



**Force Engineering & Testing Inc.**

2405 A S. Houston Ave. Suite 500

Humble, Texas 77396

Phone: (281) 540-6603

Fax: (281) 540-9966

Project Number : 13-0328T-06A

Test Report Date : December 12, 2006

Test Material: Top Panel: 26 Ga. PBR over 16 Ga. Top Hat over 26 Ga. PBR  
Panel with Hats running on top of Bottom Panel @ 4'-0" O.C.

Test Protocol : TAS 125-03  
PER ASTM E 1592-01  
*STANDARD TEST METHOD FOR THE STRUCTURAL PERFORMANCE  
OF SHEET METAL ROOF AND SIDING SYSTEM BY UNIFORM  
STATIC AIR PRESSURE DIFFERENCE*

Test Location : Force Engineering & Testing, Inc.  
2405A South Houston Avenue, Suite 500  
Humble, TX 77396

Dade County Lab Certification No: 05-1122.13

## **TOPHAT SYSTEM**

**(PURLINS @ 5'-0" O.C., TOPHAT @ 2'-6" O.C., HATS @ 4'-0" O.C.)**

Report by:

Brandon Jasek, P.E.

Reviewed by:

Terrence E. Wolfe, P.E.

Project Number: 13-0328T-06A

**PURPOSE:**

This test method covers the evaluation of the structural performance of sheet metal panels and anchor-to-panel attachments for roof systems under uniform static air pressure difference using a test chamber.

**TEST DATES:**

November 27, 2006

**TEST SPECIMEN:**

Manufacturer: TopHat Framing Systems  
8660 Lambright  
Houston, Texas 77075

Top/Bot Panels: 26 Ga. PBR Panels, .019" Coated Thickness

Panel Fasteners: 1/4-14 x 1-1/4" HWH SD @ 7"-5"-7"-5"-7" Fastener Pattern

Roof Runner: 16 Ga. inverted Hats, with pre-punched holes Spaced @ 2'-6"

RR Fasteners: Into 16 Ga. Purlin Supports: (2) 1/4-14 x 1-1/4" HWH SD @ each  
low PBR Rib

Into 16 Ga. Hats: (2) 1/4-14 x 1-1/4" HWH SD @ 2'-0" O.C.

Hats: 16 Ga. Hat @ 4'-0" O.C.

Hat Fasteners: Into Purlin Supports (2) 1/4-14 x 1-1/4" HWH SD @ 5'-0" O.C.

Support Purlins: 16 Ga. @ 4 Spans @ 5'-0" O.C.

**TESTING APPARATUS:**

High Pressure Blower: New York Blower, 15 hp, 900 cfm.

Test Chamber: 20' x 10' steel chamber.

Mounting Frame: 16-ga. cee/ I-beam composite section

Pressure Indicator: Heise Digital Pressure Indicator Model #901B, (+/-) 300-psf  
range, with max./min. hold features.

Deflection Indicators: aluminum rulers calibrated to 1/64".

**PANEL INSTALLATION:**

1. The panels were installed per manufactured.
2. Plastic was draped loosely on top of the TopHat/beneath the top panels to create a seal.

Project Number: 13-0328T-06A

**TEST PROCEDURE:**

1. Initially the system was preloaded to a pressure of 5-psf to insure proper seating of the panels and plastic film.
2. With the preloading process complete, initial deflection measurements were taken at the (8) deflection indicator locations. These initial deflection readings represented the zero position/zero load specimen status from which all readings were referenced.
3. Pressure was applied in the intervals shown on the data sheet (see appendix) for 60 seconds at a time. After each interval of loading, the system was allowed to return to atmospheric pressure.
4. Deflection readings were taken during each cycle of applied pressure. Also, a "zero" reading was taken after each cycle to record any permanent deformation produced by the load interval.
5. The test proceeded as stated above until the system reached ultimate failure.

**RESULTS/CONCLUSIONS:**

The panel assembly reached a maximum sustained test pressure of -200.0 psf and an ultimate test pressure of -210.0 psf. The failure mode was the roof runner fasteners pulled out of the 16 Ga. hat.

Graphs plotting deflection and permanent set versus pressure are found in the appendix of this report along with the raw data sheet.

Note: During this test, tape and plastic were used to seal against air leakage. The tape and plastic had no restrictive influence on the test.



2.27.07

## **Appendix**

### E-1592 Raw Test Data

**Project:** 13-0328T-06A  
**Description:** 26 Ga. PBR over TopHat over Hats over 26 Ga. PBR  
**Date:** 11/27/2006

LOAD	DEFLECTION (IN.)							
	1	2	3	4	5	6	7	8
0.00	28.8750	8.5781	28.9688	28.9063	8.5000	8.5625	29.0625	8.4063
20.00	28.7500	8.6719	28.8125	28.7500	8.6094	8.6719	29.0313	8.4375
0.00	28.8438	8.5938	28.9688	28.8750	8.5000	8.5625	29.0625	8.4063
42.00	28.6250	8.7969	28.6250	28.5313	8.7500	8.8125	28.9375	8.4844
0.00	28.8438	8.5938	28.9375	28.8750	8.5000	8.5625	29.0625	8.4063
56.00	28.5313	8.8750	28.5313	28.4063	8.8281	8.8906	28.9375	8.5000
0.00	28.8438	8.5938	28.9375	28.8750	8.5156	8.5781	29.0625	8.4219
100.00	28.3125	9.0938	28.1563	28.0000	9.1875	9.2344	28.8125	8.5781
0.00	28.8438	8.6250	28.9063	28.8438	8.5469	8.6250	29.0625	8.4219
140.00	28.0938	9.2969	27.8125	27.6250	9.4844	9.5469	28.7188	8.6563
0.00	28.8125	8.6563	28.8750	28.7813	8.5938	8.6719	29.0313	8.4375
180.00	27.8750	9.5156	27.4063	27.2188	9.8438	9.9063	28.5938	8.7500
0.00	28.7188	8.7344	28.7813	28.6563	8.6719	8.7500	29.0313	8.4688
200.00	27.7500	9.6250	27.1875	27.0000	10.0469	10.1406	28.5313	8.7813
0.00	28.6875	8.7813	28.6875	28.5938	8.7344	8.8125	29.0313	8.4844

