

MIAMI-DADE COUNTY PERFORMANCE TEST REPORT

Report No.: F7663.03-109-18

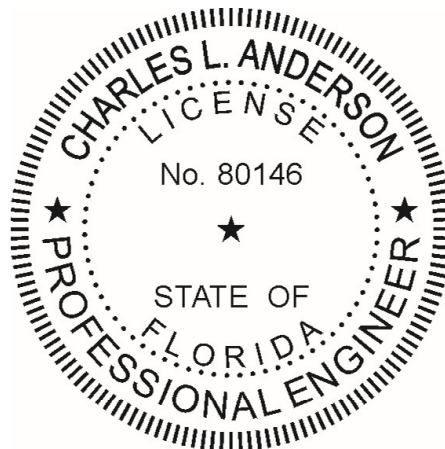
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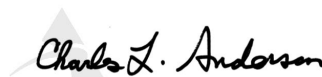
OVERHEAD DOOR CORPORATION – PENNSYLVANIA ROLLING STEEL
Lewistown, Pennsylvania

PRODUCT TYPE: Rolling Steel Door
SERIES/MODEL: 800

This report contains in its entirety:

Cover Page: 1 page
Report Body: 13 pages
Sketch(es): 2 pages
Photograph(s): 1 page
Drawing(s): 1 page




Digitally Signed by: Charles Anderson

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Test Start Date:	08/29/16
Test End Date:	10/14/16
Report Date:	11/14/16
Test Record Retention End Date:	10/14/26
Miami-Dade County Notification No.:	ATI 16022

1.0 Client Identification:

- 1.1 Report Issued To:** Overhead Door Corporation – Pennsylvania Rolling Steel
23 Industrial Park Road
P.O. Box 110
Lewistown, Pennsylvania 17044
- 1.2 Contact Person:** Thomas Steckbeck

2.0 Laboratory Identification:

- 2.1 Test Laboratory:** Architectural Testing, Inc., an Intertek company ("Intertek-ATI")
130 Derry Court
York, Pennsylvania 17406-8405
- 2.2 Phone Number:** 717-764-7700

3.0 Project Summary:

- 3.1 Introduction:** Intertek-ATI was contracted by Overhead Door Corporation to conduct TAS 201, TAS 202, and TAS 203 testing in accordance with Miami-Dade County requirements. The four specimen(s) tested met the performance requirements set forth in the protocols. The results are summarized in Table 1.

Table 1: Summary of Test Results

Specimen #	Test Protocol	Design Pressure
1	TAS 201 / 203 (Large Missile)	+55.0 / -55.0 psf
2	TAS 201 / 203 (Large Missile)	+55.0 / -55.0 psf
3	TAS 201 / 203 (Large Missile)	+55.0 / -55.0 psf
4	TAS 202	+55.0 / -55.0 psf

- 3.2 Product Type:** Rolling Steel Door
- 3.3 Series/Model:** 800
- 3.4 Miami-Dade County Notification No.:** ATI 16022
- 3.5 Laboratory Certification No.:** 12-0501.01
- 3.6 Test Date(s):** 08/29/16 – 10/14/16
- 3.7 Test Record Retention End Date:** 10/14/26
- 3.8 Test Location:** Intertek-ATI test facility in York, Pennsylvania.

3.0 Project Summary: (Continued)

3.9 Test Specimen Source: The test specimen(s) were provided by the client. Representative samples of the test specimen(s) will be retained by Intertek-ATI for a minimum of ten years from the test completion date.

3.10 Drawing Reference: The test specimen drawings have been reviewed by Intertek-ATI and are representative of the test specimen(s) reported herein. Test specimen construction was verified by Intertek-ATI per the drawings located in Appendix C. Any deviations are documented herein and on the drawings.

