



Farabaugh Engineering and Testing Inc.

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Project No. T234-11

Report Date: June 30, 2011

Total Pages (inclusive): 12

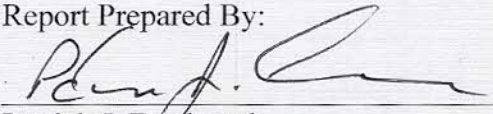
**ASTM E1592**  
STANDARD TEST METHOD FOR  
STRUCTURAL PERFORMANCE OF SHEET METAL ROOF AND SIDING  
SYSTEMS BY UNIFORM STATIC AIR PRESSURE DIFFERENCE

**7.2 PANEL**  
**36" WIDE X 0.050" ALUMINUM**

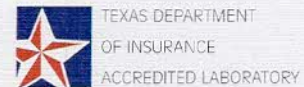
FOR

PETERSEN ALUMINUM CORP.  
1005 TONNE RD.  
ELK GROVE VILLAGE, IL 60007

Report Prepared By:

  
Patrick J. Farabaugh

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.

Project No. T234-11

### **Installation**

- The panels were installed on to 16 ga supports using 1/4"-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.

## TEST DATA

Specimen: 7.2 Panel 36" wide, 0.050" aluminum

Support Spacing: 1 ft o/c

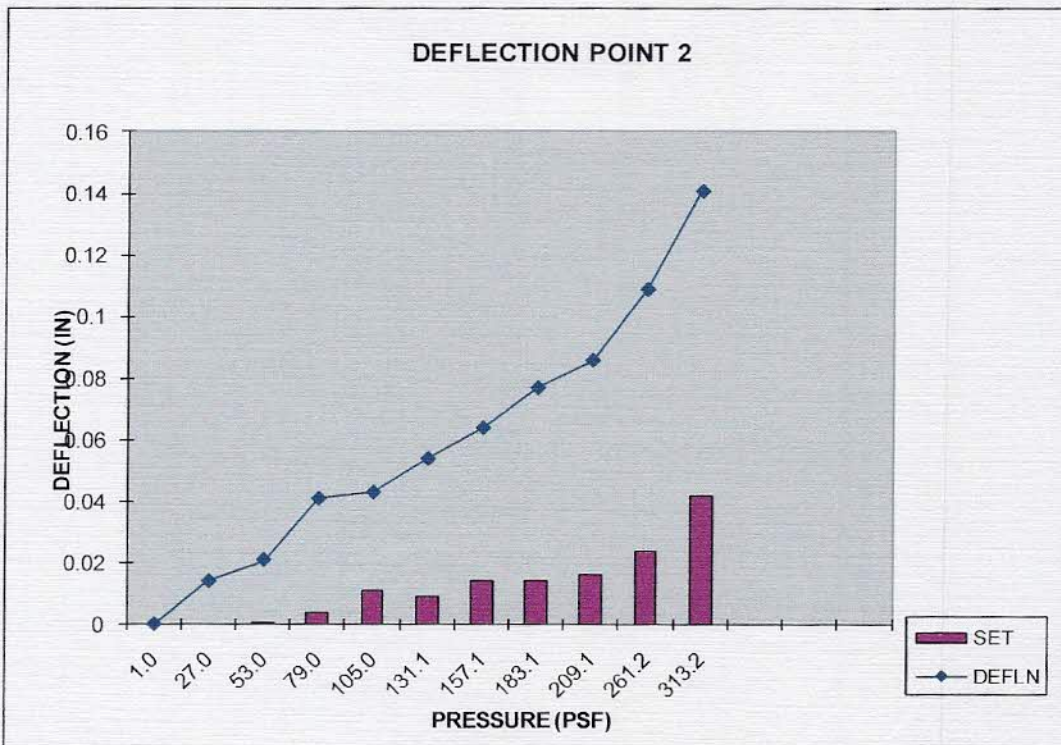
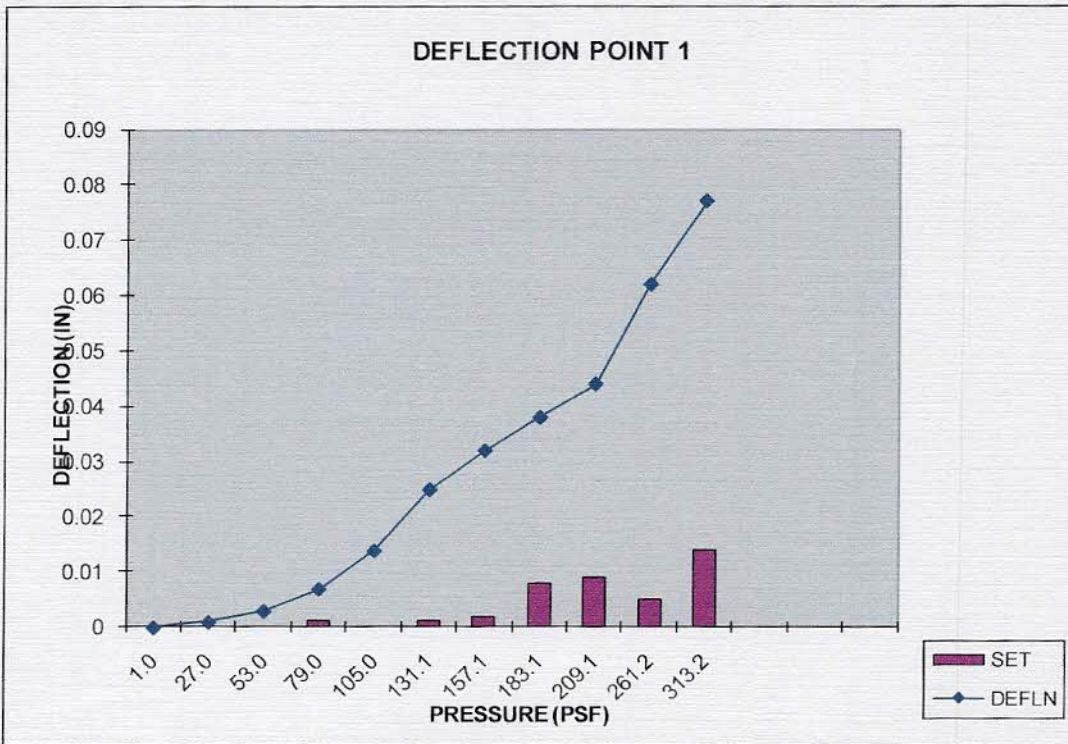
### NEGATIVE (UPLIFT) TEST PRESSURE

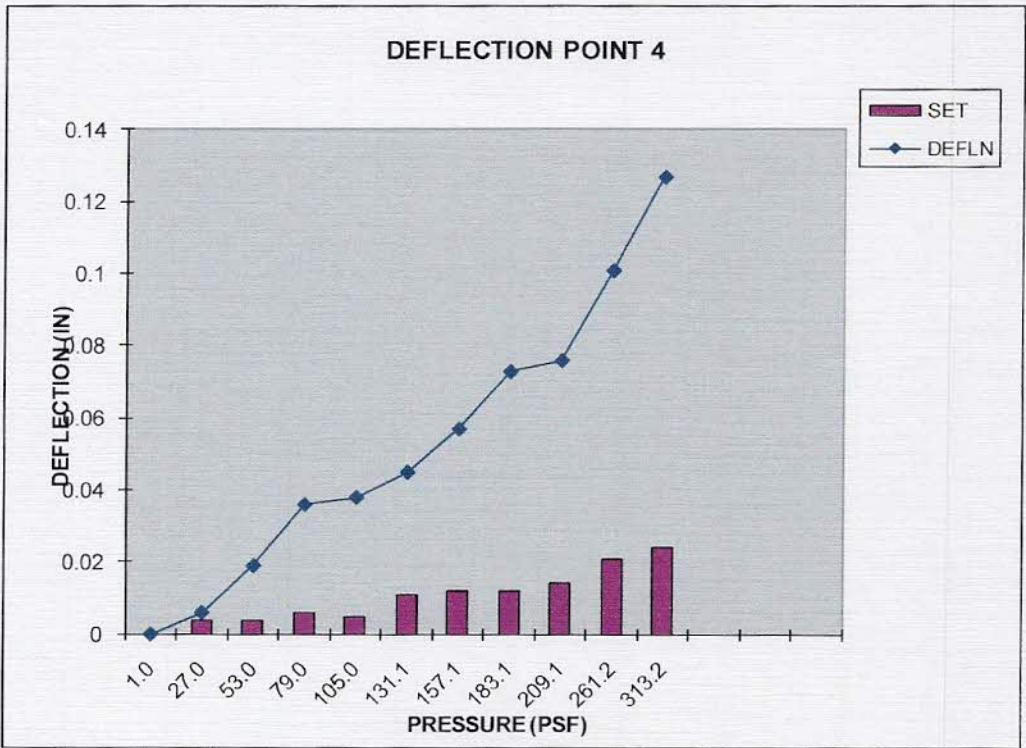
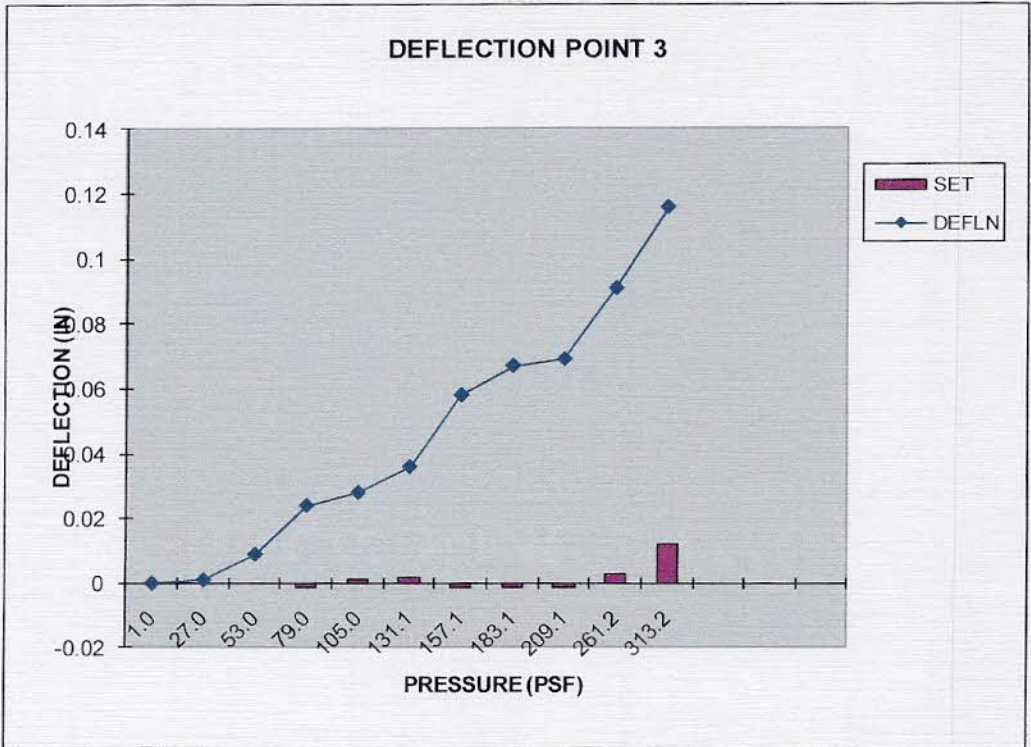
LOAD (PSF)	DEFLECTION DIAL READINGS (INCHES)								REMARKS
	D-1	D-2	D-3	D-4	D-5	D-6	D-7	D-8	
1.0	0	0	0	0	0	0	0	0	PANEL WT.
27.0	0.001	0.014	0.001	0.006	0.002	0.003	0.006	0.008	
1.0	0	0	0	0.004	0	0.001	0.003	0.002	PANEL WT.
53.0	0.003	0.021	0.009	0.019	0.005	0.005	0.013	0.019	
1.0	0	0.001	0	0.004	0.002	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.

