



MANUFACTURER'S IDENTIFICATION

- 1.0 **NAME OF APPLICANT:** Roll-a-way Storm and Security Shutters
10601 Oak Street N.E.
St. Petersburg, FL33716
(727) 803-9283
- 2.0 **CONTACT PERSON:** Mr. Don Fowler
- 3.0 **HTL NOTIFICATION #:** N/A
- 4.0 **HTL LAB CERTIFICATION #:** Miami- Dade County (01-0205.03), SBCCI (TL9704A),
Texas Department of Insurance (TDI), AAMA, Keystone Certifications

PRODUCT IDENTIFICATION (SHUTTER TEST #2)

- 5.0 **Product Type:** PVC Slat Aluminum Rebar Reinforced Roll Down Shutter System
- 6.0 **Model Number:** P55 End Retention Shutter
- 7.0 **Performance Class:** +82/-106
- 8.0 **Overall Sample Size:** 150-5/16" (w) x 132" (h)
- 9.0 **Configuration:** Face Mounted To Free Standing Posts
- 10.0 **No./Size of Panels:** Two @ 65-11/16 (w) x 132 (h) Shutters – Side by Side
- 11.0 **Drawing:** Roll-a-way Drawing # ESK02-025, Test #2, and all accompanying sheets are incorporated into this test report by reference.

PRODUCT DESCRIPTION

12.0 DETAILED DESCRIPTION:

- 12.1 **This Shutter Assembly consists of the seven components: posts, side tracks, slats, shutter box assembly, handrail, screen frames, and screens.**

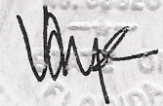
Posts Assembly: Each post is square cut at both ends and mounted directly to the opening as described in the installation section of this report.

Description	Item #	Overall Cross Section	Alloy
Post @ intermediate mullion location	J	3.000" x 4.000" x 0.125"	6005-T5
U Channel Post Base @ intermediate mullion location	N	2.700" x 1.500" x 0.125"	6005-T5
Post @ jamb mullion locations	K	3.000" x 6.000" x 0.125"	6005-T5
Post Base @ jamb mullion locations	M	4.870" x 2.125" x 0.125"	6005-T5

Side Tracks Assembly: Each sidetrack is square cut at its ends and mounted to the posts as described in the installation section of this report.

Description	Item #	Overall Cross Section	Alloy
ER Track (Flanged) @ jamb mullion locations	G	5.000" x 1.075" x 0.095"	6063-T6
ER Track (Double) @ intermediate mullion location	H	6.000" x 1.071" x 0.080"	6063-T6

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5/7/03
Vinu J. Abraham, P.E.
FL Reg. # 53820



5-Sided Shutter Box Assembly: The 5-sided shutter box assembly consists of the following components:

Description	Item #	Overall Cross Section	Alloy
5-sided 10" Die Cast Side Frame	10-5	N/A	N/A
SS Reinforcement Angles	231000020	1.500" x 1.000" x 0.060"	304L
3-1/2" header	U	N/A	6063-T5

Please refer to Roll-a-way Drawing # ESK02-025 for additional details on the overall assembly of the shutter box.

Slat Assembly: All of the slats used in each sample are square cut at the ends and assembled into a roll shutter curtain by sliding the slats together. Both sidetrack members in this sample used to secure the slats to the openings were located such that the slats had a minimum engagement of 5/8" into each sidetrack with retention screws. See Drawing # ESK02-025, page 1 for additional details.

Description	Item #	Overall Cross Section	Alloy
P55 ER (End Retention) Slats	A	2.540" x 0.551" x 0.039"	PVC
Bottom Slat	D	2.520" x 0.500" x 0.050"	6063-T6
P55 ER Rebar	B	0.574" x 0.365" x 0.055"	6005-T5
Picket	L	1.124" x 0.500" x 0.040"	6063-T6

Hand Rail Assembly: The handrail assembly consists of the following components:

Description	Item #	Overall Cross Section	Alloy
Picket	L	1.124" x 0.500" x 0.040"	6063-T6
Handrail Mount	Q	0.875" x 3.750" x 0.125"	6063-T5
Angle	R	1.000" x 2.000" x 0.125"	6063-T6
Handrail/Chairrail	Y	2.000" x 2.000" x 0.056"	6063-T6

Screen Frame: The screen frame consists of the following components: **NOTE:** This sample was not tested with screens. Only the framing was tested. See Drawing # ESK02-025 for additional details.