3.11 List of Official Observers:

<u>Name</u>	<u>Company</u>
Thomas Steckbeck	Overhead Door Corporation
Timothy J. McGill	Intertek-ATI
Charles L. Anderson, P.E.	Intertek-ATI
Joel Chronister	Intertek-ATI

4.0 Test Protocol(s):

TAS 201-94, *Impact Test Procedures*

TAS 202-94, *Criteria for Testing Impact & Non Impact Resistant Building Envelope Components Using Uniform Static Air Pressure*

TAS 203-94, *Criteria for Testing Products Subject to Cyclic Wind Pressure Loading*

ASTM E8-15a, *Standard Test Method for Tensile Testing of Metallic Materials*

5.0 Test Specimen Description:

5.1 Product Sizes: Table 2 provides product sizes for the overall test specimen(s) and operable components.

Table 2: Overall Specimen and Operable Component Sizes

Overall Area: 20 m ² (220.0 ft ²)	Width		Height	
	millimeters	inches	millimeters	inches
Overall size	6706	264	3048	120

5.0 Test Specimen Description: (Continued)

5.2 Test Chamber Construction: The doors were installed and tested in a steel chamber with a concrete jamb on one side and a 12" by 12" by 1/4" thick steel jamb on the other side.

5.3 Garage Door Description: The steel garage door utilized a 22' door opening width and a 10' door opening height. Both interior and exterior mounting conditions were installed and tested. The steel door curtain was constructed of 269-1/4" wide by 2-15/16" high by 0.032" (20 gauge) thick interlocking slats. Windlocks were located at each end of every slat and were secured using two 3/16" stainless steel pop rivets. The steel jamb utilized an "E" guide track and the concrete jamb utilized a "Z" guide track. Both the steel jamb and the concrete jamb utilized a 4" by 3" by 3/8" thick "L" shaped steel installation angle. The guide tracks consisted of a 3-1/2" by 3-1/2" by 1/4" thick "L" shaped steel angle and a 2" by 3" by 1/4" thick "L" shaped steel angle pancaked around the installation angle. The guide tracks were fastened to the installation angle with ten 5/8" x 2" long grade 5 hex head bolts, located 6" from the bottom and spaced 18" on center for the first five bolts closest to the sill and 10" on center for the second five bolts furthest from the sill. The bottom bar was composed of two 3" by 2" by 0.180" cold rolled angles secured to the bottom half slat with 5/16" x 1" long carriage bolts spaced 5-1/2" from the end and 24" on center. Two carriage bolts were utilized at each location spaced 1-9/16" apart. The bottom bar utilized two 3-1/2" by 3" by 1/8" thick pieces of vinyl at both ends as well as a 1" diameter hollow bulb gasket kerf-mounted and pancaked between the bottom bar angles. A manual chain-hoist consisting of a gear system was used to operate the door. The hood assembly was constructed from two 0.025" (24 gauge) roll-formed steel panels and two 3" wide by 3/8" thick roll-formed steel reinforcement bars. The hood panels were attached to the headplate assembly and the reinforcement bars using 1/4" x 1/2" long hex head self-tapping screws.

5.4 Installation: The installation represented an interior mount and an exterior mount. Test specimens #1 and #2 were exterior mounted and test specimens #3 and #4 were interior mounted. The installation angles were secured to the steel column with grade 5, 5/8" diameter x 1-1/4" long bolts, 6" from the bottom and spaced 18" on center for the first five bolts closest to the sill and 10" on center for the second five bolts furthest from the sill. The "Z" guide was secured to the concrete column with 5/8" diameter by 7" long concrete anchors with 3-1/2" of embedment, 6" from the bottom and spaced 18" on center for the first five bolts closest to the sill and 10" on center for the second five bolts furthest from the sill.

6.0 Test Results: The temperature during TAS 202 testing was 63°F. Results are tabulated as follows:

6.1 Protocol TAS 202-94, Static Air Pressure

Table 3 provides the results for positive and negative uniform static load test at a duration of 30 seconds.

Table 3: Test Specimen #4 TAS 202, Preload and Design Load Test Results

Load (psf)	Indicator Location	Deflection (in.)		Permanent Set (in.)	
		Measured	Allowed	Measured	Allowed
+41.25 50% of Test Pressure	1	0.55	N/A	0.04	N/A
	2	14.11	N/A	0.54	N/A
	3	0.86	N/A	0.08	N/A
+55.00 Design Pressure	1	0.60	N/A	0.05	N/A
	2	14.62	N/A	0.45	N/A
	3	0.87	N/A	0.02	N/A
-41.25 50% of Test Pressure	1	1.05	N/A	0.01	N/A
	2	17.31	N/A	0.33	N/A
	3	1.10	N/A	0.23	N/A
-55.00 Design Pressure	1	1.14	N/A	0.04	N/A
	2	17.78	N/A	0.37	N/A
	3	1.19	N/A	0.17	N/A

Table 4 provides the results for the structural overload test.

