Professional Service Industries, Inc.
Pittsburgh Testing Laboratory Division

REPORT OF TESTING OF DOOR

TESTED FOR: Overly Manufacturing Co.
574 West Otterman Street
Greensburg, PA 15601-0070
Attn: Bill Hugus

PROJECT:

DATE: 3-10-94

OUR REPORT NO.: 828-46145 PHY-40306

TEST METHOD FOR THE COMPLIANCE TO ADA REQUIREMENTS FOR DOOR OPENINGS

1. Purpose

The purpose is to provide a test method for determining the opening force required to open a Hollow Metal Acoustical type door and frame unit equipped with ADA approved hardware that allows the unit to be defined as an ADA "accessible" opening.

2. Definitions

The ADA defines an "accessible" door opening as a unit with a minimum 32 inch (813 mm) clear opening equipped with hardware made from operable parts that have a shape that is easy to grasp with one hand and does not require tight grasping, tight pinching, or twisting of the wrist to operate. It shall also be designed to have a maximum opening force of 10 pounds (push or pull operation), a minimum "time to close" of 5 seconds, and be capable of opening at least 90 degrees.

The "time to close" is defined by ADA as the length of time for the closer to move the door from the open position of 90 degrees to the open position of 12 degrees.

3. Test Specimen

The test specimen for this test is to be a 3 foot x 7 foot Hollow Metal Acoustical type door and frame unit with a door ranging in weight from 150 to 250 pounds. (See Figure 1). The unit is to be of the bolt-in type equipped with the following builders hardware:

1 - Norton closer series 7500BF-DA
1 - Schlage S10D passage set x Saturn trim
3 - Overly MCL-500 CAM-Lift Hinges
1 - Zero #164 threshold

The unit is also to be equipped with the following gasketing:

1 - set Overly "H" Type acoustical frame gasket system
1 - Overly Super "H" Door Bottom

Weight was added to the center of gravity of the door in ten (10) pound increments for a total load of 250 pounds.

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4. Test Preparation and Criteria

A rigid tube structure shall be fabricated of sufficient size and capacity to accommodate and support the 3 foot x 7 foot unit. The door, frame and gasketing system are to be installed in the test fixture per the manufacturer's installation instructions (see attachment). Great care is to be taken to make sure all of the manufacturer's installation tolerances are met. The hinges, closer and latchset are to be installed and adjusted per their individual manufacturer's instructions to properly reflect a normal unit installation.

To verify the unit is plumb, with the closer disengaged, open the door to the 90 degree position, steady it and then release the door. The door shall remain stationary at the 90 degree position.

Once proper installation has been verified, the two ADA criteria that affect the opening/closing requirements can be tested for. Since only the final performance characteristics of an ADA opening have been defined, and not an actual method of measurement, the following test procedures have been devised using the guidelines established in the following specifications:

ANSI A117.1-1992 "Accessible and Usable Buildings and Facilities"

ASTM E1408-91 "Standard Test Method for Laboratory Measurement of Sound Transmission Loss of Door Panels and Door Systems"

ANSI/BHMA A156.4-1992 "American National Standard for Door Controls-Closers"

Federal Register, Part III Dept. of Justice, Vol. 56, No. 144 Rules and Regulations

Life Safety Code Handbook

These procedures are intended to test for and provide an opening that most closely reflects normal personnel opening/closing operation. The five (5) test procedures will measure the following:

Procedure 1. Push force against closer.
Procedure 2. Push force with closer disengaged.
Procedure 3. Pull force against closer.
Procedure 4. Pull force with closer disengaged.
Procedure 5. Force to unlatch latchbolt.

Force was measured using a Chatillon Digital Force Gauge Model DRC100 calibrated 1-31-94, recalibration due on 8-31-94.

Procedure 1.

Step 1. On the push side of the door, locate a point at the center line of the lockset lever handle trim. This point will be used for all "push" test procedures.

Step 2. Mark the floor at a point where the door latch stile is at the 90 degree opening position. Mark a second point where the door latch stile is at the 12 degree open position. This will identify the starting and stopping points for the "time to close" requirement of Step 5.

Step 3. Open the door so the latchbolt is disengaged from the strike and the narrow side of the door is resting on the gasketing system.

Step 4. Using a force gauge (a push/pull meter having a maximum reading hold and a zero adjustment) located on the mark determined in Step 1, push the door open to the 90 degree mark established in Step 2 in a slow, uniform manner with the total opening time not to exceed 3 seconds. All applied forces required to open the door, shall always be made perpendicular to the face of the door. Observe the maximum push force reading. If the maximum force reading is greater than ten (10) pounds, adjust the closer spring power to meet the maximum opening force requirement of ten (10) pounds.

Step 5. Hold the door at the 90 degree mark. Release the door and time the closing sweep between the 90 degree mark and the 12 degree mark, allowing the door to close and latch completely. This " time to close", between the 90 and 12 degree marks is to be a minimum of 5 seconds. If it is less than 5 seconds, adjust the closer speed regulation valve to obtain the required 5 second "time to close." Upon reaching the 12 degree mark, the door is to be allowed to return to the closed position. Once at the closed position, the latchbolt must engage the strike and secure the door.

Step 6. Repeat Steps 4 through 6 ten times, without performing the adjustment portion of the steps. Record the maximum opening force and closing times each repetition.

Procedure 2.

Step 1. Disengage the closer.

Step 2. Using a force gauge located at the same location as used in Procedure 1, push the door open to the 90 degree mark in a slow, uniform manner with the total opening time not to exceed 3 seconds. All forces applied to the door, shall always be made perpendicular to the face of the door. Observe the maximum push force reading. Repeat and record the maximum opening force ten times, without performing any adjustments.