Description	Item #	Overall Cross Section	Alloy
Screen Frame @ interior and exterior locations	V	2.000" x 1.000" x 0.056"	6063-T6
Screen Frame @ interior locations	X	3.000" x 2.000" x 0.056"	6063-T6

PRODUCT INSTALLATION

13.0 The following section of this report details how this specimen was installed into the CMU opening:

13.1 Posts: The two posts used in this sample were installed as follows:

13.1.1 Intermediate Post: The intermediate post used in this sample was mechanically attached to the concrete opening at the sill location through a post base (Item #N) using two (2), 3/8" x 2-1/4" SS power-bolt (2" minimum). The intermediate post was mechanically attached to the concrete opening at the head location through a post base (Item #M) using two (2), 3/8" x 2-1/4" SS power-bolt (2" minimum).

13.1.2 Jamb Posts: The jamb posts used in this sample were mechanically attached to the concrete opening at the sill location through a post base (Item #M) using four (4), 3/8" x 2-1/4" SS power-bolt (2" minimum). The jamb posts used in this sample were mechanically attached to the concrete opening at the head location through a post base (Item #M) using four (4), 3/8" x 2-1/4" SS power-bolt (2" minimum).

ENGINEER OF RECORD

5/7/03

Vinu J. Abraham, P.E.
 FL Reg. # 53820



13.2 Tracks: The tracks used in each sample were installed as follows:

13.2.1 Side Tracks: The exterior leg of the sidetrack is mechanically attached to the jamb posts using 1/4-14 x 1-1/2" SS Drill-Flex (AG830) spaced 2" away from the bottom end of each track 9" on center thereafter. The interior side of the sidetrack is mechanically attached to the jamb posts using 1/4-14 x 3/4" SS Drill-Flex (AG790) spaced 2" away from the bottom end and 12" on center thereafter. See Drawing # ESK02-025, detail "E" for additional details.

13.2.2 Double Track: The double track is mechanically attached to the middle post using a double row of 1/4-14 x 1-1/2" SS Drill-Flex (AG830) spaced 3" away from the bottom end and 18" on center thereafter. See Drawing # ESK02-025, detail "C" for additional details.

13.3 5-Sided Shutter Box Assembly: The 5-sided shutter box assembly used in this sample was secured to the opening directly at either end via the SS Reinforcement angles. Each SS Reinforcement Angle is attached to the opening through the Die Cast Side Frame using two (2), #14 x 3/4" SS Drill-Flex fasteners located 1/2" away from the end of the angle. There is a 3-1/2" header (Item U) that is butted against the side frame and is attached to the SS Reinforcement Angle using two (2) 1/4-20 x 3/4" SS bolts and nuts.

13.4 Hand Rail Assembly: The handrail is attached to the adjacent posts through the handrail mount using two (2) 1/4-14 x 3/4" SS Drill-Flex (AG790) screws. Each picket is attached to the handrail using two (2), #12 x 3/4" SS SMS. The pickets are spaced 4" from the ends and 4" on center thereafter.

13.5 Screen: NOTE: This sample was not tested with screens. Only the framing was tested.

TEST RESULTS

14.0 TEST CONCLUSION:

Test Method	Test Condition	Conclusion
HTL 0006-0224-03 SPECIMEN #4		
Cyclic Load Test (ASTM E1886 & ASTM E1996)	+ 82 and - 106 psf Design Pressure	PASS
HTL 0006-0224-03 SPECIMEN #10		
Cyclic Load Test (ASTM E1886 & ASTM E1996)	+ 82 and - 106 psf Design Pressure	PASS
HTL 0006-0224-03 SPECIMEN #11		
Cyclic Load Test (ASTM E1886 & ASTM E1996)	+ 82 and - 106 psf Design Pressure	PASS
HTL 0006-0224-03 SPECIMEN #12		
Static Load Test (ASTM E330)	+ 82 and - 106 psf Design Pressure	PASS

15.0 TEST SEQUENCE:

15.1 SPECIMEN #4:

- Positive Cyclic Load Test.
- Negative Cyclic Load Test.

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5/7/03

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FL Reg. # 53820



15.2 SPECIMEN #10:

- a. Positive Cyclic Load Test.
- b. Negative Cyclic Load Test.

15.3 SPECIMEN #11:

- a. Positive Cyclic Load Test.
- b. Negative Cyclic Load Test.

