



# Farabaugh Engineering and Testing Inc.

Project No. T269-21

Report Date: November 5, 2021

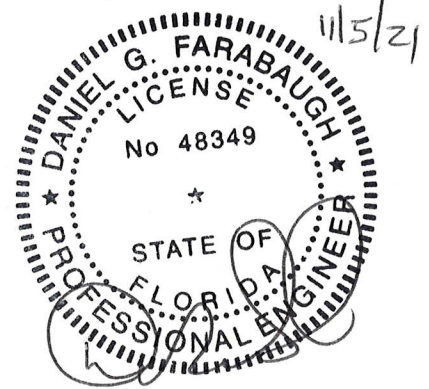
No. Pages: 18 (inclusive)

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

MODULARAL METAL PANEL  
3" DEEP X 30" WIDE COVERAGE X 0.080" ALUMINUM

FOR

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



Prepared by:

Paul G. Farabaugh

Approved by:

Daniel G. Farabaugh

**DANIEL G. FARABAUGH, P.E.**  
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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 Date**

10/26/21     Span @ 30" o.c.

**Test Specimen**

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

Test Specimen:      ModularAL Metal Panel, - 3" Deep x 30" wide coverage x 0.080" alum.  
                              (See Dwg A206 for actual dimension)

**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 panel support consisted of 16 ga. Zee supports attached to 16 ga. channel supports using #12 x 1" long wafer-head self -drilling screws. The channel supports were located at 24" o.c.
- A starter clip was attached to the Zee support using #12 x 1" lg. wafer-head, self-drilling screws. A minimum of two fasteners per starter clip or 12" o.c max. spacing per clip based on length of clip.
- The starter panel engaged into a starter clip and was top-fastened with #12 x 1" lg. Stainless Steel Cap head w/EPDM Sealing washer fasteners at the predrilled holes spaced at 12" o.c.
- The vertical edge of the panel had two (2) clips to attach that edge to the 16 ga. horizontal Zee supports using (1) #12 x 1" lg. wafer-head, self-drilling screws at each clip.
- See installation details for location of fasteners at supports and attachment of each panel.
- 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.

## TEST #1

Test Specimen:

ModularAL Metal Panel - 3" Deep x 30" wide coverage x 0.080" aluminum

Support Spacing: 30" o/c

### NEGATIVE (UPLIFT) PRESSURE

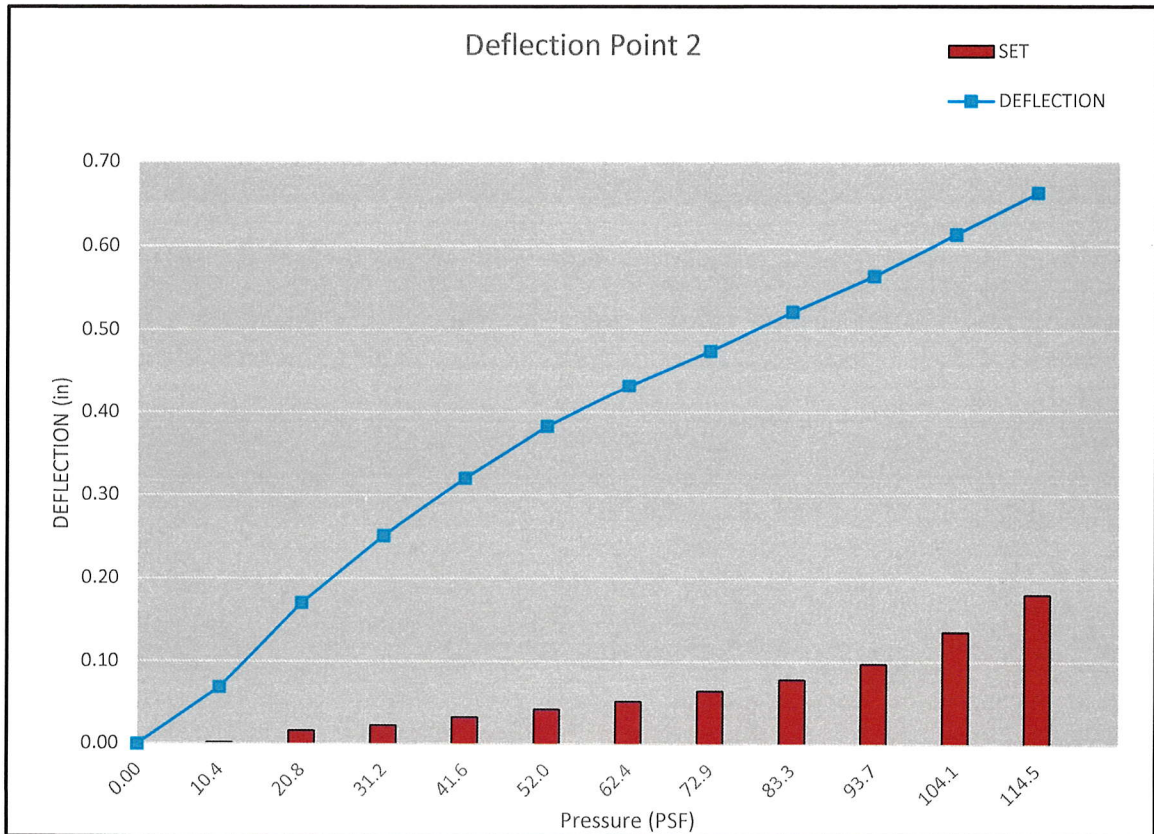
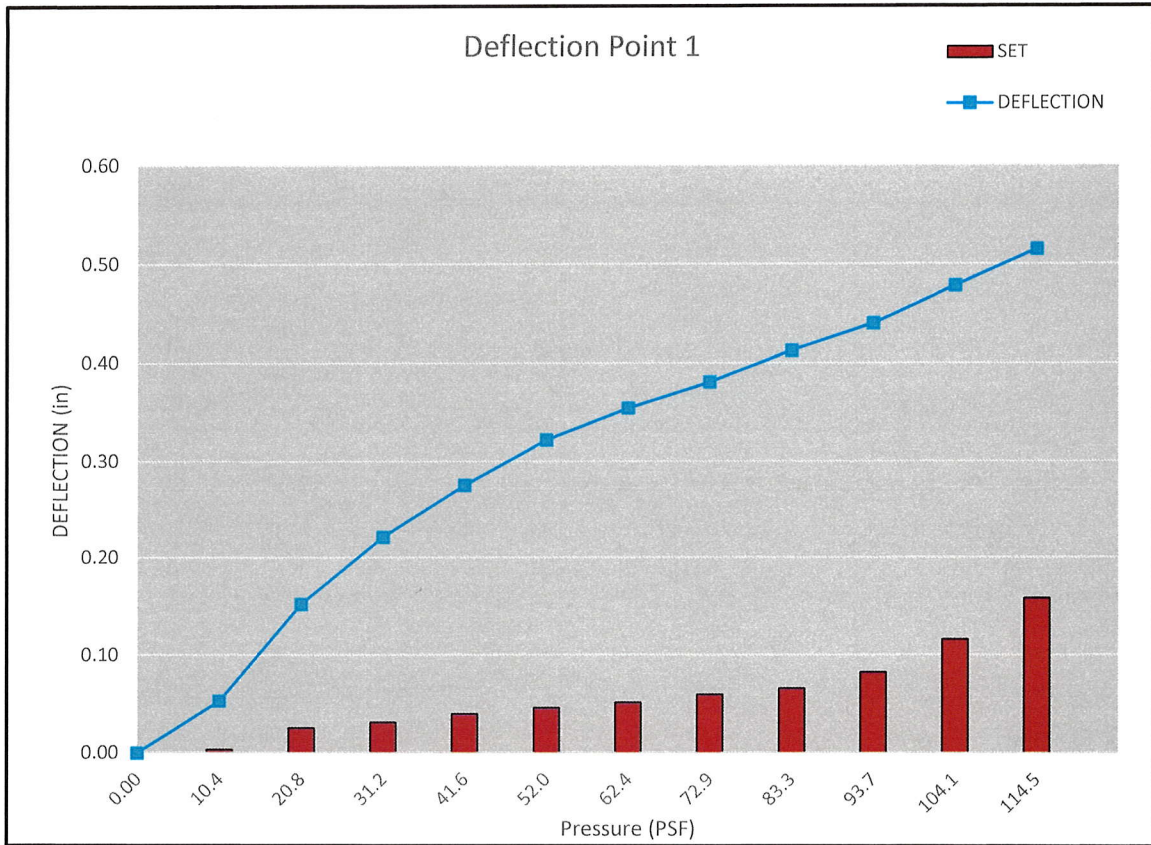
Load Pressure (in-h20)	Load Pressure (psf)	Deflection #1 (in)	Deflection #2 (in)	Deflection #3 (in)	Deflection #4 (in)	Deflection #5 (in)	Deflection #6 (in)
0	0	0	0	0	0	0	0
2	10.4	0.053	0.068	0.088	0.089	0.046	0.046
0	0.0	0.003	0.002	0.001	0.002	0.003	0.003
4	20.8	0.152	0.171	0.149	0.178	0.126	0.135
0	0.0	0.025	0.016	0.001	0.002	0.026	0.033
6	31.2	0.221	0.251	0.197	0.257	0.202	0.218
0	0.0	0.031	0.022	0.002	0.006	0.040	0.058
8	41.6	0.275	0.320	0.235	0.327	0.267	0.290
0	0.0	0.040	0.033	0.006	0.020	0.052	0.079
10	52.0	0.322	0.383	0.265	0.391	0.327	0.357
0	0.0	0.046	0.042	0.021	0.036	0.060	0.093
12	62.4	0.355	0.433	0.286	0.444	0.375	0.409
0	0.0	0.052	0.052	0.037	0.051	0.070	0.108
14	72.9	0.381	0.475	0.304	0.489	0.407	0.443
0	0.0	0.060	0.064	0.054	0.071	0.075	0.119
16	83.3	0.413	0.522	0.320	0.538	0.436	0.473
0	0.0	0.066	0.078	0.071	0.096	0.078	0.128
18	93.7	0.440	0.565	0.335	0.583	0.465	0.502
0	0.0	0.083	0.098	0.090	0.123	0.100	0.151
20	104.1	0.478	0.614	0.365	0.668	0.511	0.547
0	0.0	0.116	0.136	0.132	0.169	0.145	0.210
22	114.5	0.515	0.663	0.392	0.726	0.564	0.599
0	0.0	0.158	0.181	0.180	0.224	0.194	0.256