Table 4: Test Specimen #4 TAS 202, Structural Overload Test Results

Load (psf)	Indicator Location	Deflection (in.)		Permanent Set (in.)	
		Measured	Allowed	Measured	Allowed
+82.50 Test Pressure	1	0.71	N/A	0.08	N/A
	2	16.41	N/A	0.22	N/A
	3	0.97	N/A	<0.01	N/A
-82.50 Test Pressure	1	1.42	N/A	0.07	N/A
	2	18.99	N/A	0.32	N/A
	3	1.59	N/A	0.03	N/A

6.0 Test Results: (Continued)

6.1 Protocol TAS 202-94, Static Air Pressure

Table 5 provides the results for the forced entry resistance test.

Table 5: Test Specimen #4 TAS 202, Forced Entry Test Results

Title of Test	Results	Allowed
Forced Entry Resistance in accordance with AAMA 1304-02	Pass	No Entry

Note: See Intertek-ATI Sketch #1 for indicator locations. Deflection/permanent set reported is the overall deflection between three points (longest unsupported span) which accounts for support movement.

Conclusion: Intertek-ATI observed no signs of failure in any area of the test specimen during the TAS 202 testing; as such, the test specimen satisfies the requirements of TAS 202.

6.0 Test Results: The temperature during TAS 201 testing was 70°F to 78°F. Results are tabulated as follows:

6.2 Protocol TAS 201-94, Large Impact Procedures

Tables 6, 7, and 8 provide the results for the large missile impact test.

Table 6: Test Specimen #1 TAS 201, Large Missile Impact Test Results

Impact #	Missile Weight (lbs.)	Missile Length (in.)	Missile Velocity (ft./sec.)
1	9.16	98-1/2	49.6
2	9.16	98-1/2	49.7
3	9.16	98-1/2	49.5

Table 7: Test Specimen #2 TAS 201, Large Missile Impact Test Results

Impact #	Missile Weight (lbs.)	Missile Length (in.)	Missile Velocity (ft./sec.)
1	9.16	98-1/2	49.8
2	9.16	98-1/2	49.6

Table 8: Test Specimen #3 TAS 201, Large Missile Impact Test Results

Impact #	Missile Weight (lbs.)	Missile Length (in.)	Missile Velocity (ft./sec.)
1	9.16	98-1/2	49.5
2	9.16	98-1/2	49.6

Note: See Intertek-ATI Sketch #2 for impact locations.

Conclusion: The large missiles impacted each intended target and Intertek-ATI carefully inspected each impact location. Intertek-ATI observed no signs of penetration, rupture, or opening after the large missile impact test; as such, each test specimen satisfies the large missile requirements of TAS 201.

6.0 Test Results: The temperature during TAS 203 testing was 70°F to 78°F. Results are tabulated as follows:

6.3 Protocol TAS 203-94, Cyclic Wind Pressure Loading

Tables 9 through 17 provide the results for the positive and negative cyclic load test.

Table 9: Test Specimen #1 TAS 203, Cyclic Test Spectrum and Average Cycle Time

Design Pressure	+55.0 / -55.0 psf	Stage		
		1	2	3
Positive Pressure Range (psf)		0 – 27.5	0 – 33.0	0 – 71.5
Average Cycle Time (sec.)		7.5	8.6	N/A
Number of Cycles		600	70	1
Stage		4	5	6
Negative Pressure Range (psf)		0 – 27.5	0 – 33.0	0 – 71.5
Average Cycle Time (sec.)		6.5	8.5	N/A
Number of Cycles		600	70	1

Table 10: Test Specimen #1 TAS 203, Positive Cyclic Load Test Results

Indicator Location	Maximum Deflection (in.)	Permanent Set (in.)
1	0.98	0.01
2	14.36	0.58
3	1.07	0.05

Table 11: Test Specimen #1 TAS 203, Negative Cyclic Load test results

Indicator Location	Maximum Deflection (in.)	Permanent Set (in.)
1	0.83	<0.01
2	17.07	0.24
3	0.80	0.02

Note: See Intertek-ATI Sketch #1 for indicator locations. Deflection/permanent set reported is the overall deflection between three points (longest unsupported span) which accounts for support movement.

