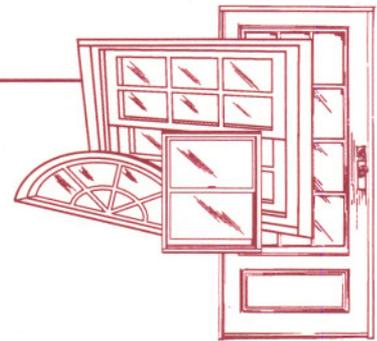


CERTIFIED TESTING LABORATORIES

Architectural Division • 7252 Narcoossee Rd. • Orlando, FL 32822
(407) 384-7744 • Fax (407) 384-7751
Web Site: www.ctlarch.com
E-mail: ctlarch.com



Report No.: CTLA-679WE

DC Not. 01010

Date: September 20, 2001

CTL Certification # 99-0105.02

Test Dates: April 16,17,June 22,2001

Test Requested By - Hurd Millwork Co, Inc.
575 South Whelen Ave
Medford, WI 54451

Tests Conducted: PA 201, Large Missile PA 202, PA 203, (with no deviations)

<u>Design Pressures :</u>	Specimen 1	(PA 202).(PA 201)and(PA203)	+ 70.0 psf.	-60.0 psf.
	Specimen 2	(PA 202) (PA 201)and(PA203)	+ 70.0 psf.	-70.0 psf.
	Specimen 3	(PA 202) Structural Only(PA201).(PA203).	+ 60.0 psf.	-60.0 psf.
	Specimens 4,5	(PA 201)and(PA203)	+ 70.0 psf.	- 70.0 psf.
	Specimens 4A	(PA 201)and(PA203)	+ 70.0 psf.	- 70.0 psf.

(1) DESCRIPTION OF SERIES:

Model Designation : Aluminum Clad Wood Single and Double Outswing French Doors

Overall Size:

Specimens 1,3.	144.875" wide x 95.5" high x 5.75" deep.
Specimen 2.	71.5" wide x 137.75" high x 5.75" deep.
Specimen 4,5.	71.5" wide x 95.5" high x 5.75" deep.
Specimen 4A.	36.3125" wide x 95.5" high x 5.75" deep.

Configuration :

Specimens 1, 3.	Mulled Double and Single door with Fixed lite.
Specimen 2.	Double Door with Muller Top Lite
Specimen 4,5.	Double Doors
Specimen 4A.	Single Fixed panel

Frame Construction: The Aluminum clad wood frames measured Specimen #1&3:144.875" wide x 95.5" high overall. Specimen# 2: 71.5"wide x 137.75" high Specimen # 4&5: 71.5" wide x 95.5" overall. The wooden portion of the main Ponderosa Pine frame as stated by manufacturer, measured 4.563"thick x 1.493"deep. Wood members are butt corner constructed and secured with two (2) # 8 x 3"SMS fasteners through head into side jambs and two (2) # 8 x 2.5"panhead fasteners through sill into side jambs . The aluminum clad is cope and butted and joined with a nylon corner key (Hurd part # OCPD 546)at head and a half nylon corner key (Hurd part # OCPD 547)at sill secured with two (2) # 6 x.625" phillips flat head SMS fasteners per corner.

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Panel Construction: Wood members are lapped together and joined with fully glued wood dowels measuring .750" dia. x 3.5" long located two (2) in the head and three (3) in the sill. Each corner had two 0.08" dia. T-nails going through into dowels. Top rail measured 4.469"x 1.688" (ponderosa / sugar pine). Bottom rail measured 7.438"x 1.644" (ponderosa / sugar pine). The hinge and stationary stile measured 4.469"x 1.688" 1.3E Timberstrand LSL by Trussjoint Mac Millan as stated by manufacturer. The lock stile measured 4.469"x 1.688"(LVL by Pacific wood Laminates Inc) as stated by manufacturer. Each hinge stile had four (4) hinges secured to frame jamb with two (2) #12 x 2.500"SMS and two (2) # 12 x .750 SMS. And to the leaf with two (2) #12 x 2.500"SMS and two (2) # 12 x .750 SMS. The astragal cap was secured with # 6 x 3"SMS fasteners located 4" from each end 8" on center thereafter.

Glazing: 11.9
Specimens # 1,3,4,4A,& 5. 3/8" Cardinal Seastorm type "B" 4mm annealed/0.015"PVB/0.007"PET/0.075PVB/4mm annealed.
Specimen # 2 9/16" Cardinal Seastorm type "B" 5mm annealed/0.015"PVB/0.007"PET/0.075PVB/5mm annealed 13.0

Glazing Method: Glazed three sides with Schnee Moorhead SM-5731 or Dow Corning 995 silicone with .5625" bite on glass and captured with a wood glazing stop 0.685"x 0.842" and Neoprene shim pieces measuring .250" x .125" x .250" located both sides of glass 4" from each corner 18" on center thereafter. Glazing stop secured with one (1) row of 14 gage x 1.250" T-nails located 1" from each end 6" on center thereafter

Daylight Opening: **Specimens # 1,2,3,4,4A,5.** 24.875" x 81.125" Door Panels and Side Panels.
Specimen # 2 68.75" x 33.25" Top Lite