Procedure 3.

Step 1. With the closer disengaged, locate a point on the pull side of the latchset directly opposite from the push point previously used in Procedure 1 and 2.

Step 2. Affix the push/pull tension meter to the pullside.

Step 3. Using the force gauge, pull the door open to the 90 degree mark in a slow, uniform manner with the total opening time not to exceed 3 seconds. All applied pulling forces required to open the door shall always be made perpendicular to the face of the door. Observe and record the maximum pull force. Repeat and record ten (10) times, without performing any adjustments.

Procedure 4.

Step 1. Reattach the closer to the door.

Step 2. Affix the force gauge to the pull side of the latchset used in Procedure 3.

Step 3. While maintaining the closer settings from the push testing of Procedure 1, use the force gauge to pull the door open to the 90 degree mark in a slow, uniform manner with the total opening time not to exceed 3 seconds. All applied pulling forces required to open the door shall always be made perpendicular to the face of the door. Observe the maximum pull force. Repeat and record ten (10) times, without performing any adjustments.

Procedure 5.

Step 1. Attach the force gauge to the outer end of the latchset lever handle on either side of the door.

Step 2. While holding the gauge parallel to the door face and perpendicular to the lever handle, pull on the handle in a slow, uniform manner until the latchbolt is completely disengaged. Observe and record the maximum force to retract the latchbolt. Repeat and record ten (10) times, without performing any adjustments.

5. Acceptance Criteria

The following items shall be used to rate the door as acceptable to meet the handicapped requirements of ADA.

1. Unit clear opening to measure 32 inches or greater.
2. Door and Frame unit is installed per manufacturer's instructions.
3. All Hardware is installed per individual manufacturer's instructions.
4. Unit must be installed plumb.
5. Door shall remain stationary at 45 and 90 degree positions.
6. "Time to Close" shall be five (5) seconds or greater.
7. Door must latch by closer upon adjustment to Item 6.
8. Force required to unseat door by Push/Pull from the 0 degree to 90 degree open position with the closer engaged to be ten (10) pounds or less.
9. Force required to unseat door by Push/Pull from the 0 degree to 90 degree open position with the closer disengaged to be five (5) pounds or less.
10. Force required to disengage latchbolt to be five (5) pounds or less.

PUSH/PULL DATA RESULTS SUMMARY

Level swing hinges

Door weight (lbs)	**150**	**160**	**170**	**180**	**190**	**200**	**210**	**220**	**230**	**240**	**250**
lbs./sq ft	7.1	7.6	8.1	8.6	9	9.5	10	10.5	11	11.4	12
Push w/closer (lbs)	7.5	7.3	7.7	7.4	7.3	7.4	7.5	7.5	7.5	7.4	7.3
Push w/o closer (lbs)	1.8	1.7	1.8	1.7	1.8	1.8	1.9	1.8	2.1	2	2
Pull w/closer (lbs)	7.7	7.5	7.6	7.6	7.5	7.4	7.7	7.7	7.7	7.7	7.5
Pull w/o closer (lbs)	1.9	1.8	1.8	1.9	1.9	2	2	2	2.2	2.3	2.3

lbs. Force to retract latch 4.7

The numbers above are the average values of 10 measurements taken for each

Cam-Lift Hinges

Door weight (lbs)	**150**	**160**	**170**	**180**	**190**	**200**	**210**	**220**	**230**	**240**	**250**
lbs./sq ft	7.1	7.6	8.1	8.6	9	9.5	10	10.5	11	11.4	12
Push w/closer (lbs)	9.6	9.6	9.7	9.5	9.8	9.7	9.7	9.6	9.9	9.7	9.5
Push w/o closer (lbs)	3.5	3.7	4	3.9	3.8	4.2	4.1	4.2	4.1	4.7	4.3
Pull w/closer (lbs)	9.7	9.6	9.7	9.8	9.8	9.9	9.9	9.7	9.6	9.7	9.7
Pull w/o closer (lbs)	3.3	3.8	4.1	4	4.5	4.8	4.6	4.4	4.8	4.7	4.9

lbs. Force to retract latch 4.7

The numbers above are the average values of 10 measurements taken for each

DOOR DATA TEST SAMPLE NUMBER 1

Door Weight: 150 pounds
Unit Clear Opening: 34 Inches
Hinge Type: CAM-LIFT

Verify if plumb at 45 degrees - -- at 90 degrees - YES

Time to close (90 to 12 degrees) in seconds/Verify Latching

Trial 1	Trial 2	Trial 3	Trial 4	Trial 5
Yes	Yes	Yes	Yes	Yes

Trial 6	Trial 7	Trial 8	Trial 9	Trial 10
Yes	Yes	Yes	Yes	Yes

Push force against closer (0 to 90 degrees)

Trial 1	Trial 2	Trial 3	Trial 4	Trial 5
9.4	9.8	9.6	9.8	9.5

Trial 6	Trial 7	Trial 8	Trial 9	Trial 10	Avg.
9.4	9.8	9.4	9.4	9.7	9.6

Push force without closer (0 to 90 degrees)

Trial 1	Trial 2	Trial 3	Trial 4	Trial 5
3.4	3.7	3.3	3.5	3.5

Trial 6	Trial 7	Trial 8	Trial 9	Trial 10	Avg.
3.3	3.3	3.7	3.6	3.6	3.5

Pull force against closer (0 to 90 degrees)

Trial 1	Trial 2	Trial 3	Trial 4	Trial 5
9.7	9.6	9.5	9.9	10.0

Trial 6	Trial 7	Trial 8	Trial 9	Trial 10	Avg.
9.7	9.5	9.5	9.5	10.1	9.7

Pull force without closer (0 to 90 degrees)

