

PITTSBURGH TESTING LABORATORY
UNIFORM LOAD TEST ON WALL PANELS

ATTACHMENT D
TO THE
STRUCTURAL REANALYSIS
PROGRAM

for the

ROBERT E. GINNA
NUCLEAR POWER PLANT

8305310159 830519
PDR ADDCK 05000244
P PDR

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- I. Report, "UNIFORM LOAD TEST ON WALL PANELS FOR GINNA POWER STATION STRUCTURAL UPGRADE PROGRAM" by Pittsburgh Testing Laboratory, January 11, 1983.
- II. Report, "PHYSICAL TESTING OF FASTENERS" by Pittsburgh Testing Laboratory, March 3, 1983.

Pittsburgh
Testing
Laboratory



UNIFORM LOAD TEST ON WALL PANELS

FOR GINNA POWER STATION

STRUCTURAL UPGRADE PROGRAM

FOR

GILBERT/COMMONWEALTH

P.O. 202267



PITTSBURGH TESTING LABORATORY

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LABORATORY No. 834682

CLIENT'S No. P.O. 202267

ORDER No. PG-21124

REPORT

January 11, 1983

REPORT OF: Load Testing on Panel Assemblies

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2. Gilbert/Commonwealth Test Procedure
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DESCRIPTION

**PITTSBURGH TESTING LABORATORY**

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REPORT

January 11, 1983

REPORT OF: Load Testing on Panel Assemblies

REPORT TO: Gilbert Associates, Inc.
P.O. Box 1498
Reading, PA 19603

We received various types of materials as supplied by E.G. Smith of Pittsburgh for fabrication and testing of panels as outlined in Gilbert/Commonwealth Work Procedure 1-WP-023-0412-0311-0 for Ginna Power Station.

Material Received from E.G. Smith

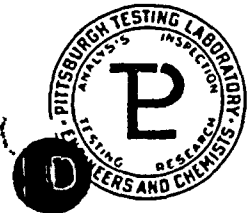
1. 1" Insulation
2. Shadowall - .032" thick - nominal
3. B-Panel - .030" thick - nominal
4. Shadowall - .040" thick - nominal
5. Ribwall - .040"
6. Fasteners

The initial test set-up and test were witnessed by Mr. John Regec of Gilbert/Commonwealth and Mr. Mark Fitzsimmons of Rochester Gas and Electric. Mr. Gene Vlasic of Elwin G. Smith assisted in the fabrication of B-Panel and shadowall assembly.

A. Test Set-Up and Procedure for Positive Pressure Test

A test chamber constructed of 2 x 12's as shown on attached sketch 1S-1 was placed around the 6' x 14'4" panel. The panels were anchored to C-12 x 20.7 channels as per typical field installation, as shown on Page 2 of attached Gilbert/Commonwealth Work Procedure 1-WP-2023-0412-0311-0 and drawings 1 and 2 of work procedure. The three (3) support girts were then tack welded to two (2) side supports made of the same channel (sketch 1S-2). This was done to prevent rotation of end supports. The panel was then built onto the girts. A layer of 6 mil polyethylene was then placed over the chamber and panel. A blower was then connected to inlet of the wood chamber. A water manometer was also connected to measure the vacuum pressure. A preload of 5 PSF was placed on the assembly to seat everything. One (1) six (6) inch and one (1) five (5) inch travel dial indicator was used to measure deflection at center of the two (2) midspans. These gages were placed on the high side of the panel. Gages are calibrated with traceability to the National Bureau of Standards. Deflection readings were taken at every 5 PSF until the end of dial gage travel.





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REPORT

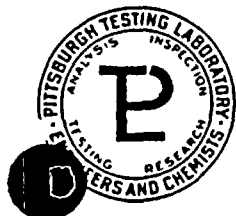
January 11, 1983

REPORT OF: Load Testing on Panel Assemblies

B. Test Results - Positive

Following is an outline of test results from data in the Appendix of the report.

<u>Test Number</u>	<u>Panel Identification</u>	<u>Initial Buckling-PSF</u>	<u>Maximum Load-PSF</u>	<u>Comments</u>
1	B-Liner .040 Shadowall	107	107	Initial Test Buckling occurred Test stopped
1	B-Liner .032 Shadowall	65-70	112	End Panel Rotated Fracturing Weld for Preventing Rotation
2	B-Liner .032 Shadowall	70-75	125	Top Section Fractured - Metal Pulled Through Around Fasteners
3	B-Liner .032 Shadowall	70-75	125	Top Section Fractured 3-Fasteners Sheared 3-Metal Pulled Through
1	.040" Shadowall	65-70	187	Maximum Load Reached on Water Manometer-No Total Fracture of Panel - Some Distortion around fasteners
2	.040" Shadowall	65-70	179.5	Bottom Section Fastener Pulled Through on Two Fasteners Not All Way Through-Fasteners Popped Out
3	.040" Shadowall	60-65	182	Maximum Load Reached on Water Manometer - No total fracture of panel. Some Distortion around fasteners.



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REPORT

January 11, 1983

REPORT OF: Load Testing on Panel Assemblies

B. Test Results - Positive (Cont'd)

<u>Test Number</u>	<u>Panel Identification</u>	<u>Initial Buckling-PSF</u>	<u>Maximum Load-PSF</u>	<u>Comments</u>
1	.040" Ribwall	75-80	179.5	Bottom span fasteners Metal Tore then popped out
2	.040" Ribwall	80-85	156.0	Bottom span fasteners metal tore then popped out
3	.040" Ribwall	80-85	176.9	Bottom Span Fasteners Metal tore then popped out and metal tore over center supports.

C. Test Set-Up & Procedure For Negative Pressure Test

The same test chamber and typical steel frame was used for the negative pressure test. The panels were built upright and when completed, frame was turned over and test conducted as per the positive pressure test.

D. Test Results - Negative

Following is an outline of test results from data in the appendix of the report.

<u>Test Number</u>	<u>Panel Identification</u>	<u>Maximum Load PSF</u>	<u>Comments</u>
1	B-Liner .032 Shadowall	80	Top Fasteners in B-Liner Pulled Through Metal to End
2	B-Liner .032 Shadowall	95	Top Fasteners in B-Liner Pulled Through Metal to End
3	B-Liner .032 Shadowall	80	Same as 1 and 2.



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ORDER No. PG-21124

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REPORT OF: Load Testing on Panel Assemblies

D. Test Results - Negative (Cont'd)

<u>Test Number</u>	<u>Panel Identification</u>	<u>Maximum Load PSF</u>	<u>Comments</u>
1	.040" Shadowall	92	At 72 PSF Panel at Center Girt Pulled off and at 92 Top End Panel Tore then popped
2	.040" Shadowall	92	At 67 PSF Panel at Center Girt Pulled off and at 92 Top End Panel tore than popped
3	.040" Shadowall	91	At 74 Panel at Center Girt Pulled off and at 91 Top End Panel tore then popped
1	.040" Ribwall	115	At 80 PSF Panel at Center Girt Pulled from Fasteners then at 115 PSF End Top Panel pulled from Fasteners
2	.040" Ribwall	90	At 90 PSF Panel at Center Girt Pulled from Fasteners Load Dropped then End Bottom Panel Pulled from Fasteners
3	.040" Ribwall	92	At 92 PSF Panel at Center Girt Pulled from Fasteners - Load Dropped and tear developed in plastic. Test shut down to repair tear and test restarted at 65 PSF End panel pulled out.

PITTSBURGH TESTING LABORATORY

Earl Gallagher Manager
Physical Testing Department

TEST PROCEDURE

WORK PROCEDURE
1-WP-023-0412-0311-0

PROCEDURE FOR TESTING OF SIDING

PURPOSE

1. Determine the maximum wind load that wall siding can transfer to the wind resisting members of a building for a 'B' panel system with shadowall profile.
2. Determine the required wind loading at which ribwall and exterior shadowall only are assumed to have 'blown off.'

MATERIAL

The following siding systems as manufactured by Elwin G. Smith Division of Cyclops Corporation will be furnished and delivered by Gilbert/Commonwealth.

'B' Panel System

Interior: 22 ga. galvanized 'B' panel
Insulation: 1" thick 6% density glass fiber
Exterior: .032 PMF aluminum shadowall (3004H14)
(See Typical Section, pg. 2)

Ribwall

0.040 PMF aluminum ribwall (3004H14).

Shadowall Exterior

0.040 PMF aluminum shadowall (3004H14).

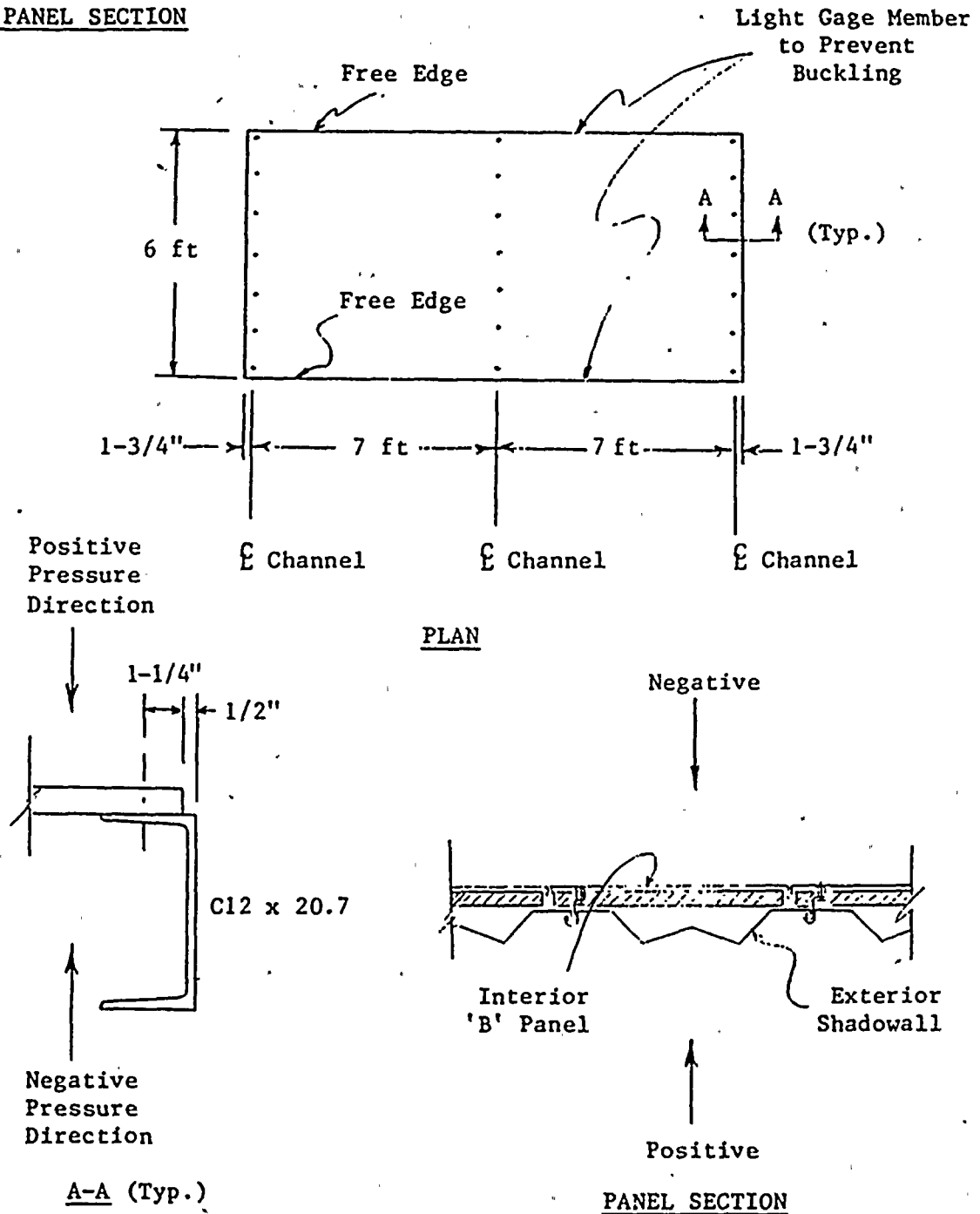
NUMBER OF TESTS PER SIDING SYSTEM

1. Positive Pressure Condition = 8 tests.
2. Negative Pressure Condition = 8 tests.

Three tests each are to be run for the positive pressure and negative pressure cases using the connection condition as it exists on the building. Three tests each may then be run for the two cases using modifications based on results of the first series of tests. The remaining material (for two tests each) will be extra in case further testing is needed.

TEST SET UP

1. The two span test condition as shown below shall be used.
2. Siding shall be installed according to the attached two sheets.

TYPICAL PANEL SECTION



TEST PROCEDURE FOR PANEL SYSTEMS

Positive Pressure Condition

1. Apply uniform pressure on panel systems of both spans. Loadings shall be applied in maximum increments of 5 psf.
2. Record load at which panel system buckles. Panel buckling shall be defined as any crease in material or any non-elastic deformation.
3. Record load at which panel connection fails or panel rips away from support.
4. Record total failure. This is defined as the load at which assembly pulls away from support such that the siding is no longer capable of transferring load to the support.
5. For all incremental loadings, test results shall provide defensible data for determining actual stress levels.

Negative Pressure Condition

1. Apply uniform pressure on panel system of both spans. Loadings shall be applied in maximum increments of 5 psf.
2. Record load at which connection of panel system fails or panel rips away from support.
3. Record load at which panel system buckles. Panel buckling shall be defined as any crease in material or any non-elastic deformation.
4. Record load at which panel system connection fails or panel rips away from support.
5. Record total failure. This is defined as the load at which assembly pulls away from support such that the siding is no longer capable of transferring load to the support.
6. For all incremental loadings, test results shall provide defensible data for determining actual stress levels.

TEST PROCEDURE FOR CONNECTIONS

Provide testing of 10 screws each for failures in tension, shear, and penetration. Penetration shall be defined as the point where the head of the screw pulls through the siding.



ADDITIONAL TESTING

1. Record incremental loadings of 5 psf and associated displacement incurred.
2. Plot applied load vs. deflection curves.

REPORT OF TESTS REPORTS

After three tests are run for each siding material for both positive and negative loading and the connections are tested, the following results shall be reported:

1. Connection capacities for tension, shear, and penetration.
2. Flexure capacities for positive and negative loadings.
3. Any additional failure modes observed and load capacities.

In addition, a description of each failure mode shall be provided. Design limits and yield points for elastic design shall be defined. Ultimate failure loading shall be determined. Prior to further testing, modification sketches will be provided by Gilbert/Commonwealth for installation. Test procedures and results will then be redone.



Gilbert Associates, Inc.

Reading, Pennsylvania

CALCULATION

RG&E - R.E. GINNA STATION
STRUCTURAL UPGRADE PROGRAM

W.O. 044824-034
EWR 3296

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3

PAGE

1

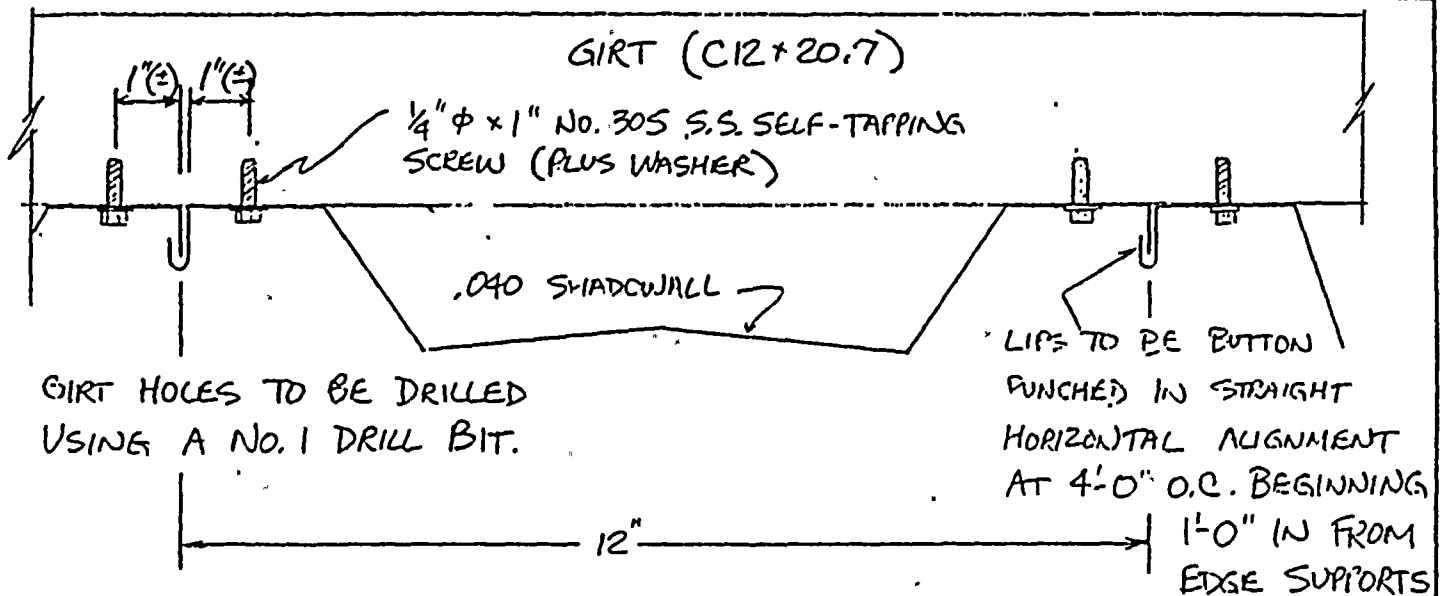
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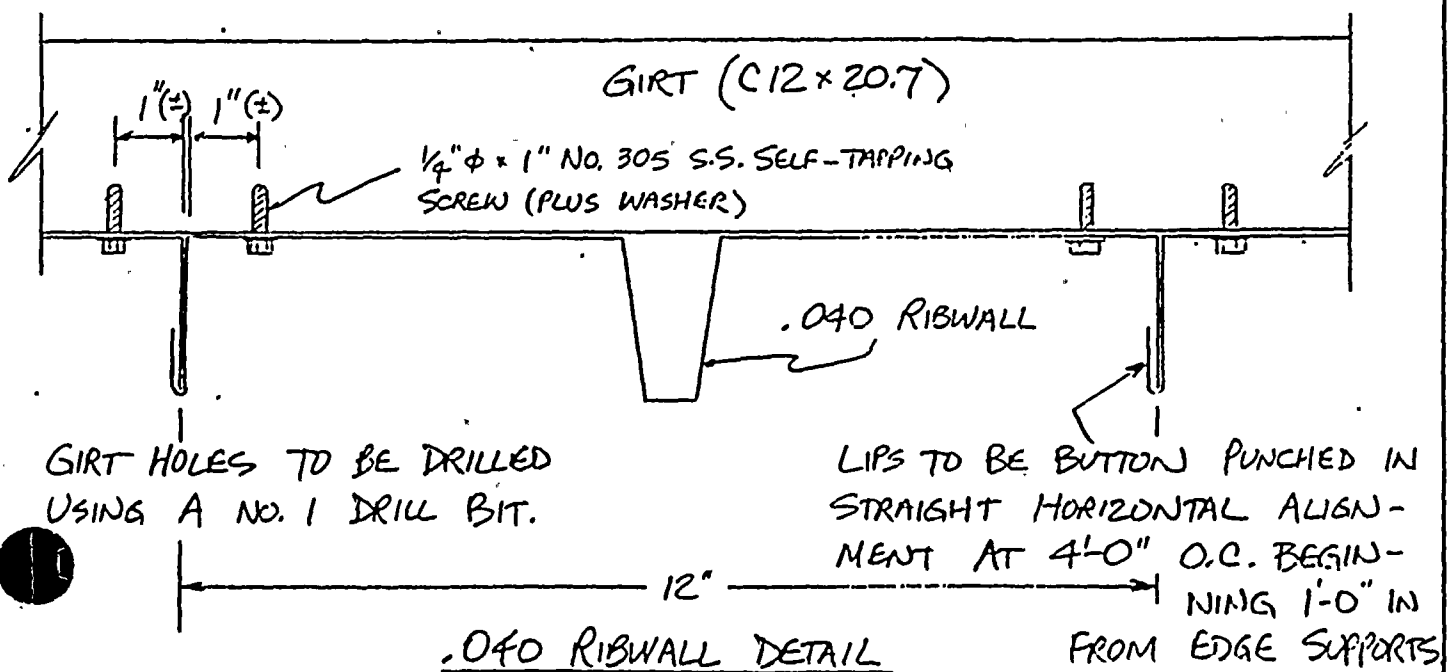
SUBJECT

SIDING TESTING SET-UP



.040 SHADOWWALL DETAIL

MODIFICATION TO 'FASTENING SCHEDULE "A" AND "C" ' ON E.G. SMITH DRAWINGS NO. 3-13, CONTRACT NO. 8338-67)



.040 RIBWALL DETAIL

(MODIFICATION TO 'FASTENING SCHEDULE "B" ' ON E.G. SMITH DRAWING NO. 3-13, CONTRACT NO. 8338-67)



Gilbert Associates, Inc.

Reading, Pennsylvania

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ORIGINATOR

DATE

11/19/82

PAGE

2

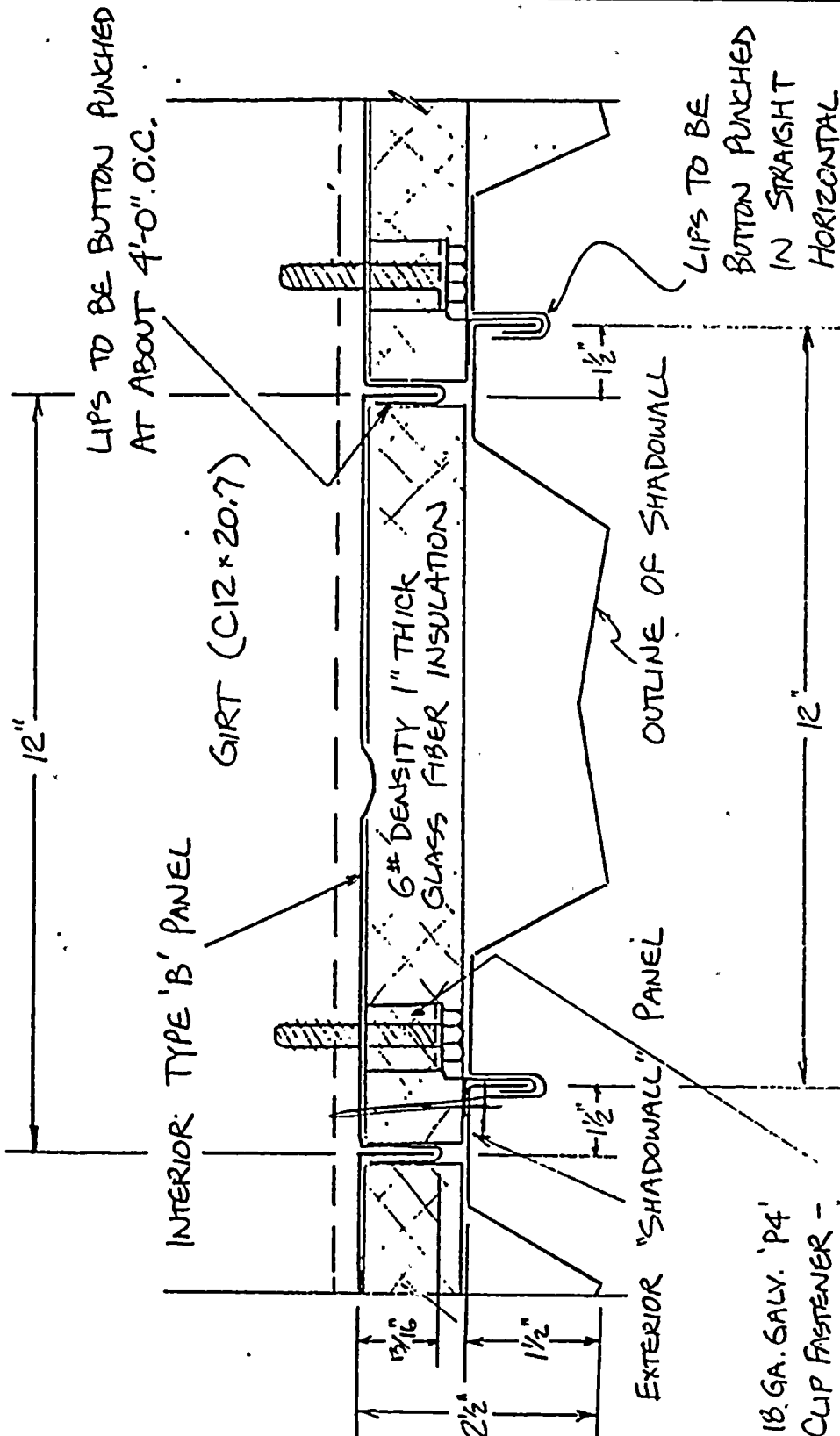
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PAGES

SUBJECT

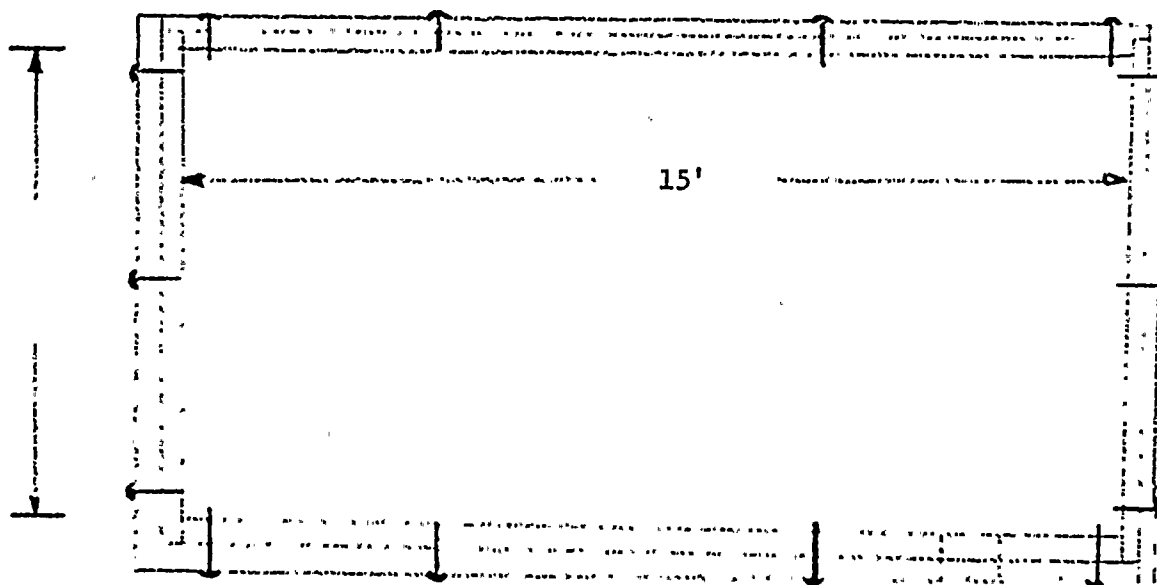
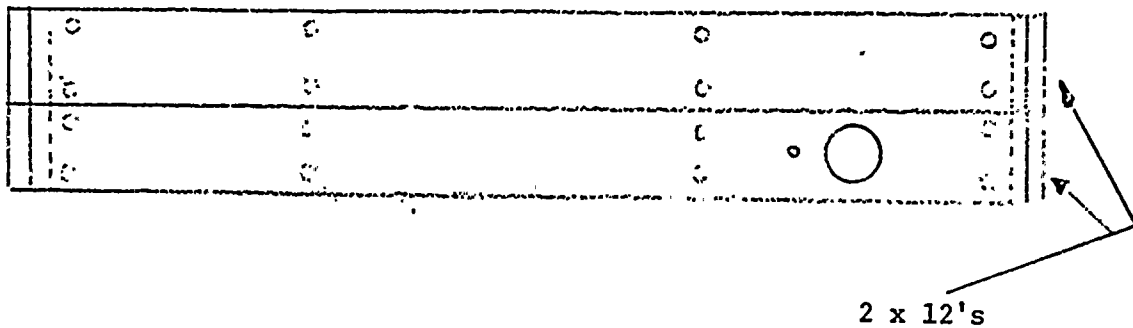
SIDING TESTING SET-UP



18 GA. GALV. 'P4'
CLIP FASTENER -
ONE PER GIRT PER
PANEL FASTENED
WITH BH-T-12C
SELF TAPPING SCREW
(#14, 1 1/2\"/>

'B' PANEL & SHADOWALL SYSTEM

(E.G. SMITH DRAWING NO 3-14, CONTRACT NO. 8917-68)



GILBERT & ASSOCIATES

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DATE: 12/27/82

ORDER NO.
PG-21124

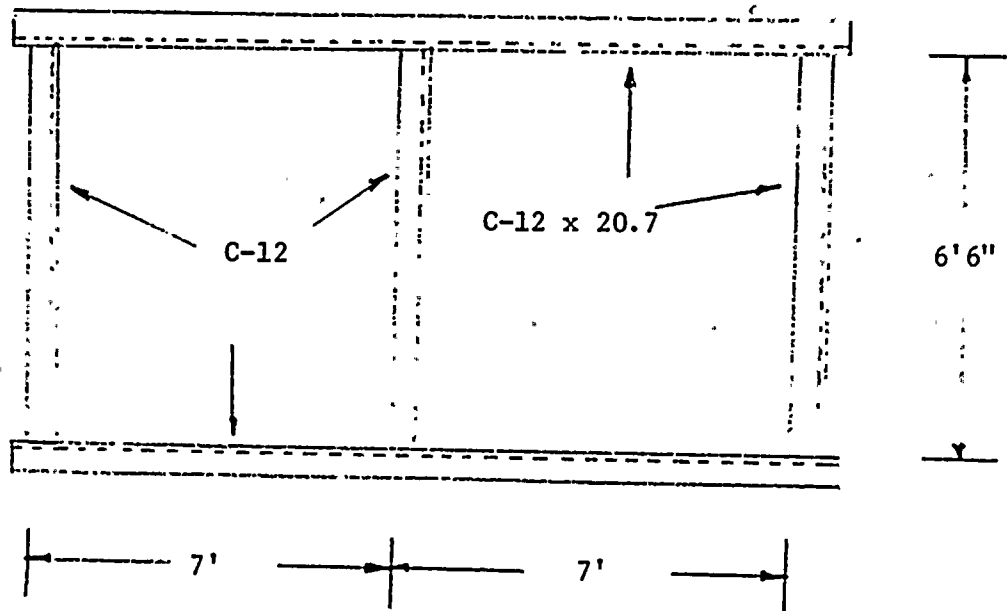
CH'KD. BY:

DATE:

PLATE NO.