**Ultimate Test Pressure:** 200- psf  
**Mode of Failure:** TopHat Fasteners Pulled out of hat

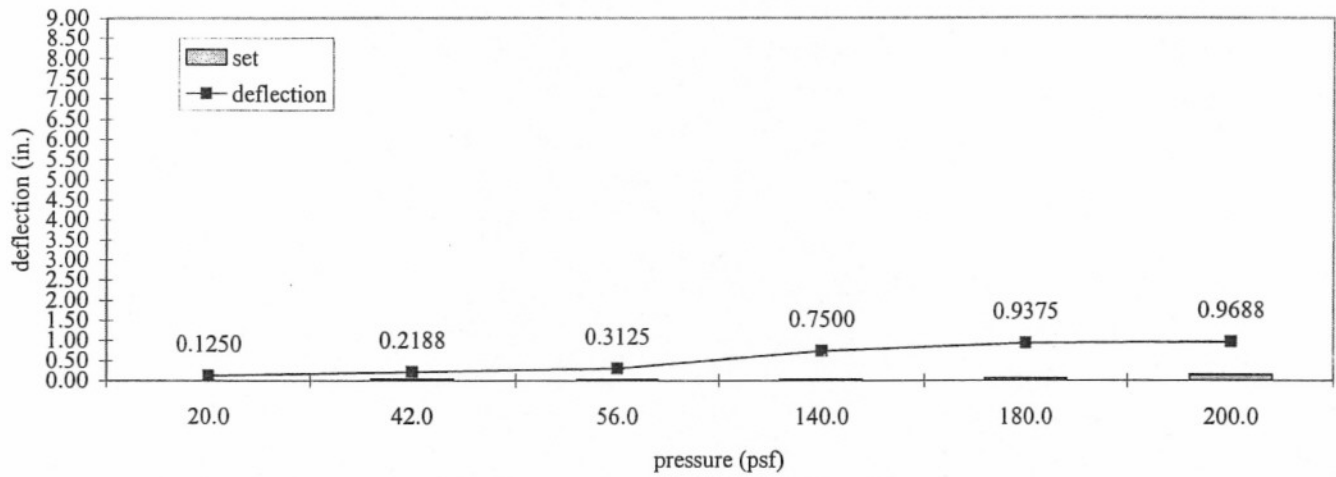


Chart 1 - Deflection vs. Pressure (position 1)

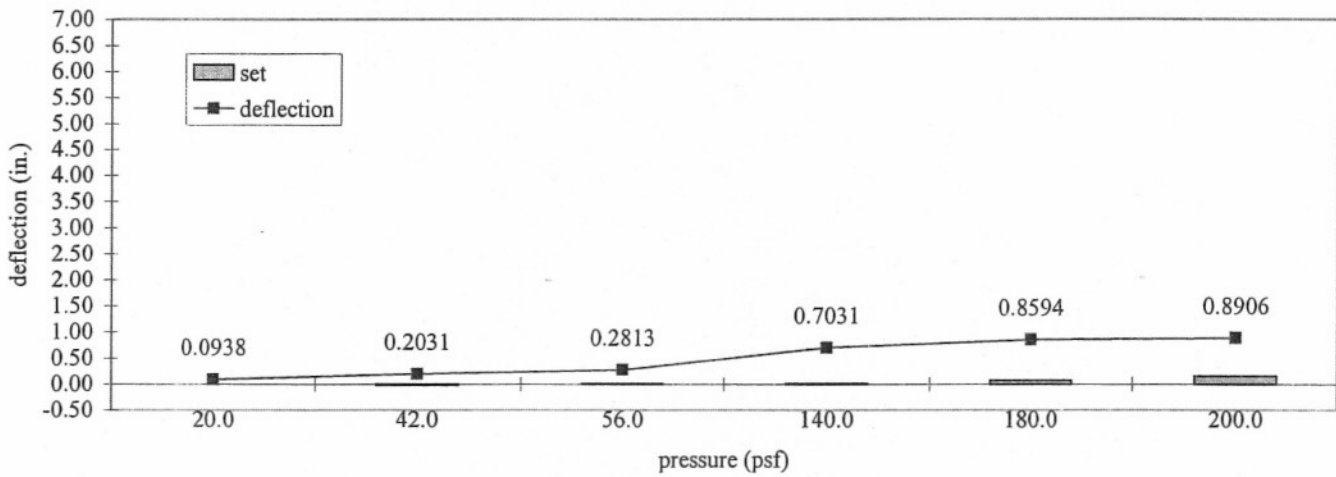


Chart 2 - Deflection vs. Pressure (position 2)

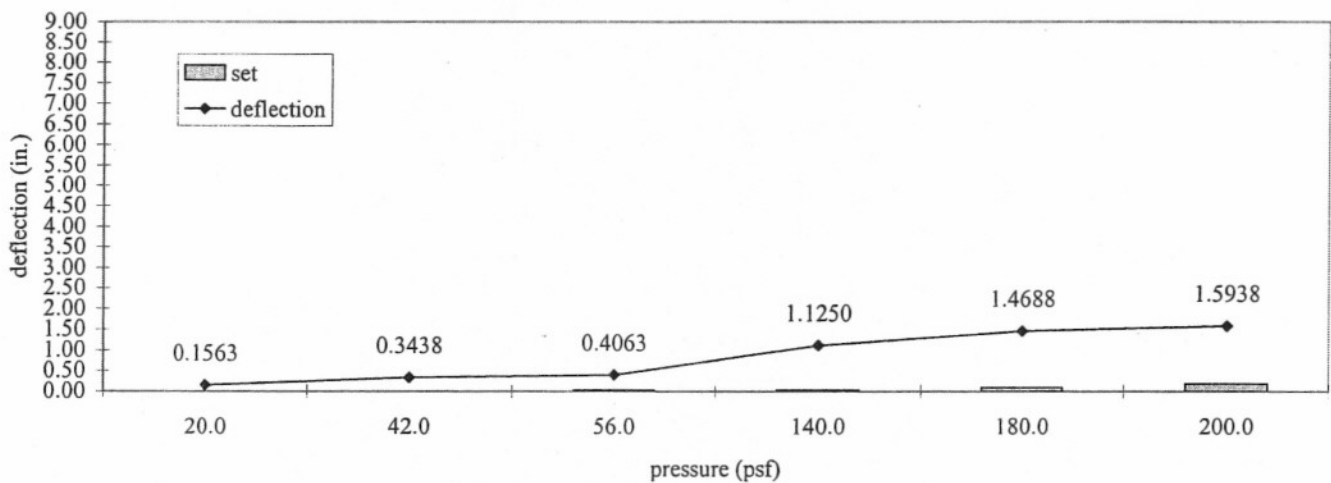


Chart 3 - Deflection vs. Pressure (position 3)