Trial 1	Trial 2	Trial 3	Trial 4	Trial 5
3.2	3.4	3.5	3.3	3.3

Trial 6	Trial 7	Trial 8	Trial 9	Trial 10	Avg.
3.3	3.5	3.4	3.3	3.2	3.3

Force to unlatch latchbolt

Trial 1	Trial 2	Trial 3	Trial 4	Trial 5
4.9	4.5	4.8	4.5	4.7

Trial 6	Trial 7	Trial 8	Trial 9	Trial 10	Avg.
4.8	5.0	4.7	4.5	4.9	4.7

DOOR DATA TEST SAMPLE NUMBER 2

Door Weight: 160 pounds
Unit Clear Opening: 34 Inches
Hinge Type: CAM-LIFT

Verify if plumb at 45 degrees - -- at 90 degrees - YES

Time to close (90 to 12 degrees) in seconds/Verify Latching

Trial 1	Trial 2	Trial 3	Trial 4	Trial 5
Done on Samples #1 & #11 only.				

Trial 6	Trial 7	Trial 8	Trial 9	Trial 10
Done on Samples #1 & #11 only.				

Push force against closer (0 to 90 degrees)

Trial 1	Trial 2	Trial 3	Trial 4	Trial 5
9.7	9.6	9.7	9.7	9.5

Trial 6	Trial 7	Trial 8	Trial 9	Trial 10	Avg.
9.4	9.7	9.5	9.5	9.6	9.6

Push force without closer (0 to 90 degrees)

Trial 1	Trial 2	Trial 3	Trial 4	Trial 5
3.9	3.7	3.5	3.6	3.7

Trial 6	Trial 7	Trial 8	Trial 9	Trial 10	Avg.
3.7	3.7	3.6	3.4	3.7	3.7

Pull force against closer (0 to 90 degrees)

Trial 1	Trial 2	Trial 3	Trial 4	Trial 5
9.5	9.5	9.8	9.6	9.5

Trial 6	Trial 7	Trial 8	Trial 9	Trial 10	Avg.
9.5	9.7	9.7	10.0	9.5	9.6

Pull force without closer (0 to 90 degrees)

Trial 1	Trial 2	Trial 3	Trial 4	Trial 5
3.9	4.3	3.7	3.4	3.8

Trial 6	Trial 7	Trial 8	Trial 9	Trial 10	Avg.
3.7	3.8	3.6	4.0	3.7	3.8

Force to unlatch latchbolt

Trial 1	Trial 2	Trial 3	Trial 4	Trial 5
Done on Sample #1 only.				

Trial 6	Trial 7	Trial 8	Trial 9	Trial 10	Avg.
Done on Sample #1 only.					

DOOR DATA TEST SAMPLE NUMBER 3

Door Weight: 170 pounds
Unit Clear Opening: 34 Inches
Hinge Type: CAM-LIFT

Verify if plumb at 45 degrees - -- at 90 degrees - YES

Time to close (90 to 12 degrees) in seconds/Verify Latching

Trial 1	Trial 2	Trial 3	Trial 4	Trial 5
Done on Samples #1 & #11 only.				

Trial 6	Trial 7	Trial 8	Trial 9	Trial 10
Done on Samples #1 & #11 only.				

Push force against closer (0 to 90 degrees)

Trial 1	Trial 2	Trial 3	Trial 4	Trial 5
9.9	9.7	9.7	9.7	9.4

Trial 6	Trial 7	Trial 8	Trial 9	Trial 10	Avg.
9.6	9.8	10.1	9.7	9.8	9.7

Push force without closer (0 to 90 degrees)

Trial 1	Trial 2	Trial 3	Trial 4	Trial 5
4.2	4.0	3.6	3.8	3.9

Trial 6	Trial 7	Trial 8	Trial 9	Trial 10	Avg.
3.9	4.3	3.8	3.9	4.4	4.0

Pull force against closer (0 to 90 degrees)

Trial 1	Trial 2	Trial 3	Trial 4	Trial 5
10.1	9.9	9.7	9.7	9.6

Trial 6	Trial 7	Trial 8	Trial 9	Trial 10	Avg.
9.9	9.4	9.4	9.5	9.9	9.7

Pull force without closer (0 to 90 degrees)

Trial 1	Trial 2	Trial 3	Trial 4	Trial 5
4.2	4.1	4.0	3.8	4.0

Trial 6	Trial 7	Trial 8	Trial 9	Trial 10	Avg.
4.2	4.1	4.2	4.4	4.2	4.1

Force to unlatch latchbolt

Trial 1	Trial 2	Trial 3	Trial 4	Trial 5
Done on Sample #1 only.				

Trial 6	Trial 7	Trial 8	Trial 9	Trial 10	Avg.
Done on Sample #1 only.					

DOOR DATA TEST SAMPLE NUMBER 4

Door Weight: 180 pounds
Unit Clear Opening: 34 Inches
Hinge Type: CAM-LIFT

Verify if plumb at 45 degrees - -- at 90 degrees - YES

Time to close (90 to 12 degrees) in seconds/Verify Latching

Trial 1	Trial 2	Trial 3	Trial 4	Trial 5

Done on Samples #1 & #11 only.

Trial 6	Trial 7	Trial 8	Trial 9	Trial 10

Done on Samples #1 & #11 only.

