Architectural Testing

MIAMI-DADE COUNTY
PERFORMANCE TEST REPORT

Rendered to:

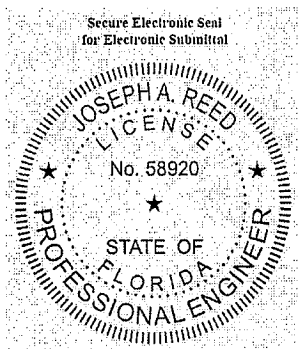
EAGLE WINDOW & DOOR, INC.

SERIES/MODEL: 8080 Series 05 Clad Ascent French Sliding Door SP1 with Harbor Master Mono

PRODUCT TYPE: Aluminum Clad Sliding Glass Door with Impact Glazing

This report contains in its entirety:

Cover Page:	**1 page**
Report Body:	**15 pages**
Sketches:	**2 pages**
Drawings:	**48 pages**



Joseph A. Reed
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Date: 2010.05.25 12:11:25 -04'00'

Report No.:	**98173.01-201-18**
Test Dates:	**03/22/10**
Through:	**03/26/10**
Report Date:	**05/25/10**
Expiration Date:	**03/26/20**
Miami-Dade County Notification No.:	**ATIMN 10002**

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2045 Kerper Boulevard
Dubuque, Iowa 52001

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Project Summary: Architectural Testing, Inc. was contracted by Eagle Window & Door, Inc. to perform testing per Florida Building Code, Test Protocols for High Velocity Hurricane Zone, Protocols TAS 201-94, TAS 202-94 and TAS 203-94 on three Series/Model 8080 Series 05 Clad Ascent French Sliding Door SP1 with Harbor Master Mono, aluminum clad sliding glass door with impact glazing. The samples tested met the performance requirements set forth in the protocols for a ±60.0 psf *Design Pressure* rating. Test specimen description and results are reported herein. The samples were provided by the client.

Test Procedures: The test specimens were evaluated in accordance with the following:

TAS 201-94, *Impact Test Procedures.*

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

TAS 203-94, *Criteria for Testing Products Subject to Cyclic Wind Pressure Loading.*

Drawing Reference: The test specimen drawings have been reviewed and verified by Architectural Testing and are representative of the samples tested.

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Test Specimen Description:

Series/Model: 8080 Series 05 Clad Ascent French Sliding Door SP1 with Harbor Master Mono

Product Type: Aluminum Clad Sliding Glass Door with Impact Glazing

Overall Size: 95-3/4" wide by 96" high

Active Panel Size: 49-1/8" wide by 93" high

Fixed Panel Size: 49-1/8" wide by 93" high

Daylight Opening Sizes (2): 39-3/4" wide by 80-1/8" high

Overall Area: 63.8 ft^2

Finish: Interior wood was natural; exterior aluminum cladding was painted.

Frame Construction: The frame was comprised of aluminum extrusions slip-fit over LVL wood side and head jambs. At the head, the aluminum frame joints were mitered, sealed with silicone and secured with a corner key and one #5 x 1-3/4" screw. The wood jambs were sealed with silicone and fastened with three #8 x 1-3/4" screws per corner. The sill was comprised of an aluminum extrusion slip-fit over a polyethylene / wood fiber composite material with an oak threshold. The sill was butted to the side jamb, sealed with silicone and fastened with three #8 x 2-1/2" screws through the sill into the wood jamb and one #6 x 1" screw into the aluminum cladding. A stationary panel support block was secured to the sill with five #10 x 1" screws.

Panel Construction: The LVL wood stiles and rails were joined by two 3/4" x 4" hardwood dowels secured with glue and two 2-1/2" brads. Extruded aluminum cladding was square-cut and butted at the corners and sealed with silicone. The fixed panel meeting stile had a full-length extruded aluminum cover strip that also formed the interlock and was fastened with #8 x 1" pan-head screws located 1-1/2" from each end and 8" to 10" on center. The fixed panel was secured through the frame jamb with three #8 x 2-1/8" screws located 6" from the head and sill and one at midspan.