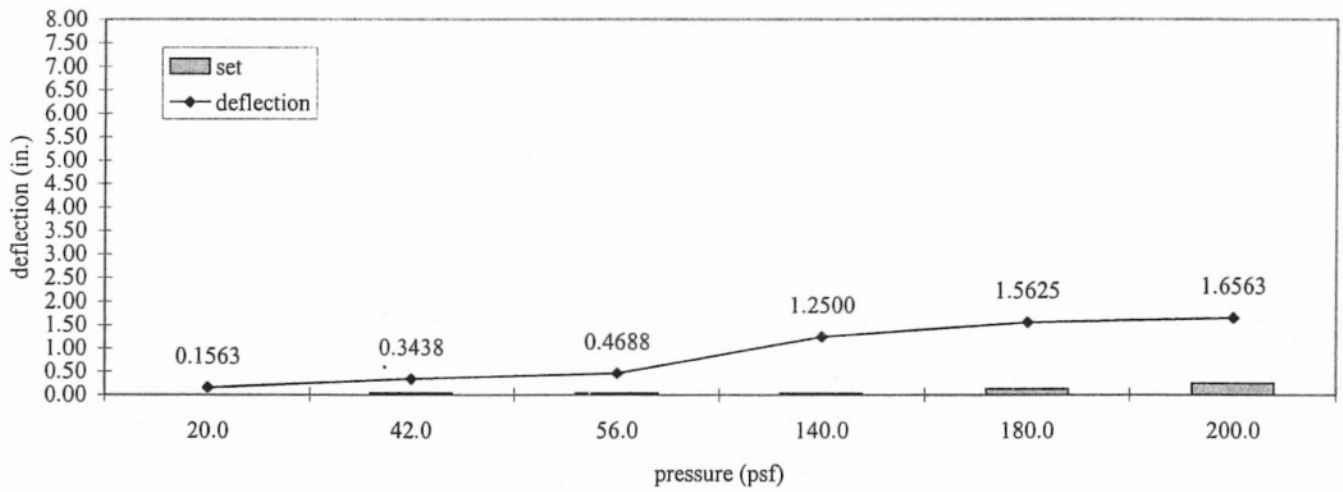


Chart 4 - Deflection vs. Pressure (position 4)

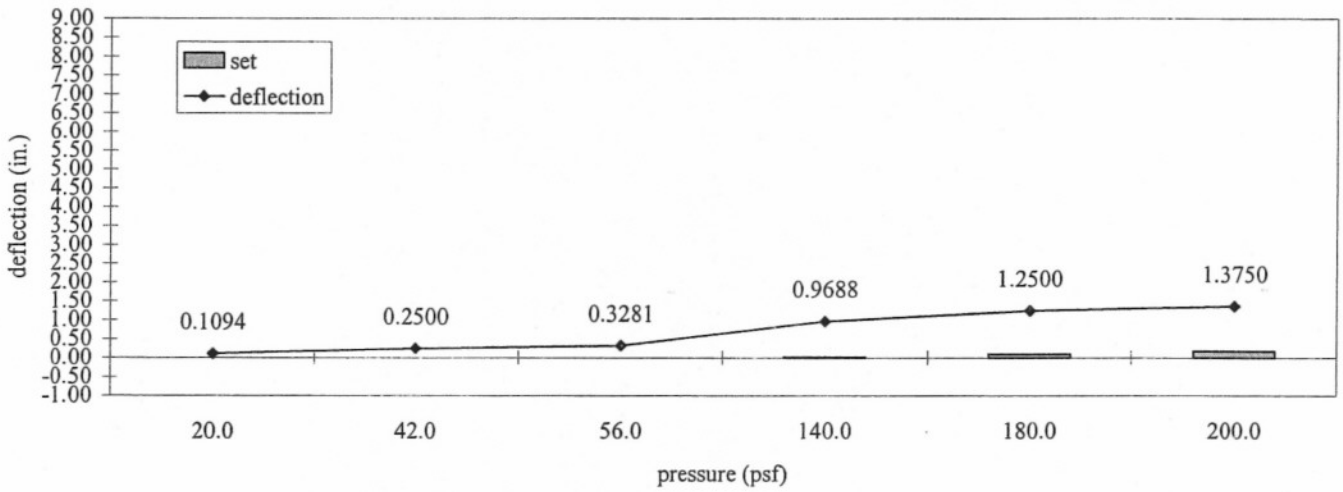


Chart 5 - Deflection vs. Pressure (position 5)