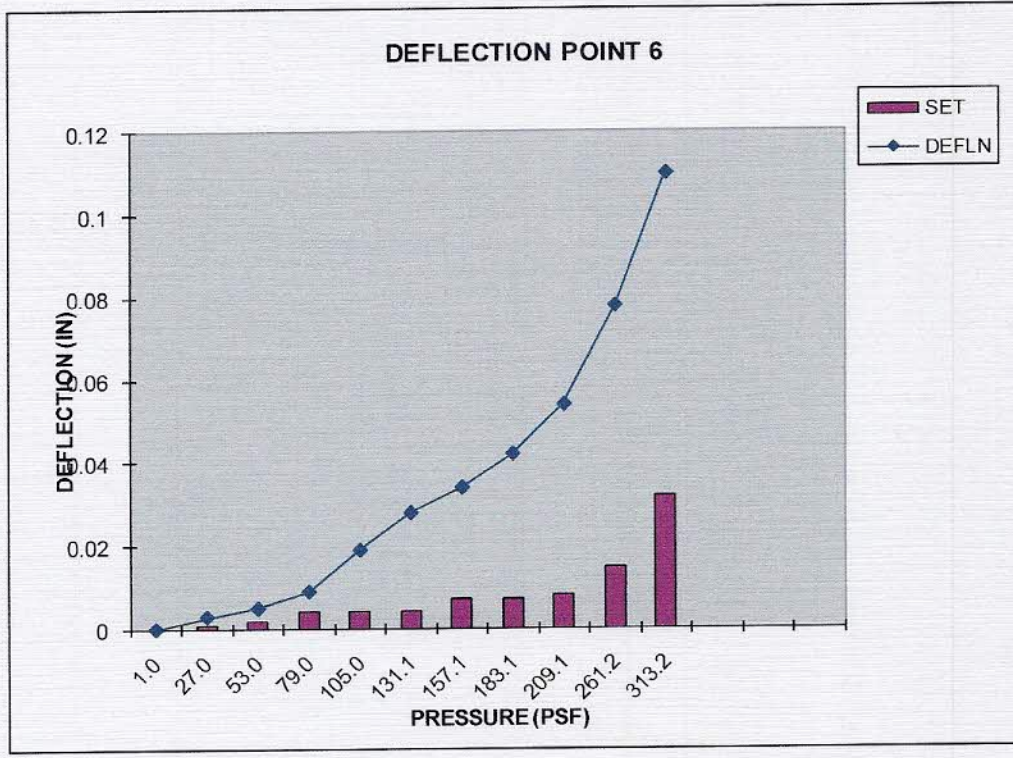
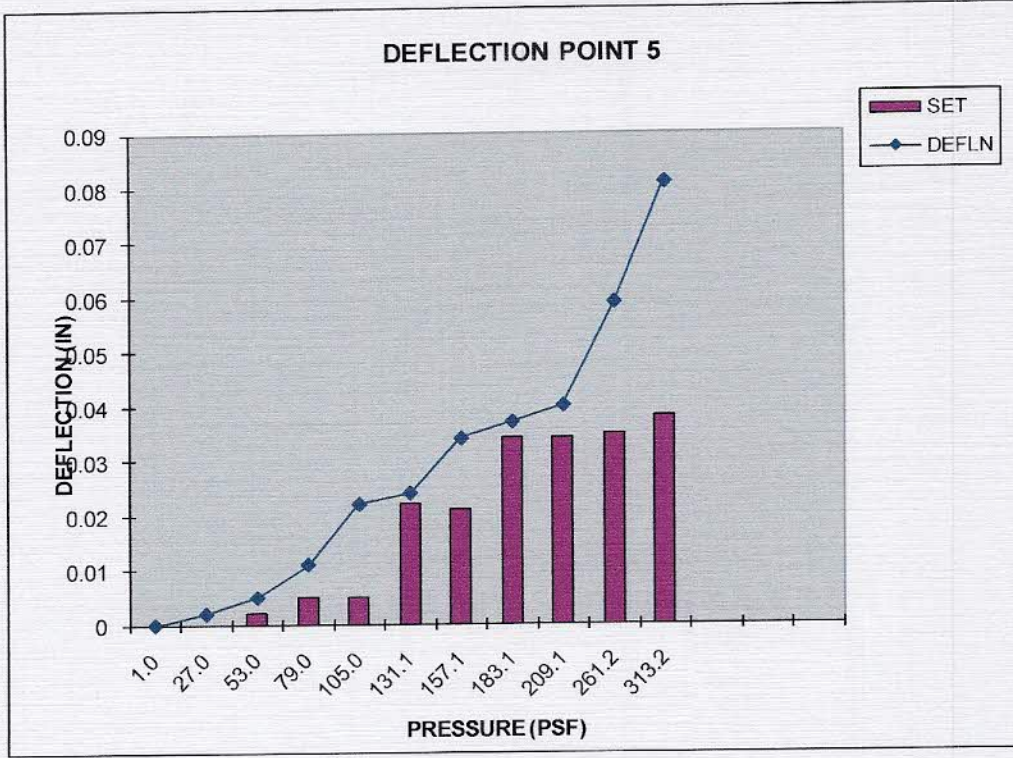
**RESULTS:**

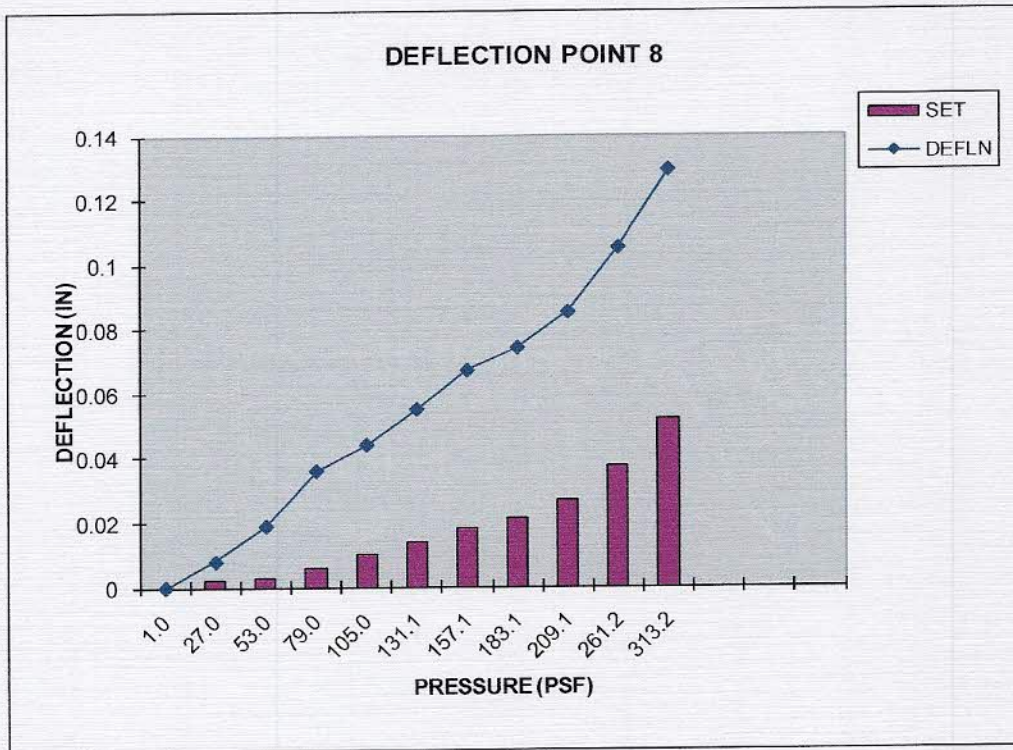
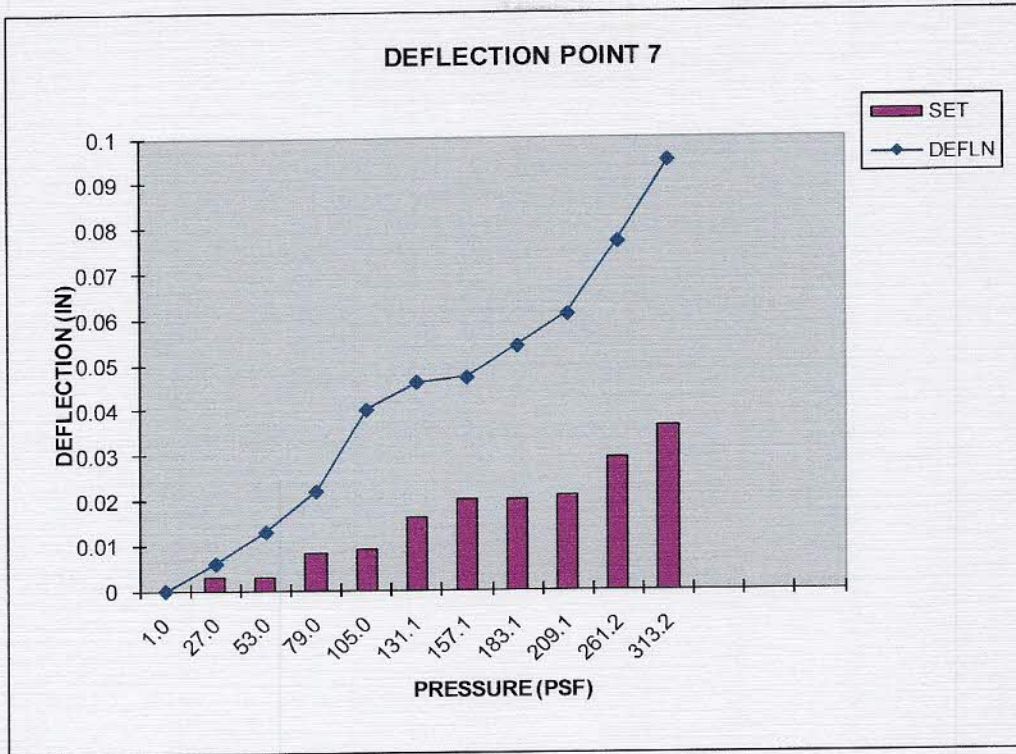
Maximum Test Load = 384.2 psf\* (No Failures )

\* Includes panel dead load.

