

PERFORMANCE TEST REPORT

Rendered to:

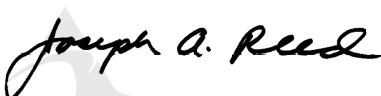
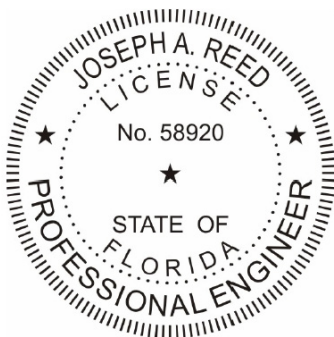
QMI SECURITY SOLUTIONS

SERIES/MODEL: P55 Double End Retention
PRODUCT TYPE: PVC Impact Roll-Down Shutter System

This report contains in its entirety:

Cover Page: 1 page
Report Body: 13 pages
Photos: 5 pages
Sketches: 2 pages
Drawings: 11 pages

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Digitally Signed by: Joseph A. Reed

Date: 2009.07.27 12:48:02 -04'00'

Report No.: 91850.01-401-44
Test Dates: 06/24/09
Through: 07/01/09
Report Date: 07/24/09
Expiration Date: 07/01/13

PERFORMANCE TEST REPORT

Rendered to:

QMI SECURITY SOLUTIONS
10601 Oak Street NE
St. Petersburg, Florida 33716

Report No.: 91850.01-401-44
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Project Summary: Architectural Testing, Inc. was contracted by QMI Security Solutions to perform testing on a Series/Model P55 Double End Retention, PVC impact roll-down shutter system at the Architectural Testing, Inc. test facility in Tampa, Florida. Test specimen description and results are reported herein. The sample was provided by the client.

The test results are such that the product does not satisfy the pass/fail criteria for Wind Zone 4 as specified in Section 7.2.1 of ASTM E1996-05. For Wind Zone 3, because the product does not satisfy both pass/fail criteria of Section 7.1.1, the specifying authority shall determine the suitability of the product.

Test Methods: The test specimen was evaluated in accordance with the following:

ASTM E 330-02, Test Method for Structural Performance of Exterior Windows, Curtain Walls and Doors by Uniform Static Air Pressure Difference.

ASTM E 1886-05, Standard Test Method for Performance of Exterior Windows, Curtain Walls, Doors and Storm Shutters Impacted by Missile(s) and Exposed to Cyclic Pressure Differentials.

ASTM E 1996-05, Standard Specification for Performance of Exterior Windows, Glazed Curtain Walls, Doors and Storm Shutters Impacted by Wind Borne Debris in Hurricanes.

Test Specimen Description:

Series/Model: P55 Double End Retention

Product Type: PVC Impact Roll-Down Shutter System

Overall Size: 1067 mm (42") wide by 2083 mm (82") high

Aluminum Base Slat Size: 946 mm (37-1/4") wide by 63.5 mm (2-1/2") high by 14.3 mm (9/16") deep

PVC Slat Size: 937 mm (36-7/8") wide by 63.5 mm (2-1/2") high by 14.3 mm (9/16") deep

Finish: Aluminum housing box, extruded aluminum tracks and base slat are all painted.

Weatherstripping:

<u>Description</u>	<u>Quantity</u>	<u>Location</u>
Vinyl bulb seal, 3/8" wide by 1/4" high	1	Bottom of the aluminum slat
0.190" high by 0.270" backed polypile with fin seal	1 Each	Interior and exterior sides of End Retention Tracks.

PVC Slat Construction: The slats were fabricated from extruded Poly Vinyl Chloride (PVC) and connected to each other by a knuckle joint, sliding together from end to end. Two pieces of aluminum reinforcement were utilized in the hollows of each slat; one in the top hollow and one in the bottom hollow. Each PVC slat utilized a nylon end cap that was secured with two 3/8" x 1/4" stainless steel staples and two #8-18 x 3-1/2" long 410 stainless steel retaining screws located at each end of the slat. The two retaining screws went through the nylon end cap into the screw boss of the reinforcement with 3" embedment. The base slat was fabricated from extruded aluminum and connected to the PVC slat via the knuckle joint. The base slat did not utilize any reinforcement, end caps or retaining screws. A 3/8" wide by 1/4" high vinyl bulb seal was utilized at the bottom of the base slat.

Hardware:

<u>Description</u>	<u>Quantity</u>	<u>Location</u>
Aluminum housing box (Reference drawing #07-232 sheet 2 of 7 for listing of components)	1	Above the head of opening

Test Specimen Description: (Continued)

Reinforcement: Each PVC slat utilized extruded aluminum reinforcement; 6063-T6 in the top of the slat and 6005-T5 in the bottom of the slat. (Reference drawings #GAS-46374 and #GAS-45356.)

Installation: The test chamber was 51" wide by 80" high by 24" deep and constructed from 8" wide by 2-1/4" deep by 1/4" thick C8 steel channel with welded corners at the head and jambs. A 2" by 2" by 7" long by 1/4" thick steel angle was welded onto the bottom of each jamb and secured to the concrete floor with two 1/4" diameter by 4" long hex head concrete screws. The head and jambs utilized 2" by 2" by 1/4" thick by 24" long steel angle supports welded 16" on center from the C8 channel to the steel test wall and filled with 3/4" plywood, and the perimeter was sealed with silicone for air leakage. Two 72" tall jambs constructed of 8" by 8" grout filled CMU with rebar were utilized. The jambs were secured between the C8 channel and a 6" wide by 71" high by 3/16" thick steel plate with 2" by 2" angle supports 16" on center to the steel wall, with one 5/8" diameter by 12" long threaded rod with a washer and nut at each end located at 16" on center (the center of every other masonry unit).

The head utilized a 50-3/4" long by 8" high by 8" deep grout-filled concrete lintel with rebar. It was secured at the head, between the C8 channel and a 34" wide by 6" deep by 3/16" thick steel plate, with 2" by 2" angle supports 16" on center to the steel wall, with two 5/8" diameter by 12" long threaded rod with a washer and nut at each end located 8" each side of the midspan. A 2" by 2" by 36" long by 1/4" thick steel angle was utilized at the midspan of the jambs at a 45° angle back to the steel test wall for additional support (see Photo No. 1).

The aluminum housing box utilized two extruded aluminum stubs, one at each end on the bottom side of the box. The right side stub was 2-1/2" long by 9/16" wide by 5/8" deep, and the left side stub was 2-1/2" long by 1" wide by 5/8" deep. The left side End Retention Track was 3" wide by 1-1/16" deep by 72" long, and the right side End Retention Track was 2-1/2" wide by 1-1/16" deep by 72" long. Each End Retention Track was slipped over the corresponding stub, with an inside dimension of 35-15/16", and secured to grout-filled CMU with 1/4" diameter by 2-3/4" long stainless steel hex head concrete screws located 3" and 5" from the top of End Retention Tracks and then 4" on center (total of 18). The PVC shutter was loaded onto the spring lock hangers located 6" from each end of the box and then 10" on center (total 4) inside the housing box (reference drawing #07-232 sheet 2 of 7), rolled up into the housing box and rolled back down engaging the Retaining Screws into the End Retention Tracks.

Test Results: The temperature during testing was 86°F. The results are tabulated as follows:

<u>Test Method</u>	<u>Title of Test</u>	<u>Results</u>
ASTM E 330	Uniform Load Deflection	
	(Deflections reported were taken on the horizontal midspan)	
	(Loads were held for 10 seconds)	
	+14,364 Pa (+300.0 psf) (positive)	52.58 mm (2.07")
	-13,742 Pa (-287.0 psf) (negative)	58.17 mm (2.29")
ASTM E 330	Uniform Load Structural	
	(Permanent sets reported were taken on the horizontal midspan)	
	(Loads were held for 10 seconds)	
	+21,546 Pa (+450.0 psf) (positive)	2.29 mm (0.09")
	-20,613 Pa (-430.5 psf) (negative)	0.76 mm (0.03")

Test Results: (Continued)

ASTM E 1886, *Large Missile Impact*

Conditioning Temperature: 25.6°C (78°F)

Missile Weight: 4173 g (9.2 lbs)

Missile Length: 2.4 m (7' 9")

Muzzle Distance from Test Specimen: 5.2 m (17' 0")

Test Unit #1

Impact #1: Missile Velocity: 15.4 m/s (50.4 fps); orientation within $\pm 5^\circ$ of vertical

Impact Area: Midspan of shutter

Observations: Missile hit target area, separated knuckle joint 3/4" deep at the midspan to 1/8" at the ends, 15" long. (See Photo No. 2)
1.13" maximum deflection.

Results: Specifying authority shall determine per ASTM E1996-05 Section 7.1.1

Impact #2: Missile Velocity: 15.0 m/s (49.3 fps); orientation within $\pm 5^\circ$ of vertical

Impact Area: Top right corner of shutter.

Observations: Missile hit target area, dented PVC slats; no penetration.
0.73" maximum deflection

Results: Pass

Test Unit #2

Impact #1: Missile Velocity: 15.5 m/s (50.9 fps); orientation within $\pm 5^\circ$ of vertical

Impact Area: Lower left corner of shutter.

Observations: Missile hit target area, separated knuckle joint 1-1/2" deep at the impact point to 1/4" at the ends, 14-1/4" long. (See Photo No. 3)

Results: Specifying authority shall determine per ASTM E1996-05 Section 7.1.1

Impact #2: Missile Velocity: 15.4 m/s (50.5 fps); orientation within $\pm 5^\circ$ of vertical

Impact Area: Midspan of shutter.

Observations: Missile hit target area, dented PVC slats; no penetration.

Results: Pass

Test Results: (Continued)

ASTM E 1886, Large Missile Impact

Test Unit #3

Impact #1: Missile Velocity: 15.0 m/s (49.1 fps); orientation within $\pm 5^\circ$ of vertical

Impact Area: Upper right corner of shutter.

Observations: Missile hit target area, dented PVC slats; no penetration.

Results: Pass

Impact #2: Missile Velocity: 15.5 m/s (50.8 fps); orientation within $\pm 5^\circ$ of vertical

Impact Area: Midspan of shutter.

Observations: Missile hit target area, dented PVC slats; no penetration.
(See Photo No. 4)

Results: Pass

Note: See Architectural Testing Sketch #2 for impact locations.