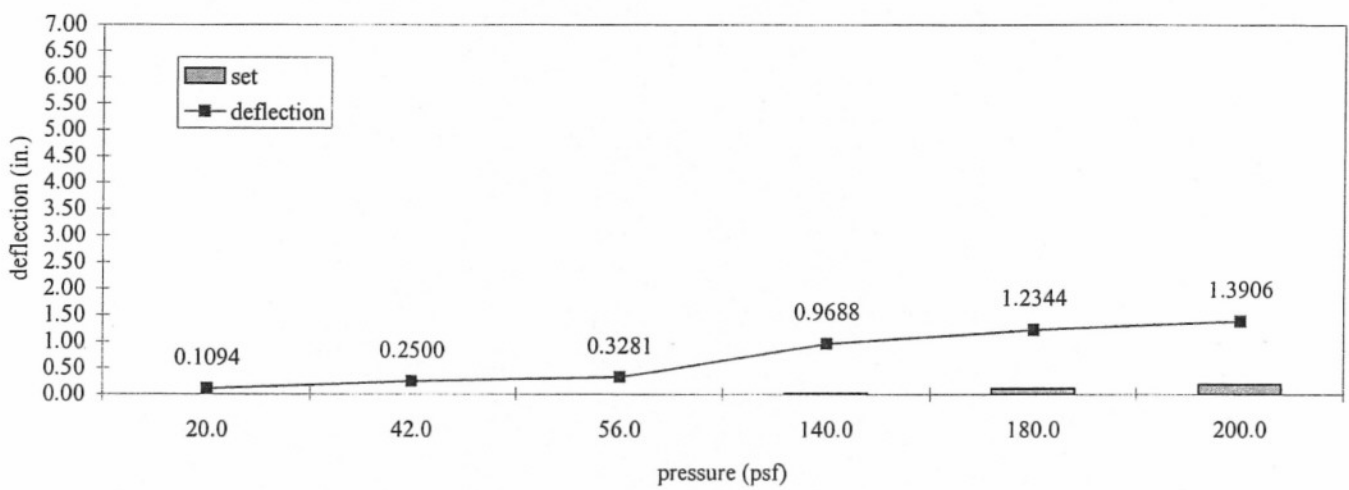
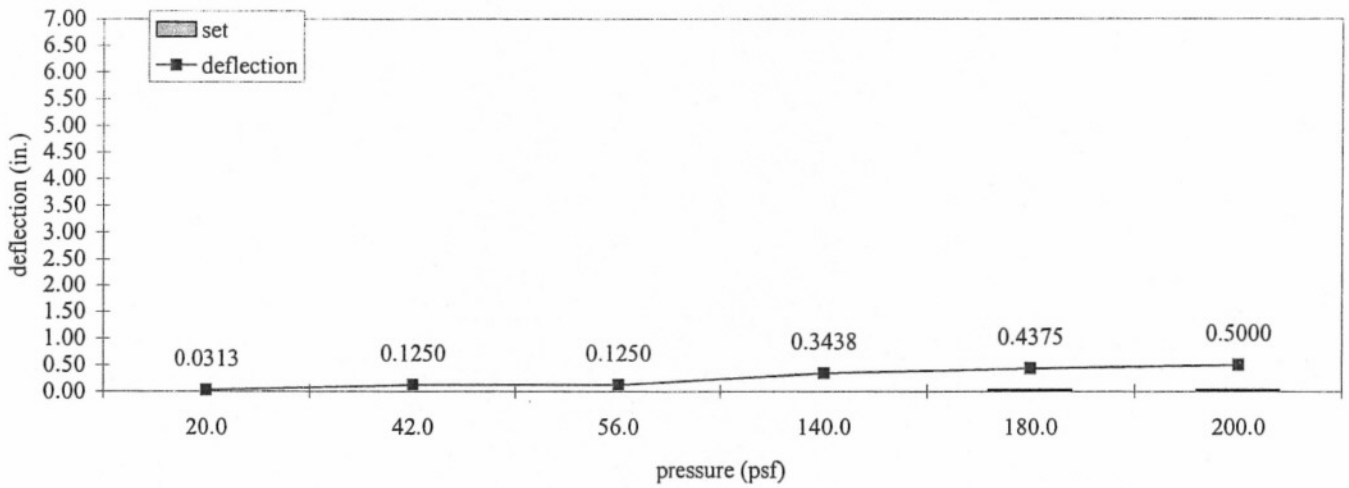
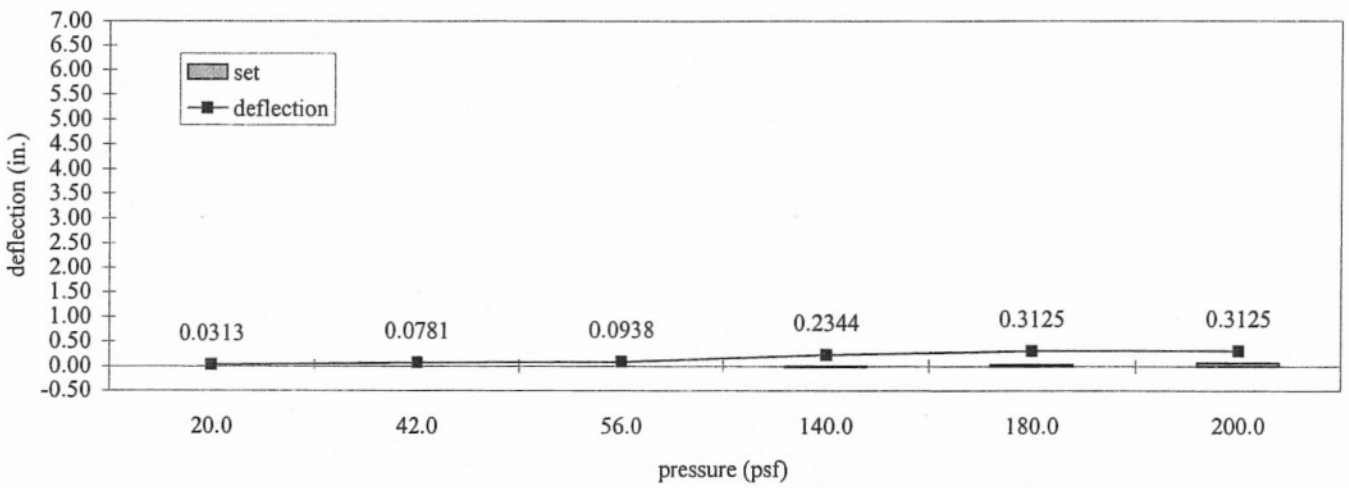


Chart 6 - Deflection vs. Pressure (position 6)

