



## Farabaugh Engineering and Testing Inc.

Project No. T201-21

Report Date: July 7, 2021

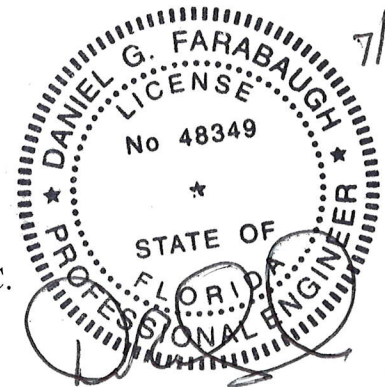
No. Pages: 15 (inclusive)

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

ELITE RIB PANEL  
36" WIDE COVERAGE X 29 GA.  
(3 SPAN @ 4'-0" O.C.)

FOR

ELITE METAL MANUFACTURING, LLC.  
10121 88<sup>TH</sup> TRACE  
LIVE OAK, FL. 32064



Prepared by:

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Approved by:

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Project No. T201-21

**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**

7/2/21

**Test Specimen**

Manufacturer: Elite Metal Manufacturing LLC.  
10121 88<sup>th</sup> Trace  
Live Oak, FL. 32064

Test Specimen: Elite Rib Metal Panel 36" wide coverage x 29 ga.

**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 positive and negative direction to monitor pressures on the panel specimen mock-up. Calibrated deflectometers were attached to monitor panel deformation as shown.

### **Installation**

- The panel were installed onto 18 ga. supports using #12-14 X 1" long, hex head, self-drilling fasteners with sealing washers at supports. The panel joint was a overlap for the panel lap. See fastening pattern for location of fasteners at ends supports and interior supports.
- 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-1592-05(2012) and as noted herein. In our opinion the tape and plastic had no influence on the results of the test.

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## TEST #1

Test Specimen: Elite Rib Metal Panel 36" wide coverage x 29 ga.

Support Spacing: 3 spans @ 4" o/c

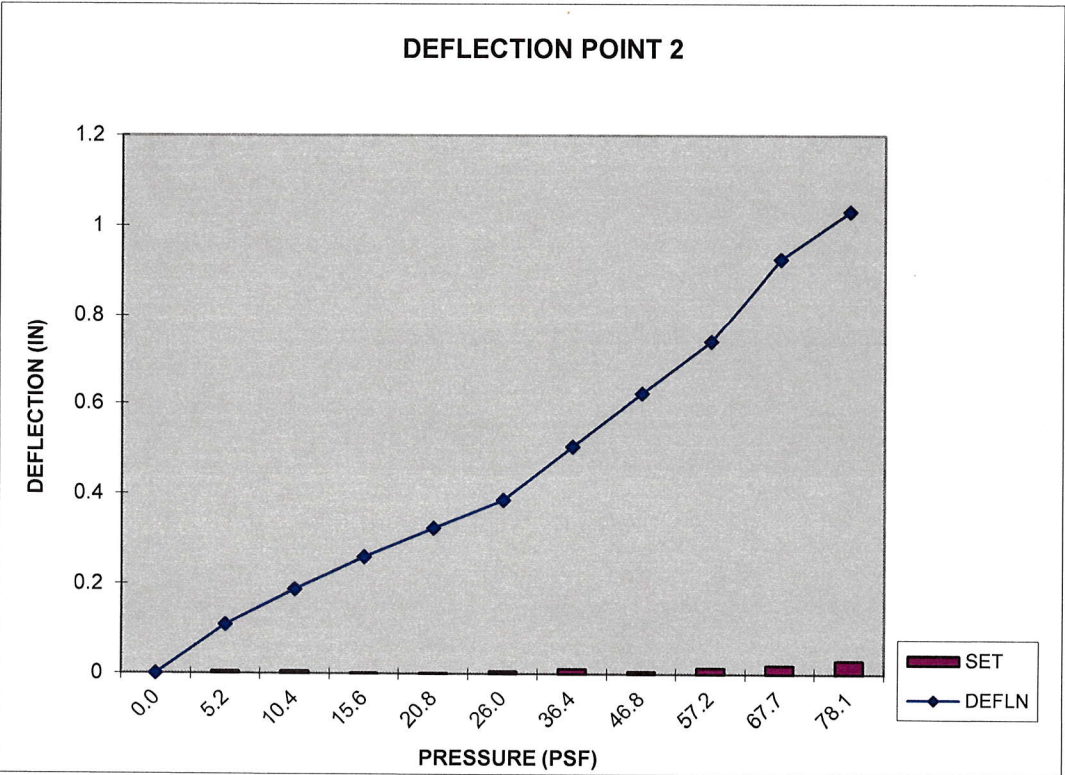
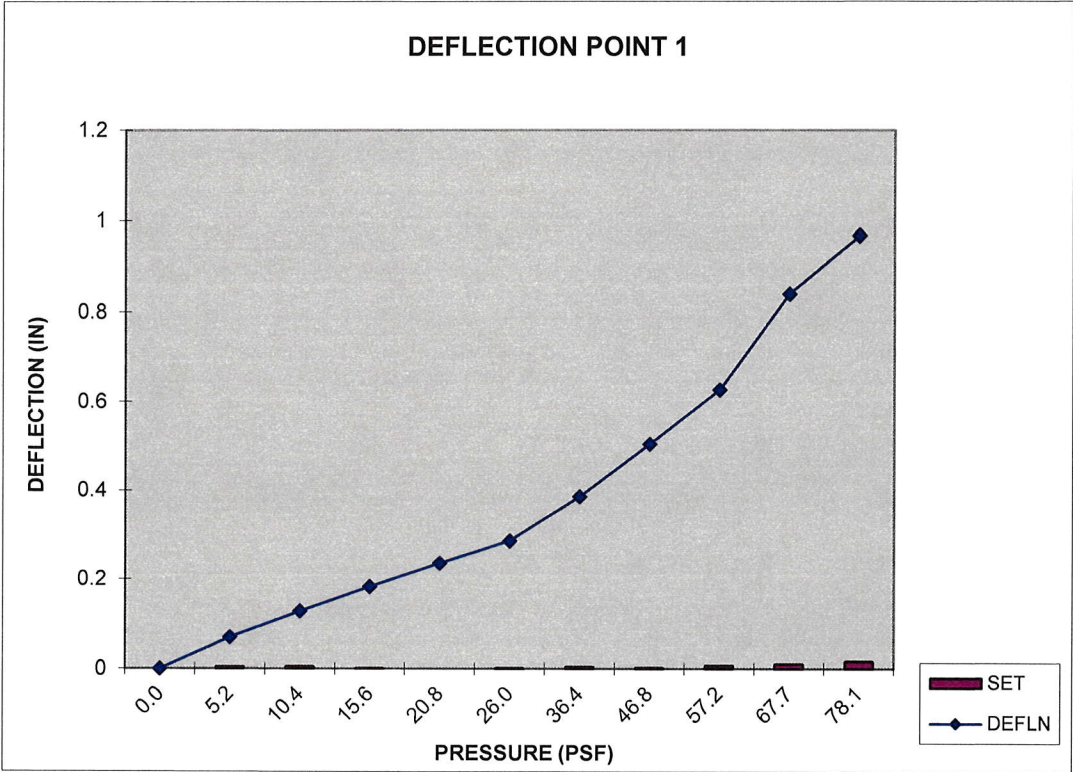
### POSITIVE (DOWNWARD) PRESSURE