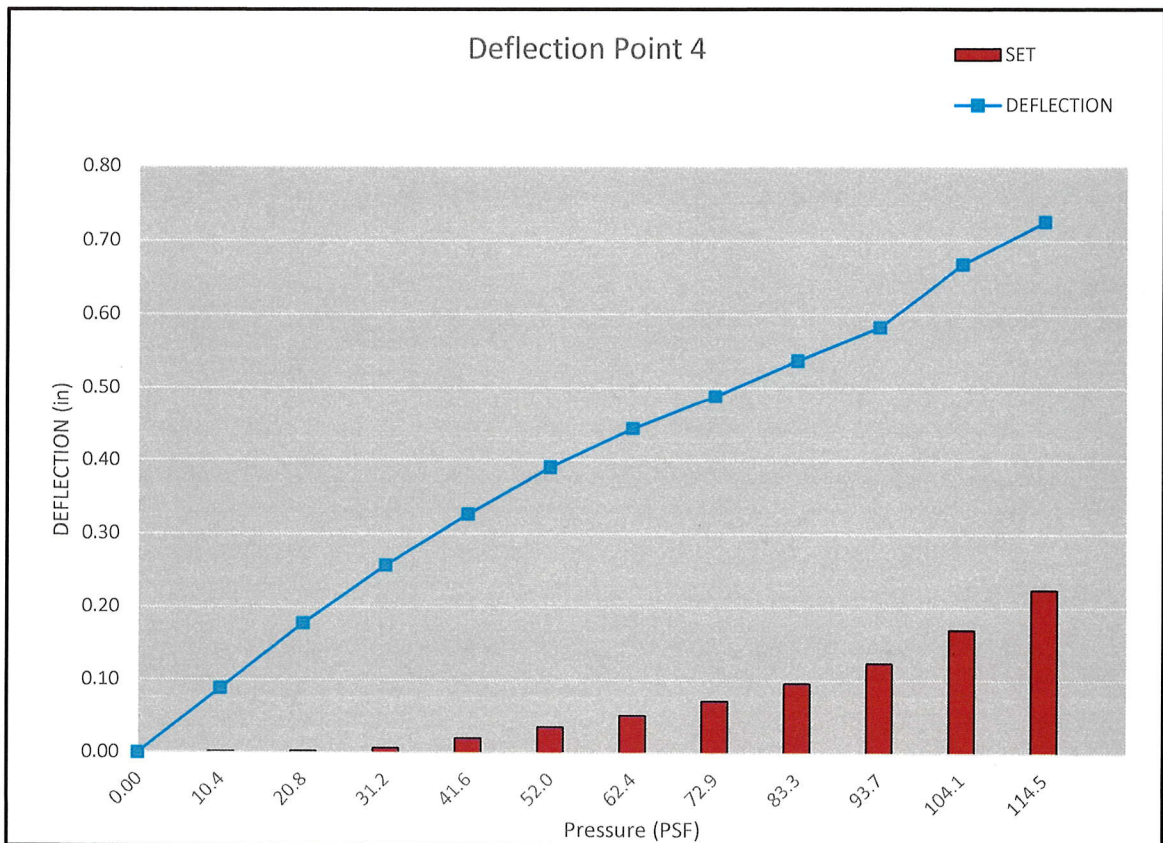
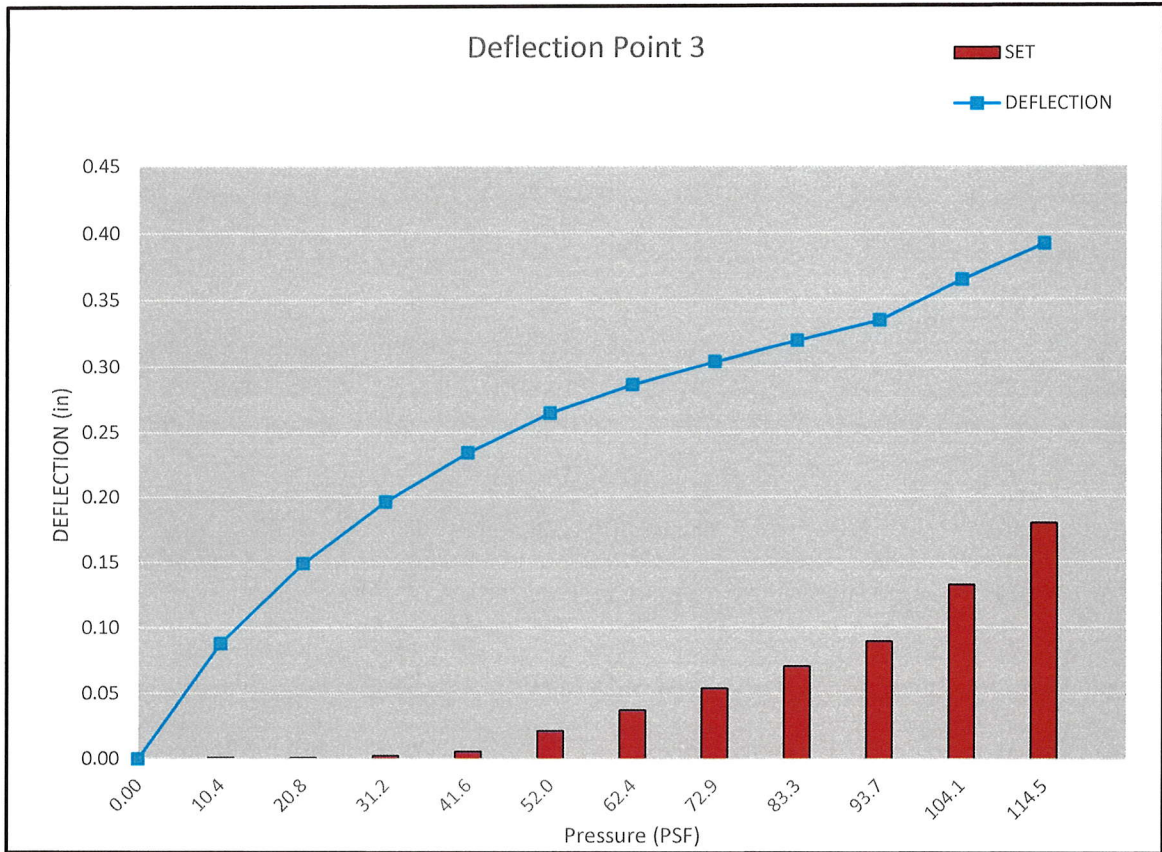
**RESULTS:**

