



Farabaugh Engineering and Testing Inc.

Project No. T166-97-A

Dade County Notification No. FET97005

Laboratory Certification No. 96-0213.03

Report Date: November 26, 1997

Report Revision Date: July 11, 2018

PROTOCOL PA-125-95 PER
ASTM 1592-95
STANDARD TEST METHOD FOR
STRUCTURAL PERFORMANCE OF SHEET METAL ROOF AND SIDING SYSTEMS BY UNIFORM STATIC AIR
PRESSURE DIFFERENCE

On

Peterson Aluminum Corp. Tite-Loc Plus Standing Seam Roof Panel

22 GA/ 16" WIDE

FOR

Petersen Aluminum Corp.

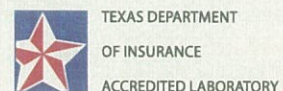
10551 PAC Rd.

Tyler, TX 75707

Report Prepared By:

Patrick J. Farabaugh

Approved By:

Daniel G. Farabaugh

ASTM 1592-95
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 Dates

Specimen "A" 11-10-97

Specimen "B" 11-11-97

Specimen "C" 11-12-97

Specimen "D" 11-13-97

Test Specimen

Manufacturer: Petersen Aluminum Corp.

10551 PAC Rd.

Tyler, TX 75707

Panel: 22 GA Petersen Aluminum Corp. Tite-Loc Plus Standing Seam Roof Panel 16" Wide

Clip: Low Floating Clip

Span Conditions: 3 Spans @ 5'-0" oc., Both Ends Open (Specimens A, B, C)

12 Spans @ 1'-0" oc. One End Fixed, One End Open (Specimen D)

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) 1/4" x 1-1/4" SDS fasteners per clip: The side joints consisted of the female rib interlocking with the male rib and seamed with a mechanical seamer. Continuity fasteners were located at the side 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 of the specific 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.

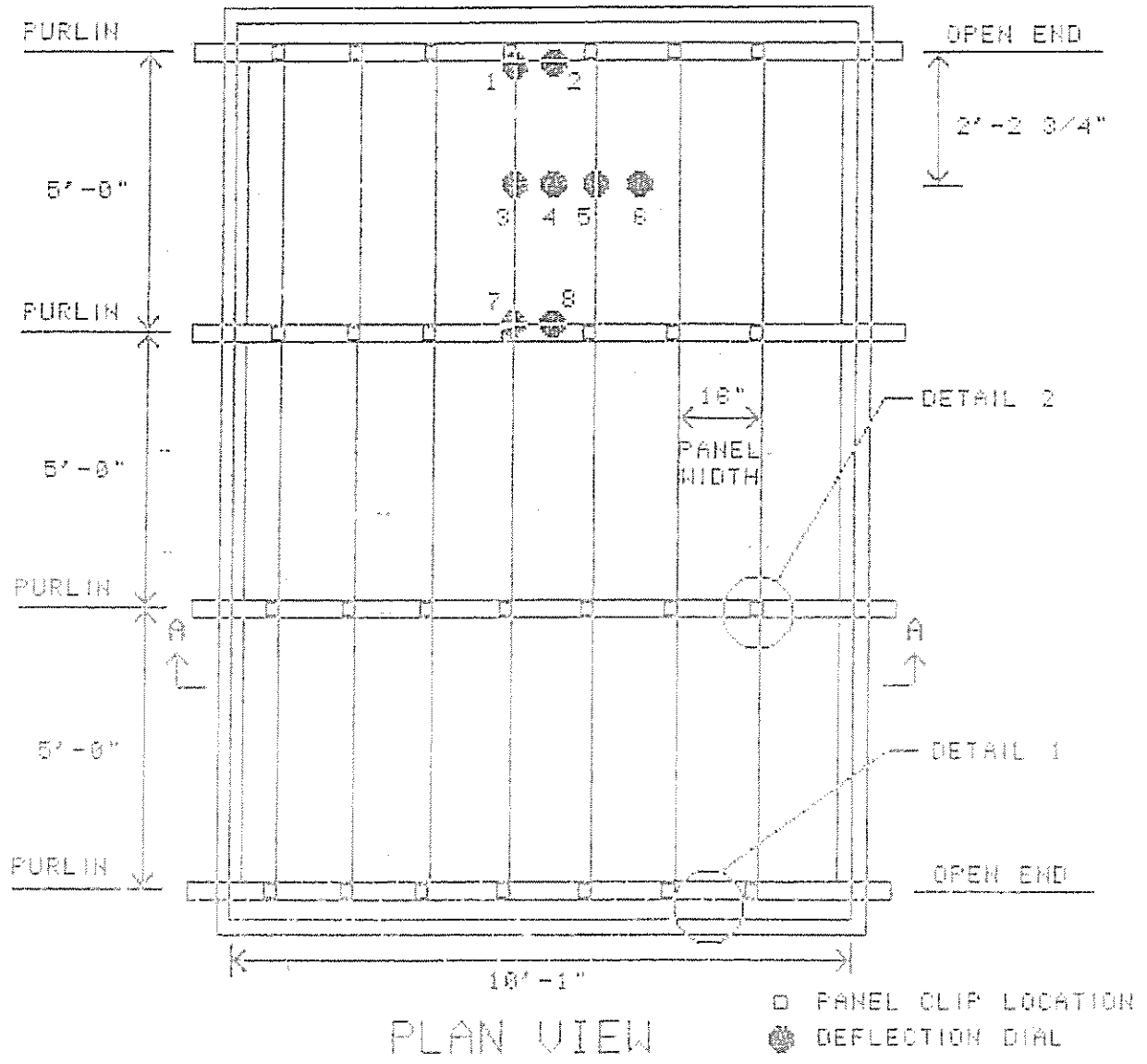
Test Witness: Daniel G. Farabaugh, PE Florida PE #0048349

401 Rosecrest Drive

Monroeville, PA 15146

Reference

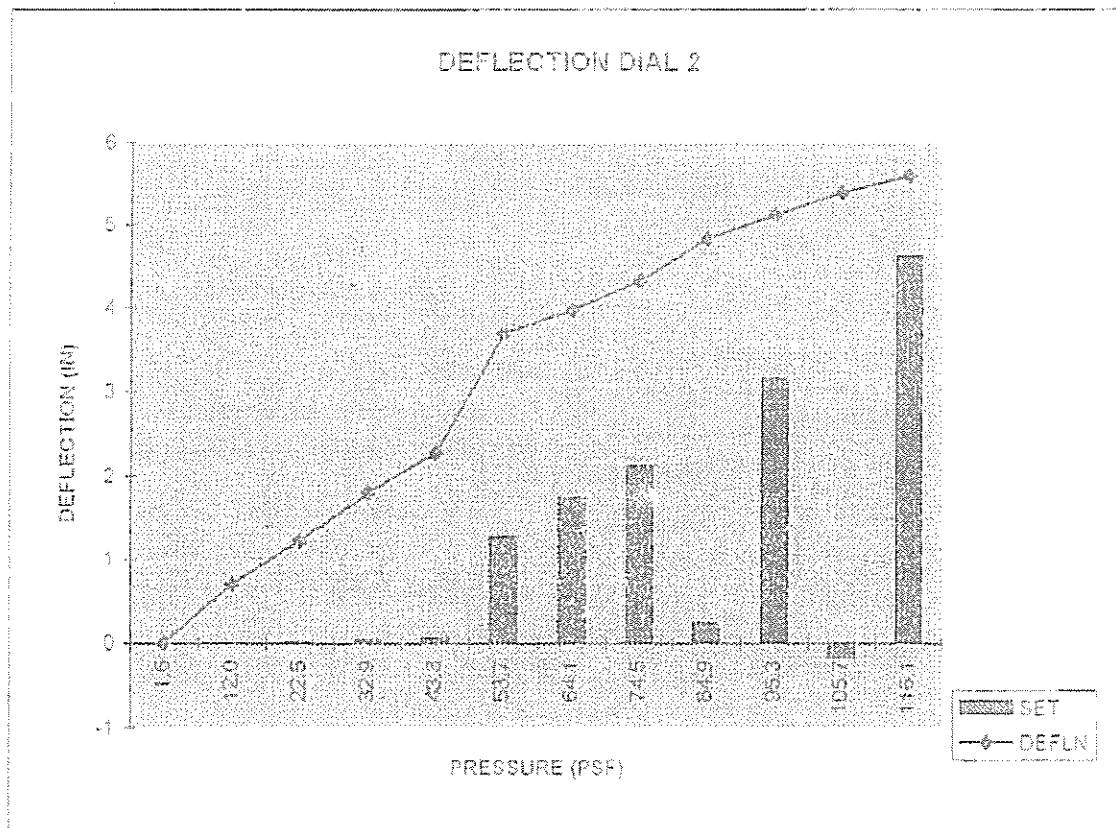
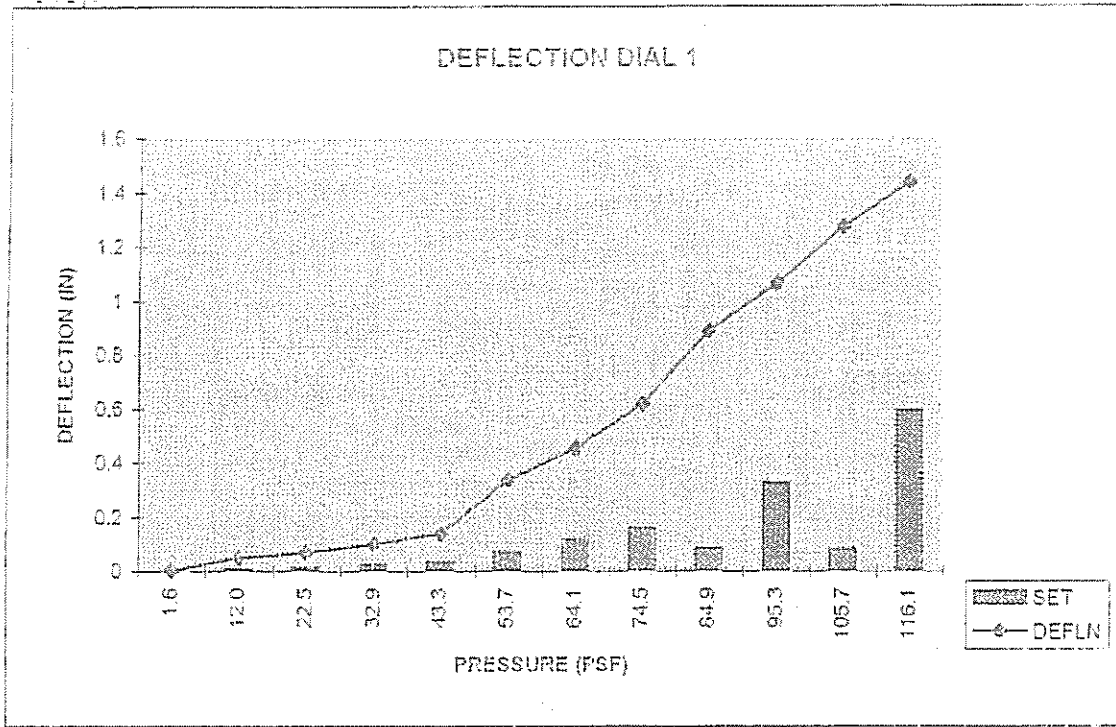
This test report references the original test report T166-97, dated 11-26-97 for MBCI for all data and specimen information provided here-in. The customer named in this report, Petersen Aluminum Corp. is authorized by MBCI for use of this test data.

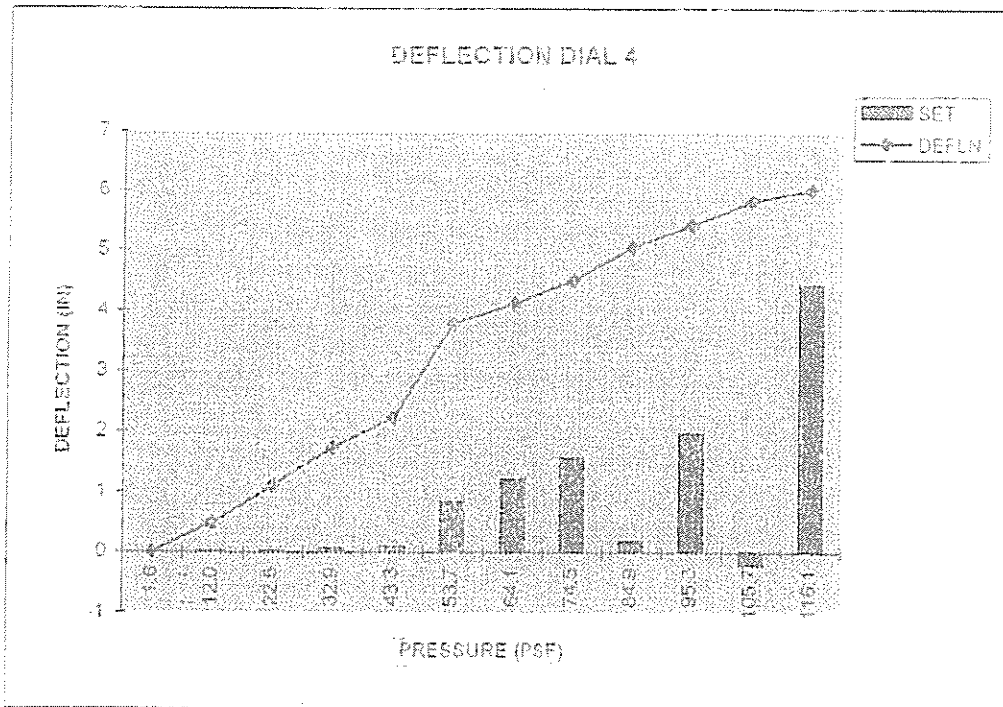
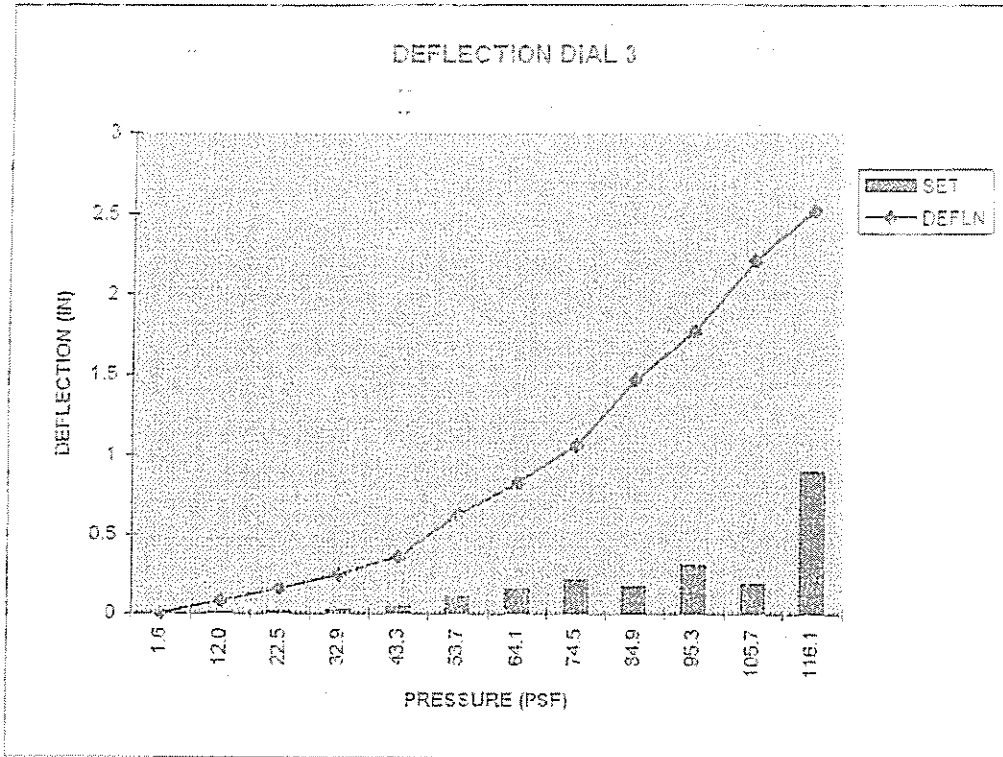