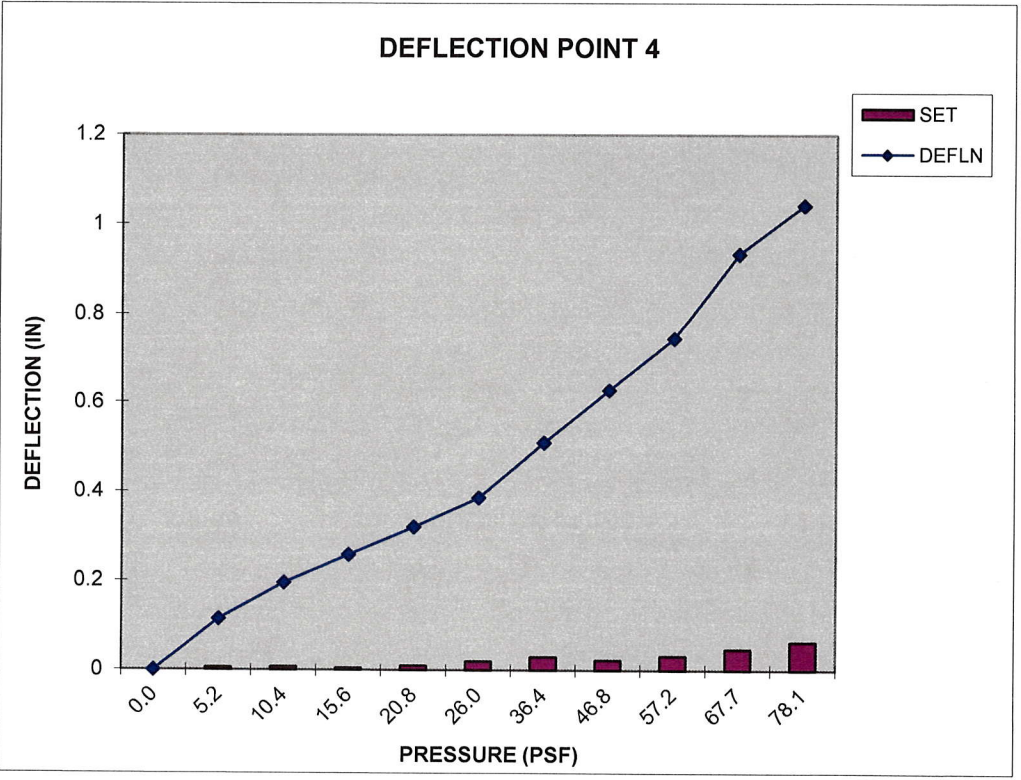
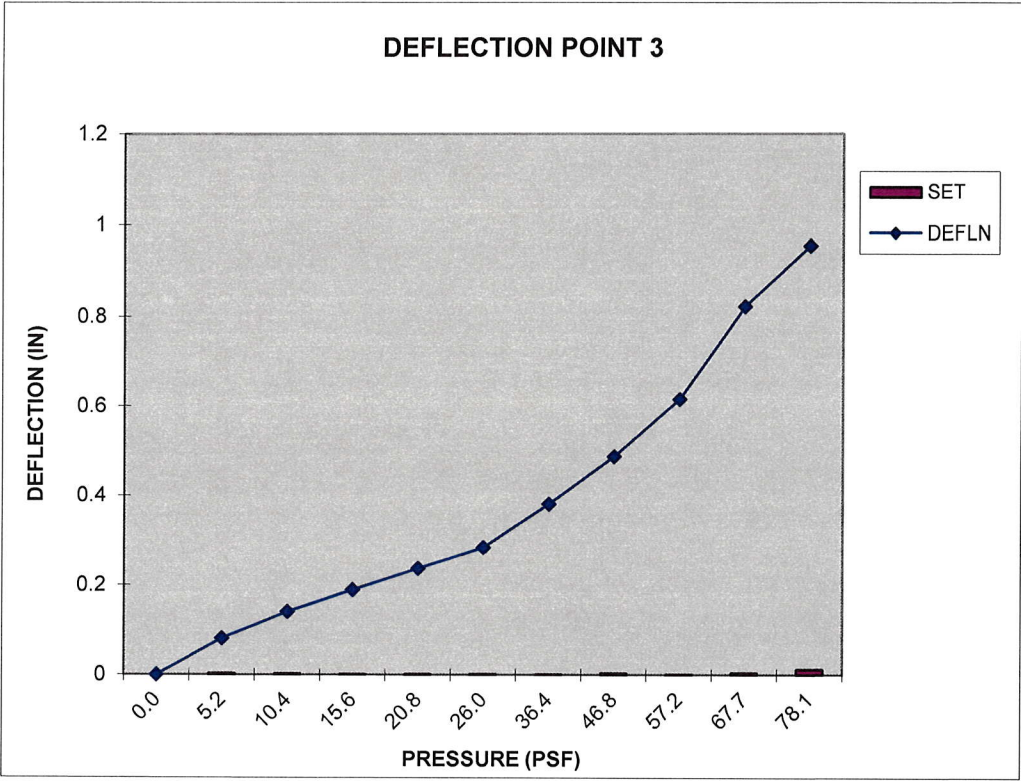
| LOAD<br>(PSF) | DEFLECTION DIAL READINGS (INCHES) |       |       |       |       |       |
|---------------|-----------------------------------|-------|-------|-------|-------|-------|
|               | D-1                               | D-2   | D-3   | D-4   | D-5   | D-6   |
| 0.0           | 0.000                             | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 |
| 5.2           | 0.070                             | 0.109 | 0.082 | 0.114 | 0.033 | 0.040 |
| 0.0           | 0.004                             | 0.005 | 0.003 | 0.006 | 0.000 | 0.001 |
| 10.4          | 0.129                             | 0.188 | 0.141 | 0.196 | 0.058 | 0.062 |
| 0.0           | 0.005                             | 0.006 | 0.002 | 0.007 | 0.002 | 0.002 |
| 15.6          | 0.183                             | 0.260 | 0.190 | 0.259 | 0.079 | 0.080 |
| 0.0           | 0.001                             | 0.002 | 0.001 | 0.005 | 0.002 | 0.001 |
| 20.8          | 0.236                             | 0.325 | 0.237 | 0.321 | 0.096 | 0.095 |
| 0.0           | 0.000                             | 0.002 | 0.002 | 0.010 | 0.005 | 0.005 |
| 26.0          | 0.286                             | 0.386 | 0.284 | 0.386 | 0.113 | 0.109 |
| 0.0           | 0.002                             | 0.006 | 0.002 | 0.021 | 0.005 | 0.006 |
| 36.4          | 0.386                             | 0.505 | 0.381 | 0.510 | 0.134 | 0.129 |
| 0.0           | 0.004                             | 0.011 | 0.001 | 0.030 | 0.001 | 0.002 |
| 46.8          | 0.504                             | 0.624 | 0.487 | 0.628 | 0.155 | 0.144 |
| 0.0           | 0.002                             | 0.006 | 0.004 | 0.023 | 0.001 | 0.002 |
| 57.2          | 0.626                             | 0.740 | 0.615 | 0.743 | 0.174 | 0.162 |
| 0.0           | 0.007                             | 0.014 | 0.001 | 0.032 | 0.001 | 0.000 |
| 67.7          | 0.840                             | 0.927 | 0.822 | 0.934 | 0.198 | 0.185 |
| 0.0           | 0.010                             | 0.020 | 0.005 | 0.048 | 0.001 | 0.003 |
| 78.1          | 0.968                             | 1.033 | 0.956 | 1.043 | 0.211 | 0.197 |
| 0.0           | 0.017                             | 0.030 | 0.013 | 0.064 | 0.001 | 0.002 |