Wood Frame

1S-1



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PG-21124

CH'KD. BY:

DATE:

PLATE NO.

Steel Frame

1S-2

POSITIVE PRESSURE TEST DATA



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LABORATORY No. 834682

ORDER No. PG-21124

REPORT

January 11, 1983

REPORT OF: Load Testing on Panel Assemblies

Test # 1 - Positive Pressure

Panel Identification: B-Panel, 1" Insulation - .040" Shadowall

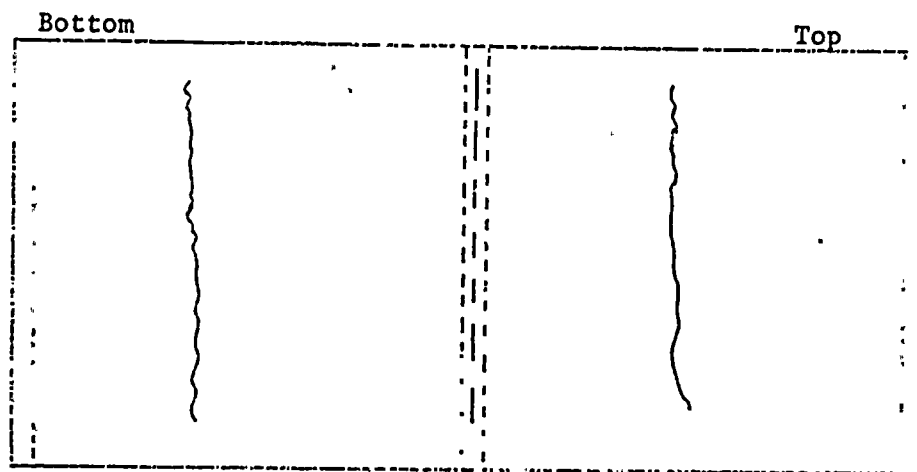
DEFLECTION READINGS - INCHES

<u>Load PSF</u>	<u>Bottom Span</u>	<u>Top Span</u>
0	0.000	0.000
5	0.117	0.100
10	0.211	0.188
15	0.305	0.275
20	0.405	0.355
25	0.510	0.438
30	0.595	0.505
35	0.695	0.587
40	0.790	0.663
45	0.890	0.758
50	0.990	0.860
55	1.110	0.950
60	1.219	1.040
65	1.431	1.245
70	1.699	1.280
75	1.840	1.411
80	Ran Out of	1.580
85	Travel	1.770
90		2.060

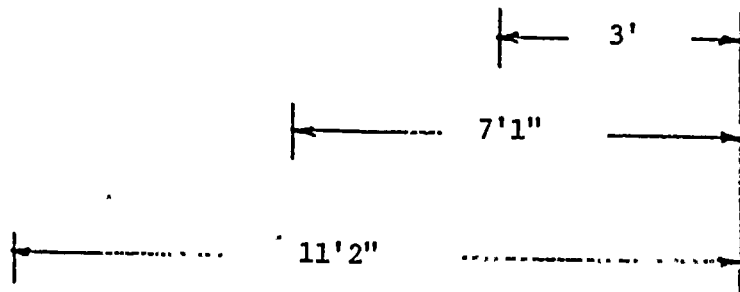
Comments: Shadowall panel buckled at 107 PSF Load test stopped at this point.



14'4"



6'



Panel: .040 Shadowall
1" Insulation
B-Panel

Test #1 Positive

GILBERT & ASSOCIATES

PITTSBURGH TESTING LABORATORY

MADE BY: JPM

DATE: 12/27/82

ORDER NO.

CH'KD. BY:

DATE:

PG-21124

Location of Buckling

PLATE NO.

1

PANEL IDENT.:	B-LINER
	.040 SHADLOWALL
	TOP SPAN



X-3
20 X 20 TO THE INCH. - 6000000
KENTON, A 134700 10000000

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PTL Order No. 21124 Lab No. 834682

Client Gilbert & Associates

Client's Order No. P.O. 202267

TEST NO.: # 1 POSITIVE

PANEL IDENT.: B-LINER
-OHG SHADWALL
Bottom SPAN

90

80

70

60

50 LOAD
PSF

40

30

20

10

DEFLECTION-INCHES

1.0

2.0

3.0

4.0

5.0

6.0

46 1240

MAX 20 X 20 TO THE INCH. 2 X 2 INCHES



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January 11, 1983

REPORT OF: Load Testing on Panel Assemblies

Test # 1 - Positive Pressure

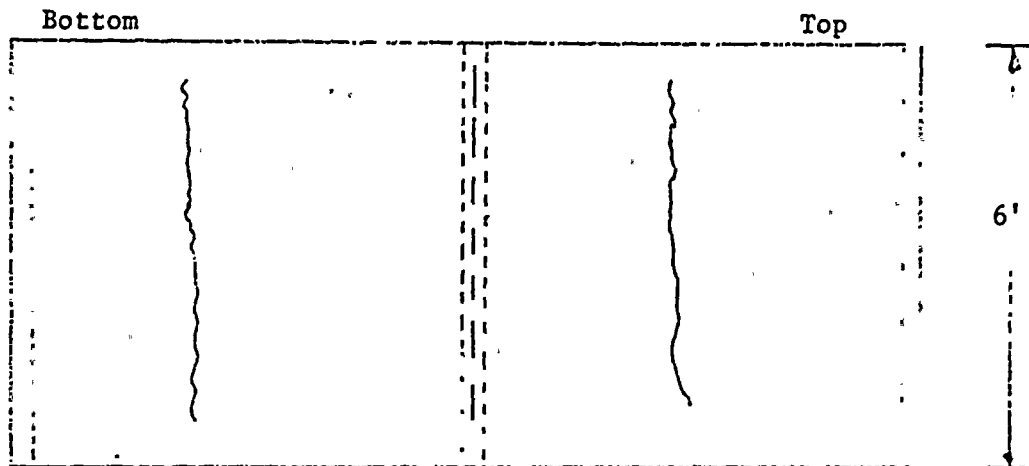
Panel Identification: B-Panel, 1" Insulation .032" Shadowall

DEFLECTION READINGS - INCHES

<u>Load PSF</u>	<u>Bottom Span</u>	<u>Top Span</u>
0	0.000	0.000
5	--	0.165
10	0.255	0.276
15	0.343	0.380
20	0.478	0.485
25	0.581	0.580
30	0.683	0.675
35	0.803	0.780
40	0.923	0.900
45	1.068	1.045
50	1.101	1.175
55	1.353	1.350
60	1.563	1.580
65	1.826	1.915
70	2.223	2.310
75	3.323	3.350
80	3.523	3.820
85	3.813	4.225
90	4.093	4.520
95	4.393	4.725
100	4.663	Ran Out of Travel

Comments: Maximum Load 112 PSF end panel rotated fractured welds on side channel. Shadowall panel initial buckled when increasing load from 65 PSF to 70 PSF.

14'4"



3'
7'1"
11'2"

Panel: .032" Shadowall
1" Insulation
B-Panel

Test #1 Positive

GILBERT & ASSOCIATES

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MADE BY: JPM

DATE: 12/27/82

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CH'KD. BY:

DATE:

PLATE NO.

Location of Buckling

2

PITTSBURGH TESTING LABORATORY

PG-

PTL Order No. 21124 Lab No. 834682

90

Client Gilbert & Associates

Client's Order No. P.O. 202267

TEST NO.: # 1 POSITION

PANEL IDENT.: B-PANEL
1032" SHADOWALL
TOP SPAN

80

70

60

50 LOAD
PSF

40

30

20

10

DEFLECTION-INCHES

1.0

2.0

3.0

4.0

5.0

6.0

46 1240

14E 20 X 20 TO THE INCHES IN DEFLECTION

PITTSBURGH TESTING LABORATORY

PG-

PTL Order No. 21124 Lab No. 834682

90

Client Gilbert & Associates

Client's Order No. P.O. 202267

TEST NO.: #1 POSITIVE

80

PANEL IDENT.: B-PANEL
0.32" SHADOWALL
30mm SPAN

70

60

50 LOAD
PSF

40

30

20

10

DEFLECTION-INCHES

1.0

2.0

3.0

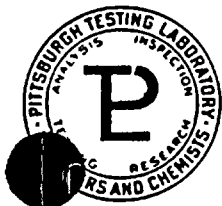
4.0

5.0

6.0

46 1240

K&E 20" X 30" TO THE INCHES 1/4" DEPTH
KROHLL & SONS CO. MANUFACTURED



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Test # 2 - Positive Pressure

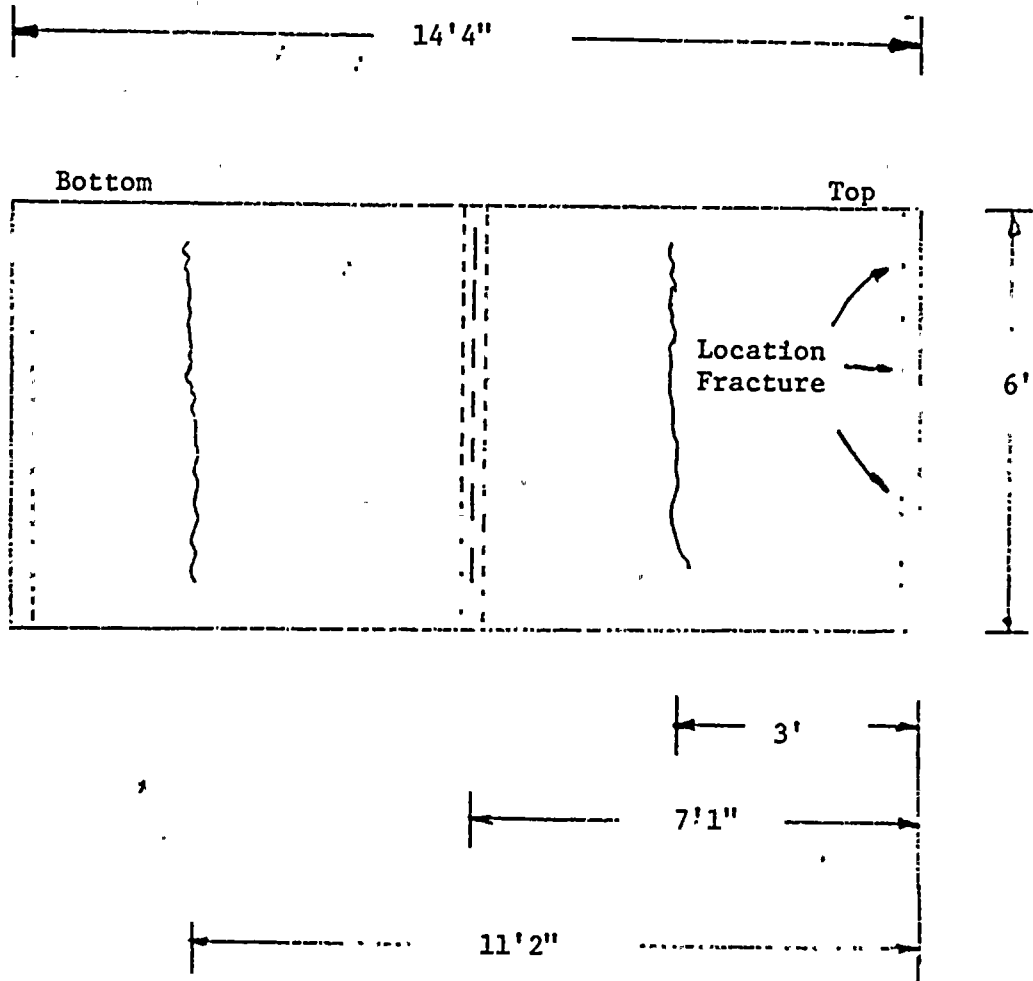
Panel Identification: B-Panel, 1" Insulation .032" Shadowall

DEFLECTION READINGS - INCHES

<u>Load PSF</u>	<u>Bottom Span</u>	<u>Top Span</u>
0	0.000	0.000
5	0.180	0.180
10	0.314	0.308
15	0.428	0.418
20	0.530	0.532
25	0.622	0.635
30	0.729	0.742
35	0.844	0.875
40	0.978	1.020
45	1.020	1.170
50	1.150	1.350
55	1.298	1.555
60	1.540	1.825
65	1.870	2.125
70	2.340	2.650
75	3.350	3.250
80	3.470	3.565
85	3.830	3.900
90	4.110	4.160
95	4.510	4.800
100	Gauges Removed	

Comments: Maximum Load 125 PSF top ends pulled out bottom span shadowall panel buckled @ load going from 70 PSF to 75 PSF





Panel: .032" Shadowall
 1" Insulation
 B-Panel

GILBERT & ASSOCIATES

PITTSBURGH TESTING LABORATORY

MADE BY: JPM

DATE: 12/27/82

ORDER NO.
PG-21124

CH'KD. BY:

DATE:

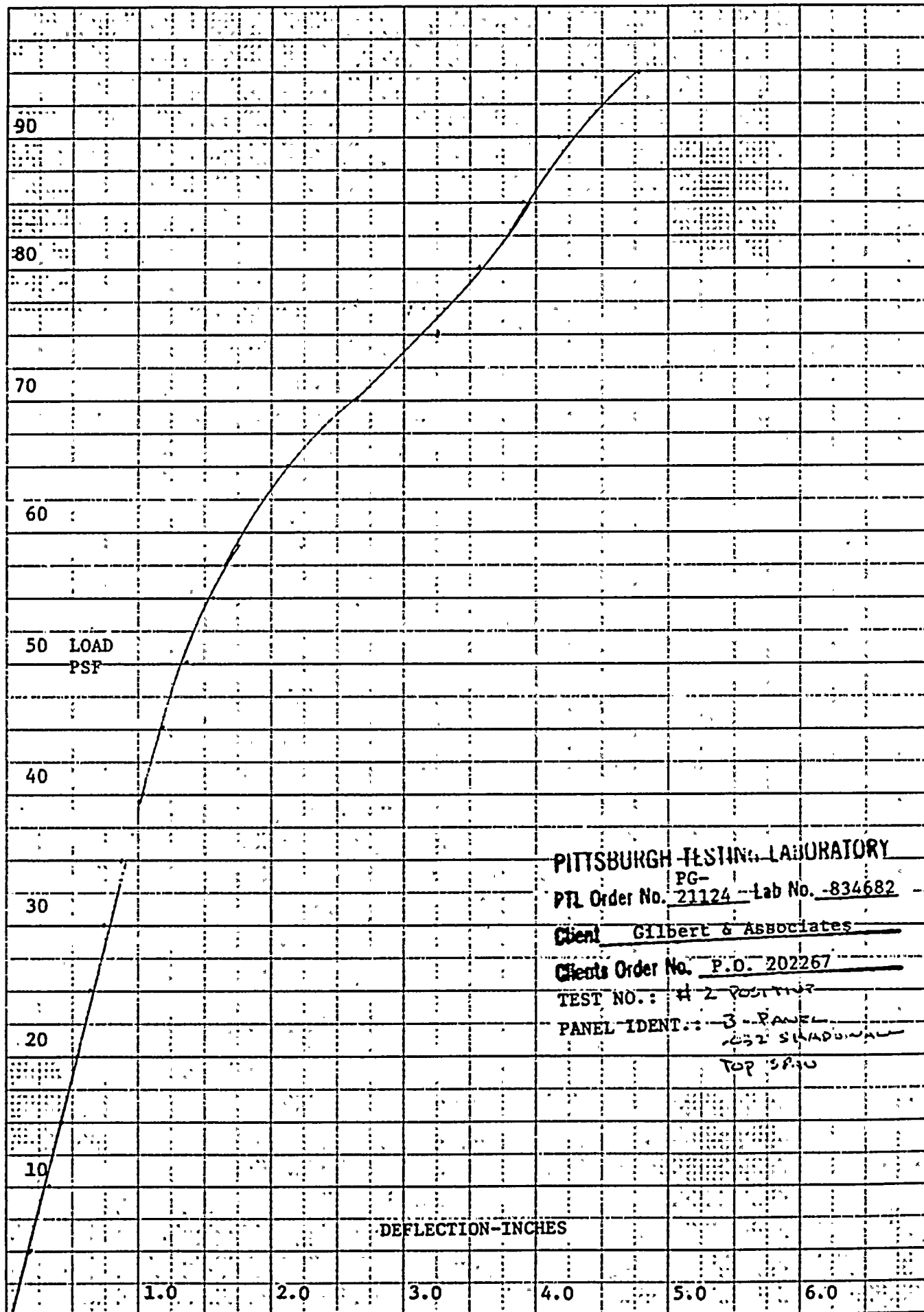
PLATE NO.

Location of Buckling

3



46 1240



PITTSBURGH TESTING LABORATORY

PG-
PTL Order No. 21124 - Lab No. 834682

Client Gilbert & Associates

Client's Order No. P.O. 202267

TEST NO.: # 2 POST-TENSION

PANEL IDENT.: 3 - PANEL

632 SHADONAW

TOP SPAN

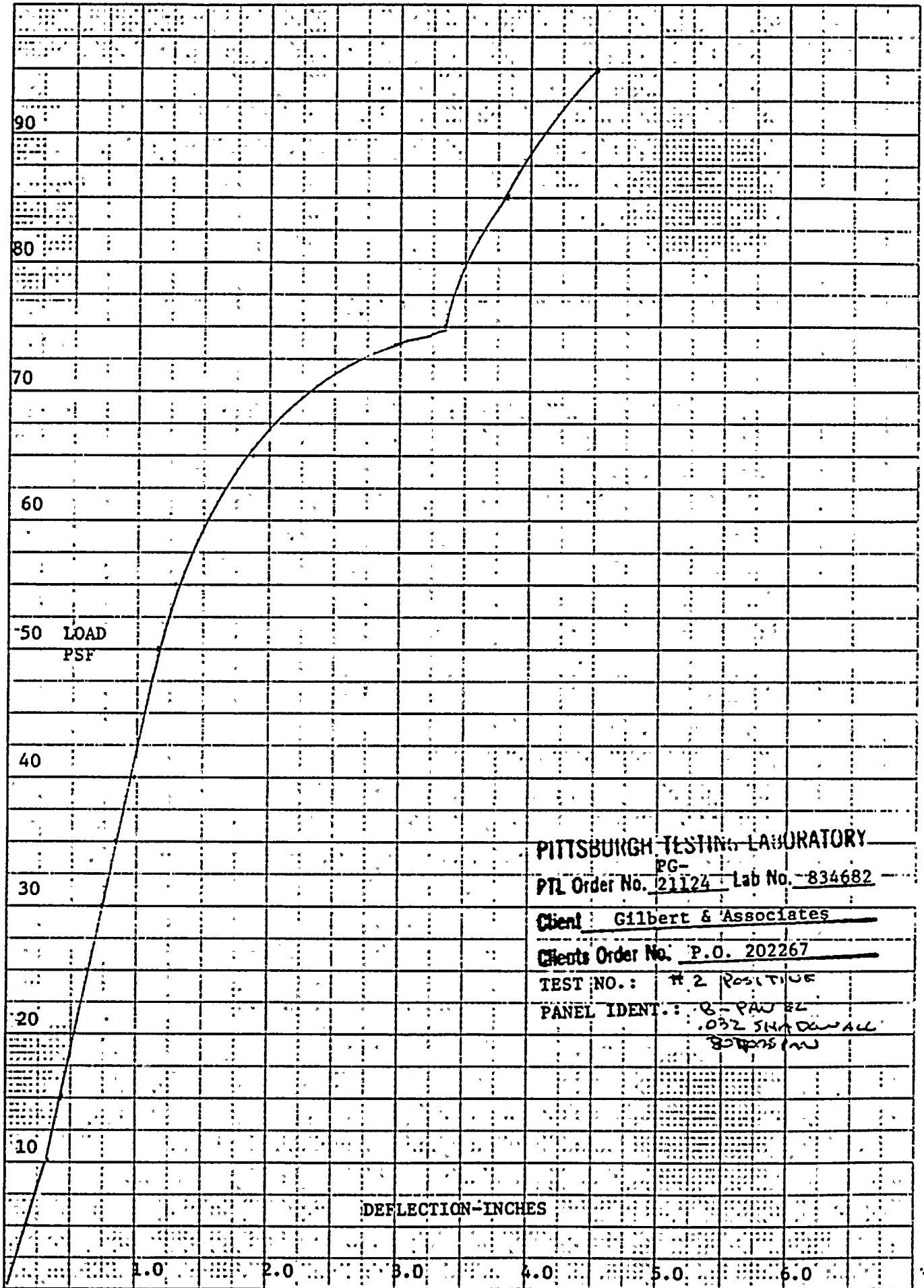
DEFLECTION-INCHES

10-20 X 30 TO THE INCHES - 1/4 IN. PER INCH
MINIMUM ASSURED VARIATION



46 1240

K&E 20 X 20 TO THE INCH
K&E TEST & TENSILE CO. MADE IN U.S.A.



PITTSBURGH TESTING LABORATORY

PG-
PTL Order No. 21124 Lab No. 834682

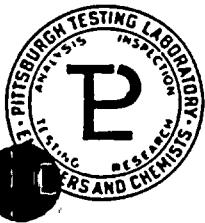
Client Gilbert & Associates

Client's Order No. P.O. 202267

TEST NO.: # 2 POSITIVE

PANEL IDENT.: 8-PANEL
.032 SHADWALL
80755121

DEFLECTION-INCHES



PITTSBURGH TESTING LABORATORY

FORM 407 REV.-PG

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850 POPLAR STREET, PITTSBURGH, PA. 15220

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PLEASE REPLY TO:
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PITTSBURGH, PA. 15230

AREA CODE 412 TELEPHONE 922-4000

LABORATORY No. 834682

CLIENT'S No. 202267

ORDER No. PG-21124

REPORT

January 11, 1983

REPORT OF: Load Testing on Panel Assemblies

Test # 3 Positive Pressure

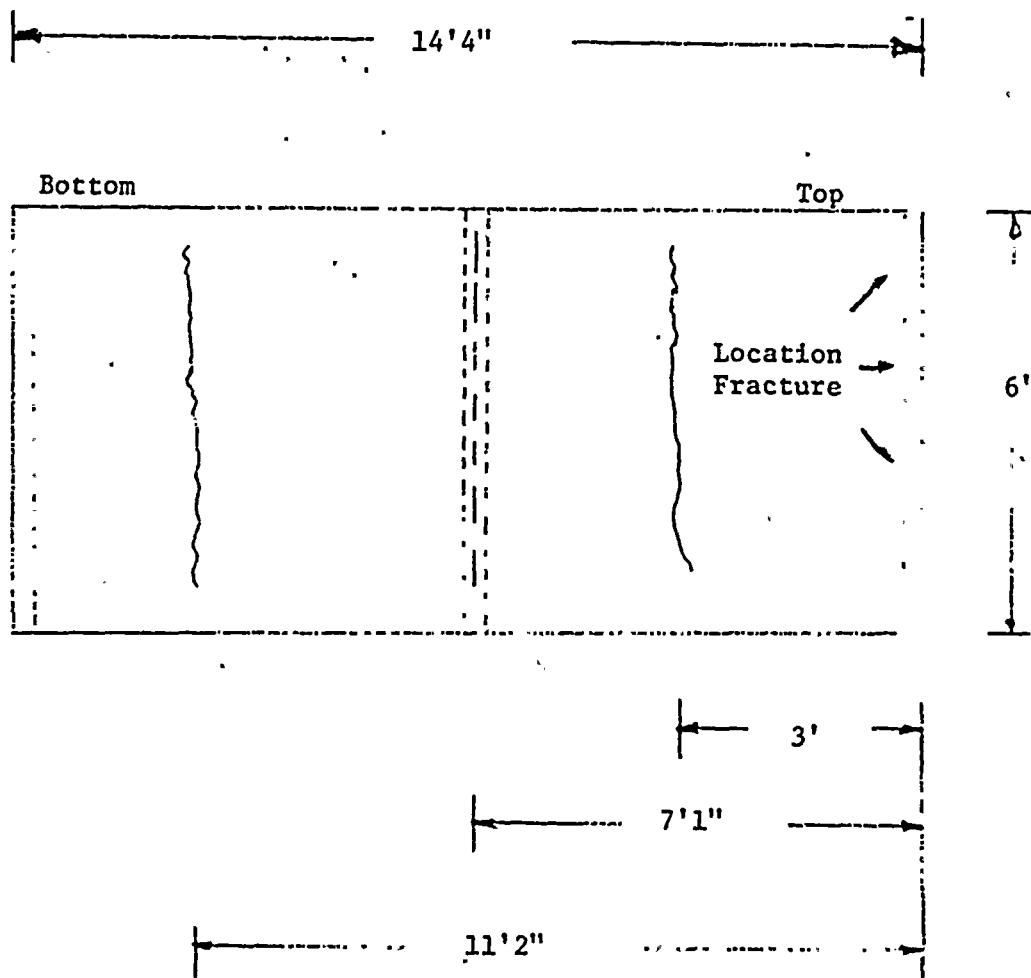
Panel Identification: B-Panel 1" Insulation .032" Shadowall

DEFLECTION READINGS - INCHES

<u>Load PSF</u>	<u>Bottom Span</u>	<u>Top Span</u>
0	0.000	0.000
5	0.148	0.145
10	0.280	0.290
15	0.390	0.380
20	0.515	0.495
25	0.620	0.592
30	0.725	0.685
35	0.855	0.810
40	0.978	0.938
45	1.130	1.085
50	1.285	1.235
55	1.423	1.405
60	1.623	1.635
65	1.902	1.885
70	2.420	2.265
75	3.390	3.545
80	3.565	3.785
85	3.887	4.120
90	4.000	4.330

Dial Gauges Removed

Comments: Bottom span shadowall panel buckled at load going from 70 PSF to 75 PSF. Maximum Load 122 PSF 3 top end connections metal shear and 3 fasteners sheared.



