



Architectural Testing

METRO-DADE COUNTY PERFORMANCE TEST REPORT

Rendered to:

JELD-WEN, Inc.
31725 Highway 97 North
Chiloquin, Oregon 97624

Report No.: 03-31370.01

Test Date: 12-03-01

thru: 12-06-01

Report Date: 01-02-02

Expiration Date: 12-06-11

Metro-Dade County Notification No.: ATI CA 01008

Series/Model: Outswing / In-swing Glazed Steel Edge Steel Door

Type: OXXO Glazed Steel Edge Steel Door

Project Summary: Architectural Testing, Inc. (ATI) was contracted by JELD-WEN, Inc. to perform testing per Metro-Dade County Protocol PA 202-94. The tests were performed upon five (5) test samples (non-impact). The samples tested met the performance requirements set forth in the protocol for a ± 55 psf *Design Load* rating.

Test Procedure: The test specimens were evaluated in accordance with the following Metro-Dade County Building Code Compliance Office Protocol with no deviations.

PA 202-94, Criteria for Testing Impact and Non Impact Resistant Building Envelope Components Using Uniform Static Air Pressure.

1 - DESCRIPTION OF UNIT:

Overall Size: Outswing – 8' 11" wide by 8' 1-1/2" high by 4-9/16" deep
In-swing – 8' 11" wide by 8' 2-1/2" high by 4-9/16" deep

Configuration: OXXO

Note: Test specimens 2 and 4 XX panels were In-swing and test specimens 1, 3 and 5 XX panels were Outswing.

Test specimens 1, 2, 3 employed the "Windjammer II" astragal and test specimens 4 and 5 the "Imperial" astragal.

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1 - DESCRIPTION OF UNIT: (Continued)

No. and Size of Panels:

- (1) Active Leaf: 2' 11-7/8" wide by 8' 0" high
- (1) In-Active Panel w/astragal: 3' 0-5/8" wide by 8' 0" high
- (2) SideLite Panel: 1' 2" wide by 8' 0" high

2 - MATERIAL CHARACTERISTICS:

Frame Construction:

All specimens head and jamb consist of primed finger jointed pine measuring 1.25 in. wide by 4.56 in. deep. The In-swing specimens employed an aluminum threshold measuring 1.25 in. wide by 4.56 in. deep, and were extruded to receive a wood support at the underside. An adjustable aluminum cap was employed at the double door threshold. The Outswing specimens employed a Pemko aluminum threshold with a wood support at the underside. The threshold measures 4.041 in. wide by 0.811 in. high and was kerfed to receive compression weatherstripping (sidelites and double doors). The head and jamb corners of all frames were coped and attached with three (3) 16 ga. 2.0 in. wire staples with 7/16" crown at each corner. The jambs and threshold corners of all frames were attached at the threshold wood support with three (3) 16 ga. 2.01 in. wire staples with a 7/16" crown at each corner. The jambs of the double door frames were mortised to receive four (4) 4.0" by 4.0" butt hinges at 8-7/8", 34-7/8", 58-7/8" and 84-7/8" from the top of the jamb. The sidelite jambs and double door hinge jambs were separated by a continuous 3/4" wide by 4-9/16" deep pressure treated wood reinforcement. CR Lawrence 33S Silicone Sealant was applied to each side face of wood reinforcement. The sidelite jambs were attached to the double door jambs with seven (7) # 8 by 2-1/2" long PFH wood screws spaced 6" from each end and five (5) equally spaced on the field. The screws were applied from the double door jamb into the sidelite jamb. A 1/4" by 1-3/8" wood mullion cap was employed at the interior and exterior face of the wood reinforcement and were held-in-place with 16 ga. x 1" trim nails located at 12" O.C. (See JELD-WEN Drawing No. 1 and 6 of 13)

Panel Construction:

The active and inactive door panels were constructed from (2) 24 ga. (0.020 in thick) galvanized steel skins with roll formed edges to receive a 1.73 in. wide x 1.219 in high 22 ga. (0.029 in. steel) one piece continuous roll formed galvanized steel side stiles and top rail. The edges of the steel panels are bent at a ninety-degree angle to overlap the steel top and bottom rails by 0.25 in. The edges of the steel panel are bent approximately 135° angle to overlap the steel stiles by 0.25 in. The bottom rail 24 ga. (0.021 in.) was roll formed steel 1.73 in. wide x 1.21 in. high formed to receive door bottom sweeps when required. The steel bottom rail was butted to the stiles. The stiles have a tab, which is bent 90° over the bottom rail and secured with a 0.25 in. x 0.5 in. 16 ga. rivet at each corner.