Test Results: (Continued)

ASTM E 1886, Air Pressure Cycling

Test Unit #1

Design Pressure: +14,364 Pa / -13,742 Pa (+300.0 psf / -287.0 psf)

POSITIVE PRESSURE

Pressure Range Pa (psf)	Number of Cycles	Average Cycle Time (seconds)	Maximum Deflection at Indicator mm (inch)			
			#1	#2	#3	#4
2871 to 7178 (60 to 150)	3500	2.05	5.33 (0.21)	43.94 (1.73)	7.62 (0.30)	1.02 (0.04)
0 to 8613 (0 to 180)	300	3.93	5.84 (0.23)	51.05 (2.01)	7.87 (0.31)	2.29 (0.09)
7178 to 11,484 (150 to 240)	600	2.52	7.87 (0.31)	54.61 (2.15)	10.67 (0.42)	3.56 (0.14)
4307 to 14,355 (90 to 300)	100	3.56	7.87 (0.31)	60.96 (2.40)	12.19 (0.48)	5.33 (0.21)
			Permanent Set			
			0.51 (0.02)	3.30 (0.13)	2.79 (0.11)	1.78 (0.07)

NEGATIVE PRESSURE

Pressure Range Pa (psf)	Number of Cycles	Average Cycle Time (seconds)	Maximum Deflection at Indicator mm (inch)			
			#1	#2	#3	#4
4115 to 13,733 (86 to 287)	50	2.76	9.40 (0.37)	78.23 (3.08)	9.65 (0.38)	2.54 (0.10)
6890 to 11,006 (144 to 230)	1050	2.42	9.91 (0.39)	71.12 (2.80)	9.65 (0.38)	2.29 (0.09)
0 to 8230 (0 to 172)	50	3.84	8.38 (0.33)	64.01 (2.52)	8.13 (0.32)	2.29 (0.09)
2728 to 6890 (57 to 144)	3350	2.38	9.14 (0.36)	61.72 (2.43)	8.89 (0.35)	2.29 (0.09)
			Permanent Set			
			2.29 (0.09)	1.78 (0.07)	1.52 (0.06)	0.25 (0.01)

Observations: The separation at the knuckle joint was 1/2" deep at the midspan, 1/8" at the ends, 10" long. (See Photo No. 5)

Result: Specifying authority shall determine per ASTM E1996-05 Section 7.1.1

Note: See Architectural Testing Sketch #1 for indicator locations.

Test Results: (Continued)

ASTM E 1886, Air Pressure Cycling

Test Unit #2

Design Pressure: +14,364 Pa / -13,742 Pa (+300.0 psf / -287.0 psf)

POSITIVE PRESSURE

Pressure Range Pa (psf)	Number of Cycles	Average Cycle Time (seconds)	Maximum Deflection at Indicator mm (inch)			
			#1	#2	#3	#4
2871 to 7178 (60 to 150)	3500	2.01	7.11 (0.28)	51.31 (2.02)	7.37 (0.29)	2.29 (0.09)
0 to 8613 (0 to 180)	300	3.94	7.62 (0.30)	58.42 (2.30)	10.92 (0.43)	2.79 (0.11)
7178 to 11,484 (150 to 240)	600	2.92	8.38 (0.33)	62.99 (2.48)	11.94 (0.47)	4.06 (0.16)
4307 to 14,355 (90 to 300)	100	3.91	9.14 (0.36)	69.08 (2.72)	13.21 (0.52)	5.59 (0.22)
			Permanent St			
			2.03 (0.08)	4.57 (0.18)	3.30 (0.13)	0.51 (0.02)

NEGATIVE PRESSURE

Pressure Range Pa (psf)	Number of Cycles	Average Cycle Time (seconds)	Maximum Deflection at Indicator mm (inch)			
			#1	#2	#3	#4
4115 to 13,733 (86 to 287)	50	3.24	12.45 (0.49)	86.61 (3.41)	9.91 (0.39)	1.78 (0.07)
6890 to 11,006 (144 to 230)	1050	1.92	12.19 (0.48)	83.06 (3.27)	10.16 (0.40)	1.52 (0.06)
0 to 8230 (0 to 172)	50	3.71	11.43 (0.45)	77.98 (3.07)	9.65 (0.38)	1.52 (0.06)
2728 to 6890 (57 to 144)	3350	2.14	10.67 (0.42)	70.61 (2.78)	8.89 (0.35)	1.52 (0.06)
			Permanent Set			
			3.30 (0.13)	3.05 (0.12)	2.79 (0.11)	1.02 (0.04)

Observations: Upon completion of Air Pressure Cycling, the separation at the knuckle joint was 1" deep at the target area, 1/8" at the ends, 14" long. (See Photo No. 6)

Result: Specifying authority shall determine per ASTM E1996-05 Section 7.1.1

Note: See Architectural Testing Sketch #1 for indicator locations.

Test Results: (Continued)

ASTM E 1886, Air Pressure Cycling

Test Unit #3

Design Pressure: +14,364 Pa / -13,742 Pa (+300.0 psf / -287.0 psf)

POSITIVE PRESSURE

Pressure Range Pa (psf)	Number of Cycles	Average Cycle Time (seconds)	Maximum Deflection at Indicator mm (inch)			
			#1	#2	#3	#4
2871 to 7178 (60 to 150)	3500	2.12	8.64 (0.34)	50.55 (1.99)	9.91 (0.39)	2.54 (0.10)
0 to 8613 (0 to 180)	300	3.96	9.65 (0.38)	58.93 (2.32)	11.94 (0.47)	4.32 (0.17)
7178 to 11,484 (150 to 240)	600	2.54	11.43 (0.45)	64.52 (2.54)	14.22 (0.56)	7.11 (0.28)
4307 to 14,355 (90 to 300)	100	4.27	14.73 (0.58)	71.88 (2.83)	16.26 (0.64)	9.40 (0.37)
			Permanent Set			
			0.76 (0.03)	10.16 (0.40)	2.54 (0.10)	2.79 (0.11)

Observations: 47 cycles into the negative 30%-100% pressure group, buck failure occurred. The CMU split at the fastener locations releasing End Retention Track from the right side. (See Photo No. 7 and Note #1 below.)

Notes:

1. The CMU columns were replaced with the columns from Specimens #1 and #2. The End Retention Tracks from Specimen #2 were reinstalled with new 1/4" diameter x 2-3/4" long stainless steel hex head concrete screws. The aluminum housing box and PVC shutters from Specimen #3 were reinstalled. Additional support was added to the test chamber.
2. See Architectural Testing Sketch #1 for indicator locations.

Test Results: (Continued)

ASTM E 1886, Air Pressure Cycling (Continued)

NEGATIVE PRESSURE

Pressure Range Pa (psf)	Number of Cycles	Average Cycle Time (seconds)	Maximum Deflection at Indicator mm (inch)			
			#1	#2	#3	#4
4115 to 13,733 (86 to 287)	50	3.35	8.64 (0.34)	56.13 (2.21)	8.64 (0.34)	2.03 (0.08)
6890 to 11,006 (144 to 230)	1050	2.31	8.64 (0.34)	53.59 (2.11)	8.38 (0.33)	1.52 (0.06)
0 to 8230 (0 to 172)	50	3.87	7.37 (0.29)	50.80 (2.00)	7.11 (0.28)	1.02 (0.04)
2728 to 6890 (57 to 144)	3350	2.53	6.86 (0.27)	46.48 (1.83)	6.35 (0.25)	0.51 (0.02)
			Permanent Set			
			1.52 (0.06)	1.02 (0.04)	1.02 (0.04)	0.25 (0.01)

Observations: No additional damage was observed.

Result: Pass

Note: See Architectural Testing Sketch #1 for indicator locations.

General Note: *All testing was performed in accordance with the referenced standards. Specifying authority shall determine suitability of product per ASTM E1996-05 Section 7.1.1*

Test Equipment: (See Appendix A)

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

Missile: 2 x 4 Southern Pine

Timing Device: Electronic Beam Type

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

Deflection Measuring Device: Linear transducers and 1" dial indicators.

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.

Drawing Reference: The test specimen drawings have been reviewed by Architectural Testing and are representative of the test specimen reported herein.

List of Official Observers:

<u>Name</u>	<u>Company</u>
Don Fowler	QMI Security Solutions
Mark Hess	Architectural Testing, Inc.
Scott Parker	Architectural Testing, Inc.

Drawing Reference: The test specimen drawings have been reviewed by Architectural Testing and are representative of the test specimen reported herein.

Detailed drawings, data sheets, representative samples of test specimens, a copy of this report, or other pertinent project documentation will be retained by Architectural Testing, Inc. for a period of four years from the original test date. At the end of this retention period, such materials shall be discarded without notice and the service life of this report will expire.

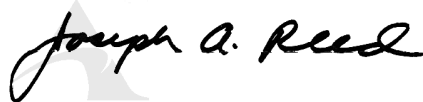
Results obtained are tested values and were secured by using the designated test methods. If test specimen contains glazing, no conclusions of any kind regarding the adequacy or inadequacy of the glass in the test specimen can be made. This report does not constitute certification of this product nor an opinion or endorsement by this laboratory. It is the exclusive property of the client so named herein and relates only to the specimen tested. This report may not be reproduced, except in full, without the written approval of Architectural Testing, Inc.

For ARCHITECTURAL TESTING, INC:



Digitally Signed by: Scott Parker

Scott Parker
Technician



Digitally Signed by: Joseph A. Reed

Joseph A. Reed, P.E.
Director-Engineering and Product Testing

SP:ck/cmd

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

- Appendix-A: Test Equipment (1)
- Appendix-B: Photographs (5)
- Appendix-C: Sketches (2)
- Appendix-D: Drawings (11)

Revision Log

<u>Rev. #</u>	<u>Date</u>	<u>Page(s)</u>	<u>Revision(s)</u>
0	07/24/09	N/A	Original report issue

Appendix A

Test Equipment

Instrument	Manufacturer	Asset #
Temp/Humidity Meter	Davis	004330
Control Panel	Architectural Testing, Inc.	004821
Linear Transducers	Celesco	004285
Linear Transducers	Celesco	004286
Linear Transducers	Celesco	004283
Linear Transducers	Celesco	004284
1" Dial Indicators	Starrett	004266
Air Cannon	Architectural Testing, Inc.	004273
U-Mule 3 (Computer)	Architectural Testing, Inc.	004784
6" Calipers	Mitutoyo	630-1

Appendix B

Photographs



Photo No. 1
Test chamber construction

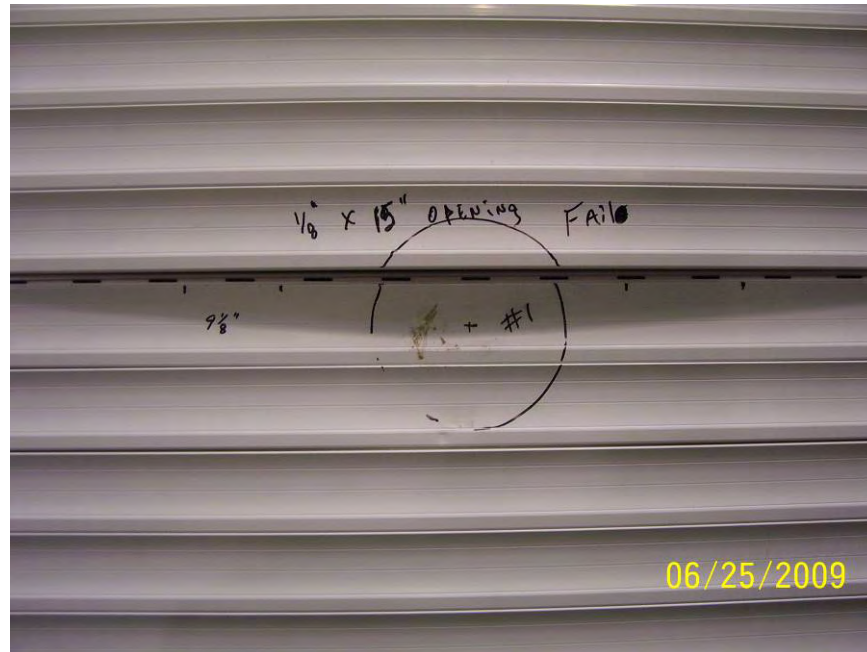


Photo No. 2
Impact Specimen #1
Midspan impact of shutter. Opening is 3/4" deep at the impact area,
1/8" deep at the ends and 15" long.