Panel: .032" Shadowall
1" Insulation
B-Panel

Test #3 Positive

GILBERT & ASSOCIATES

PITTSBURGH TESTING LABORATORY

MADE BY: JPM

DATE: 12/27/82

ORDER NO.
PG-21124

CH'KD. BY:

DATE:

PLATE NO.

Location of Buckling

4



46 1240

PG-21124

90

80

70

60

50 LOAD
PSF

40

30

20

10

DEFLECTION-INCHES

1.0

2.0

3.0

4.0

5.0

6.0

PITTSBURGH TESTING LABORATORY

PG-
PTL Order No. 21124 Lab No. 834682

Client Gilbert & Associates

Client's Order No. P.O. 202267

TEST NO.: # 3 POSITIVE

PANEL IDENT.: B-PANEL
032" SINGDOWNALL
TOP SPAN

46 1240

20 X 20 TO THE INCH
K&E GRAPHIC SYSTEMS

90

80

70

60

50 LOAD
PSP

40

30

20

10

DEFLECTION-INCHES

1.0

2.0

3.0

4.0

5.0

6.0

PITTSBURGH TESTING LABORATORY

PG-
PTL Order No. 21124 Lab No. 834682

Client Gilbert & Associates

Client's Order No. P.O. 202257

TEST NO.: # 3 POSITIVE

PANEL IDENT.: B-PANEL
032" 910 DOWN
BOTTOM SPAN





PITTSBURGH TESTING LABORATORY

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CLIENT'S No. 202267

AREA CODE 412 TELEPHONE 922-4000

LABORATORY No. 834682

ORDER No. PG-21124

REPORT

January 11, 1983

REPORT OF: Load Testing on Panel Assemblies

Test # 1 Positive

Panel Identification: .040" Shadowall

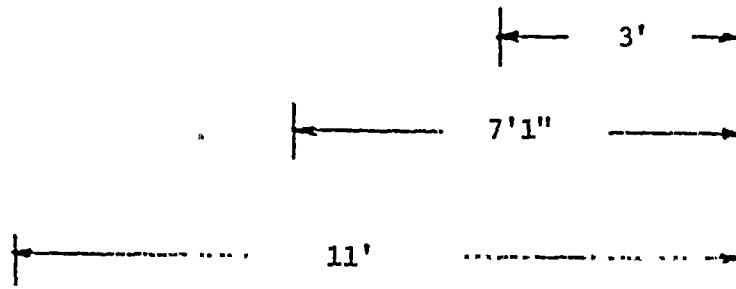
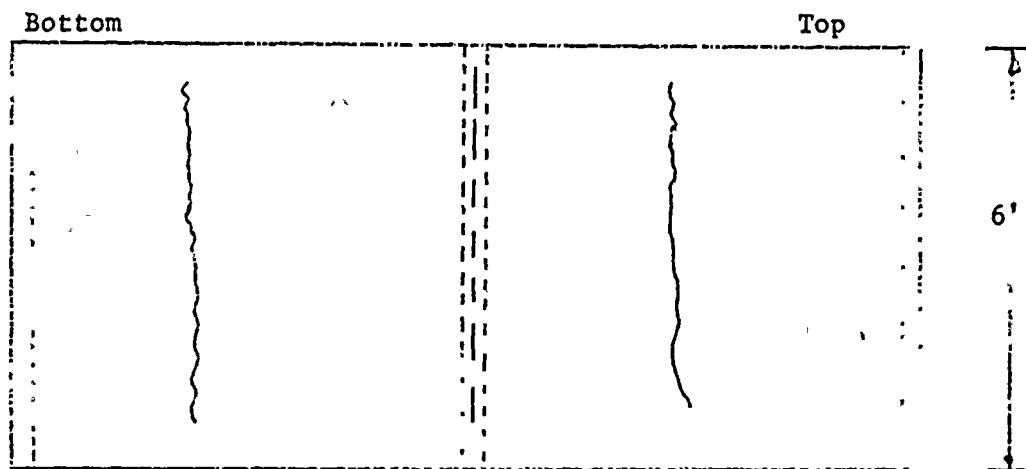
DEFLECTION READINGS - INCHES

<u>Load PSF</u>	<u>Bottom Span</u>	<u>Top Span</u>
0	0.000	0.000
5	0.068	0.062
10	0.162	0.147
15	0.242	0.215
20	0.320	0.290
25	0.395	0.347
30	0.466	0.400
35	0.540	0.460
40	0.623	0.531
45	0.705	0.600
50	0.795	0.678
55	0.915	0.770
60	1.200	0.850*
65	2.120	0.850*
70	2.705	2.150
75	3.250	3.630
80	4.015	3.830
85	4.338	4.50

Comments: *Panel was rippling across 6 ft. width causing valleys and peaks. Panel Buckled at middle between 65 PSF nad 70 PSF. No failure at maximum water column of 187 PSF. Fastener holes distorted.



14'4"



Panel: .040" Shadowall

Test #1 Positive

GILBERT & ASSOCIATES

PITTSBURGH TESTING LABORATORY

MADE BY: JPM

DATE: 12/28/82

ORDER NO.
PG-21124

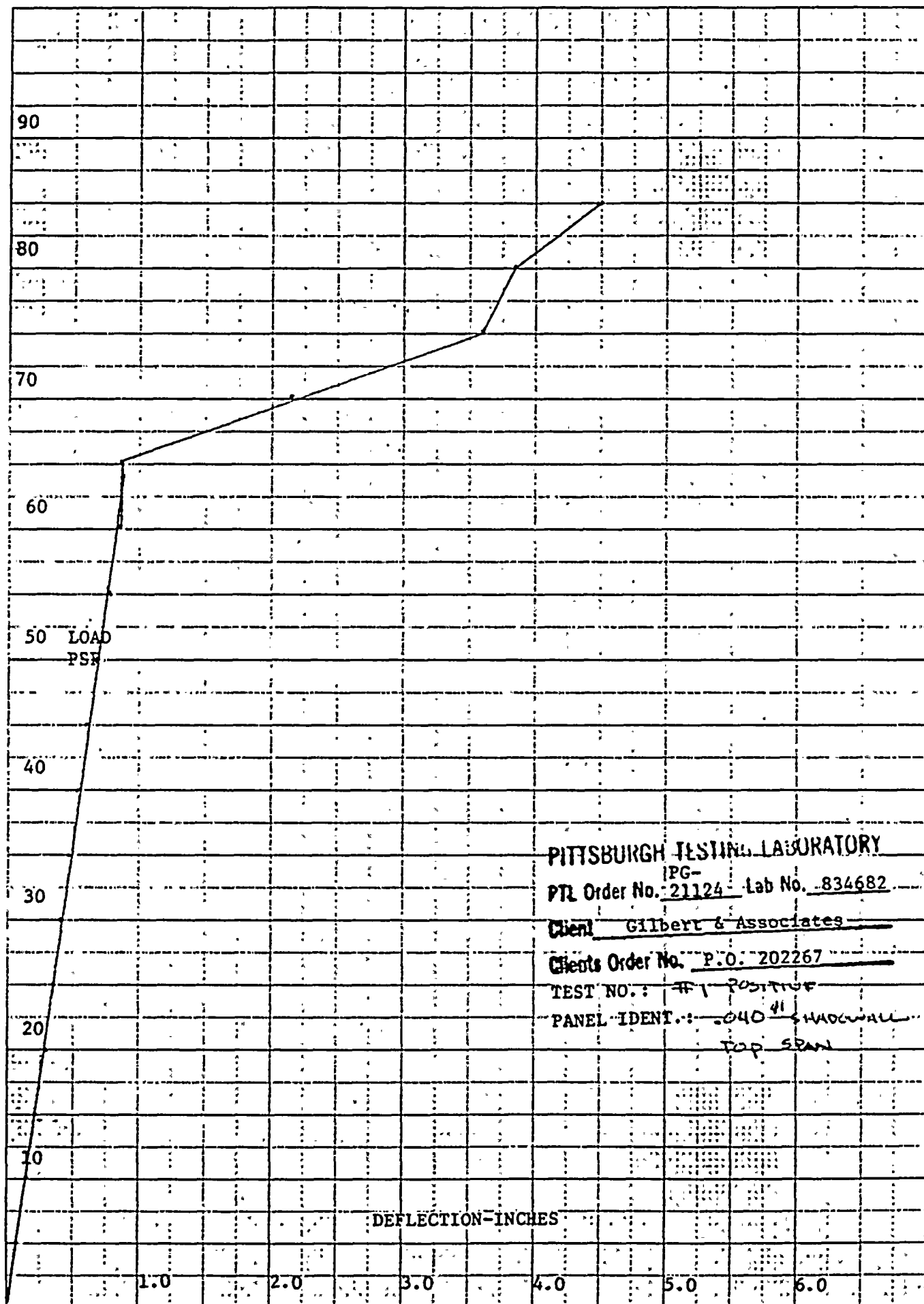
CH'KD. BY:

DATE:

PLATE NO.

Location of Buckling

5



PITTSBURGH TESTING LABORATORY

PG-
PTL Order No. 21124 Lab No. 834682

Client Gilbert & Associates

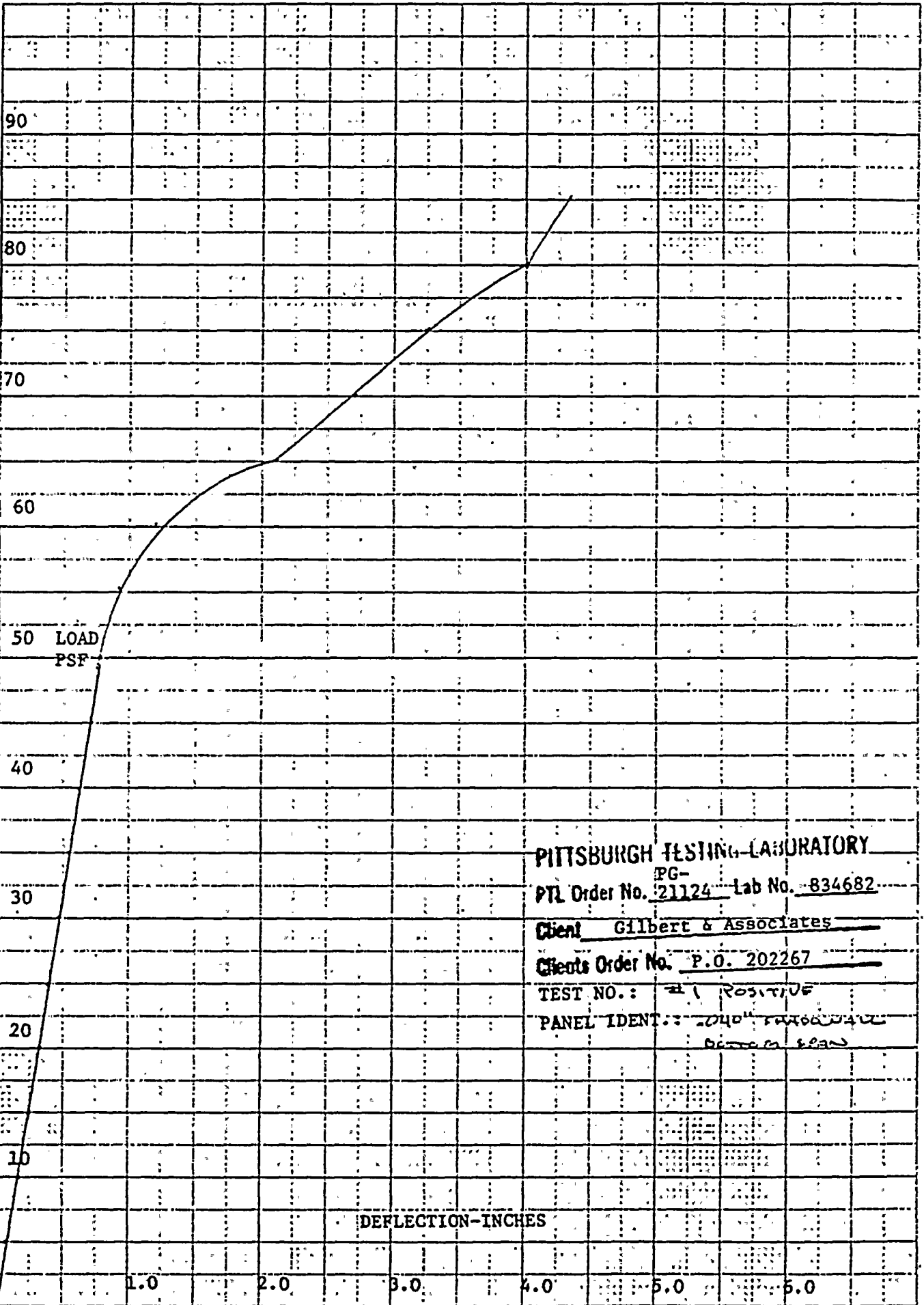
Client's Order No. P.O. 202267

TEST NO.: #1 POSITIVE

PANEL IDENT.: 040 41 SHADOWALL
TOP SPAN

46 1240

20 X 20 TO THIRTY INCHES 1/2" X 1/2" PER INCH
K&L
KIRK & LINDSEY CO. CHICAGO, ILL.



PITTSBURGH TESTING LABORATORY

PG-
PTL Order No. 21124 Lab No. 834682

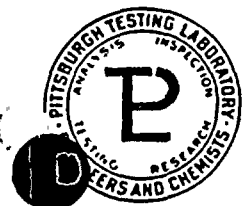
Client Gilbert & Associates

Client's Order No. P.O. 202267

TEST NO.: 11 POSITIVE

PANEL IDENT.: 2040" SQUARE
Bottom Panel



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AREA CODE 412 TELEPHONE 922-4000

CLIENT'S No. 202267

LABORATORY No. 834682

ORDER No. PG-21124

REPORT

January 11, 1983

REPORT OF: Load Testing on Panel Assemblies

Test # 2 Positive

Panel Identification: .040" Shadowall

DEFLECTION READINGS - INCHES

<u>Load PSF</u>	<u>Bottom Span</u>	<u>Top Span</u>
0	0.000	0.000
5	0.085	0.068
10	0.175	0.152
15	0.258	0.230
20	0.322	0.300
25	0.382	0.375
30	0.446	0.448
35	0.512	0.528
40	0.580	0.606
45	0.648	0.695
50	0.720	0.783
55	0.805	0.960*
60	1.020	0.960*
65	2.40	0.990*
70	3.100	1.130*
75	4.35	3.360
80	4.640	3.660
85	5.000	3.822

*Panel rippling across

Comments: Maximum Load 179.5 PSF bottom fasteners pulled metal and then popped out not tearing metal all the way too end. Middle buckled between loading increment of 65 PSF - 70 PSF. Panel was rippling across causing valleys and peaks.



14'4"

Bottom

Top

6'

Location of Fracture

3'

7'1"

11'

Panel: .040" Shadowwall

Test #2 Positive

GILBERT & ASSOCIATES

PITTSBURGH TESTING LABORATORY

MADE BY: JPM

DATE: 12/28/82

ORDER NO.
PG-21124

CH'KD. BY:

DATE:

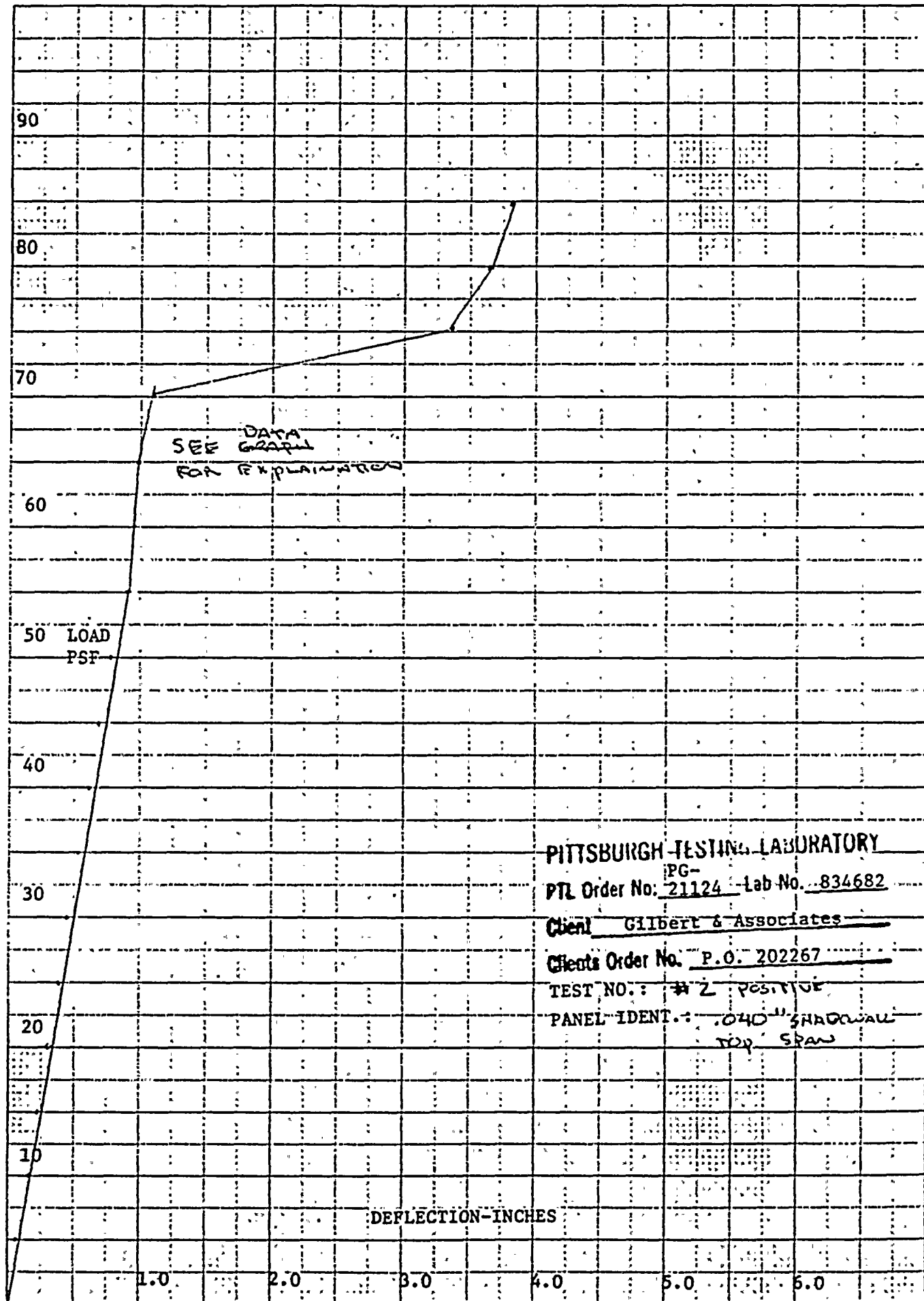
PLATE NO.

Location of Buckling

6

46 1240

PG-20 X 20 TO THE INCHES IN THE AREA
PITTSBURGH TESTING LABORATORY



PITTSBURGH TESTING LABORATORY

PG-
PTL Order No. 21124 Lab No. 834682

Client Gilbert & Associates

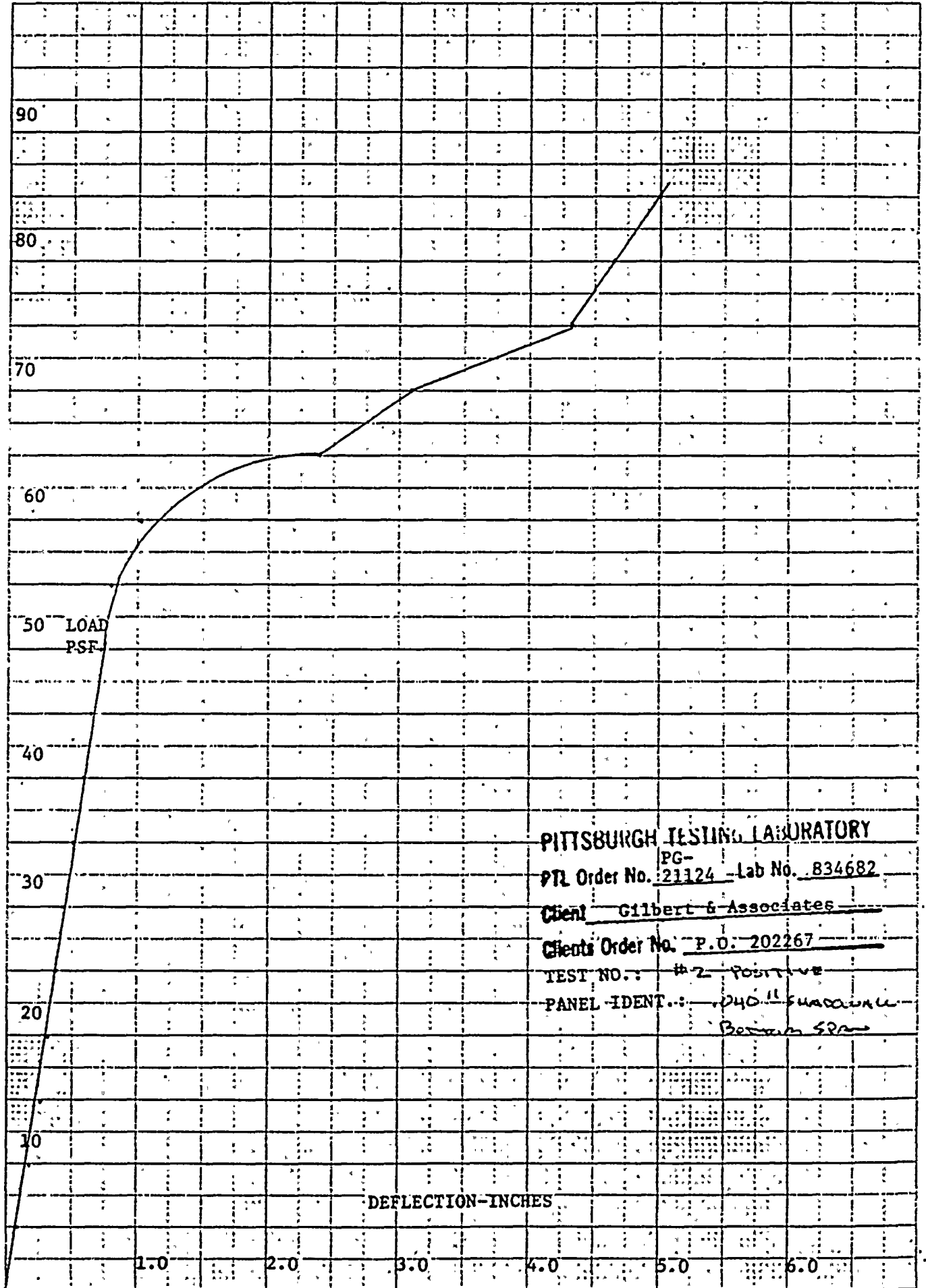
Client's Order No. P.O. 202267

TEST NO.: #2 POSITIVE

PANEL IDENT.: .040" SHALLOW
TOP SPAN

46 1240

K-2 20 X 20 TO THE INCHES 1/2 IN. DIA. Holes
REINFORCED CONCRETE



PITTSBURGH TESTING LABORATORY

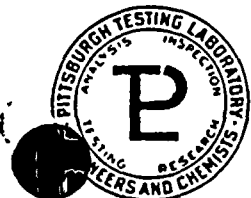
PTL Order No. PG-21124 Lab No. 834682

Client Gilbert & Associates

Client's Order No. P.O. 202267

TEST NO.: #2 POSITIVE

PANEL IDENT.: 240 II SURROUND
Bottom Span



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CLIENT'S No. 202267

AREA CODE 412 TELEPHONE 922-4000

LABORATORY No. 834682

ORDER No. PG-21124

REPORT

January 11, 1983

REPORT OF: Load Testing on Panel Assemblies

Test # 3 Positive

Panel Identification: .040" Shadowall

DEFLECTION READINGS - INCHES

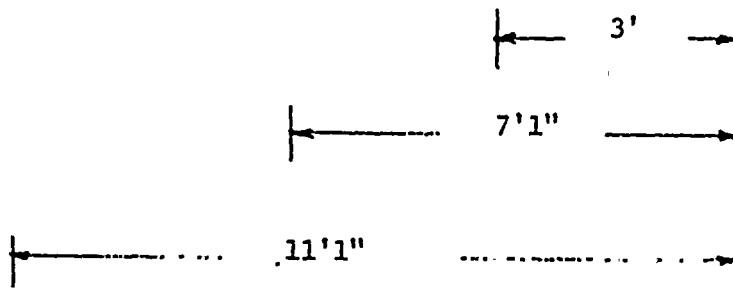
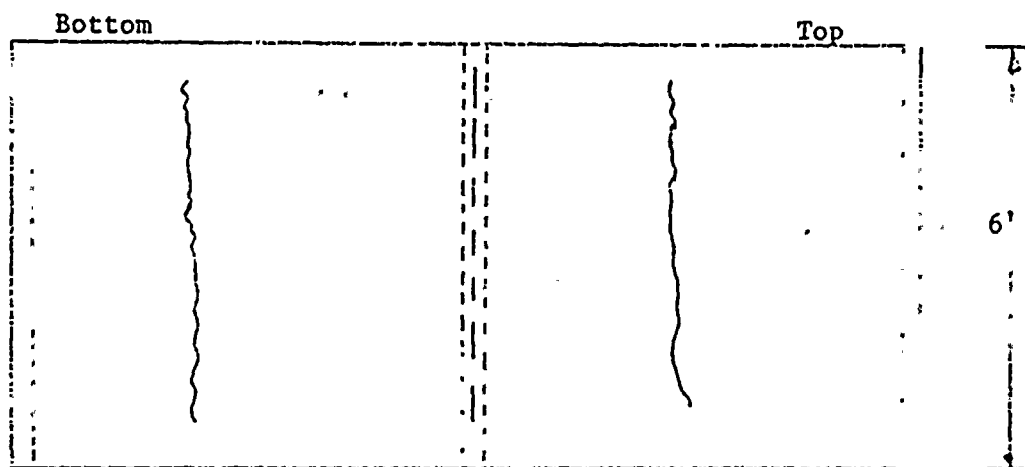
<u>Load PSF</u>	<u>Bottom Span</u>	<u>Top Span</u>
0	0.000	0.000
5	0.080	0.071
10	0.158	0.143
15	0.225	0.208
20	0.282	0.272
25	0.335	0.333
30	0.397	0.404
35	0.465	0.485
40	0.530	0.564
45	0.597	0.653
50	0.650	0.747
55	0.715	0.870
60	0.810	1.070
65	2.29	0.980*
70	2.57	1.000*
75	3.94	2.195
80	4.15	4.890
85	4.48	4.990
90	4.59	5.140

*Panel rippling across

Comments: Center Section buckling at 60 PSF to 65 PSF Maximum Load 182 PSF
Ran Out of Travel for water manometer some pull away at top right fastener.