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2 - MATERIAL CHARACTERISTICS:

Panel Construction: (Continued)

Each hinge stile is internally reinforced with a 1-1/8" wide x 1-7/32" deep x 12-13/32" long piece of pressed fiberboard, (MDF board). The interior cavity of each door is filled with polystyrene (1.0 to 1.25 lb. density) as stated and manufactured by JELD-WEN, INC. The steel face sheets are interlocked with the stiles and rails and glued to the expanded polystyrene core. All the specimens door panels are reinforced with a one piece LVL wood lock block measuring 4-1/4 in. wide x 48 in. high x 1-23/32 in. thick, located at 24 in. from the top of the door panel on the latch side. The inactive panel of specimens 1, 2, and 3 were affixed with an extruded aluminum two piece astragal (Windjamber II) kerfed to receive weather-stripping. The astragal employed integral channels to receive (2) cold rolled steel rods at the top and (2) cold rolled steel rods at the bottom (only one rod was engaged at the top and one rod engaged at the bottom of the astragal). The rods are 0.312-in. diameter x 8.0 in. long at the bottom and 17.0 in. long at the top. The bolts extend 2.0 in. beyond the end of the astragal when engaged. The astragal is attached to the panel with (9) # 10 x 1" Philips pan head sheet metal screws located 1.0 in., 3.0 in., 5.0 in. from the top of door panel, 1.0 in., 3.0 in., 5.0 in., 20.0 in., 42.0 in., and 61.0 in from the bottom of the door panel. The inactive door panels of specimens 4 & 5 were affixed with an extruded aluminum astragal (Imperial) kerfed to receive weather-stripping. The astragal consisted of an extruded aluminum channel to receive (1) cold rolled steel rod at the top and (1) cold rolled steel rod at the bottom. The rods are 0.313-in. diameter x 19.0 in. long and were attached to and operated by a sliding plastic lever. The rods are contained within extruded aluminum reinforcements measuring 1.0 in. wide x 4.5 in. long x 0.563-in. thick and snap-in vinyl inserts. The rods extended 2.5 in. beyond the end of the astragal when engaged. The astragal is attached to the panel with (14) # 10 x 1.0 in. Philips pan head sheet metal screws located at 1.0 in., 2.5 in., 4.0 in., 5.5 in., 13.0 in., 18.0 in. and 26.0 in. from the top of the astragal down, and 1.0 in., 2.5 in., 4.0 in., 5.5 in., 13.0 in., 18.0 in. and 26.0 in from the bottom of the astragal up. The center of the astragal is reinforced at the latch and deadbolt strike with three extruded aluminum slide bars measuring 1.0 in. wide x 4.5 in. long x 0.562 in. thick. The active panels of all specimens were fitted with (2) each, Ives # 454 steel surface bolts measuring 8.0 in. long x 0.75 in. wide x 0.25 in. thick. The bolts were attached to the door panels with (4) sex bolts, (1/4-20 Philips flat head machine screw and 1/4-20 female end x 1.75 in. long). The bolts were located 2.0 in. from the latch stile and 2.0 in. from the top and bottom rails. The Outswing units used a 2.125-in. x 0.75 in. x 0.50-in. thick vinyl spacer between the surface bolt retaining bracket and panel face. The in-swing units used a 2-1/8" x 3/4" x 1/4" thick steel spacer between the surface bolt retaining bracket and the panel face. The in-swing panels are fitted with an extruded vinyl in-swing door bottom sweep measuring 1.68 in. wide x 0.980 in. high.

(See JELD-WEN Drawing No. 1 and 6 of 13)

Side Lite Panel Construction:

The panels were 1.75 in. thick overall and constructed from (2) 24 ga. (0.020 in.) thick galvanized steel skins. The edges of the steel panel stiles and top rails were bent at a ninety-degree angle to overlap the polystyrene core by 3/8"

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Side Lite Panel Construction: (Continued)

The interior cavity of each panel is filled with polystyrene (1.0 to 1.25 lb. density) as stated and manufactured by JELD-WEN, INC. The steel face sheets are glued to the expanded polystyrene core. The steel panels are routed to receive lip lite inserts. The panels are set into the wood sidelite frames against the frame stops secured with 0.375 in. quarter round. The quarter round is mitered and fitted along the sidelite edges and secured to the wood frame with (22) 16-ga. steel brads 0.75 in. long. The head and sill contained three each at 1.25 in. from each end and one in the center. The sides contained eight at 1.25 in. from each end and six equally spaced on the field. When the sidelite sash was being used with an in-swing unit the sash utilized an extruded vinyl boot interlocked with compression fit into the threshold and sealed at the interior and exterior with CRL 33C-silicone sealant as stated by the MFG. (See JELD-WEN Drawing No. 1 and 6 of 13)

Glazing:

Glazing Materials:

Specimens 1, 3 and 5

(2) Door Panels – ODL plastic lip lite (Spartech Polycom PP5530 C13)
The glass is PPG 0.125 in. tempered glass (BUG verified), with a 1/2" glass bite.

