



Farabaugh Engineering and Testing, Inc.

Project No. T126-98

Report Date: March 19, 1998

ASTM 1592
STANDARD TEST METHOD FOR
STRUCTURAL PERFORMANCE OF SHEET METAL ROOF AND SIDING
SYSTEMS BY UNIFORM STATIC AIR PRESSURE DIFFERENCE

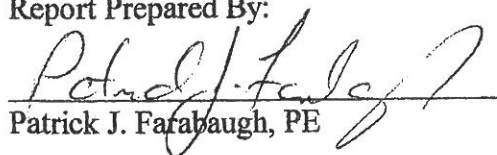
BEMO 400 PANEL
0.039 ALUM / 16" WIDE
WITH HALTER

FOR

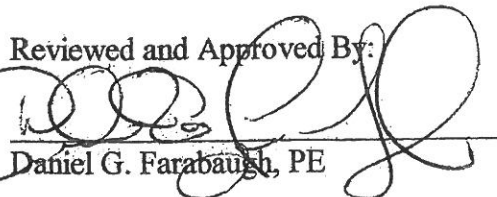


CORPORATE HEADQUARTERS
3062 N. MAPLE ST.
MESA, AZ USA 85215
480-545-7900

Report Prepared By:


Patrick J. Farabaugh, PE

Reviewed and Approved By:


Daniel G. Farabaugh, PE

Project No. T126-98

ASTM 1592
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

March 17, 1998 (3 Spans @ 5' oc.)

March 19, 1998 (7 Spans @ 2' oc.)

Test Specimen

Manufacturer: Bemo USA
3062 N. Maple Street
Mesa, AZ 85215

Panel: 0.039 Alum. BEMO 400 Standing Seam Panel 16" Wide

Clip: 4-3/4" Alum. Halter Clip

Panel Length: as shown

Testing Apparatus

Test Chamber: Vacuum Chamber Composed of Wood

Mounting Frame: 16 ga Hat Shape Subgirts fastened to W6 X 15 Wide Flange Beams

Pressure Indicator: Digital Pressure Indicator from Micro-Pneumatic Logic, Inc. with accuracy to one tenth of an inch and traceable to the National Bureau of Standards

Deflection Dials: Dial Indicators from Starrett, Fowler, CDI and Teclock with accuracy to 0.001 of an inch, certified by Do-All Gage Block #6125 traceable to the National Bureau of Standards.

Installation

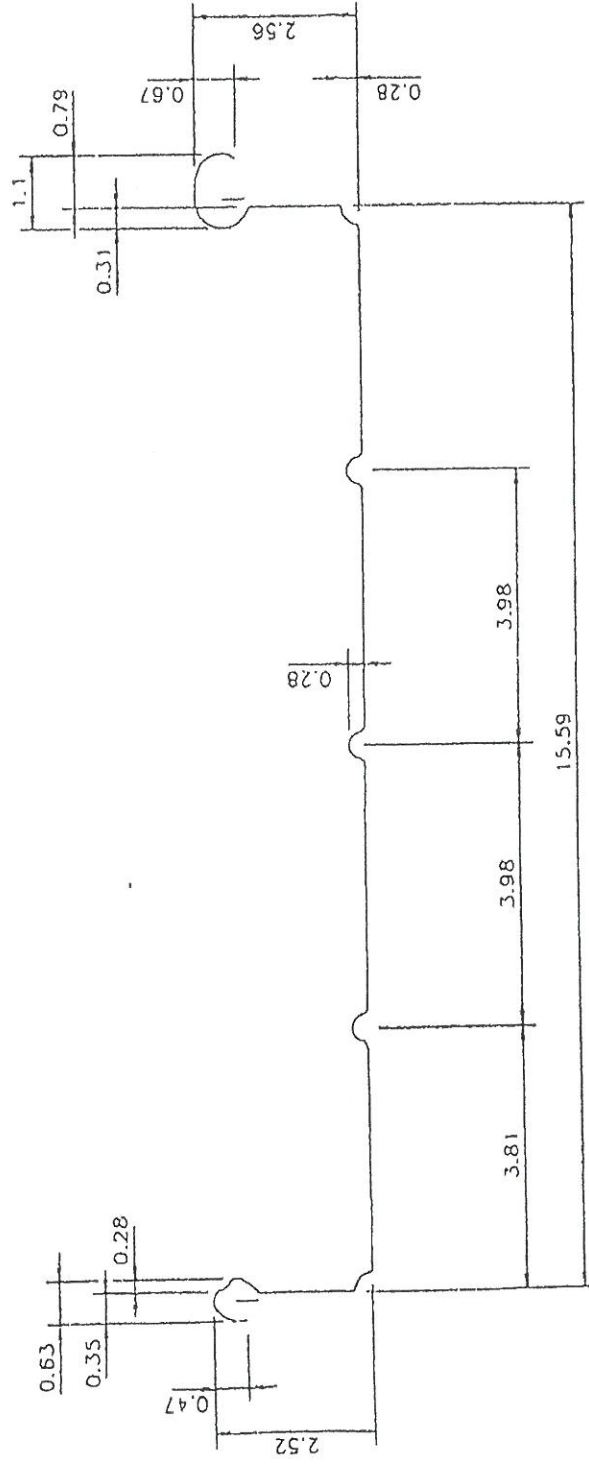
- The panels were installed with clips onto 16 ga Hat shape Subgirts using (2) #14 Tek fasteners per clip. The side joints consisted of the female rib interlocking with the male rib and mechanically seamed. Continuity fasteners were located at the interlocking joints at panel ends.
- The system was inverted and attached to the steel beams with #14 tek fasteners and C-Clamps.
- 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 devices 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-1592-94 and as noted herein. In our opinion the tape and plastic had no influence on the results of the test.

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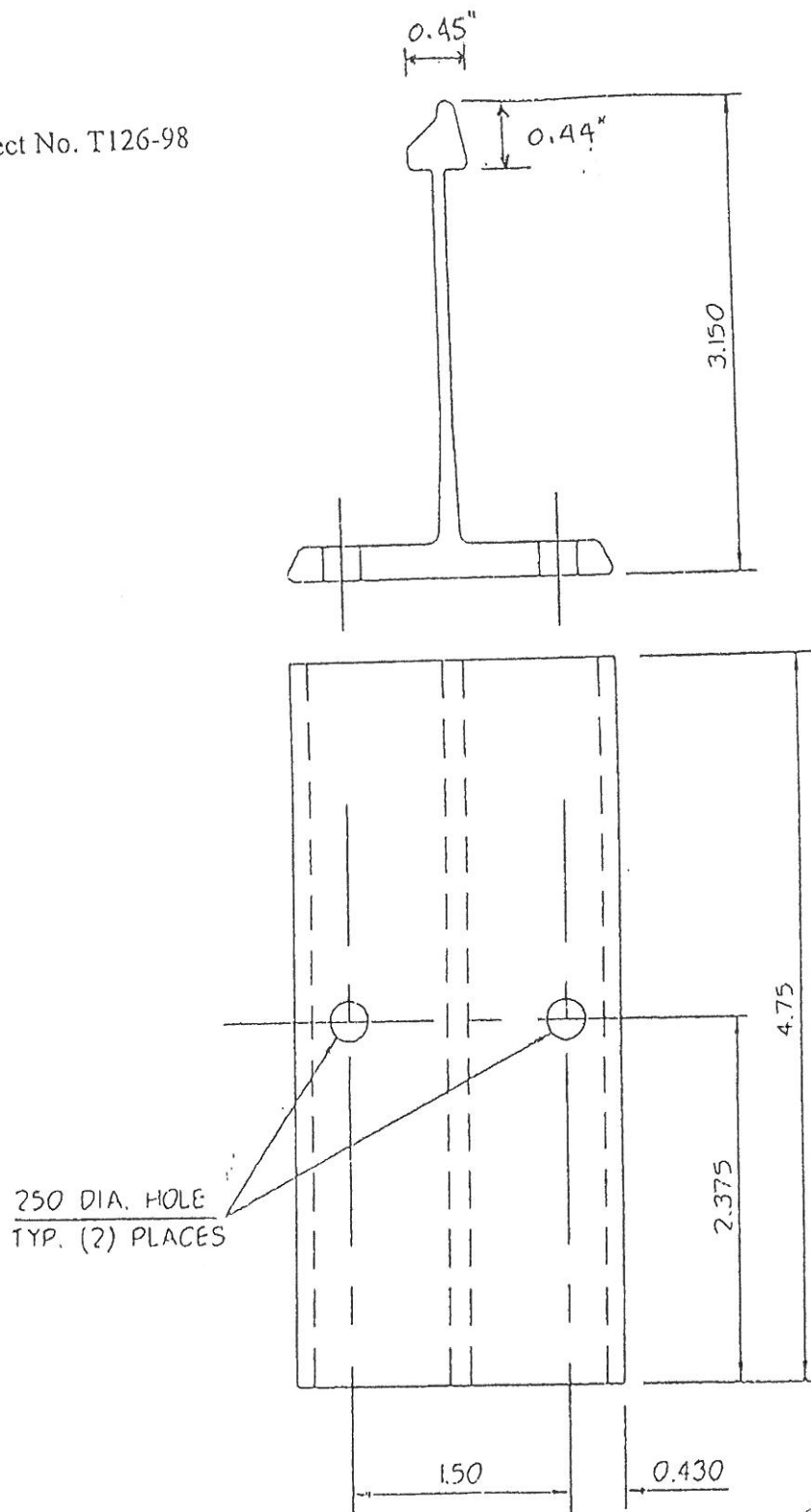
BEMO 400 PANEL