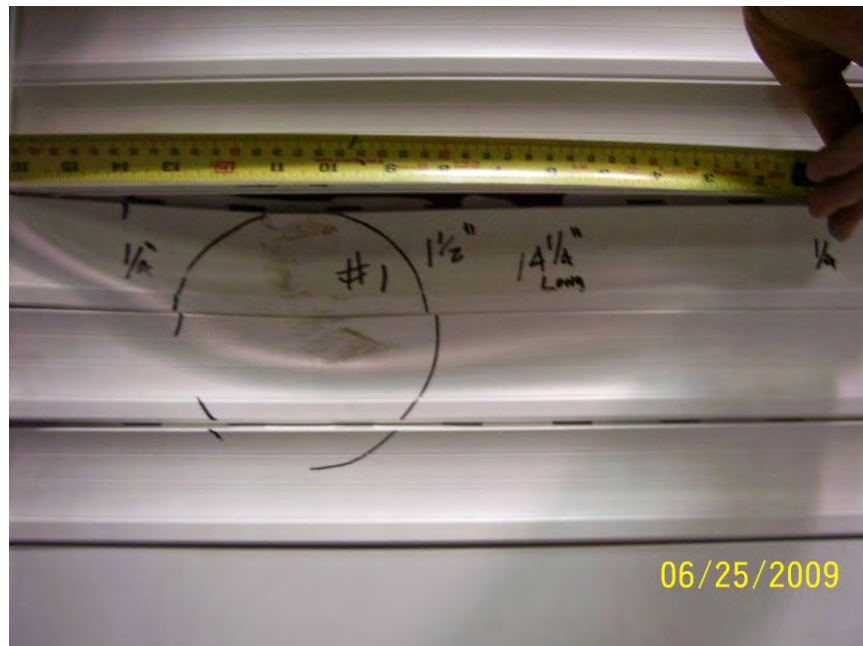


Photo No. 3
Impact Specimen #2
Lower left corner impact of shutter. Opening is 1-1/2" deep at the impact area,
1/4" deep at the ends and 14-1/4" long.



Photo No. 4
Impact Specimen #3
No penetrations or openings

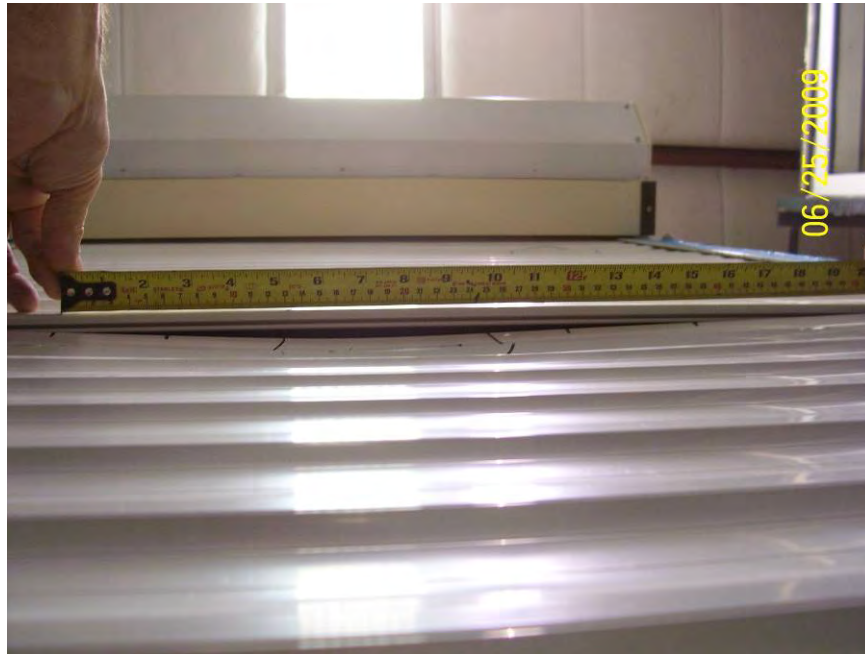


Photo No. 5
Specimen #1 after the Cyclic Pressure Test. An opening of 1/2" deep by 1/8" deep at each end by 10" long remained.



Photo No. 6
Specimen #2 after the Cyclic Pressure Test. An opening of 1" deep by 1/8" deep at each end by 14" long remained.



Photo No. 7

Specimen #3 CMU failure occurred 47 cycles into the 30%-100% negative pressure group.

Appendix C

Sketches



Architectural
Testing

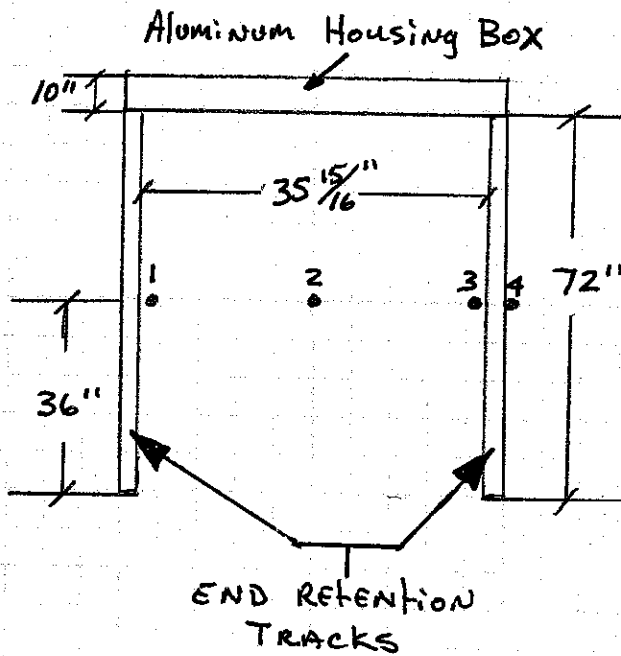
DATE: 7/21/09

BY: SP

PROJECT NO. 91850.01-401-46 SHEET 1 OF 2

PROJECT NAME: QMI Security Solutions

Sketch # 1



• - Indicator Locations
For Specimens #1, 2 & 3



Architectural
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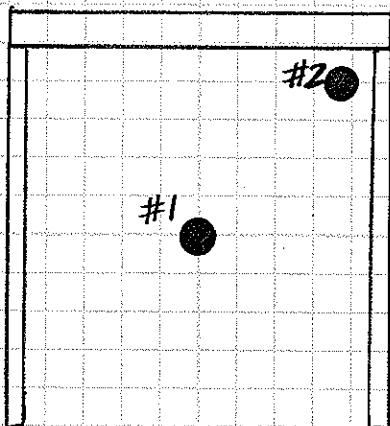
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BY: SP

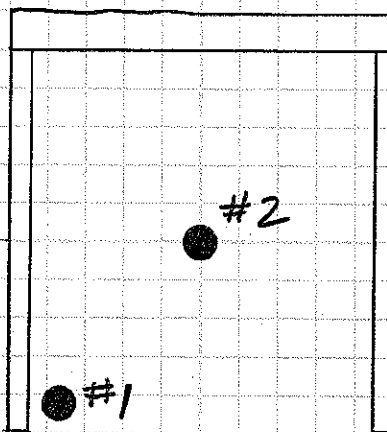
PROJECT NO. 91850.01-901-46 SHEET 2 OF 2