14'4"



Panel: .040" Shadowall

Test #3 Positive

GILBERT & ASSOCIATES

PITTSBURGH TESTING LABORATORY

MADE BY: JPM

DATE: 12/28/82

ORDER NO.
PG-21124

CH'KD. BY:

DATE:

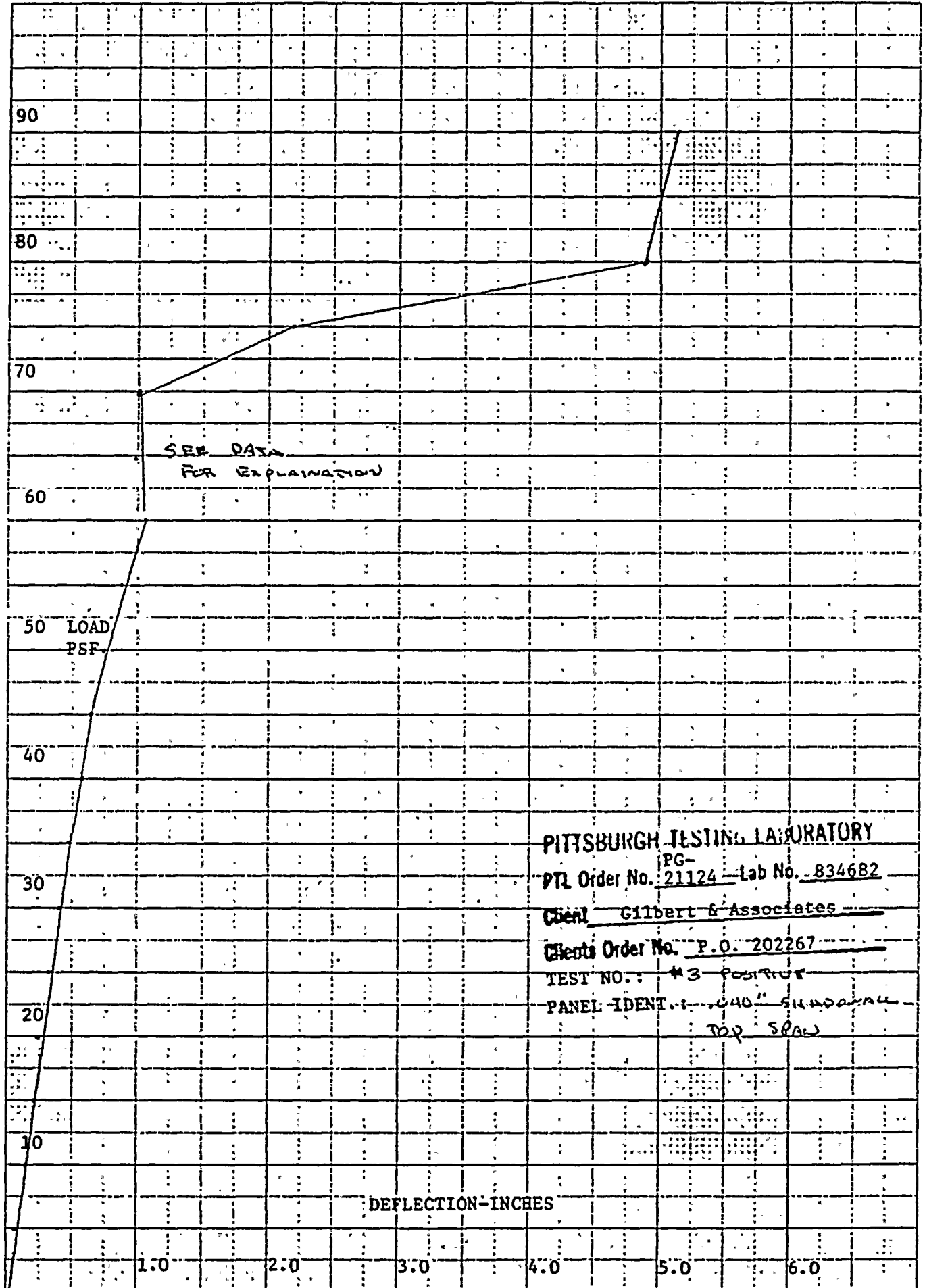
Location of Buckling

PLATE NO.

7

46 1240

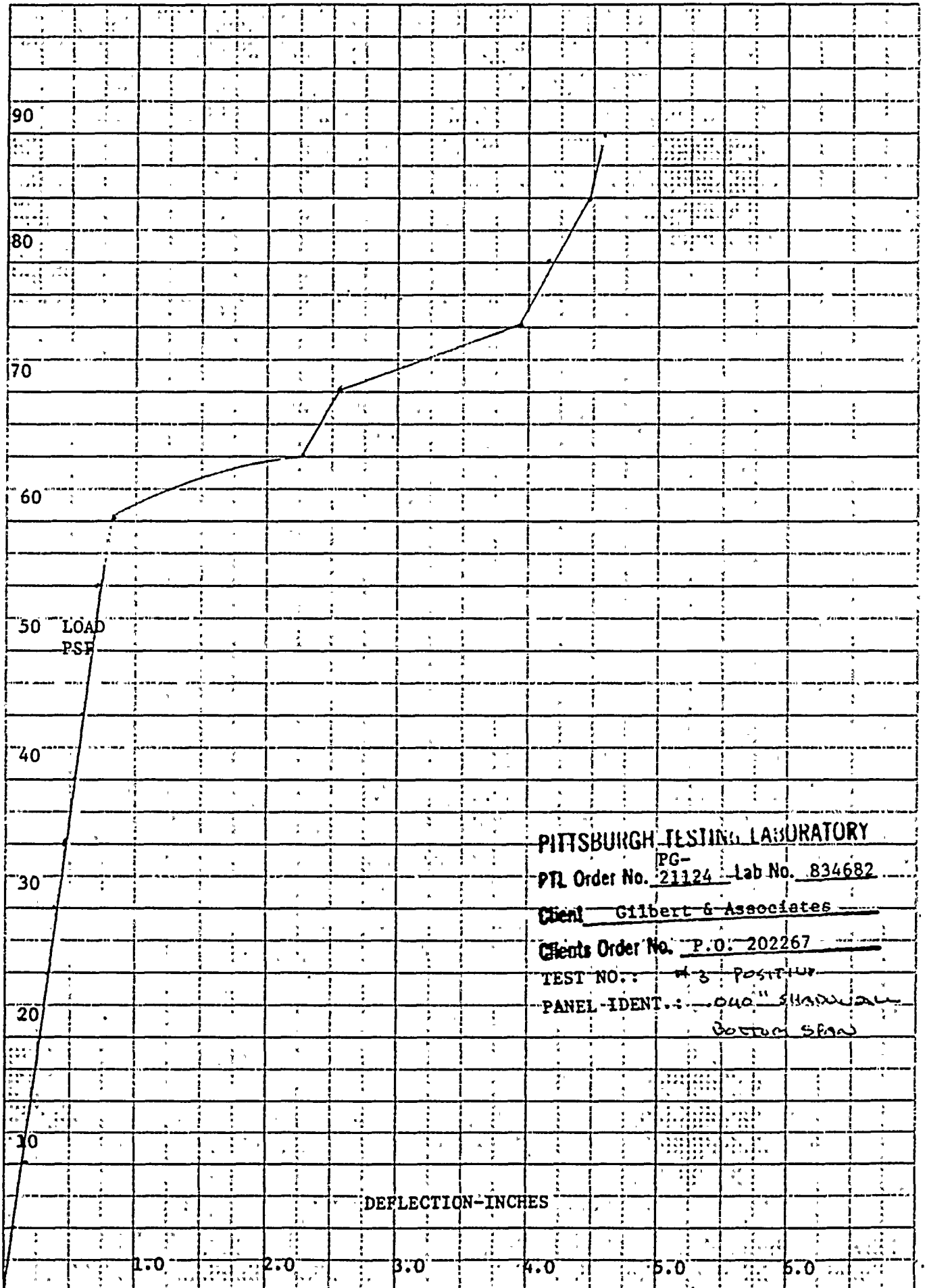
K&E 20 X 20 TO THE INCH 1/4" PER IN.
MIDDEL & ESCHCO "MANHATTAN"





46 1240

20 X 20 TO THE INCHES
K-2







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CLIENT'S No. 202267

AREA CODE 412 TELEPHONE 922-4000

LABORATORY No. 834682

ORDER No. PG-21124

REPORT

January 11, 1983

REPORT OF: Load Testing on Panel Assemblies

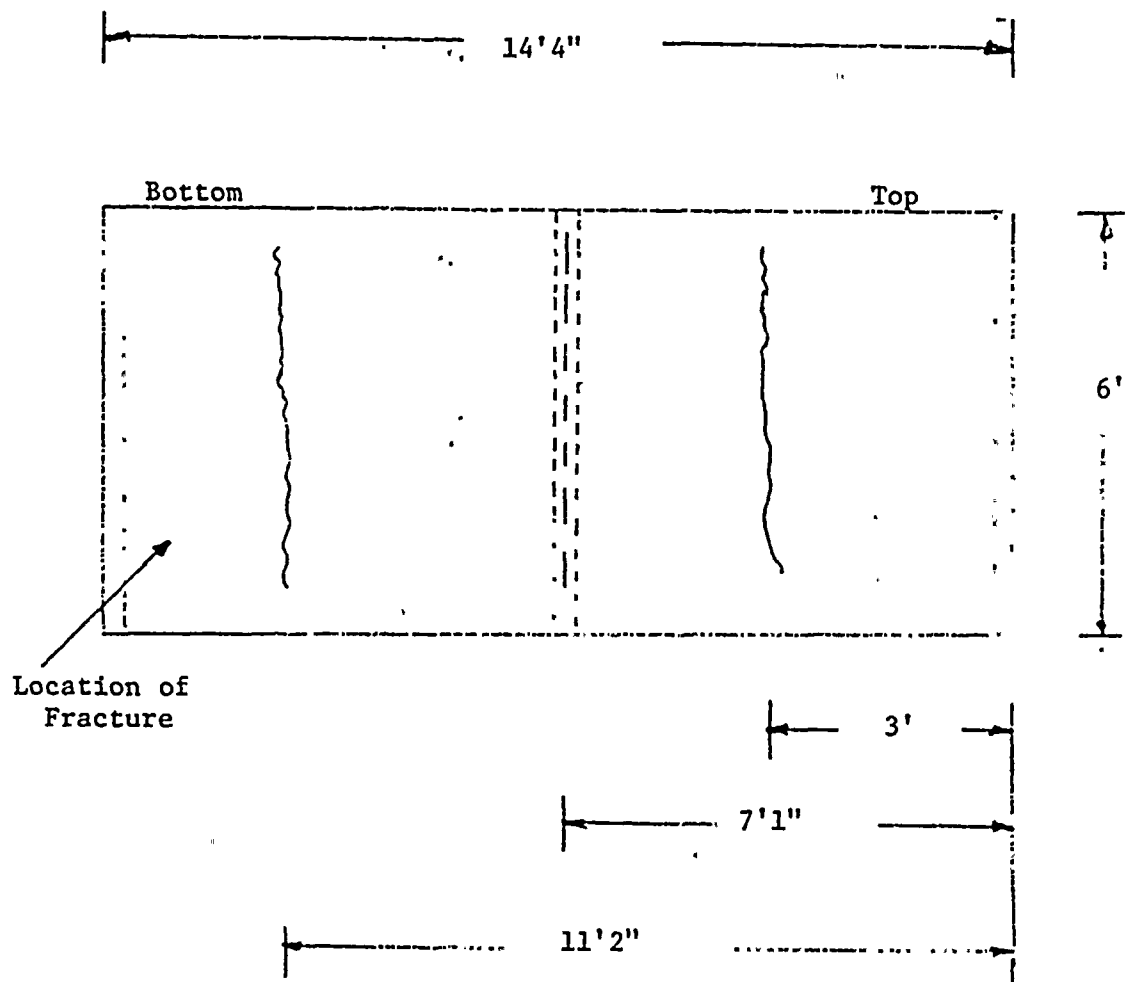
Test # 1 Positive

Panel Identification: .040" Ribwall

DEFLECTION READINGS - INCHES

<u>Load PSF</u>	<u>Bottom Span</u>	<u>Top Span</u>
0	0.000	0.000
5	0.099	0.067
10	0.170	0.140
15	0.240	0.205
20	0.320	0.288
25	0.410	0.370
30	0.480	0.445
35	0.550	0.528
40	0.640	0.631
45	0.735	0.730
50	0.830	0.840
55	0.940	0.948
60	1.050	1.080
65	1.200	1.220
70	1.385	1.415
75	1.580	1.650
80	1.930	2.070
85	2.350	2.435
90	2.740	2.910

Comments: Panel Buckled top span between 75 PSF - 80 PSF Maximum Load
179.5 PSF Bottom fasteners tear then popped out fasteners
still in beam.



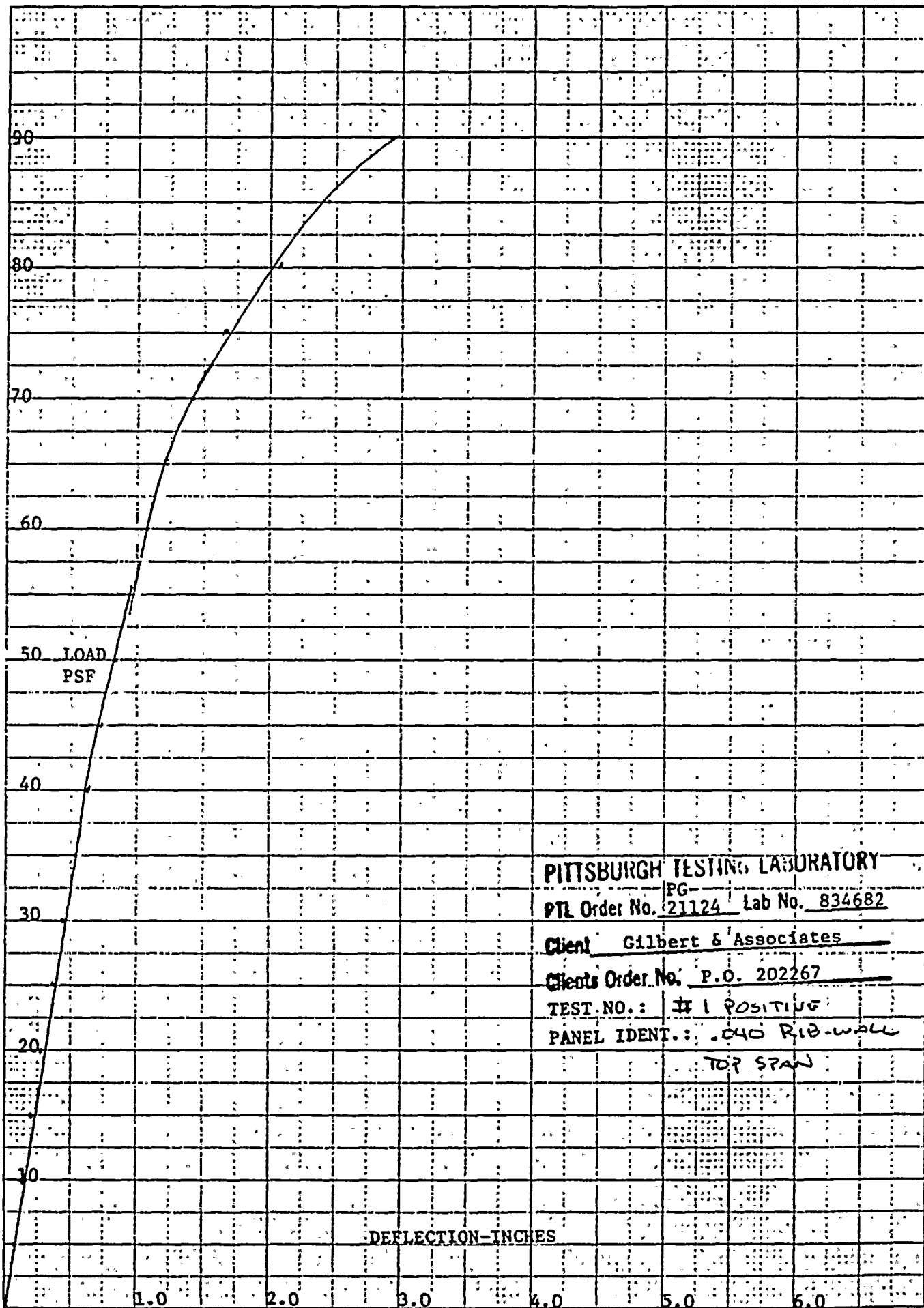
Panel: .040" Ribwall

Test #1 Positive

GILBERT & ASSOCIATES	
PITTSBURGH TESTING LABORATORY	
MADE BY: JPM	DATE: 12/29/82
CH'KD. BY:	DATE:
Location of Buckling	ORDER NO. PG-21124 PLATE NO. 8

461240

1402 20 X 20 TO THE INCH. X 10 PCHING
KLIPPEL & FENNER CO. MADE IN U.S.A.



PITTSBURGH TESTING LABORATORY

PG-
PTL Order No. 21124 Lab No. 834682

Client Gilbert & Associates

Client's Order No. P.O. 202267

TEST NO.: #1 POSITIVE

PANEL IDENT.: 040 Rib-wall

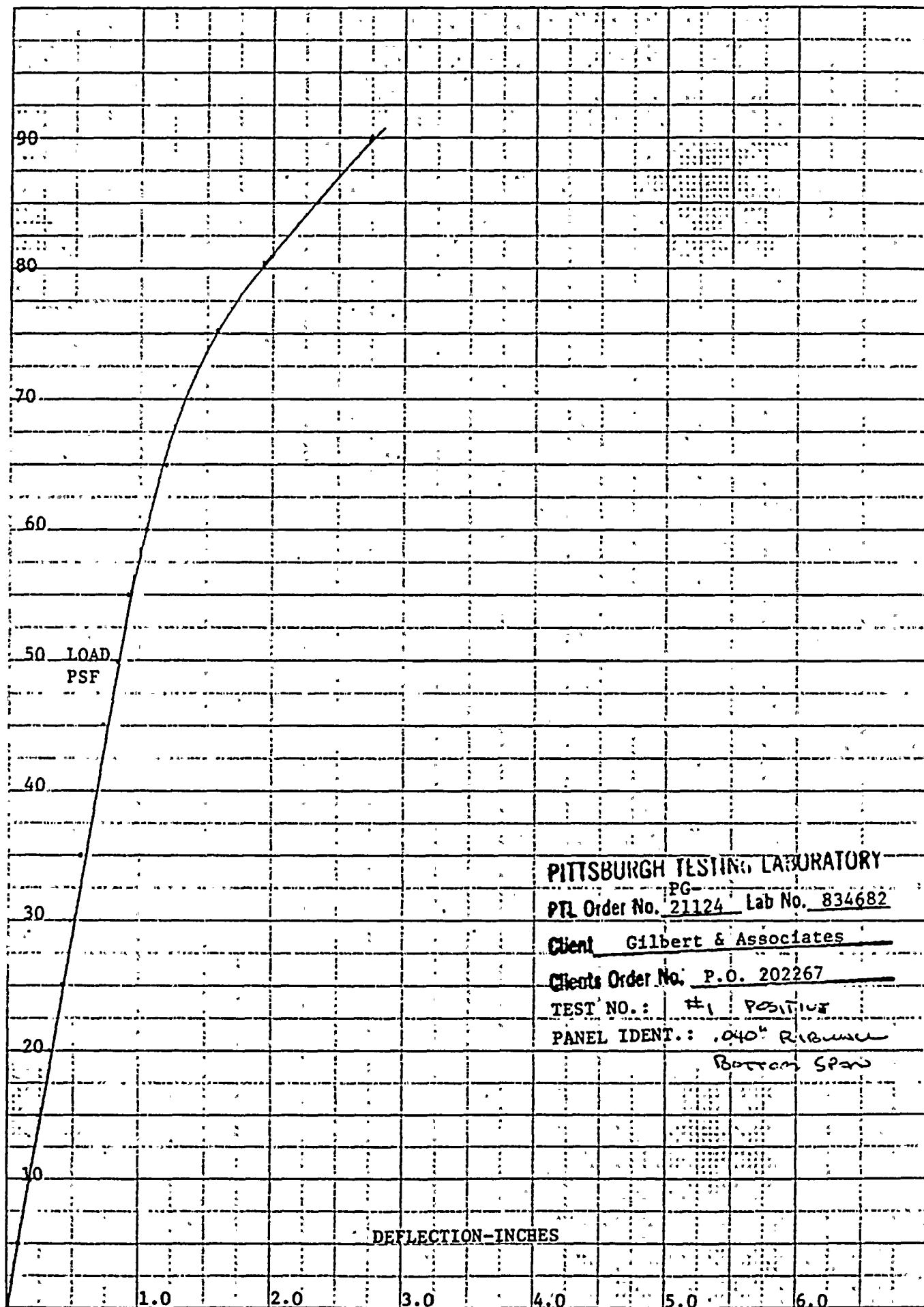
TOP SPAN

DEFLECTION-INCHES



461240

MAX. DEFLECTION INCHES: 5.0



PITTSBURGH TESTING LABORATORY

PG-
PTL Order No. 21124 Lab No. 834682

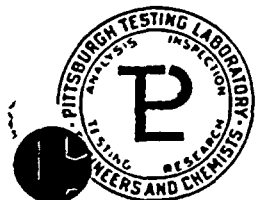
Client Gilbert & Associates

Client's Order No. P.O. 202267

TEST NO.: #1 POSITIVE

PANEL IDENT.: .040" RIBBED
Bottom Span





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CLIENT'S No. 202267

AREA CODE 412 TELEPHONE 922-4000

LABORATORY No. 834682

ORDER No. PG-21124

REPORT

January 11, 1983

REPORT OF: Load Testing on Panel Assemblies

Test # 2 Positive

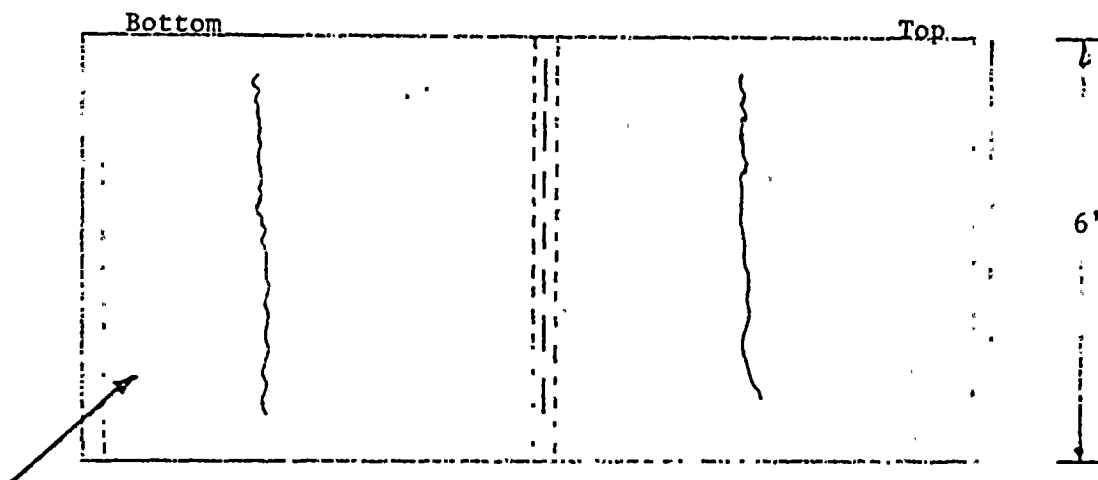
Panel Identification: .040" Ribwall

DEFLECTION READINGS - INCHES

<u>Load PSF</u>	<u>Bottom Span</u>	<u>Top Span</u>
0	0.000	0.000
5	0.090	0.075
10	0.165	0.147
15	0.228	0.216
20	0.302	0.292
25	0.380	0.371
30	0.460	0.448
35	0.545	0.529
40	0.632	0.625
45	0.725	0.722
50	0.820	0.822
55	0.922	0.931
60	1.040	1.048
65	1.190	1.179
70	1.370	1.350
75	1.560	1.560
80	1.770	1.785
85	2.170	2.110
90	2.690	2.540
95	3.030	2.935
100	3.320	3.854

Comments: Top span panel buckled a 80 PSF - 85 PSF. Maximum load 156 PSF bottom fasteners pulled and torn around fasteners then popped.

14'4"



Location of
Fracture

Panel: 0.040" Ribwall

Test #2 Positive

GILBERT & ASSOCIATES

PITTSBURGH TESTING LABORATORY

MADE BY: JPM

DATE: 12/29/82

ORDER NO.
PG-21124

CH'KD. BY:

DATE:

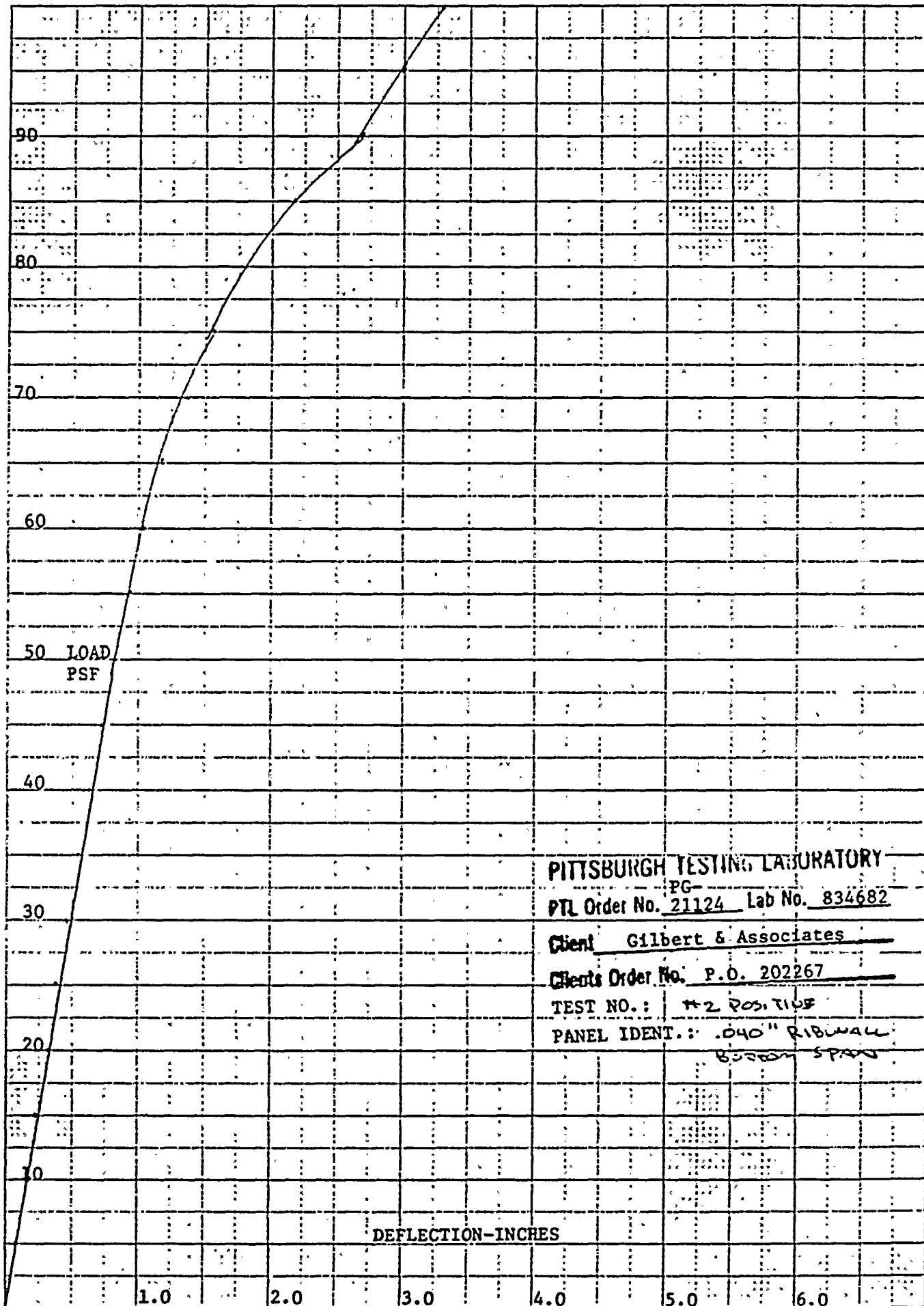
PLATE NO.