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6/16/97

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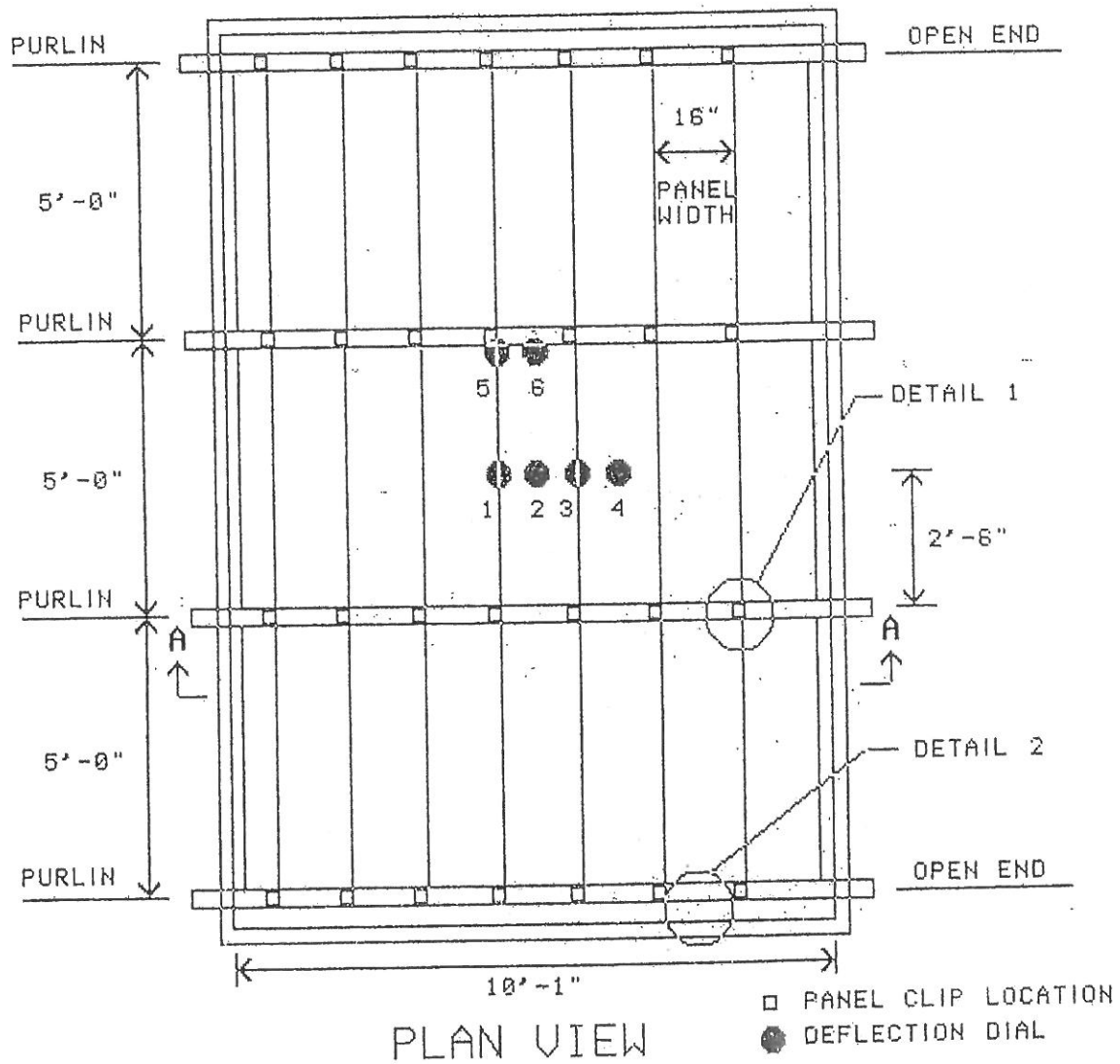


NOTES: MAT'L: 6063 AL OR EQUIVALENT

BEMO HALTER, 4.75

3/12/98

BEMO-USA
Xtreme Roofing Solutions
CORPORATE HEADQUARTERS
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MESA, AZ USA 85215
480-545-7900

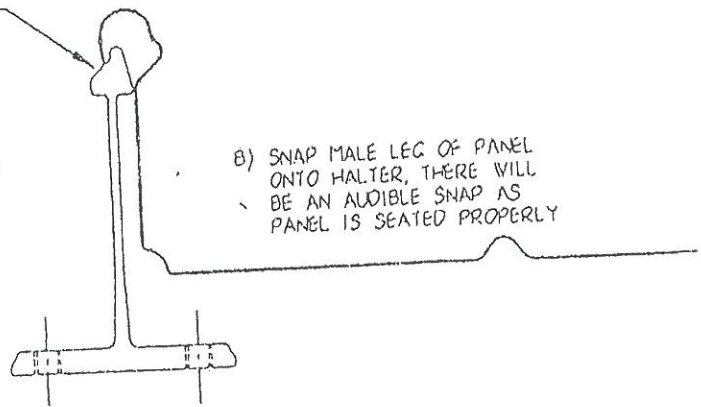


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NOTE: SLOPING PORTION OF HALTER
BULB IS FACING AWAY FROM
THE PANEL AS IT IS SNAPPED
INTO PLACE.

A) ATTACH 4 3/4" LONG HALTER TO
HAT CHANNEL W/ 2 #14 HHVH
TEK SCREWS

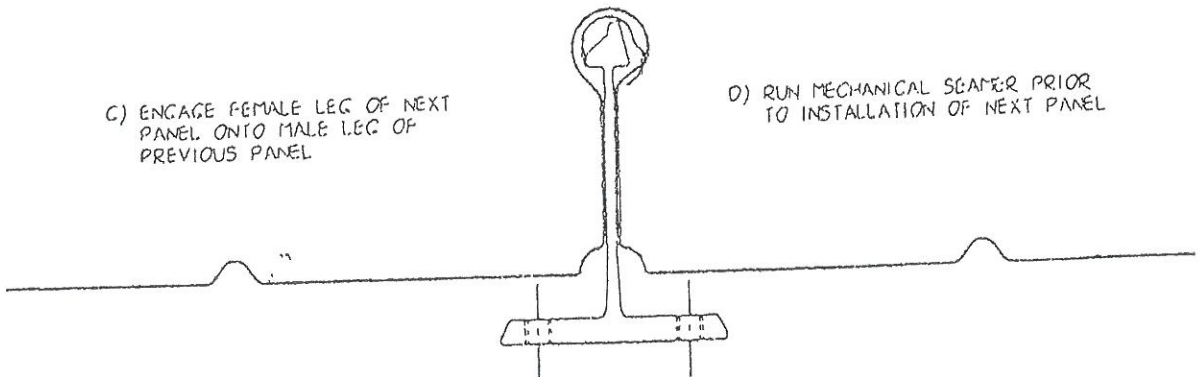
B) SNAP MALE LEG OF PANEL
ONTO HALTER, THERE WILL
BE AN AUDIBLE SNAP AS
PANEL IS SEATED PROPERLY



