



Report To: Overly Manufacturing Co. Project: LN PHY-30091 828-36065
 PO Box 70
 574 West Otterman Street
 Greensburg, PA 15601-0070 Report Of: Witness Cycle Testing

Date: 3-22-93
 5-28-93 Addendum

**ACCELERATED PHYSICAL ENDURANCE
TEST PROCEDURE FOR
OVERLY ACOUSTICAL DOOR UNITS**

1.0 SCOPE:

An Overly Manufacturing Company acoustical door model STC5292185 single swing UL labeled hollow metal fire door was subjected to physical endurance testing at Overly Manufacturing Company's facility from January 15, 1993 thru March 2, 1993. The tests were conducted jointly by OMCO engineering and a representative of Pittsburgh Testing Laboratory Division of Professional Service Industries, Inc.

1.1 PURPOSE:

The primary purpose of this test procedure shall be to establish a method of quickly testing a door assembly for adhesive bond, weld quality and durability, as well as general door slab strength. The test is to be performed on a standard production steel door and frame unit.

This test method is designed to simulate actual field operation in order to not only test the door construction, but to also check hinge and lock reinforcements as well as any other hardware preparations and attachments. This test is not designed to test the hardware performance, and if a failure occurs, these items are to be replaced.

1.2 APPARATUS AND EQUIPMENT

The main testing apparatus shall be configured as shown in Figure 1. This structure shall be of rigid construction and conform to the parts shown with the test opening of sufficient size to accommodate the mounting of a standard 4' x 8' door and frame unit.

The cycling mechanism to be used shall be constructed to perform the following cycling sequence: the handle of the door latchset shall be of the lever handled type and activated by an air powered cylinder mounted to the door face above the lock so that its stroke is of sufficient length to rotate the lever handle and retract the latchbolt. Once the latch bolt has been retracted, a second air powdered cylinder attached to the lever handle will pull the door open to a position greater than 65 degrees from the initial closed position. The door closer will be utilized to close and latch the door. Upon latching, the latch bolt will contact a snap switch mounted inside the strike which will activate the electronic counter completing one cycle and signal the beginning of the next.

1.3 TEST SPECIMEN:

A 358 pound, single swing, 4'-0" wide x 8'-0" high x 1-7/8" thick Overly model STC5292185 UL fire rated acoustical door fabricated in accordance with approved UL procedure file R3677 and Riverbank Acoustical Laboratory test report TL92-185.

The door was hung in a standard hollow metal frame with four (4) Overly full mortise cam-lift hinges, a Schlage UL listed cylindrical passagaset and a Norton 7500 surface mounted closer.

1.4 TEST PREPARATION:

The door is to be hung in a standard hollow metal frame which was prepared to accept the hardware described in section 1.3. Great care is to be taken to insure that the hinges, closer and locksets were installed properly so as to reflect a normal unit installation. The door clearances between the door edges and frame are to be measured and recorded at the locations shown in Figure 2. Also at these locations, the door thickness shall be measured and recorded.

1.5 ACCEPTANCE CRITERIA:

The door unit shall be cycled for a minimum of 500,000 cycles with inspection of the door after every 100,000 cycles. At the inspection intervals and upon completion of testing, the following items shall be checked and recorded for conformance:

- 1.5.1 Doors shall not show any visible signs of metal fatigue, cracking, or deformation anywhere on the faces or edges.
- 1.5.2 Doors shall not show signs of delamination or have weld breakage in excess of 10% of total bonded or welded service.
- 1.5.3 Top and bottom channels must remain securely in place with no visible signs of weld or bond breakage.
- 1.5.4 Where seams occur on the door, there shall be no opening or spreading of the seams.
- 1.5.5 Door thickness to be measured and recorded at each location as shown in Figure 2.
- 1.5.6 Door clearances between the door edges and frame are to be measured and recorded at each location shown in Figure 2.

If in the event that any piece of hardware should fail during the cycling, it is to be replaced and noted as such for the test record.

After 500,000 cycles the test was continued until approximately 1,000,000 cycles and additional data taken as shown on attached sheet.

Following are the results.