Location of Buckling

9

46 1240

PG-20 X 20 TO THE INCHES, 1/2" P.O. 1000



PITTSBURGH TESTING LABORATORY

PG-
PTL Order No. 21124 Lab No. 834682

Client Gilbert & Associates

Client's Order No. P.O. 202267

TEST NO.: #2 POSITIVE

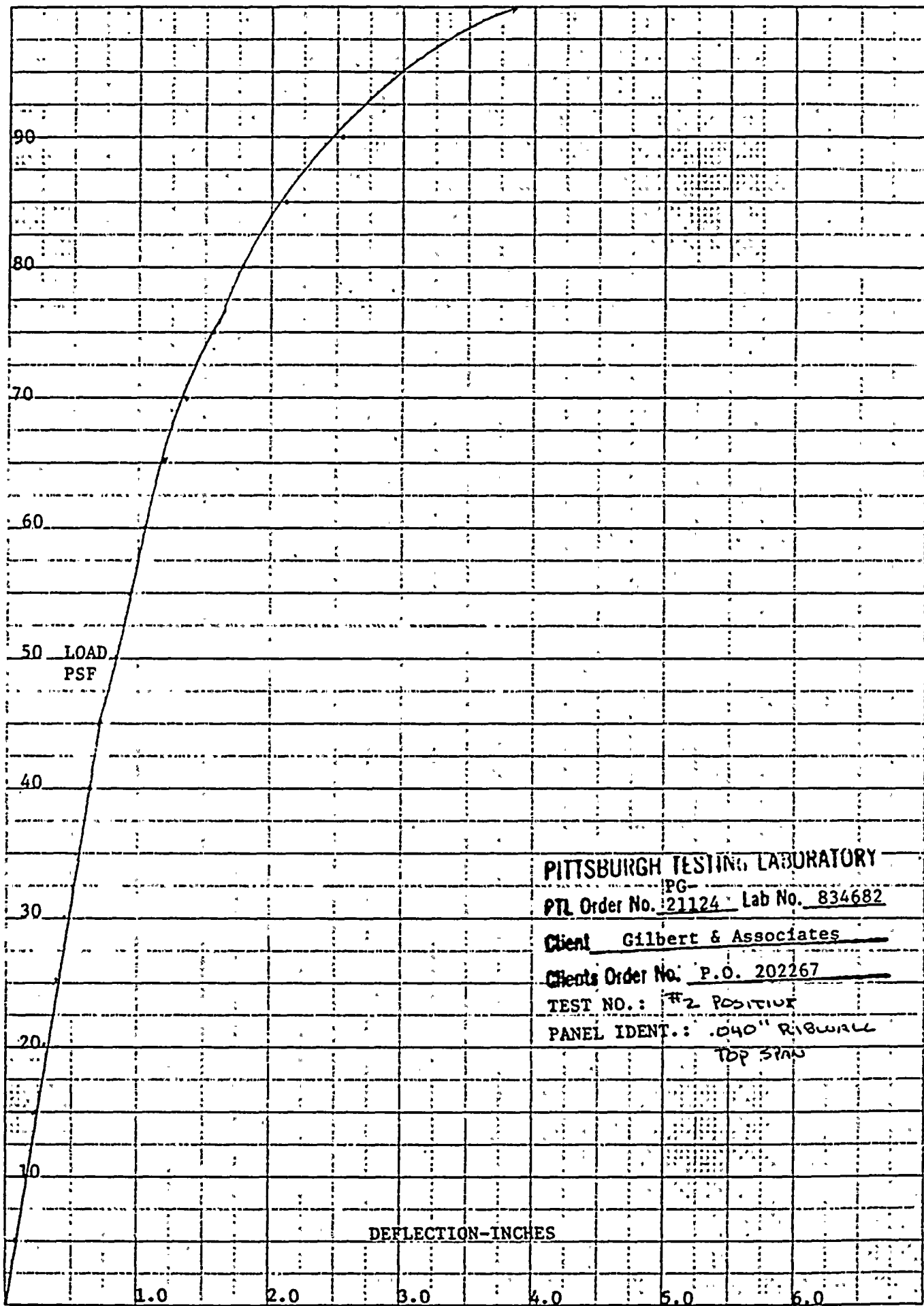
PANEL IDENT.: .040" RIBWALL
BOTTOM SPAN

DEFLECTION-INCHES



461240

20 X 20 TO THE INCH. X 1000000
K&E KUNDT, AUSTIN, TEXAS



PITTSBURGH TESTING LABORATORY

PTL Order No. PG-21124 Lab No. 834682

Client Gilbert & Associates

Client's Order No. P.O. 202267

TEST NO.: #2 POSITIVE

PANEL IDENT.: .040" RIBWALL
TOP SPAN





PITTSBURGH TESTING LABORATORY

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CLIENT'S No. 202267

AREA CODE 412 TELEPHONE 922-4000

LABORATORY No. 834682

ORDER No. PG-21124

REPORT

January 11, 1983

REPORT OF: Load Testing on Panel Assemblies

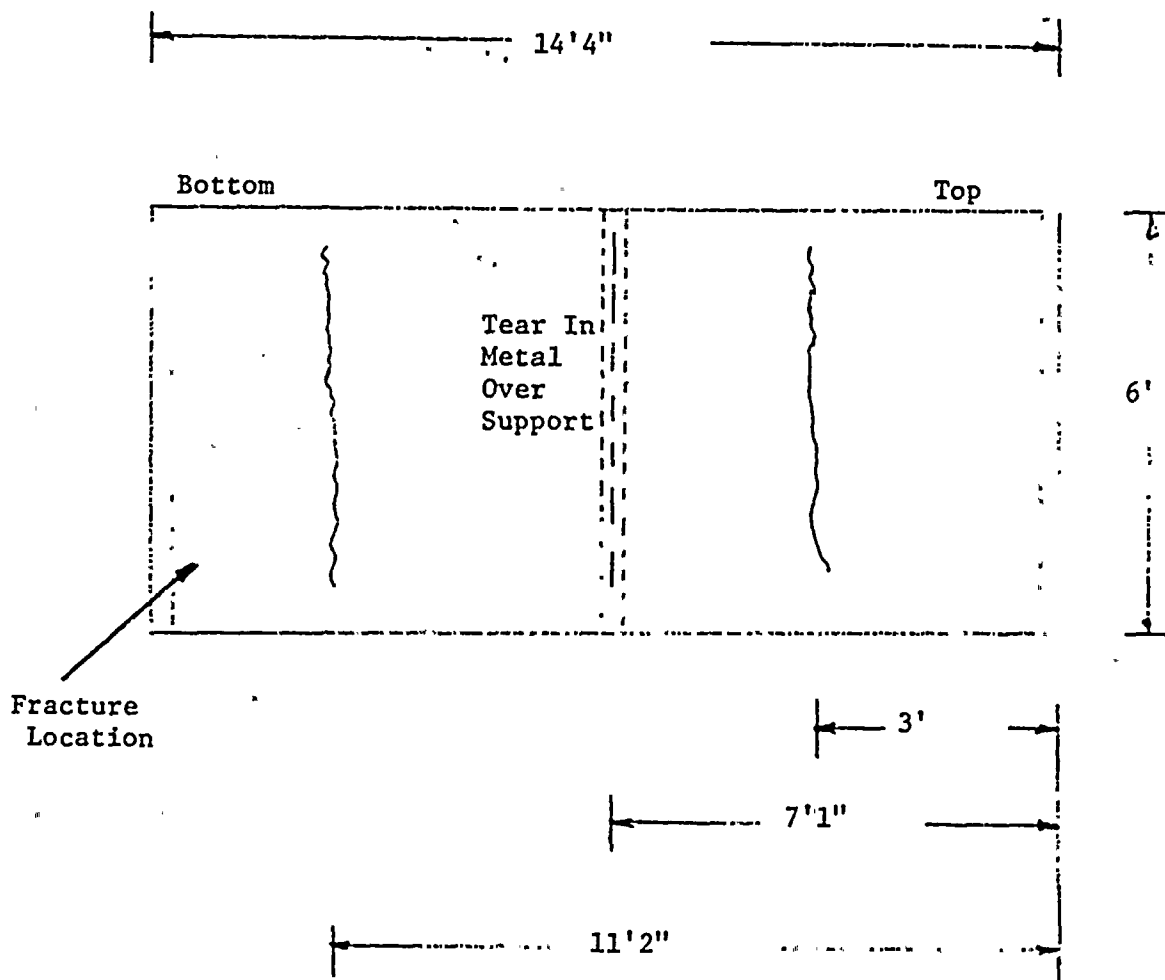
Test # 3 Positive

Panel Identification: .040" Ribwall

DEFLECTION READINGS - INCHES

<u>Load PSF</u>	<u>Bottom Span</u>	<u>Top Span</u>
0	0.000	0.000
5	0.080	0.064
10	0.158	0.134
15	0.235	0.205
20	0.310	0.282
25	0.385	0.352
30	0.460	0.427
35	0.550	0.513
40	0.630	0.608
45	0.715	0.694
50	0.810	0.788
55	0.910	0.885
60	1.040	0.999
65	1.175	1.105
70	1.330	1.240
75	1.540	1.400
80	1.760	1.575
85	2.130	2.131
90	2.540	2.465
95	3.040	3.605
100	3.280	3.830

Comments: Top span panel starting to buckle between 80 PSF - 85 PSF.
Maximum load 176.9 PSF. Bottom span fasteners metal pulled
then popped.



Panel: .040" Ribwall

Test #3 Positive

Gilbert and Associates

PITTSBURGH TESTING LABORATORY

MADE BY: JPM

DATE: 12/30/82

ORDER NO.
PG-21124

CH'KD. BY:

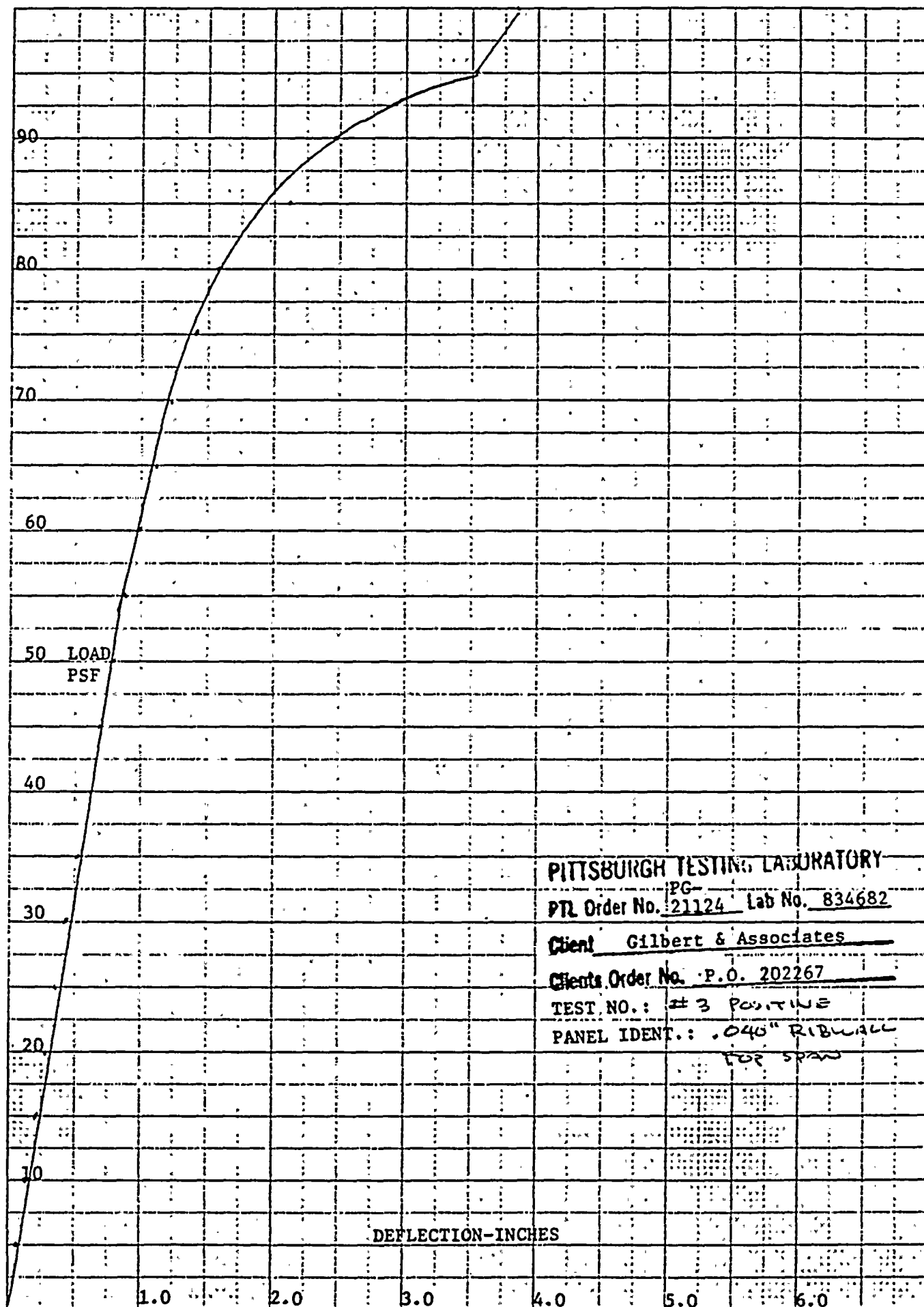
DATE:

Location of Buckling

PLATE NO.
10

20 X 20 TO THE INCHES
APPROX. 1/4" WIDE

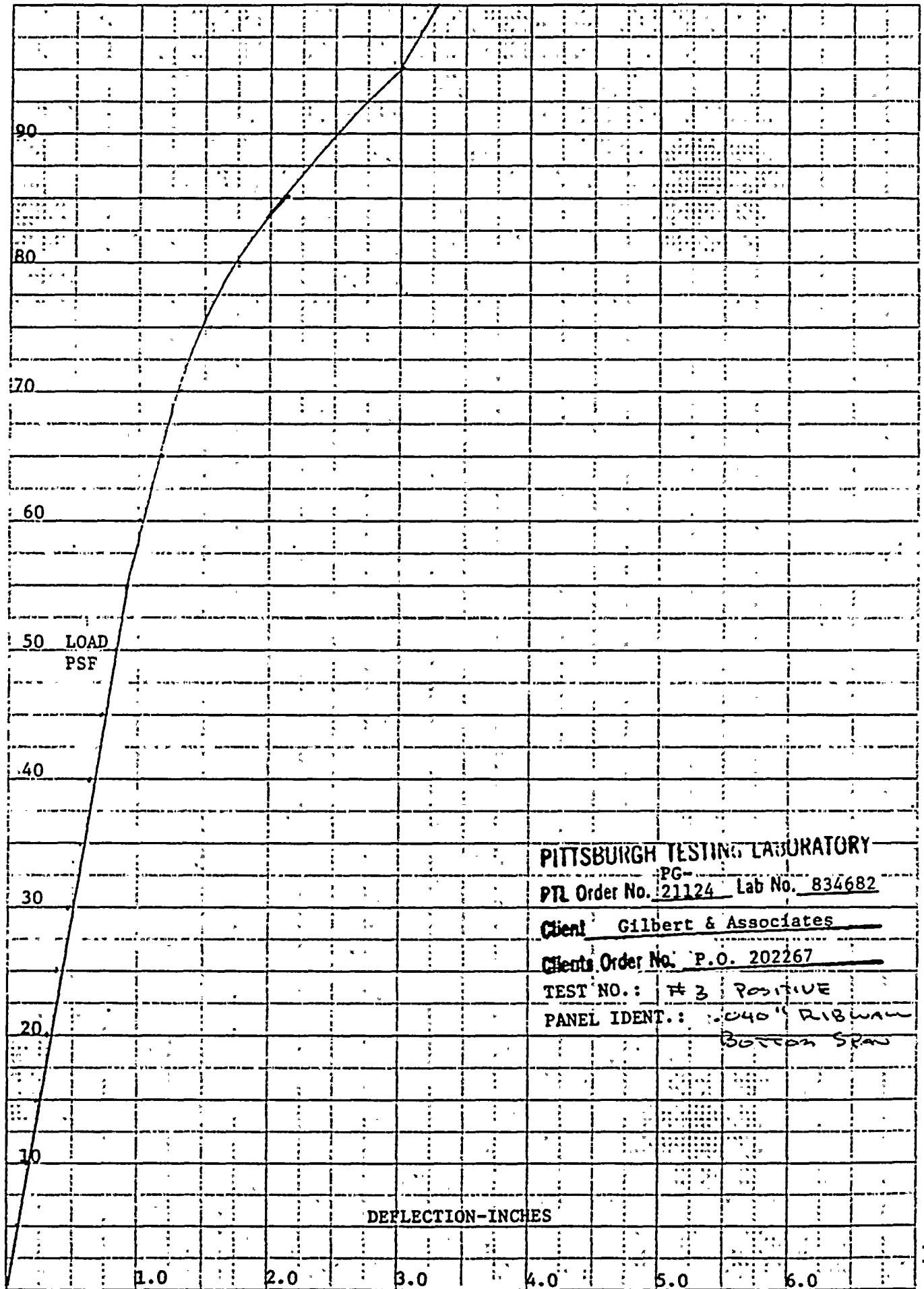
461240





461240

K&E 20 X 20 TO THE INCH 1/4" X 1/4" 1/4" X 1/4"



PITTSBURGH TESTING LABORATORY

PTL Order No. PG-21124 Lab No. 834682

Client Gilbert & Associates

Client's Order No. P.O. 202267

TEST NO.: # 3 POSITIVE

PANEL IDENT.: 2040" RIB W/ W
BOTTOM SPAN

DEFLECTION-INCHES

NEGATIVE PRESSURE TEST DATA



PITTSBURGH TESTING LABORATORY

ESTABLISHED 1881

850 POPLAR STREET, PITTSBURGH, PA. 15220

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AREA CODE 412 TELEPHONE 922-4000

LABORATORY No. 834682

CLIENT'S No. 202267

ORDER No. PG-21124

REPORT

January 11, 1983

REPORT OF: Load Testing on Panel Assemblies

Test # 1 - Negative

Panel Identification: B-Panel - .032" Shadowall

DEFLECTION READINGS - INCHES

<u>Load PSF</u>	<u>Bottom Span</u>	<u>Top Span</u>
0	0.000	0.000
5	0.285	0.330
10	0.528	0.650
15	0.700	0.910
20	0.899	1.290
25	1.128	1.470
30	1.450	1.620
35	1.640	1.870
40	1.990	2.100
45	2.218	2.390
50	2.403	2.550

Comments: Panel indicated by sound buckling of Shadowall at 60 PSF. Maximum
Load 80 PSF top Fasteners tore at top through metal.



PITTSBURGH TESTING LABORATORY

PG-
PTL Order No. 21124 Lab No. 834682

Client Gilbert & Associates

Client's Order No. P.O. 202267

TEST NO.: #1 NEGATIVE

PANEL IDENT.: B-PANEL C32 SHADOWALL
TOP-SEAM

90

80

70

60

50 LOAD
PSF

40

30

20

10

DEFLECTION-INCHES

1.0

2.0

3.0

4.0

5.0

6.0

45 1240

NOT TO SCALE TO THE INCHES

PITTSBURGH TESTING LABORATORY

PG-
PTL Order No. 21124 Lab No. B34582

Client Gilbert & Associates

Client's Order No. P.O. 202267

TEST NO.: *1 NEGATIVE

PANEL IDENT.: D-PANEL 1032" SHADOWALL
BOOTHUM SPAN

90

80

70

60

50 LOAD
PSF

40

30

20

10

DEFLECTION-INCHES

1.0

2.0

3.0

4.0

5.0

6.0

461240

SEE 20 X 20 TO THE INCH. SCALE



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LABORATORY No. 834682

ORDER No. PG-21124

CLIENT'S No. 202267

REPORT

January 11, 1983

REPORT OF: Load Testing on Panel Assemblies

Test # 2 - Negative

Panel Identification: B-Liner Insulation - .032" Shadowall

DEFLECTION READINGS - INCHES

<u>Load PSF</u>	<u>Bottom Span</u>	<u>Top Span</u>
0	0.000	0.000
5	0.202	0.285
10	0.510	0.565
15	0.770	0.750
20	1.171	0.990
25	1.429	1.220
30	1.814	1.475
35	2.129	1.695
40	2.440	1.945
45	2.694	2.190
50	2.930	2.400

Comments: Popping heard at 50 PSF. Maximum Load 95 PSF top fasteners tore through and panel then fractured.



PITTSBURGH TESTING LABORATORY

PC

PTL Order No. 21124 Lab No. B34682

Client Gilbert & Associates

Client's Order No. P.O. 202267

TEST NO.: #2 NEGATIVE

PANEL IDENT.: B-LINE INFORMATION
1032 SHADOWALL
TOR SPAN

90

80

70

60

50 LOAD
PSF

40

30

20

10

DEFLECTION-INCHES

1.0

2.0

3.0

4.0

5.0

6.0

461240

KOE 20 X 20 TO THE INCHES. 100 LBS. MINIMUM WEIGHT IN HAND



PITTSBURGH TESTING LABORATORY

PG-

PIL Order No. 21124 Lab No. 834682

90

Client Gilbert & Associates

Client's Order No. P.O. 202267

TEST NO.: #2 NEGATIVE

PANEL IDENT.: G-LINER INSULATION
.032" SHARDANAL
BOTTOM BRAN

80

70

60

50 LOAD
PSF

40

30

20

10

DEFLECTION-INCHES

1.0

2.0

3.0

4.0

5.0

6.0

46 1240

14.5 28 X 28 TO THE INCH. 1.0000



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LABORATORY No. 834682

CLIENT'S No. 202267

ORDER No. PG-21124

REPORT

January 11, 1983

REPORT OF: Load Testing on Panel Assemblies

Test # 3 - Negative

Panel Identification: B-Liner .032" Shadowall

DEFLECTION READINGS - INCHES

<u>Load PSF</u>	<u>Bottom Span</u>	<u>Top Span</u>
0	0.000	0.000
5	0.173	0.245
10	0.417	0.580
15	0.643	0.800
20	0.870	1.080
25	1.085	1.410
30	1.248	1.660
35	1.440	1.920
40	1.605	2.190
45	1.807	2.430
50	2.015	2.570
55	2.165	2.700

Comments: Popping at 50 PSF. Maximum load 80 PSF top fasteners tore to edge of metal then metal pulled off of girt.



PITTSBURGH TESTING LABORATORY

PG-

PTL Order No. 21124 Lab No. 834682

Client Gilbert & Associates

Clients Order No. P.O. 202267

TEST NO.: #3 RELATIVE

PANEL IDENT.: B-LINER .032" SHROOVAL
TOP SPAN

90

80

70

60

50 LOAD
PSF

40

30

20

10

DEFLECTION-INCHES

1.0

2.0

3.0

4.0

5.0

6.0

46 1240

WE 20 X 20 TO THE INCHES IN AREA
5000 PSI MINIMUM

PITTSBURGH TESTING LABORATORY

PG-

PTL Order No. 21124 Lab No. 834682

90

Client Gilbert & Associates

Client's Order No. P.O. 202267

TEST NO.: #3 NEGATIVE

PANEL IDENT.: B-LINER .032" SUBODURALL

3000m x 20

80

70

60

50 LOAD
PSF

40

30

20

10

DEFLECTION-INCHES

1.0

2.0

3.0

4.0

5.0

6.0

46 1240

14.2 20 X 20 TO THE INCHES X 10 IN X 10 IN
KENTON & SONS CO. NEW YORK, N.Y.





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LABORATORY No. 834682

CLIENT'S No. 202267

ORDER No. PG-21124

REPORT

January 11, 1983

REPORT OF: Load Testing on Panel Assemblies

Test # 1 - Negative

Panel Identification: .040" Shadowall

DEFLECTION READINGS - INCHES

<u>Load PSF</u>	<u>Bottom Span</u>	<u>Top Span</u>
0	0.000	0.000
5	0.080	0.105
10	0.170	0.210
15	0.265	0.318
20	0.365	0.435
25	0.499	0.500
30	0.545	0.665
35	0.640	0.775
40	0.745	0.900
45	0.835	1.005
50	0.930	1.110
55	1.030	1.235
60	1.150	1.355
65	1.240	1.460
70	1.395	1.630

Comments: At 72 PSF Panel at center girt pulled away from fasteners. At
92 PSF top end panel pulled away from fasteners.



PITTSBURGH TESTING LABORATORY

PG-

PTL Order No. 21124 Lab No. 834682

90

Client Gilbert & Associates

Client's Order No. P.O. 202267

TEST NO.: N 1 NEGATIVE

PANEL IDENT.: D40 SHADOWAC
Bottom Span

80

70

60

50 LOAD
PSF

40

30

20

10

DEFLECTION-INCHES

1.0

2.0

3.0

4.0

5.0

6.0

45 1240

NOTE: 20 X 20 TO THE INCHES, 3/4" DIA. HOLES

PITTSBURGH TESTING LABORATORY

PG-

P.L. Order No. 21024 Lab No. 834682

90

Client Gilbert & Associates

Client's Order No. P.O. 202267

TEST NO.: #1 NEGATIVE

PANEL IDENT.: 040 SHADOWN
TOP SPAN

80

70

60

50 LOAD
PSF

40

30

20

10

DEFLECTION-INCHES

1.0

2.0

3.0

4.0

5.0

6.0

46 1240

NOT TO SCALE TO THE INCH. A PROPORTION 1/4" = 1'-0"





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LABORATORY No. 834682

ORDER No. PG-21124

CLIENT'S No. 202267

REPORT

January 11, 1983

REPORT OF: Load Testing on Panel Assemblies

Test # 2 - Negative

Panel Identification: 0.040" Shadowall

DEFLECTION READINGS - INCHES

<u>Load PSF</u>	<u>Bottom Span</u>	<u>Top Span</u>
0	0.000	0.000
5	0.000	0.102
10	0.195	0.215
15	0.298	0.325
20	0.415	0.445
25	0.520	0.575
30	0.610	0.695
35	0.709	0.795
40	0.808	0.900
45	0.915	1.015
50	1.030	1.135
55	1.115	1.235
60	1.195	1.355
65	1.310	1.490

Comments: At 67 PSF Panel at center girt pulled away from fasteners.
At 92 PSF end top panel pulled away.

PITTSBURGH TESTING LABORATORY

PTL Order No. 21124 Lab No. B34682

Client Gilbert & Associates

Client's Order No. P.O. 202267

TEST NO.: #2 NEGATIVE

PANEL IDENT.: 10' 40" SHADOW WALL
TOP SPAN

90

80

70

60

50 LOAD
PSF

40

30

20

10

DEFLECTION-INCHES

1.0

2.0

3.0

4.0

5.0

6.0

46 1240

NOT TO SCALE TO THE INCH. 1/4" = 1'-0"

PITTSBURGH TESTING LABORATORY

PG-

PTL Order No. 21124 Lab No. 834682

90

Client Gilbert & Associates

Client's Order No. P.O. 202267

TEST NO.: #2 NEGATIVE

PANEL IDENT.: 040 SHADOWALL
BOTTOM SPAN

80

70

60

50 LOAD
PSF

40

30

20

10

DEFLECTION-INCHES

1.0

2.0

3.0

4.0

5.0

6.0

451240

REF 20 X 20 TO THE INCH. 1/2" PSF





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CLIENT'S No. 202267

LABORATORY No. 834682

ORDER No. PG-21124

REPORT

January 11, 1983

REPORT OF: Load Testing on Panel Assemblies

Test # 3 - Negative

Panel Identification: .040" Shadowall

DEFLECTION READINGS - INCHES

<u>Load PSF</u>	<u>Bottom Span</u>	<u>Top Span</u>
0	0.000	0.000
5	0.092	0.120
10	0.191	0.225
15	0.285	0.330
20	0.375	0.422
25	0.460	0.530
30	0.650	0.650
35	0.735	0.720
40	0.810	0.820
45	0.915	0.930
50	1.010	1.030
55	1.105	1.130
60	1.150	1.230
65	1.210	1.335
	1.330	1.465

Comments: At 74 PSF Panel at center girt pulled off and at 91 PSF Top Panel pulled off.