6.0 Test Results: (Continued)

6.3 Protocol TAS 203-94, Cyclic Wind Pressure Loading

Table 12: Test Specimen #2 TAS 203, Cyclic Test Spectrum and Average Cycle Time

Design Pressure	+55.0 / -55.0 psf	Stage		
		1	2	3
Positive Pressure Range (psf)		0 – 27.5	0 – 33.0	0 – 71.5
Average Cycle Time (sec.)		6.9	8.8	N/A
Number of Cycles		600	70	1
Stage		4	5	6
Negative Pressure Range (psf)		0 – 27.5	0 – 33.0	0 – 71.5
Average Cycle Time (sec.)		7.1	8.3	N/A
Number of Cycles		600	70	1

Table 13: Test Specimen #2 TAS 203, Positive Cyclic Load Test Results

Indicator Location	Maximum Deflection (in.)	Permanent Set (in.)
1	0.91	0.03
2	15.27	0.03
3	1.20	0.02

Table 14: Test Specimen #2 TAS 203, Negative Cyclic Load Test Results

Indicator Location	Maximum Deflection (in.)	Permanent Set (in.)
1	0.71	0.53
2	18.36	6.87
3	0.80	0.13

Note: See Intertek-ATI Sketch #1 for indicator locations. Deflection/permanent set reported is the overall deflection between three points (longest unsupported span) which accounts for support movement.

6.0 Test Results: (Continued)

6.3 Protocol TAS 203-94, Cyclic Wind Pressure Loading

Table 15: Test Specimen #3 TAS 203, Cyclic Test Spectrum and Average Cycle Time

Design Pressure	+55.0 / -55.0 psf	Stage		
		1	2	3
Positive Pressure Range (psf)		0 – 27.5	0 – 33.0	0 – 71.5
Average Cycle Time (sec.)		5.8	7.7	N/A
Number of Cycles		600	70	1
Stage		4	5	6
Negative Pressure Range (psf)		0 – 27.5	0 – 33.0	0 – 71.5
Average Cycle Time (sec.)		7.5	8.5	N/A
Number of Cycles		600	70	1

Table 16: Test Specimen #3 TAS 203, Positive Cyclic Load Test Results

Indicator Location	Maximum Deflection (in.)	Permanent Set (in.)
1	1.19	0.02
2	16.74	0.30
3	1.15	0.03

Table 17: Test Specimen #3 TAS 203, Negative Cyclic Load Test Results

Indicator Location	Maximum Deflection (in.)	Permanent Set (in.)
1	1.53	0.08
2	17.89	0.55
3	1.31	0.07

Note: See Intertek-ATI Sketch #1 for indicator locations. Deflection/permanent set reported is the overall deflection between three points (longest unsupported span) which accounts for support movement.

Conclusion: Intertek-ATI observed no signs of failure in any area of the test specimens during the cyclic load test; as such, the test specimens satisfy the cyclic load requirements of TAS 203.

6.0 Test Results: (Continued)

6.4 ASTM E8, Tensile Test

Test Method: The test specimens were evaluated in accordance with ASTM E8-16a, *Standard Test Method for Tensile Testing of Metallic Materials*.

Test Procedure: The test specimens were machined and sized in compliance with section 6 of ASTM E8. The specimens were tested using an Instron 3369 Universal Machine (ICN: 005740) utilizing a 50 kN load cell (ICN: 005741) and a Class C Extensometer (ICN: 63959). The cross head operated at a separation speed of 0.2 in/min.

The tensile properties results for the specimens are summarized in Table 18.

Table 18: ASTM E8 Tensile Properties Test Results

Test Specimen	Yield Strength (psi)	Tensile Load (lbf)	Tensile Strength (psi)	Elongation (%)	Area Reduction (%)
1	51,851	964	58,360	26.7	21
2	50,829	933	56,256	25.7	20
3	52,649	947	57,477	21.3	18
4	52,093	939	56,926	18.8	13
5	50,333	929	55,418	16.4	11
6	52,293	913	54,328	13.5	10
Average	51,675	938	56,461	20.4	16

The average Modulus of Elasticity for the tested specimens was 29.58×10^6 psi.

7.0 Test Equipment:

Cannon: Constructed from steel piping utilizing compressed air to propel the missile

Missile: 2x4 Southern Pine

Timing Device: Electronic beam type

Cycling Mechanism: Computer controlled centrifugal blower with electronic pressure measuring device

Deflection Measuring Device: Linear transducers

8.0 Laboratory Compliance Statements:

The following are provided as required by the protocols for the testing reported herein.

