

### ASTM E 1886 and ASTM E 1996 TEST REPORT

### **Report No.**: B8418.01-701-44

**Rendered to**:

### PRL ARCHITECTURAL ALUMINUM PRODUCTS

**PRODUCT TYPE**: Bottom Rolling Sliding Glass Door SERIES/MODEL: Max Slider "Cancun"

Test Dates:3/29/12Through:5/17/12Report Date:6/12/12Test Record Retention End Date:5/17/16



1.0 Report Issued To:	PRL Architectural Aluminum Products 14760 Don Julian Road City of Industry, California 91746
2.0 Test Laboratory:	Architectural Testing, Inc. 4 Rancho Circle Lake Forest, California 92630

### 3.0 Project Summary:

- 3.1 Product Type: Bottom Rolling Sliding Glass Door
- 3.2 Series/Model: Max Slider "Cancun"
- **3.3 Compliance Statement**: Results obtained are tested values and were secured by using the designated test method(s). The samples tested met the performance requirements set forth in the referenced test procedures for a +2394/-2873 Pa (+50/-60 psf) Design Pressure with missile impacts corresponding to Missile Level D and Wind Zone 3.
- **3.4 Test Dates**: 3/29/2012 5/17/2012
- **3.5 Test Record Retention End Date**: All test records for this report will be retained until May 17, 2016.
- **3.6 Test Location**: Architectural Testing, Inc.'s test facility in Lake Forest, California. Calibration of test equipment was performed by Architectural Testing in accordance with AAMA 205-01 "In-Plant Testing Guidelines for Manufacturers and Independent Laboratories".
- **3.7 Test Sample Source**: The test specimen was provided by the client. Representative samples of the test specimen(s) will be retained by Architectural Testing for a minimum of four years from the test completion date.
- **3.8 Drawing Reference**: The test specimen drawings have been reviewed by Architectural Testing and are representative of the test specimen(s) reported herein. Test specimen construction was verified by Architectural Testing per the drawings located in Appendix B. Any deviations are documented herein or on the drawings.

### 3.9 List of Official Observers:

<u>Name</u>	<u>Company</u>
Frank Fisher	PRL Architectural Aluminum Products
John S. Mayfield	Architectural Testing, Inc.



### 4.0 Test Specification(s):

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.

### 5.0 Test Specimen Description:

### 5.1 Product Sizes:

<b>Overall Area</b> :	Wie	dth	Height		
5.1m <sup>2</sup> (54.8 ft <sup>2</sup> )	millimeters	millimeters inches		inches	
Overall size	2413	95	2108	83	
Door panel size	1224	48-3/16	2057	81	

### **Test Specimens #1 - #3**:

### **5.2 Frame Construction**:

Frame Member	Material	Description
Head	Aluminum	Reference drawing #2263.
Sill track	Aluminum	Sealed to the upturned leg of the sub sill using a 3/8" bead of sealant full length, reference drawing #2259.
Bottom rail fixed panel shoe	Aluminum	Inserted and secured into the bottom rail of the fixed panel using two rows of 3/8" wide double-sided tape and snapped into the sill track, reference drawing #2249.
Sub sill	Aluminum	Bedded in sealant full length and fully sealed to each jamb member, reference drawing #BSP-01.
Jamb	Aluminum	Reference drawing #2263
Exterior jamb pocket cover	Aluminum	Snapped into the exterior jamb pocket of the strike jamb.
Interior jamb pocket cover	Aluminum	Snapped into the interior jamb pocket of the fixed panel.
Exterior head pocket cover	Aluminum	Snapped over the exterior channel of the head and sealed to the fixed interlock.



# **5.0 Test Specimen Description**: (Continued)

### **5.3 Frame Construction**:

_	Joinery Type	Detail
Hoad /Jamb	Butted and	Corners were butted and sealed full perimeter using
Head/Jamb	sealed	sealant.
Cill track / iamh	Butted and	Corners were butted and sealed full perimeter using
SIII track/jailib	sealed	sealant.

# 5.4 Panel Construction:

Fixed Panel Member	Material	Description
Rails	Aluminum	Formed from custom shaped extruded aluminum members; sealed full length at the exterior to the head and sill track, reference drawings #2204 & 2205.
Stiles	Aluminum	Formed from custom shaped extruded aluminum members; sealed full length at the exterior to the jamb, reference drawings #2201 & 2237.