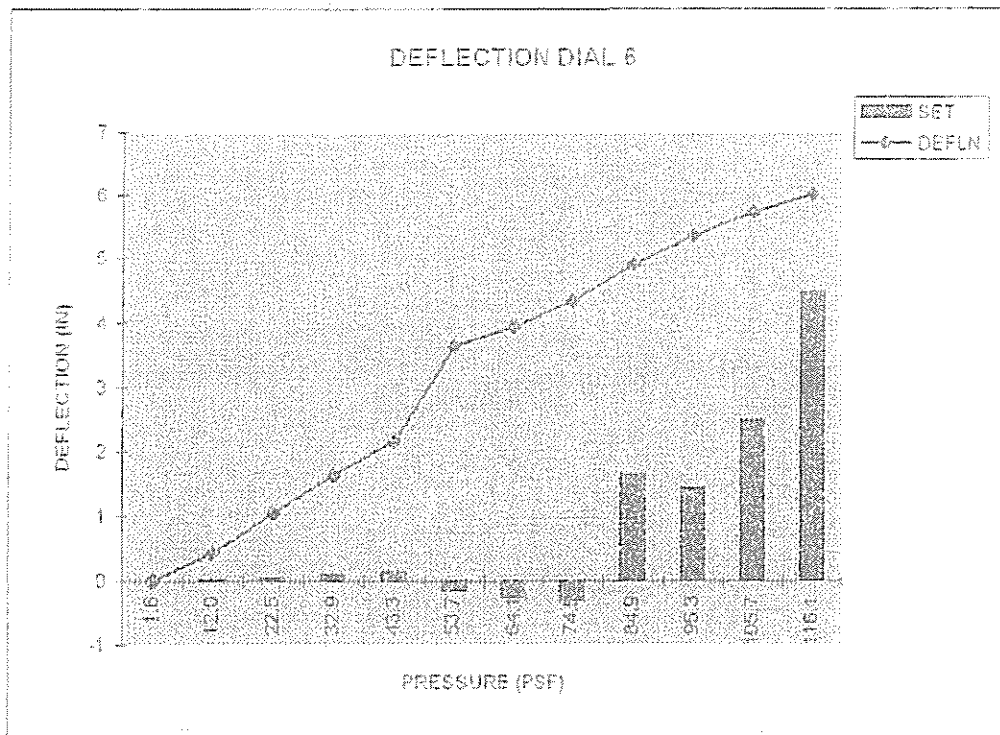
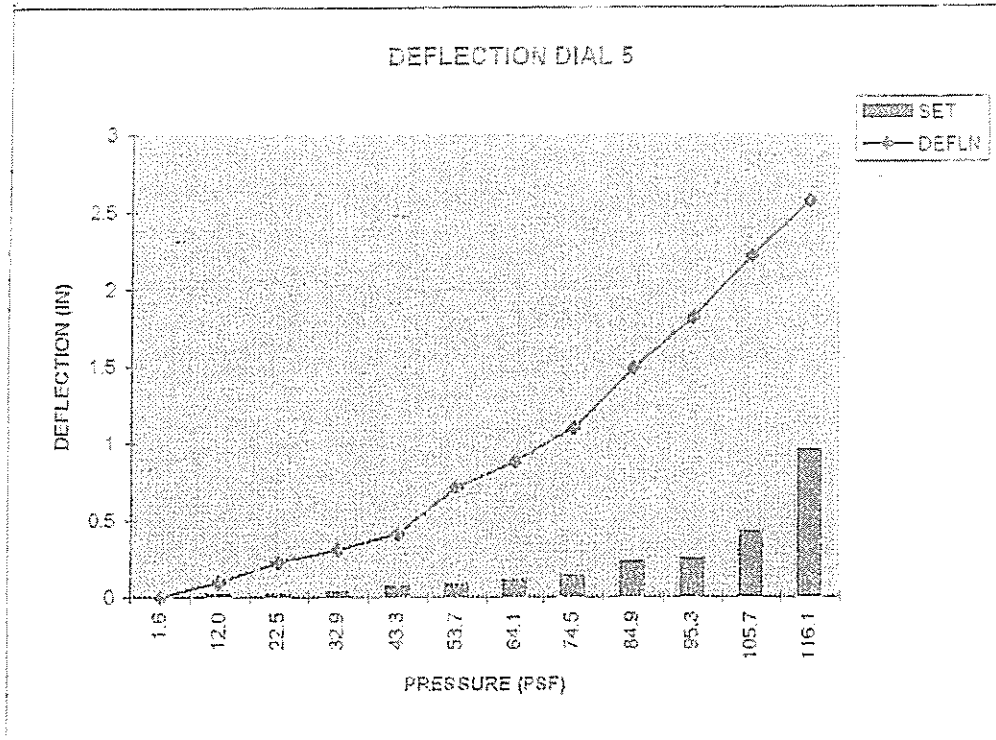
TEST DATA FOR 16" PANEL 22 GA 3 SPANS @ 5'-0" oc (SPEC. A)									
DEFLECTION DIAL READINGS (INCHES)									
LOAD (PSF)	DIAL 1	DIAL 2	DIAL 3	DIAL 4	DIAL 5	DIAL 6	DIAL 7	DIAL 8	REMARKS
1.6	0	0	0	0	0	0	0	0	PANEL WT.
12.0	0.049	0.704	0.079	0.48	0.096	0.432	0.02	0.316	
1.6	0.008	-0.013	0.009	0.011	0.019	0.024	0.004	0.012	PANEL WT.
22.5	0.068	1.219	0.161	1.111	0.225	1.049	0.062	0.944	
1.6	0.014	0.003	0.012	0.025	0.022	0.047	0.016	0.044	PANEL WT.
32.9	0.1	1.791	0.248	1.736	0.31	1.635	0.11	1.555	
1.6	0.024	0.035	0.022	0.059	0.031	0.092	0.023	0.093	PANEL WT.
43.3	0.137	2.27	0.36	2.232	0.414	2.159	0.167	2.11	
1.6	0.032	0.064	0.041	0.096	0.068	0.141	0.034	0.115	PANEL WT.
53.7	0.338	3.691	0.631	3.786	0.713	3.649	0.472	3.672	
1.6	0.069	1.266	0.108	0.844	0.081	-0.166	0.055	0.446	PANEL WT.
64.1	0.453	3.973	0.826	4.111	0.882	3.946	0.61	3.983	
1.6	0.116	1.737	0.152	1.22	0.108	-0.269	0.1	0.745	PANEL WT.
74.5	0.619	4.322	1.06	4.494	1.098	4.341	0.826	4.367	
1.6	0.157	2.112	0.214	1.563	0.138	-0.321	0.128	1.004	PANEL WT.
84.9	0.889	4.827	1.47	5.053	1.466	4.895	1.201	4.933	
1.6	0.086	0.241	0.172	0.184	0.23	1.649	0.135	0.163	PANEL WT.
95.3	1.065	5.118	1.771	5.417	1.814	5.344	1.552	5.32	
1.6	0.327	3.163	0.307	1.97	0.248	1.431	0.181	0.062	PANEL WT.
105.7	1.273	5.385	2.21	5.823	2.21	5.724	2.02	5.635	
1.6	0.08	-0.182	0.191	-0.225	0.425	2.488	0.199	-0.316	PANEL WT.
116.1	1.434	5.596	2.515	6.012	2.562	6.005	2.398	6.258	
1.6	0.593	4.623	0.895	4.414	0.954	4.479	0.949	4.385	PANEL WT.
141.6									CLIP FAILURE

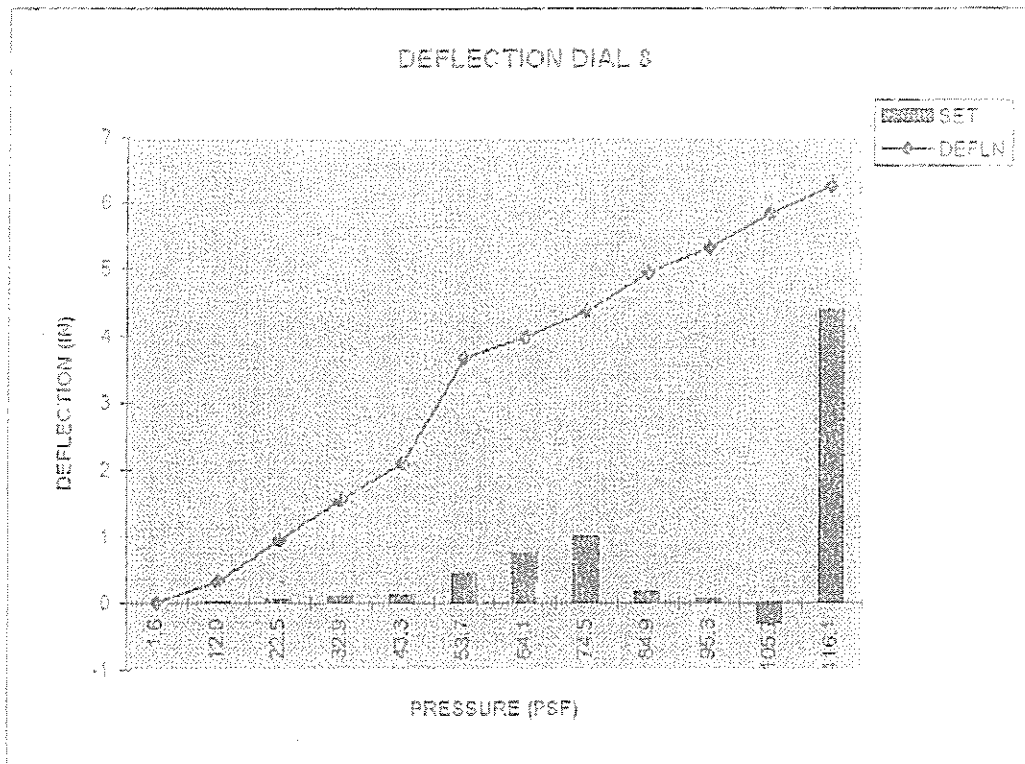
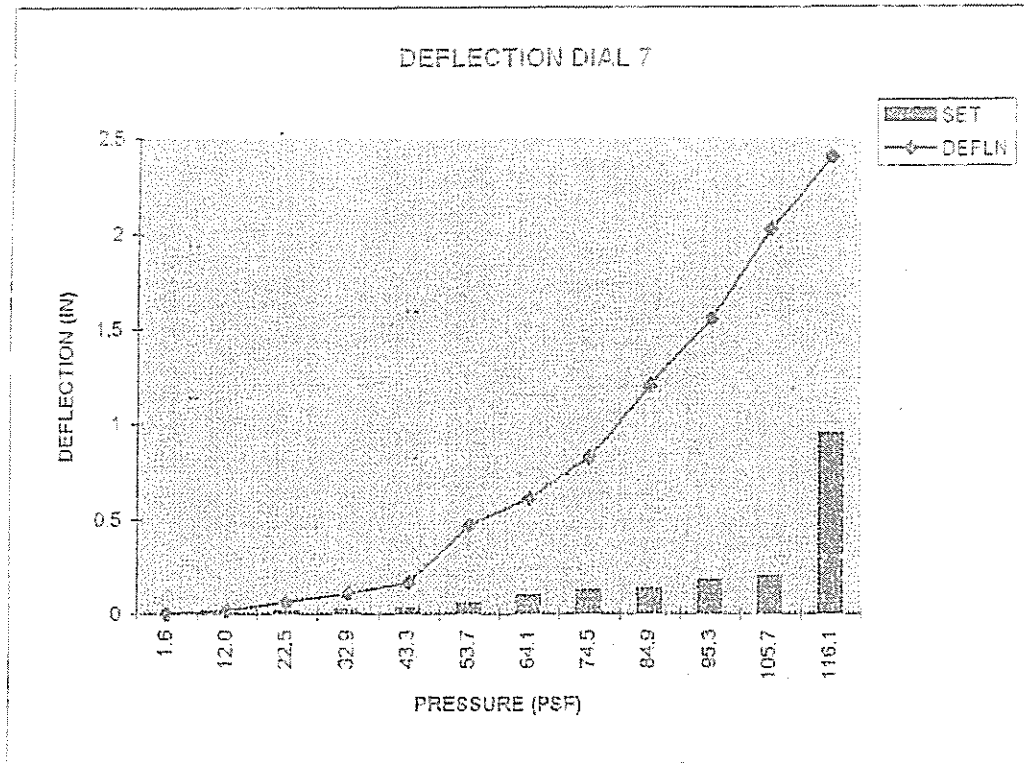
NOTE: PRIOR TO CLIP FAILURE, A LOAD OF 136.9 PSF WAS HELD FOR 1 MIN.