Load held for 1 minute = 114.5 psf

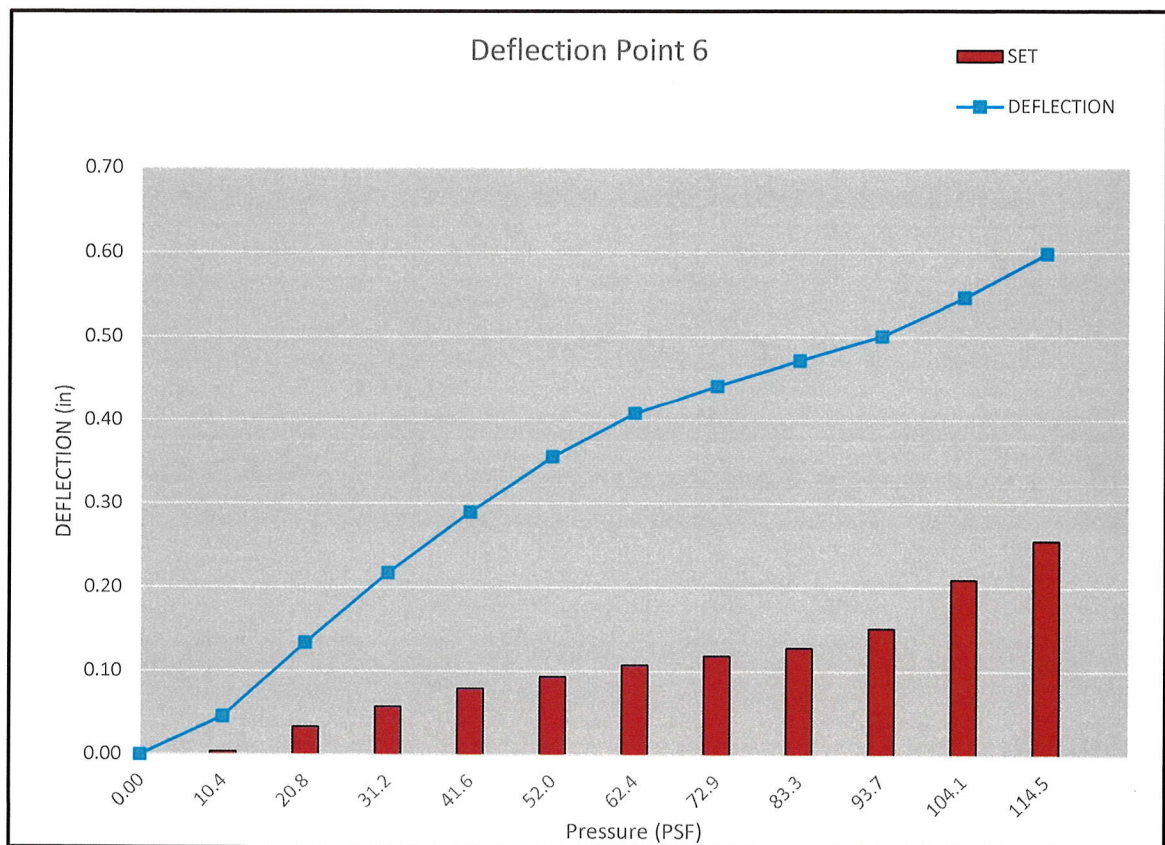
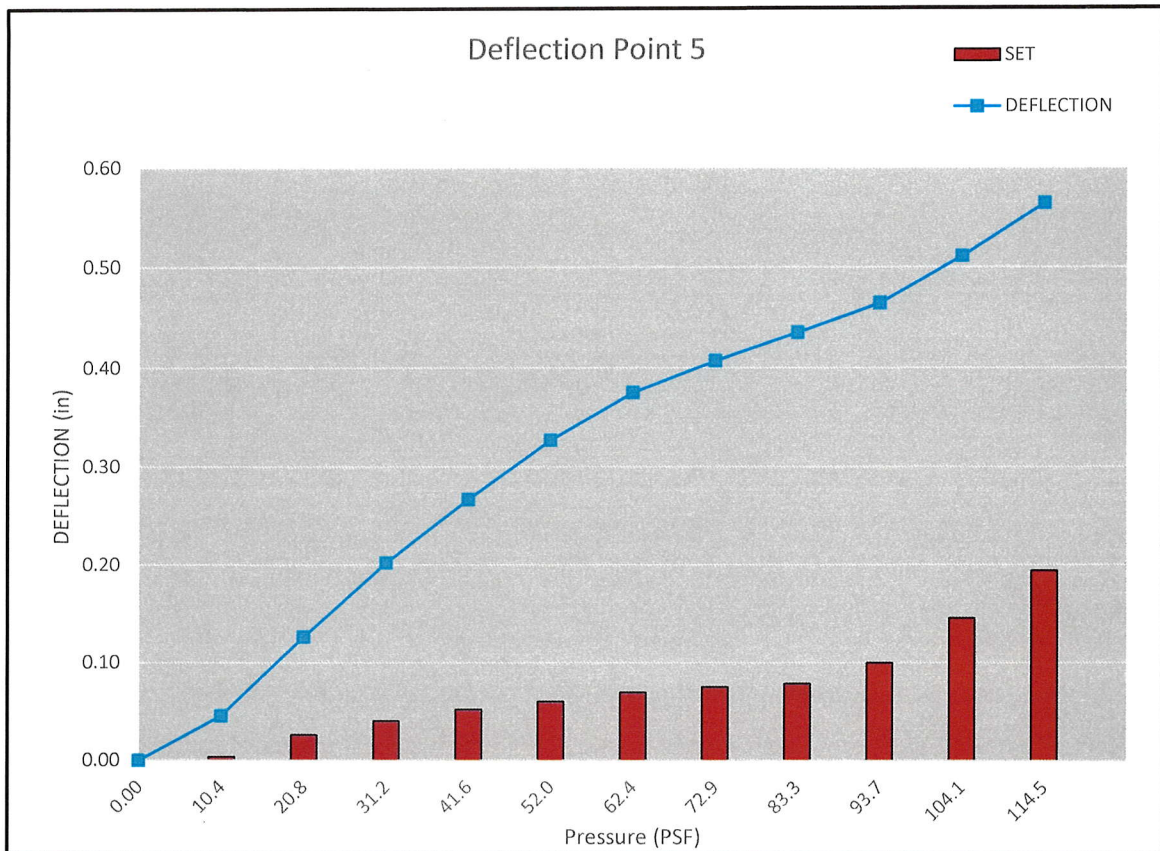
Maximum Test Load = 116.4 psf (Zee support fastener pulled out of 16 ga. lower supports)