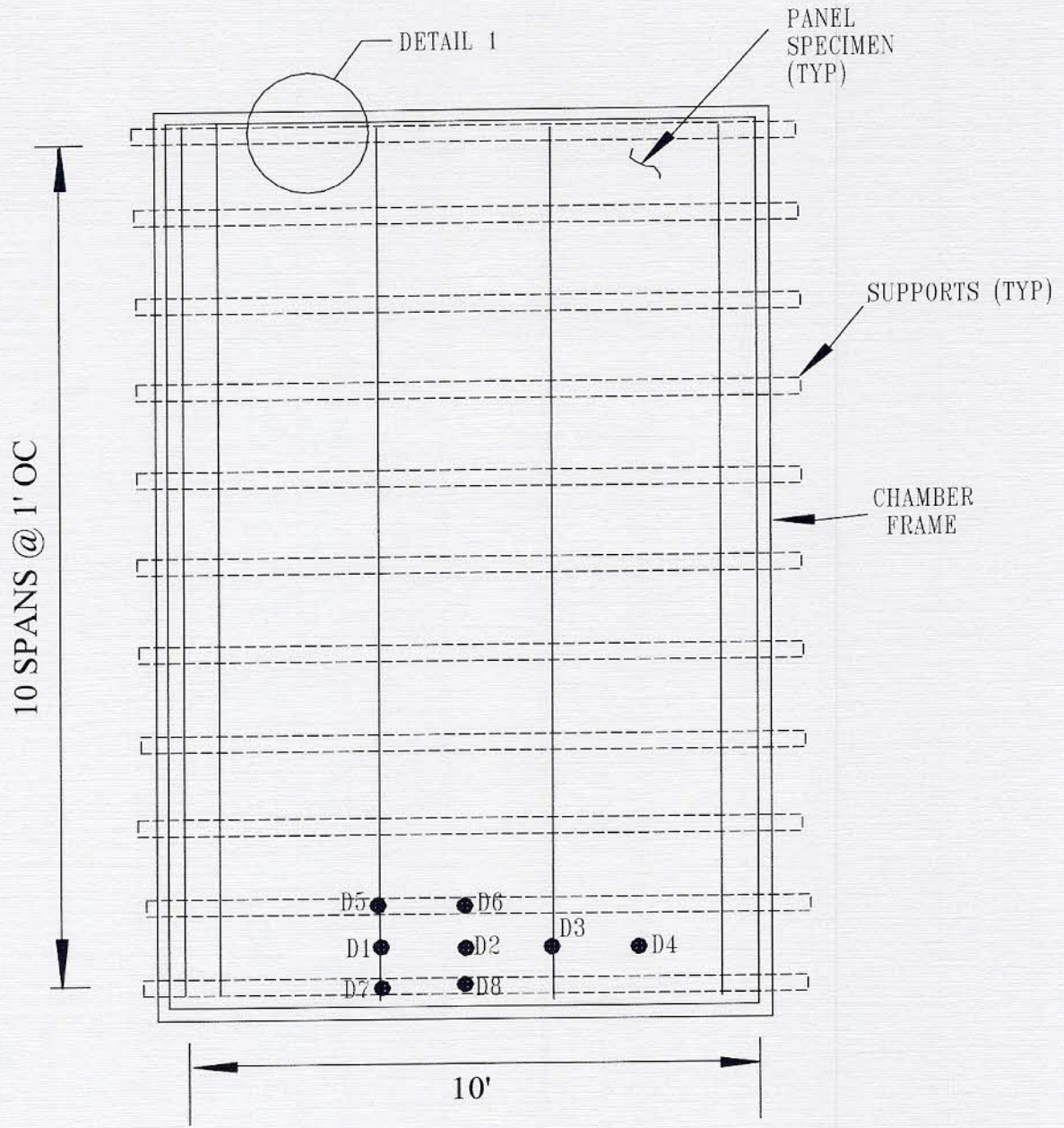






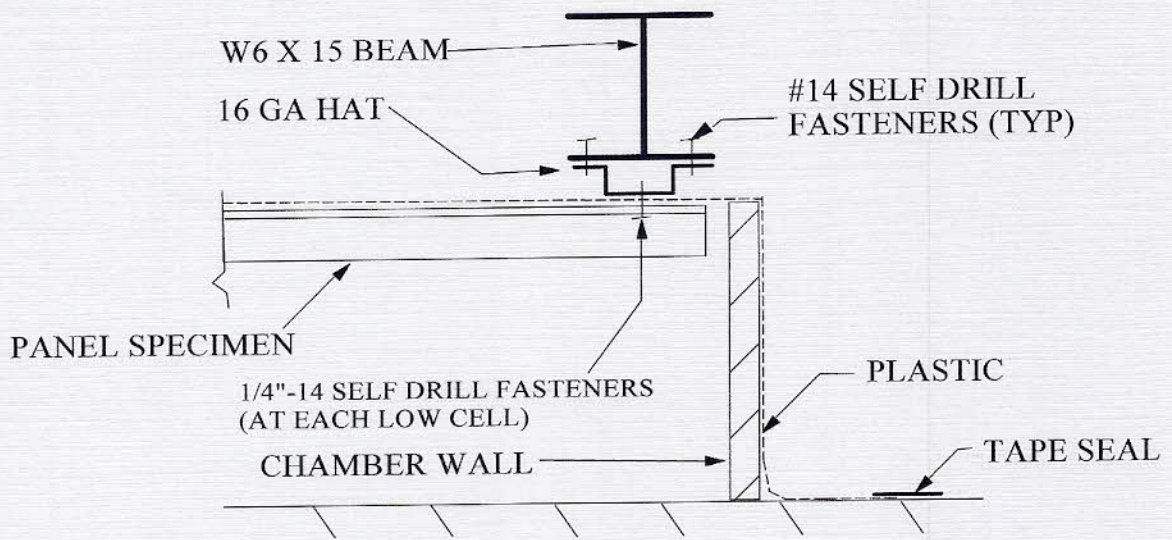






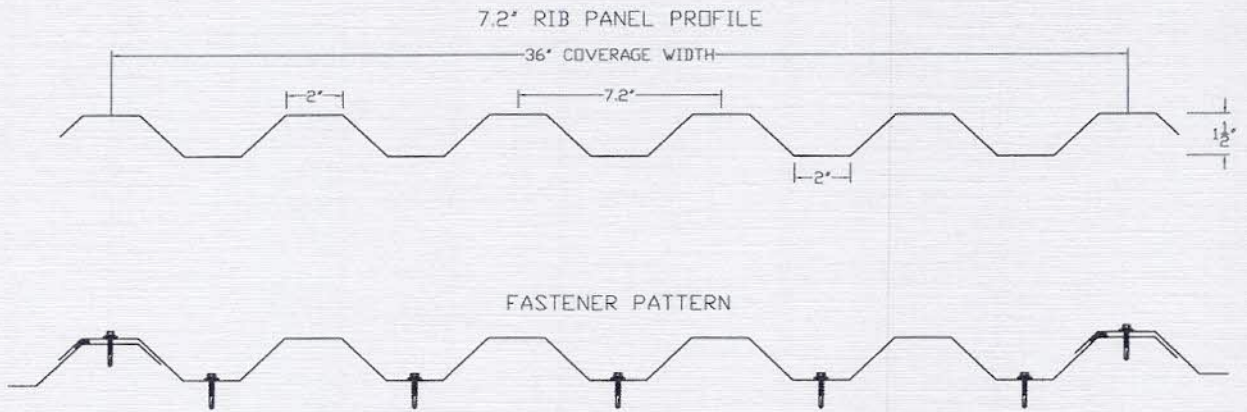
PLAN VIEW

Project No. T234-11



DETAIL 1

Project No. T234-11



PANEL TO SUPPORT FASTENERS: 1/4"-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



## Farabaugh Engineering and Testing Inc.

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Project No. T232-11

Report Date: June 30, 2011

Total Pages (inclusive): 12

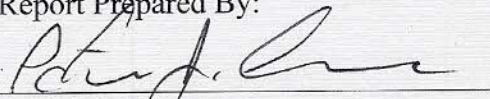
**ASTM E1592**  
STANDARD TEST METHOD FOR  
STRUCTURAL PERFORMANCE OF SHEET METAL ROOF AND SIDING  
SYSTEMS BY UNIFORM STATIC AIR PRESSURE DIFFERENCE

**7.2 PANEL**  
**36" WIDE X 0.050" ALUMINUM**

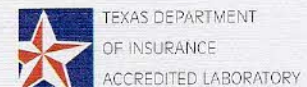
FOR

PETERSEN ALUMINUM CORP.  
1005 TONNE RD.  
ELK GROVE VILLAGE, IL 60007

Report Prepared By:

  
Patrick J. Farabaugh

Reviewed and Approved By:

  
Daniel G. Farabaugh

Project No. T232-11

**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 28, 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.

Project No. T232-11

### **Installation**

- The panels were installed on to 16 ga supports using 1/4"-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. T232-11