PITTSBURGH TESTING LABORATORY

PG-

PIL Order No. 21124 Lab No. 834682

90

Client Gilbert & Associates

Client's Order No. P.O. 202267

TEST NO.: #3 NEGATIVE

PANEL IDENT.: 040 SNOWWALL

80

TOP-SPAW

70

60

50 LOAD
PSF

40

30

20

10

DEFLECTION-INCHES

1.0

2.0

3.0

4.0

5.0

6.0

46 1240

MAX. 20 X 20 TO THE INCHES



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PTL Order No. 21124 Lab No. 834682

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Client Gilbert & Associates

Client's Order No. P.O. 202267

TEST NO.: TE 3 NEGATIVE

PANEL IDENT.: OLD SHAWWAL
6' x 6' SPAN

80

70

60

50 LOAD
PSF

40

30

20

10

DEFLECTION-INCHES

1.0

2.0

3.0

4.0

5.0

6.0

461240

16" x 20" TO THE INCH. 1" = 20" 1" = 20"





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LABORATORY No. 834682

ORDER No. PG-21124

REPORT

January 11, 1983

REPORT OF: Load Testing on Panel Assemblies

Test # 1 - Negative

Panel Identification: .040" Ribwall

DEFLECTION READINGS - INCHES

<u>Load PSF</u>	<u>Bottom Span</u>	<u>Top Span</u>
0	0.000	0.000
5	0.078	0.065
10	0.225	0.195
15	0.354	0.305
20	0.470	0.410
25	0.586	0.505
30	0.708	0.615
35	0.813	0.725
40	0.924	0.840
45	1.043	0.960
50	1.150	1.065
55	1.255	1.175
60	1.357	1.310
65	1.520	1.450
70	1.678	1.620
75	1.815	1.760
80	1.920	1.840

Comments: At 80 PSF Panels at Center Support Pulled from Fasteners.
At 115 PSF end top panel pulled from fasteners.



PITTSBURGH TESTING LABORATORY

PG-
PTL Order No. 21024 Lab No. 834682

90 Client Gilbert & Associates

Client's Order No. P.O. 202267

TEST NO.: # 1 NEGATIVE

PANEL IDENT.: .040" RIB WIDE
BOTTOM S.PAD.

80

70

60

50 LOAD
PSF

40

30

20

10

DEFLECTION-INCHES

1.0

2.0

3.0

4.0

5.0

6.0

46 1240

140E 20 X 20 TO THE INCH. 1/2" DIA. 10"



PITTSBURGH TESTING LABORATORY

PG-

PIL Order No. 21124 Lab No. 834682

90 Client Gilbert & Associates

Clients Order No. P.O. 202267

TEST NO.: # NEGATIVE

PANEL IDENT.: .640" RIBBING
TOP SPAN

80

70

60

50 LOAD
PSF

40

30

20

10

DEFLECTION-INCHES

1.0

2.0

3.0

4.0

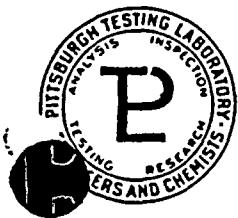
5.0

6.0

46 1240

SEE PAGE 20 X 20 TO THE INCHES IN THE
NORTH WEST CORNER





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LABORATORY No. 834682

CLIENT'S No. 202267

ORDER No. PG-21124

REPORT

January 11, 1983

REPORT OF: Load Testing on Panel Assemblies

Test # 2 - Negative

Panel Identification: .040" Ribwall

DEFLECTION READINGS - INCHES

<u>Load PSF</u>	<u>Bottom Span</u>	<u>Top Span</u>
0	0.000	0.000
5	0.080	0.085
10	0.200	0.207
15	0.340	0.347
20	0.450	0.456
25	0.560	0.572
30	0.660	0.685
35	0.775	0.800
40	0.890	0.930
45	0.985	1.038
50	1.090	1.150
55	1.180	1.245
60	1.290	1.362
65	1.380	1.470
70	1.500	1.600
75	1.620	1.730
80	1.730	1.845

Comments: At 90 PSF Center Support Panels popped off then load dropped off
then climbed back to 90 PSF when end bottom fasteners popped.



PITTSBURGH TESTING LABORATORY

PG-

PTL Order No. 21024 Lab No. 834682

Client Gilbert & Associates

Client's Order No. P.O. 202267

TEST NO.: #2 NEGATIVE

PANEL IDENT.: 1040" RIB WALL
TOP SPAN

90

80

70

60

50 LOAD
PSF

40

30

20

10

DEFLECTION-INCHES

1.0

2.0

3.0

4.0

5.0

6.0

46 1240

KEE 20 X 20 TO THE INCH. 1/2" TO 1/4" DIA.
MINIMUM SPACING 1/2" TO 1/4" DIA.



PITTSBURGH TESTING LABORATORY

PG-

PTL Order No. 21124 Lab No. 834682

90 Client Gilbert & Associates

Clients Order No. P.O. 202267

TEST NO.: #2 NEGATIVE

PANEL IDENT.: 040 RTBWA
BOTTOM SPAN

80

70

60

50 LOAD
PSF

40

30

20

10

DEFLECTION-INCHES

1.0

2.0

3.0

4.0

5.0

6.0

46 1240

20 X 20 TO THE INCHES IN P.P.S.
K&E MANUFACTURING COMPANY



**PITTSBURGH TESTING LABORATORY**

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CLIENT'S No. 202267

AREA CODE 412 TELEPHONE 922-4000

LABORATORY No. 834682

ORDER No. PG-21124

REPORT

January 11, 1983

REPORT OF: Load Testing on Panel Assemblies

Test # 3 Negative

Panel Identification: .040" Ribwall

DEFLECTION READINGS - INCHES

<u>Load PSF</u>	<u>Bottom Span</u>	<u>Top Span</u>
0	0.000	0.000
5	0.118	0.085
10	0.238	0.210
15	0.370	0.342
20	0.485	0.460
25	0.599	0.570
30	0.690	0.670
35	0.775	0.775
40	0.870	0.892
45	0.970	1.010
50	1.060	1.115
55	1.150	1.225
60	1.245	1.335
65	1.365	1.475
70	1.485	1.620
75	1.610	1.760
80	1.730	1.895
85		
90		
95		
100		
105		
110		

Comments: At 92 PSF panel at center girt pulled from fasteners. Plastic developed tear shut system down patched tear then restarted end panel this pulled out at 65 PSF.



PITTSBURGH TESTING LABORATORY

PG-

PTL Order No. 21124 Lab No. 834682

Client Gilbert & Associates

Client's Order No. P.O. 202267

TEST NO.: # 3 NEGATIVE

PANEL IDENT.: .040" RTB WALL
TOP SPAN

90

80

70

60

50 LOAD
PSF

40

30

20

10

DEFLECTION-INCHES

1.0

2.0

3.0

4.0

5.0

6.0

46 1240

K&E 20 X 20 TO THE INCHES 1/2 IN. PER INCH
MINIMUM & FOLDING INCHES



PITTSBURGH TESTING LABORATORY

PG-

PTL Order No. 21124 Lab No. 834682

90

Client Gilbert & Associates

Client's Order No. P.O. 202267

TEST NO.: *3 NEGATIVE

PANEL IDENT.: .040" REBAR
Bottom Span

80

70

60

50 LOAD
PSF

40

30

20

10

DEFLECTION-INCHES

1.0

2.0

3.0

4.0

5.0

6.0

461240

SEE PAGE 20 TO THE RIGHT FOR CONTINUATION



PHOTOGRAPHS



Lab No. 834682
Order No. PG-21124

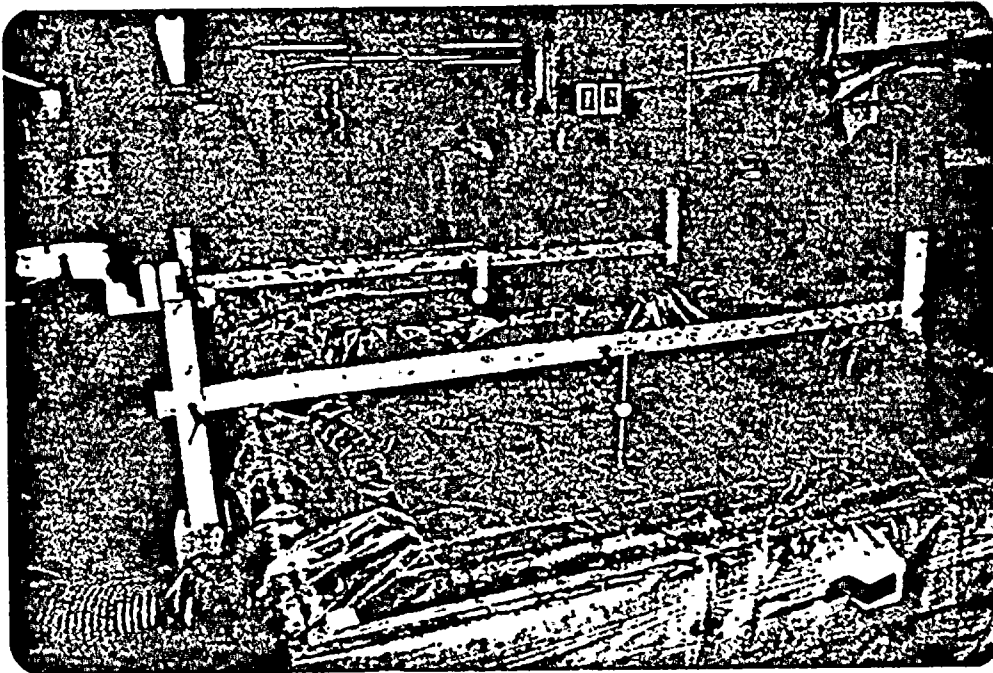


Photo #1

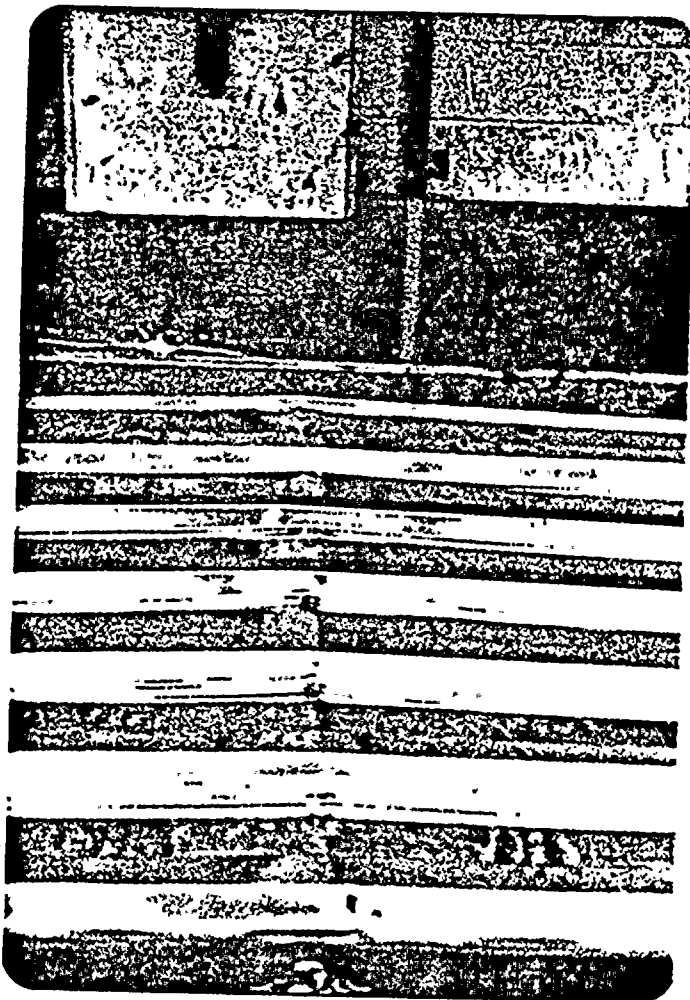
Negative Pressure
Test Set-Up



Photo #2

B-Liner
.040 Shadowwall
Positive Test





Lab No. 834682
Order No. PG-21124

Positive Tests

Photo #3

B-Liner .
.040 Shadowall
Over Support

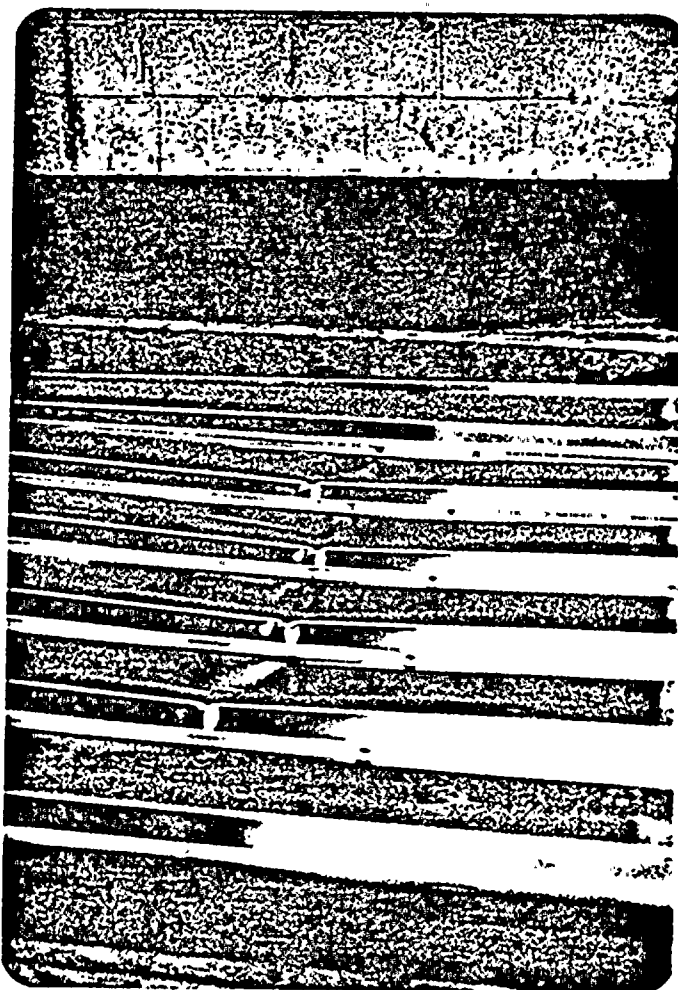


Photo #4

B-Liner .040 Shadowall
Mid Span Bottom



Lab No. 834682
Order No. PG-21124

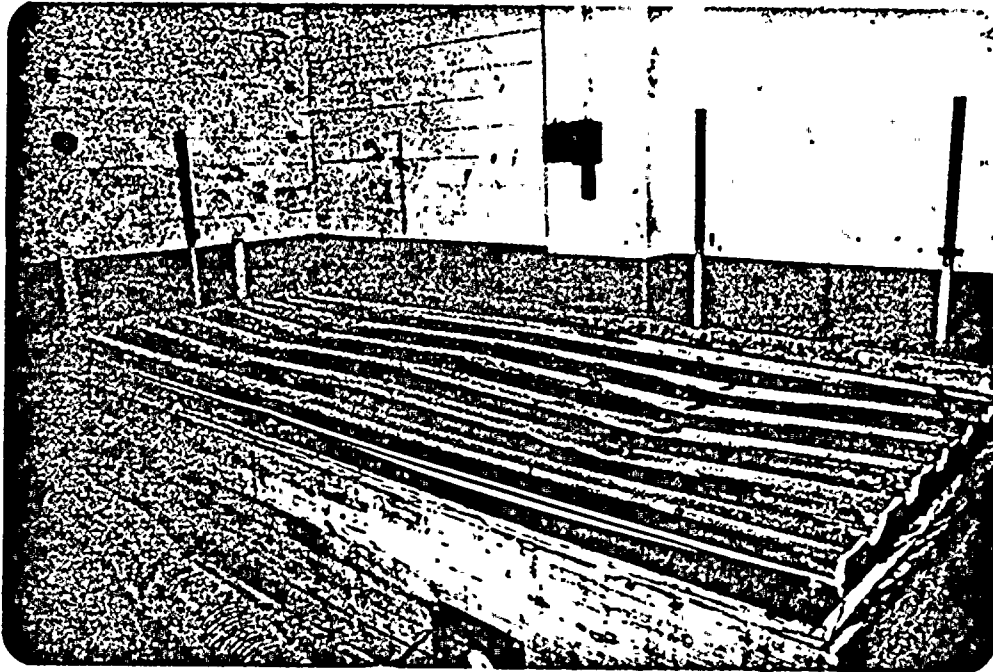


Photo #5

Test #1 Positive
B-Liner
.032 Shadowwall

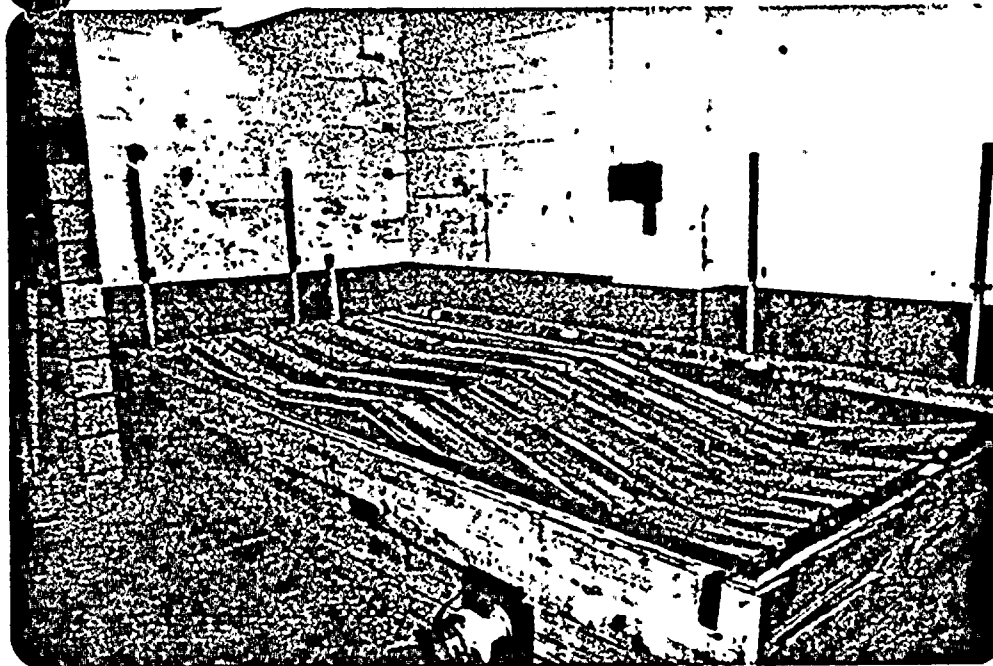
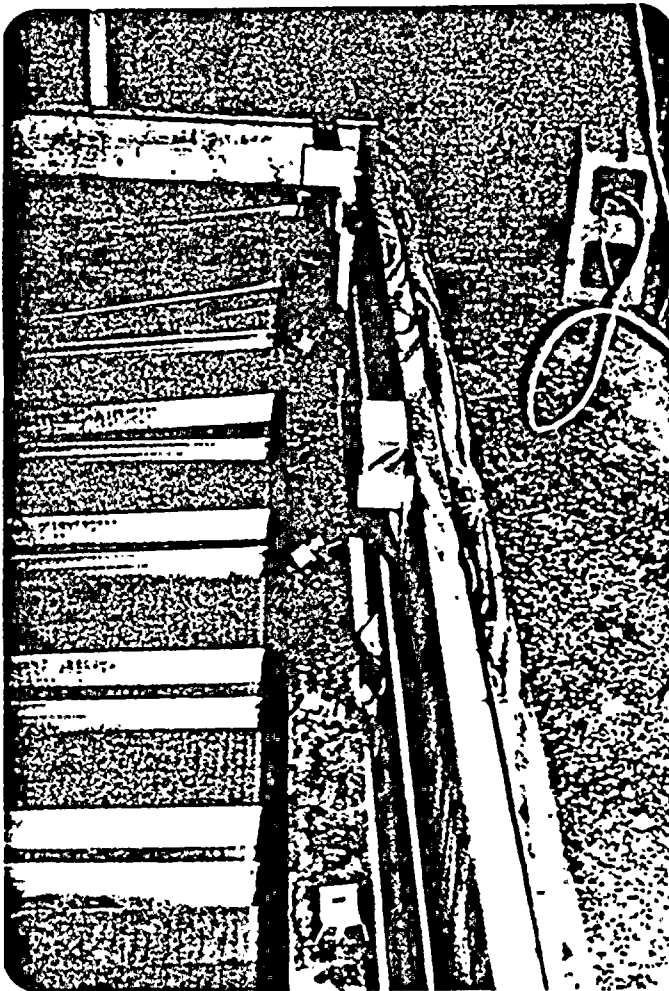