Upon completion of testing, specimens tested for TAS 201-94 met the requirements of Section 1626 of the Florida Building Code, Building.

Upon completion of testing, specimens tested for TAS 202-94 met the requirements of Section 1620 of the Florida Building Code, Building.

Upon completion of testing, specimens tested for TAS 203-94 met the requirements of Section 1625 of the Florida Building Code, Building.

Tape and film were used to seal against air leakage during structural testing. In our opinion, the tape and film did not influence the results of the test.

Intertek-ATI will service this report for the entire test record retention period. Test records such as detailed drawings, datasheets, representative samples of test specimens, or other pertinent project documentation, will be retained by Intertek-ATI for the entire test record retention period.

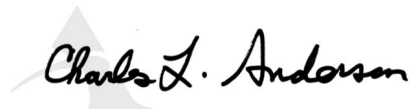
This report does not constitute certification of this product nor an opinion or endorsement by this laboratory. It is the exclusive property of the client so named herein and relates only to the specimen(s) tested. This report may not be reproduced, except in full, without the written approval of Intertek-ATI.

For ARCHITECTURAL TESTING, INC.:



Digitally Signed by: Joel Chronister

Joel Chronister
Technician



Digitally Signed by: Charles Anderson

Charles L. Anderson, P.E.
Regional Laboratory Support Engineer

JC:asm/cmd

Attachments (pages): This report is complete only when all attachments listed are included.

Appendix A: Sketch(es) (2)

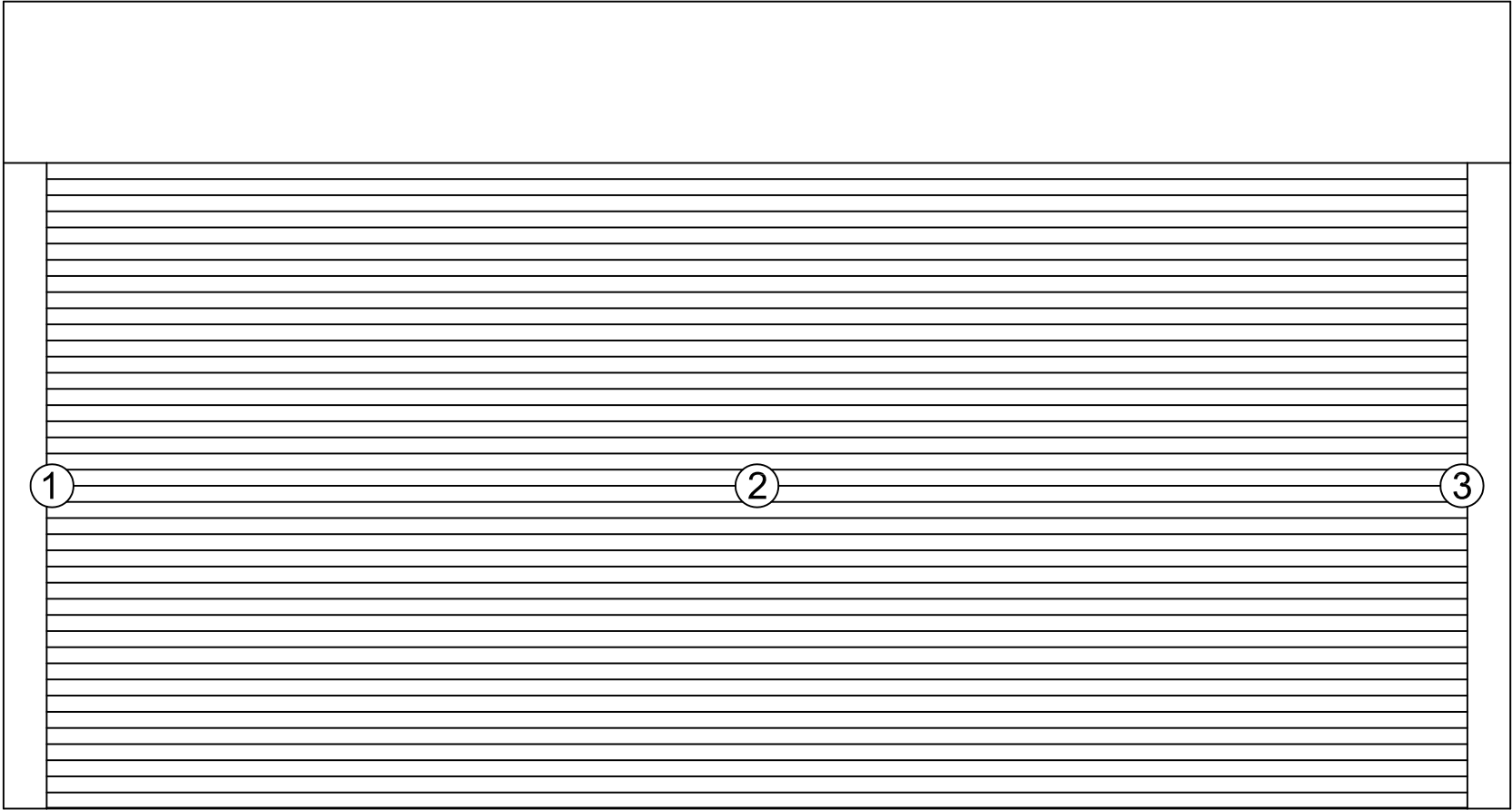
Appendix B: Photograph(s) (1)