## TEST DATA

Specimen: 7.2 Panel 36" wide, 0.050" aluminum

Support Spacing: 5 ft o/c

### NEGATIVE (UPLIFT) TEST PRESSURE

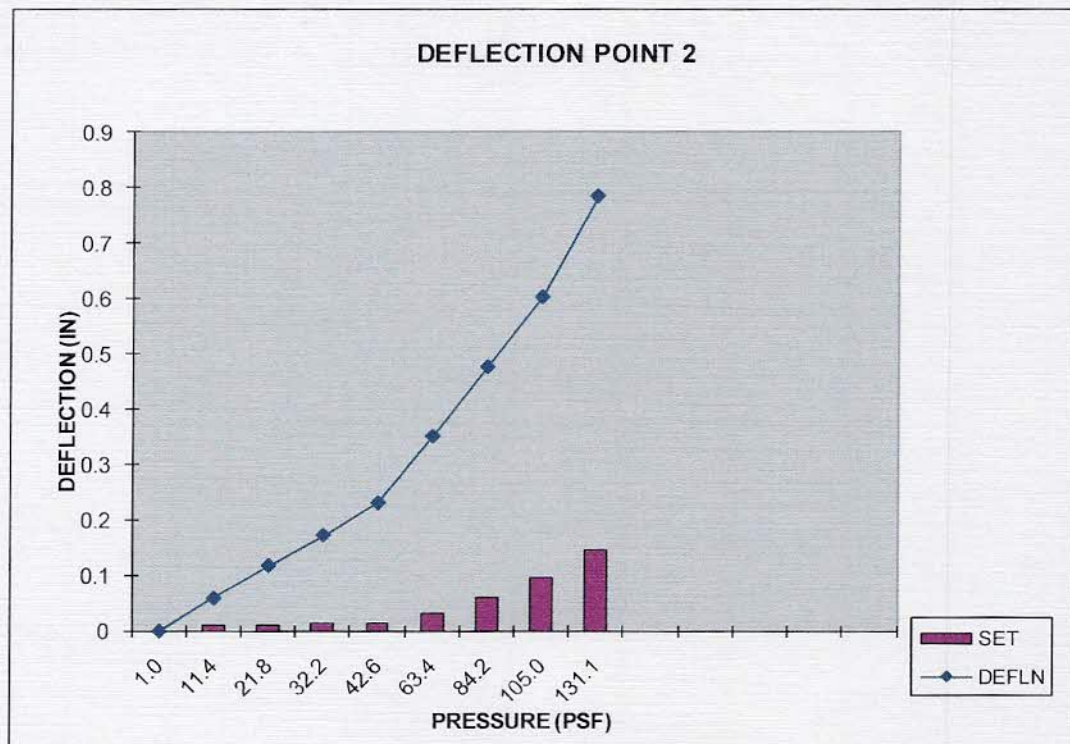
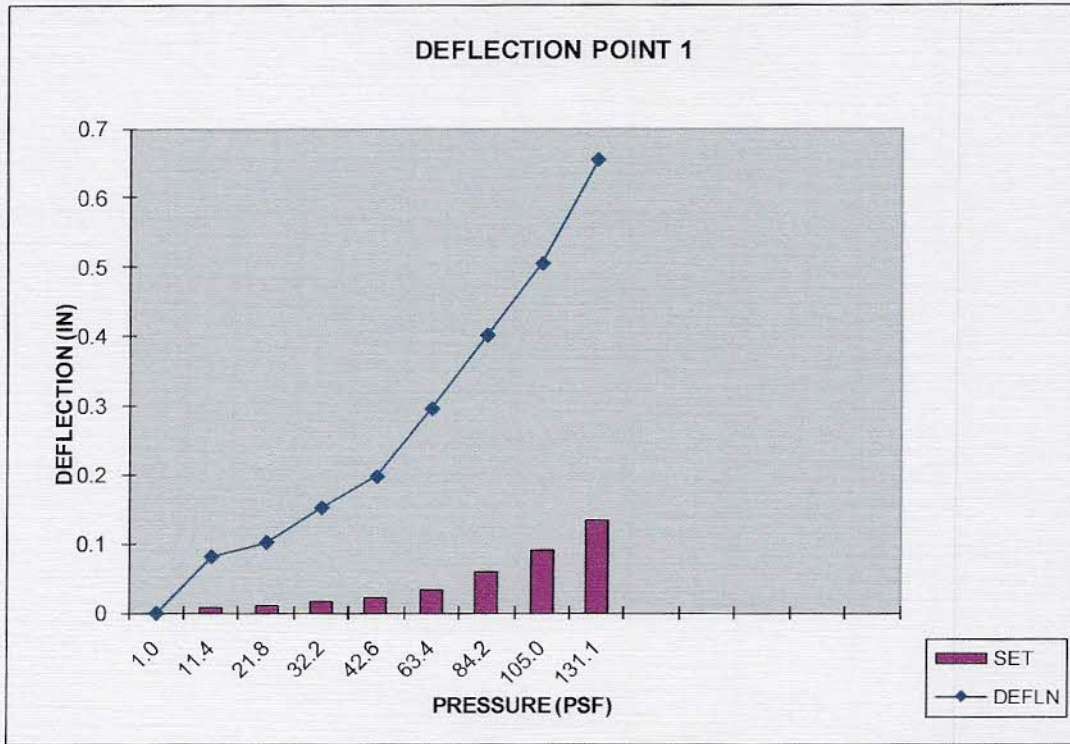
LOAD (PSF)	DEFLECTION DIAL READINGS (INCHES)								REMARKS
	D-1	D-2	D-3	D-4	D-5	D-6	D-7	D-8	
1.0	0	0	0	0	0	0	0	0	PANEL WT.
11.4	0.082	0.059	0.052	0.046	0.018	0.017	0.001	0.001	
1.0	0.008	0.009	0.011	0.002	0.001	0	0	0	PANEL WT.
21.8	0.103	0.118	0.1	0.095	0.041	0.035	0.009	0.006	
1.0	0.01	0.009	0.013	0.004	0.001	0	0	0	PANEL WT.
32.2	0.153	0.173	0.149	0.144	0.057	0.053	0.021	0.021	
1.0	0.017	0.015	0.021	0.004	0.001	0	0	0	PANEL WT.
42.6	0.198	0.231	0.198	0.202	0.077	0.069	0.035	0.039	
1.0	0.021	0.015	0.029	0.018	0.004	0	0	0.001	PANEL WT.
63.4	0.297	0.351	0.283	0.315	0.124	0.112	0.058	0.073	
1.0	0.033	0.032	0.037	0.028	0.029	0.023	0	0.003	PANEL WT.
84.2	0.402	0.477	0.384	0.42	0.17	0.163	0.094	0.111	
1.0	0.06	0.061	0.052	0.051	0.067	0.064	0.002	0	PANEL WT.
105.0	0.506	0.603	0.496	0.551	0.218	0.216	0.135	0.149	
1.0	0.091	0.095	0.078	0.08	0.111	0.11	0.005	0.001	PANEL WT.
131.1	0.656	0.785	0.628	0.725	0.288	0.29	0.181	0.205	
1.0	0.134	0.145	0.13	0.139	0.168	0.177	0.008	0.004	PANEL WT.

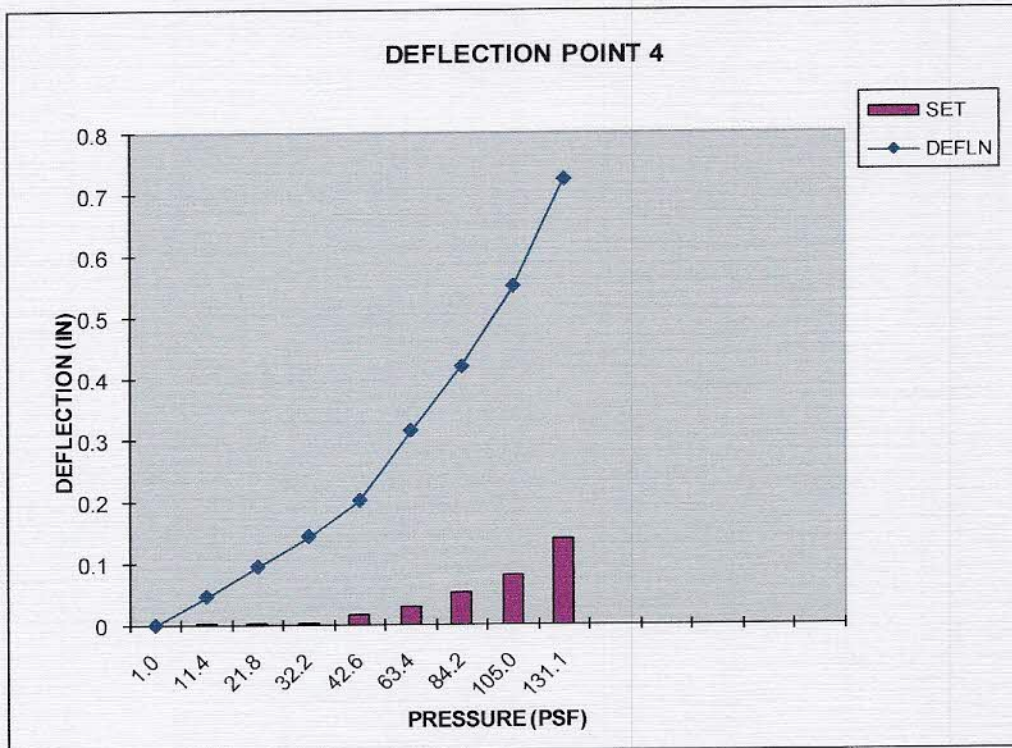
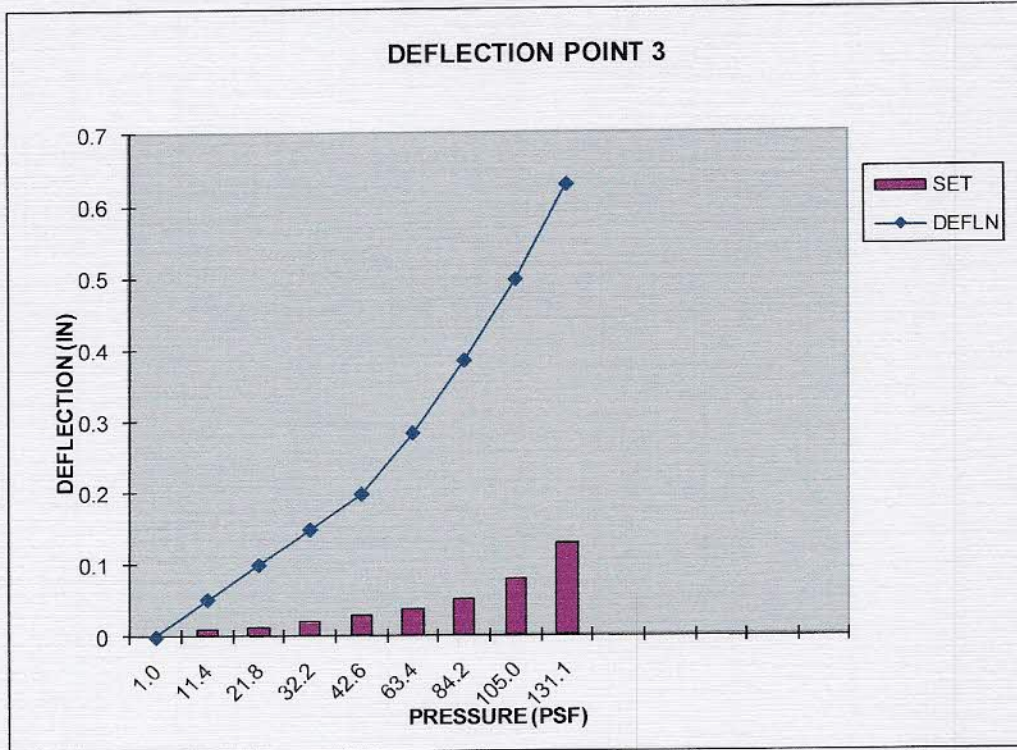
### RESULTS:

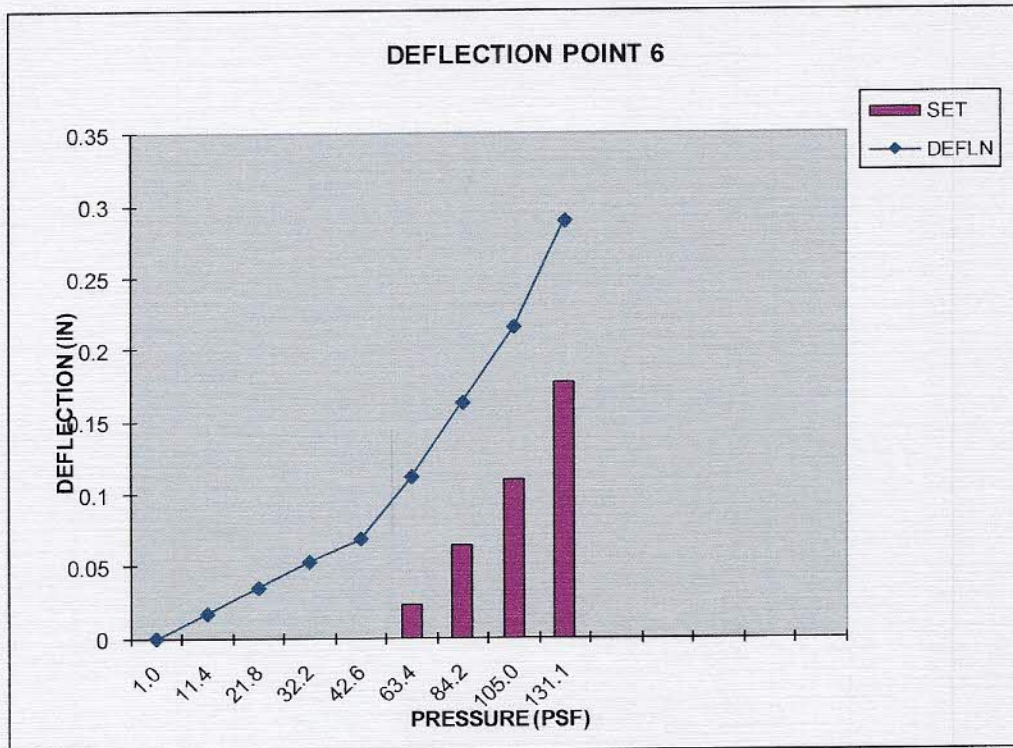
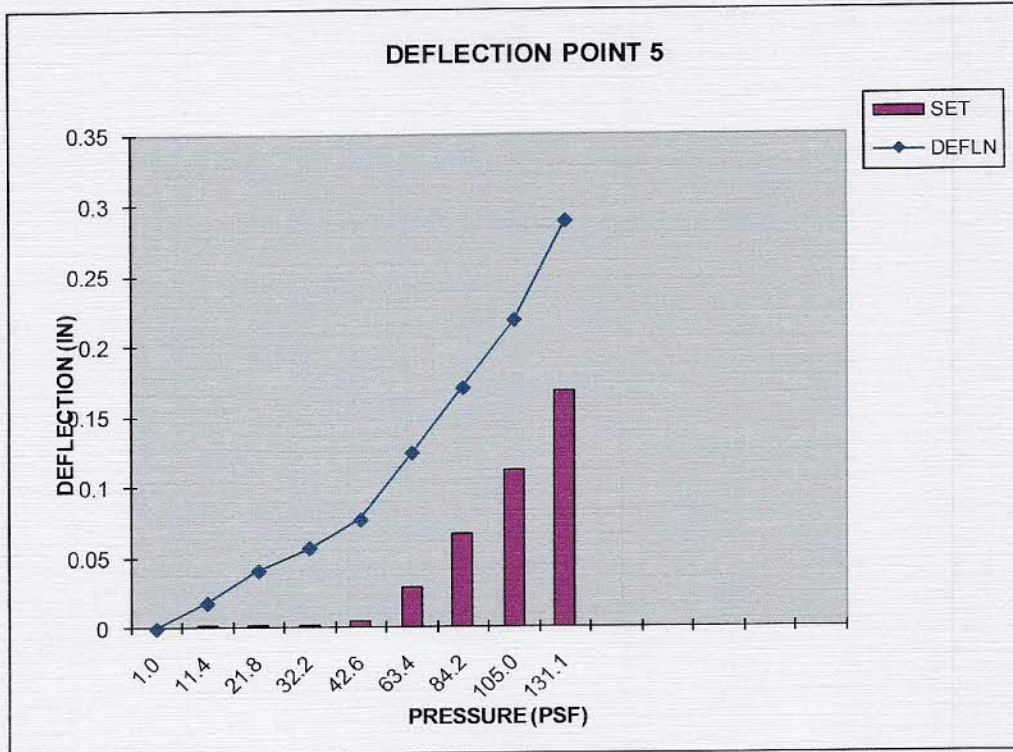
Maximum Test Load = 145.5 psf\* (Panel pulled over support fasteners )