STEP ONE

C) ENGAGE FEMALE LEG OF NEXT
PANEL ONTO MALE LEG OF
PREVIOUS PANEL

D) RUN MECHANICAL SCAMER PRIOR
TO INSTALLATION OF NEXT PANEL



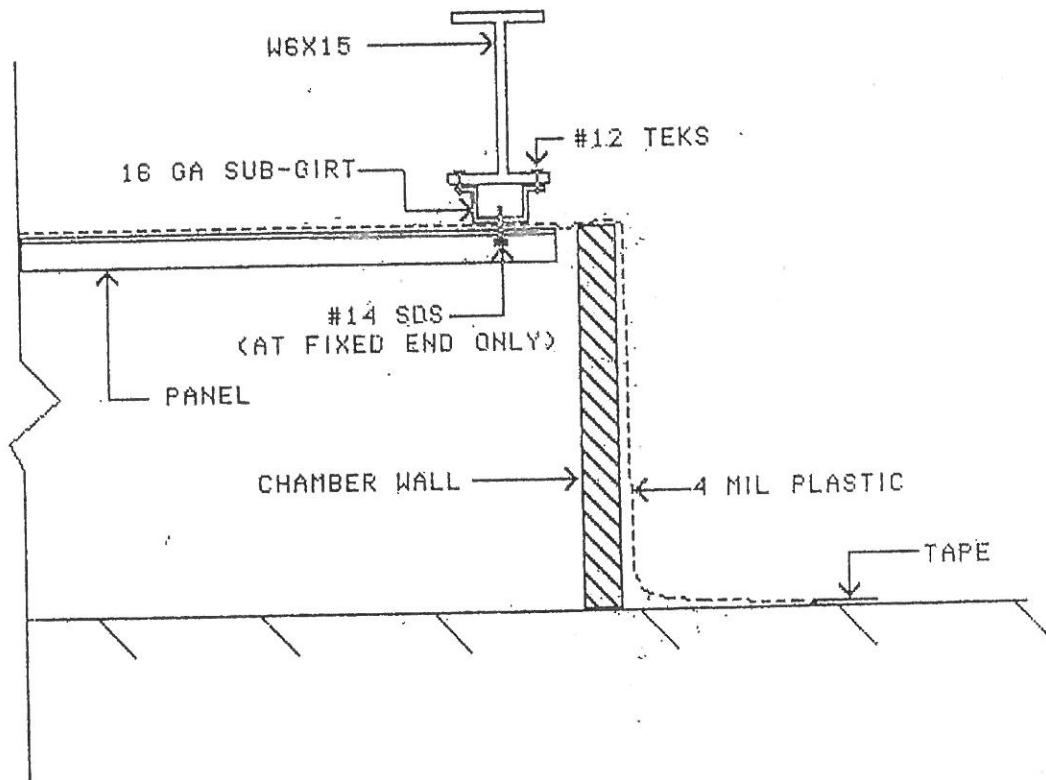
STEP TWO

DETAIL 1



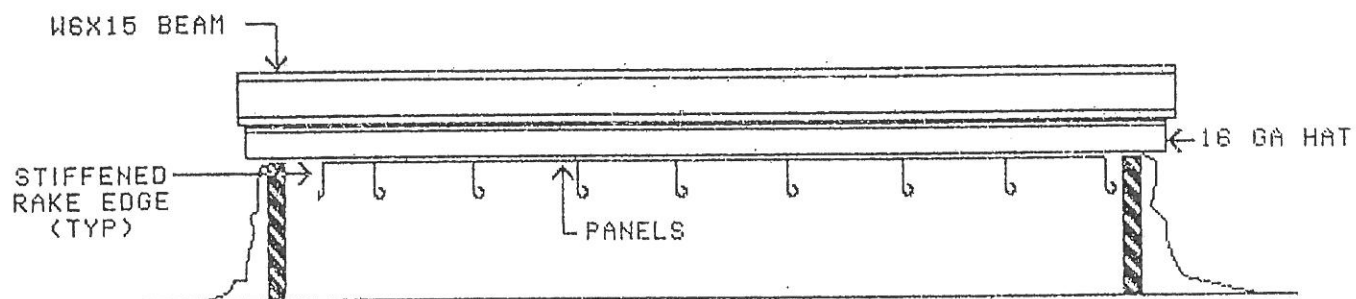
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DETAIL 2

Project No. T126-98

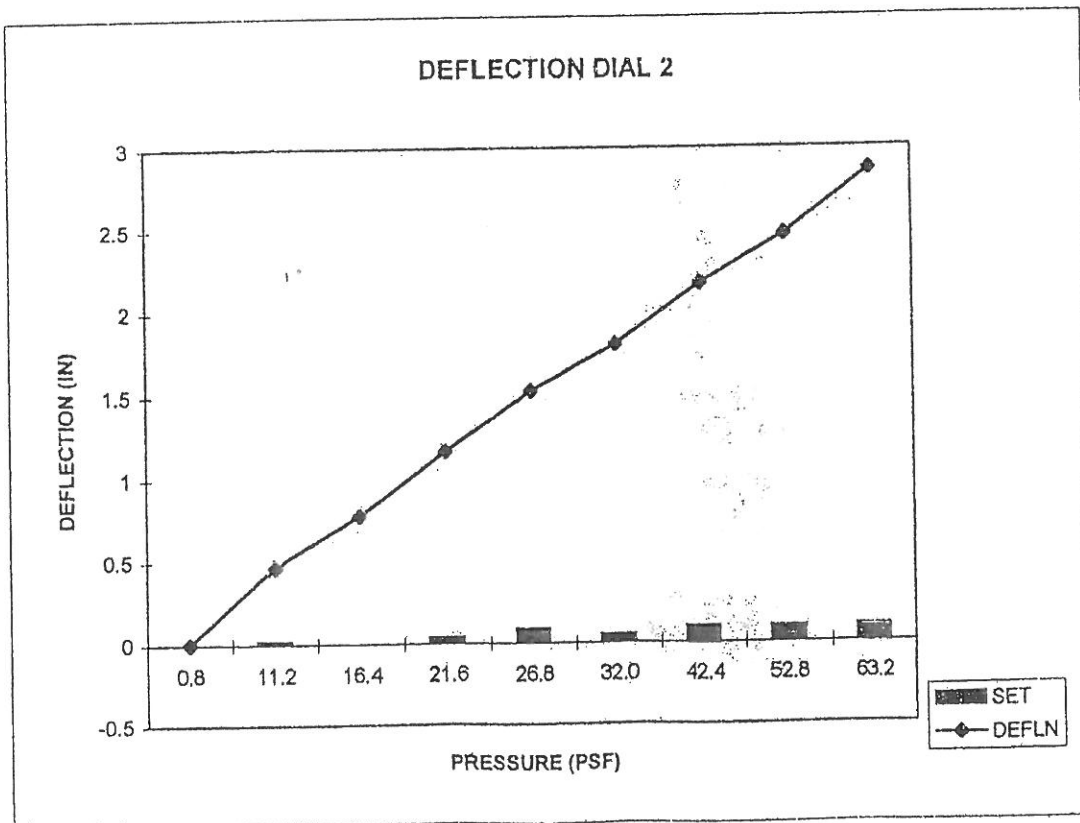
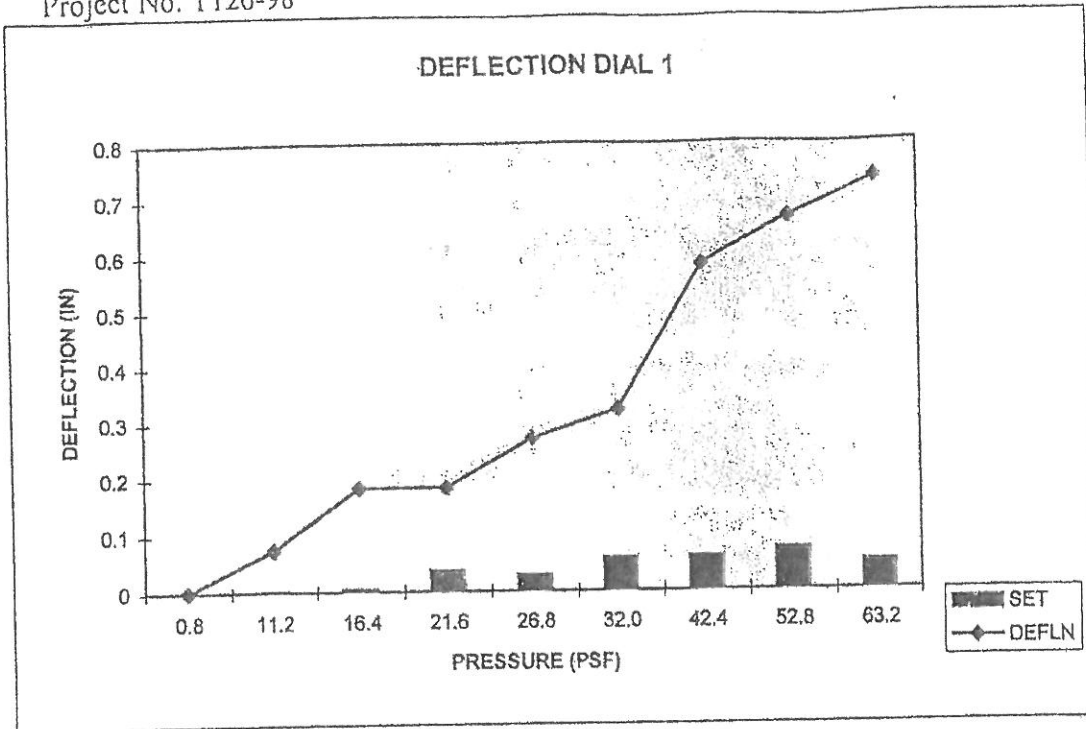