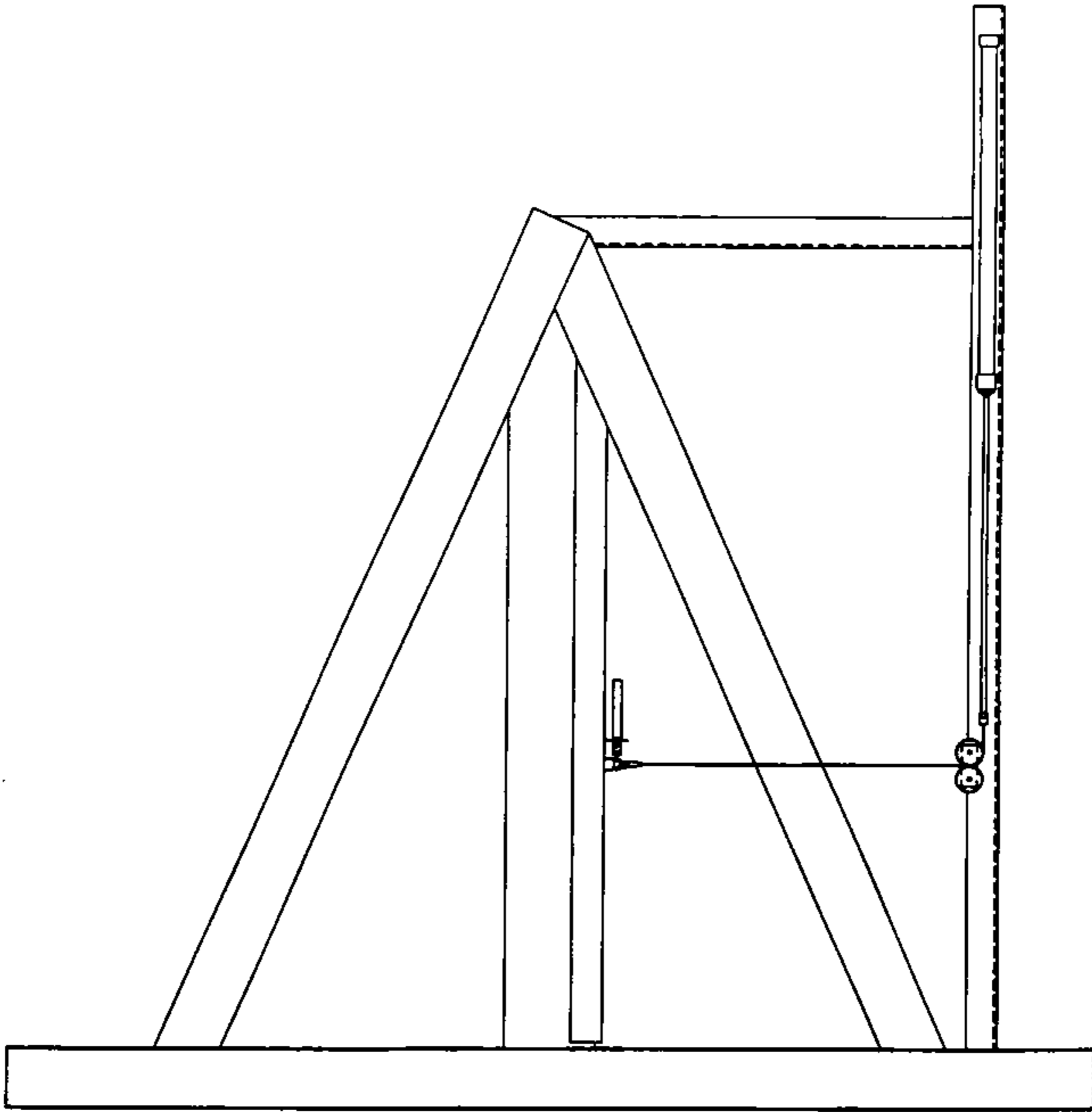


Figure 1
Test Fixture

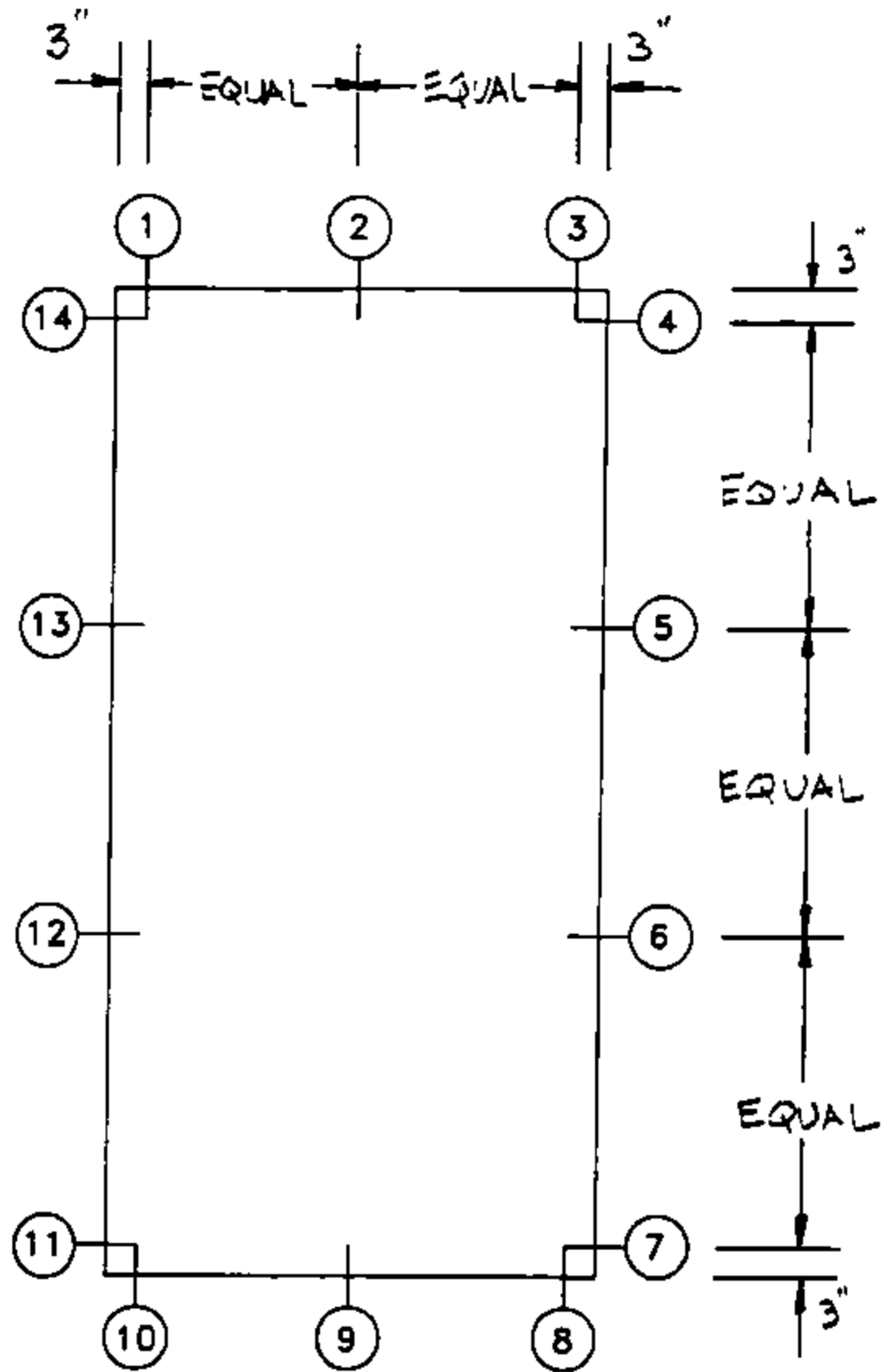


Figure 2
Door Clearance Positions
And
Door Thickness Positions

ACCELERATED PHYSICAL ENDURANCE
TEST DATA

Date: 1-15-93

Counter Reading: 0

Door Clearances (Inches)

Position 1.	.096	Position 8.	.143
Position 2.	.125	Position 9.	.086
Position 3.	.198	Position 10.	.189
Position 4.	.143	Position 11.	.174
Position 5.	.140	Position 12.	.199
Position 6.	.141	Position 13.	.155
Position 7.	.116	Position 14.	.119

Door Thickness (Inches)

Position 1.	1.915	Position 8.	1.323
Position 2.	1.916	Position 9.	1.316
Position 3.	1.888	Position 10.	1.320
Position 4.	1.916	Position 11.	1.936
Position 5.	1.943	Position 12.	1.928
Position 6.	1.965	Position 13.	1.913
Position 7.	1.913	Position 14.	1.908

Visual inspection

	Yes	No
1. Door Edges and Faces		
A. Visible signs of metal fatigue?		X
B. Visible signs of cracking?		X
C. Visible signs of deformation?		X
D. Visible signs of delamination?		X
F. Visible signs of weld breakage?		X
2. Top and Bottom Channels		
A. Visible signs of bond breakage?		X
B. Visible signs of weld breakage?		X
3. Edge Seams		
A. Visible signs of spreading?		X
4. Additional Notes		

Witness: J. Peter Merther 1-15-93
PSI/PTL

ACCELERATED PHYSICAL ENDURANCE
TEST DATA

Date: 1-27-93

Counter Reading: 106,722

Door Clearances (Inches)