Active Panel Member	Material	Description				
Rails	Aluminum	Custom shaped extruded aluminum reference drawings #2204 & 2205.				
Stiles	Aluminum	Custom shaped extruded aluminum, reference drawings #2201 & 2237.				

	Joinery Type	Detail		
Top rails/stiles & Bottom fixed rail/stiles	Butted	Members are butted and secured using an aluminum corner key that is secured through the glazing pocket of the rail member using two $1/4-20 \times 1$ " countersunk sheet metal screws and secured to each stile using a #10 x 2" flat head screw and a #10 x 3" pan head sheet metal screw.		
Active Bottom Rail/Stile	Butted	Members are butted and secured into the roller housing through the glazing pocket of the rail member using two $\#1/4-20 \times 1"$ countersunk screws and secured to each stile using two $\#10 \times 1"$ flat head screws and a $\#10 \times 3"$ pan head sheet metal screw.		



# **5.0 Test Specimen Description**: (Continued)

# 5.5 Weatherstripping:

Description	Quantity	Location
0.320" x 0.270 pile w/fin	4 rows	Sill track guide at each exterior panel face.
0.320" x 0.270 pile w/fin	4 rows	Interior and exterior facing legs of the exterior sill track.
0.320" x 0.270 pile w/fin	2 rows	Jamb face of the lock stile.
0.290" x 0.270 pile w/fin	1 row	Interior leg of the interior jamb pocket.
0.290" x 0.270 pile w/fin	1 row	Exterior leg of the interior jamb pocket.
0.320" x 0.270 pile w/fin	2 rows	Jamb face of the fixed stile.
0.290" x 0.270 pile w/fin	1 row	Exterior leg of the exterior jamb pocket.
0.290" x 0.270 pile w/fin	1 row	Interior leg of the exterior jamb pocket.
0.320" x 0.270 pile w/fin	2 rows	Interior face of the fixed interlock stile.
2" x 2" x 0.290" adhesive- backed pile	1 plug	Adhered to the sill track below the interlock of the active panel.
2" x 2" x 1" open cell foam	1 plug	Fully sealed into the top hollow of the fixed interlock extrusion.
0.290" x 0.270 pile w/fin	2 rows	Exterior face of the interlocking stile of the active panel.

# 5.6 Glazing:

Glass Type	<b>Overall Glass Thickness</b>	Glazing Method				
Laminated I.G.	1-1/8" I.G.	Marine glazing ទួ	glazed gasket.	into	а	rubber

Exterior Lite	Spacer	Interior Lite			
3/16" heat	1/2" aluminum	3/16" heat	0.060" DuPont	3/16" heat	
strengthened	box	strengthened	SentryGlas®	strengthened	

Location	Quantity	Dayligh	Class Dita	
Location	Quantity	millimeters	inches	GIASS DILE
Fixed panel	1	1067 x 1803	42 x 71	0.625"
Active panel	1	1067 x 1803	42 x 71	0.625"



# **5.0 Test Specimen Description**: (Continued)

### 5.7 Drainage:

Drainage Method	Size	Quantity	Location			
Weep slot	1/2" wide x 1/4" high	6	6" on center from the ends and 16" on center thereafter cut through the sub sill face through each leg of the sill track.			
Open cell foam baffle	1/2" wide x 1/4" high	6	Exterior face of the sill track; corresponding to each weep slot.			

### 5.8 Hardware:

Description	Quantity	Location
Roller assembly	2	Inserted into each end of the bottom rail and secured to each stile and the bottom rail using two $\#1/4-20 \ge 1"$ machine screws.
2-piece frame jamb closer	1	Located at the midpoint of the strike jamb and secured to a custom shaped steel bracket stop, located on the inside of the jam using two #10-24 screws.
Adams-Rite lock set	1	Located at the midpoint of the stile.

**5.9 Reinforcement**: No reinforcement was utilized.

### 6.0 Installation:

Each specimen was installed into a 2 aluminum test buck. The rough opening allowed for a 1/8" shim space. The exterior perimeter of each door was sealed with silicone.