Appendix C: Drawing(s) (1)

Appendix A

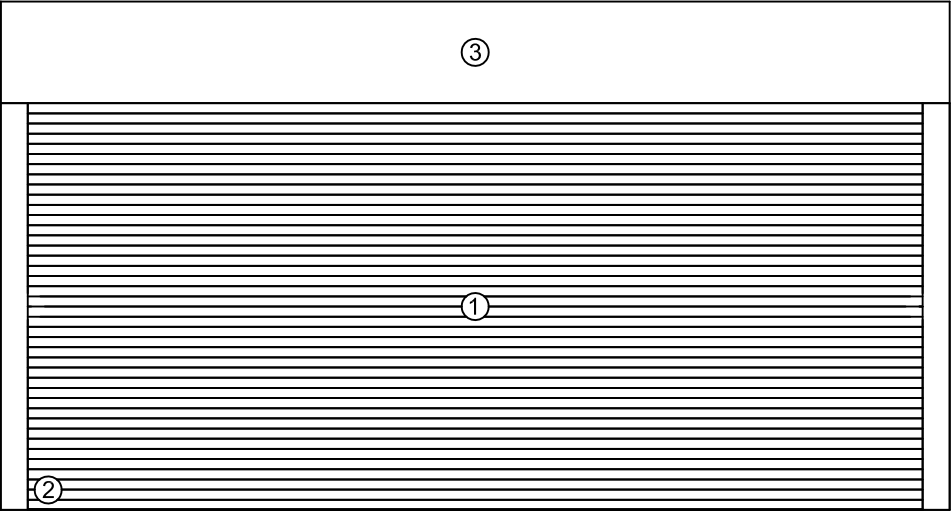
Sketch(es)