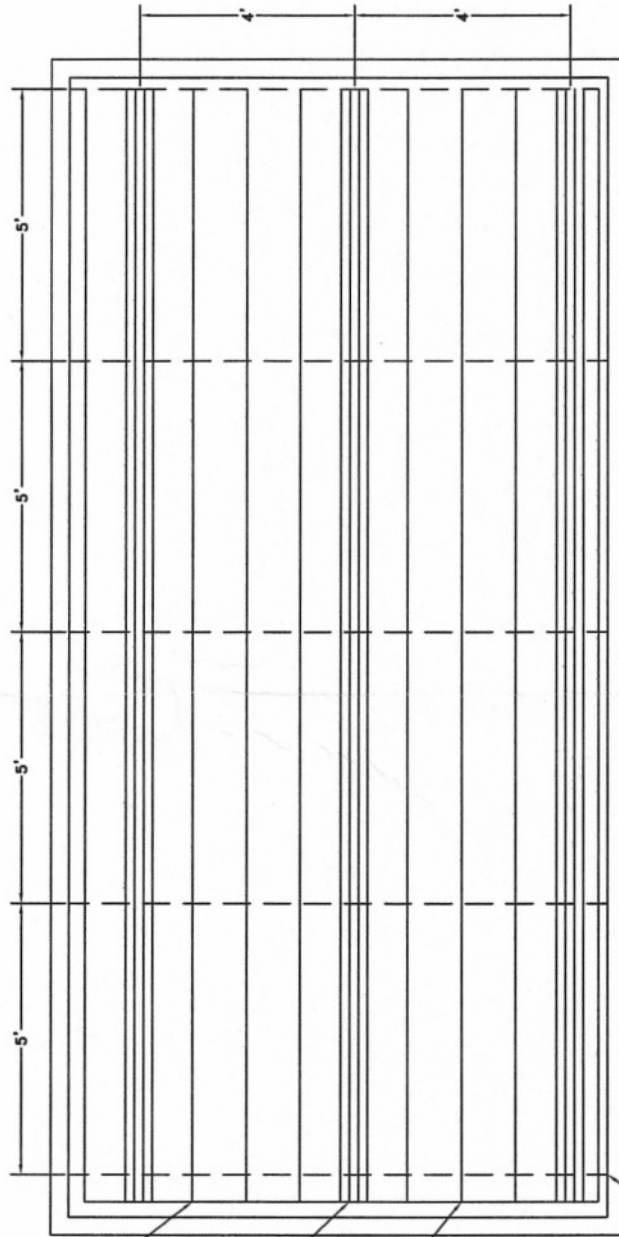


*Chart 7 - Deflection vs. Pressure (position7)*



*Chart 8- Deflection vs. Pressure (position8)*





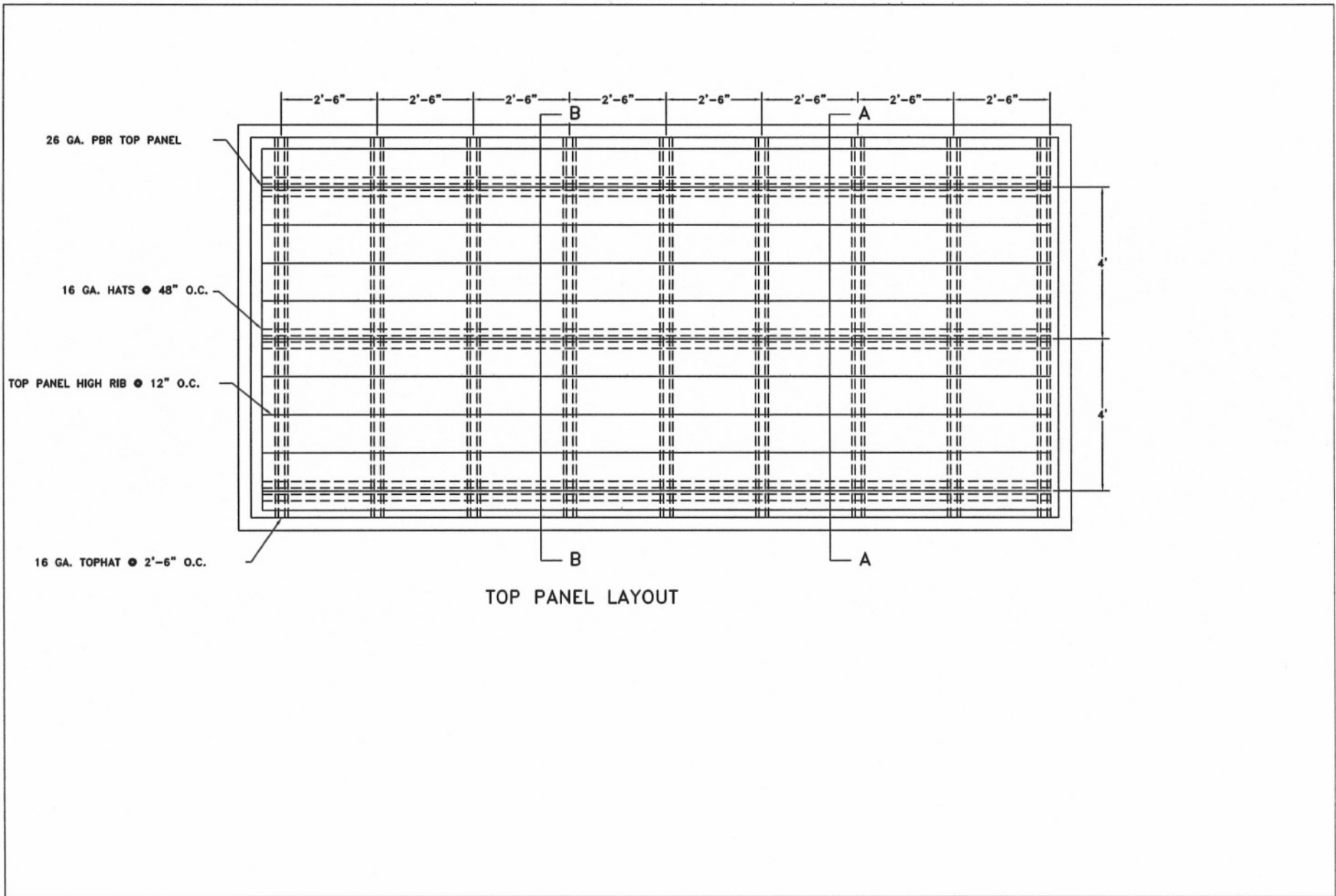
26 GA. PBR BOTTOM PANEL

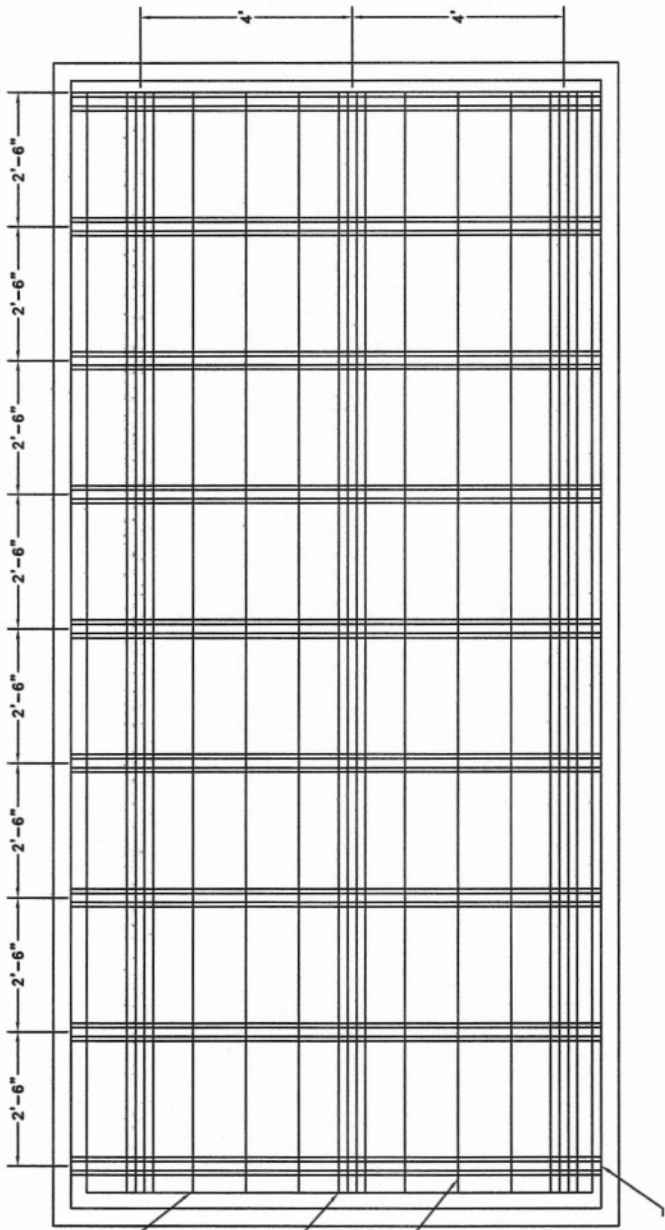
16 GA. HATS @ 48" O.C.