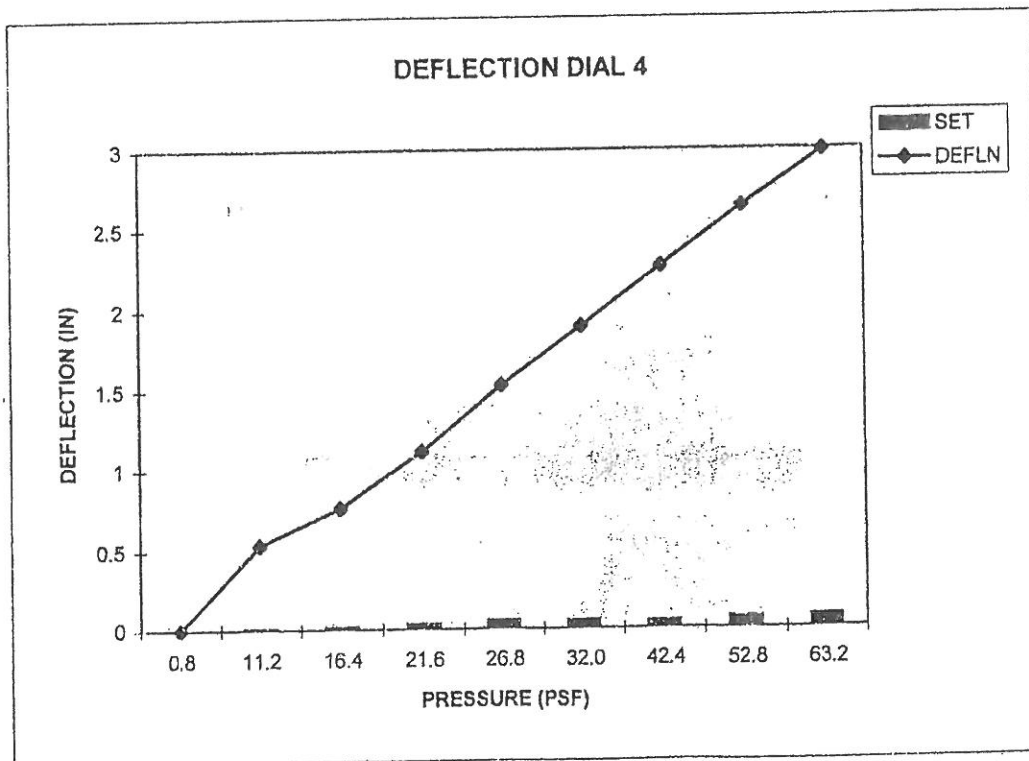
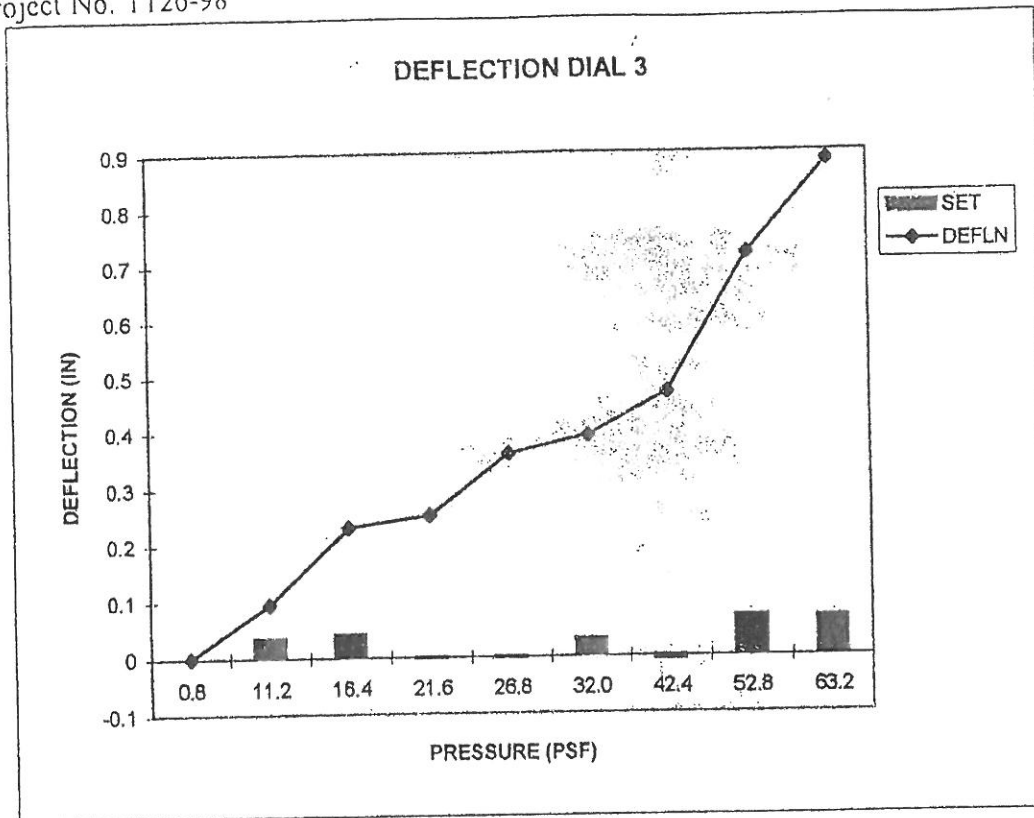
SECTION A-A

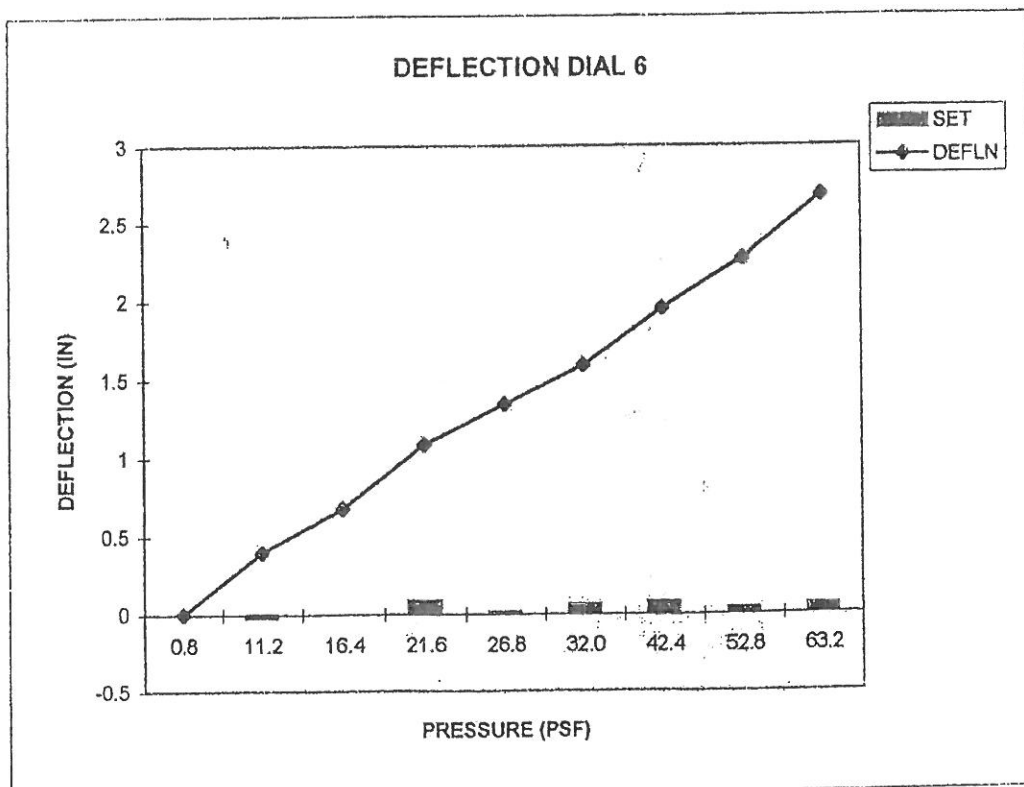
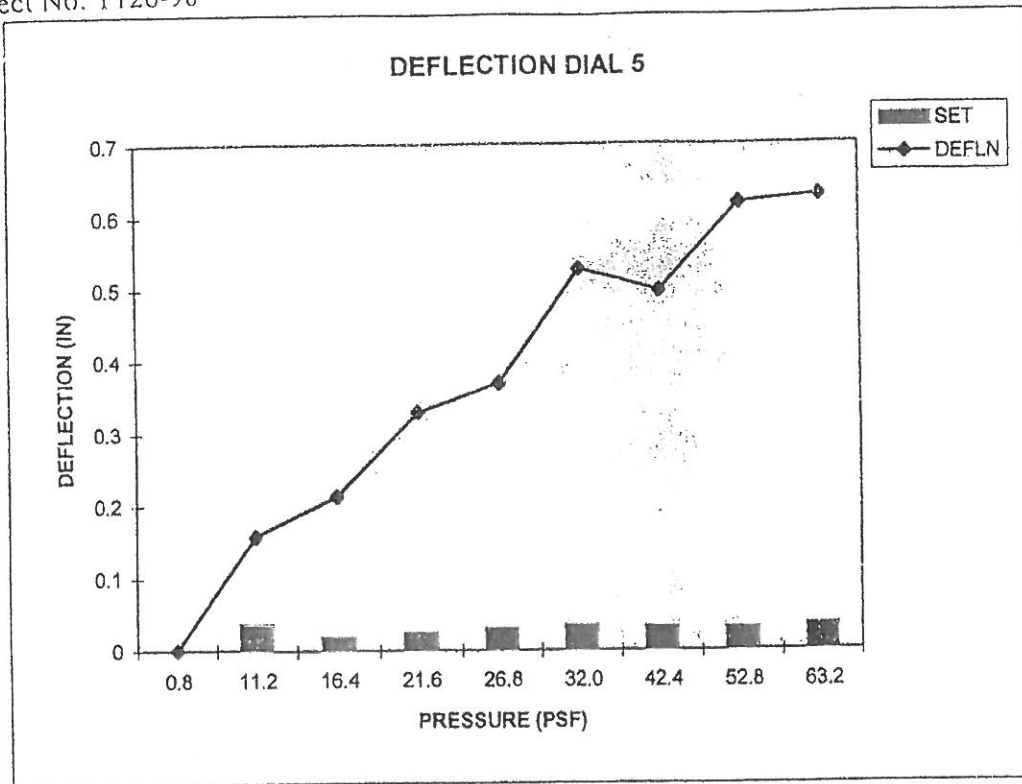
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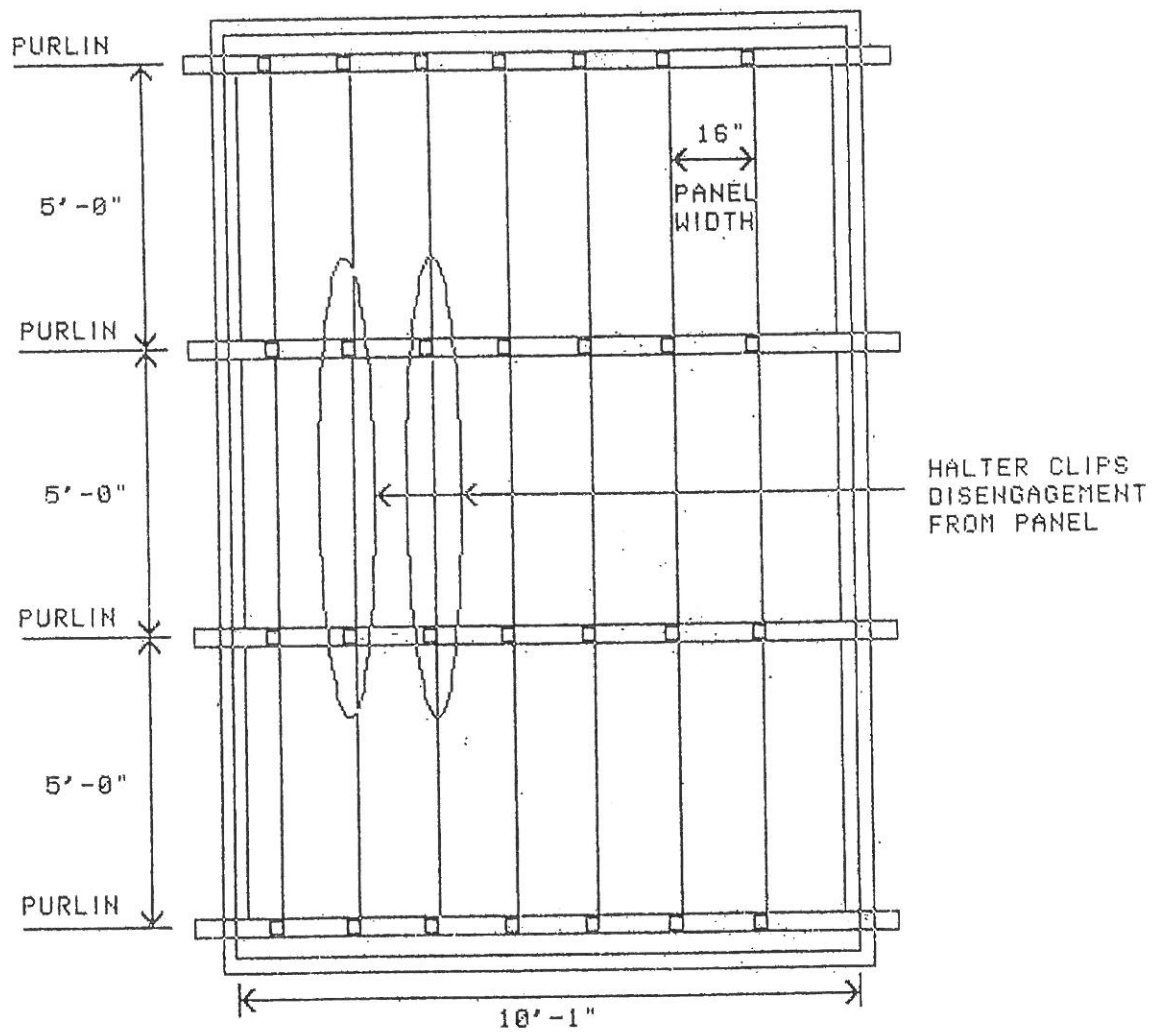
TEST DATA FOR 16" BEMO 0.039 ALUM. W/4-3/4" HALTER 3 SPANS @ 5'							
DEFLECTION DIAL READINGS (INCHES)							REMARKS
LOAD (PSF)	DIAL 1	DIAL 2	DIAL 3	DIAL 4	DIAL 5	DIAL 6	
0.8	0	0	0	0	0	0	PANEL WT.
11.2	0.074	0.47	0.094	0.537	0.157	0.4	
0.8	0.001	0.013	0.036	0.01	0.036	-0.024	PANEL WT.
16.4	0.183	0.772	0.23	0.764	0.212	0.674	
0.8	0.005	-0.001	0.041	0.018	0.018	0	PANEL WT.
21.6	0.183	1.166	0.25	1.117	0.329	1.083	
0.8	0.037	0.032	-0.004	0.033	0.024	0.083	PANEL WT.
26.8	0.27	1.524	0.359	1.528	0.368	1.343	
0.8	0.029	0.087	-0.004	0.052	0.03	0.01	PANEL WT.
32.0	0.321	1.801	0.391	1.892	0.527	1.591	
0.8	0.058	0.046	0.031	0.055	0.034	0.058	PANEL WT.
42.4	0.581	2.169	0.468	2.263	0.497	1.951	
0.8	0.06	0.092	-0.008	0.044	0.032	0.075	PANEL WT.
52.8	0.667	2.472	0.718	2.639	0.618	2.268	
0.8	0.072	0.092	0.07	0.069	0.031	0.031	PANEL WT.
63.2	0.735	2.862	0.884	2.989	0.628	2.678	
0.8	0.049	0.097	0.068	0.078	0.035	0.056	PANEL WT.
73.6							HALTER CLIP DISENGAGEMENT