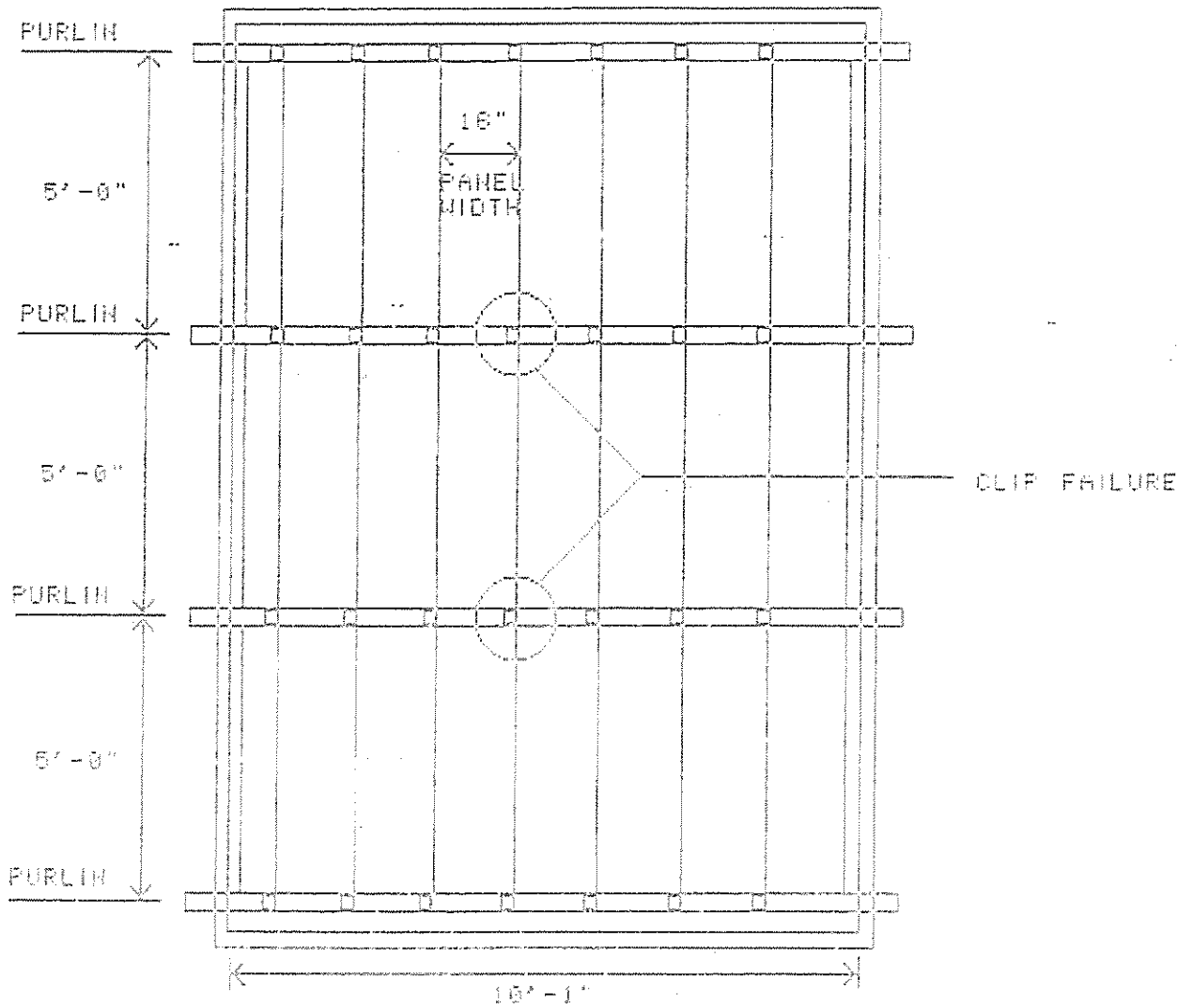
NOTE : SEE SKETCH 1 FOR LOCATION OF CLIP FAILURE.







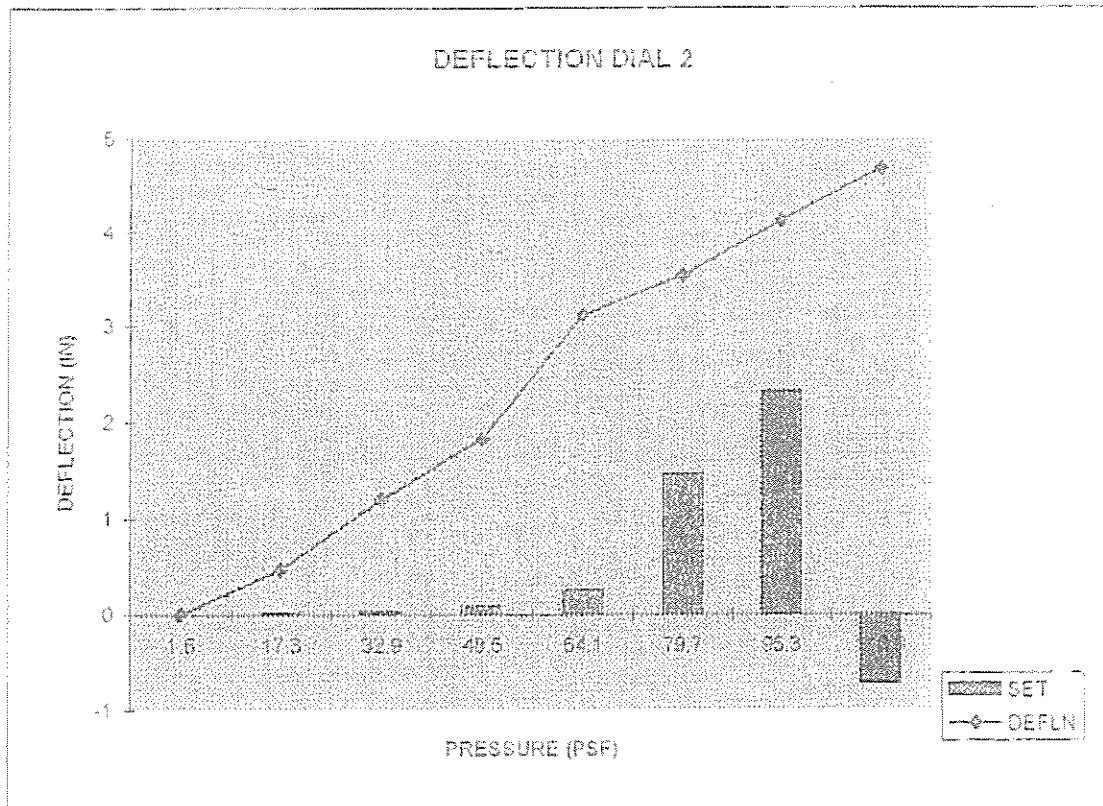
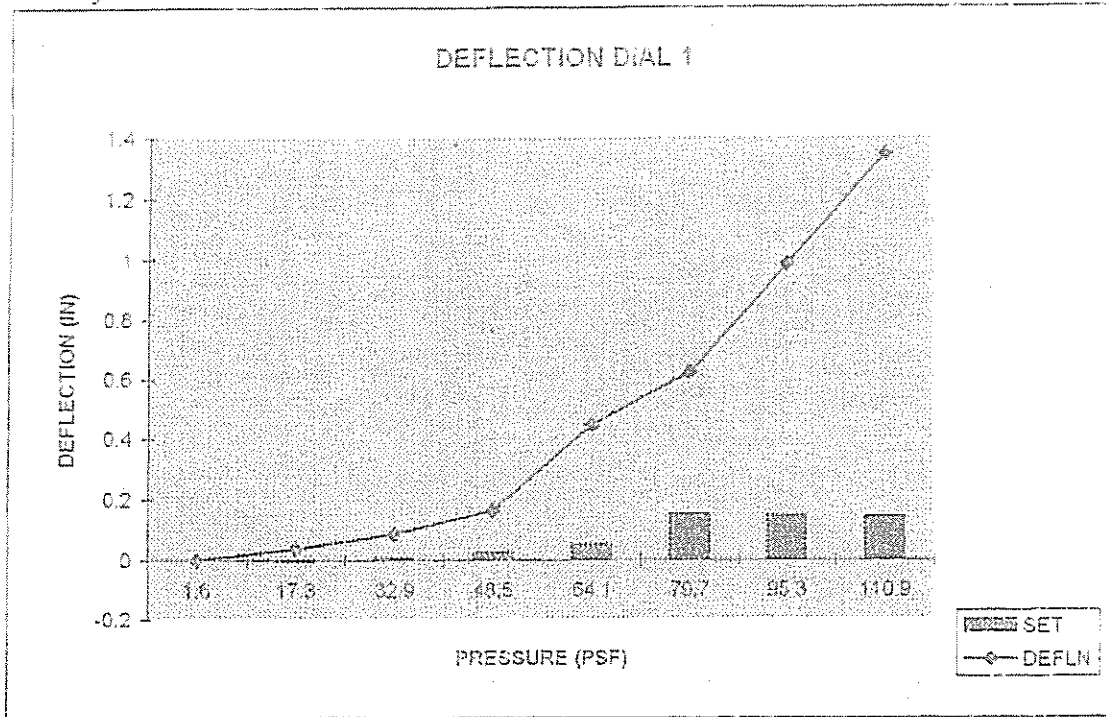


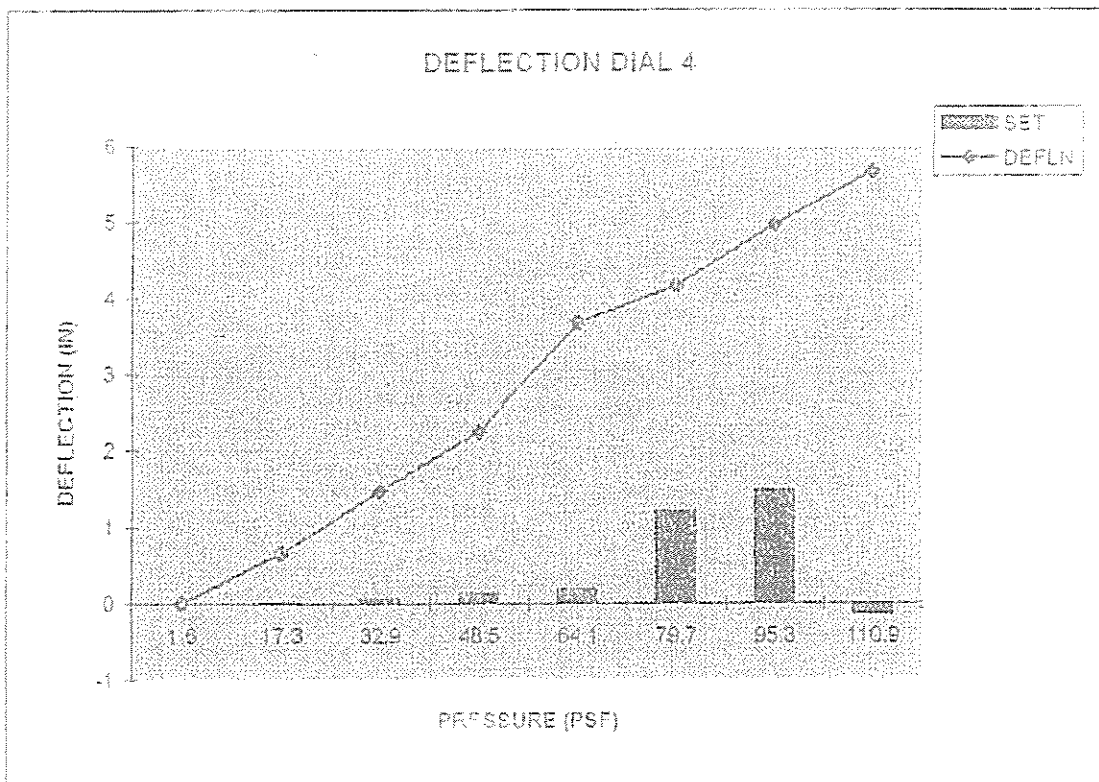
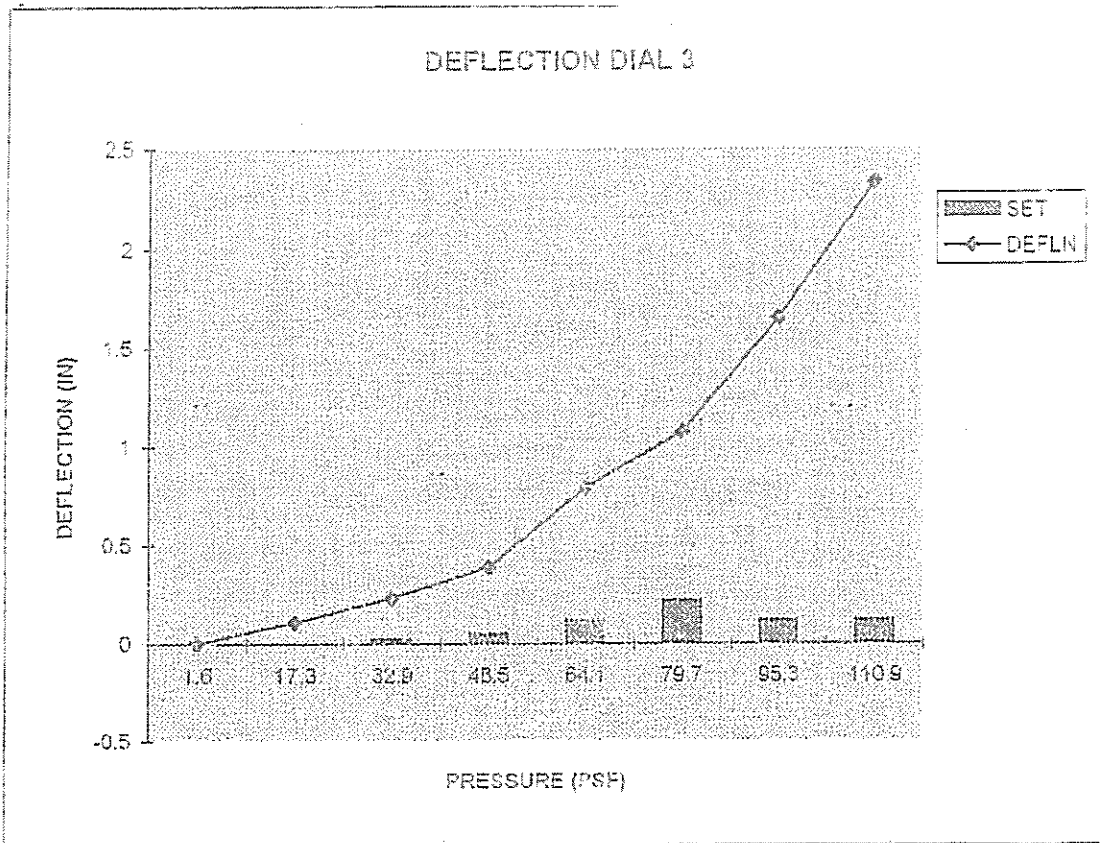