Position 1.	.098	Position 8.	.158
Position 2.	.131	Position 9.	.083
Position 3.	.186	Position 10.	.182
Position 4.	.136	Position 11.	.186
Position 5.	.141	Position 12.	.208
Position 6.	.143	Position 13.	.150
Position 7.	.128	Position 14.	.119

Door Thickness (Inches)

Position 1.	1.915	Position 8.	1.353
Position 2.	1.915	Position 9.	1.335
Position 3.	1.885	Position 10.	1.337
Position 4.	1.914	Position 11.	1.925
Position 5.	1.935	Position 12.	1.913
Position 6.	1.970	Position 13.	1.906
Position 7.	1.913	Position 14.	1.889

Visual inspection

	Yes	No
1. Door Edges and Faces		
A. Visible signs of metal fatigue?		X
B. Visible signs of cracking?		X
C. Visible signs of deformation?		X
D. Visible signs of delamination?		X
F. Visible signs of weld breakage?		X
2. Top and Bottom Channels		
A. Visible signs of bond breakage?		X
B. Visible signs of weld breakage?		X
3. Edge Seams		
A. Visible signs of spreading?		X
4. Additional Notes		
Changed lockset and adjusted closure.		

Witness: J. Peter Merther 1-27-93
PSI/PTL

ACCELERATED PHYSICAL ENDURANCE
TEST DATA

Date: 2-5-93

Counter Reading: 184,400

Door Clearances (Inches)

Position 1.	.104	Position 8.	.119
Position 2.	.132	Position 9.	.078
Position 3.	.197	Position 10.	.162
Position 4.	.148	Position 11.	.184
Position 5.	.138	Position 12.	.209
Position 6.	.143	Position 13.	.163
Position 7.	.113	Position 14.	.124

Door Thickness (Inches)

Position 1.	1.910	Position 8.	1.348
Position 2.	1.910	Position 9.	1.321
Position 3.	1.887	Position 10.	1.326
Position 4.	1.913	Position 11.	1.932
Position 5.	1.940	Position 12.	1.915
Position 6.	1.962	Position 13.	1.897
Position 7.	1.919	Position 14.	1.889

Visual inspection

1. Door Edges and Faces	Yes	No
A. Visible signs of metal fatigue?		X
B. Visible signs of cracking?		X
C. Visible signs of deformation?		X
D. Visible signs of delamination?		X
F. Visible signs of weld breakage?		X
2. Top and Bottom Channels		
A. Visible signs of bond breakage?		X
B. Visible signs of weld breakage?		X
3. Edge Seams		
A. Visible signs of spreading?		X
4. Additional Notes		

Witness: J. Peter Merther 2-5-93
PSI/PTL

**ACCELERATED PHYSICAL ENDURANCE
TEST DATA**

Date: 2-15-93

Counter Reading: 301,353

Door Clearances (Inches)

Position 1.	.111	Position 8.	.133
Position 2.	.141	Position 9.	.065
Position 3.	.207	Position 10.	.157
Position 4.	.176	Position 11.	.172
Position 5.	.148	Position 12.	.193
Position 6.	.155	Position 13.	.149
Position 7.	.127	Position 14.	.115

Door Thickness (Inches)

Position 1.	1.920	Position 8.	1.330
Position 2.	1.907	Position 9.	1.336
Position 3.	1.890	Position 10.	1.330
Position 4.	1.912	Position 11.	1.930
Position 5.	1.937	Position 12.	1.921
Position 6.	1.961	Position 13.	1.895
Position 7.	1.915	Position 14.	1.899

Visual inspection

	Yes	No
1. Door Edges and Faces		
A. Visible signs of metal fatigue?		X
B. Visible signs of cracking?		X
C. Visible signs of deformation?		X
D. Visible signs of delamination?		X
F. Visible signs of weld breakage?		X
2. Top and Bottom Channels		
A. Visible signs of bond breakage?		X
B. Visible signs of weld breakage?		X
3. Edge Seams		
A. Visible signs of spreading?		X
4. Additional Notes		

Witness: J. Peter Merther 2-15-93
PSI/PTL

ACCELERATED PHYSICAL ENDURANCE
TEST DATA

Date: 2-22-93

Counter Reading: 391,992

Door Clearances (Inches)

Position 1.	.110	Position 8.	.137
Position 2.	.143	Position 9.	.068
Position 3.	.210	Position 10.	.166
Position 4.	.132	Position 11.	.162
Position 5.	.142	Position 12.	.193
Position 6.	.151	Position 13.	.147
Position 7.	.123	Position 14.	.120

Door Thickness (Inches)