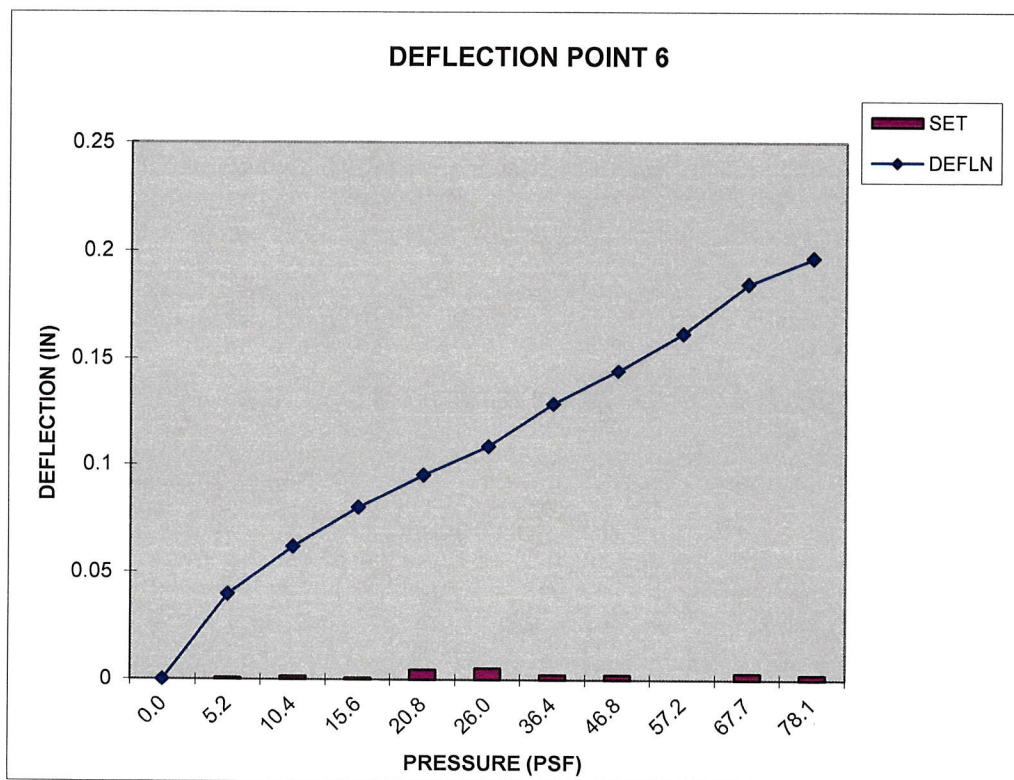
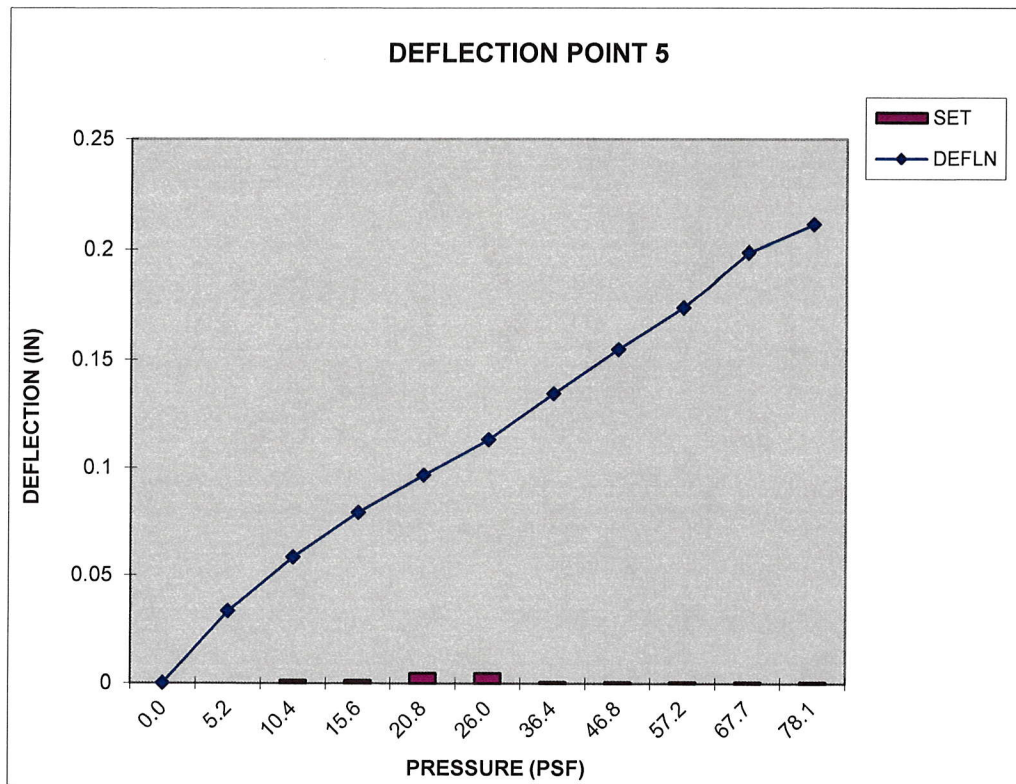
### RESULTS:

Maximum Load held for 1 minute = 83.2 psf

Maximum Test Load at Failure= 85.8 psf (Buckling at support)







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## TEST #2

Test Specimen: Elite Rib Metal Panel 36" wide coverage x 29 ga.

Support Spacing: 3 spans @ 4" o/c

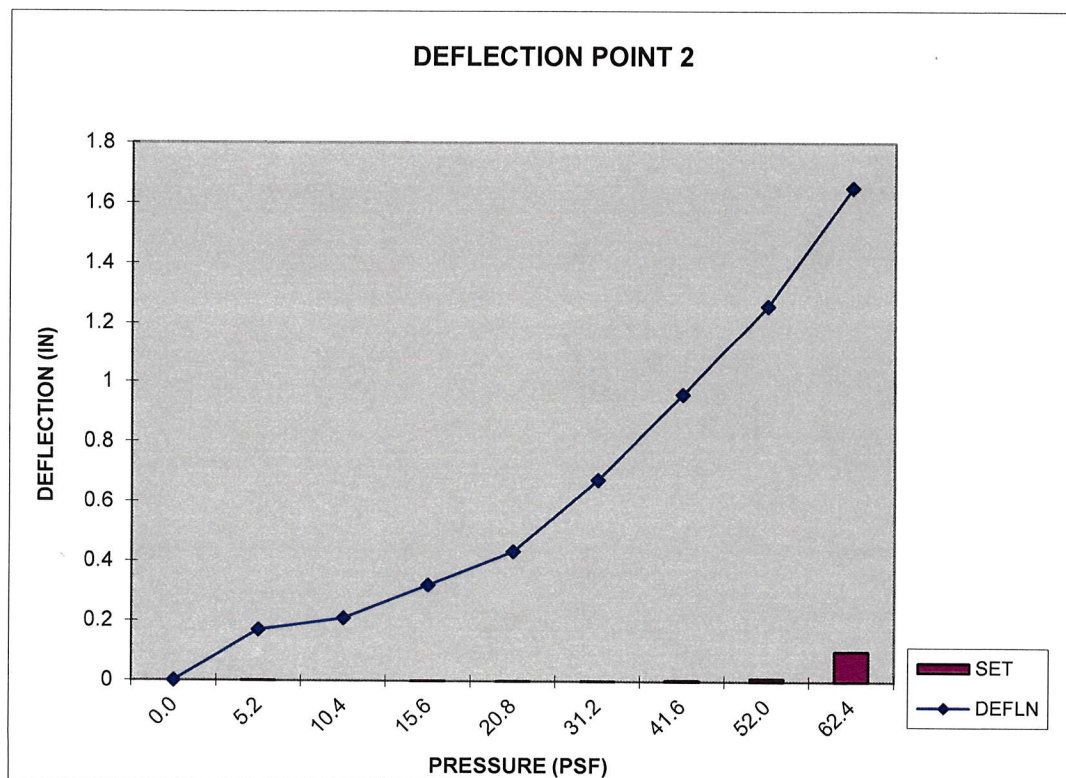
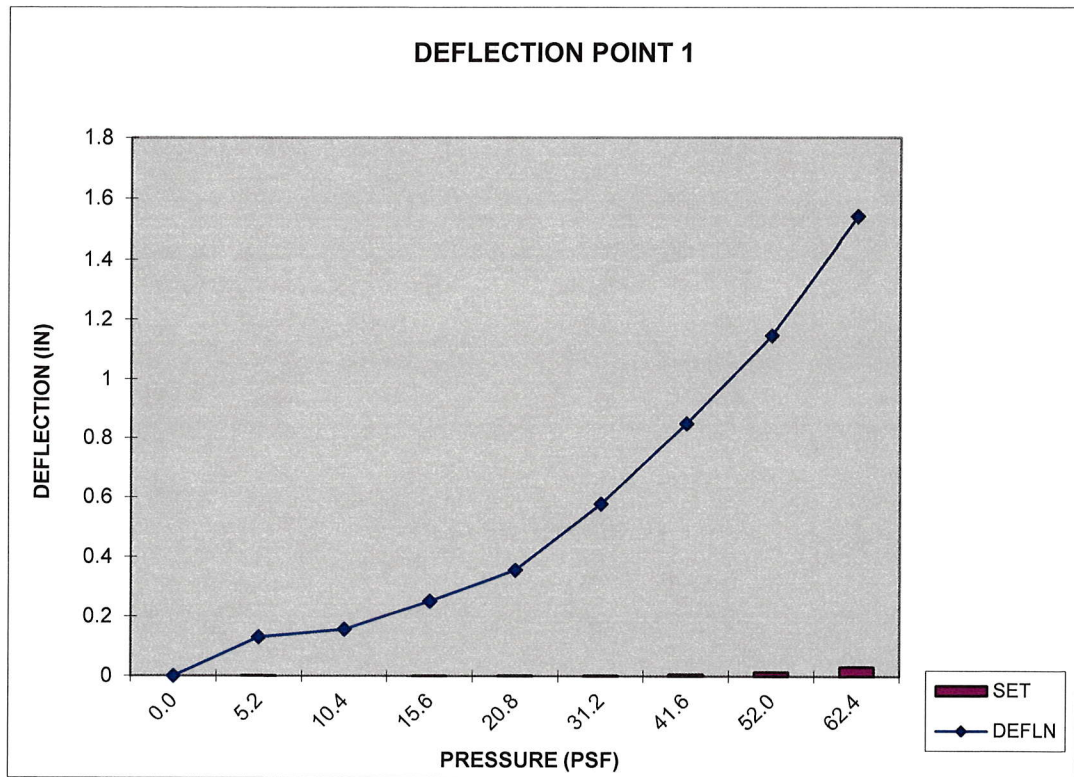
### NEGATIVE (UPLIFT) PRESSURE