# **6.0 Installation**: (Continued)

Location	Anchor Description	Anchor Location			
Threshold	#10 x 1" pan head sheet metal screw	Located at 6", 8", and 45" from each end through each of the 4 panel tracks in the threshold.			
Jambs	#1/4-20 x 1" flat head screw	Located at 6" on center from the ends and 24" on center thereafter through the interior and exterior pocket of the jamb.			
Head	#1/4-20 x 1" flat head screw	Located at 6" on center from the ends and 20" on center thereafter through the interior and exterior track of the head.			
Head	#1/4-20 x 1" flat head screw	The interior and exterior channels of the head were each secured using 5 screws centered at midpoint with 2 screws on each side spaced approximately 1" apart, 10 fasteners total.			



**7.0 Test Results**: The results are tabulated as follows:

ASTM E 1886, Large Missile Impact

**Conditioning Temperature**: 24°C (76°F) **Missile Weight**: 4146 g (9.14 lbs) **Missile Length**: 2.4 m (7'10") **Muzzle Distance from Test Specimen**: 4.9 m (16'0")

**Test Unit #1**: Orientation within ±5° of horizontal

Impa	Impact #1: Missile Velocity: 15.2 m/s (50.0 fps)				
Impact Area: Bottom left corner of active door panel.					
<b>Observations</b> :	Missile hit target causing a 2"x 4" rupture in glass.				
Results:	Pass				

**Test Unit #2**: Orientation within ±5° of horizontal

Impact #1: Missile Velocity: 15.3 m/s (50.1 fps)				
Impact Area:	Center of active door panel.			
Observations:	Missile hit target area, no ruptures, no penetrations.			
Results:	Pass			

**Test Unit #3**: Orientation within ±5° of horizontal

Impact #1: Missile Velocity: 15.2 m/s (50.0 fps)				
Impact Area:	Top right corner of active door panel.			
Observations:	Missile hit target area, no ruptures, no penetrations.			
Results:	Pass			

*Note*: See Architectural Testing Sketch #1 for impact locations.



## 7.0 Test Results: (Continued)

ASTM E 1886, Air Pressure Cycling

**Test Unit #1 Design Pressure**: +2394/-2873 Pa (+50/-60psf)

Pressure	Numberof	Average	Maximum Defl	ection at Indica	tor mm (inches)
Range Pa (psf)	Cycles	Cycle Time (seconds)	#1	#2	#3
479 to 1197 (10.0 to 25.0)	3500	1.87	4.8 (0.19)	9.7 (0.38)	3.0 (0.12)
0 to 1436 (0 to 30.0)	300	2.03	4.8 (0.19)	11.4 (0.45)	3.0 (0.12)
1197 to 1915 (25.0 to 40.0)	600	2.01	5.1 (0.20)	13.2 (0.52)	3.0 (0.12)
718 to 2394 (15.0 to 50.0)	100	2.18	5.3 (0.21)	15.7 (0.62)	3.3 (0.13)
			Permanent Set mm (inches)		
			3.6 (0.14)	2.5 (0.10)	2.0 (0.08)

#### **POSITIVE PRESSURE**

### **NEGATIVE PRESSURE**

Pressure	Number of	Number of Average		Maximum Deflection at Indicator mm (inches)		
Range Pa (psf)	Cycles	Cycle Time (seconds)	#1	#2	#3	
862 to 2873 (18.0 to 60.0)	50	2.69	4.0 (0.16)	16.8 (0.66)	2.3 (0.09)	
1436 to 2298 (30.0 to 48.0)	1050	2.12	3.3 (0.13)	14.2 (0.56)	2.3 (0.09)	
0 to 1724 (0 to 36.0)	50	2.38	2.3 (0.09)	10.4 (0.41)	1.0 (0.04)	
575 to 1436 (12.0 to 30.0)	3350	2.02	2.0 (0.08)	8.9 (0.35)	1.0 (0.04)	
			Permanent Set mm (inches)			
			0.3 (0.01)	0.3 (0.01)	0.3 (0.01)	