NOTE: SEE SKETCH 1 FOR LOCATION OF HALTER CLIP DISENGAGEMENT.

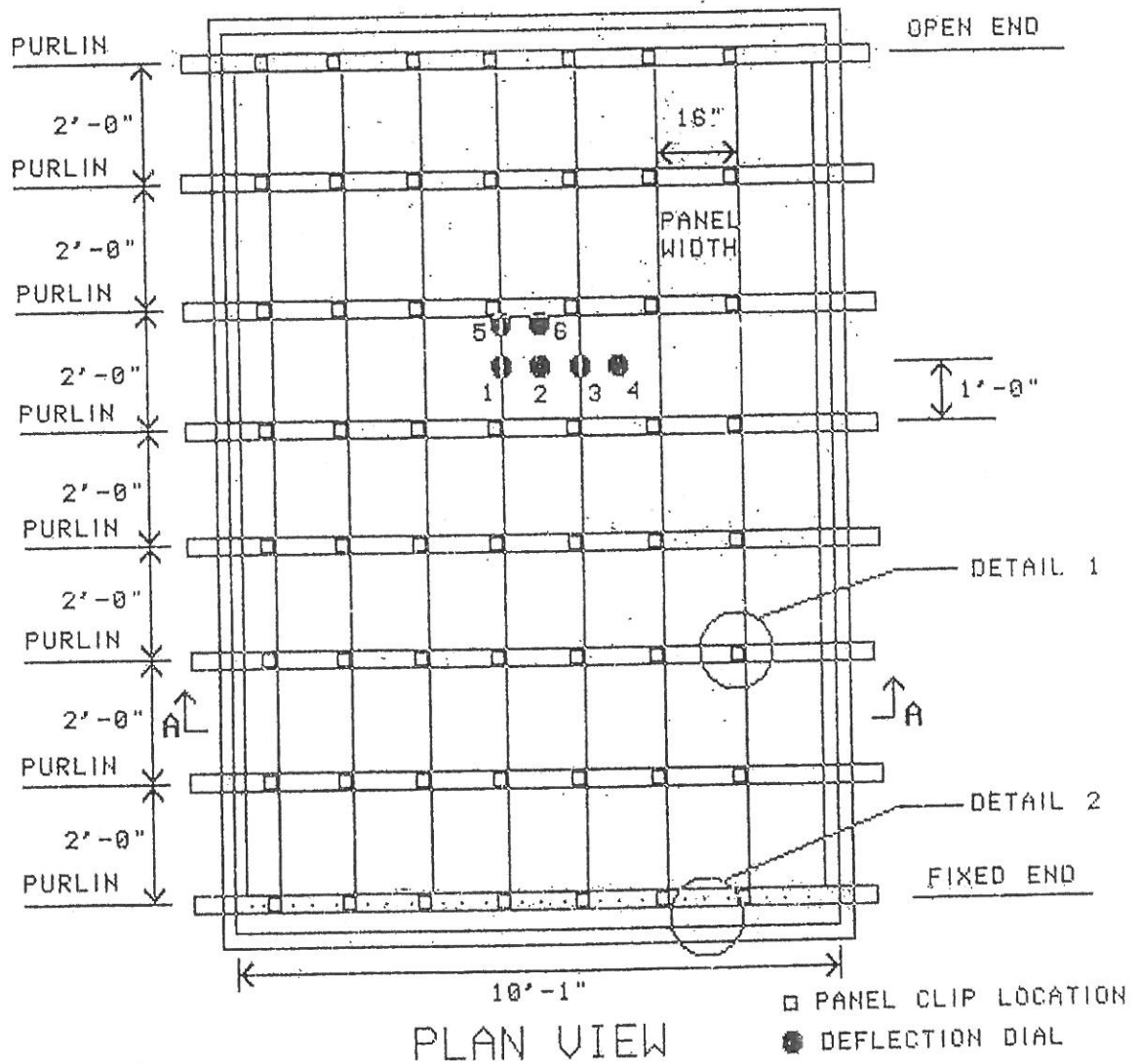








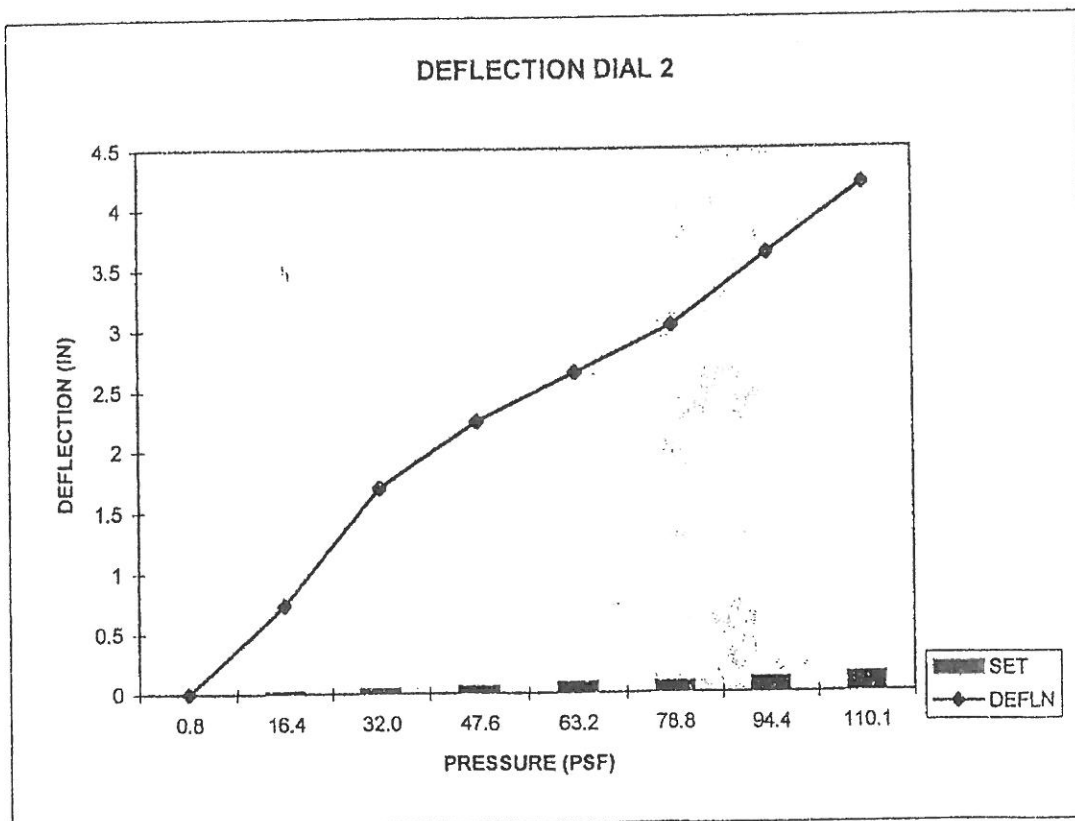
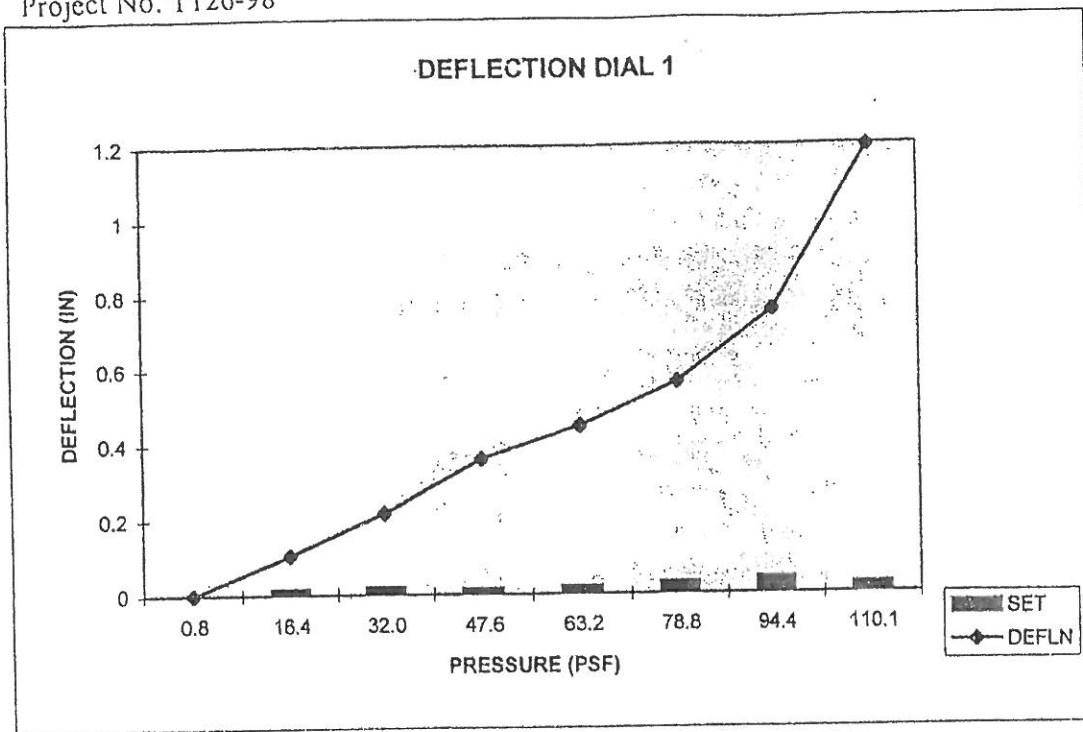
SKETCH 1

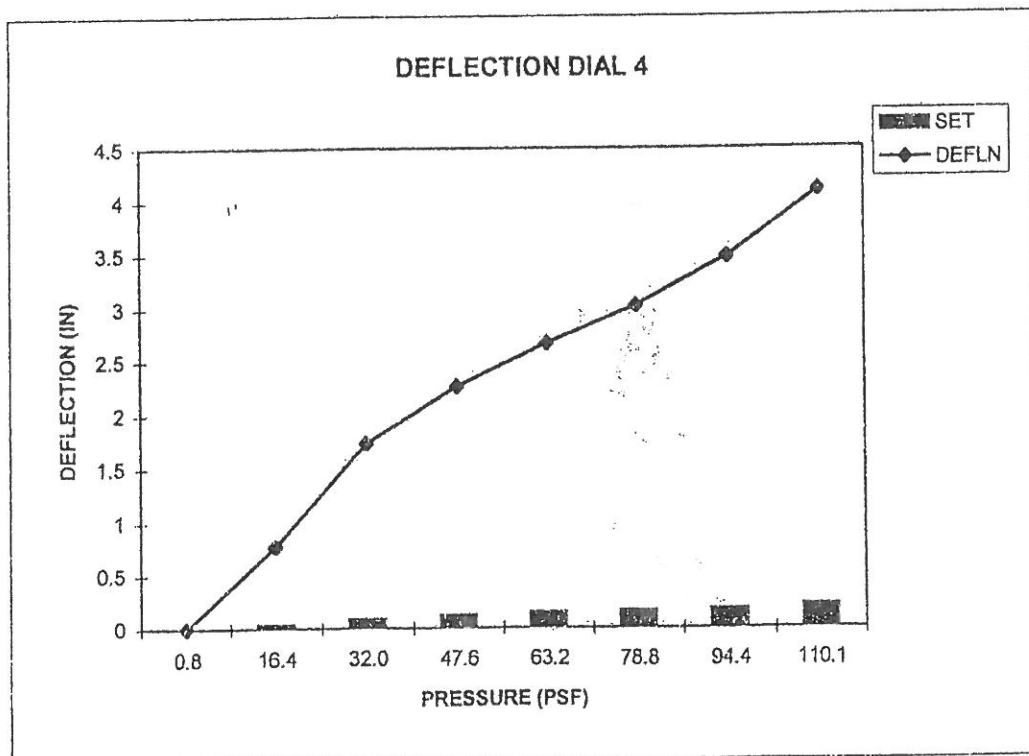
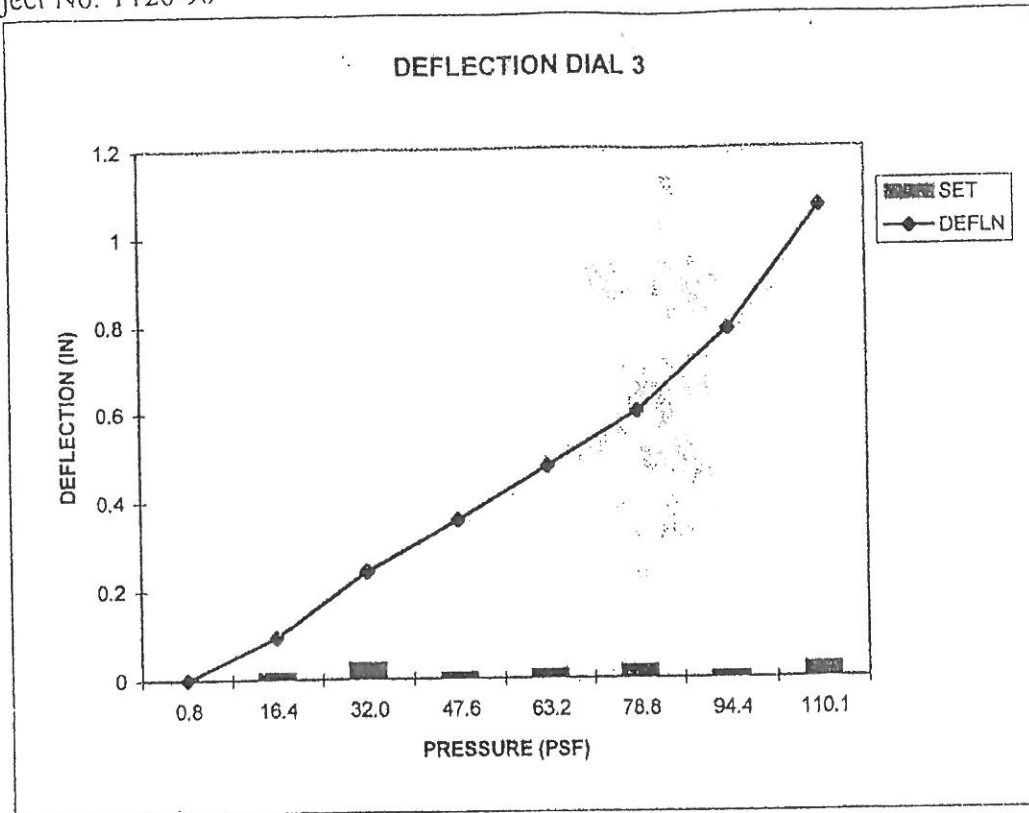