PROJECT NAME: QMI Security Solutions

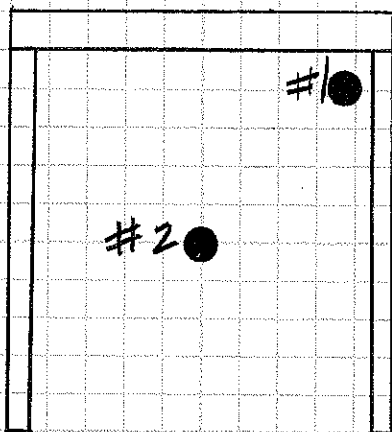
Sketch #2



SPECIMEN #1



SPECIMEN #2



SPECIMEN #3

Appendix D

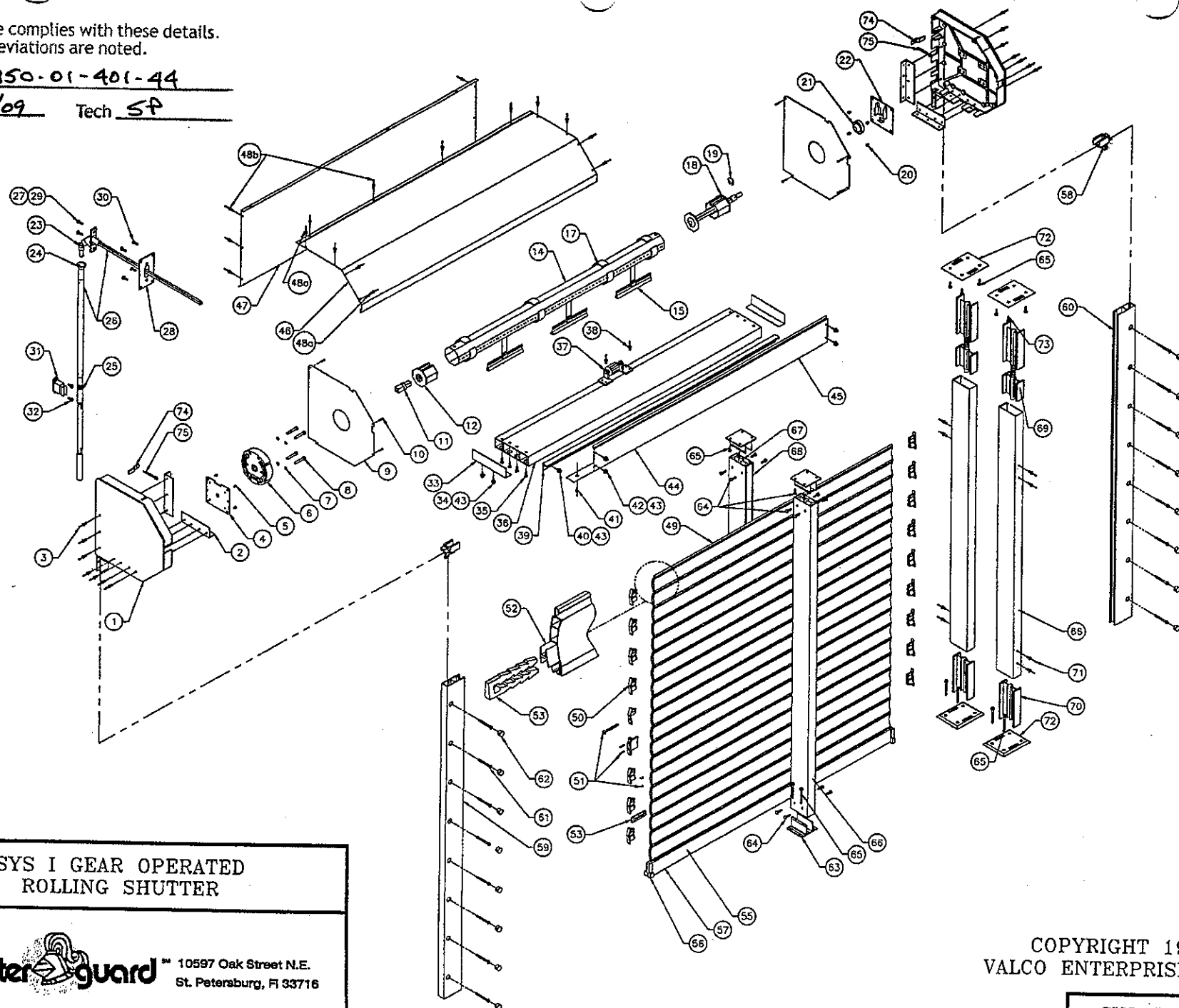
Drawings

Architectural Testing

Test sample complies with these details.
Deviations are noted.

Report# 91850-01-401-44

Date 7/23/09 Tech SP



SYS I GEAR OPERATED
ROLLING SHUTTER

shutter-guard™ 10597 Oak Street N.E.
St. Petersburg, FL 33716

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VALCO ENTERPRISES LTD.

SYS-I-GEAR

Bill of Materials					
System I Shutters					
Operator: Gear					
Ref #	Part Description	Part Number	UOM	Quantity	Notes
1	Sideframes		PR	1	Choose from one of the following
1a	Sideframe Pair, 10" - 5 sided	23-11050C	PR		C=color, 0=mill, 1=white, 2=ivory, 3=bronze
1b	Sideframe Pair, 10" - 6 sided	23-11060C	PR		C=color, 0=mill, 1=white, 2=ivory, 3=bronze
1c	Sideframe Pair, 12" - 5 sided	23-11250C	PR		C=color, 0=mill, 1=white, 2=ivory, 3=bronze
1d	Sideframe Pair, 12" - 6 sided	23-11260C	PR		C=color, 0=mill, 1=white, 2=ivory, 3=bronze
2	Sideframe Support Angles	NPN	EA	2 or 4	Qty = 2 without header & 4 with header
3	Blind Rivet, SSD-66-SSBS	49-482660	EA	6 or 14	To attach S/F support angles, 6 w/o header & 14 w/ header
4	Mounting Plate, Record Gear	31-110260	EA	1	Used to affix 10:1 Record Gear to sideframe.
5	Mounting Plate Fastener	NPN	EA	4	Used to affix gear mntg plate to sideframe, come with plate
6	Gear		EA	1	Choose from one of the following
6a	Gear, Simu 5:1 with stop	33-111215	EA		For shutters up to 35 LBS. Gear is free floating: NOTE: this gear does NOT get a mounting plate nor mounting plate fasteners
6b	Gear, Record, 10:1 with stop	33-111210	EA	1	For shutters up to 52 LBS, the gear is affixed to the sideframe
7	Washer Flat; for 10:1 gear	NPN	EA	2	Goes between cap screw and gear: (comes with gear)
8	Cap Screw; for 10:1 gear	NPN	EA	2	To affix gear to gear mounting plate: (comes with gear)
9	Safety Plate		EA	varies	Choose from one of the following
9a	10" Safety Plate	23-100200	EA		Qty=2, (if US60, P55 w/endlocks, AF200 or Endretention then Qty=0). Need to specify if 9" or 10" setting.
9b	12" Safety Plate	23-100210	EA		Qty=2, (if US60, P55 w/endlocks, AF200 or Endretention then Qty=0). Need to specify if 11" or 12" setting.
10	Tap screw, 6Ax5/16, PN,PH,SS	49-480605	EA	12 or 16	To attach safety plates to S/F, 12 for five sided, 16 for six sided
11	Gear Connector Pinion		EA	1	Choose from one of the following
11a	Gear Connector, Pinion, Simu	31-110230	EA		For 5:1 gear with stop.
11b	Gear Connector, Pinion, Record	NPN	EA		For 10:1 Gear with stop (comes with gear)
12	Cap, End, 60mm, plastic, 13mmhl	32-601450	EA	1	Use as drive cap with gear connector pinion in 60mm reel.
13	Omitted				
14	Reel		FT	varies	Choose from one of the following
14a	Reel, octagon, 60mm OD x .6mm	21-290560	FT		Reel deflection determines reel type
14b	Reel, octagon, 60mm OD x .9mm	21-290520	FT		Reel deflection determines reel type
15	Slat Hangar		EA	varies	Choose from one of the following
15a	Slat Hangar, P55, AF200, plastic bottom	24-100455	EA		For P55, AF200 slats, slat hangars are slit punched and fit into oct.reel
15b	Slat Hangar, US60, R60/65, alum. bottom	24-100470	EA		For US60, R60/65 slats, slat hangars are slit punched and fit into oct.reel
16	Omitted				
17	Reel spacer, 2 1/2 inch reel, nylon	20-142500	EA	varies	Qty = (1 spacer per each slat hangar) + 1
18	Cap, Adjusting, 60mm, plastic	32-601460	EA	1	
19	Retaining Ring, E-Type, 5/8"	49-513362	EA	1	
20	Mounting Plate screws	NPN	EA	4	To attach mounting plate to S/F, comes with plate
21	Bearing, System I	32-601630	EA	1	Affixes to Bearing Mounting Plate
22	Mounting Plate, bearing	31-110250	EA	1	Affixes to sideframe with 4 mounting screws
23	Universal, w/pln, grey	75-601776	EA	1	Used with removable crank handles only
24	Crank Handle, Bell		EA	1	Choose from one of the following
24a	Crank Handle, Bell	75-320020	EA		For stainless steel crank handle; used with universal w/pin
24b	Crank Handle, Bell	75-321120	EA		For aluminum crank handle; used with universal w/pin
25	Label, handle, up/down, w/logo	50-300100	EA	1	affixes to crankhandle
26	Crank Handle, fixed, not pictured		EA	1	Choose from one of the following
26a	Crank Handle, fixed	75-320016	EA		For SS crank handle. Comes with universal attached.
26b	Crank Handle, fixed	75-321116	EA		For alum. crank handle. Comes with universal attached.
27	Universal Mounting Screws	varies	EA	2	When mounting universal, (with no mntg. plate), the fasteners vary with the substrate.
28	Universal Mounting Plate	31-110242	EA	1	Optional, used when universal is wall mounted to drywall
29	Machine Screw, M5 x 8, FL-90, SS	49-491610	EA	2	To attach universal to universal mounting plate
30	Universal Mounting Plate Fasteners	varies	EA	4	Varies with substrate, though usually using #10 x 1 1/2 Tap screw PN, SQ, SS P#49-481015 with 1/4" yellow anchors P#49-492620 to anchor into drywall.
31	Bracket, crank handle, adj	32-601720	EA	1	
32	Fasteners for bracket	varies	EA	2	Varies with substrate though usually using #10 x 1 1/2 Tap screw PN, SQ, SS P#49-481015 with 1/4" yellow anchors P#49-492620 to anchor into drywall.
33	Header Angle Cap		EA	2	Choose from one of the following
33a	Header, Angle Cap, 3 1/2"	75-20350C	EA		C=color, goes on 3 1/2" header
33b	Header, Angle Cap, 5 7/8"	75-20500C	EA		C=color, goes on 5 7/8" header
33c	Header, Angle Cap, 7 1/4"	75-20700C	EA		C=color, goes on 7 1/4" header
34	Tap screw, 8a x 5/8, Oval, SQ, SS	40-425020	EA	varies	Used with finish washers to mount angle cap to header
35	Tap Screw, 12 x 1, PN, SQ, SS	49-110150	EA	4,8,or10	To mount header to sidefrms, 3.5hdr=4, 5 7/8hdr=8, 7 1/4hdr=10
36	Header		FT	varies	Choose from one of the following
36a	Header 3 1/2"	21-29325C	FT		C=color, used on 10' + 12" 5+6 sided sideframes
36b	Header 5 7/8"	21-29340C	FT		C=color, used on 10" + 12" 5+6 sided sideframes



Architectural Testing

Test sample complies with these details.
Deviations are noted.

BOM-Sys I, Gear.xls

2/15/99 11:29 AM, Copyright 1998 Valco Enterprises, Ltd.