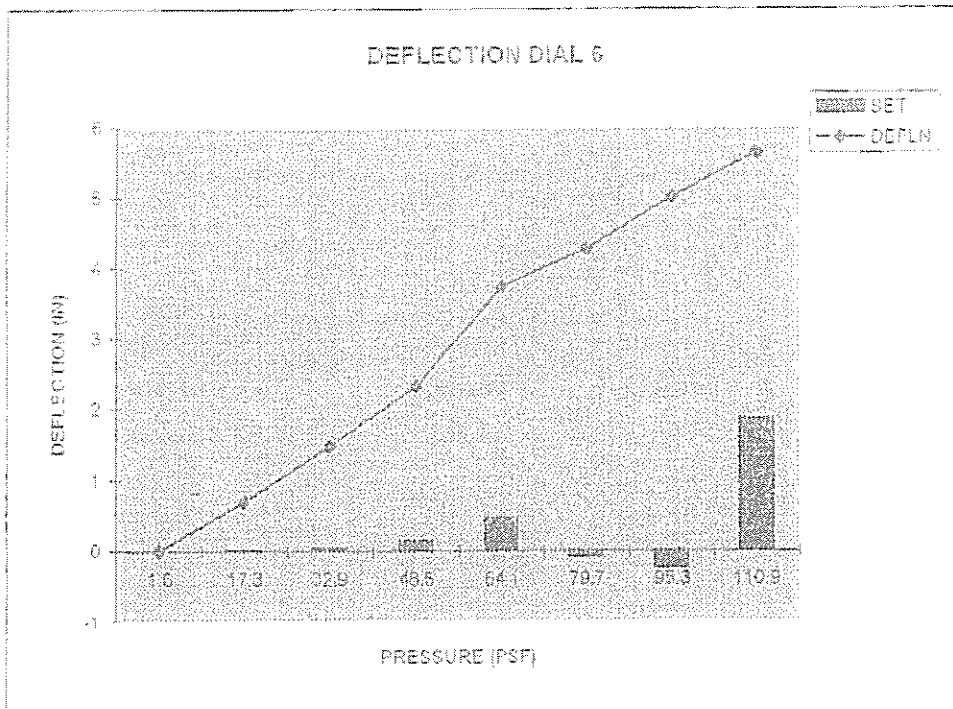
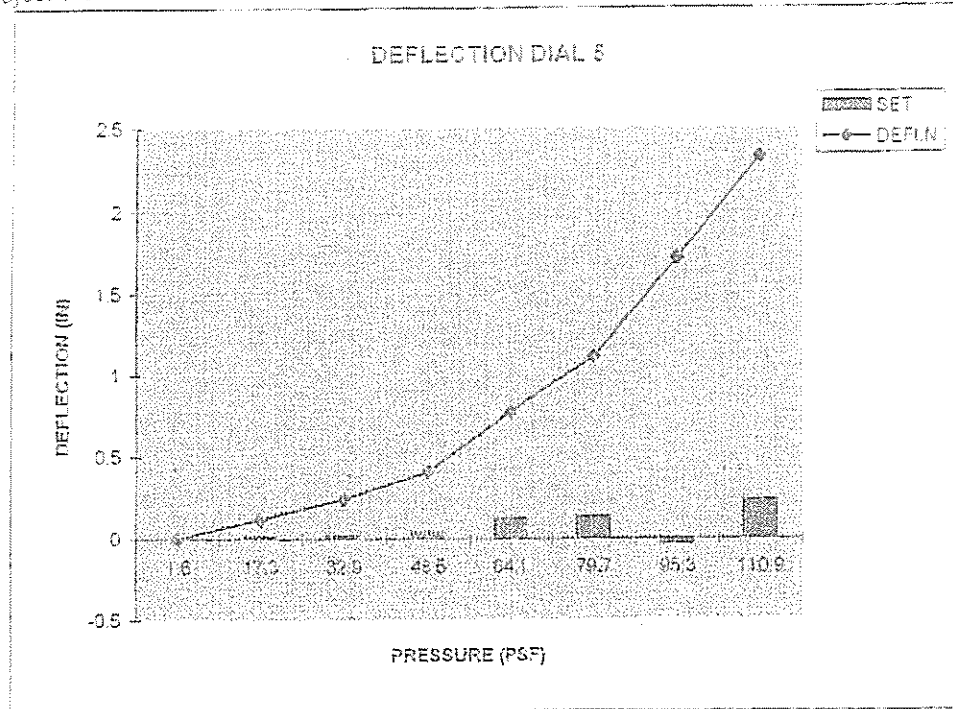
SKETCH 1

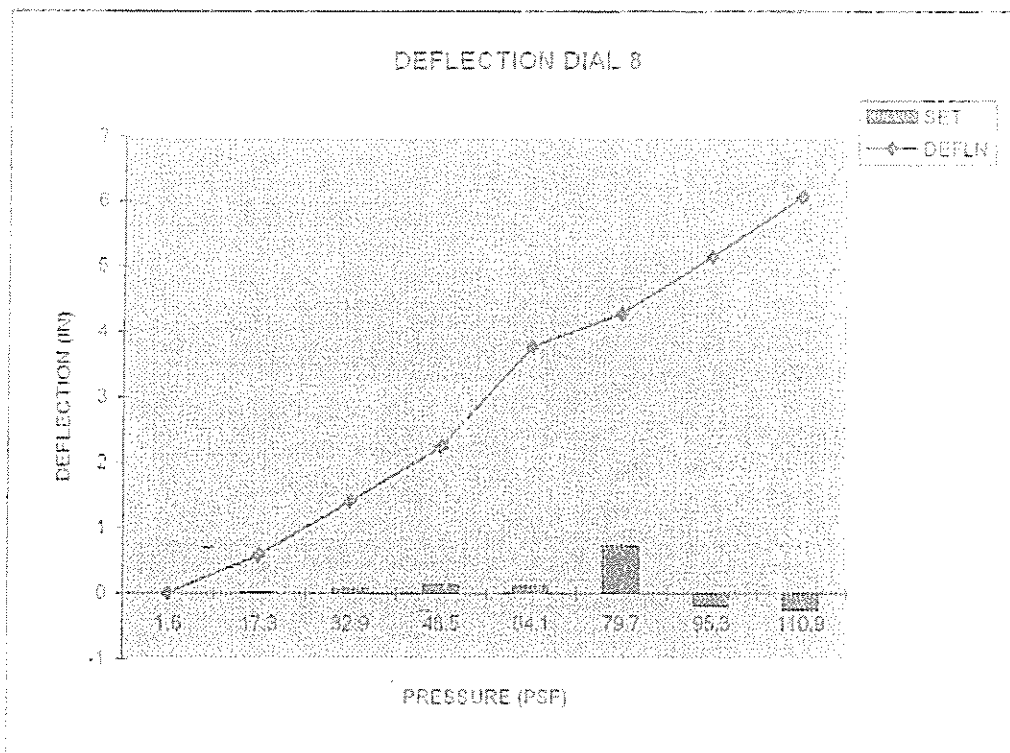
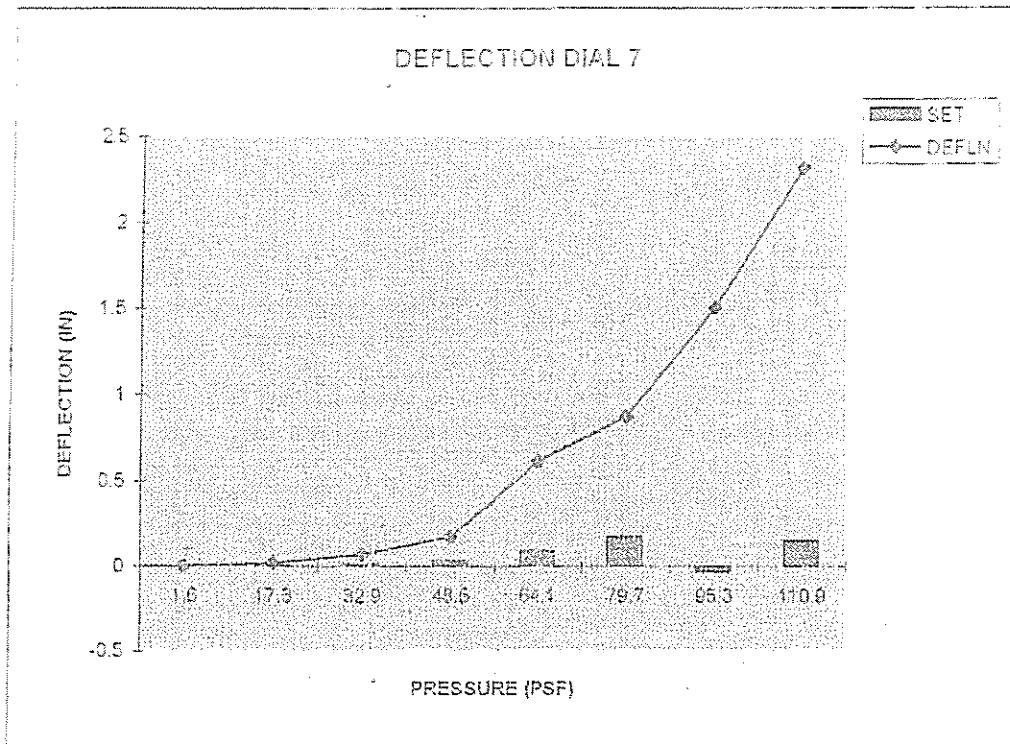
TEST DATA FOR 16" PANEL 22 GA 3 SPANS @ 5'-0" oc (SPEC. B)									
DEFLECTION DIAL READINGS (INCHES)									
LOAD (PSF)	DIAL 1	DIAL 2	DIAL 3	DIAL 4	DIAL 5	DIAL 6	DIAL 7	DIAL 8	REMARKS
1.6	0	0	0	0	0	0	0	0	PANEL WT.
17.3	0.037	0.476	0.105	0.662	0.12	0.701	0.02	0.584	
1.6	-0.006	0.022	-0.001	0.008	0.014	0.016	-0.001	0.021	PANEL WT.
32.9	0.086	1.193	0.23	1.472	0.242	1.47	0.07	1.412	
1.6	0.007	0.033	0.023	0.056	0.023	0.047	0.011	0.067	PANEL WT.
48.5	0.163	1.825	0.385	2.247	0.404	2.325	0.176	2.248	
1.6	0.025	0.085	0.045	0.122	0.042	0.142	0.038	0.133	PANEL WT.
64.1	0.444	3.12	0.789	3.678	0.771	3.727	0.611	3.771	
1.6	0.05	0.256	0.113	0.155	0.125	0.466	0.094	0.11	PANEL WT.
79.7	0.619	3.542	1.069	4.161	1.109	4.267	0.871	4.277	
1.6	0.151	1.463	0.216	1.213	0.133	-0.09	0.175	0.724	PANEL WT.
95.3	0.982	4.124	1.648	4.903	1.715	5.008	1.505	5.152	
1.6	0.145	2.313	0.114	1.489	-0.035	-0.248	-0.035	-0.198	PANEL WT.
110.9	1.345	4.679	2.328	5.657	2.322	5.631	2.311	6.066	
1.6	0.143	-0.727	0.115	-0.143	0.236	1.852	0.151	-0.262	PANEL WT.
123.4									CLIP FAILURE

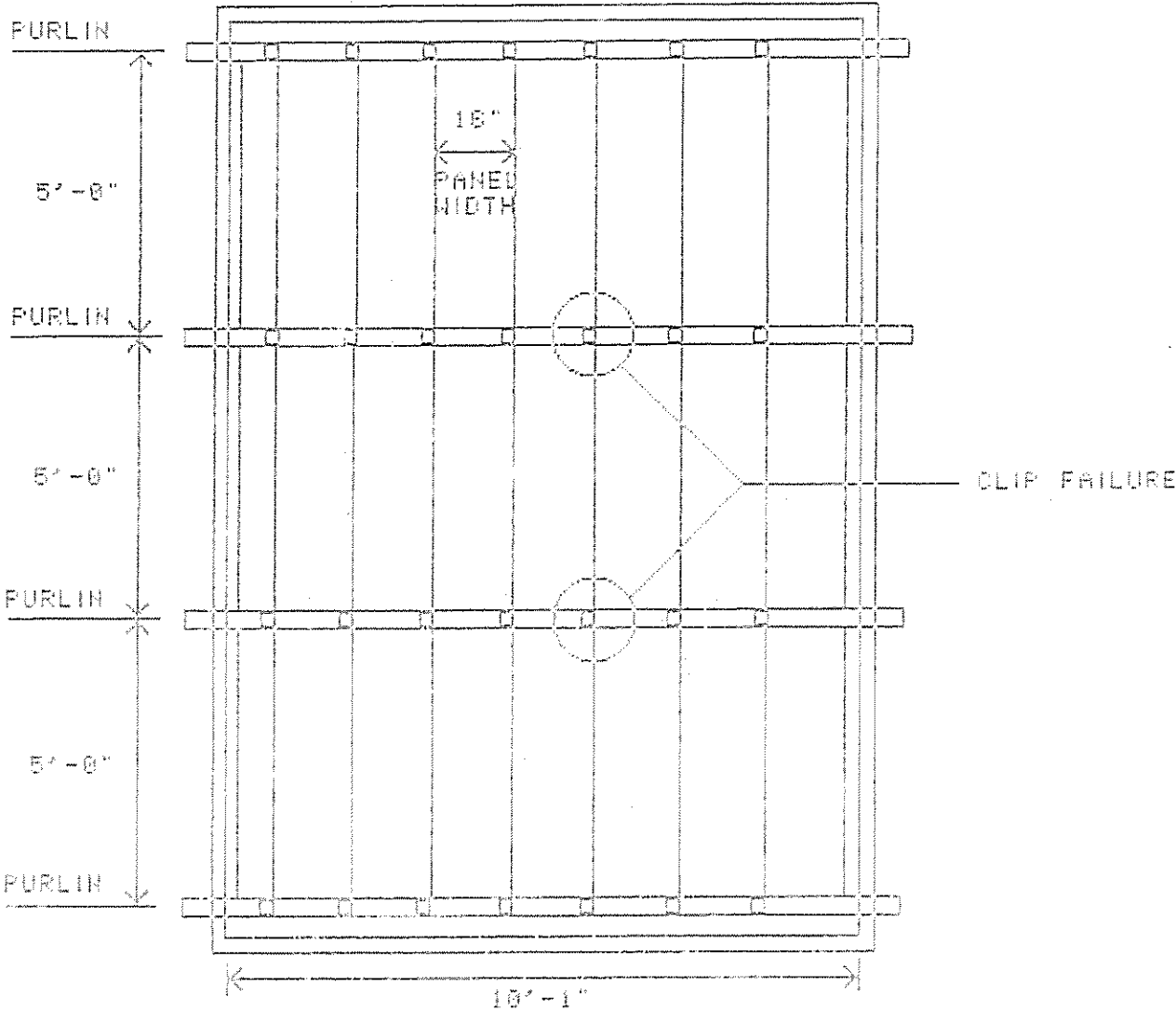
NOTE: SEE SKETCH 2 FOR LOCATION OF CLIP FAILURE.