**Observations**: No additional damage or deglazing was observed.

Result: Pass

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



### 7.0 Test Results: (Continued)

ASTM E 1886, Air Pressure Cycling

**Test Unit #2 Design Pressure**: +2394/-2873 Pa (+50/-60psf)

Pressure	Number of	Average	Maximum Defl	ection at Indicat	tor mm (inches)
Range Pa (psf)	Cycles	(seconds)	#1	#2	#3
479 to 1197 (10.0 to 25.0)	3500	1.83	4.1 (0.16)	9.1 (0.36)	3.0 (0.12)
0 to 1436 (0 to 30.0)	300	1.94	4.1 (0.16)	10.7 (0.42)	3.0 (0.12)
1197 to 1915 (25.0 to 40.0)	600	1.94	4.3 (0.17)	12.7 (0.50)	3.3 (0.13)
718 to 2394 (15.0 to 50.0)	100	2.12	4.6 (0.18)	15.0 (0.59)	3.3 (0.13)
			Permanent Set mm (inches)		
			2.3 (0.09)	3.0 (0.12)	1.8 (0.07)

#### **POSITIVE PRESSURE**

#### **NEGATIVE PRESSURE**

Pressure	Number of	Average	Maximum Deflection at Indicator mm (inches)		
Range Pa (psf)	Cycles	(seconds)	#1	#2	#3
862 to 2873 (18.0 to 60.0)	50	2.43	3.6 (0.14)	17.3 (0.68)	1.5 (0.06)
1436 to 2298 (30.0 to 48.0)	1050	2.04	3.0 (0.12)	13.7 (0.54)	1.5 (0.06)
0 to 1724 (0 to 36.0)	50	2.54	2.3 (0.09)	10.2 (0.40)	0.3 (0.05)
575 to 1436 (12.0 to 30.0)	3350	2.02	2.0 (0.08)	8.4 (0.33)	0.8 (0.03)
			Permanent Set mm (inches)		
			0.5 (0.02)	0.5 (0.02)	0.5 (0.02)

**Observations**: No additional damage or deglazing was observed.

### Result: Pass

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



## 7.0 Test Results: (Continued)

### ASTM E 1886, Air Pressure Cycling

**Test Unit #3 Design Pressure**: +2394/-2873 Pa (+50/-60psf)

Pressure Number of		Average	Maximum Deflection at Indicator mm (inches)			
Range Pa (psf)	Cycles	(seconds)	#1	#2	#3	
479 to 1197 (10.0 to 25.0)	3500	1.83	4.6 (0.18)	9.4 (0.37)	3.3 (0.13)	
0 to 1436 (0 to 30.0)	300	2.07	4.6 (0.18)	10.4 (0.41)	3.3 (0.13)	
1197 to 1915 (25.0 to 40.0)	600	1.98	4.6 (0.18)	12.7 (0.50)	3.3 (0.13)	
718 to 2394 (15.0 to 50.0)	100	2.52	4.8 (0.19)	15.0 (0.59)	3.6 (0.14)	
			Permanent Set mm (inches)			
			3.0 (0.12)	3.0 (0.12)	2.0 (0.08)	

### **POSITIVE PRESSURE**

### **NEGATIVE PRESSURE**

Pressure	Number of	Number of Average		Maximum Deflection at Indicator mm (inches)		
Range Pa (psf)	Cycles	(seconds)	#1	#2	#3	
862 to 2873 (18.0 to 60.0)	50	2.61	5.1 (0.20)	16.8 (0.66)	1.8 (0.07)	
1436 to 2298 (30.0 to 48.0)	1050	2.08	4.8 (0.19)	16.0 (0.63)	1.8 (0.07)	
0 to 1724 (0 to 36.0)	50	2.25	3.0 (0.12)	9.7 (0.38)	1.0 (0.04)	
575 to 1436 (12.0 to 30.0)	3350	1.99	2.8 (0.11)	8.1 (0.32)	1.0 (0.04)	
			Permanent Set mm (inches)			
			0.8 (0.03)	1.0 (0.04)	0.3 (0.01)	

**Observations**: No additional damage or deglazing was observed.

Result: Pass

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



*General Note:* Upon completion of testing, the specimens met the requirements of Section 7 of ASTM E 1996.

### 8.0 Test Equipment:

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

Missile: 2"x4' Southern Pine

Timing Device: Electronic Beam Type

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

**Deflection Measuring Device**: Linear transducers

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.