REV	DATE	DESCRIPTION	BY

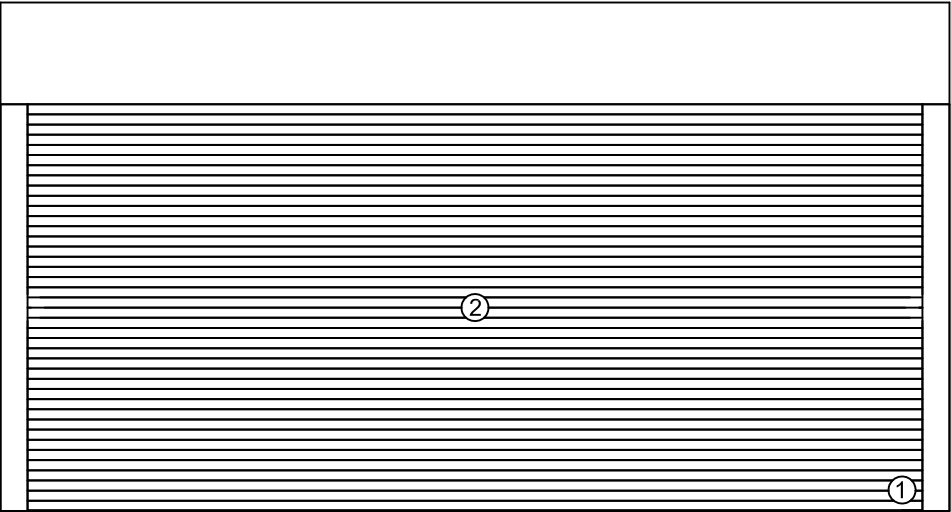


INDICATOR LOCATIONS

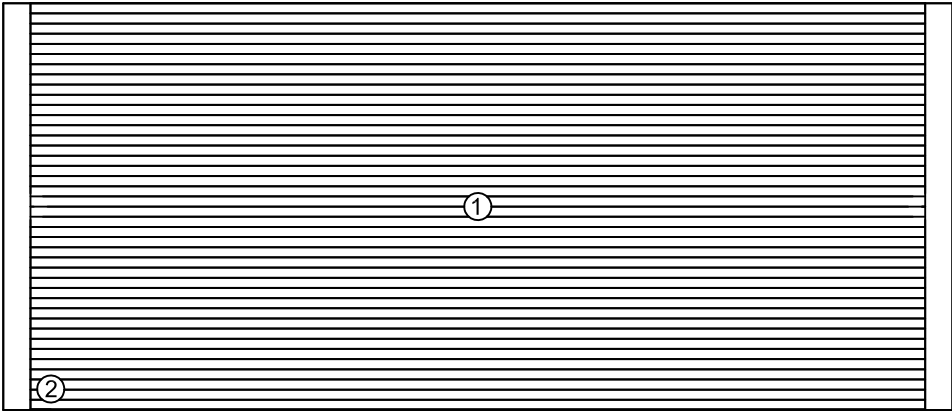
REV	DATE	DESCRIPTION	BY



UNIT #1 EXTERIOR MOUNT



UNIT #2 EXTERIOR MOUNT



UNIT #3 INTERIOR MOUNT

IMPACT LOCATIONS

Appendix B
Photograph(s)



Photo No. 1
Exterior Mounted Specimen



Photo No. 2
Interior Mounted Specimen

Appendix C

Drawing(s)

1. UNIFORM STATIC AIR PRESSURE TEST PERFORMED PER TAS 202.	3. CYCLIC PRESSURE TEST PERFORMED ON 3 SAMPLES PER TAS 203.
2. LARGE MISSILE IMPACT TEST PERFORMED ON 3 SAMPLES PER TAS 201 TO QUALIFY INTERIOR & EXTERIOR MOUNT.	4. TENSILE TEST PERFORMED ON CURTAIN MATERIAL PER ASTM E8
	5. TESTED BY INTERTEK-ATI, YORK, PA

6. CURTAIN MATERIAL: ASTM A-653, GR.40
7. GUIDE MATERIAL: STRUCTURAL STEEL PER ASTM A36
8. HOOD IS 24GA GALVANIZED STEEL
9. WINDLOCKS ATTACHED WITH (2) 3/16" STAINLESS STEEL POP RIVETS
10. RATED DESIGN LOAD: ± 55 PSF



 Report #: F7663.03-109-18
 Date: 10/20/16
 Verified by: *Jul Chernick*



BOTTOM BAR DETAIL



	ASSEMBLY BOLT	WALL BOLT STEEL JAMB	WALL ANCHOR CONCRETE JAMB*
#14 SLAT	5/8" GRADE 2 18" O.C.	5/8" GRADE 2 18" O.C.	5/8" X 3.5" EMBED 18" O.C.

UNLESS OTHERWISE SPECIFIED		APPROVALS		DATE		The Genuine. The Original.		OVERHEAD DOOR CORP LEWISVILLE, TEXAS			
INTERPRET DIMS & TOLS PER ASME Y14.5M		TOLERANCES:		DRAWN T. STECKBECK		8/19/2016				DESCRIPTION 22'x10', 800 SERIES, HVHZ, ±55PSF, WINDLOAD TEST	
ALL DIMS ARE IN INCHES DO NOT SCALE		.X = N/A .XX = N/A .XXX = N/A ANGULAR = N/A		CHECKED		-		-			
		HOLES: < Ø.251 = N/A Ø.251-Ø.500 = N/A > Ø.500 = N/A		APPROVED		-		-			
		ALL GEOMETRY GOVERNED BY 3D CAD DATABASE:		MATERIAL							
				FINISH							
DIMS CIRCLED WITH SYMBOL  ARE CRITICAL TO QUALITY DESIGN FEATURES & MUST MEET APPLICABLE IN-PROCESS INSPECTION STANDARDS.				SIZE		DWG NO.		REV			
				B		035-0042		-			
						SCALE 1:1		UOM =		SHEET1 OF 1	