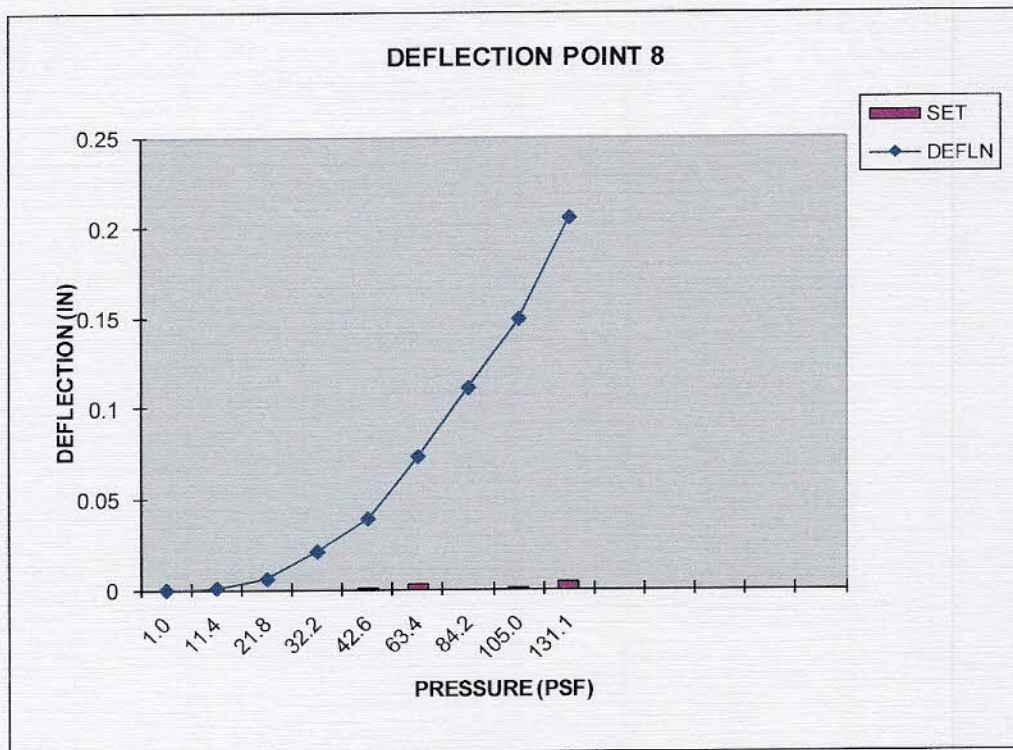
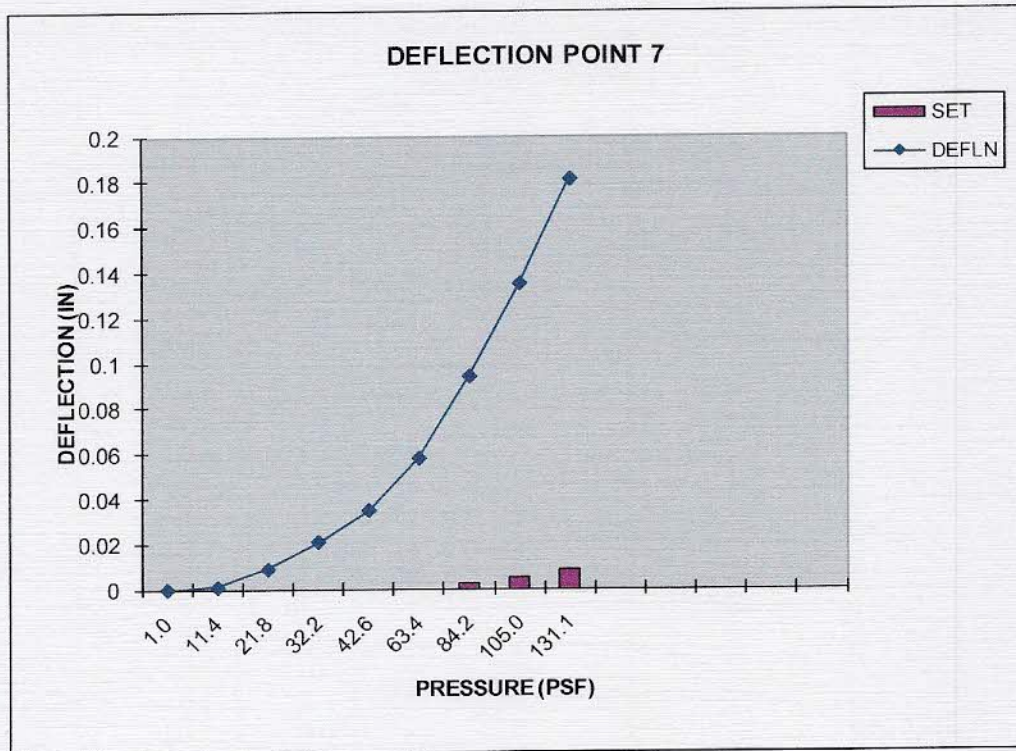
\* Includes panel dead load.

