BLACKWATER TESTING INC.

7341 Westport Pl Suite 1A, West Palm Beach Fl. 33413

Phone: 561-508-2830 E-mail: Engdep@blackwatertesting.com

REPORT NO: BT-SRS-18-001 MIAMI-DADE CERTIFICATION #17-1010.33

TESTING OF UNIFORM STATIC AIR PRESSURE TAS 202-94 (ASTM E330-02), LARGE MISSILE IMPACT TAS 201-94, CYCLING TAS 203-94 FOR "Shutters"

Test Dates: Start:10/19/2018 End: 10/23/2018

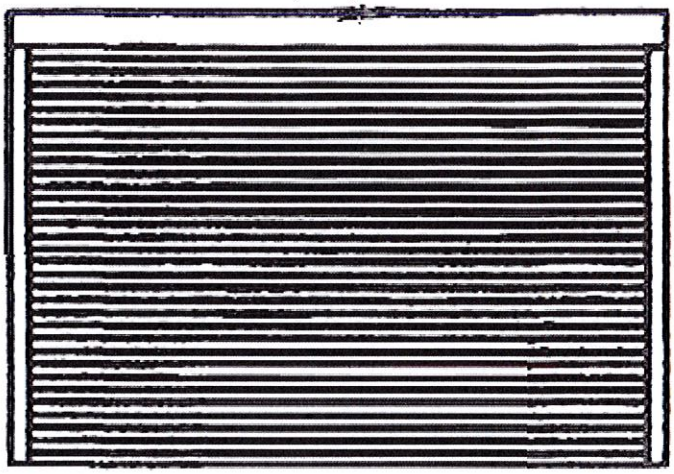
Client:

SECURITY ROLLING SHUTTERS & SHADES, INC

12581 Metro Parkway, Unit: 24

Ft. Myers, FL 33966

Phone: (877) 783-2105



Product Description of Unit	R&D Shutter
Overall Size	Mock Up 1: 60"w x 36"h
	Mock Up 2: 60"w x 24"h
Rough Opening	Mock Up 1: 60"w x 36"h
	Mock Up 2: 60"w x 24"h

Note: Shutters were mounted to a 2x4 SYP wood buck

Test Protocol:

Specimen # 1: Apply incremental negative wind loads starting at 60 psf, unloading and measuring recovery. Continue in 15 psf increments registering recovery again after unloading, all the way until recovery is 80 %. After that , try to get into failure load and register said load.

Specimen # 2: Apply impact at center and corner per TAS201. Then cycle 671 cycles in the negative direction for what ever was the maximum load obtained for specimen # 1 at 80 % recovery divided by 1.5.

Statement of Conformance:

This is a general statement and does not supersede the specific product descriptions in this report. The specimens are in conformance with drawings provided by the manufacturer. These drawings have been marked to indicate the appropriate portions descriptive of this test series. Blackwater Testing Inc. does not take responsibility of product performance and whose only purpose is to test and gather pertinent data under test report format for the client.

Witness to Testing:

Dennis Duffy, BT CEO
Michael Hanrahan, BT Lab Technician
Daniel Hollingshead, BT Lab Technician

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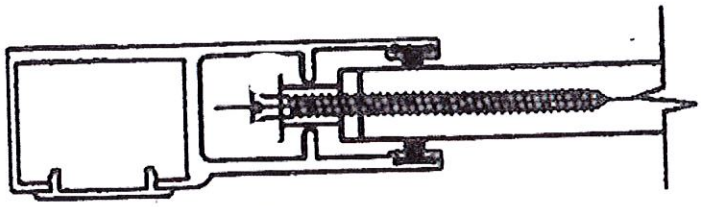
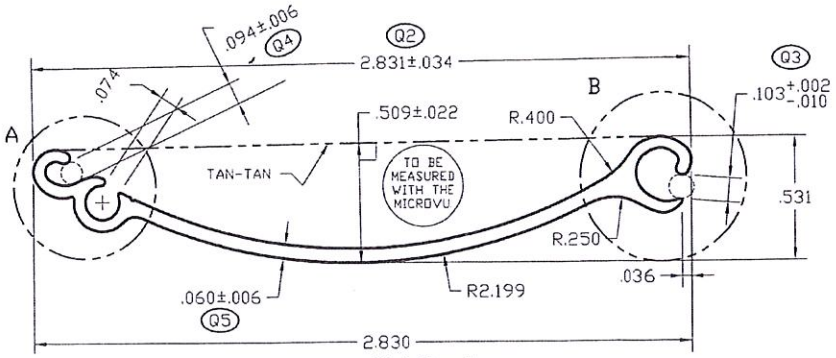
Material Characteristics

Frame and Panel Construction:
Mock Up 1 & 2

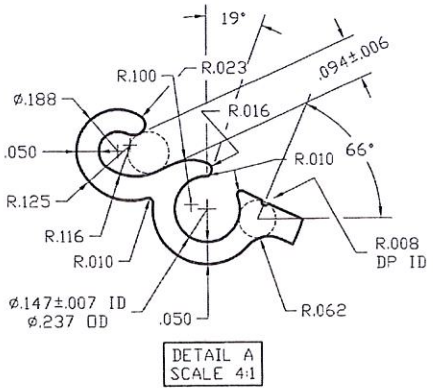
Mounting Condition



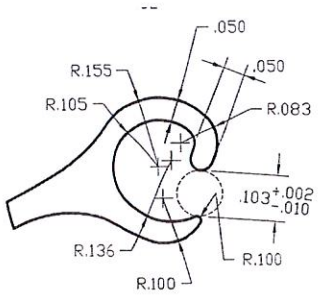
Guide Rail With End Retention



Slat Used



DETAIL A
SCALE 4:1



DETAIL B
SCALE 4:1

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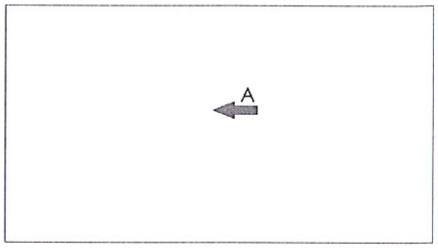
TEST RESULTS