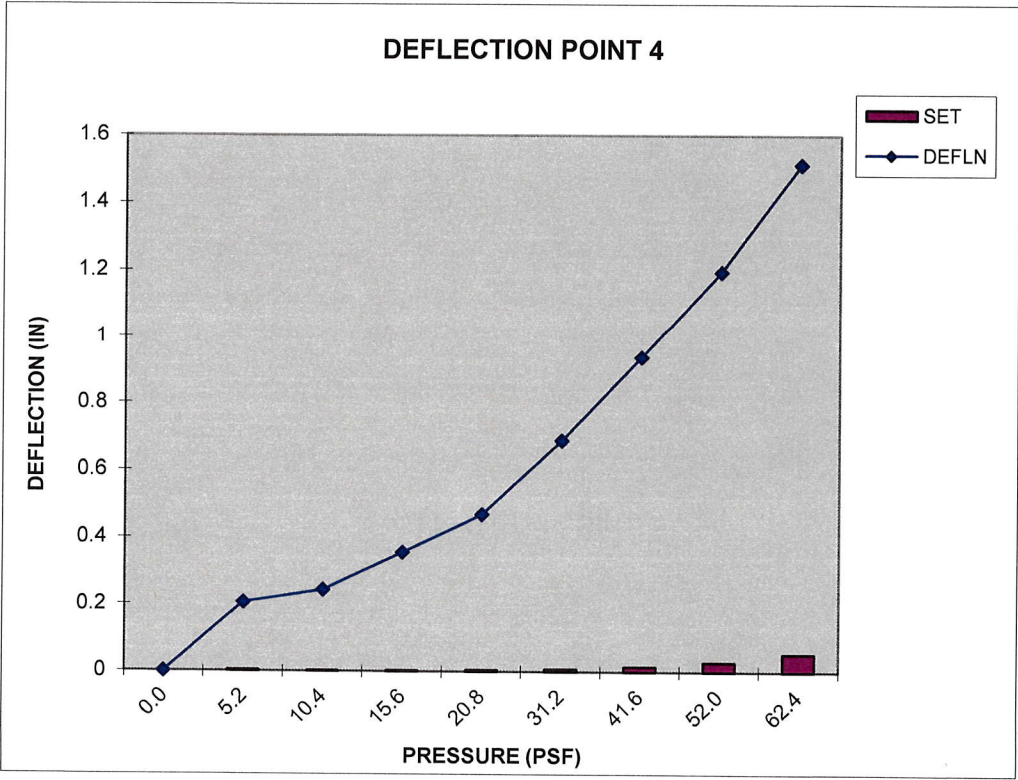
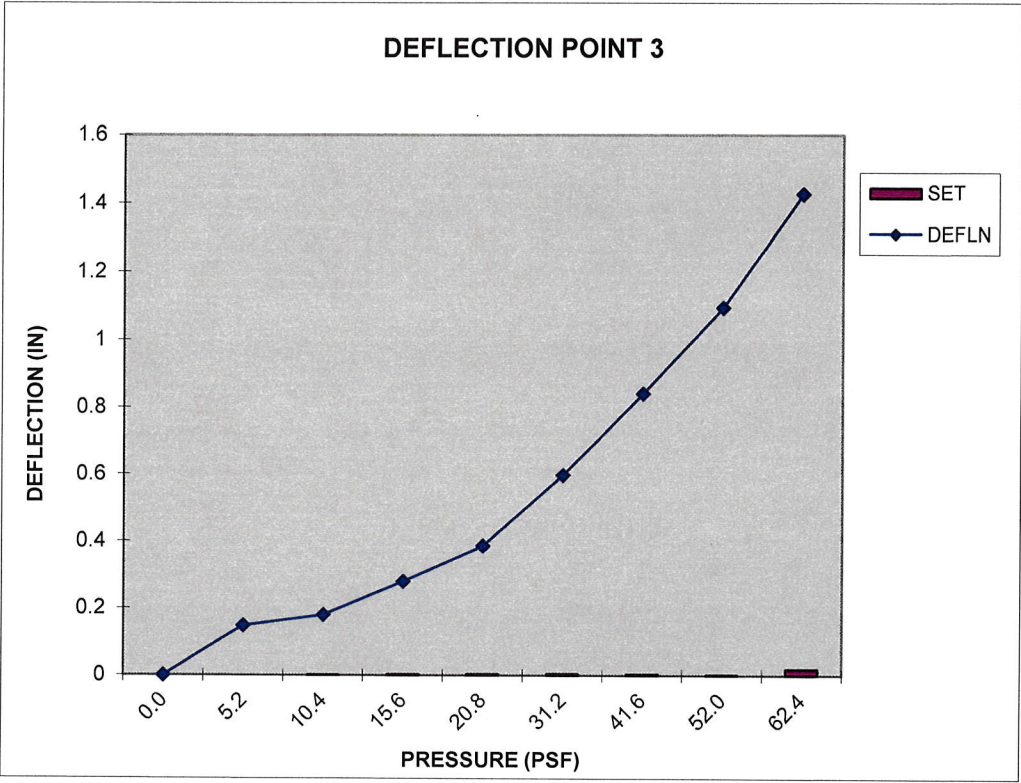
| LOAD<br>(PSF) | DEFLECTION DIAL READINGS (INCHES) |       |       |       |       |       |
|---------------|-----------------------------------|-------|-------|-------|-------|-------|
|               | D-1                               | D-2   | D-3   | D-4   | D-5   | D-6   |
| 0.0           | 0.000                             | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 |
| 5.2           | 0.130                             | 0.170 | 0.148 | 0.206 | 0.044 | 0.061 |
| 0.0           | 0.001                             | 0.001 | 0.000 | 0.004 | 0.002 | 0.001 |
| 10.4          | 0.157                             | 0.209 | 0.180 | 0.244 | 0.056 | 0.080 |
| 0.0           | 0.000                             | 0.000 | 0.002 | 0.002 | 0.001 | 0.001 |
| 15.6          | 0.252                             | 0.321 | 0.280 | 0.357 | 0.089 | 0.124 |
| 0.0           | 0.001                             | 0.001 | 0.003 | 0.003 | 0.001 | 0.001 |
| 20.8          | 0.355                             | 0.435 | 0.386 | 0.469 | 0.123 | 0.165 |
| 0.0           | 0.002                             | 0.001 | 0.004 | 0.005 | 0.001 | 0.001 |
| 31.2          | 0.578                             | 0.673 | 0.597 | 0.688 | 0.184 | 0.250 |
| 0.0           | 0.002                             | 0.001 | 0.006 | 0.008 | 0.003 | 0.003 |
| 41.6          | 0.849                             | 0.959 | 0.840 | 0.940 | 0.250 | 0.337 |
| 0.0           | 0.006                             | 0.004 | 0.004 | 0.016 | 0.010 | 0.007 |
| 52.0          | 1.146                             | 1.258 | 1.095 | 1.196 | 0.319 | 0.428 |
| 0.0           | 0.013                             | 0.010 | 0.002 | 0.029 | 0.019 | 0.016 |
| 62.4          | 1.540                             | 1.651 | 1.426 | 1.513 | 0.403 | 0.540 |
| 0.0           | 0.033                             | 0.102 | 0.019 | 0.055 | 0.033 | 0.040 |