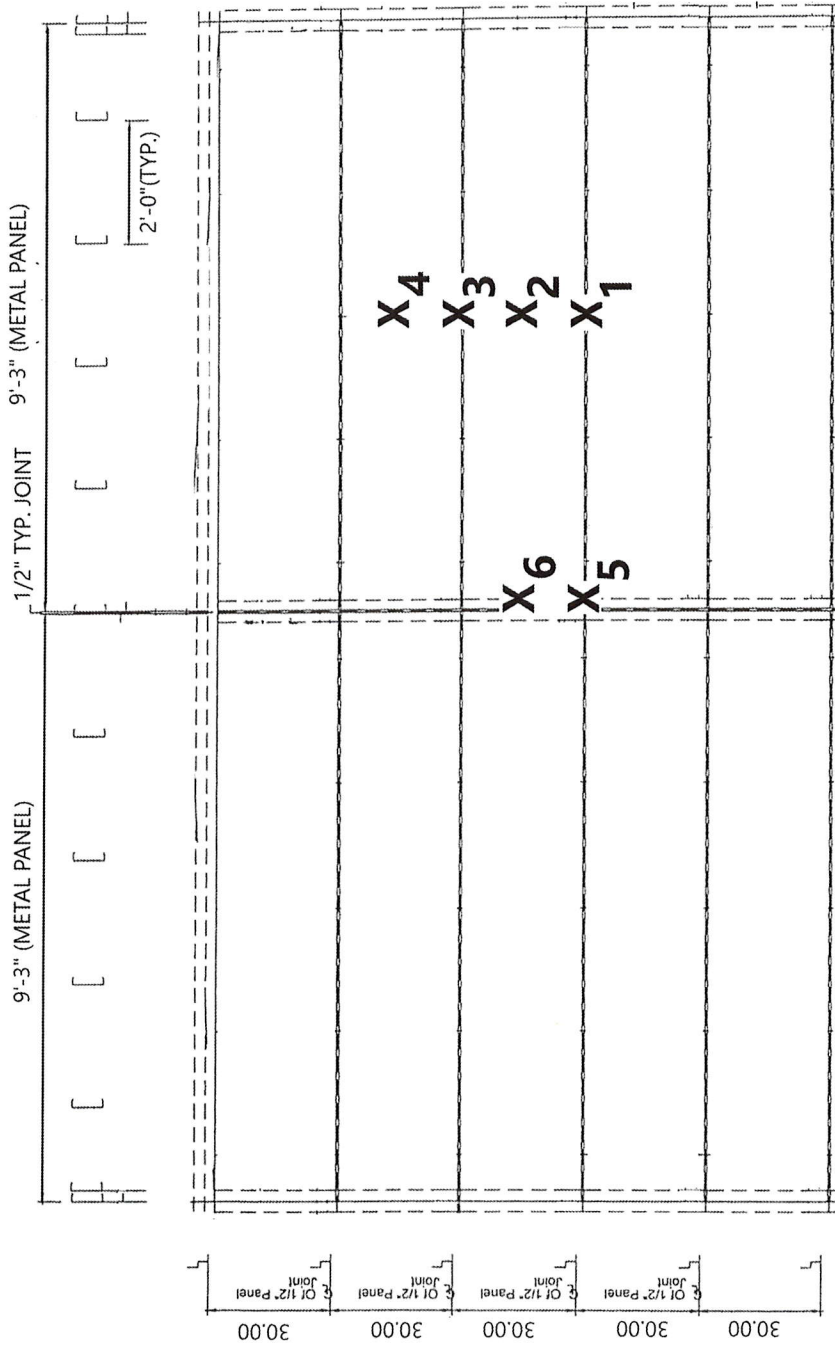








# TEST #1

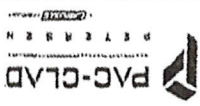


E1592 Test Chamber Layout .080 Metal Panel  
Scale: 1" = 1'-0"