Report# _____

Date _____ Tech _____

Bill of Materials					
System I Shutters					
Operator: Gear					
Ref #	Part Description	Part Number	UOM	Quantity	Notes
36c	Header 7 1/4"	21-29350C	FT		C=color, used on 12" 5+6 sided sideframes.
37	Hood roller	24-100550	EA	varies	One hoodroller for each pair of purllins
38	Blind Rivet, SSD-64-SSBS	49-482640	EA	2/roller	To fasten hood roller to header
39	Hood Support	21-29310C	FT	varies	C=color
40	Tap screw, 8a x 5/8, Oval, SQ, SS	40-425020	EA	varies	Used with finish washers to mount hood support to header
41	Blind rivet, AD-42-ABS	49-48142C	EA	varies	C=color, mounts hood support to service panel
42	Service Panel Fasteners		EA	4 or 6	Choose from one of the following
42a	Tap screw, 8a x 3/8, oval, SQ, SS	49-480840	EA	4	To mount service panel with header to sideframes
42b	Tap screw, 8a x 3/8, oval, SQ, SS	49-480840	EA	6	To mount service panel with no header to sideframes
43	Finish Washer, Plastic	49-49197C	EA	varies	C=color, 1 is white, 9 is black, used with all 8A x 5/8 and all 8A x 3/8 Oval, SQ, SS Tap screws.
44	Hood Bottom, with header		FT	varies	Choose from one of the following
44a		25-10506C	FT		For 10' - 5/6 sided, with 3.5" Header
44b		25-10507C	FT		For 10' - 5/6 sided, with 5 7/8" Header
44c		25-12506C	FT		For 12' - 5/6 sided, with 3.5" Header
44d		25-12507C	FT		For 12' - 5/6 sided, with 5 7/8" Header
44e		25-12508C	FT		For 12' - 5/6 sided, with 7 1/4" Header
45	Hood Bottom, without header		FT	varies	Choose from one of the following
45a		25-13215C	FT		For 10' - 5/6 sided
45b		25-15215C	FT		For 12' - 5/6 sided
46	Hood, Top, without backpanel		FT	varies	Choose from one of the following
46a		25-15168C	FT	varies	For 10", 5 sided boxes, C=color
46b		25-13205C	FT	varies	For 10", 6 sided boxes, C=color
46c		25-18168C	FT	varies	For 12", 5 sided boxes, C=color
46d		25-15205C	FT	varies	For 12", 6 sided boxes, C=color
47	Backpanel, (only)		FT	varies	Choose from one of the following
47a	Backpanel, (only), 10'	25-11225C	FT		
47b	Backpanel, (only), 12"	25-13225C	FT		
48	Fasteners		EA	varies	Choose from the following: 48a or 48b
48a	Blind rivet, AD-44-ABS	49-48144C	EA		For top hood only, 8x
48b	Blind rivet, AD-44-ABS	49-48144C	EA		For top hood and backpanel, 18x
49	Slats		FT	varies	Choose from one of the following
49a	R60, Non Vented	22-58000C	FT		C=color, 1=white, 2=ivory, 4=beige, 6=gray
49b	R60, Vented	22-58011C	FT		C=color
49c	R65, Non Vented	22-58500C	FT		C=color, 1=white, 2=ivory, 4=beige, 6=gray
49d	R65, Vented	22-58511C	FT		C=color
49e	P55, Non Vented	22-55500C	FT		C=color, 1=white, 2=ivory, 4=beige, 6=gray
49f	P55, Vented	22-55511C	FT		C=color
49g	US60, Non Vented	22-22600C	FT		C=color, 1=white, 2=ivory, 3=bronze
49h	US60, Vented	22-22601C	FT		C=color
49k	AL, 55MM, Non Vented	22-21155C	FT		C=color, 1=white, 2=ivory, 3=bronze
49L	AL, 55MM, Vented	22-20155C	FT		C=color
50	Endlocks		EA	varies	Choose from one of the following
50a	End locks, P55	20-14090Y	EA	varies	Y=1 for left, 2 for right; every other slat gets 1 left and 1 right endlock
50b	End locks, P55, Endretention	20-14084Y	EA		Y=1 for left, 2 for right; every slat receives 1 left and 1 right endlock.
50c	Endlocks, US60	20-14096Y	EA		Y=1 for left, 2 for right; every other slat gets 1 left and 1 right endlock
50d	Endlocks, AR55	20-140945	EA		Same endlock fits both right and left; every slat gets 2 endlocks
51	Fasteners for endlocks		EA	varies	Choose from one of the following
51a	Tap Screw, 4A x 3/4, OV, PH, SS	20-140170	EA		To attach end locks to US60 slats; 2 per endlock
51b	Staple, 1/4", endlock, PVC/AR55	20-140900	EA		To attach endlocks to slats for P55, P55ER and AF200; 2 per endlock
51c	Tap screw, 12A x 2 1/2, TR, SQ, SS	20-140165	EA		End retention retaining screw; 1 per endlock
52	Rebar		FT	varies	Choose from one of the following
52a	Rebar, R60/65	21-290050	FT		Aluminum, rebar are used in ev.3rd or ev.2nd, or in every slat.
52b	Rebar, P55	21-290000	FT		Aluminum, rebar are used in ev.3rd or ev.2nd, or in every slat.
52c	Rebar, P55, Endretention	21-290055	FT		Used in every slat, not pictured
53	Rebar bushing		EA	varies	Choose from one of the following
53a	Rebar bushing, R60/65	20-140100	EA		Hold rebar in slats w/o end locks; 1 for each rebar
53b	Rebar bushing, P55	20-140150	EA		Hold rebar in slats w/o end locks; 1 for each rebar
54	Omitted				
55	Bottom Slat		FT	varies	Choose from one of the following
55a	Bottom Slat, R60/65	21-29280C	FT		C=color
55b	Bottom slat P55	21-29255C	FT		C=color
56	Up-Stop, New, natural	20-140200	EA	2	Attaches to either end of aluminum bottom slat.
57	Bottom slat weather strip	20-160109	FT	varies	Black, for R60/65, P55 Bottom Slats
58	Terminal Guide		EA	2	Choose from one of the following
58a	Terminal Guide, System I	20-14081S	EA		S=1 for left and 2 for right, 1 left and 1 right per shutter
58b	Terminal Guide, NEW, Endretention	21-50930S	EA		S=1 for left and 2 for right, 1 left and 1 right per shutter, per R.L. 12/4/98



Architectural Testing

Bill of Materials					
System I Shutters					
Operator: Gear					
Ref #	Part Description	Part Number	UOM	Quantity	Notes
59	Tracks		FT	varies	Choose from one of the following
59a	Tracks System I	21-29420C	FT		C=color
59b	Tracks, Endretention	21-29500C	FT		C=color
60	Weatherstripping, Track	20-160200	FT	varies	Weatherstripping with Fin
61	Mounting fasteners	varies	EA	varies	Varies with PSF and substrate; reference Product Approval
62	Hole plugs, 5/8"	19-48580C	EA	varies	C=color, 1=white, 2=ivory, 8=black
63	Purlin base		EA	4	Choose from one of the following
63a	Purlin Base, Anodized, for 2.3" fixed	75-292165	EA		For 2.3" fixed purlin, (Qty=4/pair purlins)
63b	Purlin Base, Anodized, for 3" fixed	75-292180	EA		For 3" fixed purlin, (Qty=4/pair purlins)
63c	Purlin Base, Anodized, for 4" fixed	75-292210	EA		For 4" fixed purlin, (Qty=4/pair purlins)
64	Tap Screw, 12A x 3/4, PN, SQ, SS	49-110125	EA	20	To attach purlin base to header + purlins. For fixed purlins only (Qty=20/pair purlins)
65	Purlin Base/Plate Mtg Screws	varies	EA	12	To fasten bases and plates to flr and ceiling. Varies with PSF and substrate; reference Product Approval. (Qty=12/pr purlins)
66	Purlin		FT	varies	Choose from one of the following
66a	Purlin 2.3"	21-29213C	FT		C=color; Product Approval determines usage
66b	Purlin 3"	21-29214C	FT		C=color; Product Approval determines usage
66c	Purlin 4"	21-29201C	FT		C=color; Product Approval determines usage
67	Purlin Insert		FT	varies	Choose from one of the following
67a	Purlin Insert 2.3"	21-292150	FT		Product Approval determines usage.
67b	Purlin Insert 3"	21-292190	FT		Product Approval determines usage.
67c	Purlin Insert 4"	21-292200	FT		Product Approval determines usage.
68	Weatherstripping, purlin		FT	varies	Choose from one of the following
68a	Weatherstripping, purlin	40-100100	FT		grey, used on 2.3" purlins
68b	Weatherstripping, purlin	20-16050C	FT		C=1 for white, 9 for black, used on 3" and 4" purlins
69	Springloaded Insert Top		EA	1	Choose from one of the following
69a	Springloaded Insert Top, for 2.3"	75-343030	EA		2 per pair of 2.3" springloaded purlins
69b	Springloaded Insert Top, for 3"	75-343040	EA		2 per pair of 3" springloaded purlins
69c	Springloaded Insert Top, for 4"	75-343050	EA		2 per pair of 4" springloaded purlins
70	Insert Purlin Bottom		EA	1	Choose from one of the following
70a	Insert Purlin Btm, for 2.3" spl. purlin	75-292152	EA		2 per pair of 2.3" springloaded purlins
70b	Insert Purlin Btm, for 3" spl. purlin	75-292303	EA		2 per pair of 3" springloaded purlins
70c	Insert Purlin Btm, for 4" spl. purlin	75-292205	EA		2 per pair of 4" springloaded purlins
71	Blind Rivet		EA	4	Choose from one of the following
71a	Blind Rivet, SSD-44-SSBS	49-482440	EA		8 per pair of 2.3" springloaded purlins
71b	Blind Rivet, SSD-56-SSBS	49-482560	EA		8 per pair of 3" springloaded purlins
71c	Blind Rivet, SSD-56-SSBS	49-482560	EA		8 per pair of 4" springloaded purlins
72	Base Plate, Anod., spring loaded		EA	4	Choose from one of the following
72a	Base Plate, Anod., 2.3" spring loaded	31-110720	EA		For 2.3" springloaded purlins, slots for insert legs need to be routed out in header and in concrete
72b	Base Plate, Anod., 3" spring loaded	31-110715	EA		For 3" springloaded purlins, slots for insert legs need to be routed out in header and in concrete
72c	Base Plate, Anod., 4" spring loaded	31-110725	EA		For 4" springloaded purlins, slots for insert legs need to be routed out in header and in concrete
73	Tap Screw, 12A x 3/4, PN, SQ, SS	49-110125	EA	4	To fasten springloaded purlin plate to header
74	Mounting Strip, 2-Bar	24-100600	EA	2	To affix sideframes to structure
75	Fastener	varies	EA	2	Fastener varies according to substrate



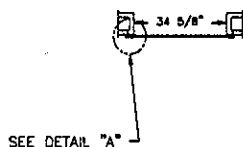
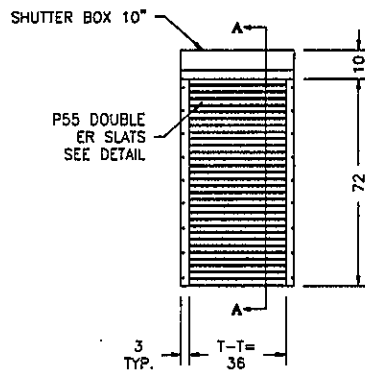
Architectural Testing

Test sample complies with these details.
Deviations are noted.