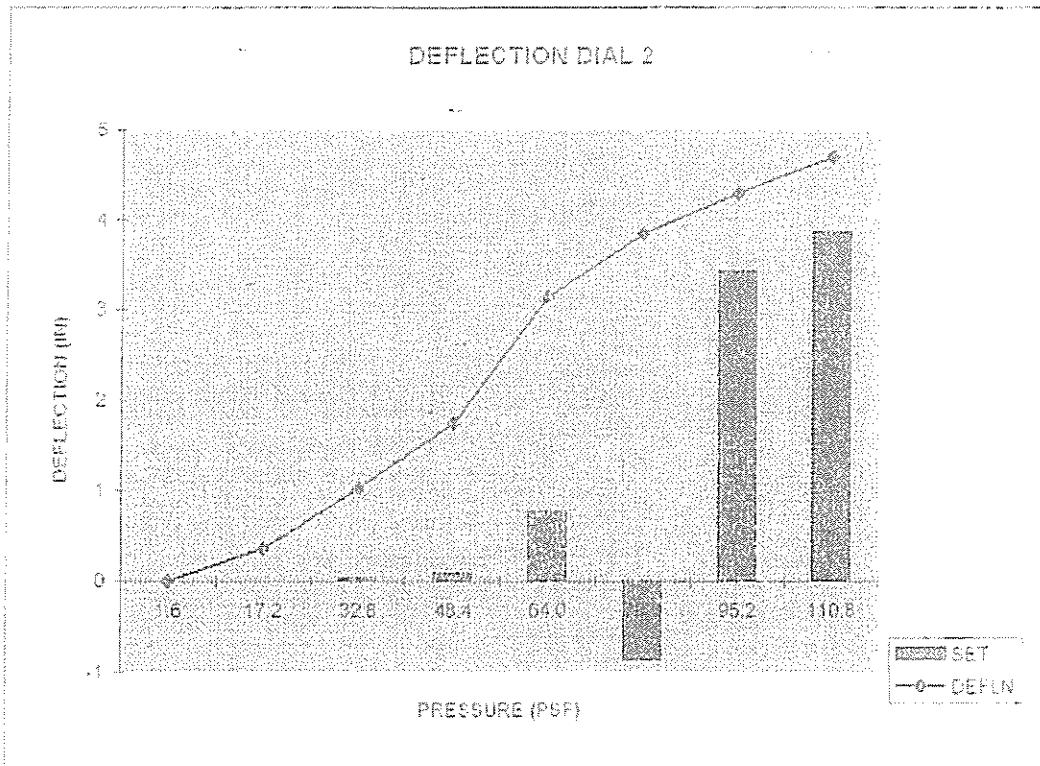
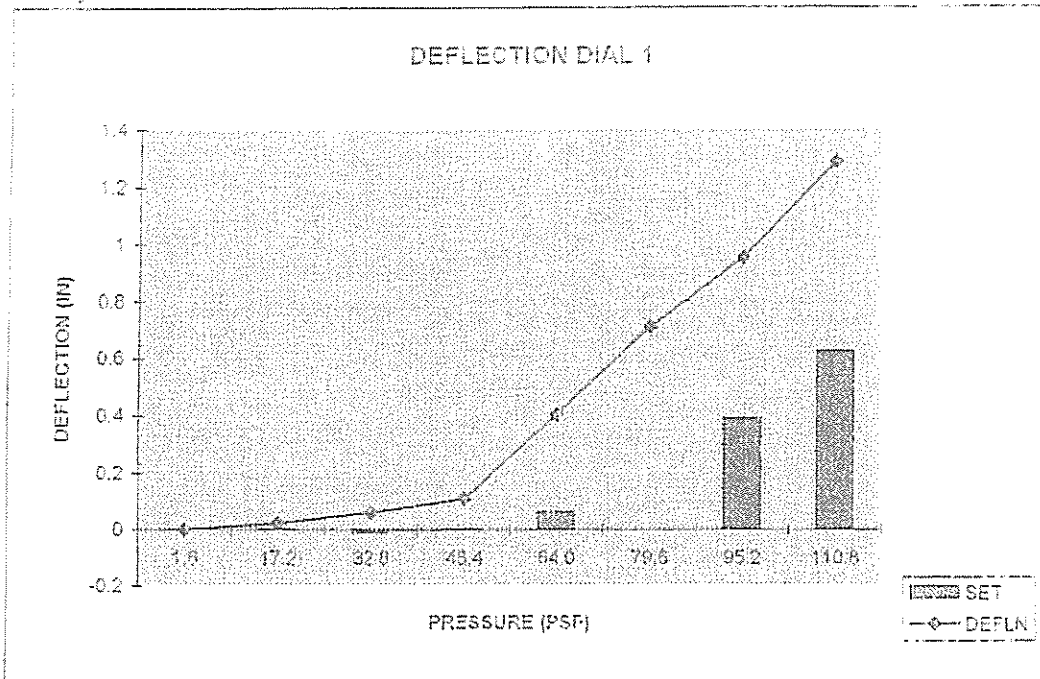


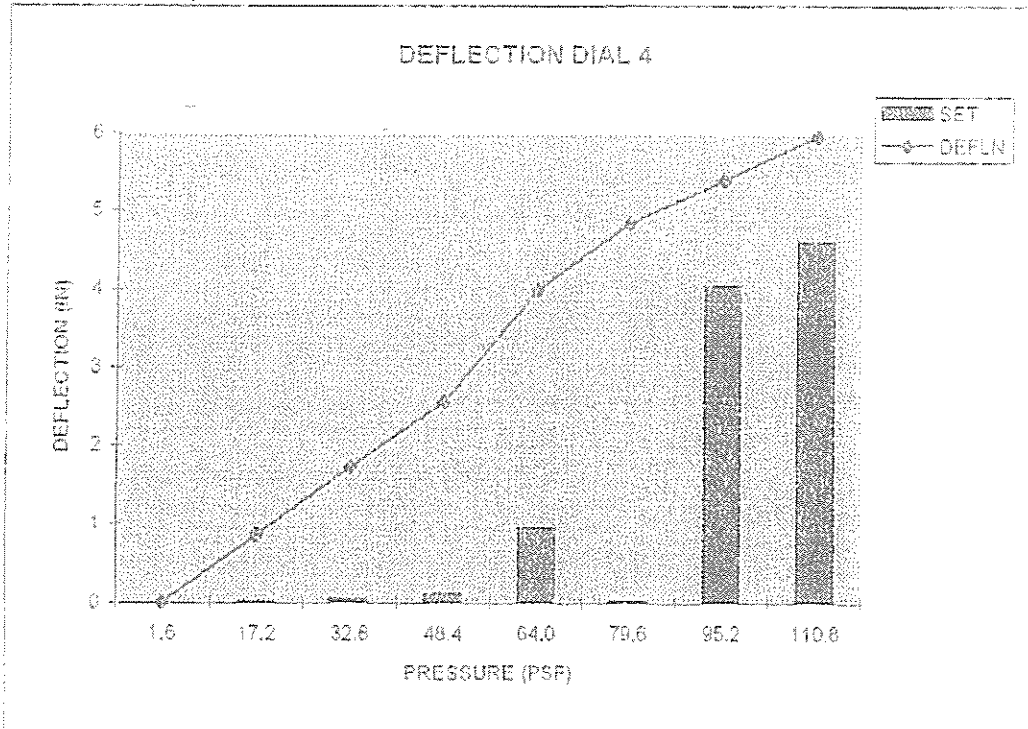
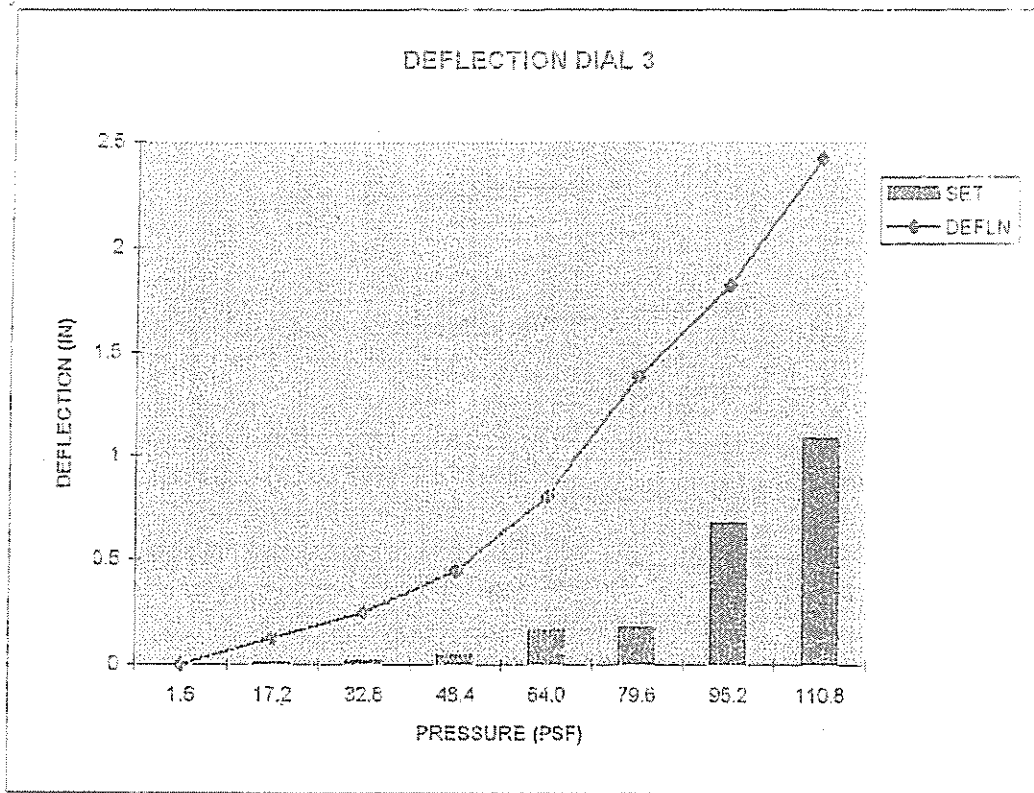


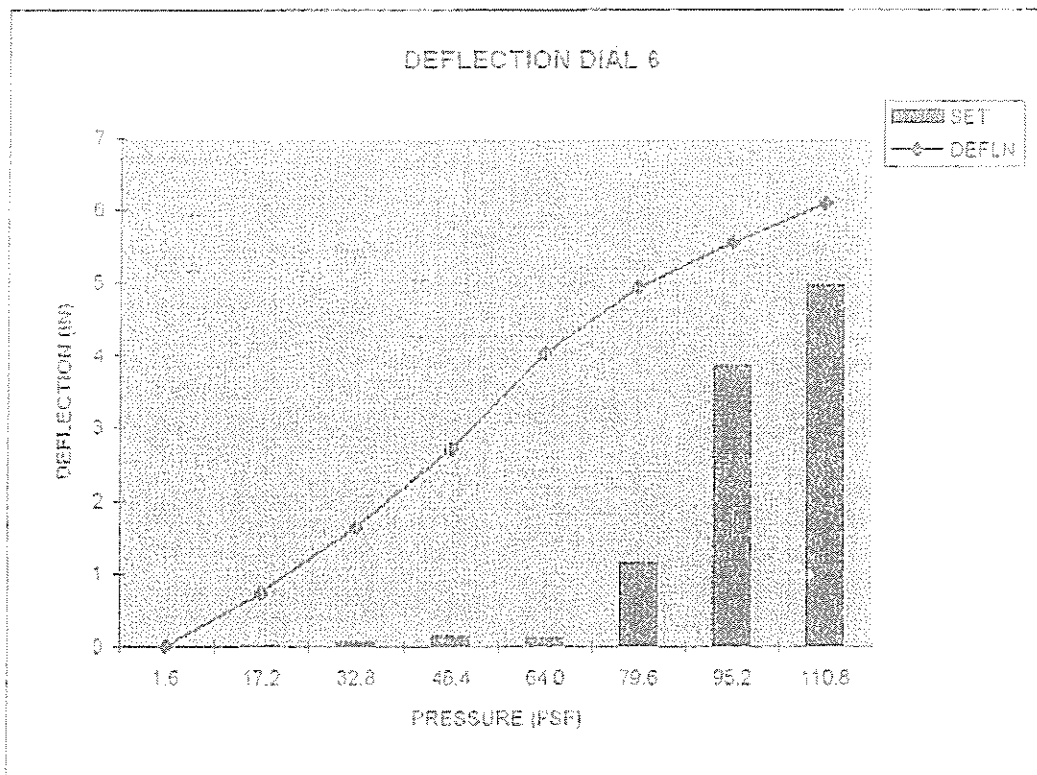
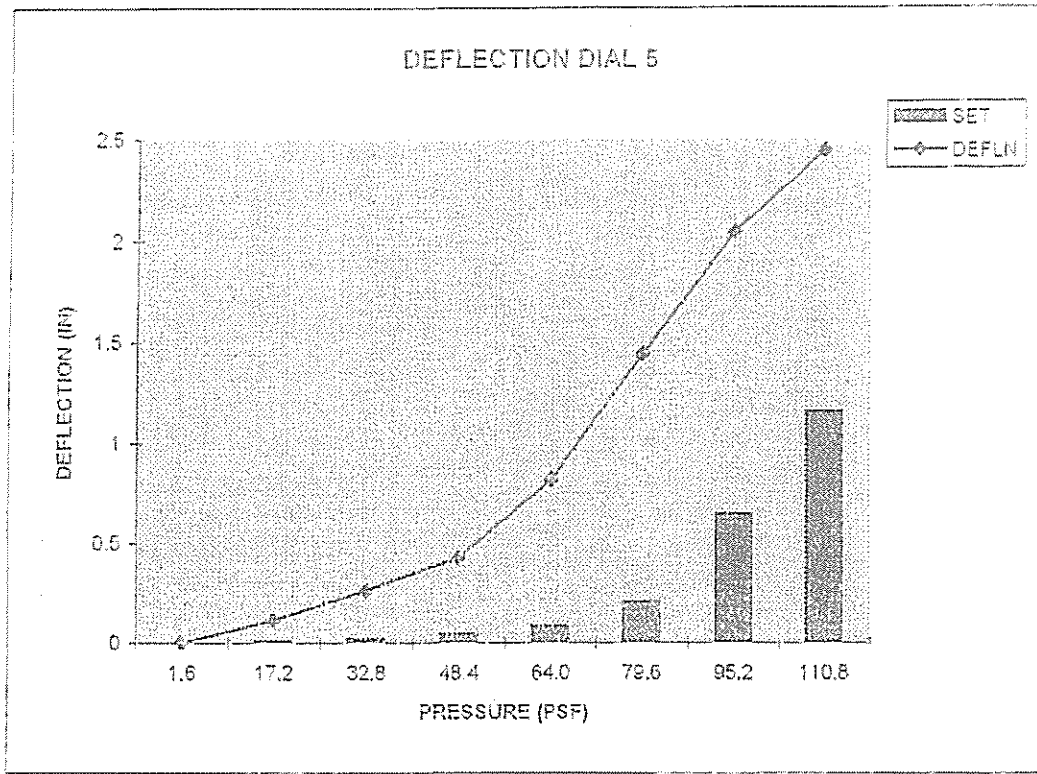
SKETCH 2