X# - DEFLECTION  
LOCATION

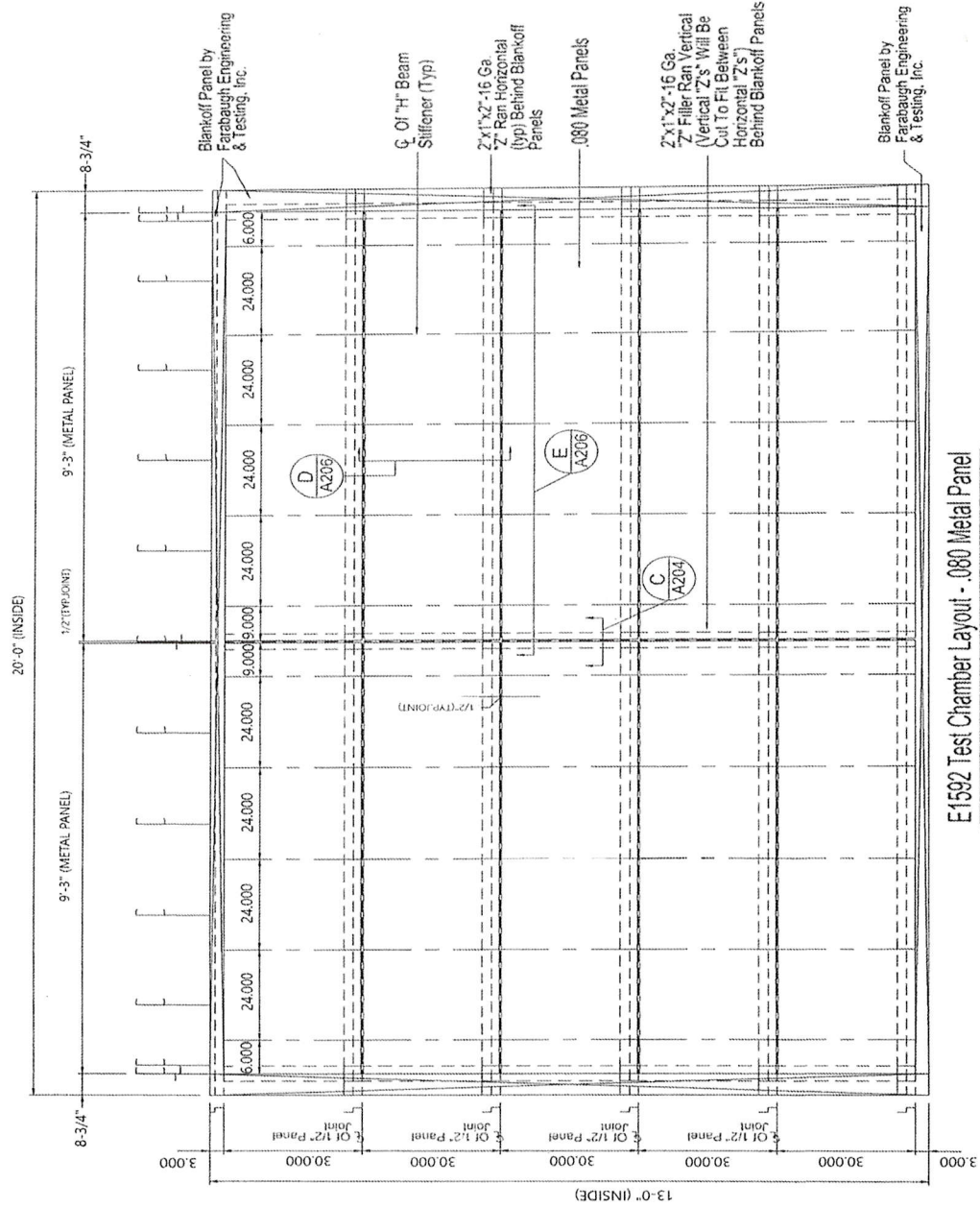
## PLAN VIEW





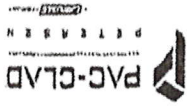
Profile: Modular 3" PANEL

A200



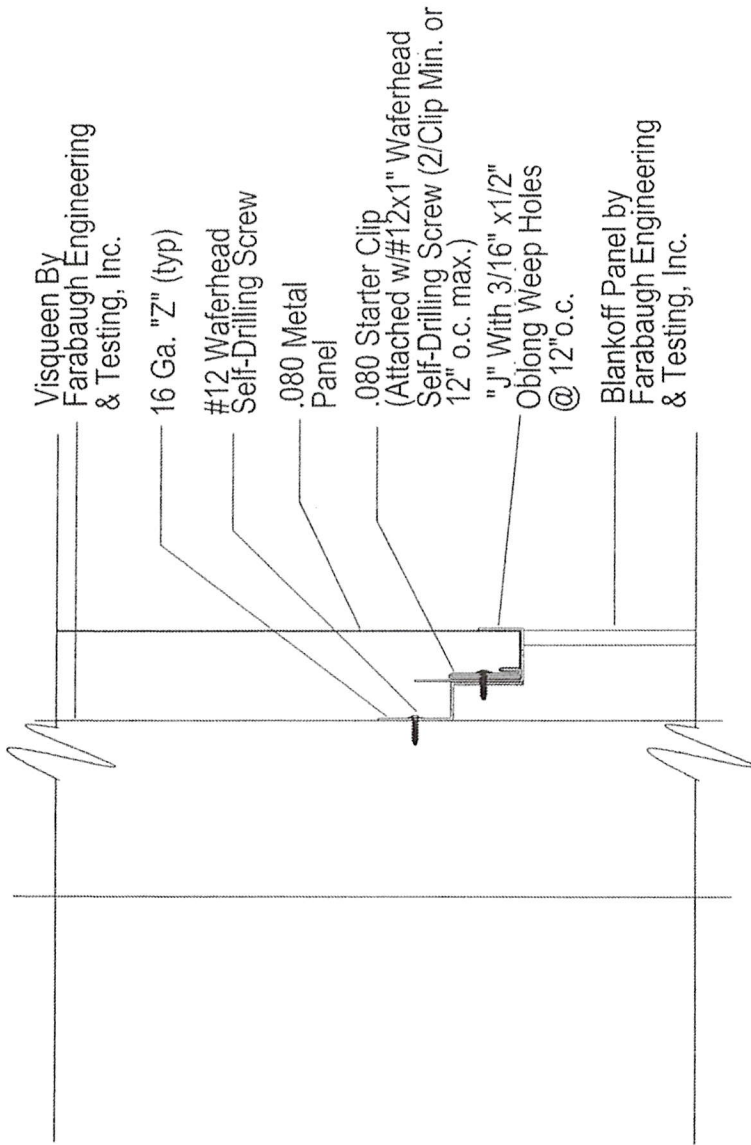
E1592 Test Chamber Layout - .080 Metal Panel  