Test Specimen Description: (Continued)

Weatherstripping:

Description	QuantityL	ocation
Foam filled vinyl leaf	1 Row	Lock jamb and head jamb
Wool pile with center fin	1 Row	Bottom rail of operable panel and fixed panel interlock
13/8" foam-filled weatherstrip	1 Row	Fixed panel interlock
Closed-cell foam pad	1	Base of interlock
Pile weatherstrip pad	1	Top of interlock

Glazing Details: All units utilized a 0.397" thick laminated glass fabricated from two nominal 5/32" annealed sheets separated by a 0.090" thick DuPont SentryGlas® Plus interlayer. The glass was set from the interior against an Instant Glaze II sealant and backfilled with silicone. Wood glazing stops with a single-sided adhesive foam tape were utilized on the interior and secured with 1-1/4" brad nails located 1" from each corner and 6" to 8" on center. Glass bite was 1/2".

Drainage:

Description	QuantityL	ocation
1" wide by 1/8" deep weep slot	2	Top of the sill to the interior of the sill track, 1" from each jamb

Hardware:

Description	QuantityL	ocation
Adjustable steel rollers	2	Active panel, 11" from each end
Adjustable mortise latch with handle	1	Lock stile of operating panel, 39" from bottom rail with keeper located on jamb

Reinforcement: The fixed panel meeting stile was reinforced with an aluminum reinforcement secured with #8 x 1-3/4" screws located 3" from each end and 9" on center. (See drawing A60A.)

Test Specimen Description: (Continued)

Installation: The door was installed within a Spruce-Pine-Fir test buck and secured at one jamb and the head with steel installation straps located 6" from each corner and 21" on center. Each installation strap was secured to the door frame with four #8 x 5/8" screws and to the test buck with two #8 x 1-1/2" screws each at the exterior and at the interior. The opposite jamb was mulled to a 2" LVL mullion. The sill was set onto a bead of silicone sealant. The head jamb was additionally secured with #8 x 2-1/2" screws; two at the meeting stile and one located 3" from each corner. And, with two #10 x 2-1/2" screws through a meeting stile reinforcement bracket and head jamb into the buck. The sill was additionally secured with two #10 x 2" screws through a meeting stile reinforcement bracket and the sill into the buck. The locking jamb was additionally secured through the lock keeper with two #10 x 2-1/2" screws. The unit was sealed to the buck with silicone.

Test Results: The following results have been recorded:

Protocol TAS 202-94, *Static Air Pressure Tests*

Test Unit #1
Design Pressure: ±60.0 psf

Title of Test	Results		
Air Infiltration			
1.57 psf (25 mph)	0.16 cfm/ft^2		
6.24 psf (50 mph)	0.40 cfm/ft^2		
	Indicator Readings (inch)		
Structural Loads	#1	#2	#3
50% of Test Pressure (+45.0 psf)			
Maximum Deflection	0.18	0.93	0.15
Permanent Set	0.03	0.02	<0.01
Design Pressure (+60.0 psf)			
Maximum Deflection	0.23	1.27	0.21
Permanent Set	0.04	0.03	0.01
50% of Test Pressure (-45.0 psf)			
Maximum Deflection	0.13	0.91	0.21
Permanent Set	0.05	0.07	0.05
Design Pressure (-60.0 psf)			
Maximum Deflection	0.19	1.23	0.27
Permanent Set	0.07	0.10	0.07
Water Infiltration			
15% Positive Design Pressure (+9.0 psf)	No Penetration		
Test Pressure (+90.0 psf)	Fail - the glass broke in the fixed panel		

Test Results: (Continued)

Protocol TAS 202-94, ***Static Air Pressure Tests***

Test Unit #1R
Design Pressure: ±60.0 psf

Title of Test	Results		
	Indicator Readings (inch)		
Structural Loads	#1	#2	#3
50% of Test Pressure (+45.0 psf)			
Maximum Deflection	0.18	1.15	0.17
Permanent Set	0.05	0.08	0.03
Design Pressure (+60.0 psf)			
Maximum Deflection	0.25	1.59	0.23
Permanent Set	0.07	0.10	0.04
50% of Test Pressure (-45.0 psf)			
Maximum Deflection	0.19	1.02	0.22
Permanent Set	0.06	0.09	0.06
Design Pressure (-60.0 psf)			
Maximum Deflection	0.30	1.45	0.32
Permanent Set	0.09	0.13	0.09
Test Pressure (+90.0 psf)			
Maximum Deflection	0.32	2.16	0.31
Permanent Set	0.07	0.12	0.05
Test Pressure (-90.0 psf)			
Maximum Deflection	0.52	2.20	0.51
Permanent Set	0.11	0.16	0.11
Forced Entry - ASTM F 842-97		Pass	

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

Test Results: (Continued)

Protocol TAS 201-94, ***Impact Test Procedures***

Conditioning Temperature: 70°F
Missile Weight: 9.2 lbs
Missile Length: 96-3/8"
Muzzle Distance from Test Specimen: 16 ft.