Specimen 1

STATIC LOAD DATA SHEET		psf	Comments: All loads were held at load for 30 s T= 88°F
		60	

Negative Pressure				
Psf	H2O	A	A	Load until recovery is 80% this will be max load.
		Deflection (in.)	Permanent Set (in.)	
60.00	11.54	2.81	0.06	
75.00	14.42	3.25	0.13	
90.00	17.31	3.44	0.00	
105.00	20.19	3.88	0.00	
120.00	23.08	4.00	0.06	
135.00	25.96	4.25	0.00	
150.00	28.85	4.38	0.06	
165.00	31.73	4.63	0.25	
180.00	34.62	4.88	0.13	
195.00	37.50	5.06	0.19	

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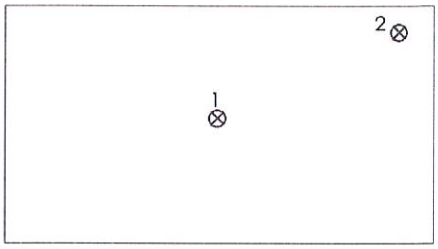
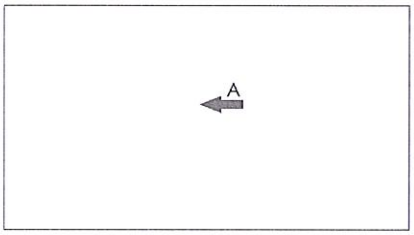


Specimen 2

LARGE MISSLE IMPACT DATA SHEET						
Ambient Temperature	T= °F	Location			Keyence	Results
Sample	Shot	Area	X (in.)	Y (in.)	ft/s	Pass/Fail
Specimen 2	1	Center	32	16	49.9	Pass
Specimen 2	2	Corner	55	18	50	Pass

Notes: 1.
Large Missile Velocity 50 ft/s Measurements taken from bottom left corner.
2. Impacted with a 9.05 lb., 96 "long, S4S, 2x4, of No. 2 Southern Pine lumber.
3. Impact location is given on Cartesian Grid, right (x) and up (y) from lower left hand corner.
4. The location description is relative to the product assembly i.e. Corner, Center, and Left Center.
5. Impact velocity measured with a Keyence KV-16DR, verified by the video method.



Specimen 2

CYCLIC LOAD DATA SHEET						Pd psf
						130
Negative Pressure						
No. of cycles	Range	Load (psf)	Load (H_2O)	A		
				Deflection (in.)	Permanent Set (in.)	
600	0% to 50%	65	12.5	3.563	0.125	
70	0% to 60%	78	15	3.938	0.188	
1	0% to 130%	169	32.5	5.125	0.250	

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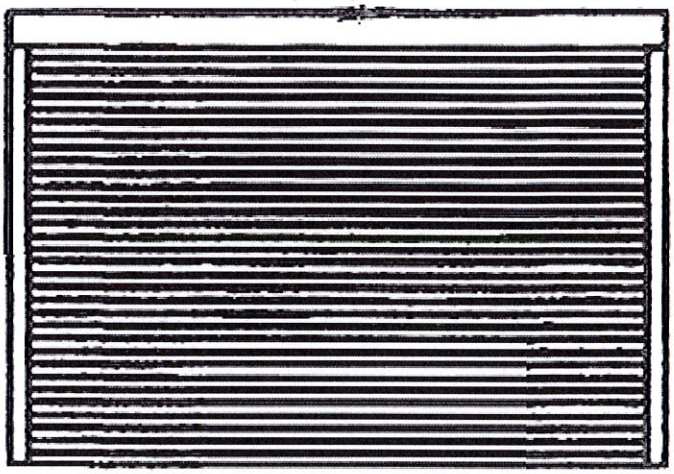

STATIC WIND LOADS: Mock Up 1 was subjected to static wind loads in accordance with **TAS 202-94**. Mock Up 1 completed wind loads to verify a **Max Design Load of 195 PSF.**

LARGE MISSILE IMAPCTS TAS 201-94: Mock Up 2 was subjected to large missile impacts per TAS 201-94. Mock Up 2 passed testing criteria.

CYCLIC LOADS TAS 203-94: Mock Up 2 was subjected to cyclic wind loads in accordance with **TAS 203-94**. Mock Up 2 successfully completed the cyclic wind loads to verify a **Design Load of +/-130 PSF**.

CONCLUSION: Following testing Mock Ups 1& 2 were disassembled. No failures were observed in the fastenings, panes or anchorages. **The "R&D Shutter" product was tested in accordance with and meets the requirements to comply with Florida Building Code 2017.**

Respectfully submitted,

BLACKWATER TESTING INC.
(Miami-Dade Certification #17-1010.33)

NOV 1 5 2018

Dennis Orth, CEO