Scale: 1" = 1'-0"





Profile: Modular 3" PANEL

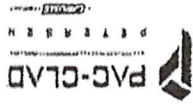
A202



# Enlarged Detail

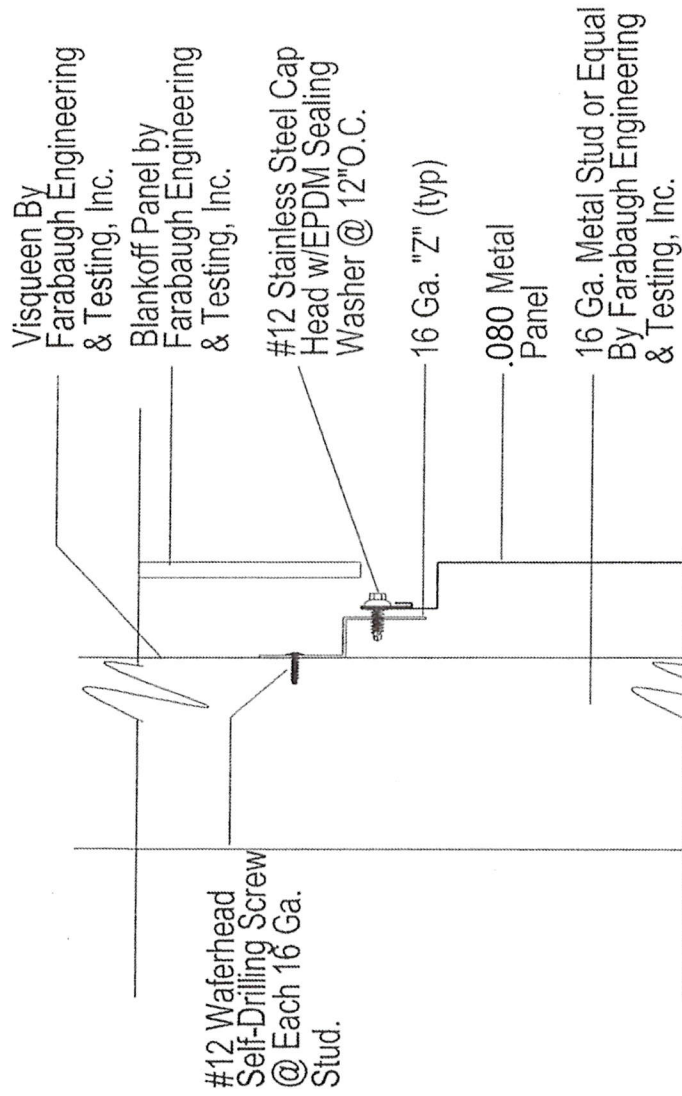
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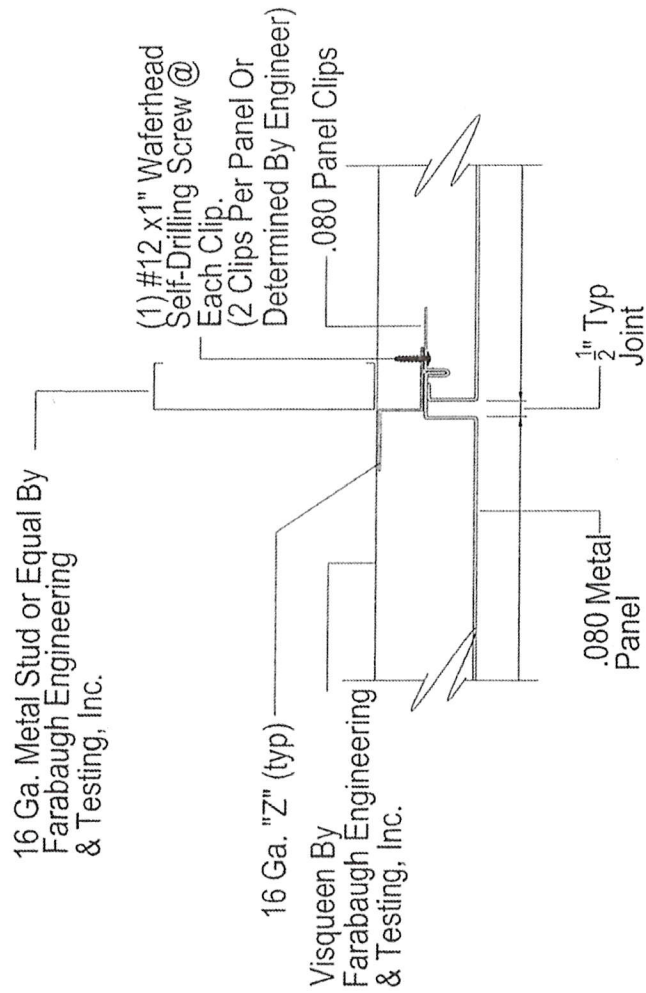