Report # 91850.01-401-44

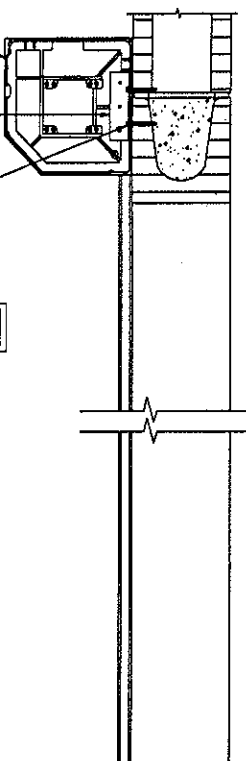
Date 7/23/09 Tech SP

SHUTTER #1
SCALE: 1/4" = 1'-0"
4 SAMPLES - (3) IMPACT AND CYCLIC (1) UNIFORM STATIC

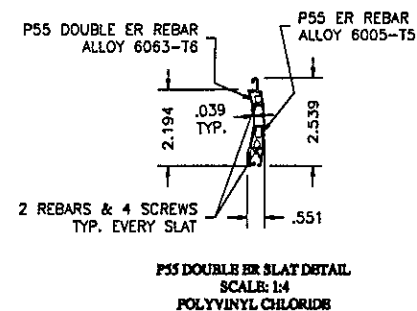
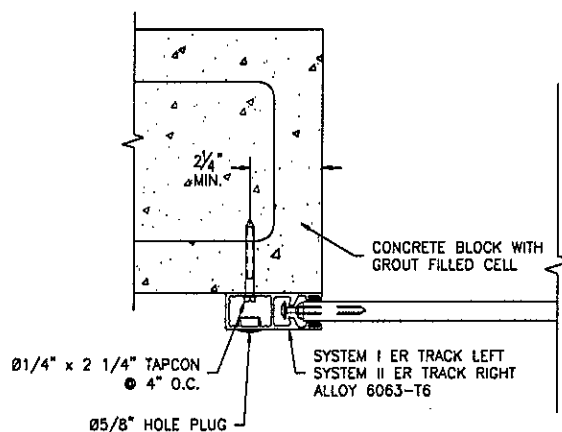


DIE CAST SIDEFRAME
SYS I 10" - 5 SIDED
(10-5 SYS II RIGHT SIDE)
1 1/2" x 1" x 3/32" x 5"
INTERNAL ALUM. ANGLE W/
(3) #56 SS POP RIVETS
TO SIDEFRAME
(2) Ø1/4" x 2 1/4" TAPCON
TO CONCRETE BLOCK

SECTION "A-A"
SCALE 1:10



DETAIL "A"
SCALE 1:4



- NOTES:**
1. DESIGN PRESSURE 300 PSF.
2. ASTM E1886/E1996-05 IMPACT PROTECTIVE SYSTEM TESTING, MISSILE LEVEL, "D".
3. ASTM E830 UNIFORM STATIC TESTING.



Architectural Testing

Test sample complies with these details.
Deviations are noted.

Report# 91850.01-401-44

Date 7/22/09 Tech SP

REV	REVISION	
	REV	DESCRIPTION
A		
B		
C		
D		
E		

THIRD ANGLE PROJECTION	10001 OAK STREET N.E. ST. PETERSBURG, FL 33716 COPYRIGHT © 2003 VALCO ENTERPRISES, LTD.	P55 DOUBLE END RETENTION	HIGH RISE HIGH PSF
DATE	5-15-09	DATE	5-15-09
CHECKED	DLF	DATE	5-15-09
APPROVED	DLF	DATE	5-15-09
DESIGN	DLF	DATE	5-15-09
SCALE	AS NOTED	DATE	5-15-09
BY	B	DATE	5-15-09
PROJECT	S-0509-EG	DATE	5-15-09
SHEET	1	OF	1

Test sample complies with these details.
 Deviations are noted.

Report# 91850.01-401-44

Date 7/23/09 Tech SP

PRODUCTION DRAWING

8/28/00

RELEASED DATE:

G. BRADLEY

RELEASED BY:

DESTROY ALL PREVIOUS COPIES

CUSTOMER ROLL-A-WAY

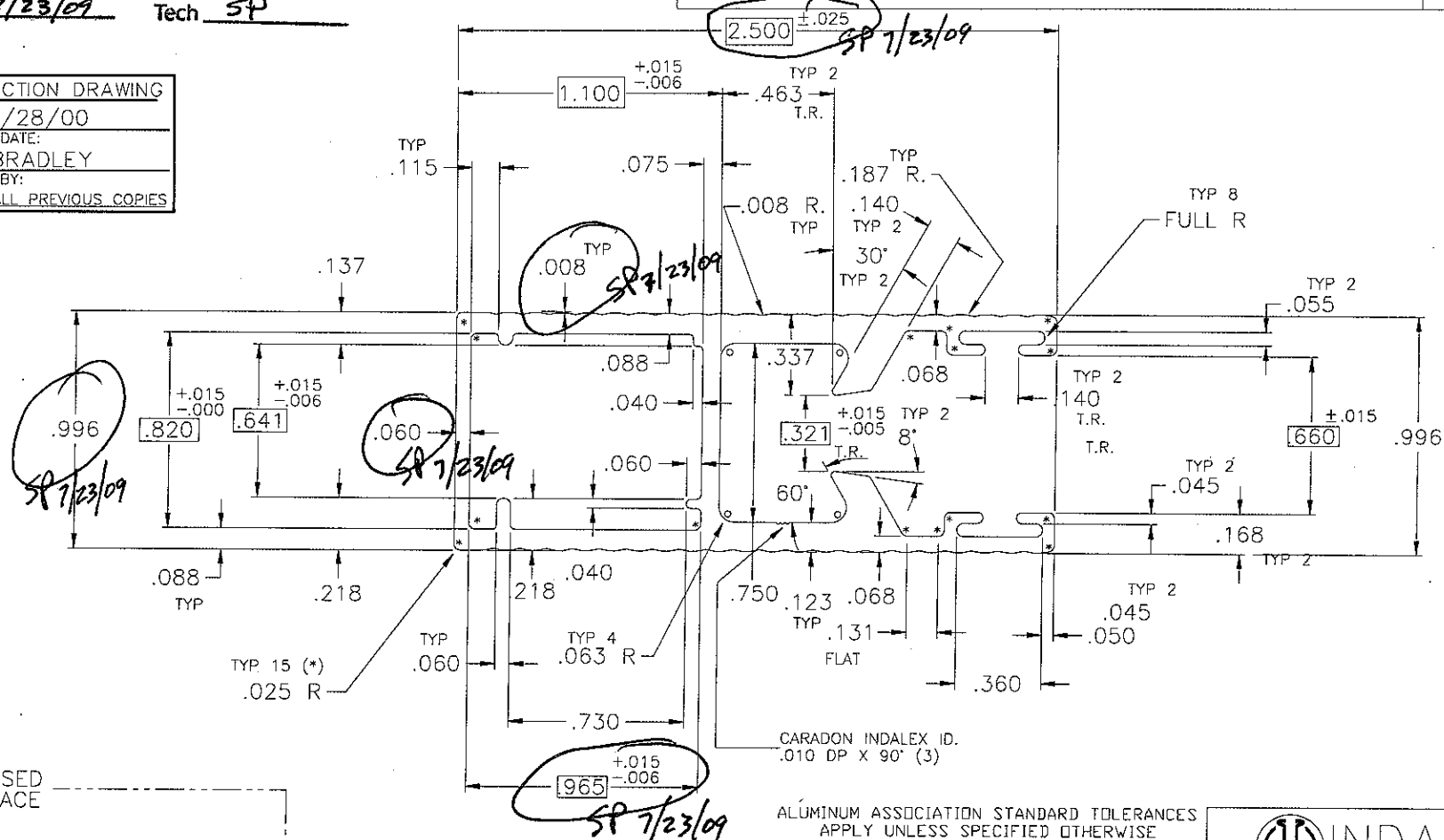
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3-12-463

DIE NO.
GAH-45855

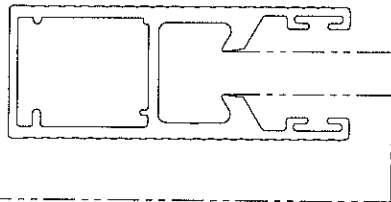
REV.

[illegible]

PROPOSAL NO.
R5769-2



EXPOSED
SURFACE



ACTUAL SIZE

ALUMINUM ASSOCIATION STANDARD TOLERANCES
APPLY UNLESS SPECIFIED OTHERWISE

UNSPECIFIED: WALL THICKNESS

UNSPECIFIED RADIUS .016

DIFF. RATING 3



INDEX

ALUMINUM SOLUTIONS
GAINESVILLE, GEORGIA

EST.AREA	.692 IN ²	DWN BY GB	PRESS 1			GAINESVILLE, GEORGIA	
EST.WT.	.830 LBS/FT.	CKD BY	CAV. 1				
EST.PER.	15.802IN	SCALE 2=1	BACK #NONE				
DWT PER.	11.917IN	CODE -	BOL # 1021				
EXPD PER.	9.602 IN	DATE 8/28/00	RATIO 80				
FACTOR	19	POCKET AREA -	BLADE -				
C.C.D.	2.696 IN	ALLOY 6063-T6		DATE	SYM	REVISION	RY



Date 7/22/09 Tech SP

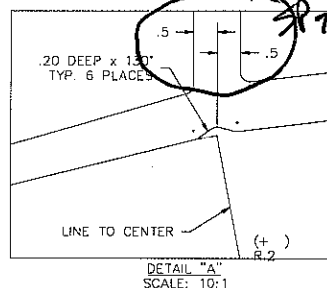
DIE NO.	
GAH-45203	
REV	
BY	
REVISION	
SYM	
DATE	



Test sample complies with these details.
Deviations are noted.

Report# 91850.01-401-44
Date 7/27/1

Date 7/22/09

Tech SP

Top View Dimensions:

- Total width: 10.791
- Left hook width: 5.08
- Distance from left edge to first vertical slot: 3.4
- Distance between vertical slots: 1.78
- Radius of inner corner: R1.11 (+0.1/-0.0)
- Distance from right edge to last vertical slot: 6.18
- Radius of outer corner: R2.91
- Distance from centerline to right edge: 6.08
- Overall length: 45.636
- Distance from left edge to centerline: 3.81
- Distance from centerline to right edge: 9.314
- Right hook width: 6.08
- Overall height: 13.994

Side View Dimensions:

- Height: 52.74 NTS
- Radius of bottom curve: R58.55 NTS
- Distance from centerline to bottom edge: 5.537
- Bottom radius: R120.65 NTS

Notes:

- ALL DIMENSIONS ARE IN MILLIMETERS $\pm 0.1\text{mm}$.
- BREAK ALL SHARP CORNERS WITH A RADIUS OF .2 MILLIMETERS.
- TYP WALL THICKNESS 1mm, HOOK THICKNESS 1.1mm TOLERANCE +0.1, -0.0 mm
- MATERIAL: POLY VINYL CHLORIDE (PVC), SG: 1.48
- ANGLE TOLERANCE ± 1 DEGREE.