Photo #6

Test #2 Positive
B-Liner
.032 Shadowwall





Lab No. 834682
Order No. PG-21124

Photo #7

Test #2 - Positive
B-Liner
.032 Shadowall
End Fracture

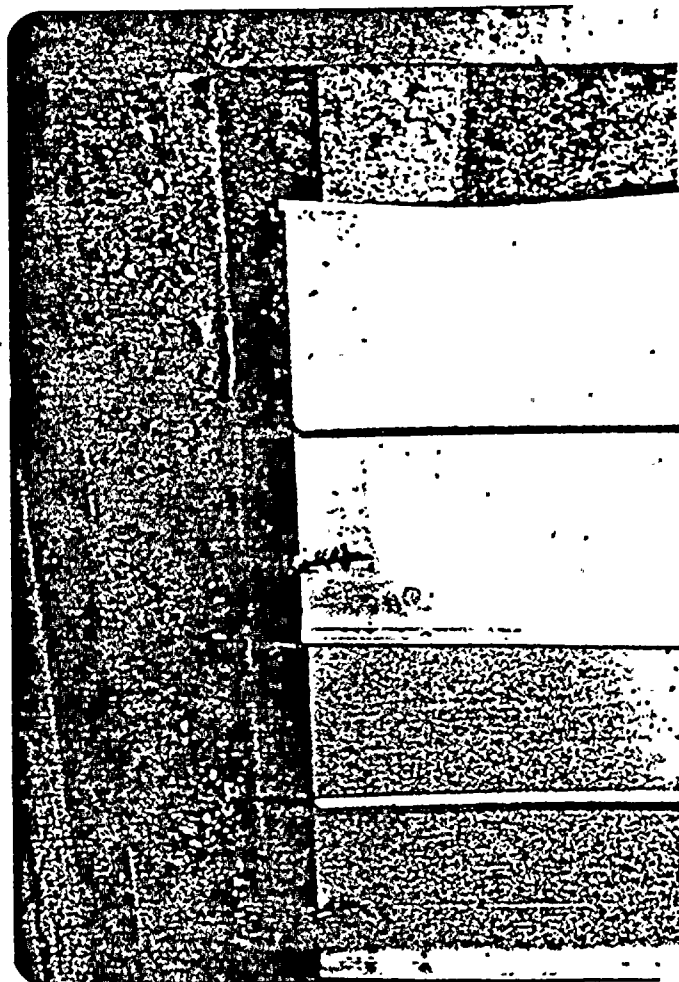


Photo #8

Test #2 Positive
B-Liner
.032 Shadowall



Lab No. 834682
Order No. PG-21124

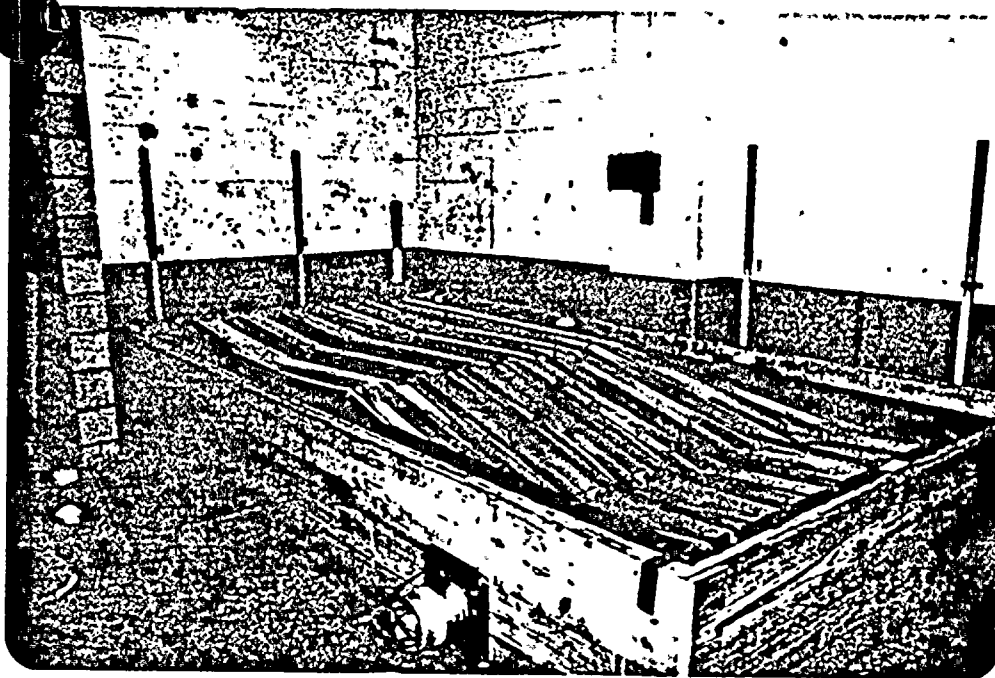


Photo #9

Test #3 Positive
B-Liner .032 Shadowall



Photo #10

Test #3 Positive
B-Liner .032 Shadowall
End Fracture





Lab No. 834682
Order No. PG-21124

Photo #11

Test #3 Positive
B-Liner .032 Shadowall

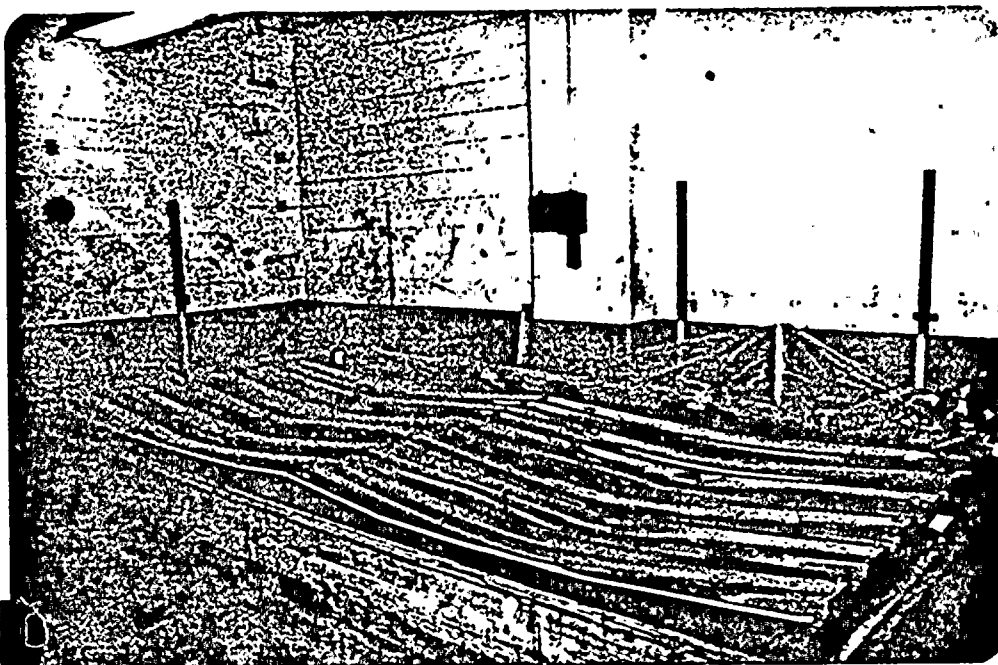


Photo #12

Test #1
.040 Shadowall
Positive Test



Lab No. 834682
Order No. PG-21124

Positive Tests

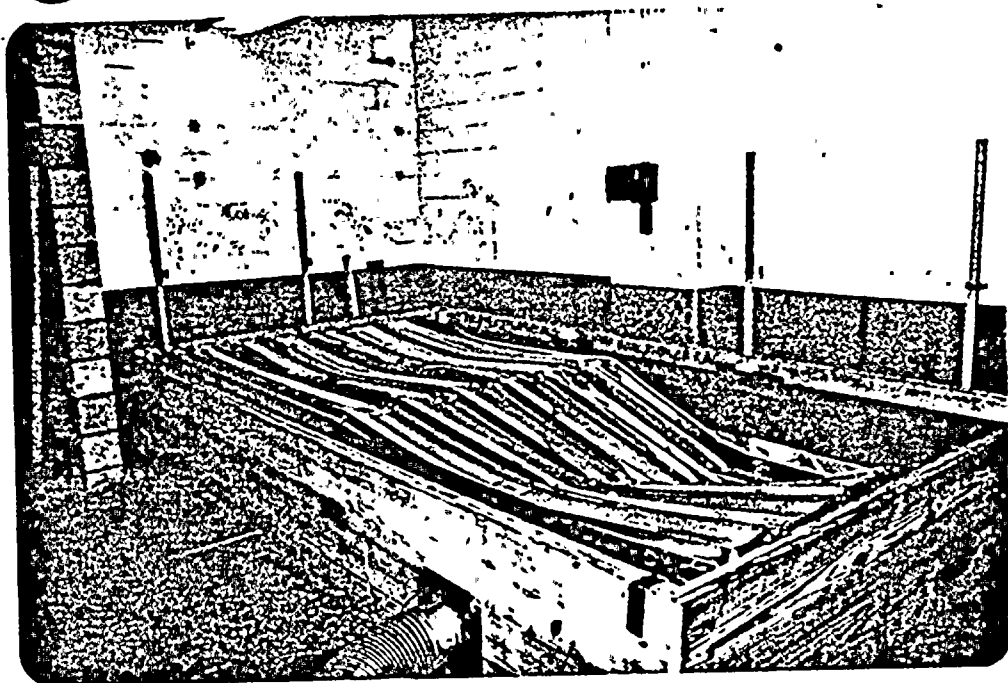


Photo #13

Test #2-.040 Shadowall



Photo #14

Test #2-.040 Shadowall



Lab No. 834682
Order No. PG-21124

Positive Tests

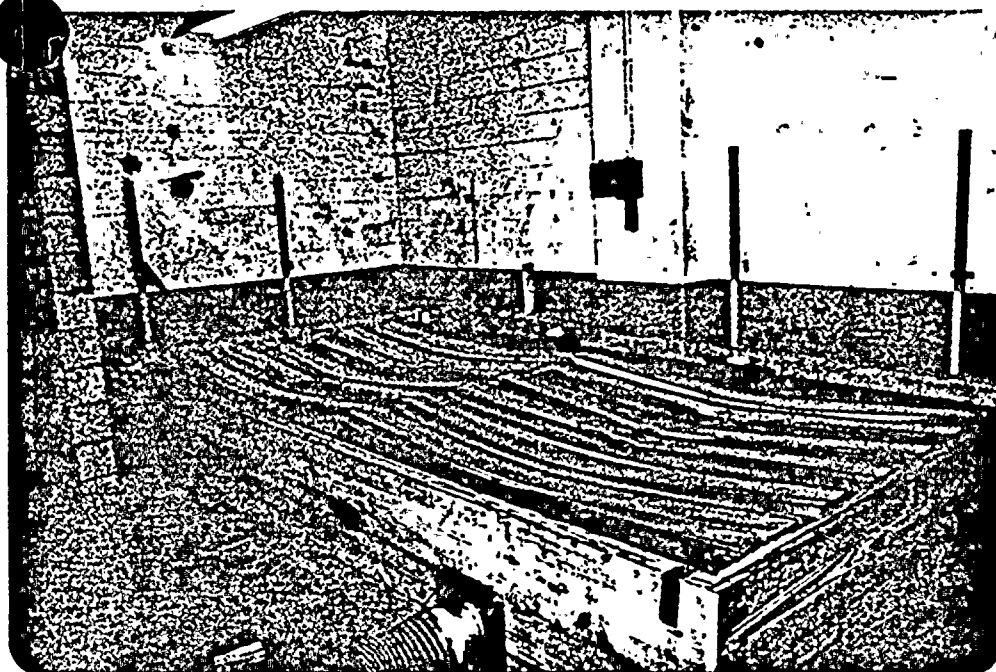


Photo #15

Test #3-.040 Shadowall

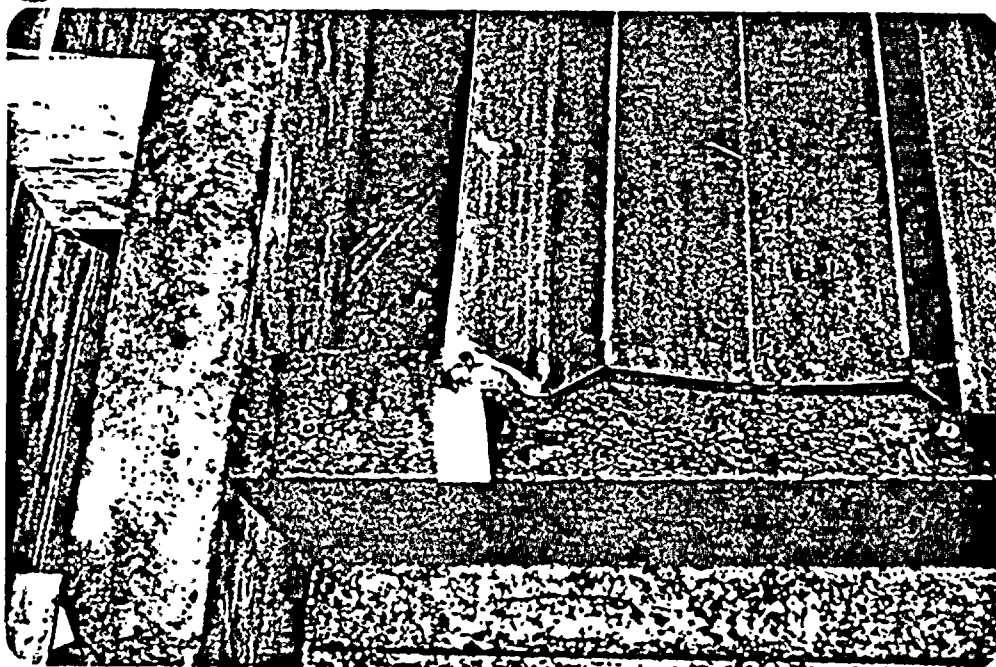
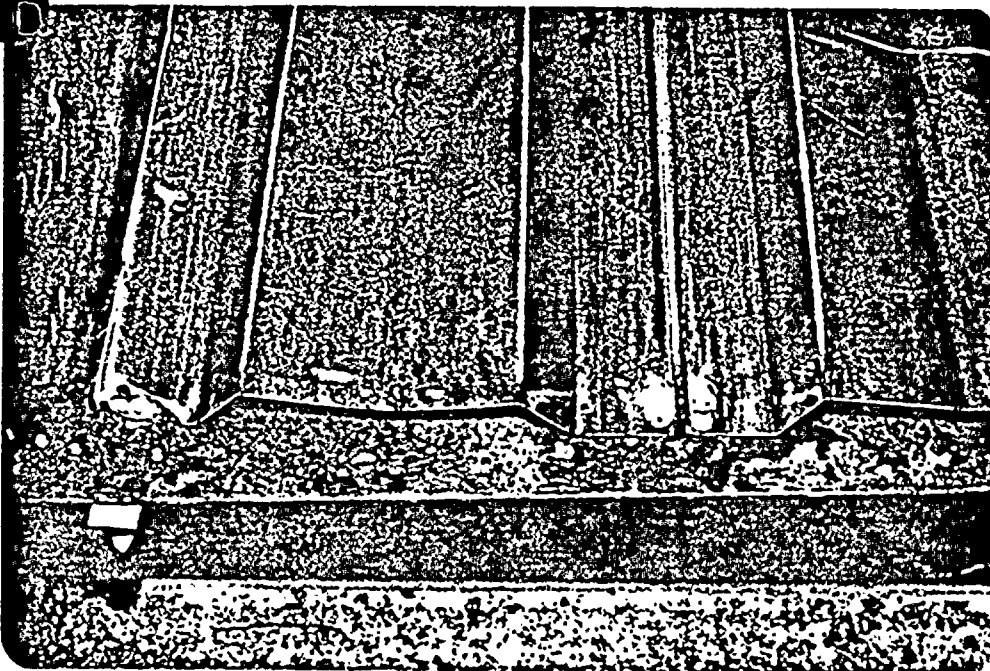


Photo #16

Test #3-.040 Shadowall



Lab No. 834682
Order No. PG-21124



Positive Tests

Photo #17

Test #3
.040 Shadowall

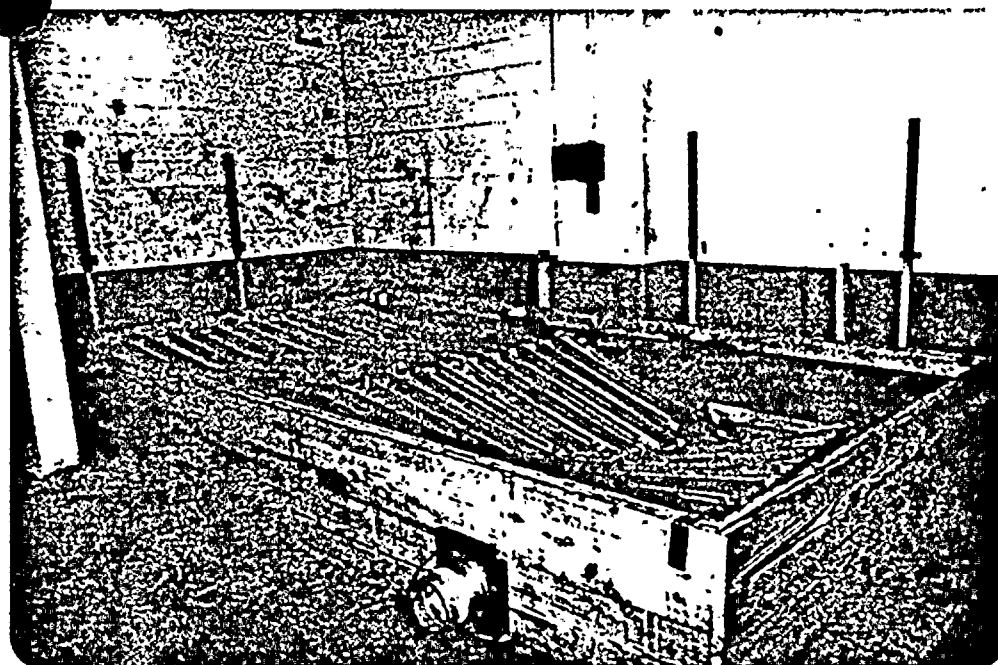


Photo #18

Test #1
.040 Ribwall



Lab No. 834682
Order No. PG-21124

Positive Tests

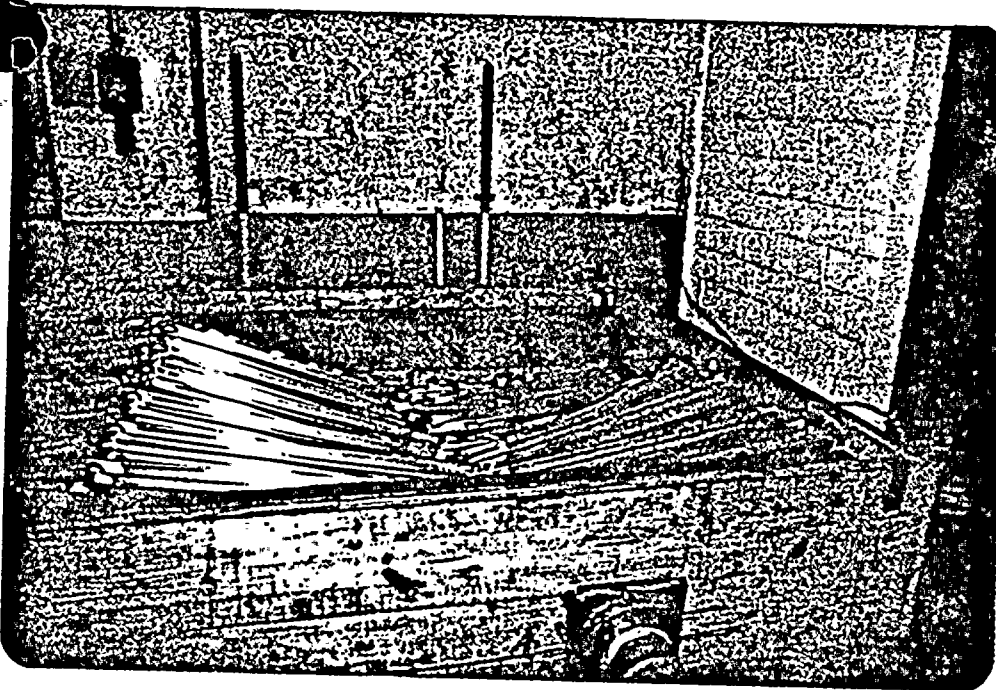


Photo #19

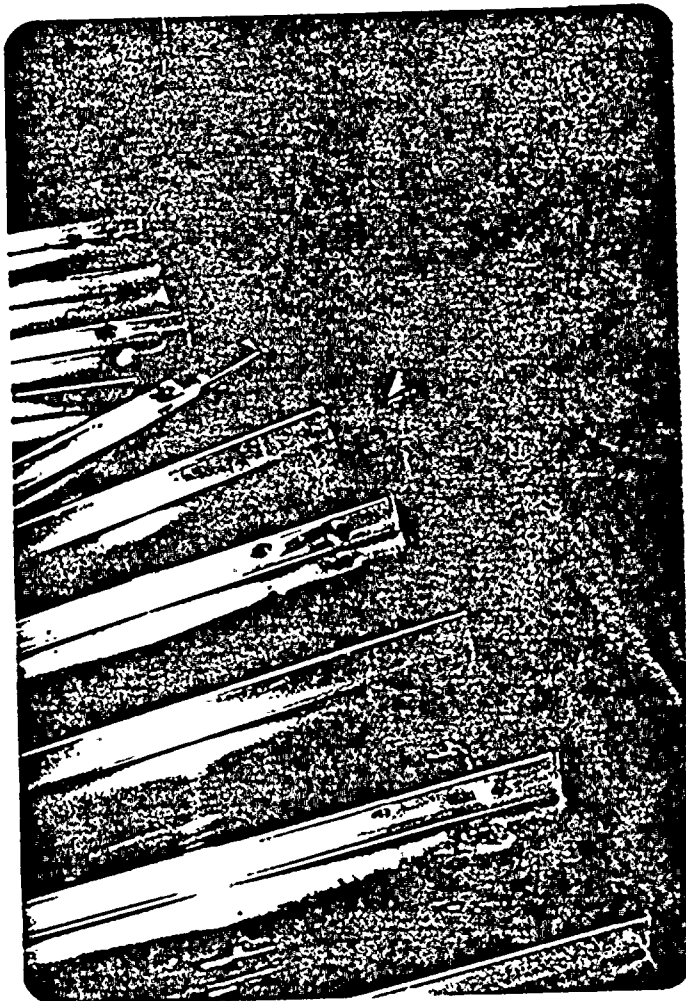
Test #1
.040 Ribwall



Photo #20

Test #1
.040 Ribwall
End Fracture





Lab No. 834682
Order No. PG-21124

Positive Tests

Photo #21

Test #1
.040 Ribwall
End Fracture

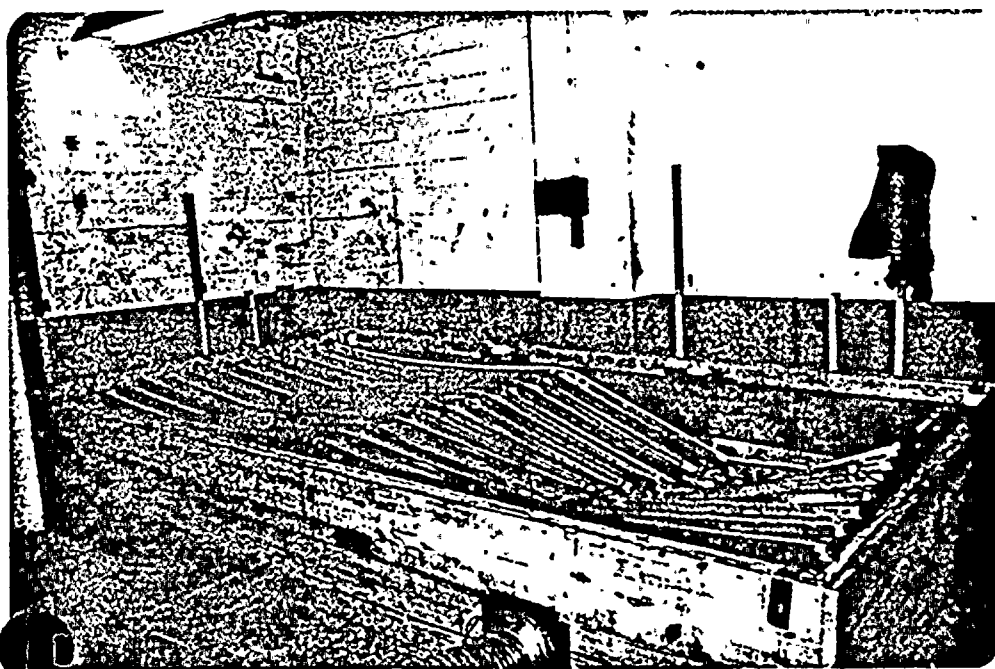
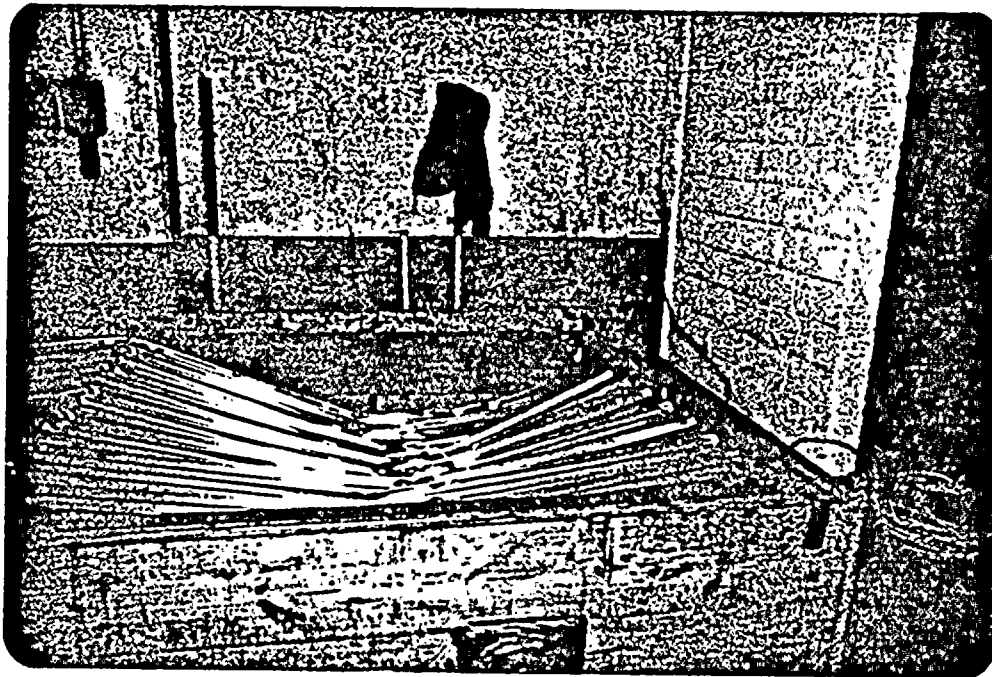


Photo #22

Test #2
.040 Ribwall



Lab No. 834682
Order No. PG-21124



Positive Tests

Photo #23

Test #2
.040 Ribwall

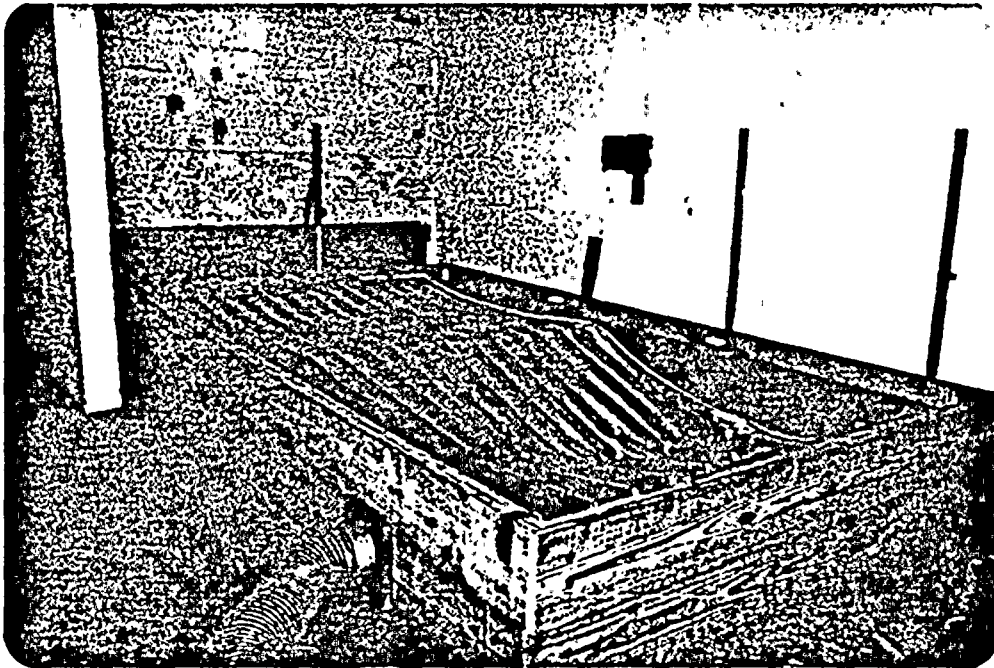


Photo #24

Test #2
.040 Ribwall
End Fracture



Lab No. 834682
Order No. PG-21124



Positive Tests

Photo #25

Test #3
.040 Ribwall

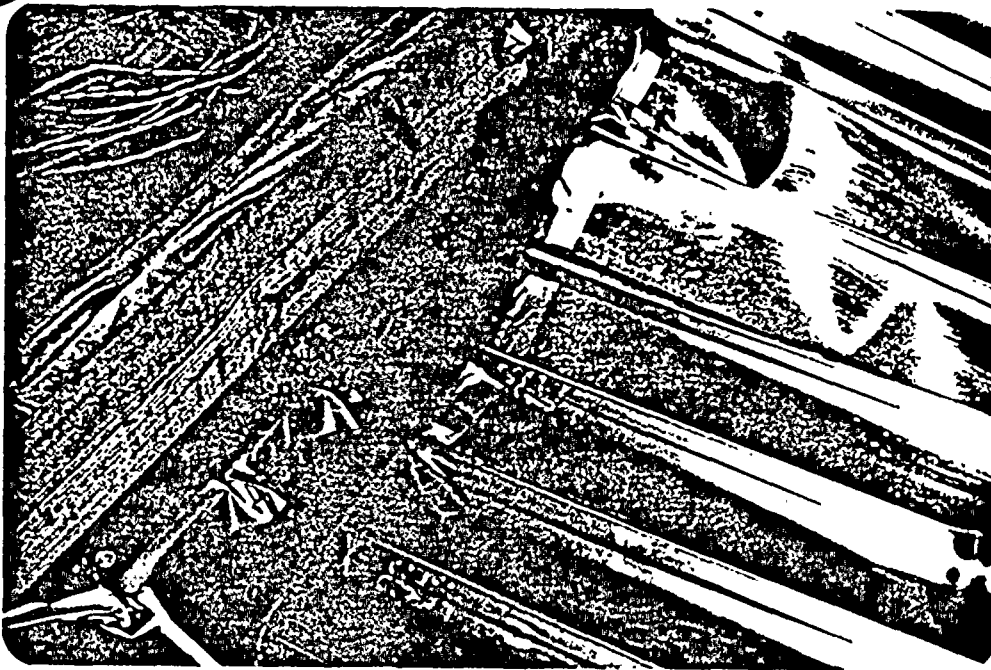


Photo #26

Test #3
.040 Ribwall
End Fracture



Lab No. 834682
Order No. PG-21124

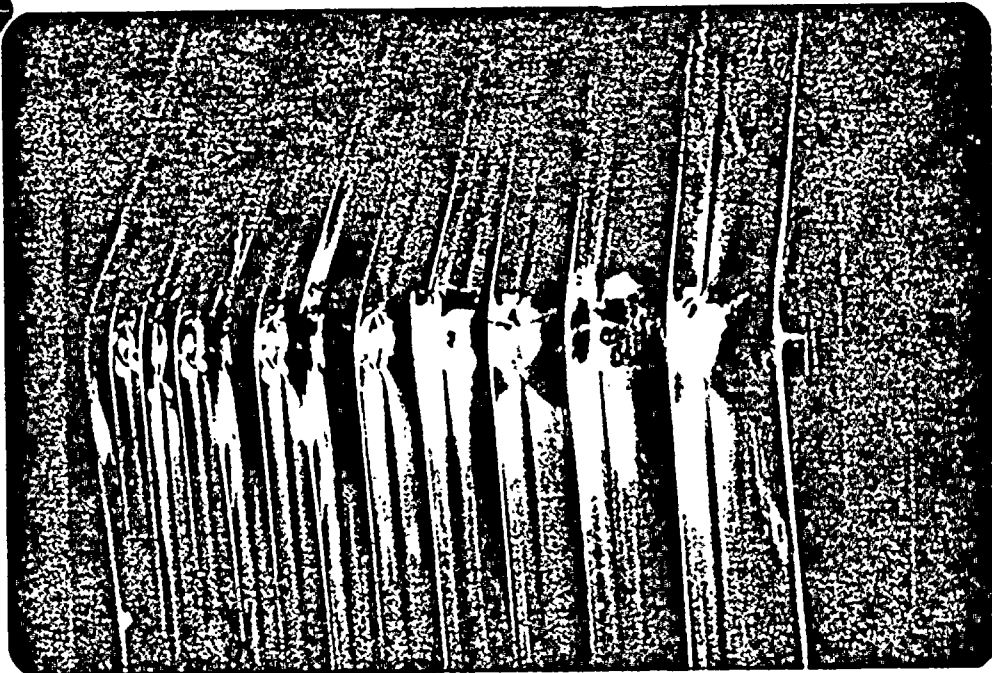


Photo #27

Test #3
.040 Ribwall
Middle Support
Positive Test

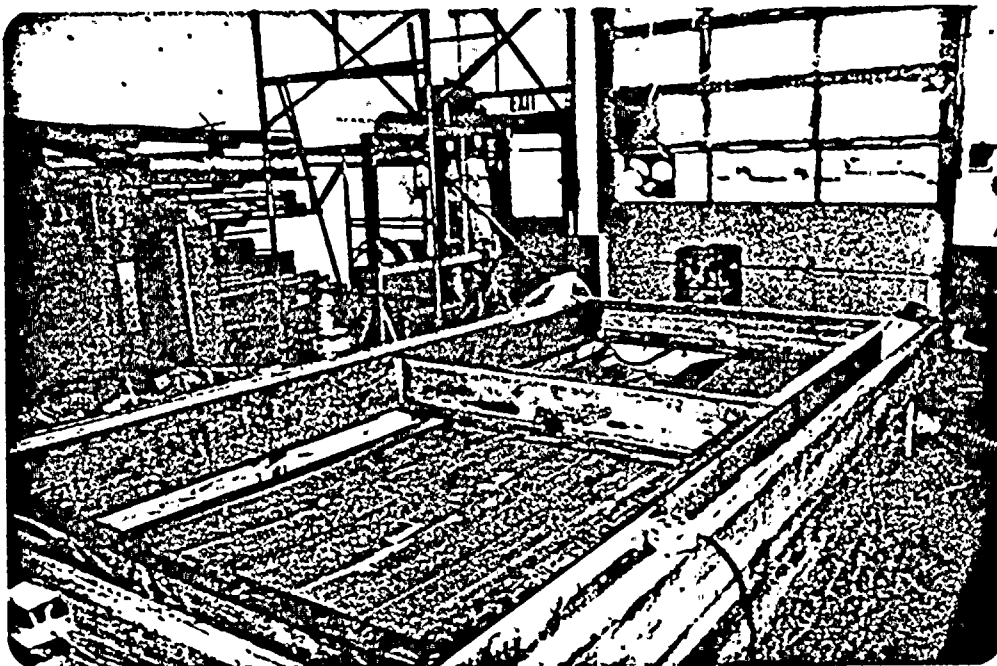
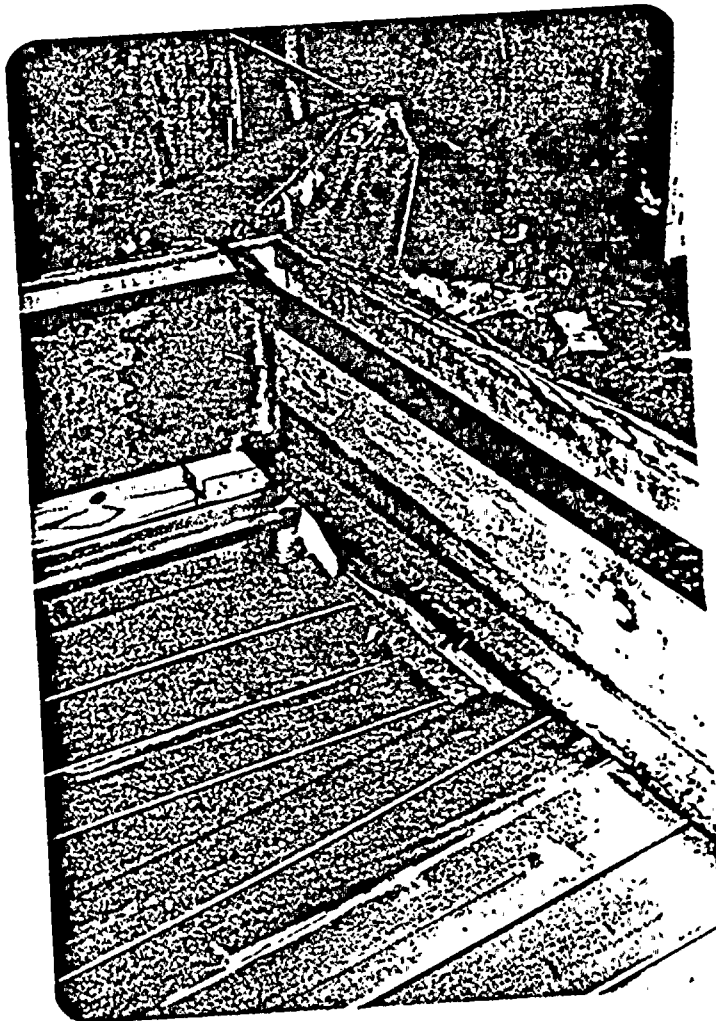