BOT PANEL HIGH RIB @ 12" O.C.

16 GA. PURLINS @ 5'-0" O.C.

BOTTOM PANEL AND HAT LAYOUT





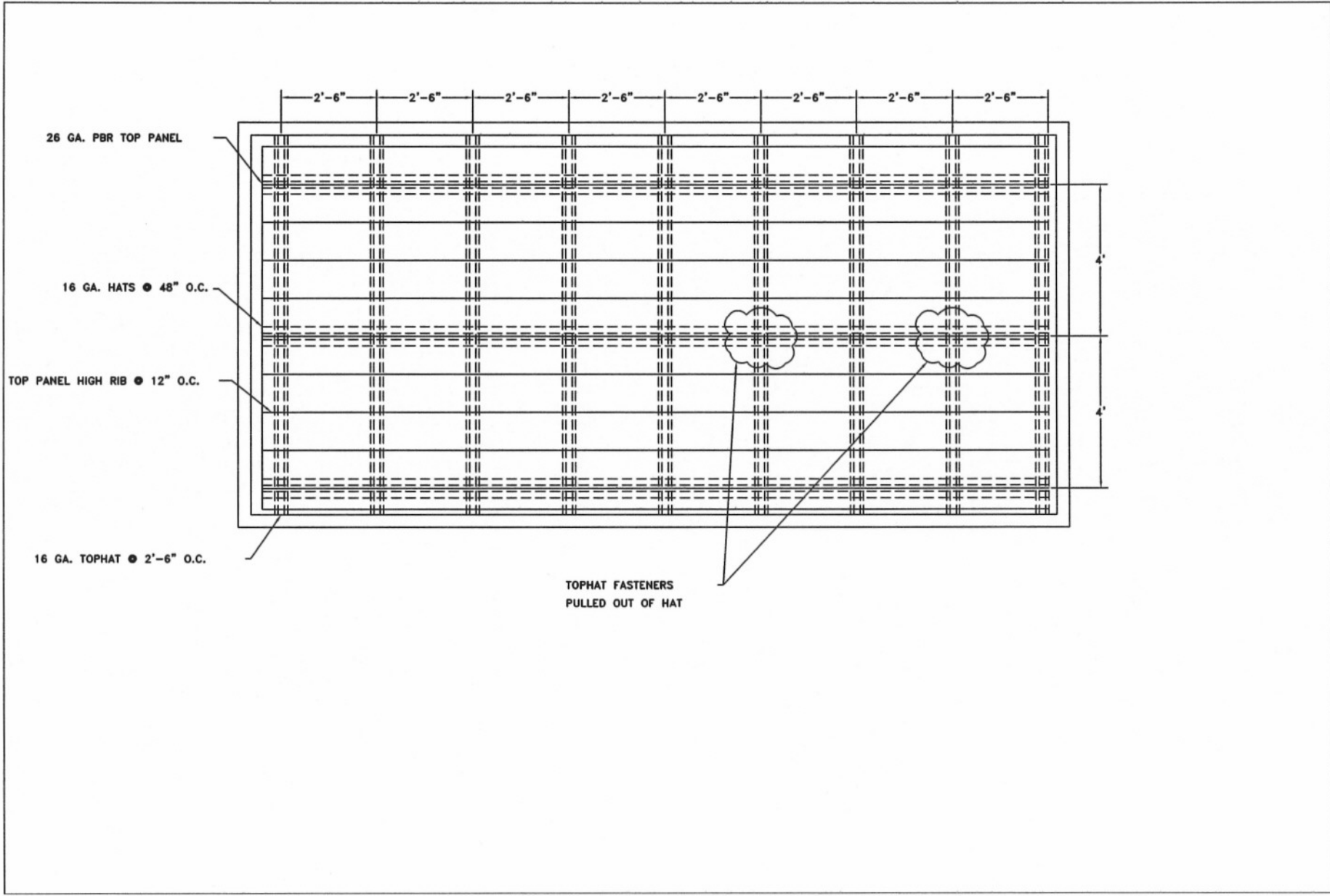
26 GA. PBR BOTTOM PANEL

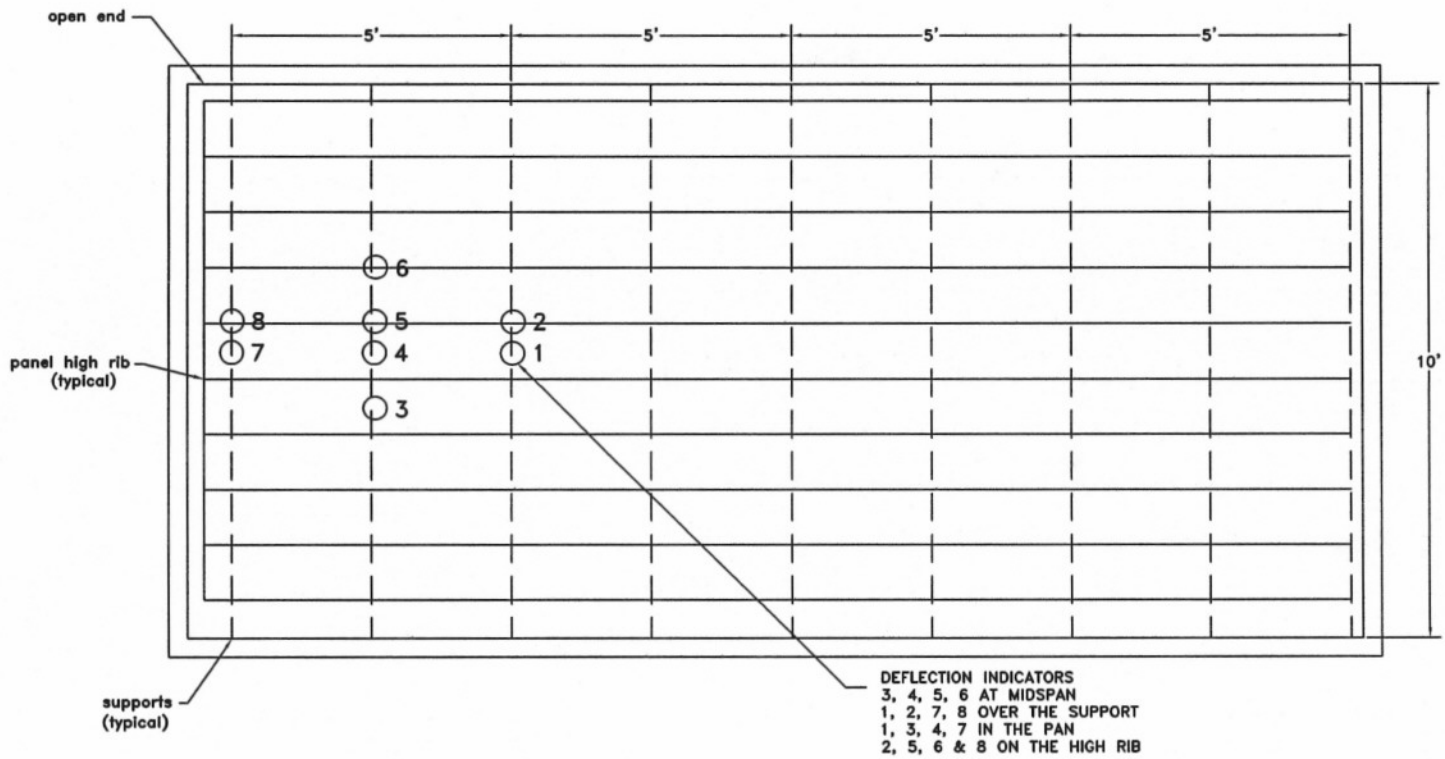
16 GA. HATS @ 48" O.C.