Position 1.	1.912	Position 8.	1.331
Position 2.	1.909	Position 9.	1.346
Position 3.	1.885	Position 10.	1.336
Position 4.	1.914	Position 11.	1.924
Position 5.	1.947	Position 12.	1.915
Position 6.	1.961	Position 13.	1.901
Position 7.	1.922	Position 14.	1.890

Visual inspection

	Yes	No
1. Door Edges and Faces		
A. Visible signs of metal fatigue?		X
B. Visible signs of cracking?		X
C. Visible signs of deformation?		X
D. Visible signs of delamination?		X
F. Visible signs of weld breakage?		X
2. Top and Bottom Channels		
A. Visible signs of bond breakage?		X
B. Visible signs of weld breakage?		X
3. Edge Seams		
A. Visible signs of spreading?	X (Some minor signs edge door.)	
4. Additional Notes		

Witness: J. Peter Merther 2-22-93
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ACCELERATED PHYSICAL ENDURANCE
TEST DATA

Date: 3-2-93

Counter Reading: 500,100

Door Clearances (Inches)

Position 1.	.112	Position 8.	.120
Position 2.	.145	Position 9.	.064
Position 3.	.214	Position 10.	.140
Position 4.	.141	Position 11.	.165
Position 5.	.152	Position 12.	.193
Position 6.	.152	Position 13.	.147
Position 7.	.124	Position 14.	.120

Door Thickness (Inches)

Position 1.	1.914	Position 8.	1.340
Position 2.	1.904	Position 9.	1.350
Position 3.	1.886	Position 10.	1.320
Position 4.	1.914	Position 11.	1.940
Position 5.	1.938	Position 12.	1.912
Position 6.	1.956	Position 13.	1.902
Position 7.	1.912	Position 14.	1.886

Visual inspection

1. Door Edges and Faces	Yes	No
A. Visible signs of metal fatigue?		X
B. Visible signs of cracking?		X
C. Visible signs of deformation?		X
D. Visible signs of delamination?		X
F. Visible signs of weld breakage?		X
2. Top and Bottom Channels		
A. Visible signs of bond breakage?		X
B. Visible signs of weld breakage?		X
3. Edge Seams		
A. Visible signs of spreading?	X	
4. Additional Notes		

Witness: J. Peter Merther 3-2-93
PSI/PTL

ACCELERATED PHYSICAL ENDURANCE
TEST DATA

Date: 5-27-93

Counter Reading: 1004215

Door Clearances (Inches)

Position 1.	.124	Position 8.	.190
Position 2.	.117	Position 9.	.037
Position 3.	.225	Position 10.	.127
Position 4.	.131	Position 11.	.146
Position 5.	.121	Position 12.	.181
Position 6.	.129	Position 13.	.130
Position 7.	.105	Position 14.	.093

Door Thickness (Inches)

Position 1.	1.896	Position 8.	1.330
Position 2.	1.895	Position 9.	1.330
Position 3.	1.877	Position 10.	1.320
Position 4.	1.908	Position 11.	1.918
Position 5.	1.925	Position 12.	1.905
Position 6.	1.954	Position 13.	1.912
Position 7.	1.897	Position 14.	1.894

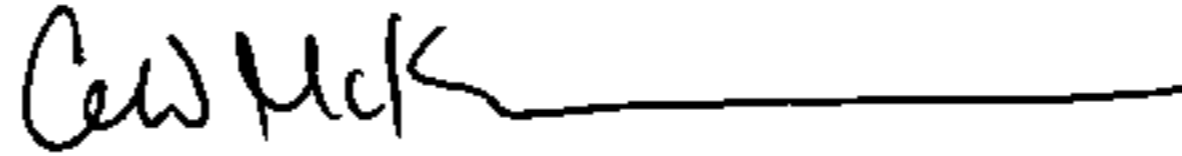
Visual inspection

	Yes	No
1. Door Edges and Faces		
A. Visible signs of metal fatigue?		X
B. Visible signs of cracking?		X
C. Visible signs of deformation?		X
D. Visible signs of delamination?		X
F. Visible signs of weld breakage?		X
2. Top and Bottom Channels		
A. Visible signs of bond breakage?		X
B. Visible signs of weld breakage?		X
3. Edge Seams		
A. Visible signs of spreading?	X	
4. Additional Notes		

Witness: J. Peter Merther 3-2-93
PSI/PTL

Project: LN PHY-30091 828-36065
Date: 3-22-93, 5-28-93 Add.

PROFESSIONAL SERVICE INDUSTRIES, INC.

A handwritten signature in black ink, appearing to read "G.W. McKewan", followed by a long horizontal line extending to the right.

Gregory W. McKewan, Manager
Physical Testing Laboratory

cc: 1-Client
caj