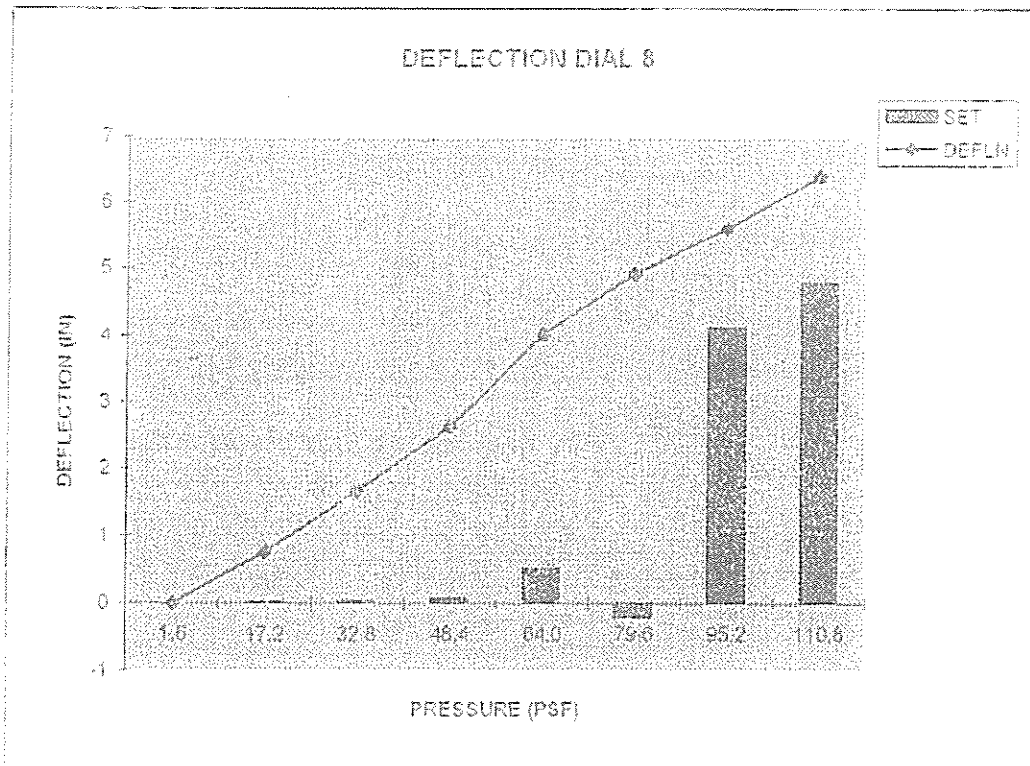
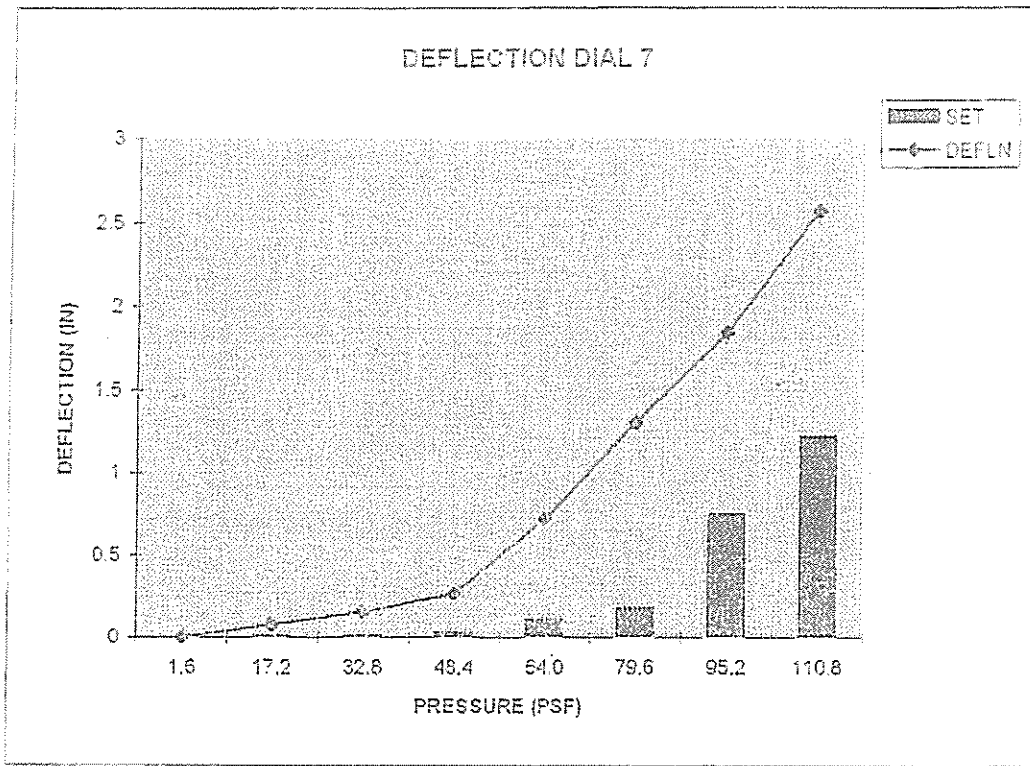
TEST DATA FOR 16" PANEL 22 GA 3 SPANS @ 5'-0" oc (SPEC. C)									
DEFLECTION DIAL READINGS (INCHES)									
LOAD (PSF)	DIAL 1	DIAL 2	DIAL 3	DIAL 4	DIAL 5	DIAL 6	DIAL 7	DIAL 8	REMARKS
1.6	0	0	0	0	0	0	0	0	PANEL WT.
17.2	0.022	0.354	0.123	0.857	0.113	0.74	0.075	0.747	
1.6	-0.002	-0.003	0.009	0.009	0.007	0.013	0.003	0.015	PANEL WT.
32.8	0.061	1.023	0.247	1.724	0.261	1.643	0.154	1.657	
1.6	-0.012	0.028	0.019	0.045	0.019	0.054	0.01	0.028	PANEL WT.
48.4	0.107	1.738	0.443	2.562	0.428	2.711	0.264	2.637	
1.6	0.002	0.082	0.042	0.114	0.046	0.144	0.03	0.069	PANEL WT.
64.0	0.402	3.134	0.804	3.988	0.815	4.02	0.72	4.023	
1.6	0.063	0.762	0.161	0.945	0.082	0.119	0.111	0.513	PANEL WT.
79.6	0.709	3.84	1.364	4.84	1.441	4.923	1.301	4.915	
1.6	0.001	-0.869	0.179	0.023	0.204	1.155	0.175	-0.219	PANEL WT.
95.2	0.952	4.295	1.818	5.389	2.044	5.545	1.843	5.602	
1.6	0.389	3.43	0.676	4.046	0.645	3.84	0.751	4.11	PANEL WT.
110.8	1.285	4.692	2.417	5.96	2.444	6.086	2.566	6.395	
1.6	0.624	3.863	1.088	4.602	1.158	4.956	1.217	4.791	PANEL WT.
121.2									CLIP FAILURE AND SCREW PULLOUT

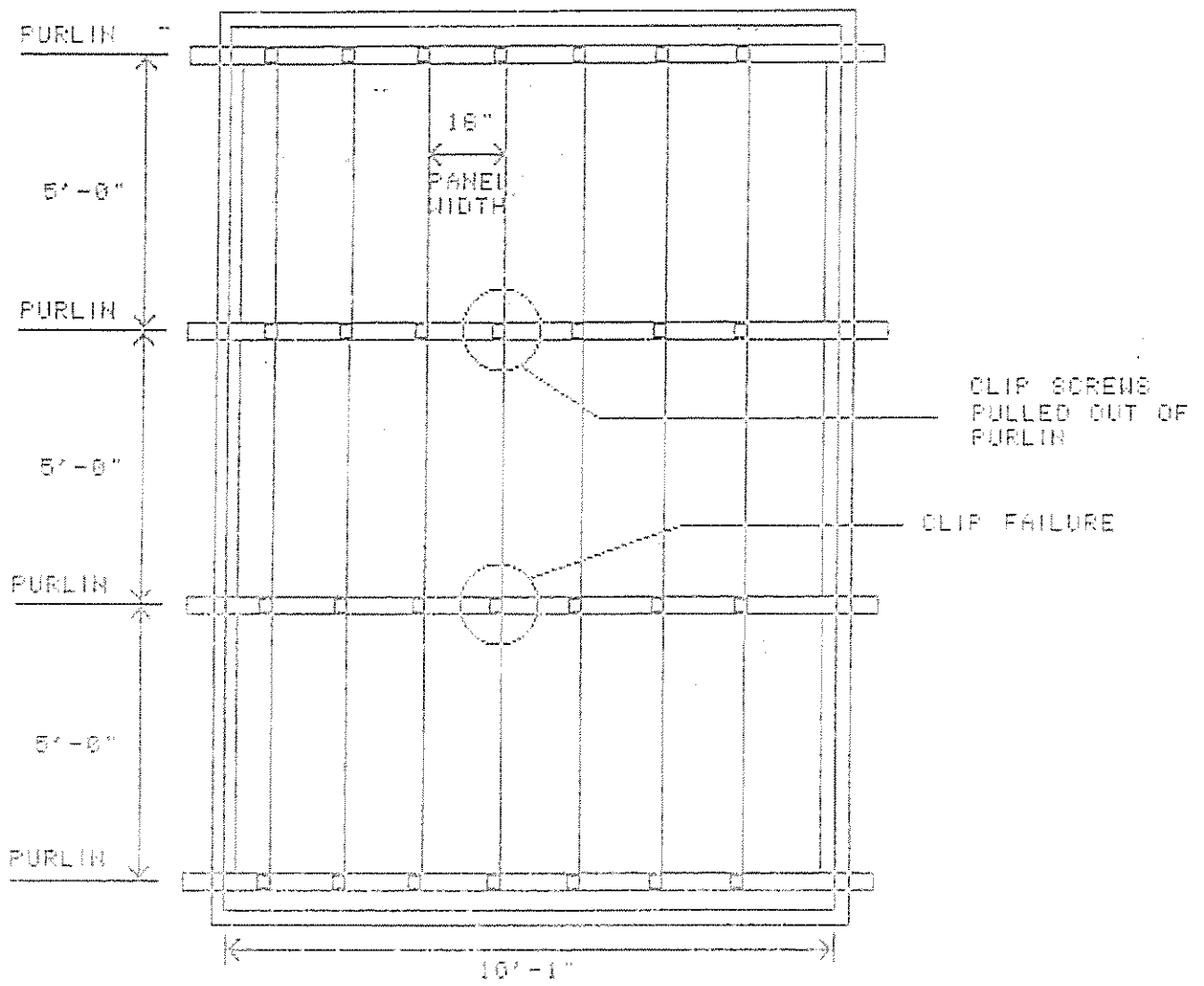
NOTE: SEE SKETCH 3 FOR LOCATION OF CLIP FAILURE AND SCREW PULLOUT.