Push force against closer (0 to 90 degrees)

Trial 1	Trial 2	Trial 3	Trial 4	Trial 5
9.3	9.8	9.4	9.1	9.5

Trial 6	Trial 7	Trial 8	Trial 9	Trial 10	Avg.
9.3	9.5	9.6	9.7	9.6	9.5

Push force without closer (0 to 90 degrees)

Trial 1	Trial 2	Trial 3	Trial 4	Trial 5
4.3	3.6	3.8	3.8	4.0

Trial 6	Trial 7	Trial 8	Trial 9	Trial 10	Avg.
4.2	3.8	4.0	4.0	3.8	3.9

Pull force against closer (0 to 90 degrees)

Trial 1	Trial 2	Trial 3	Trial 4	Trial 5
9.7	10.0	9.9	10.4	9.6

Trial 6	Trial 7	Trial 8	Trial 9	Trial 10	Avg.
9.8	9.5	9.8	9.5	9.6	9.8

Pull force without closer (0 to 90 degrees)

Trial 1	Trial 2	Trial 3	Trial 4	Trial 5
4.2	3.9	4.0	3.9	3.9

Trial 6	Trial 7	Trial 8	Trial 9	Trial 10	Avg.
4.1	3.9	4.2	4.1	4.2	4.0

Force to unlatch latchbolt

Trial 1	Trial 2	Trial 3	Trial 4	Trial 5

Done on Sample #1 only.

Trial 6	Trial 7	Trial 8	Trial 9	Trial 10	Avg.

Done on Sample #1 only.

DOOR DATA TEST SAMPLE NUMBER 5

Door Weight: 190 pounds
Unit Clear Opening: 34 Inches
Hinge Type: CAM-LIFT

Verify if plumb **at 45 degrees - --** **at 90 degrees - YES**

Time to close (90 to 12 degrees) in seconds/Verify Latching

Trial 1	Trial 2	Trial 3	Trial 4	Trial 5
Done on Samples #1 & #11 only.				

Trial 6	Trial 7	Trial 8	Trial 9	Trial 10
Done on Samples #1 & #11 only.				

Push force against closer (0 to 90 degrees)

Trial 1	Trial 2	Trial 3	Trial 4	Trial 5
9.7	9.5	9.7	10.0	10.2

Trial 6	Trial 7	Trial 8	Trial 9	Trial 10	Avg.
9.6	9.5	9.9	9.9	9.8	9.8

Push force without closer (0 to 90 degrees)

Trial 1	Trial 2	Trial 3	Trial 4	Trial 5
4.0	3.8	3.7	3.9	3.8

Trial 6	Trial 7	Trial 8	Trial 9	Trial 10	Avg.
3.8	3.8	3.8	4.0	3.6	3.8

Pull force against closer (0 to 90 degrees)

Trial 1	Trial 2	Trial 3	Trial 4	Trial 5
9.9	10.0	9.6	9.8	9.9

Trial 6	Trial 7	Trial 8	Trial 9	Trial 10	Avg.
10.1	9.8	9.8	9.8	9.6	9.8

Pull force without closer (0 to 90 degrees)

Trial 1	Trial 2	Trial 3	Trial 4	Trial 5
4.7	4.1	4.8	4.3	4.3

Trial 6	Trial 7	Trial 8	Trial 9	Trial 10	Avg.
4.4	4.4	5.0	4.6	4.8	4.5

Force to unlatch latchbolt

Trial 1	Trial 2	Trial 3	Trial 4	Trial 5
Done on Sample #1 only.				

Trial 6	Trial 7	Trial 8	Trial 9	Trial 10	Avg.
Done on Sample #1 only.					

DOOR DATA TEST SAMPLE NUMBER 6

Door Weight: 200 pounds
Unit Clear Opening: 34 Inches
Hinge Type: CAM-LIFT

Verify if plumb at 45 degrees - -- at 90 degrees - YES

Time to close (90 to 12 degrees) in seconds/Verify Latching

Trial 1	Trial 2	Trial 3	Trial 4	Trial 5
Done on Samples #1 & #11 only.				

Trial 6	Trial 7	Trial 8	Trial 9	Trial 10
Done on Samples #1 & #11 only.				

Push force against closer (0 to 90 degrees)

Trial 1	Trial 2	Trial 3	Trial 4	Trial 5
9.6	9.7	10.0	9.5	9.4

Trial 6	Trial 7	Trial 8	Trial 9	Trial 10	Avg.
9.5	9.5	9.8	9.8	9.8	9.7

Push force without closer (0 to 90 degrees)

Trial 1	Trial 2	Trial 3	Trial 4	Trial 5
4.1	4.2	4.2	4.3	4.1

Trial 6	Trial 7	Trial 8	Trial 9	Trial 10	Avg.
4.3	4.1	4.3	4.3	4.3	4.2

Pull force against closer (0 to 90 degrees)

Trial 1	Trial 2	Trial 3	Trial 4	Trial 5
10.2	9.7	10.0	9.7	9.4

Trial 6	Trial 7	Trial 8	Trial 9	Trial 10	Avg.
9.7	9.9	10.1	9.9	9.9	9.9

Pull force without closer (0 to 90 degrees)

Trial 1	Trial 2	Trial 3	Trial 4	Trial 5
4.2	4.5	4.1	4.3	4.3

Trial 6	Trial 7	Trial 8	Trial 9	Trial 10	Avg.
4.4	4.3	4.6	4.8	4.7	4.4

Force to unlatch latchbolt

Trial 1	Trial 2	Trial 3	Trial 4	Trial 5
Done on Sample #1 only.				

Trial 6	Trial 7	Trial 8	Trial 9	Trial 10	Avg.
Done on Sample #1 only.					

DOOR DATA TEST SAMPLE NUMBER 7

Door Weight: 210 pounds
Unit Clear Opening: 34 Inches
Hinge Type: CAM-LIFT

Verify if plumb at 45 degrees - -- at 90 degrees - YES

Time to close (90 to 12 degrees) in seconds/Verify Latching

Trial 1	Trial 2	Trial 3	Trial 4	Trial 5
Done on Samples #1 & #11 only.				