15.4 SPECIMEN #12:

- a. Uniform static load test at positive pre load.
- b. Uniform static load test at positive design pressure.
- c. Uniform static load test at 100% of positive test pressure.
- d. Uniform static load test at negative pre load.
- e. Uniform static load test at negative design pressure.
- f. Uniform static load test at 100% of negative test pressure.

16.0 SPECIMEN #4 TEST RESULTS

16.1 CYCLIC LOAD TEST:

16.1.1 TEST PARAMETERS:

Positive Design Load	82 psf
Negative Design Load	106 psf

16.1.2 TEST SPECTRUM:

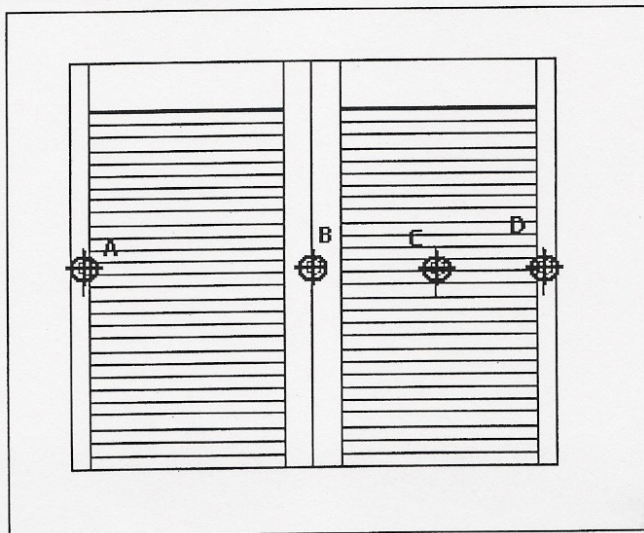
Positive Loads:

# OF INWARD ACTING CYCLES/STAGE			
16.4 – 41 (psf)	0 – 49.2 (psf)	41 – 65.6 (psf)	24.6 – 82 (psf)
3500	300	600	100

Negative Loads:

# OF OUTWARD ACTING CYCLES/STAGE			
31.8 – 106 (psf)	53 – 84.8 (psf)	0 – 63.6 (psf)	21.2 – 53 (psf)
50	1050	50	3350

16.1.3 DEFLECTION GAGE LOCATIONS:



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Vinny J. Abraham

5/7/03
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 FL Reg. # 53820



16.1.4 DEFLECTION DATA:

Location	INWARD (POSITIVE) LOAD			OUTWARD (NEGATIVE) LOAD		
	Max (in.)	Perm. Set (in.)	% Recovery	Max (in.)	Perm. Set (in.)	% Recovery
A	1.38	0.38	72.73	1.75	0.31	82.14
B	2.13	0.13	94.12	2.17	0.05	97.93
C	7.13	1.06	85.09	6.63	0.25	96.23
D	1.31	0.13	90.48	1.75	0.00	100.00

16.2 TEST OBSERVATIONS:

This sample was inspected carefully upon completion of the cyclic test for failures. None were found. As such, this specimen was found to satisfy the cyclic test requirements of ASTM E1886/E1996.

17.0 SPECIMEN #10 TEST RESULTS

17.1 CYCLIC LOAD TEST:

17.1.1 TEST PARAMETERS:

Positive Design Load	82 psf
Negative Design Load	106 psf

17.1.2 TEST SPECTRUM:

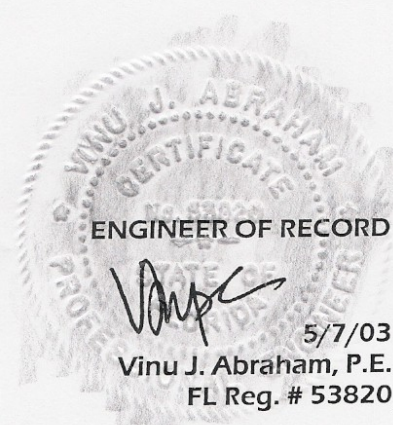
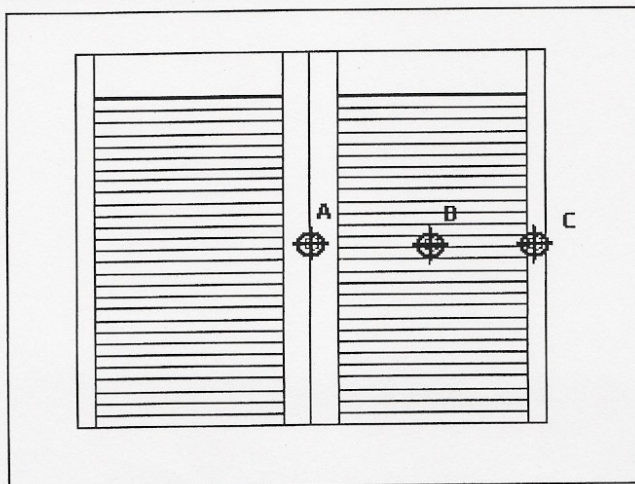
Positive Loads:

# OF INWARD ACTING CYCLES/STAGE			
16.4 – 41 (psf)	0 – 49.2 (psf)	41 – 65.6 (psf)	24.6 – 82 (psf)
3500	300	600	100

Negative Loads:

# OF OUTWARD ACTING CYCLES/STAGE			
31.8 – 106 (psf)	53 – 84.8 (psf)	0 – 63.6 (psf)	21.2 – 53 (psf)
50	1050	50	3350

17.1.3 DEFLECTION GAGE LOCATIONS:



5/7/03

Vinu J. Abraham, P.E.
 FL Reg. # 53820



17.1.4 DEFLECTION DATA:

Location	INWARD (POSITIVE) LOAD			OUTWARD (NEGATIVE) LOAD		
	Max (in.)	Perm. Set (in.)	% Recovery	Max (in.)	Perm. Set (in.)	% Recovery
A	2.88	0.63	78.26	2.63	0.50	80.95
B	6.88	0.75	89.09	6.88	1.38	80.00
C	1.63	0.25	84.62	1.88	0.25	86.67

17.2 TEST OBSERVATIONS:

This sample was inspected carefully upon completion of the cyclic test for failures. None were found. As such, this specimen was found to satisfy the cyclic test requirements of ASTM E1886/E1996.

18.0 SPECIMEN #11 TEST RESULTS

18.1 CYCLIC LOAD TEST:

18.1.1 TEST PARAMETERS:

Positive Design Load	82 psf
Negative Design Load	106 psf

18.1.2 TEST SPECTRUM:

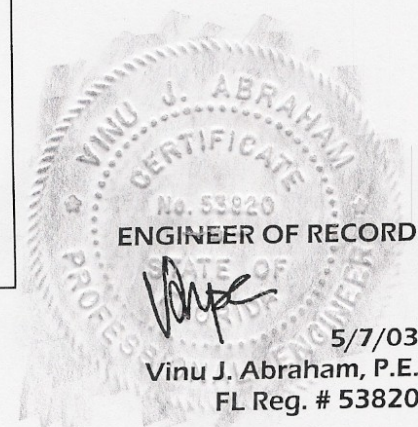
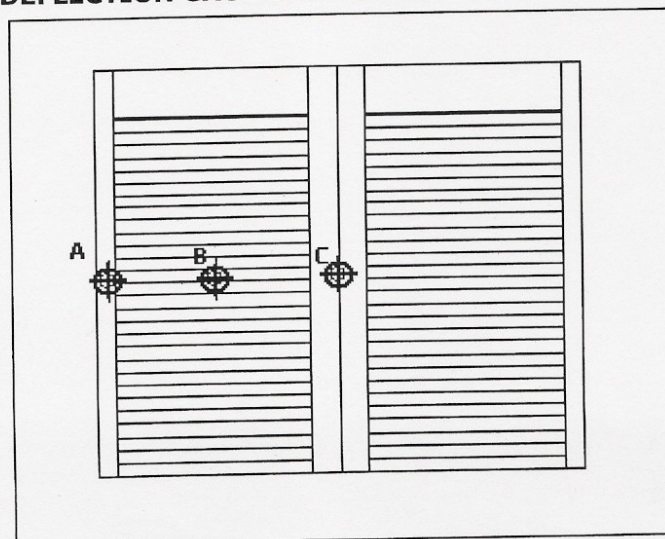
Positive Loads:

# OF INWARD ACTING CYCLES/STAGE			
16.4 – 41 (psf)	0 – 49.2 (psf)	41 – 65.6 (psf)	24.6 – 82 (psf)
3500	300	600	100

Negative Loads:

# OF OUTWARD ACTING CYCLES/STAGE			
31.8 – 106 (psf)	53 – 84.8 (psf)	0 – 63.6 (psf)	21.2 – 53 (psf)
50	1050	50	3350

18.1.3 DEFLECTION GAGE LOCATIONS:



5/7/03
 Vinu J. Abraham, P.E.
 FL Reg. # 53820



18.1.4 DEFLECTION DATA:

Location	INWARD (POSITIVE) LOAD			OUTWARD (NEGATIVE) LOAD		
	Max (in.)	Perm. Set (in.)	% Recovery	Max (in.)	Perm. Set (in.)	% Recovery
A	2.50	0.31	87.50	2.25	0.50	77.78
B	6.38	0.38	94.12	6.25	1.13	82.00
C	1.50	0.00	100.00	1.13	0.25	77.78