Profile: ModularAL 3" PANEL

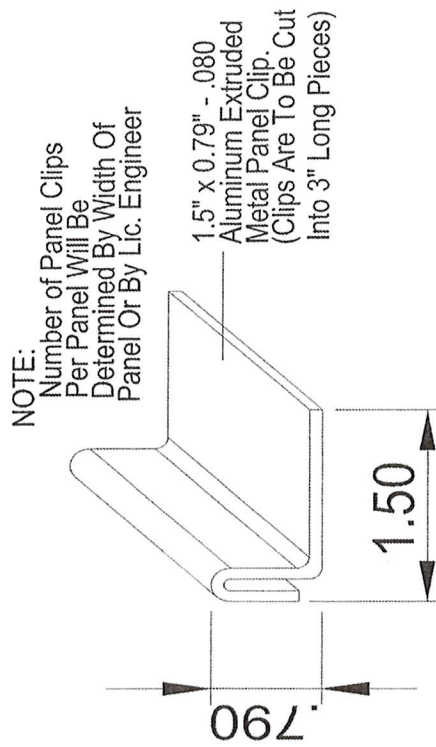
A203



# B Enlarged Detail

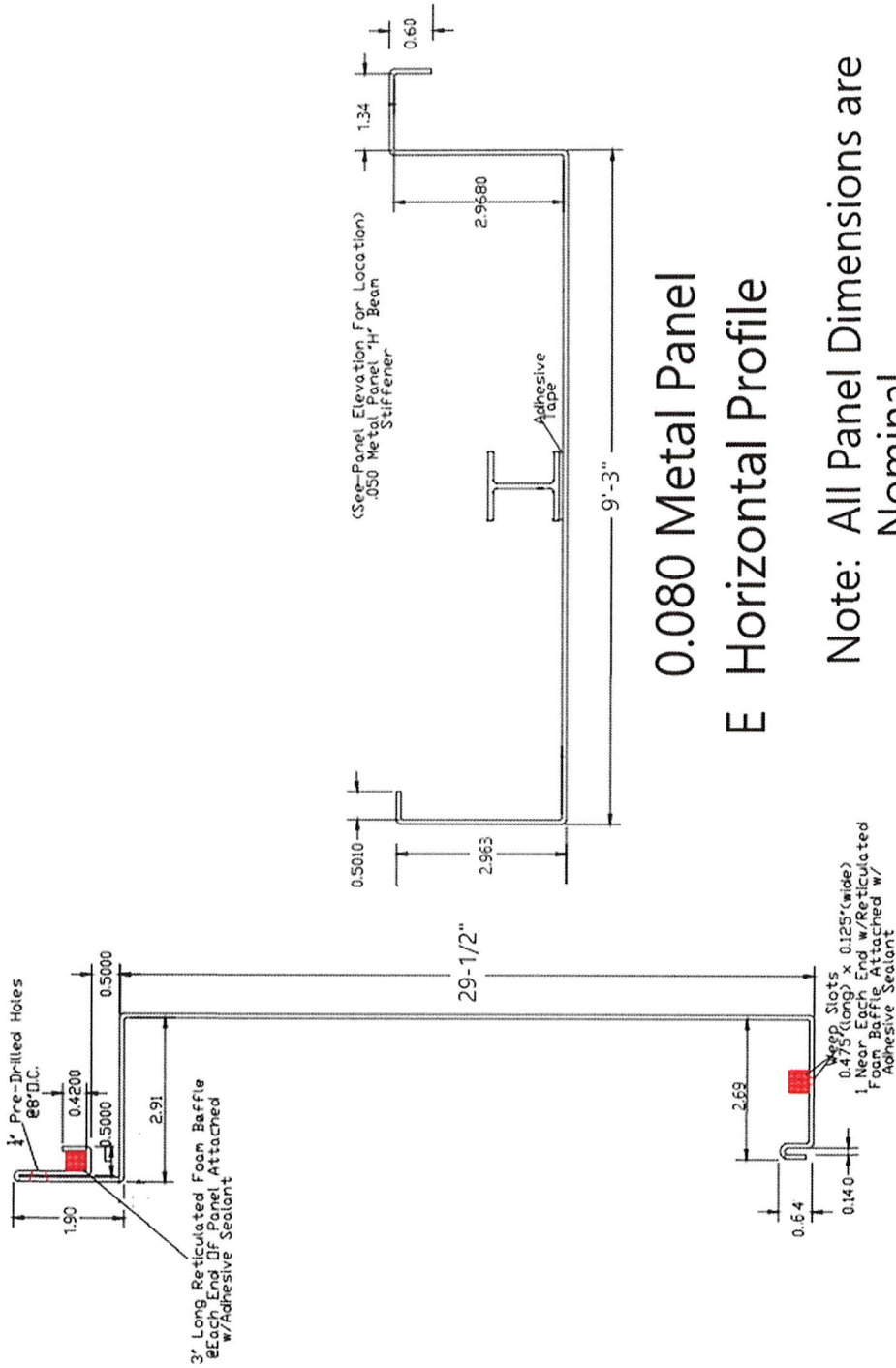


# C Enlarged Detail



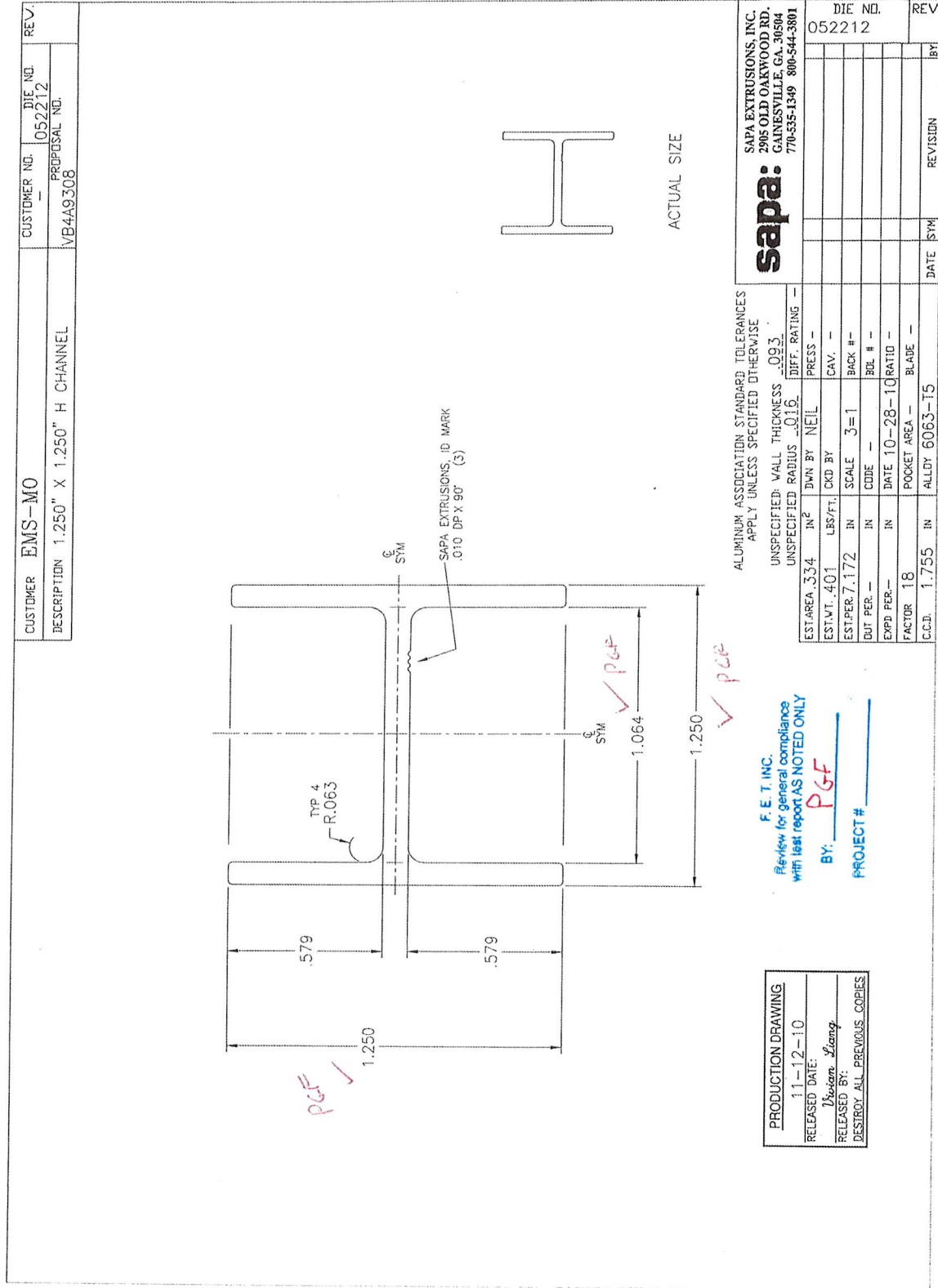
# Enlarged Detail



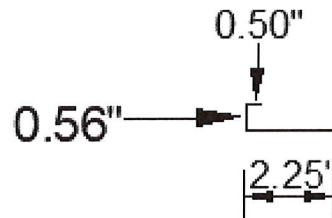


0.080 Metal Panel  
E Horizontal Profile

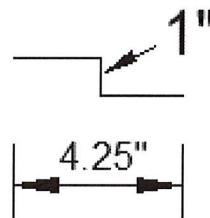
0.080 Metal Panel  
D Vertical Profile



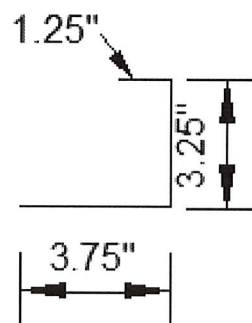
## ADDITIONAL SUPPORT AND TRIM EXTRUSIONS



0.080" ALUM.  
STARTER CLIP



16 GA. ZEE SUPPORT



0.080" ALUM. "J" TRIM  
(TESTING PURPOSES ONLY)



**Spectrochemical Laboratories-Material Evaluation, Inc.**

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

Date: 05-Nov-21  
 Page No.: 1 of 1

**Report of Tensile Testing**

Client: Farabaugh Engineering & Testing (PO #: Verbal - Pat Farabaugh)

PIN #	Dimensions (in.)	Area (sq. in.)	Yield Point (lb.)	Tensile Strength (lb.)	Yield Strength (psi.)	Tensile Strength (psi.)	Elongation (% in 2 in.)	Fracture location
PAC 0080"	0.4955 x 0.0770	0.0382	797	843	20900	22100	7.3	U/4 Break

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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 For more information call: 724-334-4140

Respectfully submitted,



Todd A. Ault  
 Laboratory Manager