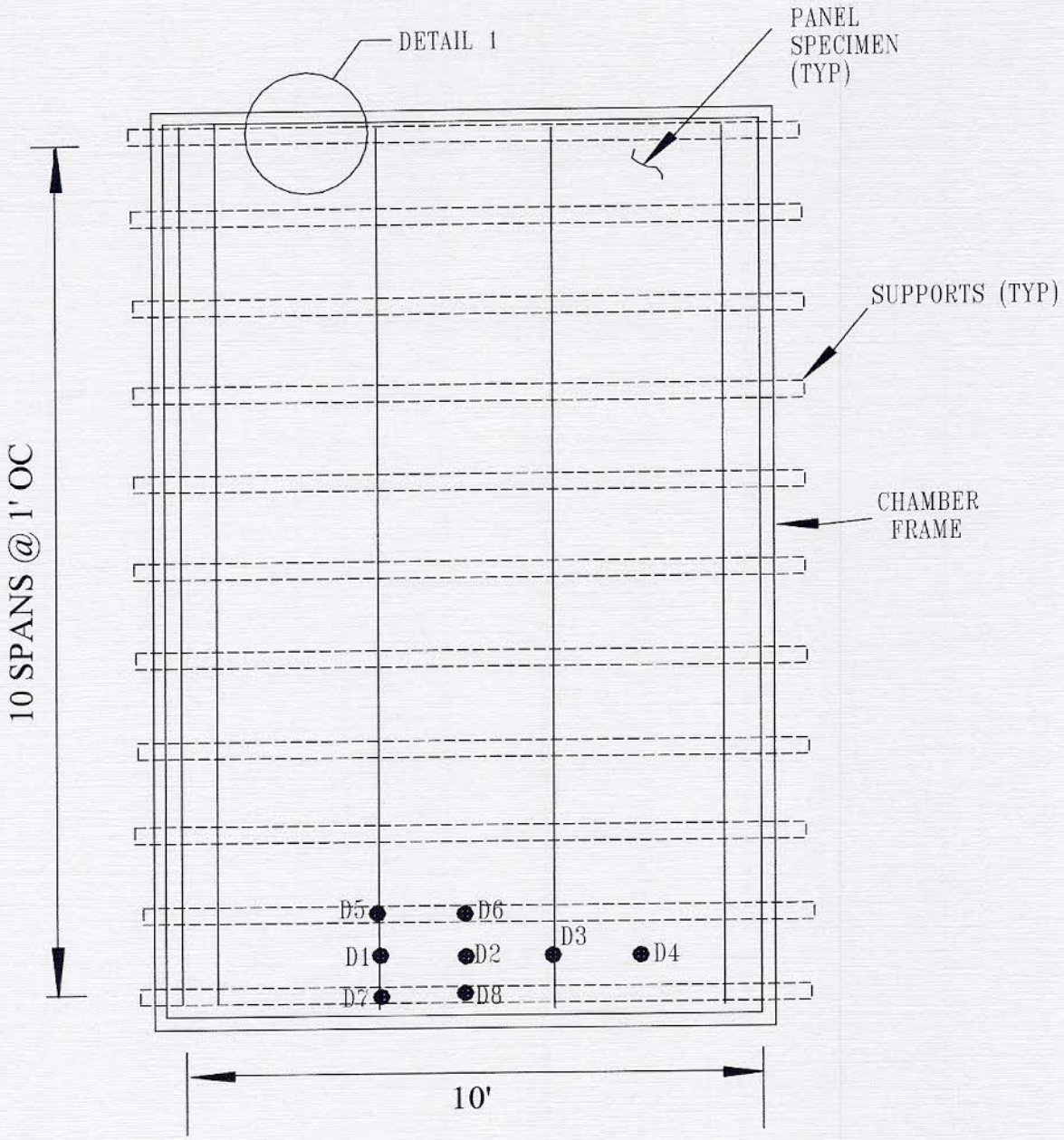

DEFLECTION POINT 4
0.14
0.12
0.1
0.08
0.06
0.04
0.02
0
DEFLECTION (IN)
1.0
27.0
53.0
79.0
105.0
131.1
157.1
183.1
209.1
261.2
313.2
PRESSURE (PSF)
SET
DEFLN


DEFLECTION POINT 5
SET
DEFLN
DEFLECTION (IN)
0.09
0.08
0.07
0.06
0.05
0.04
0.03
0.02
0.01
0
1.0
27.0
53.0
79.0
105.0
131.1
157.1
183.1
209.1
261.2
313.2
PRESSURE (PSF)