Photo #28

Test #1
Negative Test
B-Liner
.032 Shadowall





Lab No. 834682
Order No. PG-21124

Photo #29

Typical End Fracture
B-Liner
.032 Shadowall
Negative Test

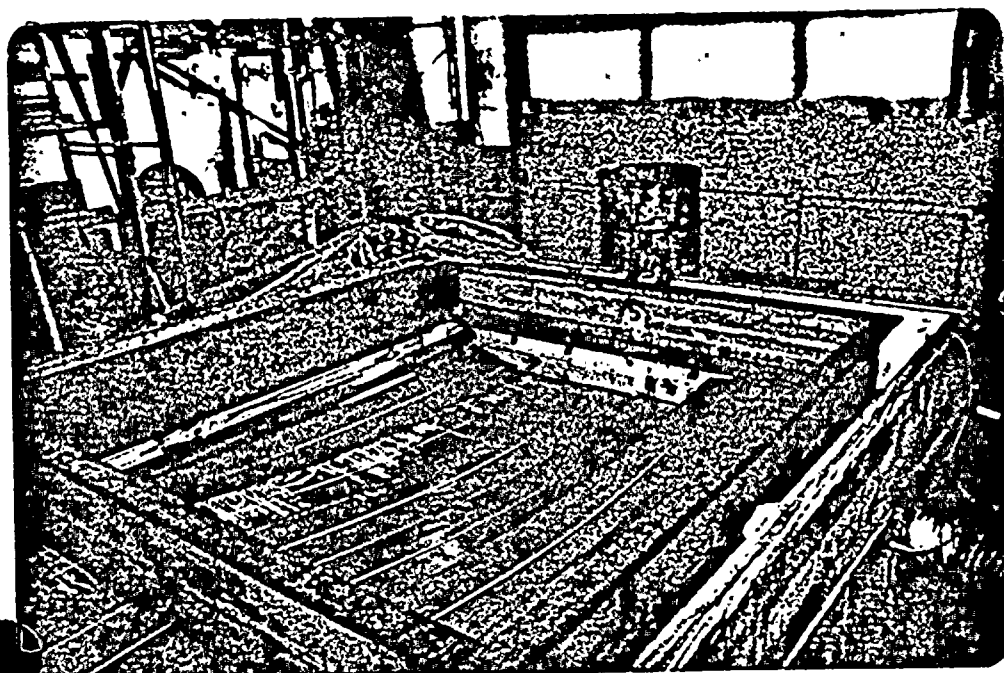
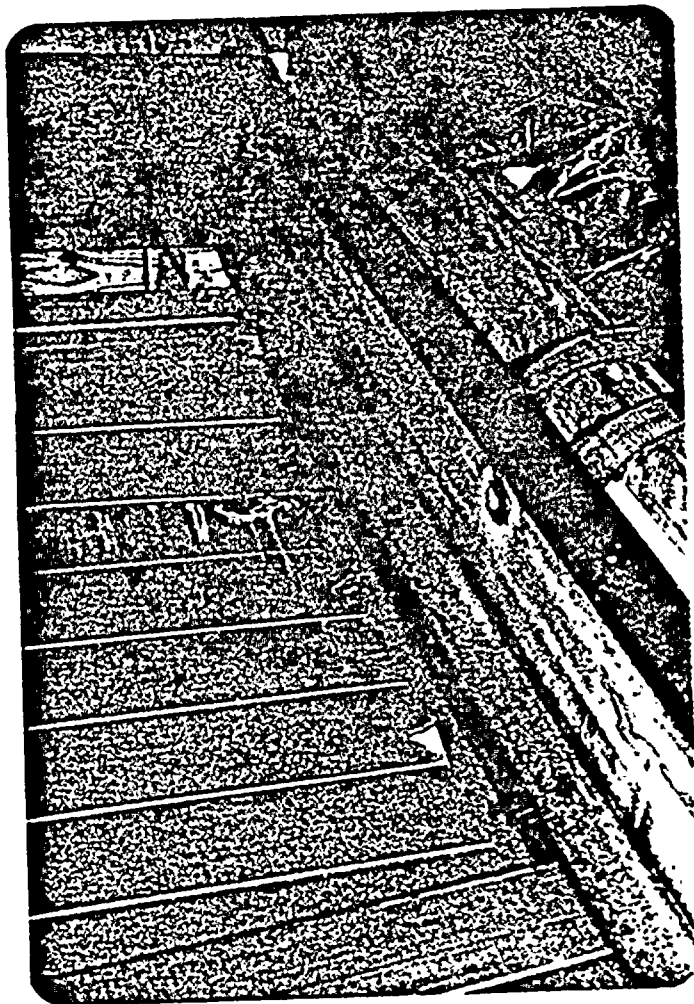


Photo #30

Fracture B-Liner
.032 Shadowall
Negative Test





Lab No. 834682
Order No. PG-21124

Photo #31

Typical End
Fracture
B-Liner
.032 Shadowall
Negative Test



Photo #32

Typical Center
Girt
Fracture Shadowall
Negative Test



Lab No. 834682
Order No. PG-21124

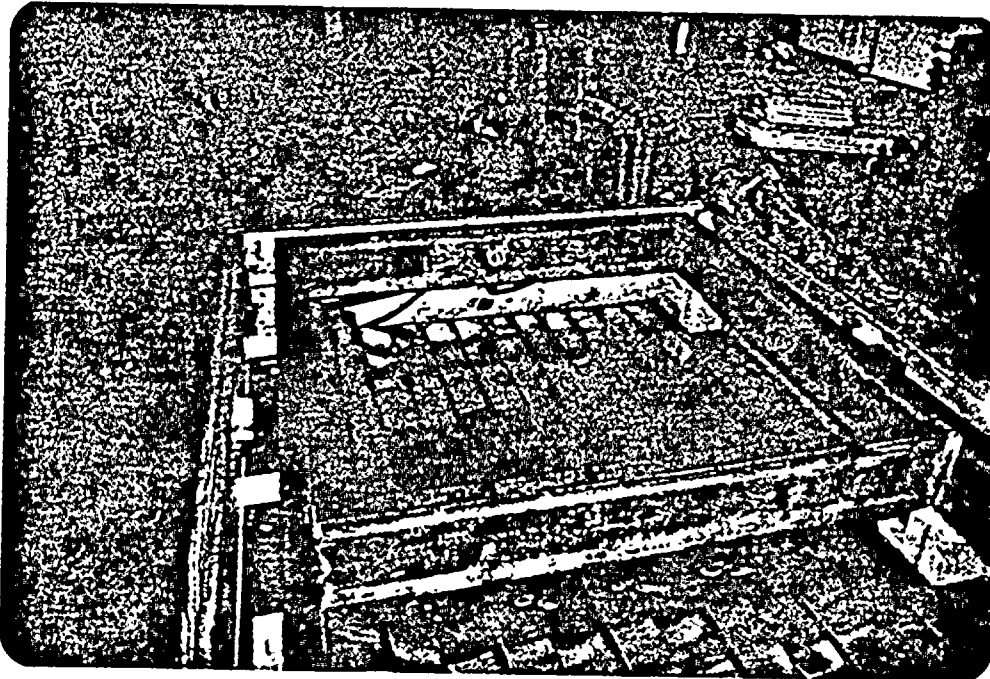


Photo #33

Typical Fracture
Ribwall
Negative Test



Photo #34

Typical Fracture
Ribwall
Negative Test



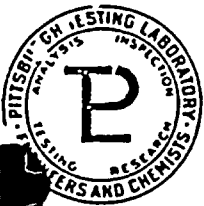
"PHYSICAL TESTING OF FASTENERS"

by

Pittsburgh Testing Laboratory

March 3, 1983





PITTSBURGH TESTING LABORATORY

ESTABLISHED 1881

850 POPLAR STREET, PITTSBURGH, PA. 15220

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PITTSBURGH, PA. 15230

AREA CODE 412 TELEPHONE 922-4000

LABORATORY No. 835968

CLIENT'S No. P.O. No. 202267

ORDER No. PG-21124

REPORT

March 3, 1983

REPORT OF: Physical Testing on Fasteners

REPORT TO: Gilbert Associates
P.O. Box 1498
Reading, PA 19603

We were requested to perform the following tests on fasteners used in
testing program PG-21124 LN 834682 for Ginna Station.

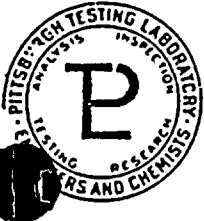
1. 6 single shear tests of Ribwall (Shadowall fasteners).
2. 6 single shear tests of "B" panel system fasteners.
3. 6 Penetration test of fasteners with washers.
4. 6 Penetration test of "B" panel fasteners.

Following are the results:

Single Shear Test

<u>Sample Number</u>	<u>Sample Ident.</u>	<u>Maximum Load Pounds</u>
1	Ribwall/Shadowall	2,700
2	Ribwall/Shadowall	2,790
3	Ribwall/Shadowall	2,910
4	Ribwall/Shadowall	2,850
5	Ribwall/Shadowall	2,760
6	Ribwall/Shadowall	2,810
1	"B" Panel	3,780
2	"B" Panel	2,760
3	"B" Panel	3,146
4	"B" Panel	2,580
5	"B" Panel	2,790
6	"B" Panel	3,020





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FORM 407 REV. PG

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PITTSBURGH, PA. 15230

AREA CODE 412 TELEPHONE 922-4000

LABORATORY No. 835968

CLIENT'S No. P.O. No. 202267

ORDER No. PG-21124

REPORT

March 3, 1983

REPORT OF: Physical Testing on Fasteners

Penetration/Punch Through Tests

<u>Sample Number</u>	<u>Sample Identification</u>	<u>Material Thickness Inches</u>	<u>Maximum Load Pounds</u>
1	Ribwall/Shadowall	.040	784
2	Ribwall/Shadowall	.040	850
3	Ribwall/Shadowall	.040	882
4	Ribwall/Shadowall	.040	856
5	Ribwall/Shadowall	.040	901
6	Ribwall/Shadowall	.040	824
1	"B" Panel	.040	597
2	"B" Panel	.040	716
3	"B" Panel	.040	724
4	"B" Panel	.040	608
5	"B" Panel	.040	760
6	"B" Panel	.040	781

Samples submitted by client for testing.

PITTSBURGH TESTING LABORATORY

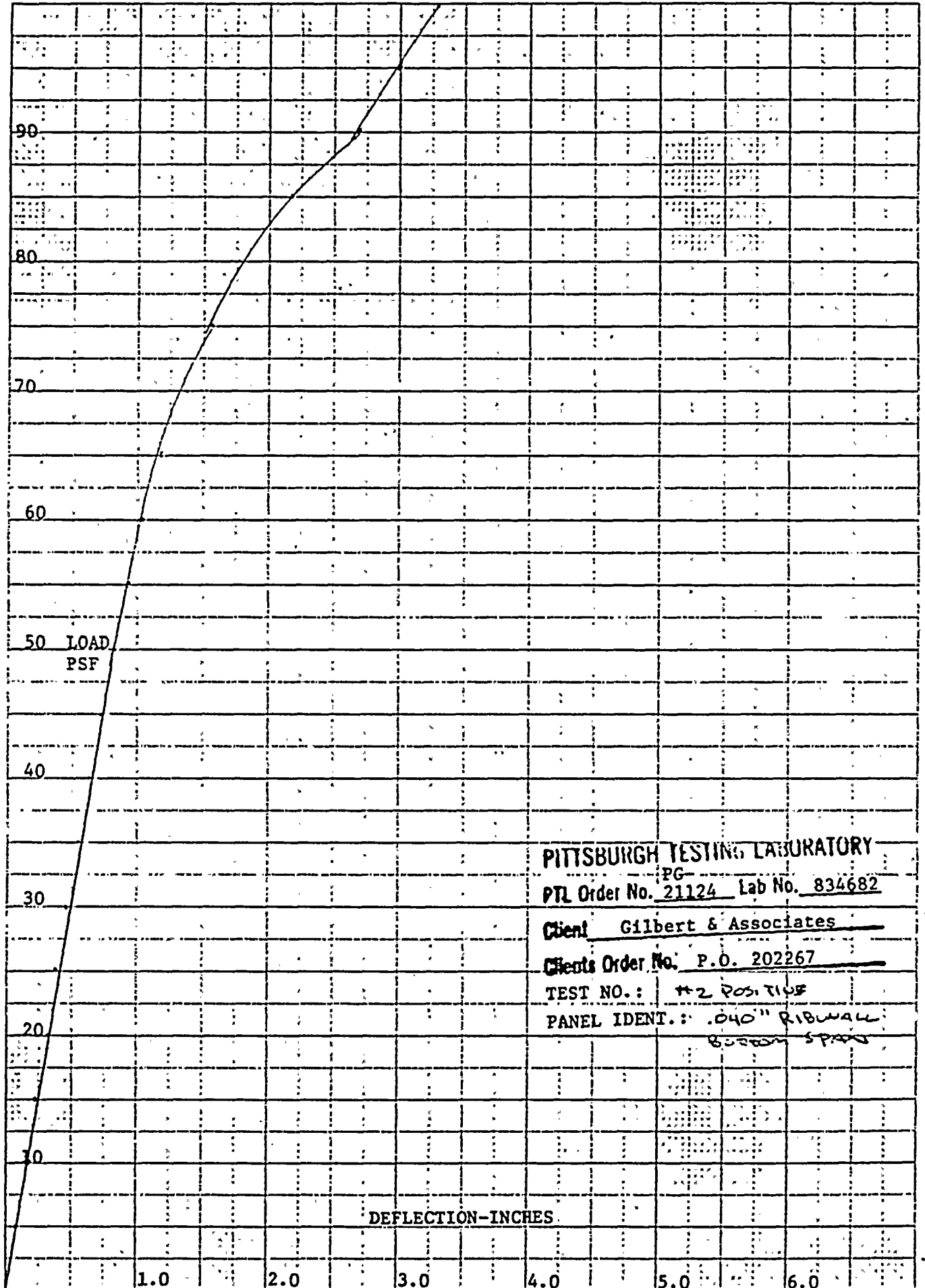
Earl Gallagher, Manager
Physical Testing Department

cc: 3-Client
Attn: J. E. Regec



46 1240

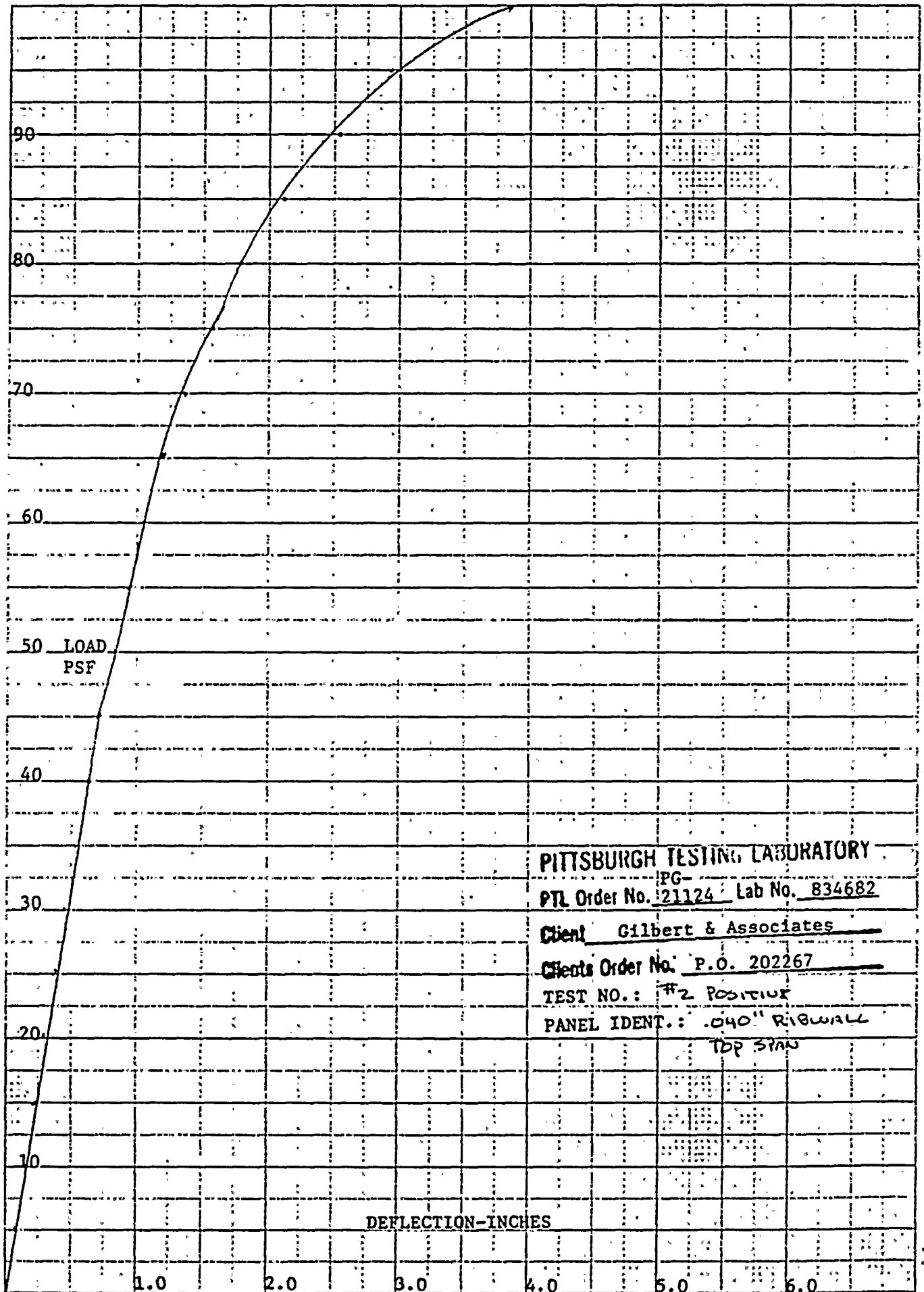
K&S 20 X 20 TO THE INCH, 1/4" DIA. HOLES





46 1240

W.C. 20 X 20 TO THE INCHES 7 X 10 P.S.I.
RUBBER INSULATED W.C.P.C.A.



PITTSBURGH TESTING LABORATORY

PTL Order No. 21124 Lab No. 834682

Client Gilbert & Associates

Client Order No. P.O. 202267

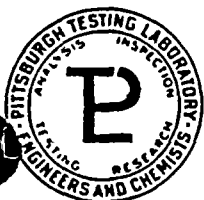
TEST NO.: #2 Positive

PANEL IDENT.: .040" Ribwall

Top Span

DEFLECTION-INCHES





PITTSBURGH TESTING LABORATORY

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850 POPLAR STREET, PITTSBURGH, PA. 15220

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FORM 407 REV.-PG

PLEASE REPLY TO:
P. O. BOX 1646
PITTSBURGH, PA. 15230

CLIENT'S No. 202267

AREA CODE 412 TELEPHONE 922-4000

LABORATORY No. 834682

ORDER No. PG-21124

REPORT

January 11, 1983

REPORT OF: Load Testing on Panel Assemblies

Test # 3 Positive

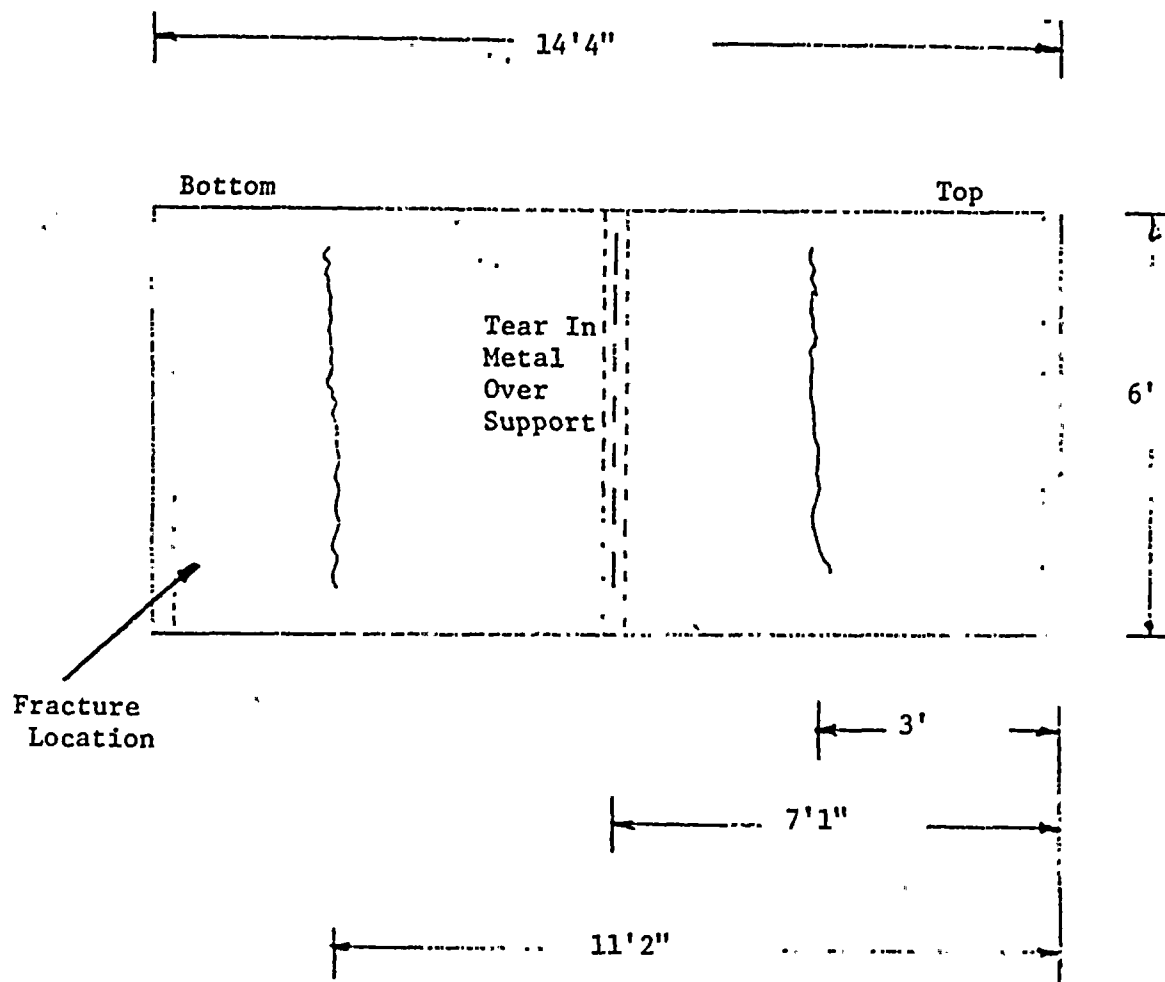
Panel Identification: .040" Ribwall

DEFLECTION READINGS - INCHES

<u>Load PSF</u>	<u>Bottom Span</u>	<u>Top Span</u>
0	0.000	0.000
5	0.080	0.064
10	0.158	0.134
15	0.235	0.205
20	0.310	0.282
25	0.385	0.352
30	0.460	0.427
35	0.550	0.513
40	0.630	0.608
45	0.715	0.694
50	0.810	0.788
55	0.910	0.885
60	1.040	0.999
65	1.175	1.105
70	1.330	1.240
75	1.540	1.400
80	1.760	1.575
85	2.130	2.131
90	2.540	2.465
95	3.040	3.605
100	3.280	3.830

Comments: Top span panel starting to buckle between 80 PSF - 85 PSF. Maximum load 176.9 PSF. Bottom span fasteners metal pulled then popped.





Panel: .040" Ribwall

Test #3 Positive

Gilbert and Associates

PITTSBURGH TESTING LABORATORY

MADE BY: JPM

DATE: 12/30/82

ORDER NO.
PG-21124

CH'KD. BY:

DATE:

Location of Buckling

PLATE NO.
10