(2) Sidelite Sash – ODL plastic lip lite (Spartech Polycom PP5530 C13)
The glass is PPG 0.125 in. tempered glass (BUG verified), with a 1/2" glass bite.

Specimens 2 and 4

(2) Door Panels – ODL plastic lip lite (Spartech Polycom PP5530 C13)
The glass is PPG 0.5 in. overall insulated glass consisting of two sheets of 1/8" tempered glass (BUG verified), with a 1/2" glass bite.

(2) Sidelite Sash – ODL plastic lip lite (Spartech Polycom PP5530 C13)
The glass is PPG 0.5 in. overall insulated glass consisting of two sheets of 1/8" tempered glass (BUG verified), with a 1/2" glass bite.

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Glazing Method:

The door panels were sandwich glazed into the steel panels with (24) # 8 x 1-1/2 in. self tapping screws, (4) in the top and bottom member at 3.0 in. from each corner, and 6 O.C. and (8) in each side member at 3.0 in., 13.5 in., 24.5 in., 36.0 in., 46.0 in., 57.5 in., 68.5. and 79.0 in. from the top of the lite frame. CRL silicone glazing compound was used to seal the plastic lite frames to the door sash panels.

The sidelite panels were sandwich glazed into the steel panels with (20) # 8 x 1.50 in. self tapping screws, (2) in the top and bottom member at 3.0 in. from each corner and (8) in. each side member at 3.0 in., 13.5 in., 24.5 in., 36.0 in., 46.0 in., 57.5 in., 68.5. and 79.0 in. from the top of the lite frame. A CRL silicone glazing compound was used to seal the plastic lite frames to the door and sash panels.

Daylight Opening:

All Specimens

Door Panel – 1' 9-1/8" wide x 6' 7-1/8" high

Sidelite Sash – 0' 7-1/8" wide x 6' 7-1/8" high

Weather-stripping:

Out-Swing

<u>Description</u>	<u>Quantity</u>	<u>Location</u>
Schlegel Q-lon QDS 650	1 length	Head, the bump threshold, each jamb and the astragal.
Schlegel corner pads	6	One at the top and bottom of each door jamb and the threshold.

In-swing:

<u>Description</u>	<u>Quantity</u>	<u>Location</u>
Schlegel Q-lon QDS 650	1 length	Head, each jamb and the astragal.
Schlegel corner pads	6	One at the top and bottom of each door jamb and the threshold.
Four fin vinyl bottom sweeps	2	One each fitted into the kerfed bottom rail.

(See JELD-WEN Drawing No. 12 of 13)

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Hardware: All Specimens

<u>Description</u>	<u>Quantity</u>	<u>Location</u>
Kwikset 400 Latchbolt	1	36" from the bottom of panel
Kwikset 780 Deadbolt	1	48" form the bottom panel
Hager 4" butt type hinge (0.097" leaf thickness)	4 pair	Spaced at 8-1/8", 34-1/16", 58-1/16" and 84-1/16" from the top of the door panel down. The hinges are attached to the door panel with four (4) # 8 x 1" PFHWS and attached to the jamb with three (3) # 8 x 3/4" PFHWS and one (1) # 10 x 2-1/2" long PFHWS.
Ives Model 454 surface bolt with strike	2	Top and bottom of the active panel

(See JELD-WEN Drawing No. 11 and 12 of 13 and 1 of 1)

Weepholes: None

Muntins: None

Reinforcement: None

Sealant: Latex caulking as needed to seal unit into rough opening.

CRL 33C Silicone Sealant was applied as follows:

1. All main frame corners i.e. head/jamb and jamb/threshold corners (full depth)
2. Perimeter of sidelite panels to the frame (exterior and interior)
3. Each side of the mullion cap to the mullion
4. Perimeter of ODL Plastic Liplite to the steel panels and to the glass
5. The astragal to the inactive panel at the interior and exterior
6. The astragal to the Q-Lon weather-stripping continuous to the top of the corner pads.
7. Top horizontal edge of all corner pads
8. Q-Lon weather-stripping to the threshold (Outswing door only)

The hollow ends of the Imperial astragal employed a closed foam pad.

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3 – INSTALLATION: All specimens were installed into a 1-3/8" x 6-1/4" Laminated Veneer Lumber (LVL) wood test buck. The doors were attached using shims and the following screw attachments.