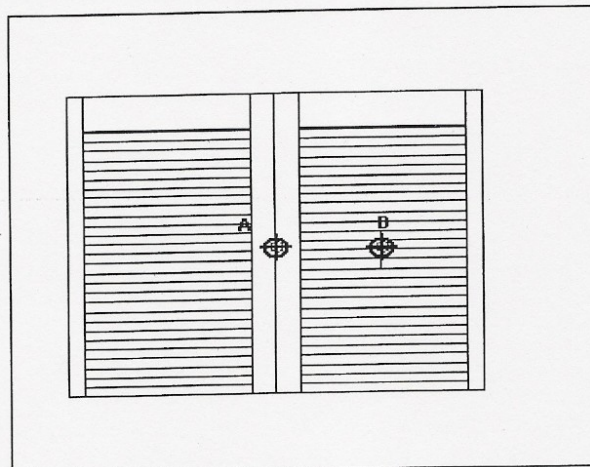
18.2 TEST OBSERVATIONS:

This sample was inspected carefully upon completion of the cyclic test for failures. None were found. As such, this specimen was found to satisfy the cyclic test requirements of ASTM E1886/E1996.

19.0 SPECIMEN #12 TEST RESULTS

19.1 UNIFORM STATIC LOAD TEST:

19.1.1 DEFLECTION GAGE LOCATIONS:



19.1.2 TEST RESULTS:

+ 61.5 psf			
Location	Net Deflection (in.)	Permanent Set (in.)	% Recovery
A	4.69	0.00	100.00
B	1.47	0.01	99.32
+ 82 psf			
Location	Net Deflection (in.)	Permanent Set (in.)	% Recovery
A	5.50	0.00	100.00
B	1.98	0.05	97.47

ENGINEER OF RECORD

5/7/03
 Vinu J. Abraham, P.E.
 FL Reg. # 53820



+ 123 psf			
Location	Net Deflection (in.)	Permanent Set (in.)	% Recovery
A	8.50	0.19	100.00
B	3.25	0.18	94.46

19.1.3 NEGATIVE LOAD:

- 79.5 psf			
Location	Net Deflection (in.)	Permanent Set (in.)	% Recovery
A	7.00	0.13	98.21
B	1.68	0.14	91.67
- 106 psf			
Location	Net Deflection (in.)	Permanent Set (in.)	% Recovery
A	8.25	0.25	96.97
B	2.25	0.21	90.62
+ 159 psf			
Location	Net Deflection (in.)	Permanent Set (in.)	% Recovery
A	9.50	0.50	94.74
B	3.69	0.49	86.72

19.2 TEST OBSERVATIONS:

The static load test performed on this test specimen was completed on 2/28/03 and was conducted according to the test procedure outlined in ASTM E330. No signs of failure were observed in any area of this test specimen during the uniform static load test.

MISCELLANEOUS INFORMATION

20.0 CERTIFICATION & DISCLAIMER STATEMENT:

The test and the results summarized in this test report were conducted in accordance with the specifications of the applicable codes, standards & test methods listed below by the Hurricane Test Laboratory, Inc. located at 6655 Garden Road, Riviera Beach, FL 33404. This report is only intended for the use of the entity named in section 1.0 of this report. The above results were secured by using the designated test methods and they indicate compliance with the performance requirements of the referenced specification.

21.0 APPLICABLE CODES, STANDARDS & TEST METHODS:

ASTM E1886 – Standard Test Method for Performance of Exterior Windows, Curtain Walls, Doors and Storm Shutters Impacted by Missiles(s) and Exposed to Cyclic Pressure Differentials.

ENGINEER OF RECORD

5/7/03

Vinu J. Abraham, P.E.
FL Reg. # 53820



ASTM E1996 – Standard Specification for Performance of Exterior Walls, Glazed Curtain Walls, Doors, and Storm Shutters Impacted by Windborne Debris in Hurricanes.

ASTM E330 - Standard Test Method for Structural Performance of Exterior Windows, Curtain Walls, and Doors by Uniform Static Air Pressure Difference.

22.0 LIST OF OFFICIAL OBSERVERS:

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