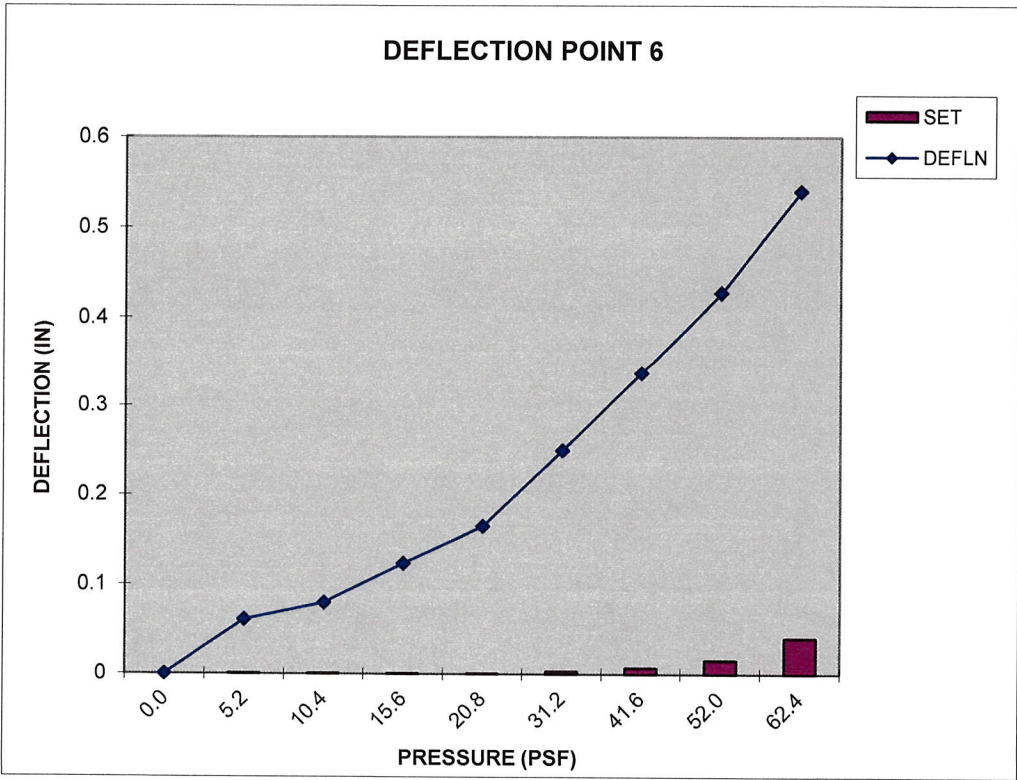
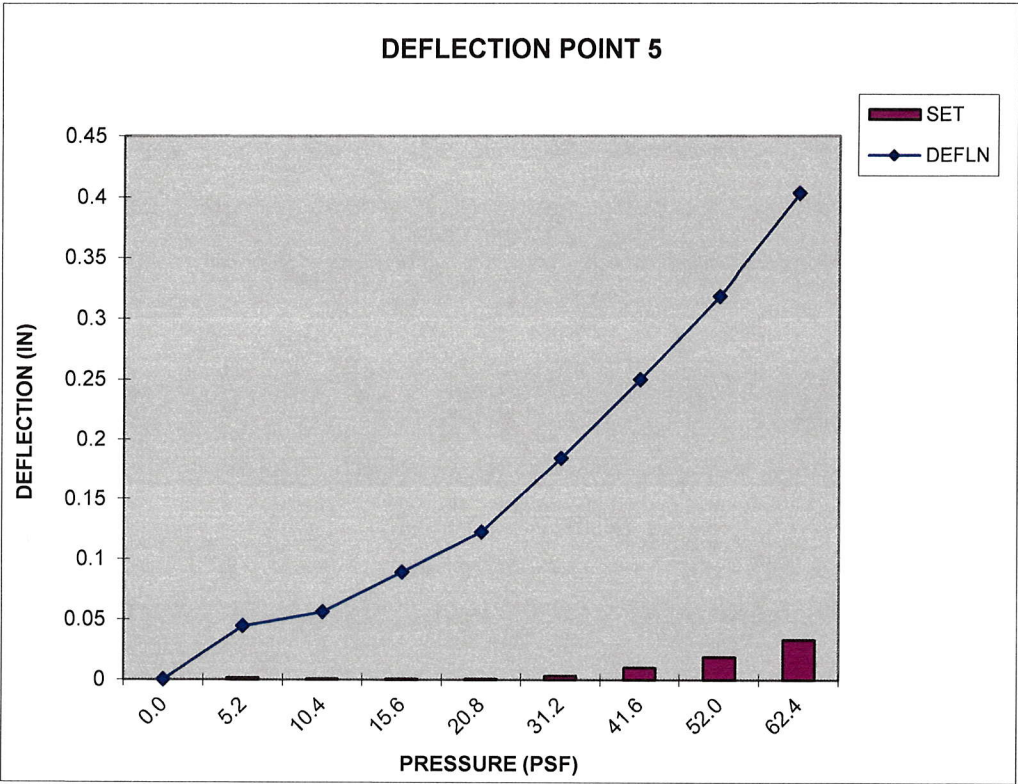
### RESULTS:

Maximum Load held for 1 minute = 62.4 psf

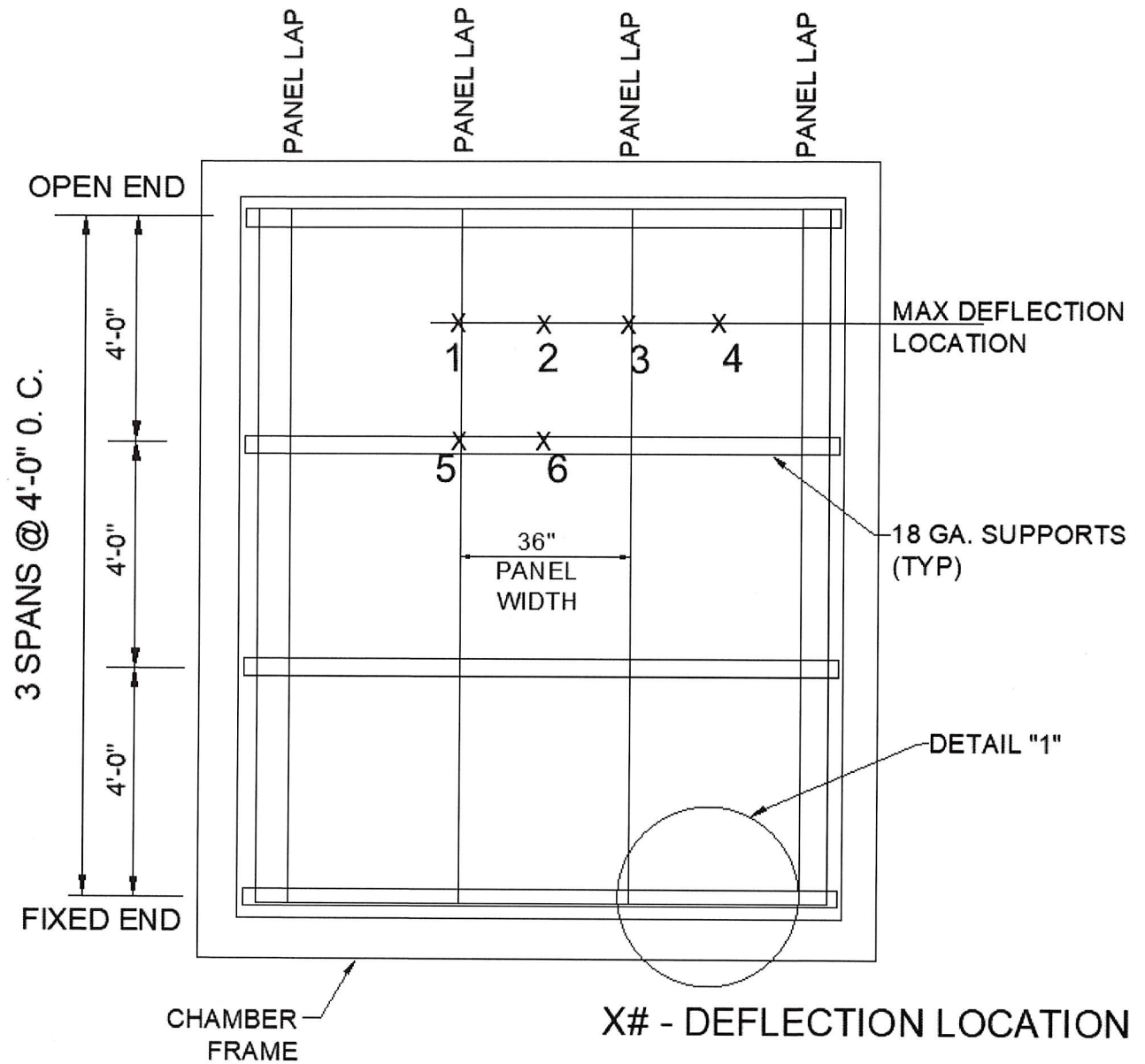
Maximum Test Load at Failure= 65.5 psf (Buckling at end span)



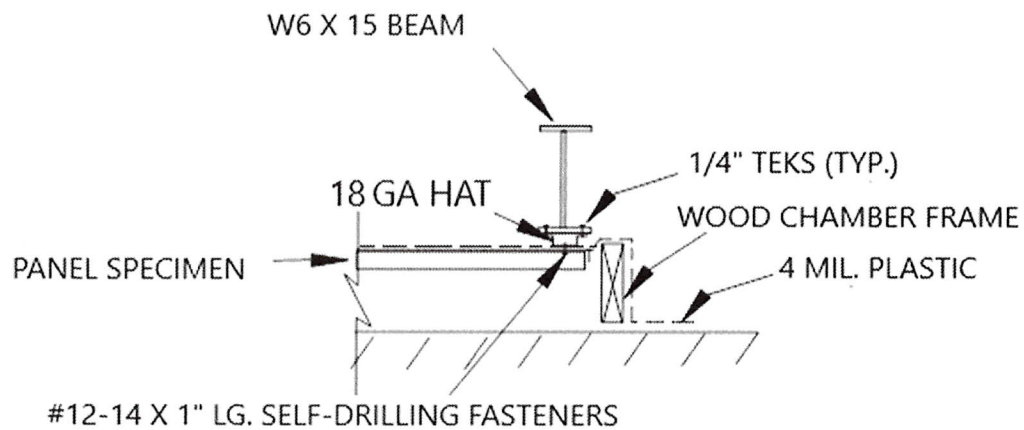




## TEST SETUP

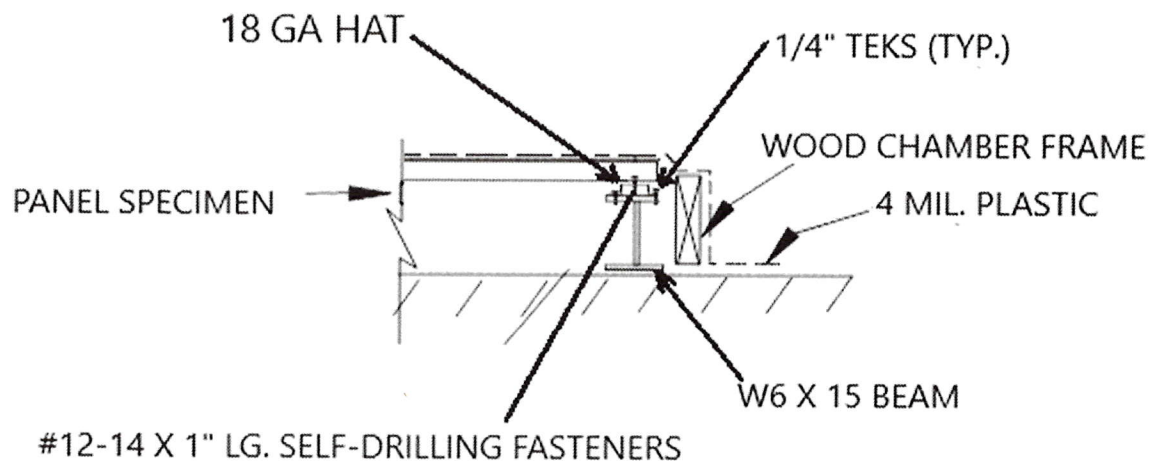


## PLAN VIEW



## DETAIL "1"

(NEGATIVE PRESSURE)