Screws and Method of Attachment:

28 - # 8 x 2.5" Philips flat head wood screws located as follows:

- (7) # 8 x 2.5" Jambs to buck – 6" from each vertical corner with (5) more equally spaced on the field.
- (2) # 8 x 2.5" Each Side Lite Head – 1 @ 3.0" from each horizontal corner.
- (6) # 8 x 2.5" Door Head – 6.0" from each corner with (4) more equally spaced on the field.
- (2) # 8 x 2.5" Each Side Lite sill – 1 @ 3.0" from each horizontal corner.

5 - # 10 x 2.5" Philips flat head wood screws located as follows:

- (5) # 10 x 2.5" Door sill – 3-1/2" from each corner with (3) more equally spaced on the field.
(See JELD-WEN Drawing No. 11 of 13)

4 – SEQUENCE OF TESTS PERFORMED:

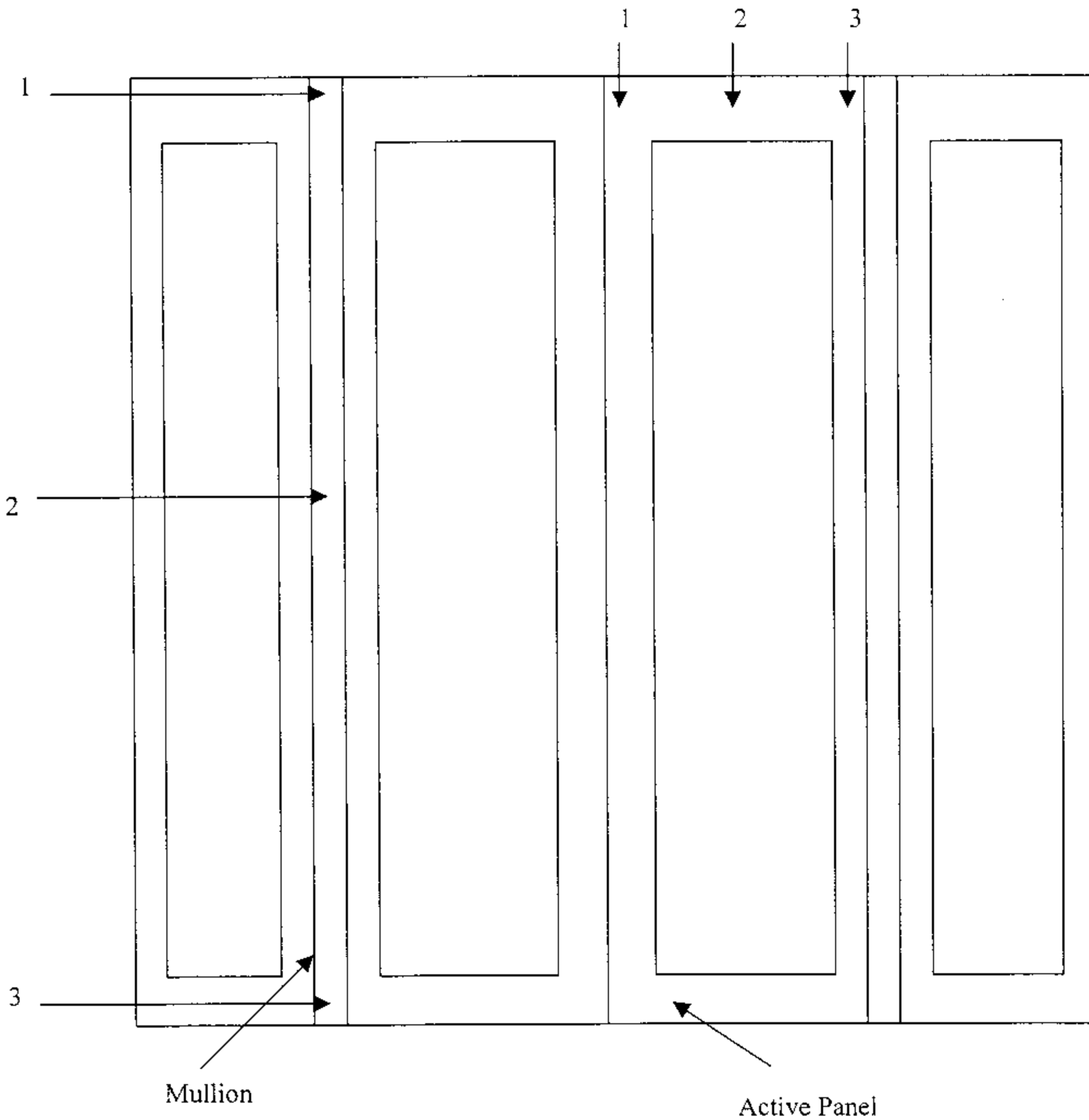
Test Sequence: PA 202

1. Air Infiltration
2. 14.4 psf positive
3. 14.4 psf negative
4. 2.16 psf water with only Latchbolt engaged
5. 1/2 Test Pressure Positive
6. Design Pressure Positive
7. 1/2 Test Pressure Negative
8. Design Pressure Negative
9. Water Infiltration Positive Direction with all locks engaged
10. Full Test Pressure Positive
11. Full Test Pressure Negative
12. Forced Entry