Revision History:

REVISION			
DESCRIPTION	APPROVED:	DATE:	
REVISED OLD CAD FILE	HP	3-4-98	

Drawing Information:

DRAWN: PHW DATE: 2-27-98
 APPROVED: HP DATE: 3-4-98
 EST. AREA: 189.6 mm² EST. WT: 85.7 g/m²
 THIRD ANGLE PROJECTION

Roll-a-way
 STORM AND SECURITY BLINDS
 10601 OAK STREET N.E.
 ST. PETERSBURG, FL 33716
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P55 SLAT

SIZE: B FSCM NO: DRAWING NO: 3-12-302 REV: 1

NOTES:

1. ALL DIMENSIONS ARE IN MILLIMETERS $\pm 0.1\text{mm}$.
2. BREAK ALL SHARP CONERS WITH A RADIUS OF .2 MILLIMETERS
3. TYP WALL THICKNESS 1mm, HOOK THICKNESS 1.1mm
TOLERANCE $+0.1, -0.0\text{ mm}$
4. MATERIAL: POLY VINYL CHLORIDE (PVC), SG: 1.48
5. ANGLE TOLERANCE $\pm 1\text{ DEGREE}$.

DRAWN:	PHW	DATE:	2-27-98
APPROVED:	HP	DATE:	3-4-98
EST. AREA:	189.6	EST. WT:	85.7



10601 OAK STREET N.E.
ST. PETERSBURG, FL 33716

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TITLE:



THIRD ANGLE
PROJECTION

P55 SLAT

SIZE: B	FSCM NO:	DRAWING NO: 3-12-302	REV: C
SCALE: 4:1	SHEET 1 OF 1		

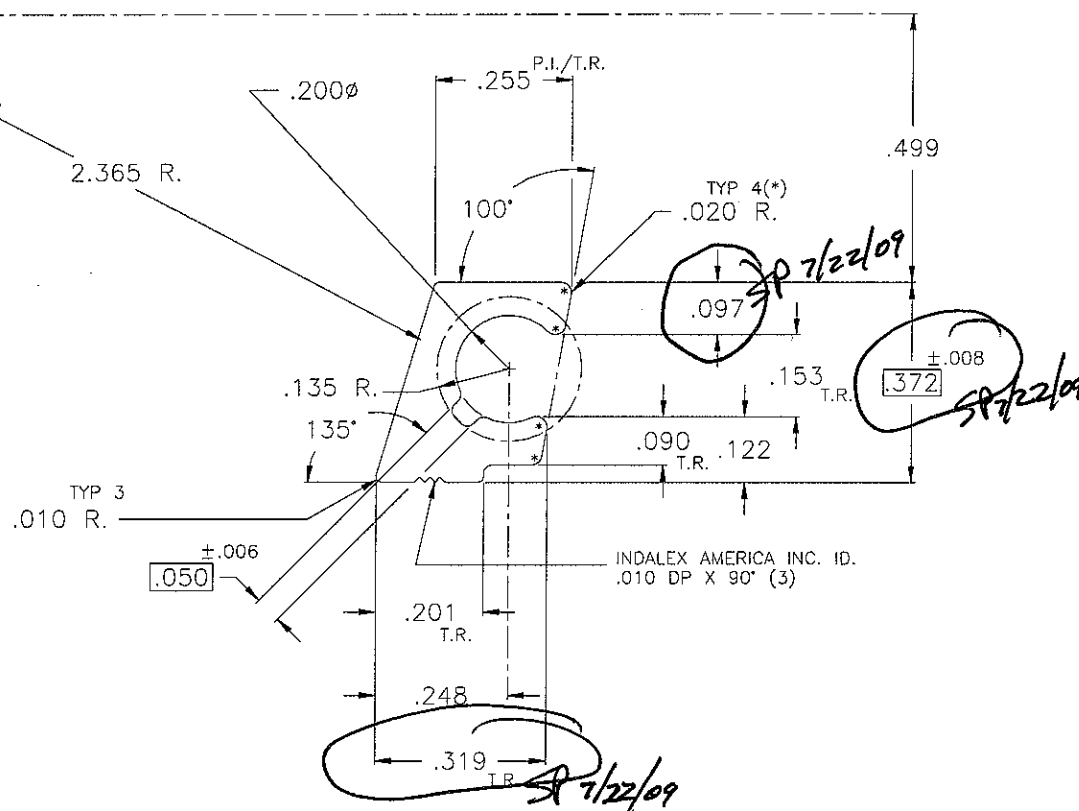
REVISION			
REV	DESCRIPTION	APPROVED:	DATE:
A	REVISED OLD CAD FILE	HP	3-4-98
B	ADDED SPECIFIC GRAVITY, NOTE #4		
C	ADDED TOLERANCES NOTE #1,3,5	OLF	08-22-03

CUSTOMER ROLL-A-WAY

CUSTOMER NO.
4-12-479DIE NO.
GAS-46374

REV.

DESCRIPTION P55 ER REBAR, DOUBLE END RETENTION

PROPOSAL NO.
R6534-1

Test sample complies with these details.
Deviations are noted.

Report# 91850.01-401-44

Date 7/22/09 Tech SP

ALUMINUM ASSOCIATION STANDARD TOLERANCES
APPLY UNLESS SPECIFIED OTHERWISE

UNSPECIFIED: WALL THICKNESS —

UNSPECIFIED RADIUS .016

DIFF. RATING 3



INDALEX AMERICA INC.
2905 OLD OAKWOOD RD.
GAINESVILLE, GA. 30504
770-535-1349
800-544-3801

EST.AREA	.066	IN ²	DWN BY	GB	PRESS	3
EST.WT.	.079	LBS/FT.	CKD BY		CAV.	8
EST.PER.	1.703	IN	SCALE	4=1	BACK #	40454
OUT PER.	—	IN	CODE	—	BOL #	1115
EXPD PER.	—	IN	DATE	8/13/01	RATIO	81
FACTOR	22		POCKET AREA	—	BLADE	—
C.C.D.	.508	IN	ALLOY	6063-T6		

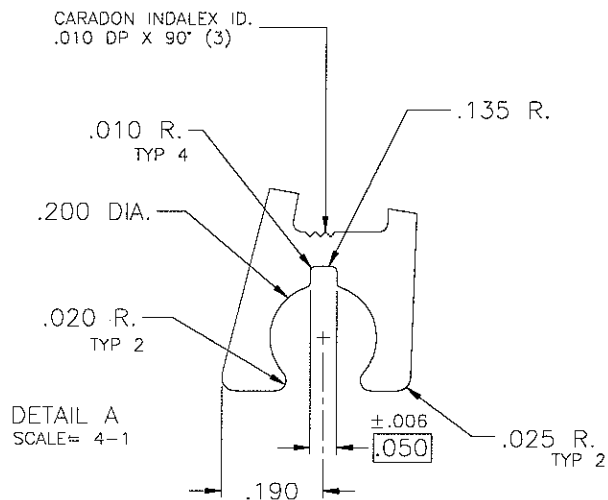
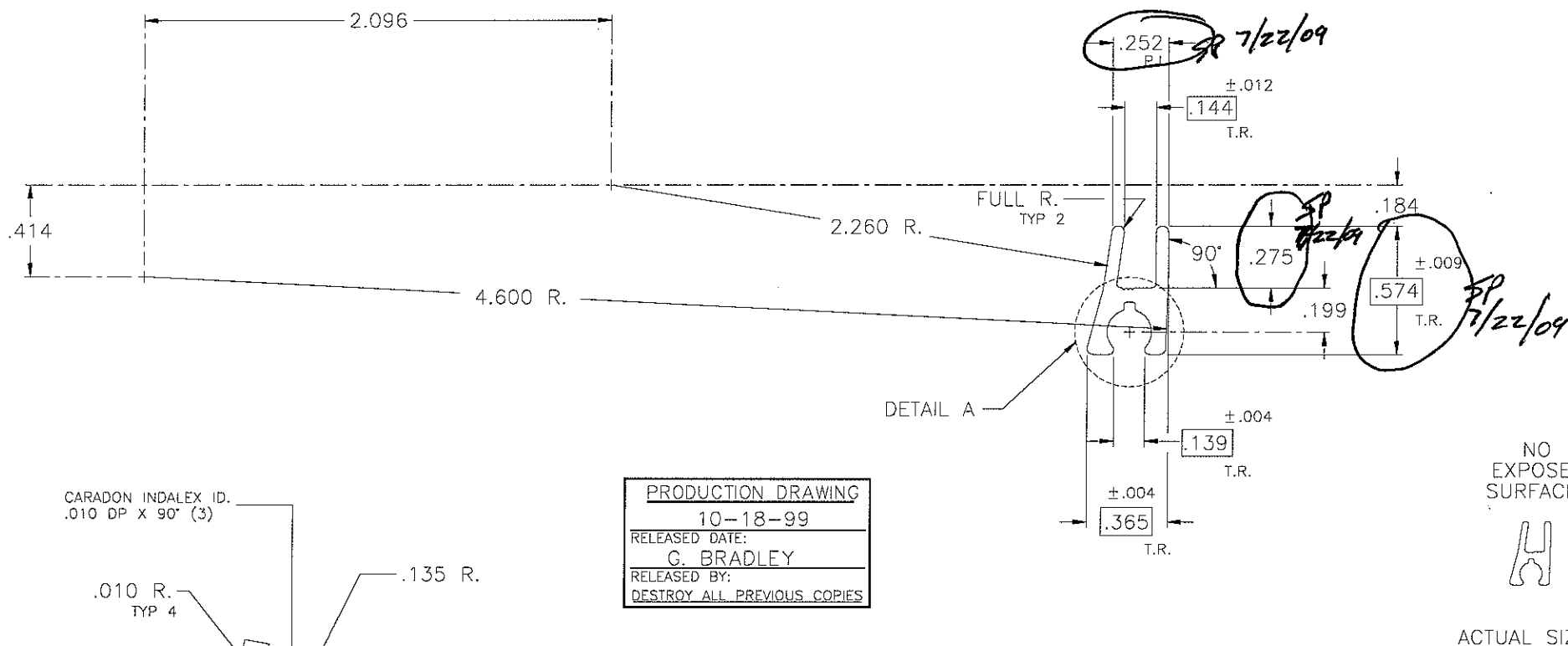
DATE	SYM	REVISION	BY
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DIE NO.
GAS-46374
REV



Date 7/22/09 Tech SP

CUSTOMER	ROLL-A-WAY	CUSTOMER NO.	DIE NO.	REV
		3-12-422	GAS-45356	
DESCRIPTION	P55 END RETENTION REBAR		PROPOSAL NO.	
			R5371-1	