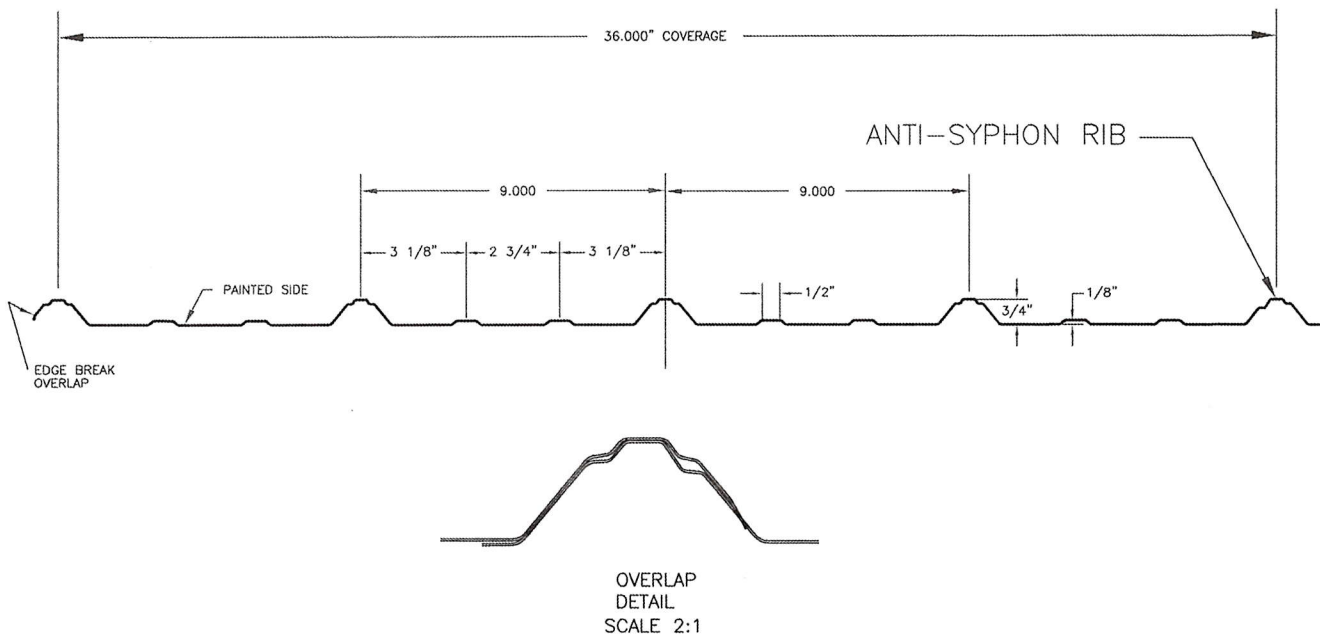


## DETAIL "1"

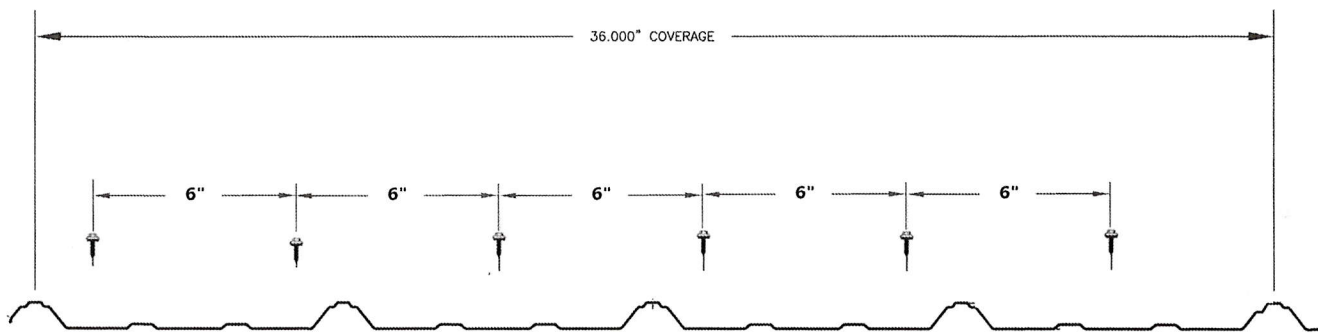
(POSITIVE PRESSURE)

**ELITE RIB PANEL**

STRIP WIDTH = 40.875



**ELITE RIB PANEL**



6-6-6-6-6 PATTERN AT ALL SUPPORTS

# *Spectrochemical Laboratories-Material Evaluation, Inc.*

155 Prominence Drive, New Kensington, PA. 15068

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

Date: 29-Jun-21

Page No.: 1 of 1

## Report of Tensile Testing

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

| PIN #           | Dimensions (in.)<br>Width x Thickness | Area<br>(sq. - in.) | Yield<br>Point (lb.) | Tensile<br>Strength (lb.) | Yield<br>Strength (psi.) | Tensile<br>Strength (psi.) | Elongation<br>(% in 2 in.) | Fracture<br>Location |
|-----------------|---------------------------------------|---------------------|----------------------|---------------------------|--------------------------|----------------------------|----------------------------|----------------------|
| ELITE RIB PANEL | 0.5009 x 0.0124                       | 0.0062              | 672                  | 707                       | 108100                   | 113800                     | 0.5                        | U/4 (Out of GL)      |

Test Method: Q2300.04 rev.14 (ASTM A370-20, 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

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Please send your comments and concerns to us at [feedback@spectrochemicalinc.com](mailto:feedback@spectrochemicalinc.com)

For more information call: 724-334-4140

Respectfully submitted,



Todd A. Ault

Laboratory Manager