Test Unit #1R

Impact #1: Missile Velocity: 49.8 fps

Impact Area: Center of glazing of active panel
Observations: No rips, tears or penetrations

Results: Pass

Impact #2: Missile Velocity: 50.0 fps

Impact Area: Lower right glazing corner of active panel
Observations: No rips, tears or penetrations

Results: Pass

Impact #3: Missile Velocity: 50.1 fps

Impact Area: Midspan bottom rail of active panel
Observations: Cracked bottom rail on interior.

Results: Pass

Impact #4: Missile Velocity: 49.0 fps

Impact Area: Midspan of meeting stiles
Observations: Dented exterior cladding, cracked fixed panel glazing

Results: Pass

Note: *Refer to Architectural Testing Sketch #2 for impact locations.*

Test Results: (Continued)

Protocol TAS 203-94, ***Cyclic Wind Pressure Loading***

Test Unit #1

Design Pressure: ±60.0 psf

POSITIVE PRESSURE

Pressure Range (psf)	Number of Cycles	Average Cycle Time (sec.)	Maximum Deflection at Indicator (inch)		
			#1	#2	#3
12.0 to 30.0	3500	1.82	0.17	0.96	0.18
0 to 36.0	300	2.55	0.18	1.15	0.20
30.0 to 48.0	600	2.05	0.24	1.50	0.24
18.0 to 60.0	100	2.98	0.27	1.72	0.28
			Permanent Set (inch)		
			0.08	0.14	0.07

NEGATIVE PRESSURE

Pressure Range (psf)	Number of Cycles	Average Cycle Time (sec.)	Maximum Deflection at Indicator (inch)		
			#1	#2	#3
18.0 to 60.0	50	2.91	0.30	1.76	0.32
30.0 to 48.0	1050	2.40	0.25	1.52	0.29
0 to 36.0	50	2.93	0.18	1.21	0.23
12.0 to 30.0	3350	2.45	0.14	1.00	0.20
			Permanent Set (inch)		
			0.03	0.18	0.08

Result: Pass

Note: Refer to Architectural Testing Sketch #1 for indicator locations.

Test Results: (Continued)

Protocol TAS 201-94, ***Impact Test Procedures***

Conditioning Temperature: 70°F
Missile Weight: 9.2 lbs
Missile Length: 96-3/8"
Muzzle Distance from Test Specimen: 16 ft.

Test Unit #2

Impact #1: Missile Velocity: 49.6 fps

Impact Area: Center of glazing of active panel
Observations: No rips, tears or penetrations

Results: Pass

Impact #2: Missile Velocity: 49.7 fps

Impact Area: Upper left glazing corner of active panel
Observations: No rips, tears or penetrations

Results: Pass

Impact #3: Missile Velocity: 49.6 fps

Impact Area: Midspan bottom rail of active panel
Observations: Cracked bottom rail on interior.

Results: Pass

Impact #4: Missile Velocity: 49.6 fps

Impact Area: Midspan of meeting stiles
Observations: Dented exterior cladding

Results: Pass

Note: Refer to Architectural Testing Sketch #2 for impact locations.

Test Results: (Continued)

Protocol TAS 203-94, ***Cyclic Wind Pressure Loading***

Test Unit #2

Design Pressure: ±60.0 psf

POSITIVE PRESSURE

Pressure Range (psf)	Number of Cycles	Average Cycle Time (sec.)	Maximum Deflection at Indicator (inch)		
			#1	#2	#3
12.0 to 30.0	3500	1.93	0.13	0.89	0.16
0 to 36.0	300	2.70	0.15	1.00	0.19
30.0 to 48.0	600	2.04	0.19	1.29	0.24
18.0 to 60.0	100	2.98	0.21	1.58	0.29
			Permanent Set (inch)		
			0.03	0.09	0.03

NEGATIVE PRESSURE

Pressure Range (psf)	Number of Cycles	Average Cycle Time (sec.)	Maximum Deflection at Indicator (inch)		
			#1	#2	#3
18.0 to 60.0	50	2.64	0.34	1.46	0.38
30.0 to 48.0	1050	2.08	0.30	1.40	0.30
0 to 36.0	50	2.97	0.19	0.99	0.31
12.0 to 30.0	3350	2.02	0.18	0.87	0.29
			Permanent Set (inch)		
			0.10	0.20	0.14

Result: Pass

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

Test Results: (Continued)

Protocol TAS 201-94, ***Impact Test Procedures***

Conditioning Temperature: 70°F
Missile Weight: 9.2 lbs
Missile Length: 96-3/8"
Muzzle Distance from Test Specimen: 16 ft.