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Deflection gauges set at Location # 1, # 2 and # 3



ATI DRAWING NO. 1

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Test Results:

Protocol PA 202-94 "Static Air Pressure Tests"

Test Unit 1: Outswing with Windjamber II Astragal

Title of Test	Results ¹
Air Infiltration @ 1.57 psf	0.02 cfm/ft ²
Only lock cylinder engaged all other locks were not engaged for the following tests:	
Structural Loads (Positive) @ 14.4 psf	No damage
Structural Loads (Negative) @ 14.4 psf	No damage
Water Infiltration @ 2.16 psf	No penetration

All locks were engaged during the following tests:

	Indicators ²		
	#1	#2	#3
Structural Loads (Positive) @ 50% of Test Pressure (41.25 psf)			
Maximum Deflection: Mullion	0.050"	0.255"	0.065"
Top Rail	0.040"	0.190"	0.200"
Permanent Set: Mullion	0.005"	0.005"	0.005"
Top Rail	0.000"	0.000"	0.000"
Structural Loads (Positive) @ Design Pressure (55.00 psf)			
Maximum Deflection: Mullion	0.065"	0.360"	0.090"
Top Rail	0.180"	0.280"	0.230"
Permanent Set: Mullion	0.005"	0.010"	0.005"
Top Rail	0.000"	0.000"	0.000"
Structural Loads (Negative) @ 50% of Test Pressure (41.25 psf)			
Maximum Deflection: Mullion	0.050"	0.280"	0.050"
Top Rail	0.070"	0.260"	0.150"
Permanent Set: Mullion	0.000"	0.010"	0.010"
Top Rail	0.000"	0.000"	0.000"

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Test Results: (Continued)
Protocol PA 202-94 "Static Air Pressure Tests"
Test Unit 1: Outswing with Windjamber II Astragal

Title of Test	Results ¹		
Structural Loads (Negative) @ Design Pressure (55.00 psf)			
Maximum Deflection: Mullion	0.075"	0.330"	0.055"
Top Rail	0.090"	0.450"	0.300"
Permanent Set: Mullion	0.010"	0.020"	0.020"
Top Rail	0.000"	0.000"	0.000"
Water Infiltration @ 15% Design Pressure (8.25 psf)			
No Penetration			
		Indicators ²	
	#1	#2	#3
Structural Loads (Positive) @ Test Pressure (82.5 psf)			
Maximum Deflection: Mullion	0.090"	0.420"	0.115"
Top Rail	0.390"	0.530"	0.380"
Permanent Set: Mullion	0.005"	0.010"	0.010"
Top Rail	0.000"	0.000"	0.000"
Structural Loads (Negative) @ Test Pressure (82.5 psf)			
Maximum Deflection: Mullion	0.120"	0.480"	0.110"
Top Rail	0.390"	0.560"	0.430"
Permanent Set: Mullion	0.030"	0.020"	0.010"
Top Rail	0.000"	0.060"	0.030"
Forced Entry per South Florida Building Code, Section 3603.283			
Top Lock 300#	No entry		
Center Lock 300#	No entry		
Bottom Lock 300#	No entry		

¹"Doors and windows shall be operable after this test." (Reference PA 202-94, Section 5.1.3). "Specimen and fasteners, when used, shall not become disengaged during test procedure." (Reference PA 202-94, Section 5.1.4).

²Reference ATI Drawing on page 8 for specific locations.

Test unit passed at a design pressure of +/-55.0 psf.

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Test Results:
Protocol PA 202-94 "Static Air Pressure Tests"
Test Unit 2: In - swing with Windjamber II Astragal

Title of Test	Results ¹
Air Infiltration @ 1.57 psf	0.03 cfm/ft ²
Only lock cylinder engaged all other locks were not engaged for the following tests:	
Structural Loads (Positive) @ 14.4 psf	No damage
Structural Loads (Negative) @ 14.4 psf	No damage
Water Infiltration @ 0.0 psf	No penetration

All locks were engaged during the following tests:

	Indicators ²		
	#1	#2	#3
Structural Loads (Positive) @ 50% of Test Pressure (41.25 psf)			
Maximum Deflection: Mullion	0.080"	0.360"	0.095"
Top Rail	0.050"	0.160"	0.160"
Permanent Set: Mullion	0.000"	0.000"	0.000"
Top Rail	0.010"	0.015"	0.010"
Structural Loads (Positive) @ Design Pressure (55.00 psf)			
Maximum Deflection: Mullion	0.110"	0.500"	0.130"
Top Rail	0.200"	0.305"	0.240"
Permanent Set: Mullion	0.000"	0.000"	0.000"
Top Rail	0.010"	0.015"	0.010"
Structural Loads (Negative) @ 50% of Test Pressure (41.25 psf)			
Maximum Deflection: Mullion	0.080"	0.370"	0.080"
Top Rail	0.090"	0.140"	0.190"
Permanent Set: Mullion	0.010"	0.020"	0.000"
Top Rail	0.005"	0.010"	0.005"

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Test Results: (Continued)
Protocol PA 202-94 "Static Air Pressure Tests"
Test Unit 2: In - swing with Windjamber II Astragal

Title of Test	Results ¹		
Structural Loads (Negative) @ Design Pressure (55.00 psf)			
Maximum Deflection: Mullion	0.100"	0.430"	0.090"
Top Rail	0.120"	0.210"	0.230"
Permanent Set: Mullion	0.010"	0.020"	0.010"
Top Rail	0.005"	0.010"	0.005"
Water Infiltration @ 2.86 psf			
No Penetration			
	Indicators ²		
	#1	#2	#3
Structural Loads (Positive) @ Test Pressure (82.5 psf)			
Maximum Deflection: Mullion	0.155"	0.780"	0.150"
Top Rail	0.160"	0.460"	0.490"
Permanent Set: Mullion	0.010"	0.045"	0.030"
Top Rail	0.060"	0.060"	0.060"
Structural Loads (Negative) @ Test Pressure (82.5 psf)			
Maximum Deflection: Mullion	0.125"	0.700"	0.155"
Top Rail	0.120"	0.300"	0.380"
Permanent Set: Mullion	0.000"	0.025"	0.010"
Top Rail	0.050"	0.030"	0.005"
Forced Entry per South Florida Building Code, Section 3603.283			
Top Lock 300#	No entry		
Center Lock 300#	No entry		
Bottom Lock 300#	No entry		

¹"Doors and windows shall be operable after this test." (Reference PA 202-94, Section 5.1.3). "Specimen and fasteners, when used, shall not become disengaged during test procedure." (Reference PA 202-94, Section 5.1.4).

²Reference ATI Drawing on page 8 for specific locations.

Test unit passed at a design pressure of +/-55.0 psf.

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Test Results:
Protocol PA 202-94 "Static Air Pressure Tests"
Test Unit 3: Outswing with Windjamber II Astragal

Title of Test	Results ¹
Air Infiltration @ 1.57 psf	0.06 cfm/ft ²
Only lock cylinder engaged all other locks were not engaged for the following tests:	
Structural Loads (Positive) @ 14.4 psf	No damage
Structural Loads (Negative) @ 14.4 psf	No damage
Water Infiltration @ 2.16 psf	No penetration

All locks were engaged during the following tests:

	Indicators ²		
	#1	#2	#3
Structural Loads (Positive) @ 50% of Test Pressure (41.25 psf)			
Maximum Deflection: Mullion	0.080"	0.280"	0.055"
Top Rail	0.090"	0.170"	0.180"
Permanent Set: Mullion	0.000"	0.000"	0.000"
Top Rail	0.020"	0.020"	0.010"
Structural Loads (Positive) @ Design Pressure (55.00 psf)			
Maximum Deflection: Mullion	0.120"	0.400"	0.080"
Top Rail	0.180"	0.250"	0.230"
Permanent Set: Mullion	0.000"	0.020"	0.010"
Top Rail	0.020"	0.025"	0.020"
Structural Loads (Negative) @ 50% of Test Pressure (41.25 psf)			
Maximum Deflection: Mullion	0.075"	0.330"	0.080"
Top Rail	0.020"	0.100"	0.120"
Permanent Set: Mullion	0.015"	0.035"	0.025"
Top Rail	0.010"	0.020"	0.000"

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Test Results: (Continued)
Protocol PA 202-94 "Static Air Pressure Tests"
Test Unit 3: Outswing with Windjamber II Astragal