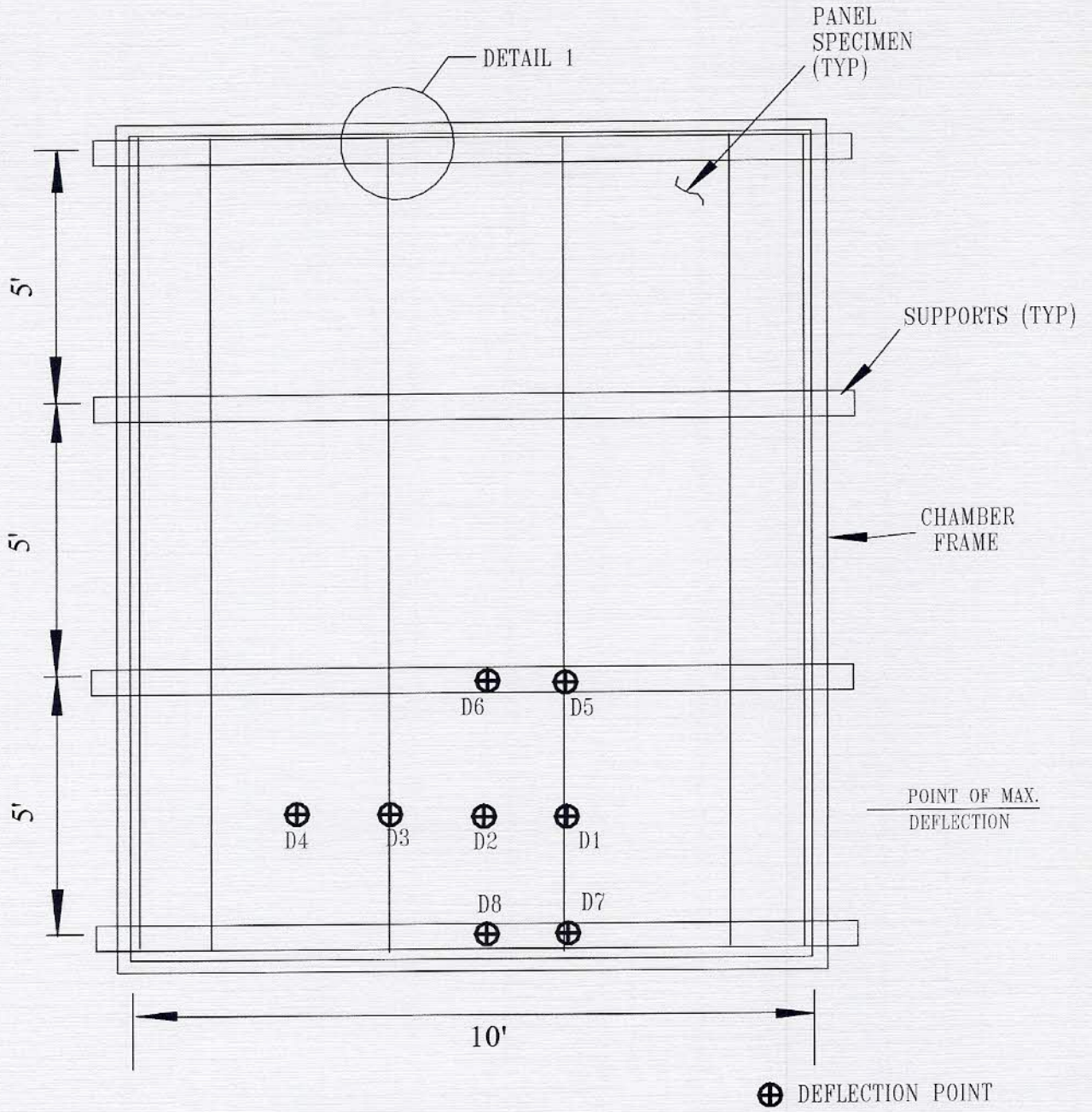




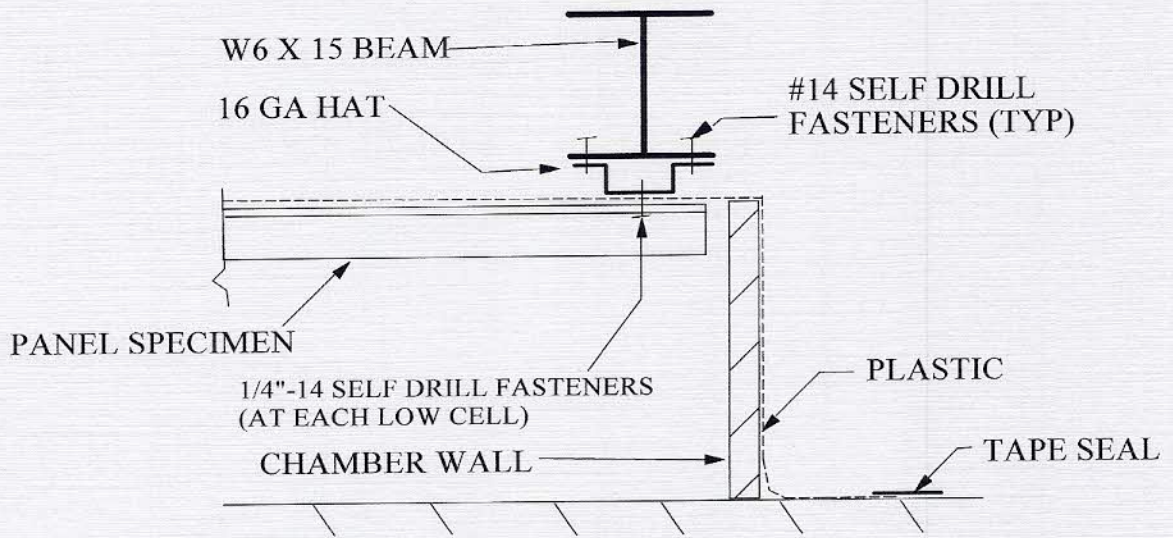






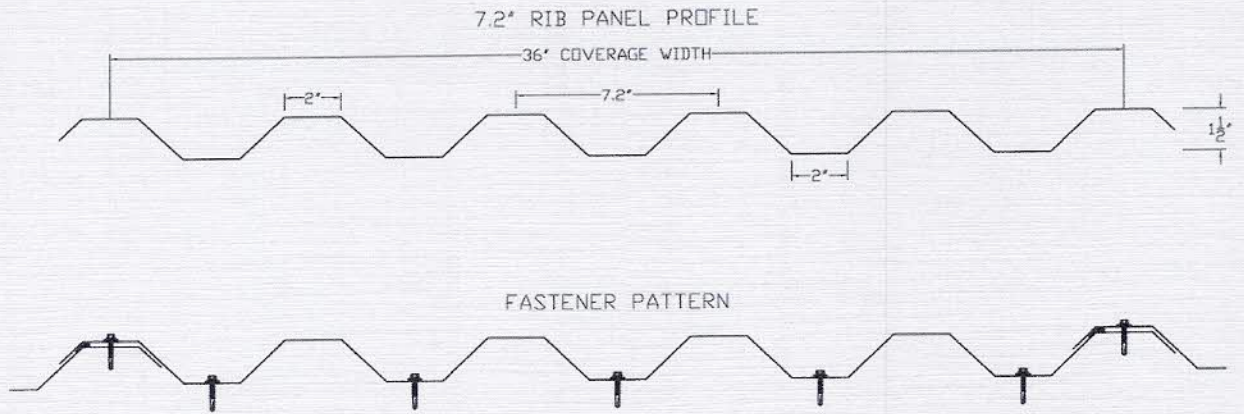


PLAN VIEW



DETAIL 1

Project No. T232-11



PANEL TO SUPPORT FASTENERS: 1/4"-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. T232-11

## 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





## Farabaugh Engineering and Testing Inc.

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**ASTM E1592**  
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STRUCTURAL PERFORMANCE OF SHEET METAL ROOF AND SIDING  
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**7.2 PANEL**  
**36" WIDE X 0.050" ALUMINUM**

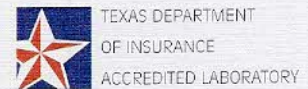
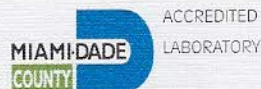
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Report Prepared By:

  
Patrick J. Farabaugh

Reviewed and Approved By:

  
Daniel G. Farabaugh

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**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 29, 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)  
with reinforced panel to support connection

**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.

Project No. T233-11

### **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 (2 fasteners located at every low cell of the panel). 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. T233-11

## TEST DATA

Specimen: 7.2 Panel 36" wide, 0.050" aluminum  
with reinforced panel to support connection

Support Spacing: 5 ft o/c

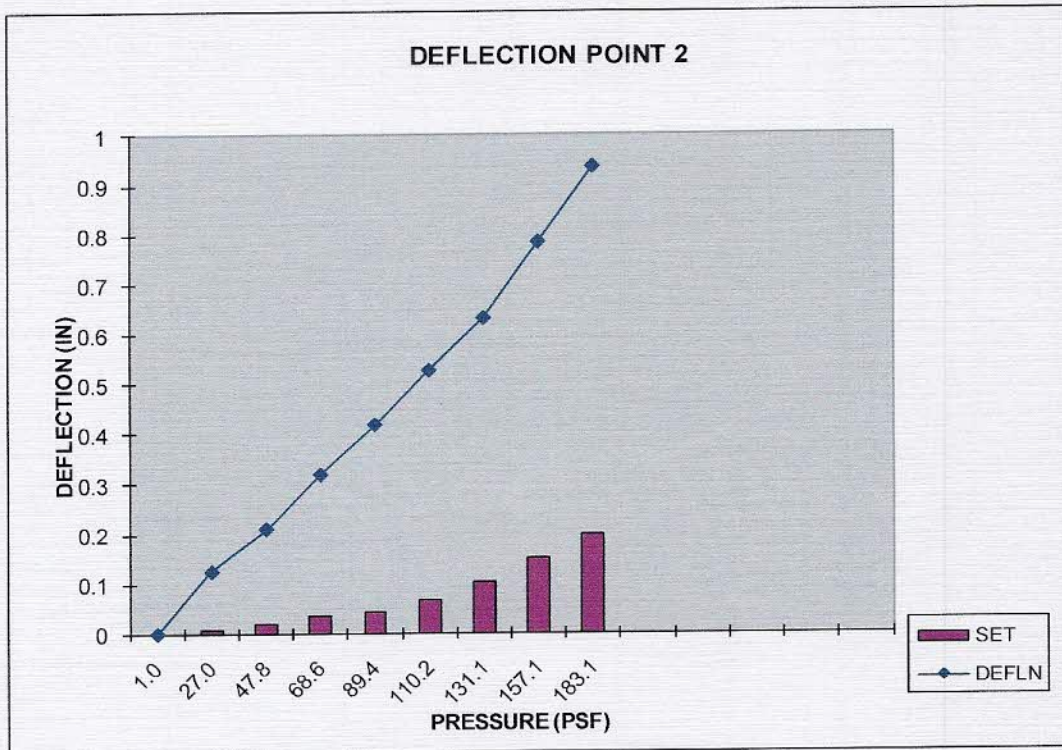
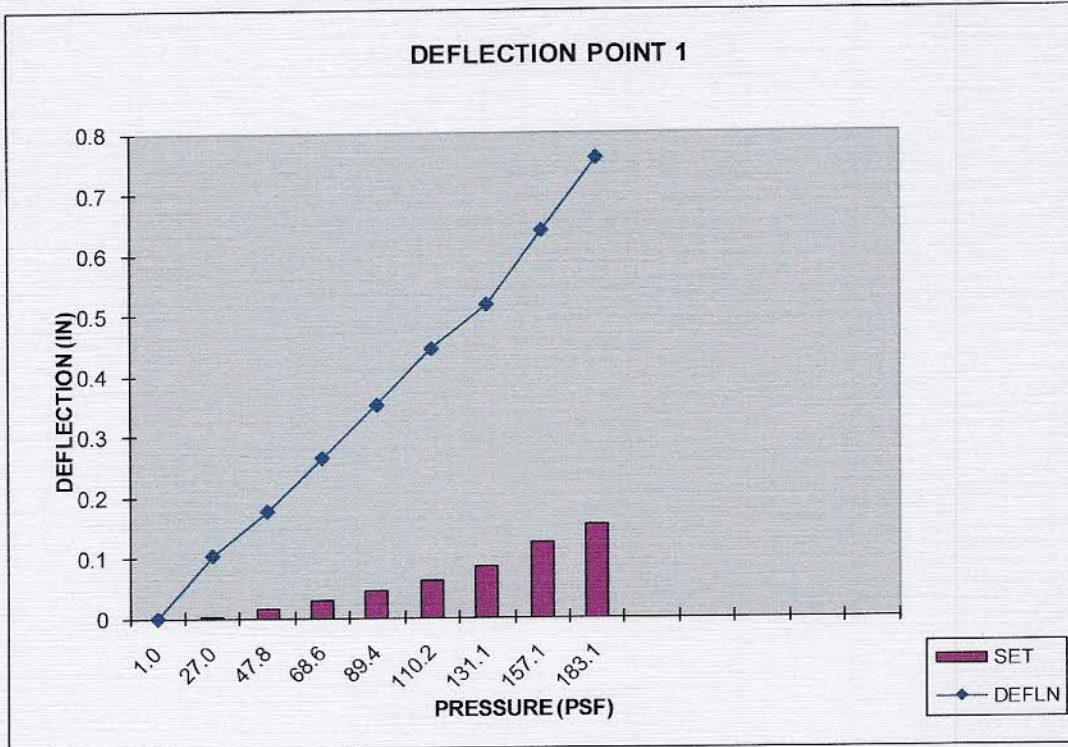
### NEGATIVE (UPLIFT) TEST PRESSURE