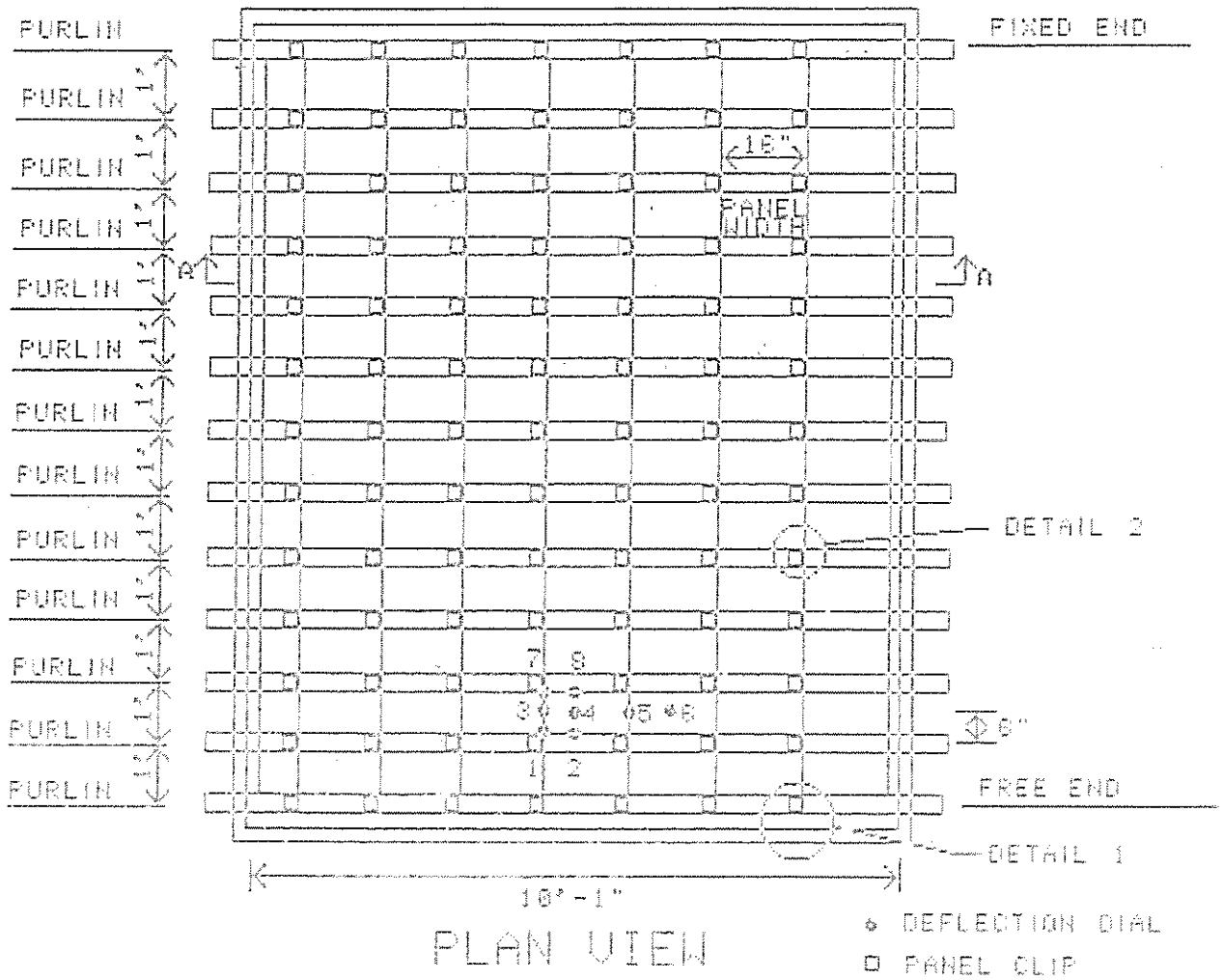






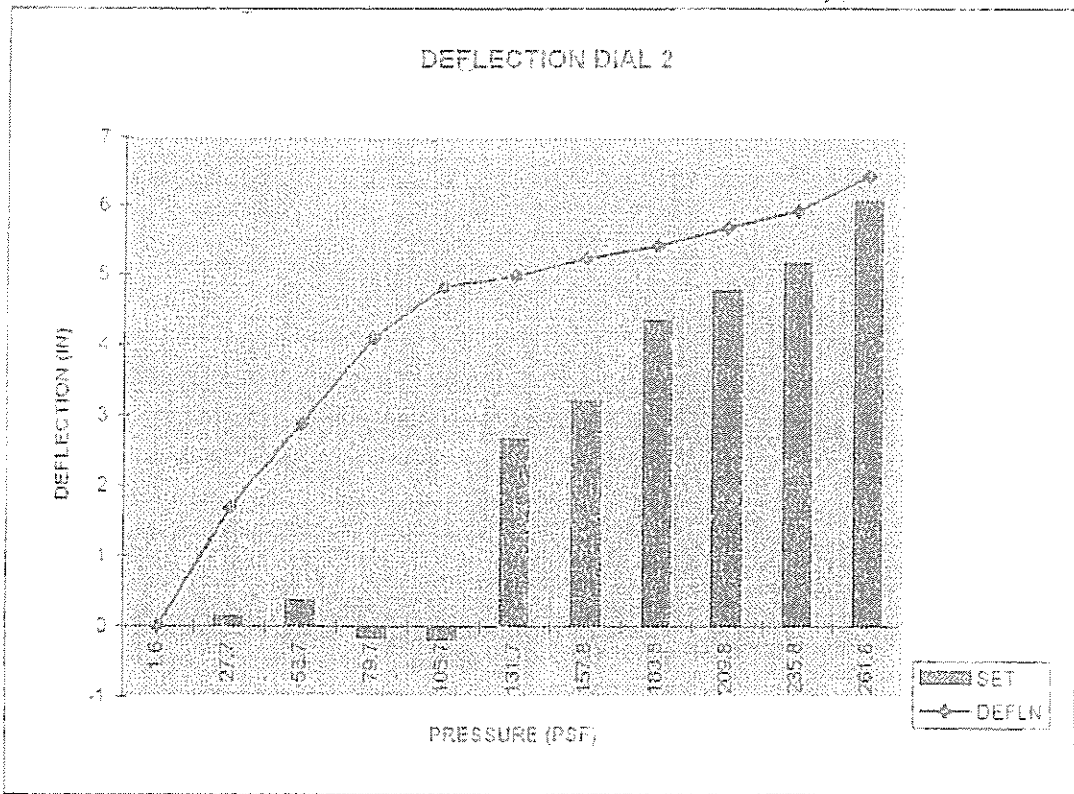
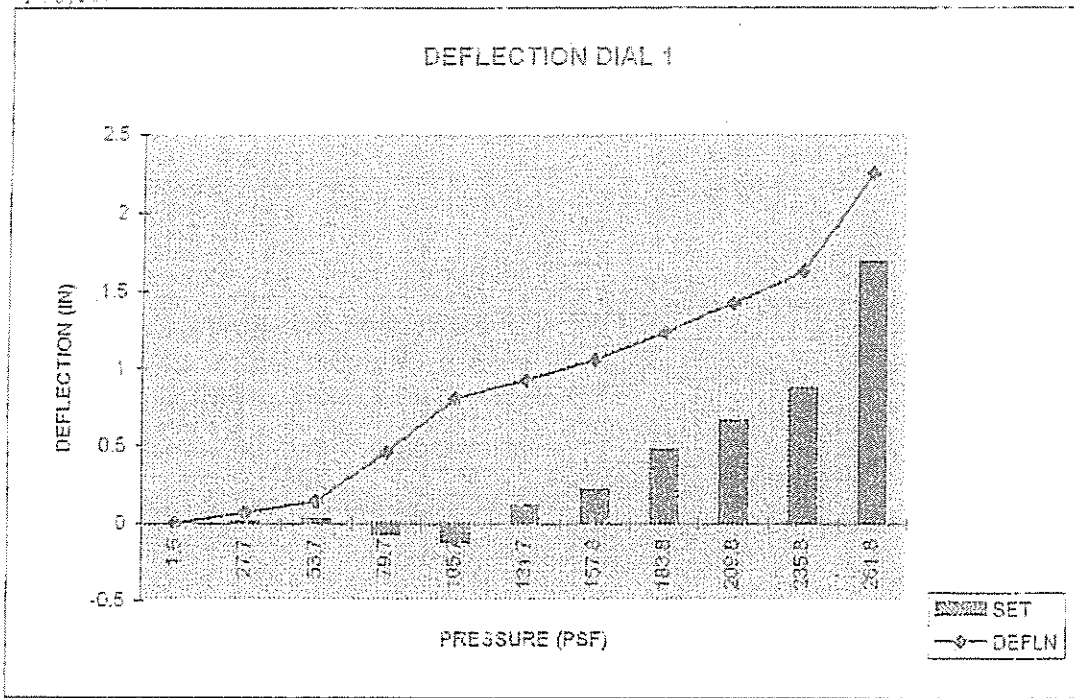


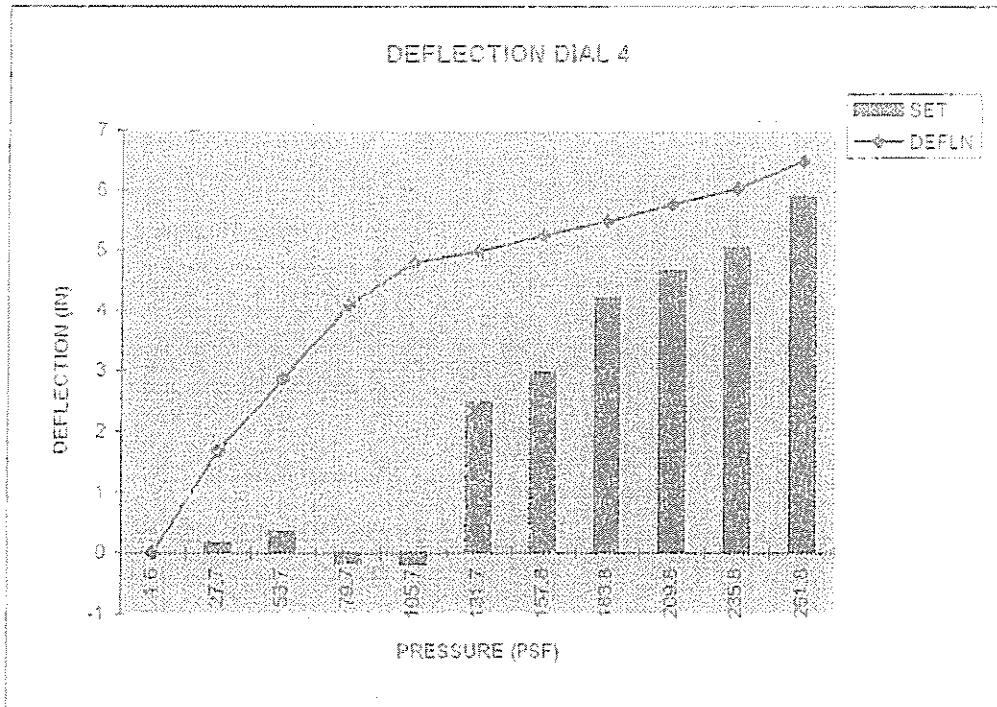
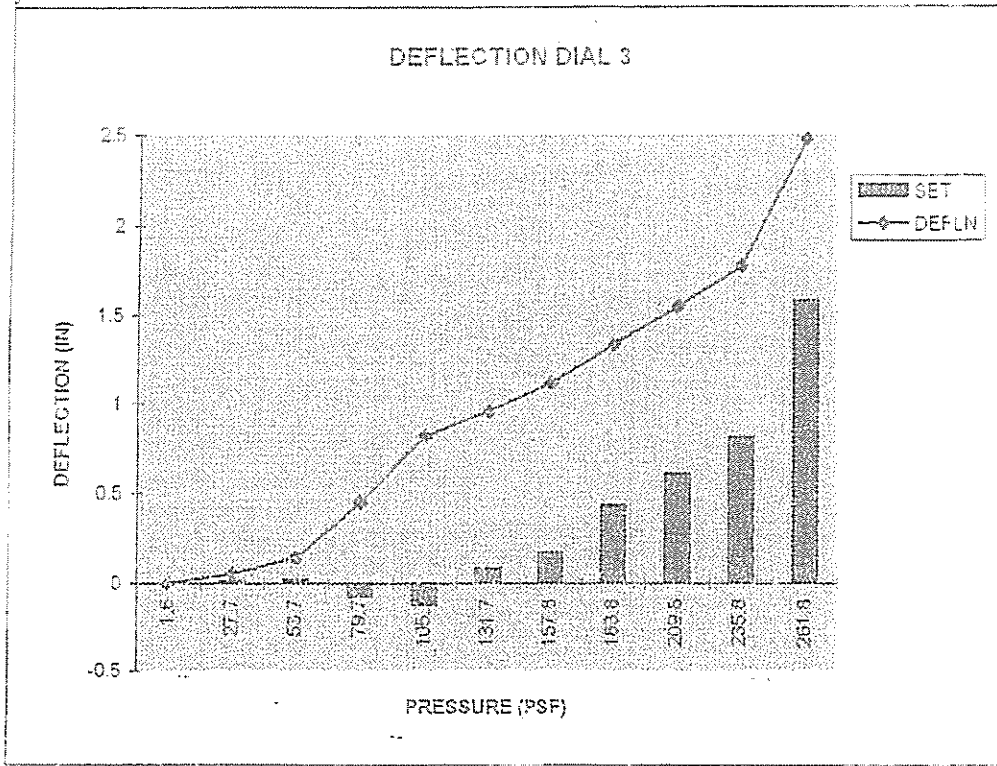
SKETCH 3

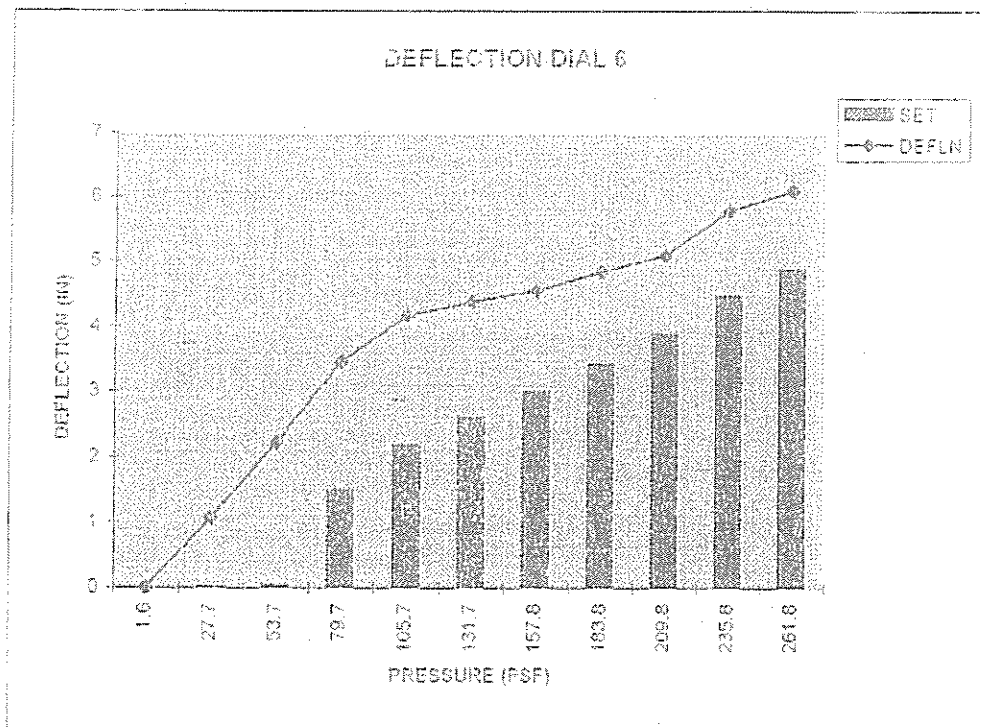
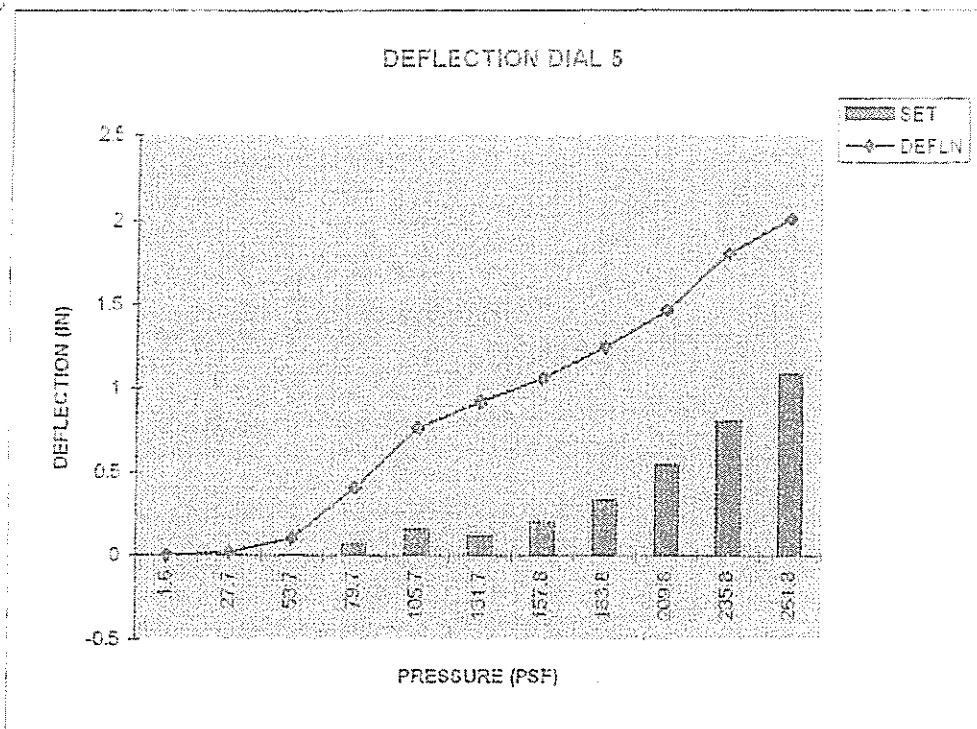