BOTTOM PANEL HIGH RIB @ 12" O.C.

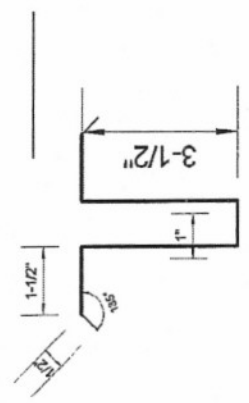
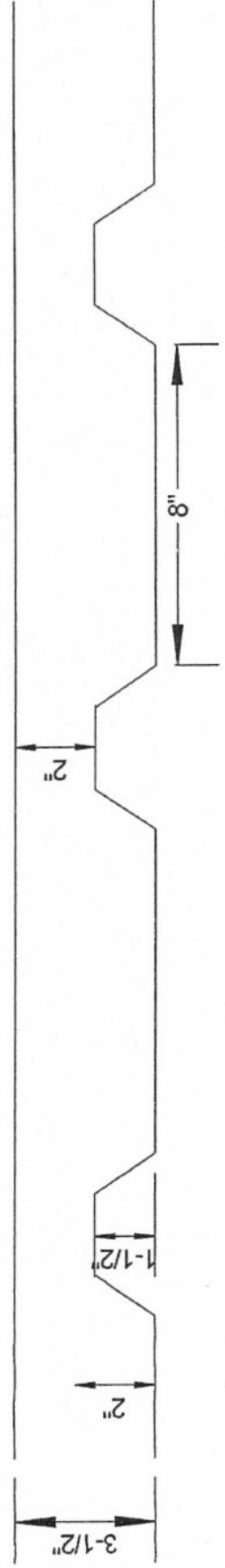
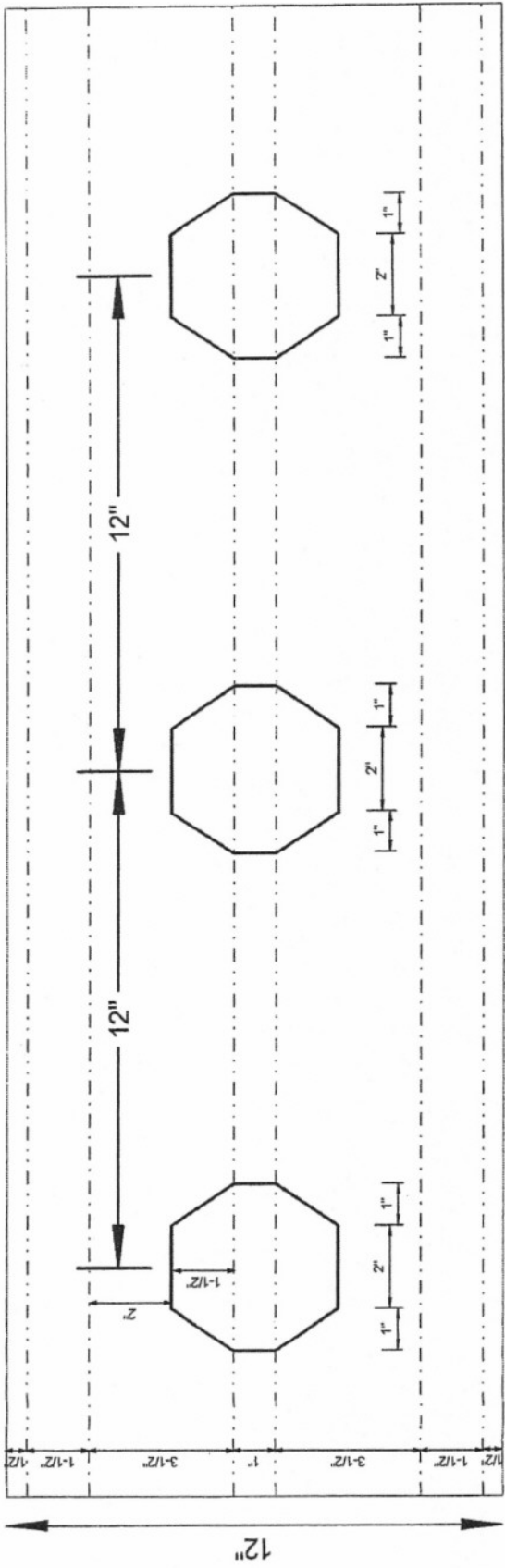
16 GA. TOPHAT @ 2'-6" O.C.