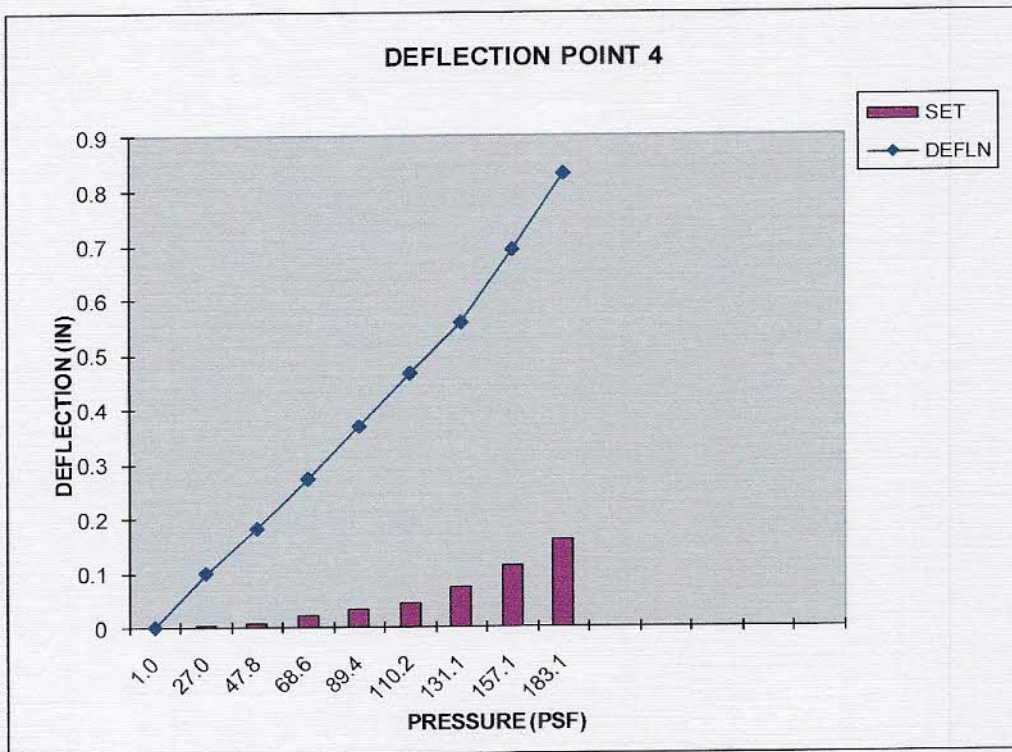
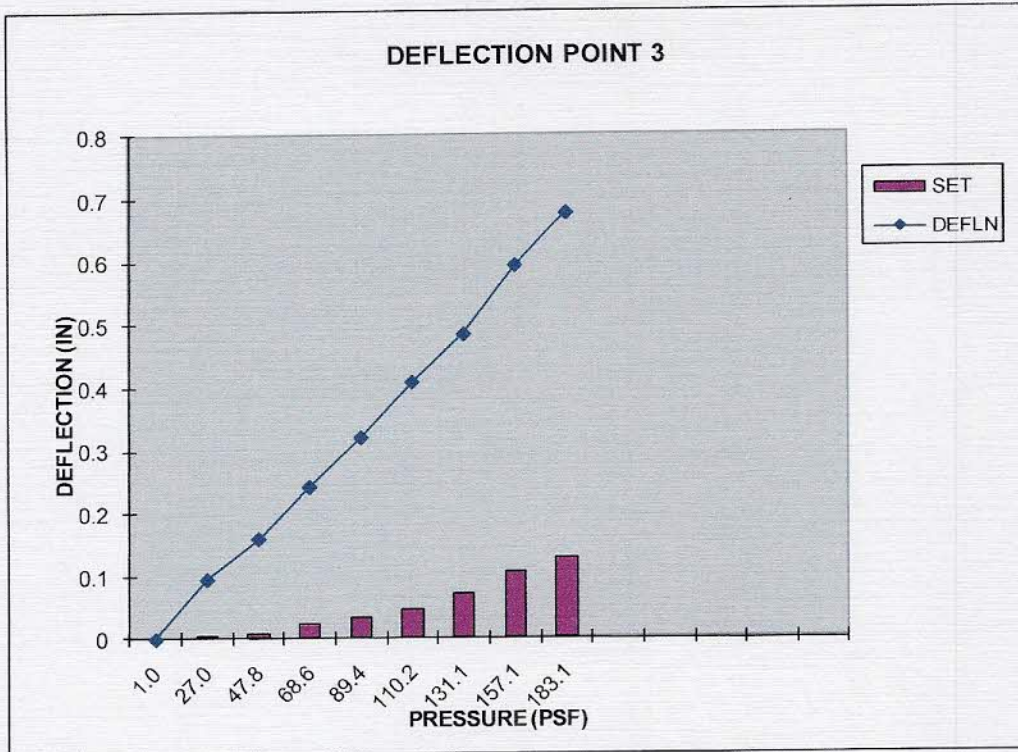
LOAD (PSF)	DEFLECTION DIAL READINGS (INCHES)								REMARKS
	D-1	D-2	D-3	D-4	D-5	D-6	D-7	D-8	
1.0	0	0	0	0	0	0	0	0	PANEL WT.
27.0	0.104	0.125	0.095	0.099	0.025	0.031	0.013	0.013	
1.0	0.003	0.006	0.003	0.001	0.01	0.003	0.001	0	PANEL WT.
47.8	0.177	0.211	0.16	0.181	0.07	0.055	0.037	0.034	
1.0	0.014	0.018	0.007	0.008	0.018	0.015	0.005	-0.001	PANEL WT.
68.6	0.264	0.32	0.242	0.272	0.101	0.085	0.061	0.059	
1.0	0.028	0.037	0.023	0.021	0.039	0.032	0.01	0.002	PANEL WT.
89.4	0.351	0.419	0.32	0.367	0.134	0.117	0.083	0.092	
1.0	0.044	0.044	0.033	0.034	0.059	0.058	0.015	0.006	PANEL WT.
110.2	0.444	0.528	0.408	0.464	0.169	0.149	0.107	0.12	
1.0	0.06	0.068	0.047	0.046	0.087	0.086	0.019	0.012	PANEL WT.
131.1	0.517	0.633	0.484	0.557	0.204	0.175	0.131	0.15	
1.0	0.082	0.102	0.07	0.072	0.109	0.115	0.029	0.026	PANEL WT.
157.1	0.639	0.786	0.593	0.691	0.247	0.211	0.164	0.19	
1.0	0.124	0.15	0.106	0.113	0.144	0.149	0.047	0.045	PANEL WT.
183.1	0.758	0.938	0.677	0.83	0.288	0.247	0.198	0.225	
1.0	0.153	0.2	0.129	0.159	0.188	0.185	0.064	0.071	PANEL WT.

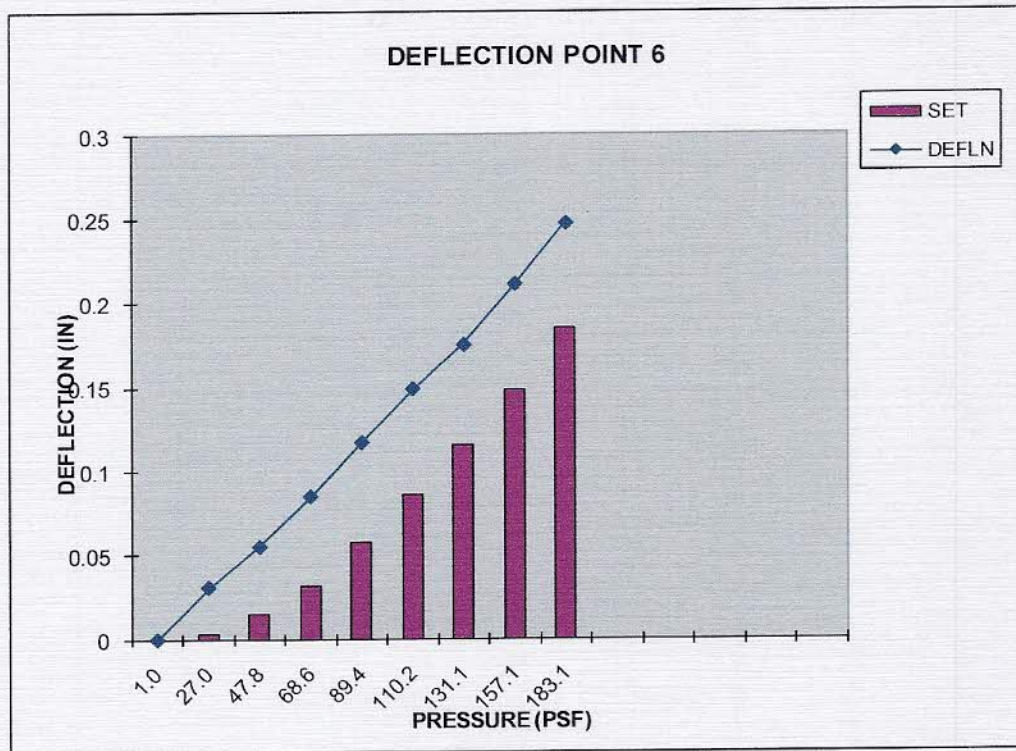
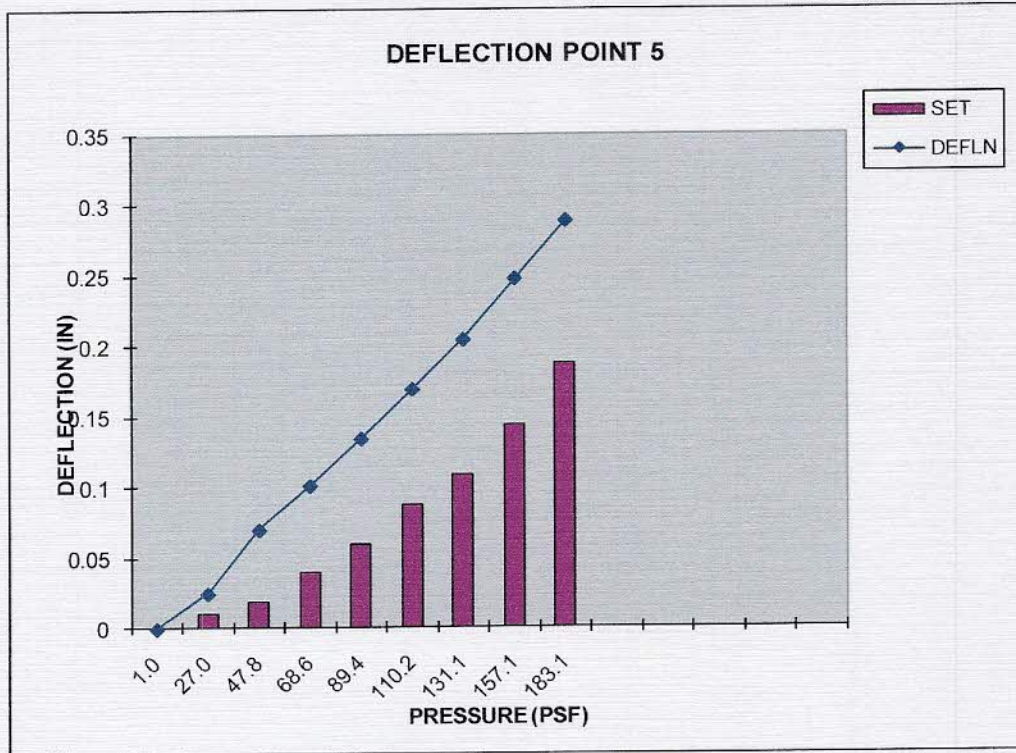
### RESULTS:

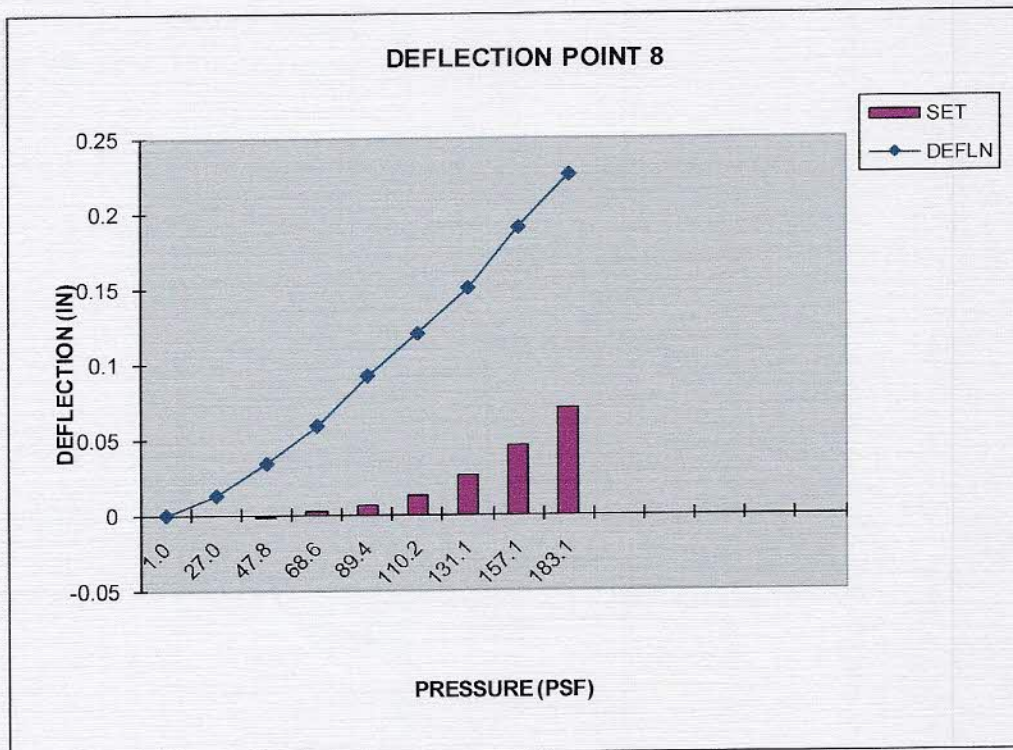
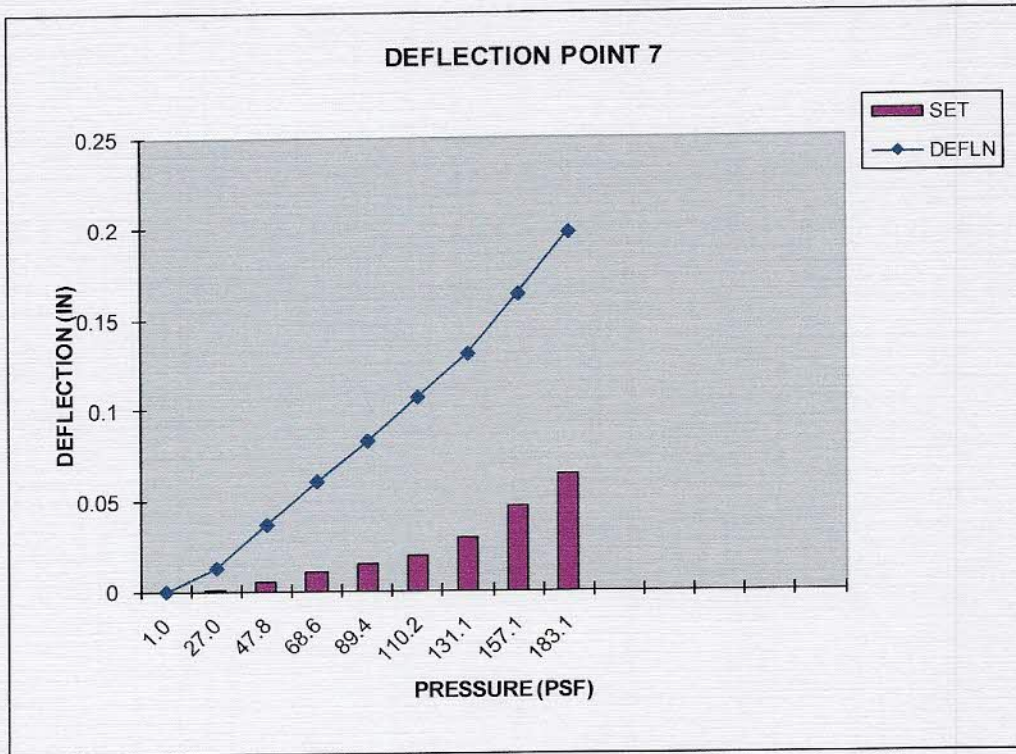
Maximum Test Load = 289.0 psf\* (Panel buckling at end span )

\* Includes panel dead load.

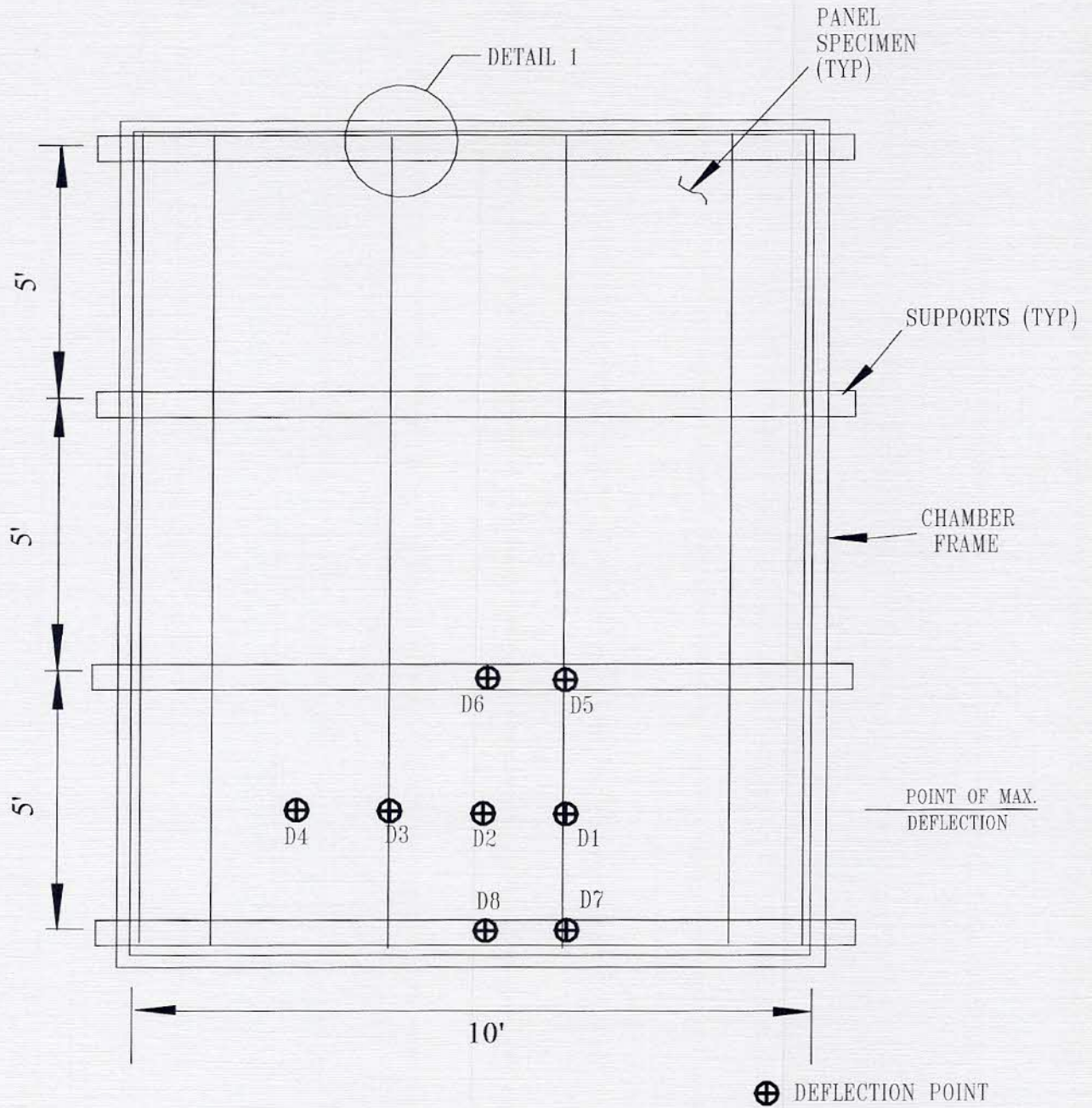




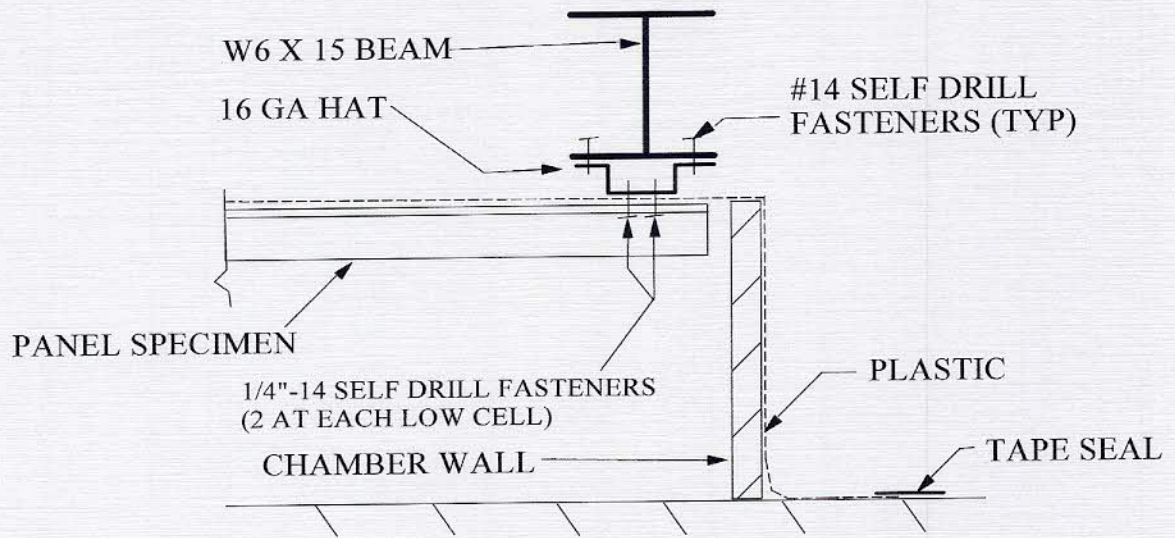






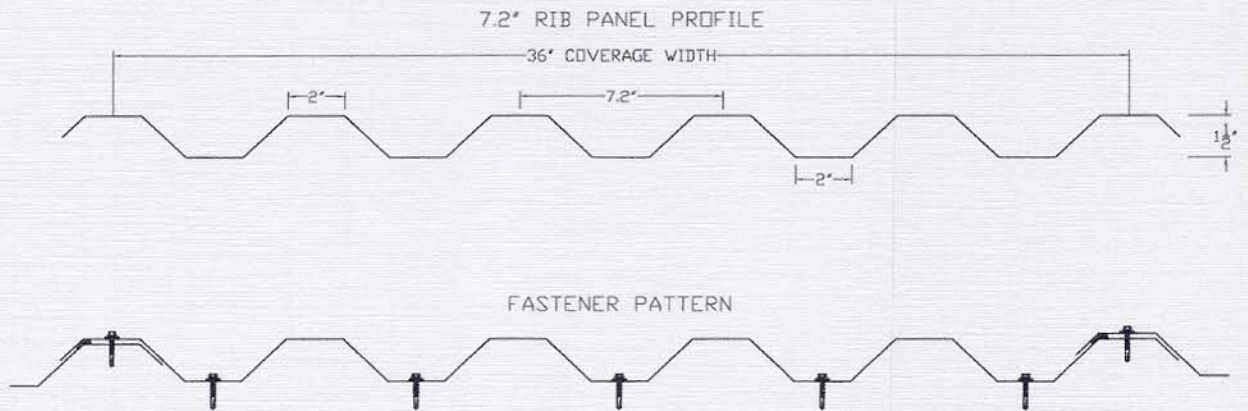


PLAN VIEW



DETAIL 1

Project No. T233-11



PANEL TO SUPPORT FASTENERS: 1/4"-14 X 1-1/4" SELF DRILL HEX HEAD  
W/ 9/16" INTEGRAL SEAL WASHER  
(2 PER LOW CELL,  
10 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. T233-11

## 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