Trial 6	Trial 7	Trial 8	Trial 9	Trial 10
Done on Samples #1 & #11 only.				

Push force against closer (0 to 90 degrees)

Trial 1	Trial 2	Trial 3	Trial 4	Trial 5
9.7	9.9	9.8	9.5	9.6

Trial 6	Trial 7	Trial 8	Trial 9	Trial 10	Avg.
9.8	9.8	9.8	9.9	9.3	9.7

Push force without closer (0 to 90 degrees)

Trial 1	Trial 2	Trial 3	Trial 4	Trial 5
4.0	4.0	3.7	4.0	4.1

Trial 6	Trial 7	Trial 8	Trial 9	Trial 10	Avg.
4.1	3.9	4.1	4.4	4.5	4.1

Pull force against closer (0 to 90 degrees)

Trial 1	Trial 2	Trial 3	Trial 4	Trial 5
10.0	9.9	10.0	9.9	9.9

Trial 6	Trial 7	Trial 8	Trial 9	Trial 10	Avg.
9.9	9.7	9.8	9.9	9.9	9.9

Pull force without closer (0 to 90 degrees)

Trial 1	Trial 2	Trial 3	Trial 4	Trial 5
4.9	5.3	4.8	5.0	4.4

Trial 6	Trial 7	Trial 8	Trial 9	Trial 10	Avg.
4.5	4.1	4.1	4.3	4.4	4.6

Force to unlatch latchbolt

Trial 1	Trial 2	Trial 3	Trial 4	Trial 5
Done on Sample #1 only.				

Trial 6	Trial 7	Trial 8	Trial 9	Trial 10	Avg.
Done on Sample #1 only.					

DOOR DATA TEST SAMPLE NUMBER 8

Door Weight: 220 pounds
Unit Clear Opening: 34 Inches
Hinge Type: CAM-LIFT

Verify if plumb at 45 degrees - -- at 90 degrees - YES

Time to close (90 to 12 degrees) in seconds/Verify Latching

Trial 1	Trial 2	Trial 3	Trial 4	Trial 5
Done on Samples #1 & #11 only.				

Trial 6	Trial 7	Trial 8	Trial 9	Trial 10
Done on Samples #1 & #11 only.				

Push force against closer (0 to 90 degrees)

Trial 1	Trial 2	Trial 3	Trial 4	Trial 5
9.3	9.5	9.3	9.7	9.7

Trial 6	Trial 7	Trial 8	Trial 9	Trial 10	Avg.
9.7	9.8	9.7	9.7	9.7	9.6

Push force without closer (0 to 90 degrees)

Trial 1	Trial 2	Trial 3	Trial 4	Trial 5
4.4	4.2	3.9	4.2	4.2

Trial 6	Trial 7	Trial 8	Trial 9	Trial 10	Avg.
4.3	4.2	4.3	4.1	4.0	4.2

Pull force against closer (0 to 90 degrees)

Trial 1	Trial 2	Trial 3	Trial 4	Trial 5
9.8	9.9	10.1	9.9	9.5

Trial 6	Trial 7	Trial 8	Trial 9	Trial 10	Avg.
9.5	9.6	9.4	10.0	9.7	9.7

Pull force without closer (0 to 90 degrees)

Trial 1	Trial 2	Trial 3	Trial 4	Trial 5
4.6	3.9	4.1	4.4	4.3

Trial 6	Trial 7	Trial 8	Trial 9	Trial 10	Avg.
4.7	4.4	4.3	4.4	4.7	4.4

Force to unlatch latchbolt

Trial 1	Trial 2	Trial 3	Trial 4	Trial 5
Done on Sample #1 only.				

Trial 6	Trial 7	Trial 8	Trial 9	Trial 10	Avg.
Done on Sample #1 only.					

DOOR DATA TEST SAMPLE NUMBER 9

Door Weight: 230 pounds
Unit Clear Opening: 34 Inches
Hinge Type: CAM-LIFT

Verify if plumb at 45 degrees - -- at 90 degrees - YES

Time to close (90 to 12 degrees) in seconds/Verify Latching

Trial 1	Trial 2	Trial 3	Trial 4	Trial 5
Done on Samples #1 & #11 only.				

Trial 6	Trial 7	Trial 8	Trial 9	Trial 10
Done on Samples #1 & #11 only.				

Push force against closer (0 to 90 degrees)

Trial 1	Trial 2	Trial 3	Trial 4	Trial 5
9.7	10.1	10.0	9.7	9.5

Trial 6	Trial 7	Trial 8	Trial 9	Trial 10	Avg.
9.9	9.7	9.9	9.9	10.1	9.9

Push force without closer (0 to 90 degrees)

Trial 1	Trial 2	Trial 3	Trial 4	Trial 5
4.1	3.6	4.0	4.1	4.0

Trial 6	Trial 7	Trial 8	Trial 9	Trial 10	Avg.
4.4	3.8	4.4	4.3	4.6	4.1

Pull force against closer (0 to 90 degrees)

Trial 1	Trial 2	Trial 3	Trial 4	Trial 5
9.6	9.3	9.7	9.6	9.9

Trial 6	Trial 7	Trial 8	Trial 9	Trial 10	Avg.
9.8	9.6	9.5	9.7	9.6	9.6

Pull force without closer (0 to 90 degrees)

Trial 1	Trial 2	Trial 3	Trial 4	Trial 5
5.1	4.7	4.6	4.6	4.6

Trial 6	Trial 7	Trial 8	Trial 9	Trial 10	Avg.
4.8	4.6	4.8	5.0	5.0	4.8

Force to unlatch latchbolt

Trial 1	Trial 2	Trial 3	Trial 4	Trial 5
Done on Sample #1 only.				