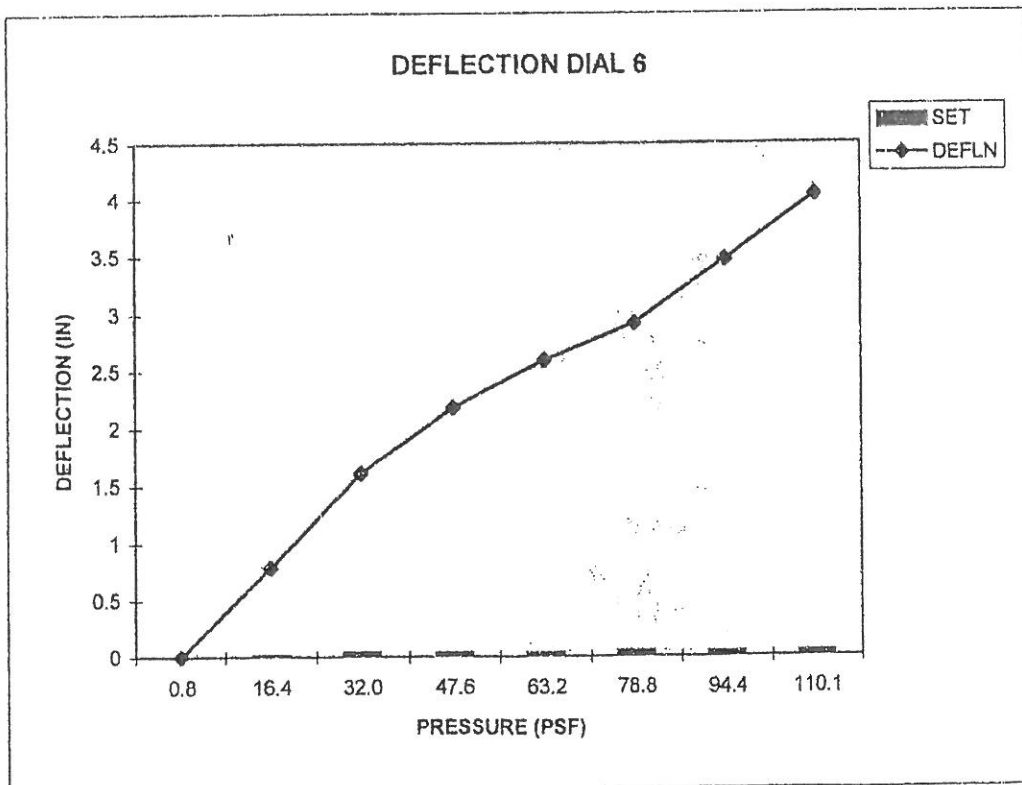
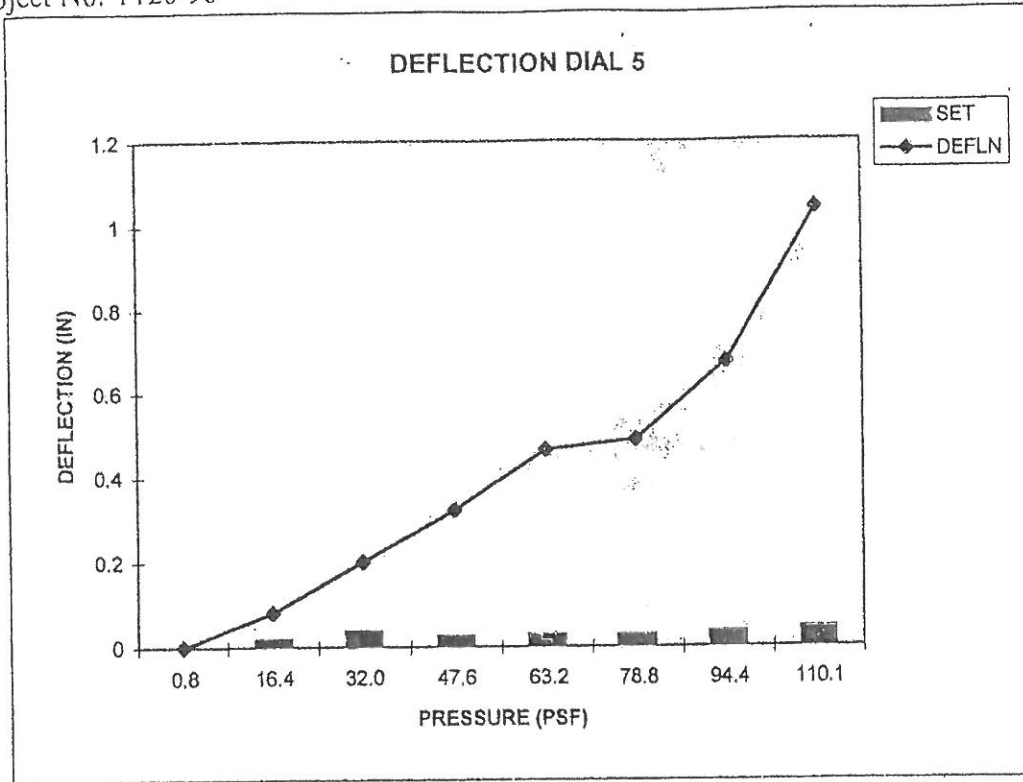
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TEST DATA FOR 16" BEMO 0.039 ALUM W/ 4-3/4" HALTER 7 SPANS @ 2'							
DEFLECTION DIAL READINGS (INCHES)							REMARKS
LOAD (PSF)	DIAL 1	DIAL 2	DIAL 3	DIAL 4	DIAL 5	DIAL 6	
0.8	0	0	0	0	0	0	PANEL WT.
16.4	0.105	0.735	0.094	0.771	0.079	0.781	
0.8	0.018	0.015	0.015	0.039	0.019	0.009	PANEL WT.
32.0	0.215	1.693	0.241	1.732	0.2	1.609	
0.8	0.021	0.04	0.035	0.084	0.036	0.04	PANEL WT.
47.6	0.361	2.238	0.355	2.265	0.323	2.18	
0.8	0.015	0.054	0.012	0.12	0.024	0.032	PANEL WT.
63.2	0.447	2.645	0.476	2.666	0.464	2.593	
0.8	0.02	0.086	0.018	0.145	0.027	0.036	PANEL WT.
78.8	0.563	3.029	0.598	3.024	0.489	2.917	
0.8	0.031	0.085	0.026	0.163	0.027	0.044	PANEL WT.
94.4	0.756	3.626	0.787	3.483	0.673	3.473	
0.8	0.043	0.121	0.012	0.175	0.035	0.038	PANEL WT.
110.1	1.194	4.204	1.066	4.101	1.04	4.043	
0.8	0.026	0.152	0.03	0.217	0.044	0.038	PANEL WT.
123.6							HALTER CLIP DISENGAGEMENT

NOTE: SEE SKETCH 2 FOR LOCATION OF HALTER CLIP DISENGAGEMENT.









WEST PENN TESTING LABORATORIES, INC.

AN INDEPENDENT INSPECTION BUREAU AND TESTING LABORATORY

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File No.: WP-9048
Report No.: 057
Date: 3/11/98
Rev.: 3/19/98

REPORT OF TENSILE STRENGTH

Client: Farabaugh Engineering & Testing

Date of Test: March 10, 1998

Test Method: ASTM A-370-97a

Pin #	Dimensions (in.)	Area (sq-in)	Yield Point (lbs)	Tensile Strength (lbs.)	Yield Point (psi)	Tensile Strength (psi)	Elongation (% in 2")	Fracture Location
BEMO 16" W. Al. *	0.4990 x 0.0390	0.0195	700	795	35,970	40,850	5.0	U/3