Title of Test	Results ¹			
Structural Loads (Negative)				
@ Design Pressure (55.00 psf)				
Maximum Deflection:	Mullion	0.100"	0.420"	0.080"
	Top Rail	0.120"	0.240"	0.220"
Permanent Set:	Mullion	0.015"	0.065"	0.035"
	Top Rail	0.020"	0.030"	0.010"
Water Infiltration				
@ 15% Design Pressure (8.25 psf)				
No Penetration				
		Indicators ²		
		#1	#2	#3
Structural Loads (Positive)				
@ Test Pressure (82.5 psf)				
Maximum Deflection:	Mullion	0.180"	0.640"	0.150"
	Top Rail	0.200"	0.480"	0.300"
Permanent Set:	Mullion	0.030"	0.015"	0.000"
	Top Rail	0.060"	0.080"	0.060"
Structural Loads (Negative)				
@ Test Pressure (82.5 psf)				
Maximum Deflection:	Mullion	0.170"	0.630"	0.190"
	Top Rail	0.320"	0.430"	0.400"
Permanent Set:	Mullion	0.020"	0.035"	0.020"
	Top Rail	0.040"	0.060"	0.050"
Forced Entry per South Florida Building Code, Section 3603.283				
Top Lock 300#	No entry			
Center Lock 300#	No entry			
Bottom Lock 300#	No entry			

¹"Doors and windows shall be operable after this test." (Reference PA 202-94, Section 5.1.3). "Specimen and fasteners, when used, shall not become disengaged during test procedure." (Reference PA 202-94, Section 5.1.4).

²Reference ATI Drawing on page 8 for specific locations.

Test unit passed at a design pressure of +/-55.0 psf.

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Test Results:
Protocol PA 202-94 "Static Air Pressure Tests"
Test Unit 4: In - swing with Imperial Astragal

Title of Test	Results ¹
Air Infiltration @ 1.57 psf	0.13 cfm/ft ²
Only lock cylinder engaged all other locks were not engaged for the following tests:	
Structural Loads (Positive) @ 14.4 psf	No damage
Structural Loads (Negative) @ 14.4 psf	No damage
Water Infiltration @ 2.16 psf	No penetration

All locks were engaged during the following tests:

	Indicators ²		
	#1	#2	#3
Structural Loads (Positive) @ 50% of Test Pressure (41.25 psf)			
Maximum Deflection: Mullion	0.070"	0.365"	0.095"
Top Rail	0.100"	0.160"	0.180"
Permanent Set: Mullion	0.010"	0.015"	0.000"
Top Rail	0.010"	0.010"	0.010"
Structural Loads (Positive) @ Design Pressure (55.00 psf)			
Maximum Deflection: Mullion	0.100"	0.500"	0.140"
Top Rail	0.160"	0.260"	0.250"
Permanent Set: Mullion	0.030"	0.010"	0.000"
Top Rail	0.020"	0.030"	0.030"
Structural Loads (Negative) @ 50% of Test Pressure (41.25 psf)			
Maximum Deflection: Mullion	0.070"	0.430"	0.140"
Top Rail	0.070"	0.180"	0.210"
Permanent Set: Mullion	0.010"	0.035"	0.025"
Top Rail	0.000"	0.020"	0.020"

Allen H. Rivera
22 JANUARY 2002



Test Results: (Continued)
Protocol PA 202-94 "Static Air Pressure Tests"
Test Unit 4: In - swing with Imperial Astragal

Title of Test	Results ¹			
Structural Loads (Negative) @ Design Pressure (55.00 psf)				
Maximum Deflection:	Mullion	0.095"	0.540"	0.185"
	Top Rail	0.120"	0.240"	0.280"
Permanent Set:	Mullion	0.010"	0.035"	0.025"
	Top Rail	0.000"	0.020"	0.030"
Water Infiltration @ 2.86 psf				
No Penetration				
		Indicators ²		
		#1	#2	#3
Structural Loads (Positive) @ Test Pressure (82.5 psf)				
Maximum Deflection:	Mullion	0.165"	0.655"	0.180"
	Top Rail	0.330"	0.600"	0.520"
Permanent Set:	Mullion	0.005"	0.010"	0.010"
	Top Rail	0.020"	0.080"	0.080"
Structural Loads (Negative) @ Test Pressure (82.5 psf)				
Maximum Deflection:	Mullion	0.110"	0.610"	0.160"
	Top Rail	0.280"	0.640"	0.650"
Permanent Set:	Mullion	0.000"	0.020"	0.020"
	Top Rail	0.000"	0.070"	0.010"
Forced Entry per South Florida Building Code, Section 3603.283				
Top Lock 300#	No entry			
Center Lock 300#	No entry			
Bottom Lock 300#	No entry			

¹"Doors and windows shall be operable after this test." (Reference PA 202-94, Section 5.1.3). "Specimen and fasteners, when used, shall not become disengaged during test procedure." (Reference PA 202-94, Section 5.1.4).

²Reference ATI Drawing on page 8 for specific locations.