Trial 6	Trial 7	Trial 8	Trial 9	Trial 10	Avg.
Done on Sample #1 only.					

DOOR DATA TEST SAMPLE NUMBER 10

Door Weight: 240 pounds
Unit Clear Opening: 34 Inches
Hinge Type: CAM-LIFT

Verify if plumb at 45 degrees - -- at 90 degrees - YES

Time to close (90 to 12 degrees) in seconds/Verify Latching

Trial 1	Trial 2	Trial 3	Trial 4	Trial 5
Done on Samples #1 & #11 only.				

Trial 6	Trial 7	Trial 8	Trial 9	Trial 10
Done on Samples #1 & #11 only.				

Push force against closer (0 to 90 degrees)

Trial 1	Trial 2	Trial 3	Trial 4	Trial 5
9.5	9.9	9.7	10.0	9.8

Trial 6	Trial 7	Trial 8	Trial 9	Trial 10	Avg.
9.5	9.3	9.7	9.6	10.0	9.7

Push force without closer (0 to 90 degrees)

Trial 1	Trial 2	Trial 3	Trial 4	Trial 5
4.5	4.7	4.8	4.6	4.7

Trial 6	Trial 7	Trial 8	Trial 9	Trial 10	Avg.
4.9	4.7	4.7	4.7	4.5	4.7

Pull force against closer (0 to 90 degrees)

Trial 1	Trial 2	Trial 3	Trial 4	Trial 5
9.1	9.9	9.8	9.5	9.8

Trial 6	Trial 7	Trial 8	Trial 9	Trial 10	Avg.
10.0	9.4	9.8	9.6	9.7	9.7

Pull force without closer (0 to 90 degrees)

Trial 1	Trial 2	Trial 3	Trial 4	Trial 5
4.6	4.6	4.8	4.8	4.7

Trial 6	Trial 7	Trial 8	Trial 9	Trial 10	Avg.
4.7	4.7	4.9	4.7	4.6	4.7

Force to unlatch latchbolt

Trial 1	Trial 2	Trial 3	Trial 4	Trial 5
Done on Sample #1 only.				

Trial 6	Trial 7	Trial 8	Trial 9	Trial 10	Avg.
Done on Sample #1 only.					

DOOR DATA TEST SAMPLE NUMBER 11

Door Weight: 250 pounds
Unit Clear Opening: 34 Inches
Hinge Type: CAM-LIFT

Verify if plumb at 45 degrees - NO at 90 degrees - YES

Time to close (90 to 12 degrees) in seconds/Verify Latching

Trial 1	Trial 2	Trial 3	Trial 4	Trial 5
Yes	Yes	Yes	Yes	Yes
Trial 6	**Trial 7**	**Trial 8**	**Trial 9**	**Trial 10**
Yes	Yes	Yes	Yes	Yes

Push force against closer (0 to 90 degrees)

Trial 1	Trial 2	Trial 3	Trial 4	Trial 5	
9.2	9.4	9.2	9.4	9.6	
Trial 6	**Trial 7**	**Trial 8**	**Trial 9**	**Trial 10**	**Avg.**
9.4	9.6	9.4	9.9	9.6	9.5

Push force without closer (0 to 90 degrees)

Trial 1	Trial 2	Trial 3	Trial 4	Trial 5	
4.0	4.3	4.2	4.0	4.2	
Trial 6	**Trial 7**	**Trial 8**	**Trial 9**	**Trial 10**	**Avg.**
4.5	4.3	4.2	4.5	4.4	4.3

Pull force against closer (0 to 90 degrees)