* Note: Al. samples were embossed

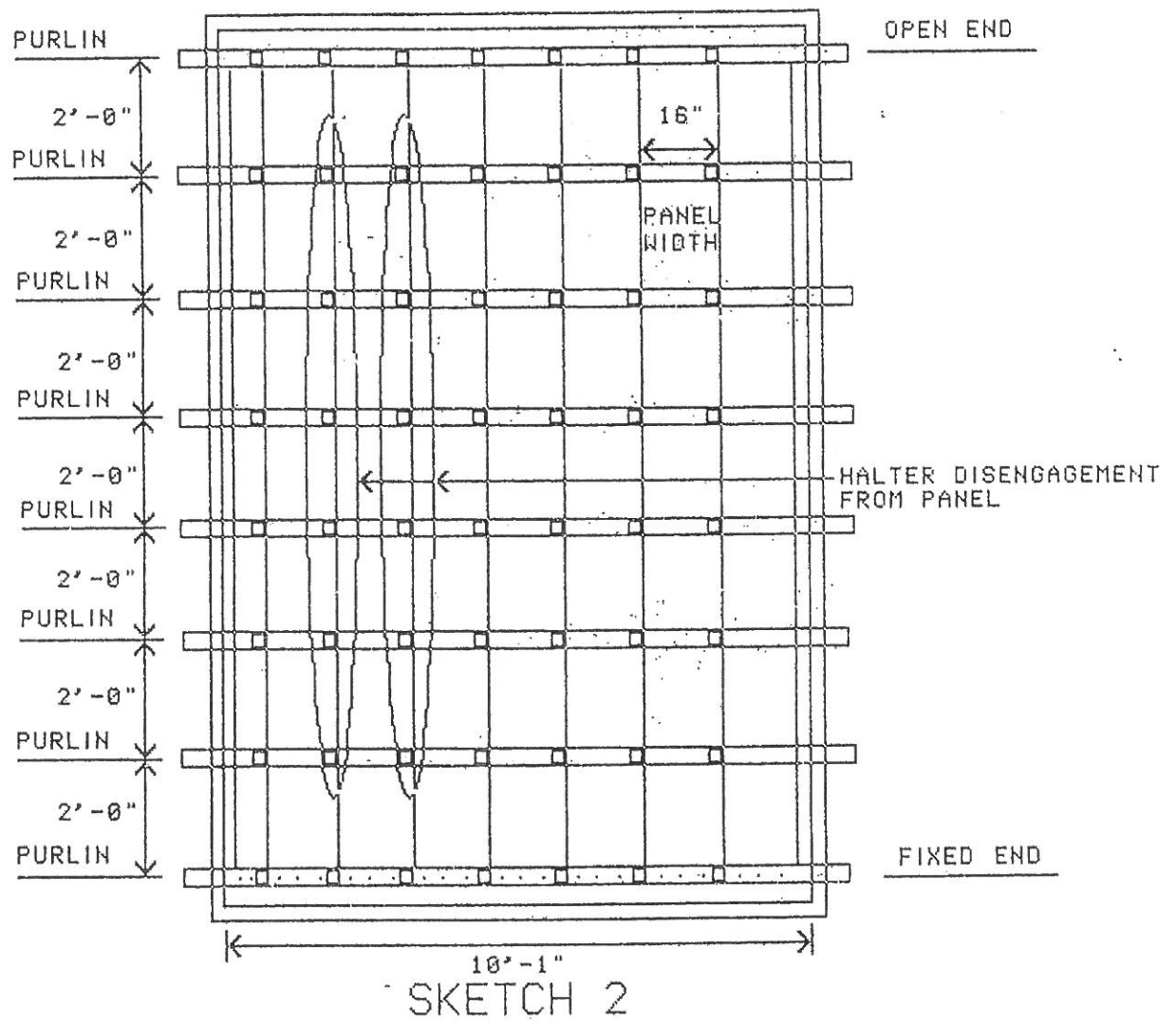
Yield Point: Aluminum - 0.2 % Offset Method, Steel - Autographic Method
(See attached Load/Strain Plots)

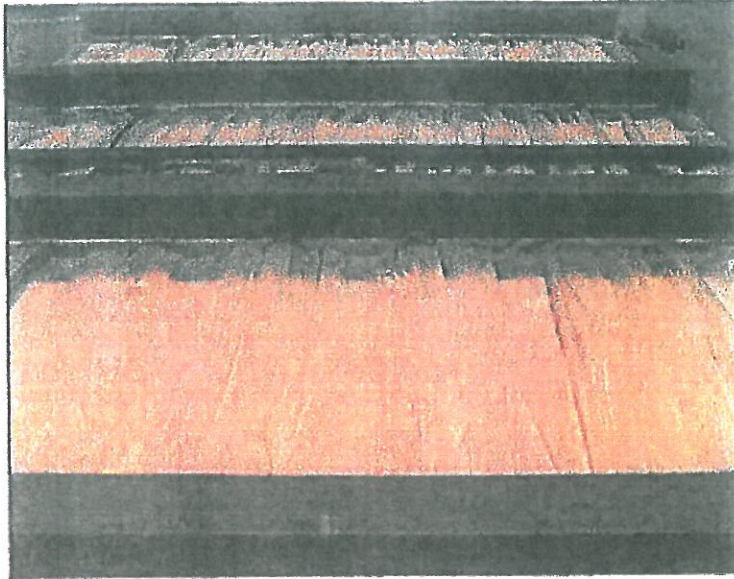
Test Equipment: ATS System 910 #A901779, Extensometer #889036, Recorder #13355
Technician: R. Burgard

Respectfully submitted,

Todd A. Ault (M.E.T.)

WEST PENN TESTING LABORATORIES, INC.

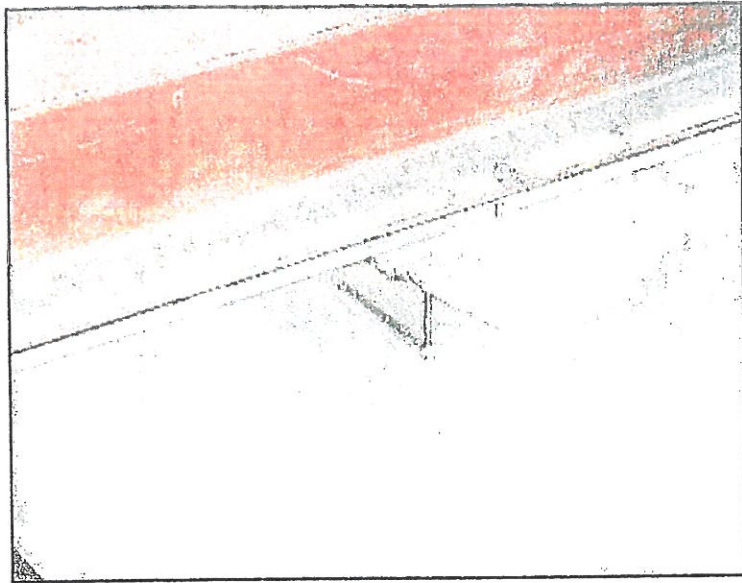




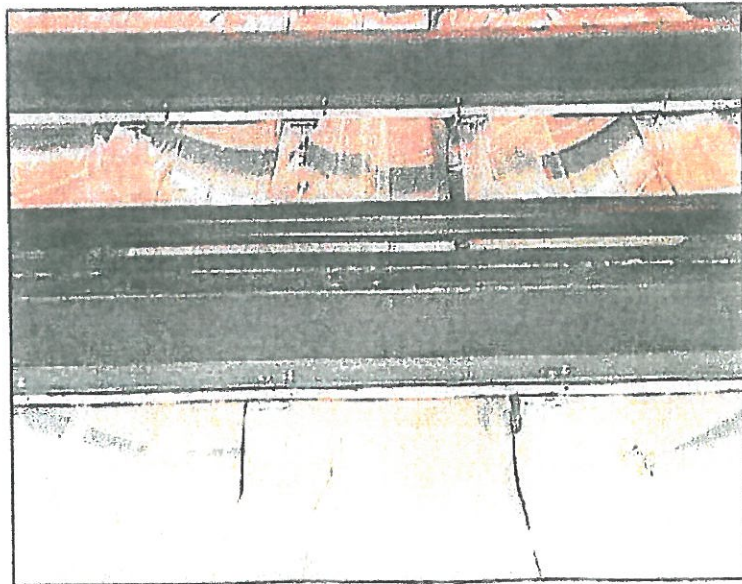
SPECIMEN SETUP



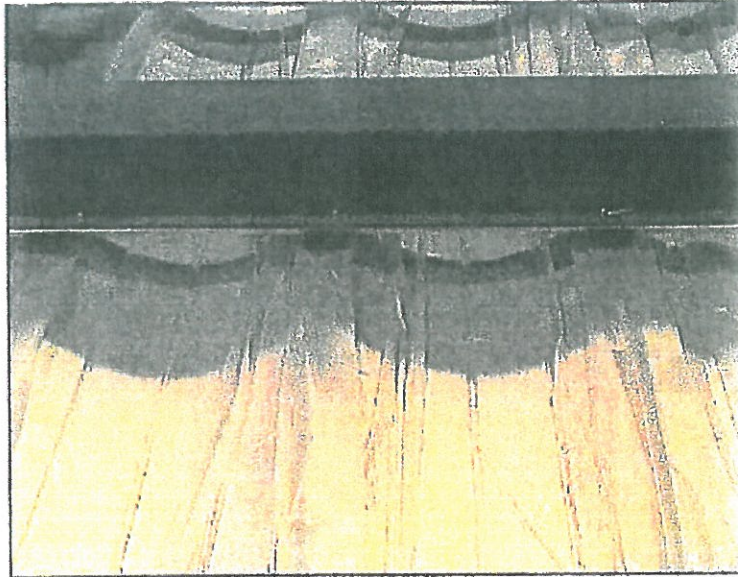
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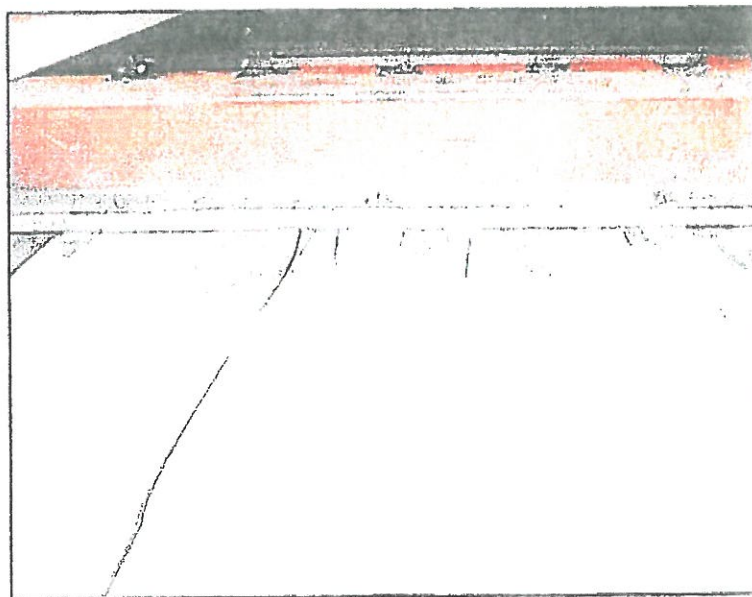
HALTER CLIP DISENGAGEMENT



HALTER CLIP DISENGAGEMENT



SPECIMEN UNDER LOAD



SPECIMEN UNDER LOAD