PRODUCTION DRAWING
10-18-99
RELEASED DATE:
G. BRADLEY
RELEASED BY:
DESTROY ALL PREVIOUS COPIES

ALUMINUM ASSOCIATION STANDARD TOLERANCES
APPLY UNLESS SPECIFIED OTHERWISE

UNSPECIFIED: WALL THICKNESS .055

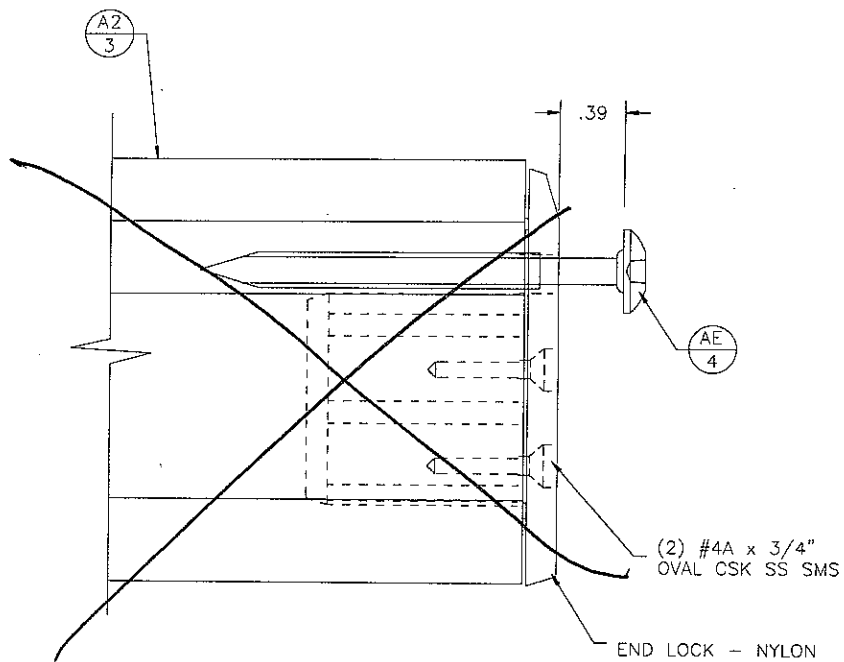
UNSPECIFIED RADIUS .016

DIFF. RATING 3

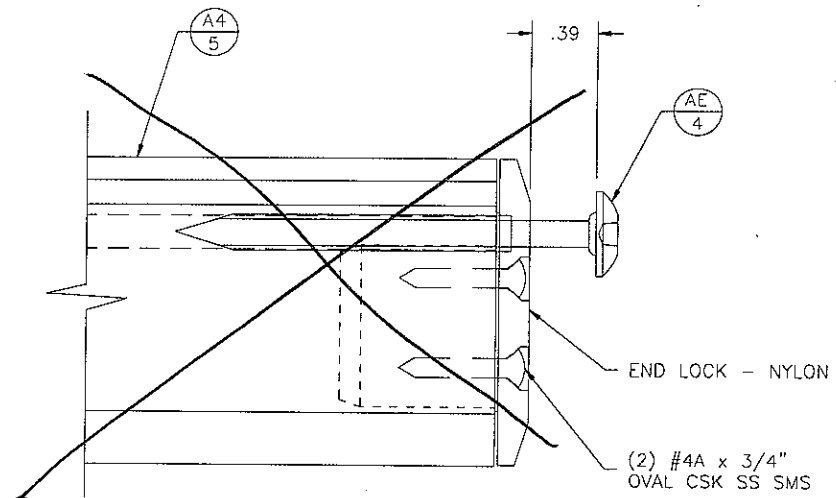
EST.AREA	.092	IN ²	DWN BY	G.B.	PRESS	2						CAS-45356
EST.WT.	.110	LBS/FT.	CKD BY		CAV.	8						DATE IN
EST.PER.	2.729	IN	SCALE	2=1	BACK #	40454						REVISED
OUT PER.	-	IN	CODE	-	BOL #	1115						
EXPD PER.	-	IN	DATE	10-18-99	RATIO	75						
FACTOR	25		POCKET AREA	-	BLADE	-						
C.C.D.	.670	IN	ALLOY	6005-T5			DATE	SYM		REVISION		BY

Caradon Indalex
a division of Caradon America, Inc.
GAINESVILLE, GEORGIA

ACTUAL SIZE



US60 END RETENTION DETAIL
(EVERY SLAT)

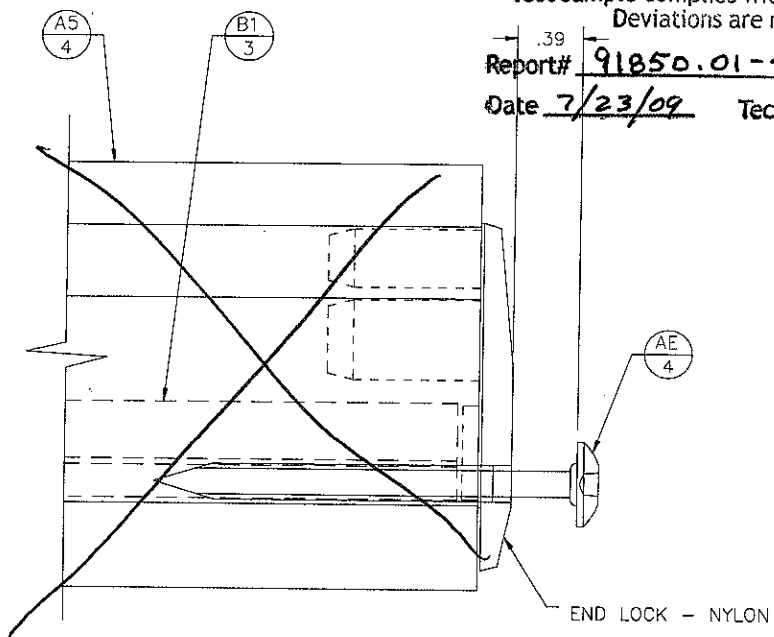


1138 END RETENTION DETAIL
(EVERY OTHER SLAT)

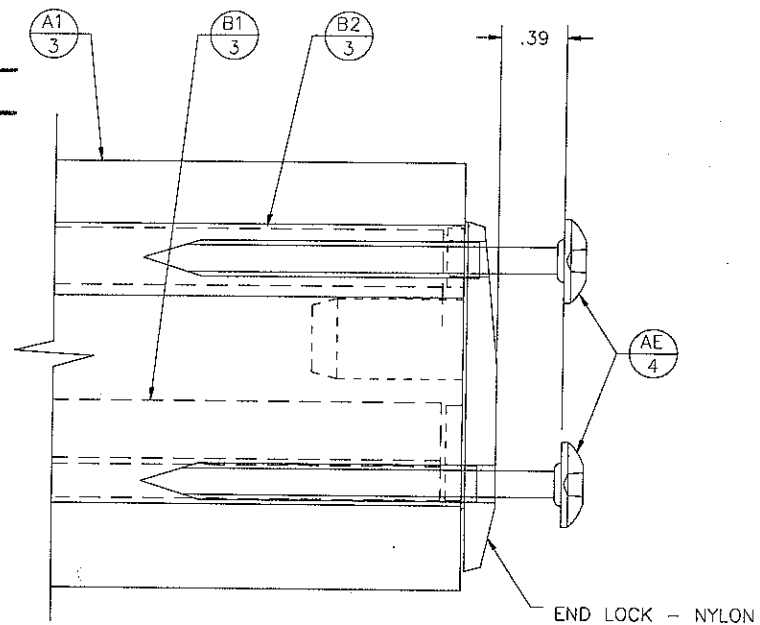
Architectural Testing

Test sample complies with these details.
Deviations are noted.

Report# 91850.01-401-44
Date 7/23/09 Tech SP



P55 & P55 2ND END RETENTION DETAIL
(P55ER EVERY SLAT)
(P55ER 2ND EVERY OTHER SLAT)



P55 DOUBLE END RETENTION DETAIL
(EVERY SLAT)



Architectural
Testing

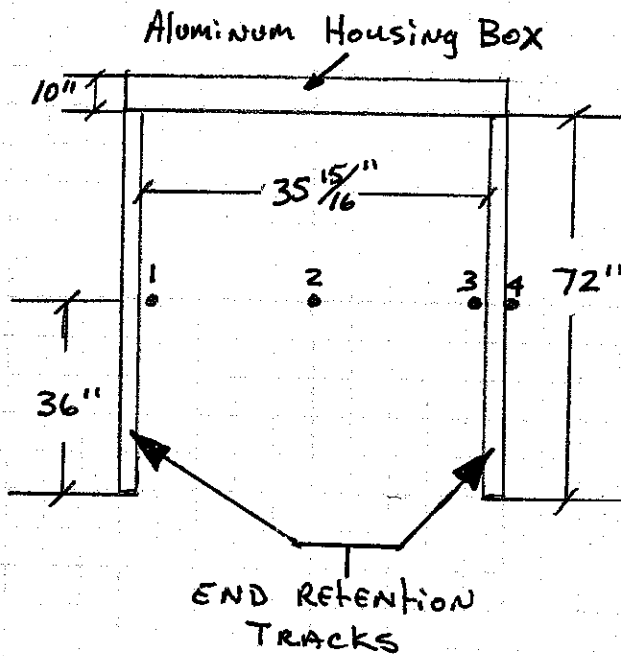
DATE: 7/21/09

BY: SP

PROJECT NO. 91850.01-401-46 SHEET 1 OF 2

PROJECT NAME: QMI Security Solutions

Sketch # 1



• - Indicator Locations
For Specimens #1, 2 & 3



Architectural
Testing

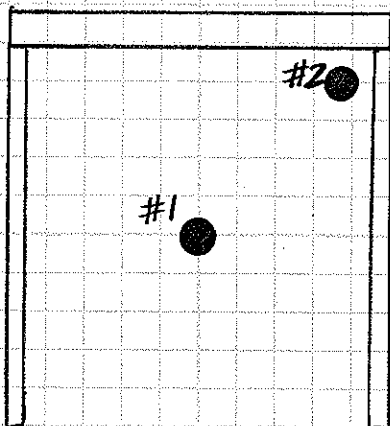
DATE: 7/21/09

BY: SP

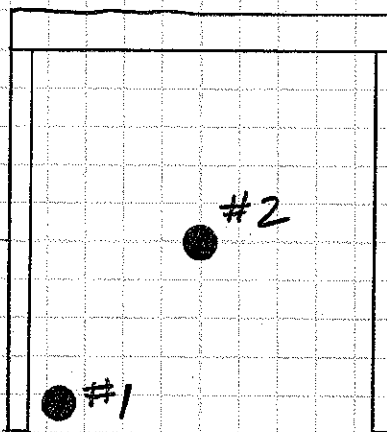
PROJECT NO. 91850.01-901-46 SHEET 2 OF 2

PROJECT NAME: QMI Security Solutions

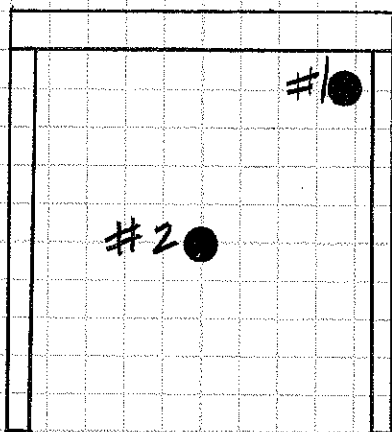
Sketch #2



SPECIMEN #1



SPECIMEN #2



SPECIMEN #3