TOPHAT LAYOUT

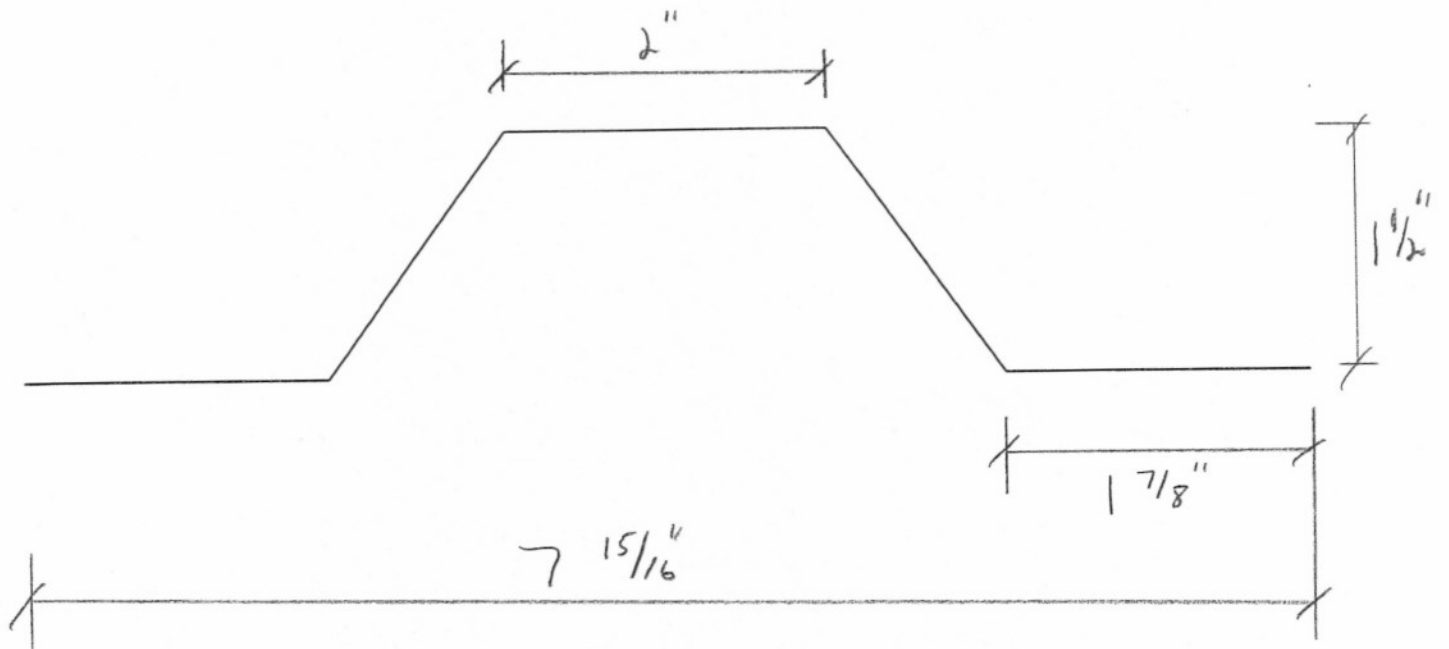




DEFLECTION RULER SETUP

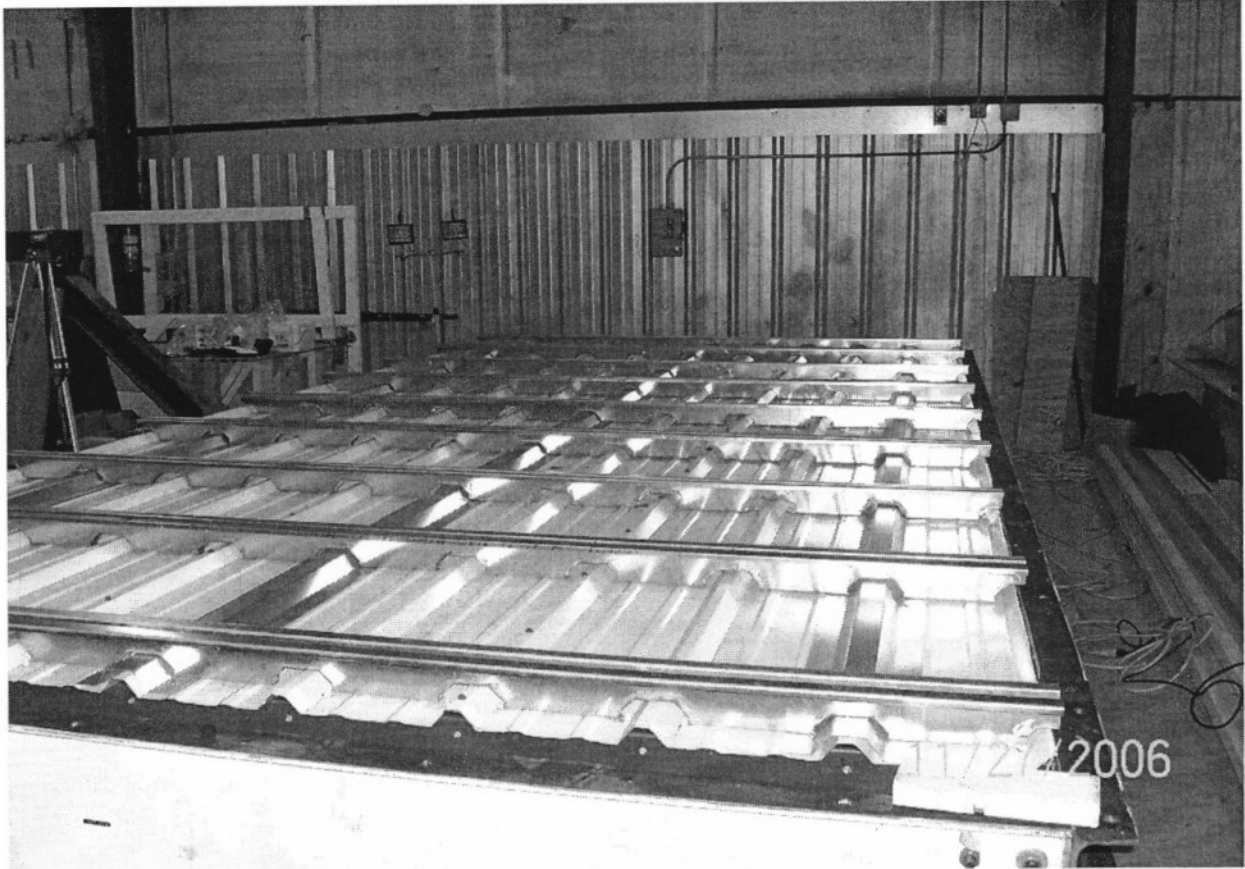


16 GA. HAT  
@ 4'-0" O.C.



**Photos**





**TOPHAT @ 2'-6" O.C., HATS @ 4'-0" O.C.**



**ASSEMBLY AFTER TESTING, TOPHAT PULLED OUT OF HAT SUPPORT**