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

For ARCHITECTURAL TESTING, Inc.

John S. Mayfield Project Manager Shawn Collins, P.E. Laboratory Support Engineer

JM:sc/lg

Attachments (pages): This report is complete only when all attachments listed are included. Appendix A: Sketch (1) Appendix B: Drawings (18)

This report produced from controlled document template ATI 00498, issued 01/31/12.

# Appendix A

# Sketches



# Appendix B

Drawings

# PRL Max sliding door "CANCUN"

Bill of Material

key number	PRL part number	manufacturer	description	qty required	size
1	2263	PRL proprietary	top frame rail	1	W
2	2204	PRL proprietary	sash top rail	2	(W/2)- 5 1/16"
3	BSP-01	PRL proprietary	sub sill	1	W
4	2205	PRL proprietary	bottom sash rails	2	(W/2)- 5 1/16"
5	2259	PRL proprietary	sill track	1	W-13/8"
6	2263	PRL proprietary	frame jamb	2	H- 2 1/16"
7	2201	PRL proprietary	sash lock/jamb stile	2	H-1 9/16"
8	2237	PRL proprietary	sash interlock stiles	2	H-1 9/16"
9	2197	PRL proprietary	frame jamb closer	2	H-1"
10	2249	PRL proprietary	non operating leaf support shoe	2	6"
11	29027045BKQB	Amesbury	fin seal 0.290 x 0.270 base (typ horizontally)	8	W
11	29027045BKQB	Amesbury	fin seal 0.290 x 0.270 base (typ vertically)	12	Н
12	BL-4288	bandlock	glazing channel	2	(4*H)+(2*W)
21		PRL proprietary	roller wheels	2	as drawn
23	generic		open cell foam	6	2"
	corner key	PRL proprietary	rail to stile corner key (top only)	4	as drawn
	lock keeper	PRL proprietary		1	as drawn
			insulated glass width	2	(W/2)- 3 3/4"
			insulated glass height	2	H-7 5/16"
		Д	dams Rite 4189 lock set with 4195 interior handl	e 1	



Test sample complies with these details. Deviations are noted.

Report#\_ Date\_\_\_ 418.01 -// 2---Tech









UNLESS OTHERWISE SPECIFIED STANDAR ALUMINUM ASSOCIATION TOLERANCES APPLY		DIE NO. 2259
Architectural Testing Test sample complies with these details. Deviations are noted. Report#	• •	
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	Architectural Testing Test sample complies with these details. Deviations are noted. Report# <u>R8148.01</u> Date <u>5/22/12</u> Tech 4.7787	.0500
MAT.'L AREA WT. / FT PERI. FACTOR C.C.D.	HOLES * CRITICAL DIN   BACKER SPECIAL TON   BOLSTER W/P   W/P DRAWN:   EXT. RATIO DATE:   CLASS Hollow	ALUMINUM INC. 14760 DON JULIAN RD. M. INDUSTRY CA. 91746 TEL. (877) 775–2586 PRL-ALUM FAX (877) 274–8800 PART NAME: PART #



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CUSTOMER: ALUMINUM INC. 14760 DON JULIAN RD.							
AT.'LXXHOLES* CRITICALDIM.INDUSTRYCA.91746REAXXBACKERImplementationTEL.(877)775-2586T. / FTXXBOLSTERImplementationPRL-ALUMPRL-ALUMERI.XXW/PDRAWN:AJFAX(877)274-8800ACTORXXEXT.RATIODATE:xxPARTNAME:.C.D.CLASSSolidSCALE11PART#							

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.060	
I.860	
Architectural Testing	
Test sample complies with these details. Deviations are noted.	
Report# <u>B8148-01</u>	
Date of the letter	
UNLESS OTHER WISE NOTED .050 TYP. WALL ALL UNMARK CORNER ARE	0.010
ALUMINUM IN 14760 DON JULIAN RD	C.
MAT.'L 6063-T5 HOLES * CRITICAL DIM. INDUSTRY CA. 91746 AREA 167 BACKER # CRITICAL DIM. TEL (877) 775-25	586
WT. / FT   20   BOLSTER   BOLSTER   PRL-ALL     PERI   6.70   W/P   DRAWN: AJ   FAX (877) 274-88	JM 600
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