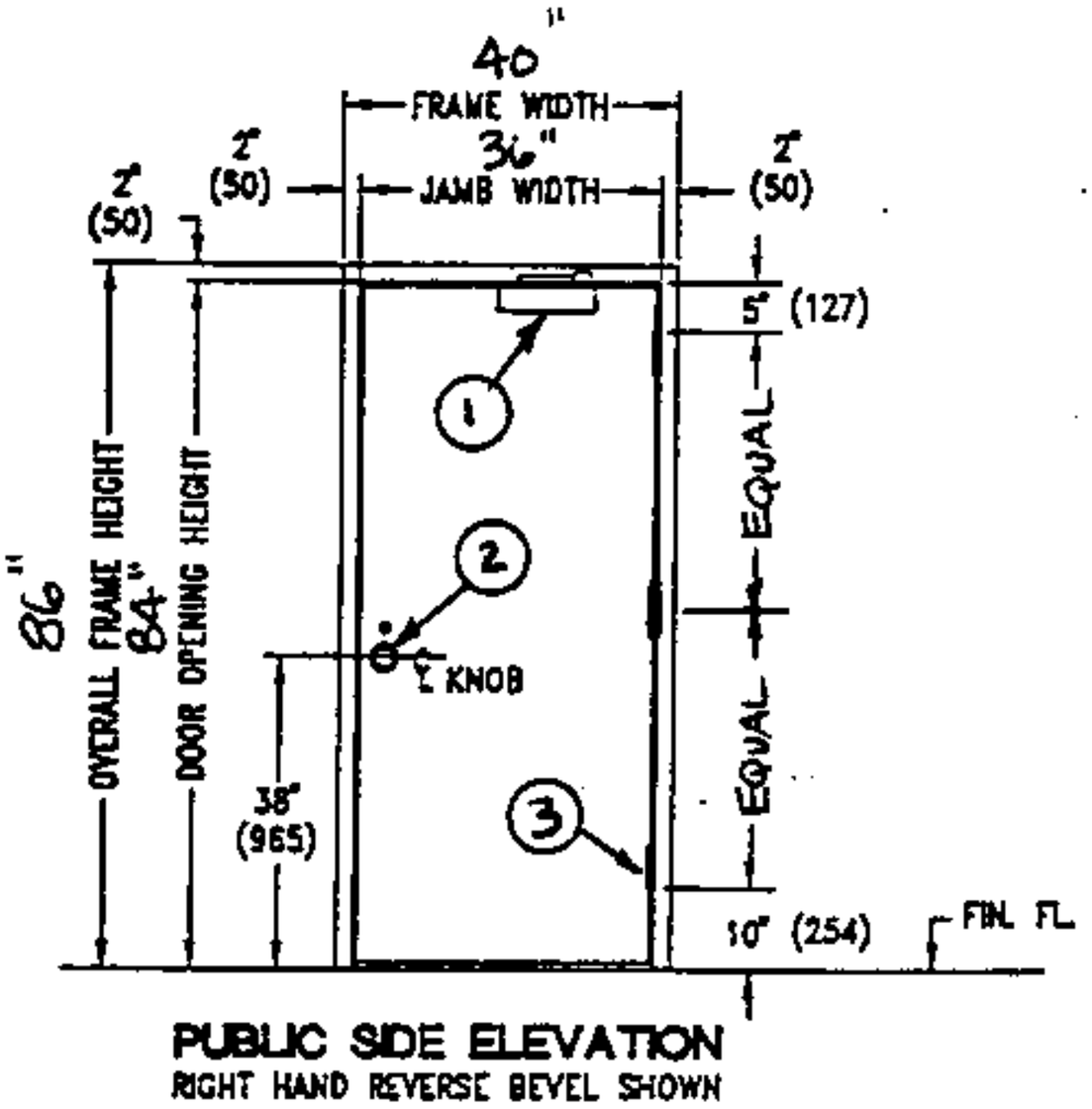
Trial 1	Trial 2	Trial 3	Trial 4	Trial 5	
9.7	9.4	9.9	9.7	9.9	
Trial 6	**Trial 7**	**Trial 8**	**Trial 9**	**Trial 10**	**Avg.**
9.5	9.5	9.6	9.7	9.7	9.7

Pull force without closer (0 to 90 degrees)

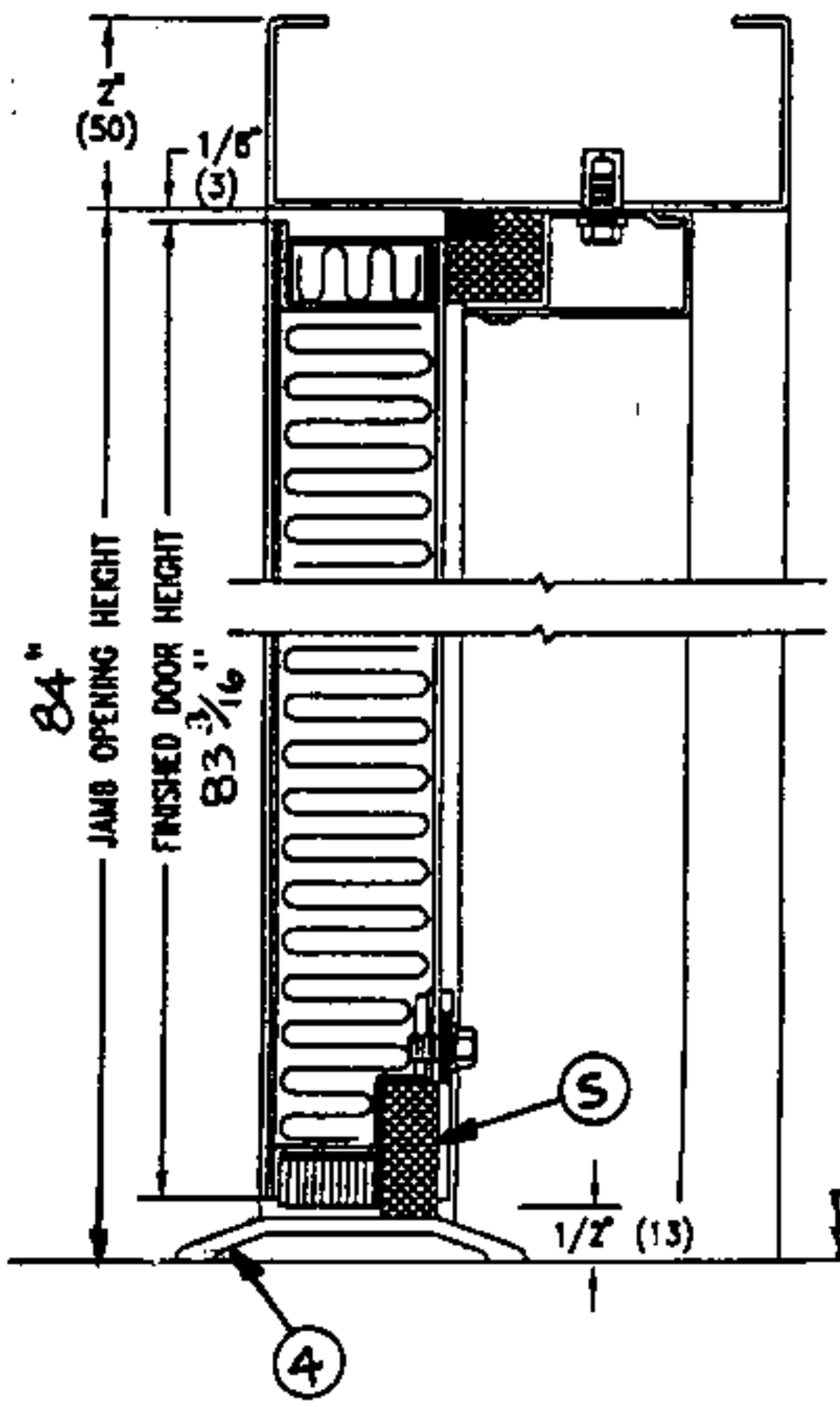
Trial 1	Trial 2	Trial 3	Trial 4	Trial 5	
5.1	4.5	4.5	4.6	5.0	
Trial 6	**Trial 7**	**Trial 8**	**Trial 9**	**Trial 10**	**Avg.**
5.0	4.8	5.0	5.0	4.9	4.8