Test unit passed at a design pressure of +/-55.0 psf.

Allen M. Russo
22 JANUARY 2002



Test Results:
Protocol PA 202-94 "Static Air Pressure Tests"
Test Unit 5: Outswing with Imperial Astragal

Title of Test	Results ¹
Air Infiltration @ 1.57 psf	0.12 cfm/ft ²

Only lock cylinder engaged all other locks were not engaged for the following tests:

Structural Loads (Positive) @ 14.4 psf	No damage
Structural Loads (Negative) @ 14.4 psf	No damage
Water Infiltration @ 2.16 psf	No penetration

All locks were engaged during the following tests:

	Indicators ²		
	#1	#2	#3
Structural Loads (Positive) @ 50% of Test Pressure (41.25 psf)			
Maximum Deflection: Mullion	0.090"	0.375"	0.120"
Top Rail	0.070"	0.190"	0.210"
Permanent Set: Mullion	0.030"	0.060"	0.040"
Top Rail	0.000"	0.015"	0.025"
Structural Loads (Positive) @ Design Pressure (55.00 psf)			
Maximum Deflection: Mullion	0.130"	0.500"	0.170"
Top Rail	0.075"	0.255"	0.260"
Permanent Set: Mullion	0.045"	0.060"	0.050"
Top Rail	0.000"	0.010"	0.030"
Structural Loads (Negative) @ 50% of Test Pressure (41.25 psf)			
Maximum Deflection: Mullion	0.050"	0.180"	0.060"
Top Rail	0.140"	0.210"	0.280"
Permanent Set: Mullion	0.005"	0.050"	0.060"
Top Rail	0.010"	0.010"	0.010"

Allen N. Revere
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Test Results: (Continued)
Protocol PA 202-94 "Static Air Pressure Tests"
Test Unit 5: Outswing with Imperial Astragal

Title of Test	Results ¹		
Structural Loads (Negative) @ Design Pressure (55.00 psf)			
Maximum Deflection: Mullion	0.070"	0.380"	0.110"
Top Rail	0.190"	0.290"	0.360"
Permanent Set: Mullion	0.010"	0.090"	0.060"
Top Rail	0.010"	0.020"	0.025"
Water Infiltration @ 15% Design Pressure (8.25 psf)			
No Penetration			
		Indicators ²	
	#1	#2	#3
Structural Loads (Positive) @ Test Pressure (82.5 psf)			
Maximum Deflection: Mullion	0.170"	0.850"	0.175"
Top Rail	0.430"	0.620"	0.580"
Permanent Set: Mullion	0.010"	0.075"	0.000"
Top Rail	0.050"	0.050"	0.030"
Structural Loads (Negative) @ Test Pressure (82.5 psf)			
Maximum Deflection: Mullion	0.110"	0.930"	0.170"
Top Rail	0.300"	0.430"	0.455"
Permanent Set: Mullion	0.010"	0.060"	0.020"
Top Rail	0.020"	0.040"	0.040"
Forced Entry per South Florida Building Code, Section 3603.283			
Top Lock 300#	No entry		
Center Lock 300#	No entry		
Bottom Lock 300#	No entry		

¹"Doors and windows shall be operable after this test." (Reference PA 202-94, Section 5.1.3). "Specimen and fasteners, when used, shall not become disengaged during test procedure." (Reference PA 202-94, Section 5.1.4).

²Reference ATI Drawing on page 8 for specific locations.

Test unit passed at a design pressure of +/-55.0 psf.

Allen M. Rewen
22 JANUARY 2002



Test Equipment:

Air Infiltration: Computer controlled centrifugal blower with electronic pressure device and laminar flow element.

Water Penetration: Computer controlled centrifugal blower with electronic pressure device and water spray system.

Structural Loads: Computer controlled centrifugal blower with electronic pressure device.

Deflection Measuring Device: Dial Indicators; tape measure

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.

List of Official Observers:

Steve Strawn	JELD-WEN
Brett Carroll	JELD-WEN
John Singler	JELD-WEN
Steve Frey	JELD-WEN
Leaton Kirk	Architectural Testing, Inc.
Allen N. Reeves, P.E.	Architectural Testing, Inc.
James Pearson	Architectural Testing, Inc.
Hector Lara Jr.	Architectural Testing, Inc.

Representative samples of the test specimen and a copy of this report will be retained by ATI for a period of ten years. This report is the exclusive property of the client so named herein and is applicable to the sample tested. Results obtained are tested values and do not constitute an opinion or endorsement by this laboratory.

For ARCHITECTURAL TESTING, INC.

Leaton Kirk
Regional Manager

Allen N. Reeves, P.E.
Director-Engineering Services

22 JANUARY 2002