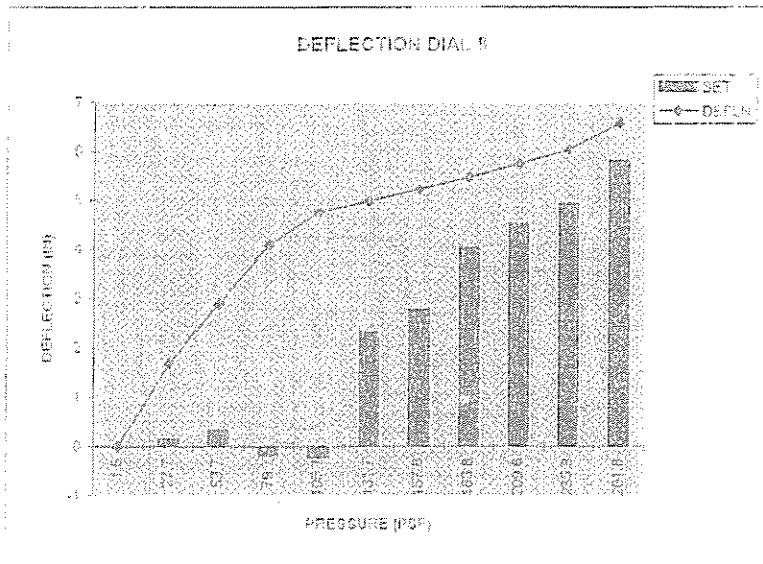
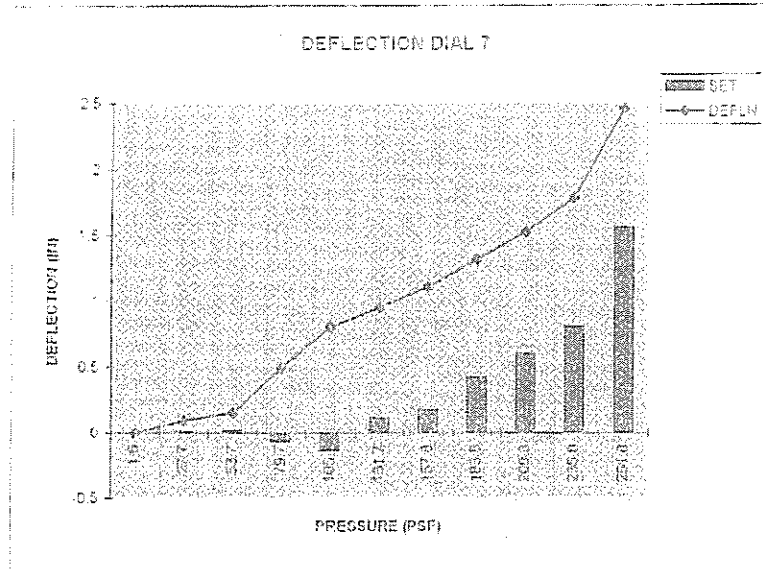
TEST DATA FOR 16" PANEL 22 GA 12 SPANS @ 1'-0" oc (SPEC. D)									
DEFLECTION DIAL READINGS (INCHES)									
LOAD (PSF)	DIAL 1	DIAL 2	DIAL 3	DIAL 4	DIAL 5	DIAL 6	DIAL 7	DIAL 8	REMARKS
1.6	0	0	0	0	0	0	0	0	PANEL WT.
27.7	0.059	1.688	0.05	1.689	0.02	1.052	0.095	1.683	
1.6	0.014	0.139	0.013	0.15	-0.004	0.009	0.013	0.155	PANEL WT.
53.7	0.146	2.881	0.144	2.849	0.104	2.221	0.151	2.895	
1.6	0.029	0.363	0.010	0.354	0.007	0.036	0.022	0.341	PANEL WT.
79.7	0.461	4.099	0.447	4.076	0.407	3.448	0.493	4.083	
1.6	-0.071	-0.177	-0.08	-0.174	0.071	1.489	-0.067	-0.192	PANEL WT.
105.7	0.808	4.829	0.818	4.78	0.764	4.158	0.798	4.758	
1.6	-0.123	-0.203	-0.132	-0.2	0.16	2.165	-0.131	-0.232	PANEL WT.
131.7	0.925	4.982	0.955	4.974	0.921	4.376	0.95	4.987	
1.6	0.118	2.647	0.082	2.489	0.121	2.601	0.114	2.321	PANEL WT.
157.8	1.055	5.233	1.116	5.233	1.057	4.546	1.105	5.226	
1.6	0.22	3.192	0.169	2.965	0.199	2.991	0.171	2.779	PANEL WT.
183.8	1.234	5.413	1.334	5.454	1.245	4.832	1.313	5.473	
1.6	0.477	4.342	0.436	4.185	0.337	3.416	0.418	4.038	PANEL WT.
209.8	1.423	5.675	1.543	5.753	1.464	5.09	1.526	5.761	
1.6	0.667	4.769	0.61	4.638	0.544	3.883	0.598	4.523	PANEL WT.
235.8	1.629	5.925	1.775	6.021	1.807	5.785	1.782	6.034	
1.6	0.874	5.159	0.812	5.031	0.806	4.455	0.8	4.928	PANEL WT.
261.8	2.251	6.425	2.476	6.476	2.011	6.099	2.458	6.566	ULTIMATE
1.6	1.689	6.056	1.582	5.891	1.086	4.877	1.558	5.815	PANEL WT.

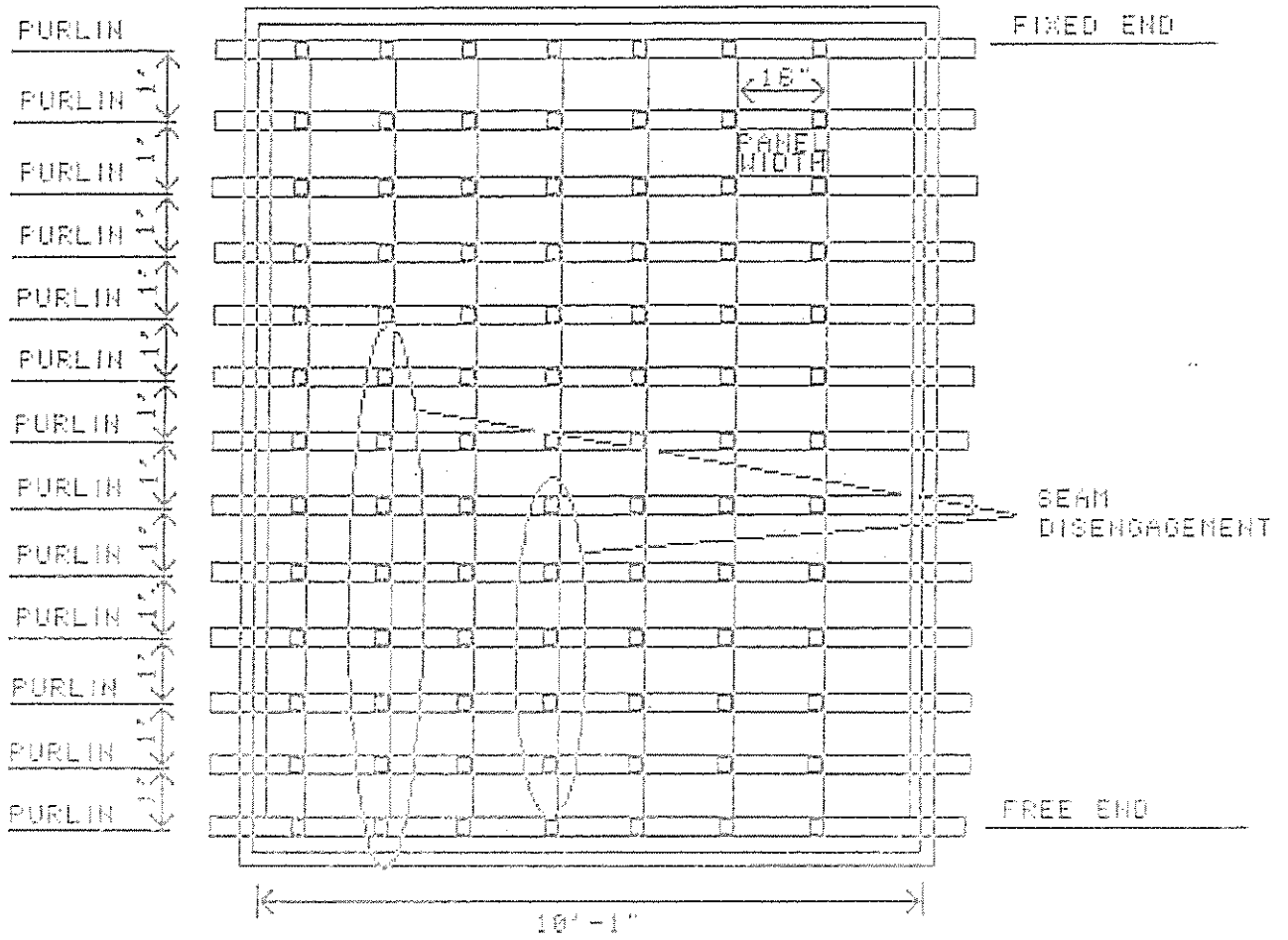
NOTE SEE SKETCH 4 FOR LOCATION OF SEAM DISENGAGEMENT.





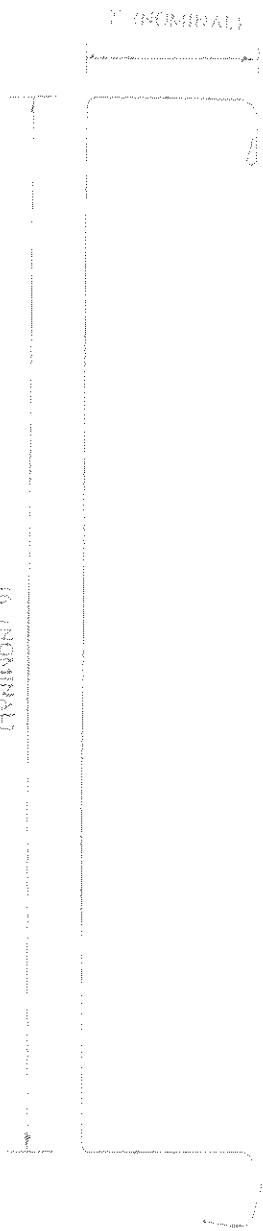




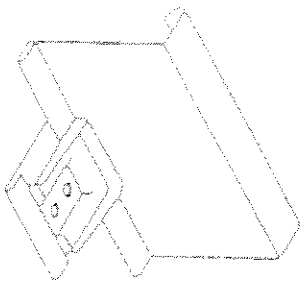


SKETCH 4

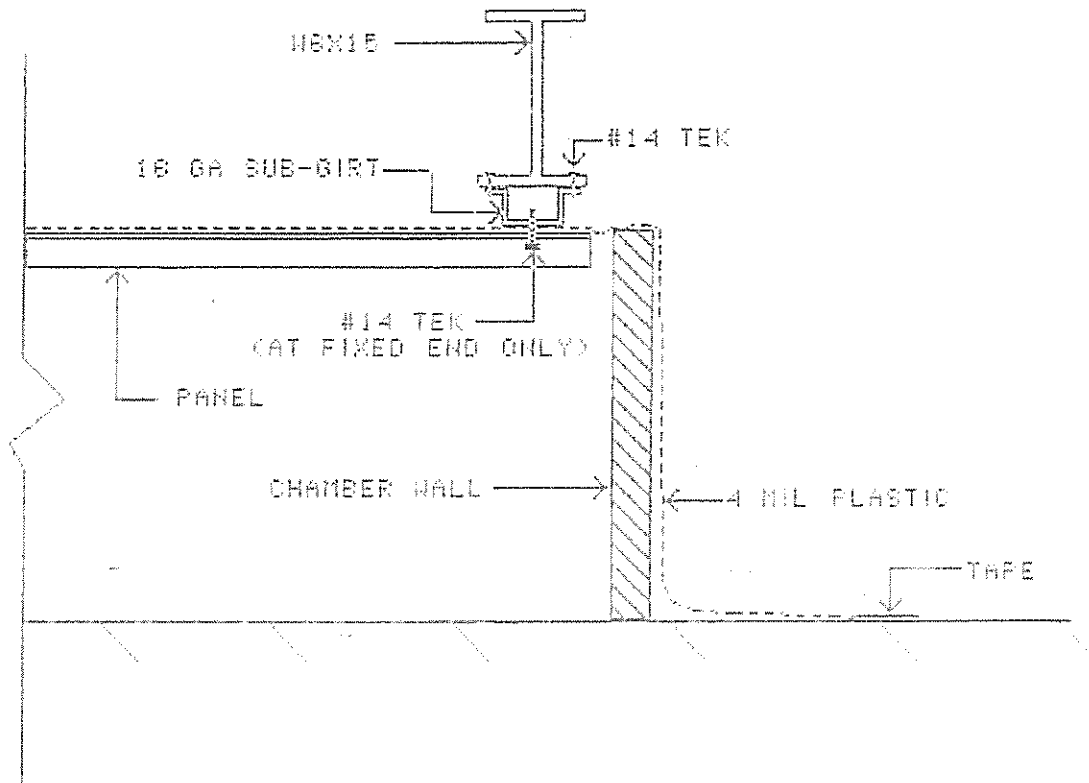
APPENDIX



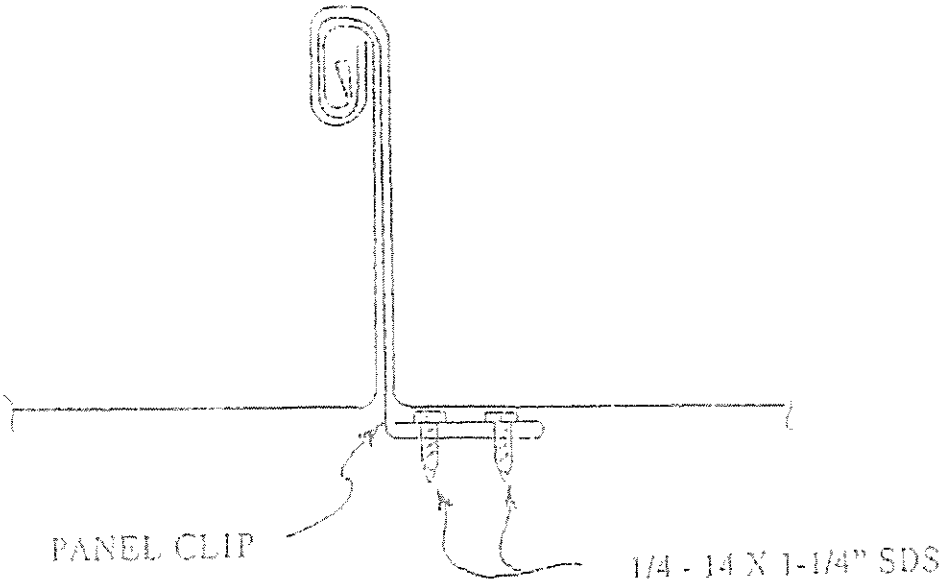
Peterson Aluminum Corp. Tite-loc Plus Panel



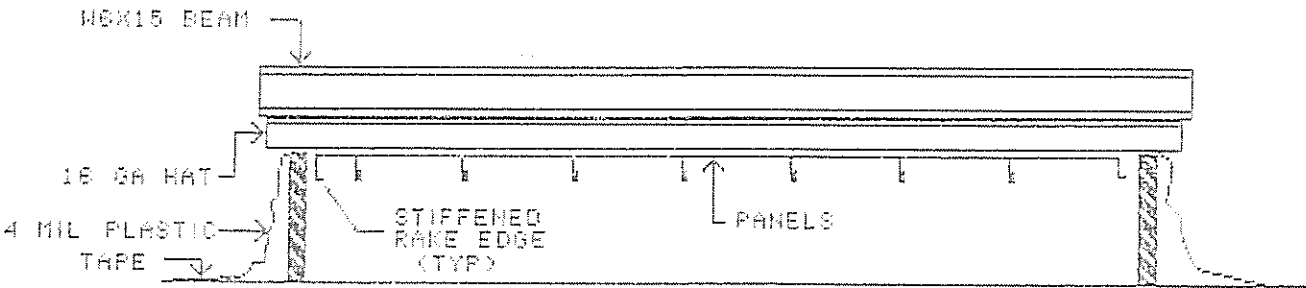
PANEL CLIP



DETAIL 1



DETAIL 2



SECTION A-A



WEST PENN TESTING LABORATORIES, INC.
 AN INDEPENDENT INSPECTION BUREAU AND TESTING LABORATORY

Keystone Commons • 501 Bradlock Ave. • Turtle Creek, PA 15145-2084
 PHONE: (412) 824-1900 • FAX: (412) 824-9755

File No.: WP-9043
 Report No.: 055
 Date: 12/12/97

REPORT OF TENSILE STRENGTH

Client: Parabaugh Engineering & Testing

Date of Test: Dec 11, 1997

Test Method: ASTM A-370

Part #	Dimensions (in.)	Area (sq.in.)	Yield Point (lbs.)	Tensile Strength (lbs.)	Yield Point (psi)	Tensile Strength (psi)	Elongation (% in 2")	Fracture Location
MBCI 16" Superlok, 22 ga.	0.0307 x 0.4999	0.0153	701	863	49,590	56,230	25.0	U/3

Yield Point determined by the Autographic / Halt-of-the-Load Method
 Test Equipment: ATS System 910 #A901779, Extensometer #889026, Recorder #960709
 Technician: D. Rebert

Respectfully submitted,

Todd A. Ault (M.E.T.)
 WEST PENN TESTING LABORATORIES, INC.