Force to unlatch latchbolt

Trial 1	Trial 2	Trial 3	Trial 4	Trial 5	
Done on Sample #1 only.					
Trial 6	**Trial 7**	**Trial 8**	**Trial 9**	**Trial 10**	**Avg.**
Done on Sample #1 only.					



PUBLIC SIDE ELEVATION
RIGHT HAND REVERSE BEVEL SHOWN



VERTICAL SECTION

Hardware Set

(1) 1 - Norton Closer series 7500BF-DA

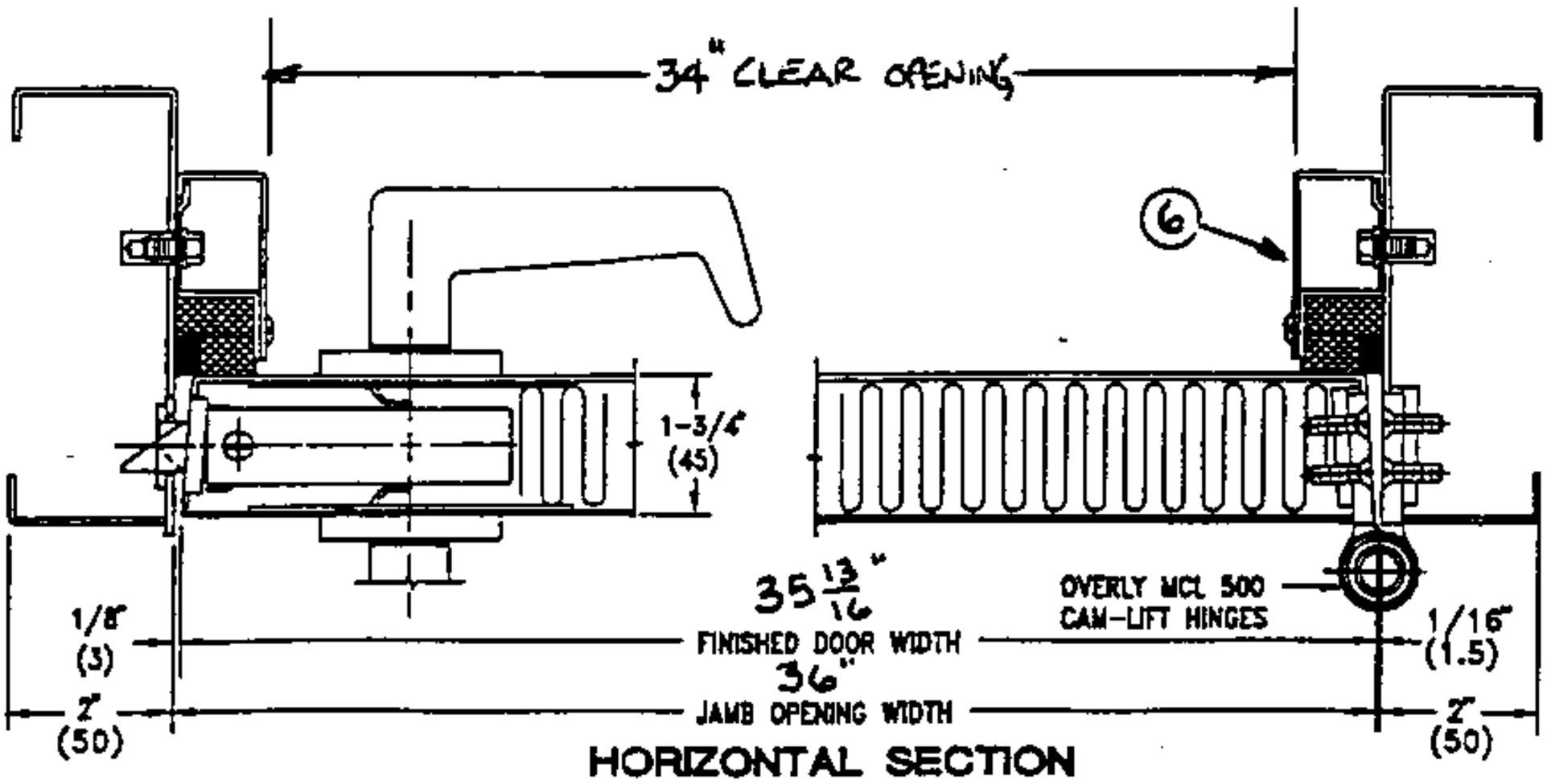
(2) 1 - Schlage S10D passage set x Saturn trim

(3) 3 - MCL-500 5" x 4-1/2" Cam-lift Hinges

(4) 1 - Zero #164 threshold

(5) 1 - Overly Super "H" Door Bottom

(6) 1 - Set Overly "H" seals



HORIZONTAL SECTION

FIGURE 1