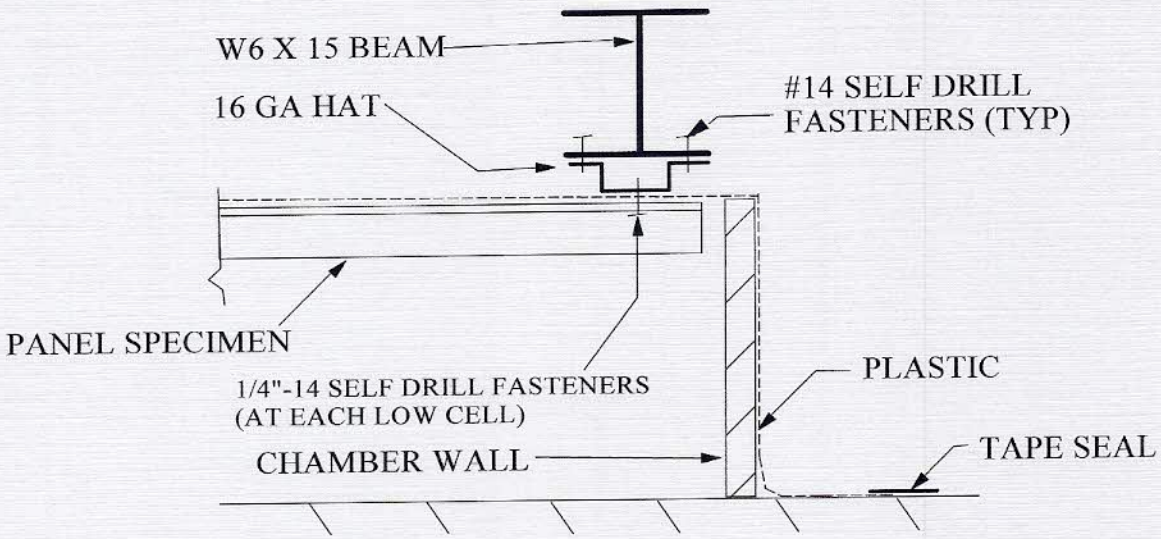

DEFLECTION POINT 6
SET
DEFLN
DEFLECTION (IN)
0.12
0.1
0.08
0.06
0.04
0.02
0
1.0
27.0
53.0
79.0
105.0
131.1
157.1
183.1
209.1
261.2
313.2
PRESSURE (PSF)


DEFLECTION POINT 7
SET
DEFLN
DEFLECTION (IN)
0.1
0.09
0.08
0.07
0.06
0.05
0.04
0.03
0.02
0.01
0
1.0
27.0
53.0
79.0
105.0
131.1
157.1
183.1
209.1
261.2
313.2
PRESSURE (PSF)

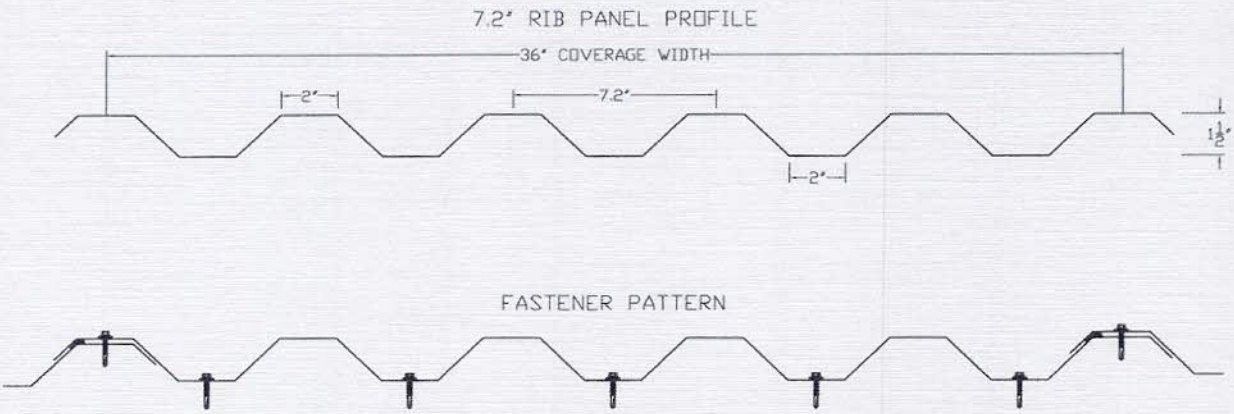

DEFLECTION POINT 8
SET
DEFLN
DEFLECTION (IN)
0.14
0.12
0.1
0.08
0.06
0.04
0.02
0
1.0
27.0
53.0
79.0
105.0
131.1
157.1
183.1
209.1
261.2
313.2
PRESSURE (PSF)


DETAIL 1
PANEL SPECIMEN (TYP)
SUPPORTS (TYP)
CHAMBER FRAME
10 SPANS @ 1' OC
D5
D6
D3
D1
D2
D4
D7
D8
10'
DEFLECTION POINT

PLAN VIEW


W6 X 15 BEAM
16 GA HAT
#14 SELF DRILL
FASTENERS (TYP)
PANEL SPECIMEN
1/4"-14 SELF DRILL FASTENERS
(AT EACH LOW CELL)
PLASTIC
CHAMBER WALL
TAPE SEAL

DETAIL 1



PANEL TO SUPPORT FASTENERS: ¼"-14 X 1-1/4" SELF DRILL HEX HEAD
W/ 9/16" INTEGRAL SEAL WASHER
(5 PER PANEL AT EACH SUPPORT)

PANEL SIDELAP FASTENERS: #12-14 X 1" SELF DRILL HEX HEAD
W/ 9/16" INTEGRAL SEAL WASHER
(LOCATED AT 12" OC)

PANEL PROFILE & FASTENING DETAIL

Project No. T234-11

TENSILE TEST REPORT

Client: Petersen Aluminum Corp.
1005 Tonne Rd.
Elk Grove Village, IL 60007

Test Date: June 30, 2011

Test Method: ASTM A370-10

Material Description: 7.2 Panel, 36" wide, 0.050" aluminum

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)
027-11	0.502	0.051	492.37	592.94	19,232	23,160	18.32

Equipment Used: Tensile Machine #QT7-061196-020
Caliper #081410113-1
Extensometer #10311744D
Micrometer #070490473