Test Unit #3

Impact #1: Missile Velocity: 49.9 fps

Impact Area: Center of glazing of active panel
Observations: No rips, tears or penetrations

Results: Pass

Impact #2: Missile Velocity: 49.5 fps

Impact Area: Lower left glazing corner of active panel
Observations: No rips, tears or penetrations

Results: Pass

Impact #3: Missile Velocity: 49.6 fps

Impact Area: Midspan bottom rail of active panel
Observations: Cracked bottom rail on interior.

Results: Pass

Impact #4: Missile Velocity: 49.3 fps

Impact Area: Midspan of meeting stiles
Observations: No damage

Results: Pass

Note: Refer to Architectural Testing Sketch #2 for impact locations.

Test Results: (Continued)

Protocol TAS 203-94, ***Cyclic Wind Pressure Loading***

Test Unit #3

Design Pressure: ±60.0 psf

POSITIVE PRESSURE

Pressure Range (psf)	Number of Cycles	Average Cycle Time (sec.)	Maximum Deflection at Indicator (inch)		
			#1	#2	#3
12.0 to 30.0	3500	1.81	0.07	0.67	0.11
0 to 36.0	300	2.85	0.06	0.83	0.13
30.0 to 48.0	600	2.65	0.09	1.00	0.16
18.0 to 60.0	100	1.98	0.12	1.20	0.19
			Permanent Set (inch)		
			0.03	0.06	0.04

NEGATIVE PRESSURE

Pressure Range (psf)	Number of Cycles	Average Cycle Time (sec.)	Maximum Deflection at Indicator (inch)		
			#1	#2	#3
18.0 to 60.0	50	2.06	0.24	1.54	0.32
30.0 to 48.0	1050	2.10	0.23	1.34	0.29
0 to 36.0	50	2.98	0.19	1.05	0.24
12.0 to 30.0	3350	2.13	0.19	0.95	0.23
			Permanent Set (inch)		
			0.12	0.24	0.09

Result: Pass

Note: Refer to Architectural Testing Sketch #1 for indicator locations.

Test Equipment:

Cannon: Steel pipe barrel utilizing compressed air to propel the missile

Missile: 2x4 Southern Pine

Timing Device: Electronic Beam Type

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

Deflection Measuring Device: Linear transducers

Laboratory Compliance Statements: The following are provided as required by the protocols for the testing reported herein.

Upon completion of testing, specimens tested for TAS 201-94 met the requirements of Section 1626 of the Florida Building Code.

Upon completion of testing, specimens tested for TAS 202-94 met the requirements of Section 1620 of the Florida Building Code.

Upon completion of testing, specimens tested for TAS 203-94 met the requirements of Section 1626 of the Florida Building Code.

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.

Testing was conducted at the Architectural Testing, Inc. laboratory located in St. Paul, Minnesota.

List of Official Observers:

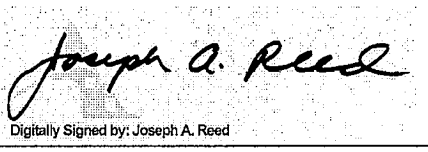
Name	Company
Chad Cornell	Eagle Window & Door, Inc.
Joe Cogan	Eagle Window & Door, Inc.
Tony D. Gavin	Architectural Testing, Inc.
Karl A. Lips-Eakins	Architectural Testing, Inc.
Joseph A. Reed, P.E.	Architectural Testing, Inc.
Eric J. Schoenthaler	Architectural Testing, Inc.

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 ten 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. 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 specimens tested. This report may not be reproduced, except in full, without the written approval of Architectural Testing, Inc.

For ARCHITECTURAL TESTING, INC.

Eric J. Schoenthaler
Project Manager



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

EJS:es/cmd

Attachments (pages): This report is complete only when all attachments listed are included.
Appendix-A: Sketches (2)
Appendix-B: Drawings (48)