Weatherstripping:

<u>Quality</u>	<u>Description</u>	<u>Location</u>
Four (4) strips	Amesbury; Santoprene Thurmo Plastic Rubber (Part # OCPD670)	All frame members
One (1) strip	Climatex; Rigid & Flexible PVC (Part # OCPD536H)	Panel top rails
One (1) strip	Climatex; UV Heat Resistant PVC (Part # OCPD536H)	Panel bottom rails
Two (2) strips	Amesbury; Santoprene Thurmo Plastic Rubber (Part # OCPD670)	Astragal Cap

Hardware & Location:

<u>Quality</u>	<u>Description</u>	<u>Location</u>
Specimens 1,2,3,4. (4)	4"x 4"Hager 1191 Brass Hinges Located 9",34.8,60.6" and 86.4"measuring from top of panel	Each door Leaf
(1)	Mortise lock 5-point locking System (Hardware Technologies Ltd.)	Active door leaf
(1)	2- point shoot bolt assembly Hardware Technologies Ltd.)	Inactive door leaf
(1)	Handle	Inactive and Active door leafs

Weepholes: None

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<u>Reinforcements:</u>	<u>Quality</u>	<u>Description</u>	<u>Location</u>
	One(1)	1/4"x 5.0" 6061-T6 aluminum bar	At each mullion
	One (1)	1.0"x 10.250"x 0.188"Stainless steel bar corner reinforcement.	Each corner of panels
	One (1)	1.867" x 4.125"x 0.090"Stainless steel Sill strike reinforcement (Double doors)	Frame Sill
	One (1)	1.867" x 2.063"x 0.090"Stainless steel Sill strike reinforcement (Single doors)	Frame Sill
	One (1)	Head strike Stainless steel 1.3"x 6" x .125" (Double doors)	Frame Head
	One (1)	Head strike Stainless steel 1.3"x 2.673" x .125" (Single doors)	Frame Head
	One (1)	Head Plate 16 ga galvanized steel 4" x 9"x .056"	Frame Head
	Two (2)	Astragal Plate aluminum 1.32" x 3.78" x.093"	Frame Top and Bottom

Additional Description: **Specimens # 1,3.** Were mulled together with a 1/4" x 5"aluminum reinforcement bar and secured with # 1/4" x 2.5"tapcon fasteners located 4" from each end 12" on center thereafter each side.

Specimen # 2 Was mulled together with a 1/4" x 5"aluminum reinforcement bar and secure with # 1/4" x 2.5"tapcon fasteners located 4" from each end 16" on center thereafter each side.

Installation:

Specimen 1,. Door frames secured in a 2" x 12" Pine PT frame and to a 2 x 4 pine buck with SMS screws. Fixed panel and single door head jambs: Secured with three (3) # 10 x 3" Phillips F.H. SMS 4"from the corners and mid-span of each panel. Double door head jamb: Secured with five (5) #10 x 3" Phillips F.H. SMS 4"from the corners and equally spaced across the head. In addition there was a #10 x 3"SMS placed on each side of each mullion 7" off the centerline and three (3)# 10 x 2.5" through the head strike plate into the buck.. Side jambs: Eight (8) # 10 x 3 Phillips F.H. SMS 4"from the corners and equally spaced (approximately 12.5" O.C.). Fixed panel and single door sills: Secured with three (3) # 10 x 3" Phillips F.H. SMS 4"from the corners; and mid-span of each panels. Double door sill: Secured with six (6) #10 x 3" Phillips F.H. SMS 4"from the corners, at each panel mid-span and 4" off each side of the door center. In addition there was a #10 x 3"SMS placed on each side of each mullion 7" off the centerline and three (3)# 10 x 2.5" through the sill strike plate into the buck..

Specimens 2 Door frame secured in a 2" x 12" Pine PT frame and to a 2 x 4 pine buck with hurricane clips. Each clip was 1.5" x 6.438" x 0.058" thick galvanized steel secured to the jamb with one (1) # 8 x .750" and one (1) # 8 x .625" P.H. SMS screws and wrapped at both sides of the buck and screwed to the buck with one (1) # 10 x 1.25"P.H.SMS screw each side. Transom head jamb: Six (6) clips 4" from corners and equally spaced (approximately 12.8" O.C.). Transom side jamb: Four (4) clips 4" from corners and equally spaced (approximately 12" O.C.). Note: One clip was replaced with a # 10 x 3" SMS screw at the mullion corner at right side of unit. Door Side jambs: Eight (8) clips 4"from corners and equally spaced (approximately 12.5" O.C.). In addition, at the door side jamb, two (2) # 12 x 2.5"S.S. SMS were used at each hinge through the hinge and jamb into buck. Note: One (1) clip was replaced with a # 10 x 3" SMS screw at the mullion corner right side of unit.

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Door sill: Secured with six (6) #10 x 3" Phillips F.H. SMS 4" from the corners, at each panel mid-span and 4" off each side of the door center. In addition there were three (3) # 10 x 2.5" through the sill strike plate into the buck..

Additional fasteners at mullion ends: Additional clip placed at the left side of the unit 7" off mullion centerline each side of mullion. Additional #10 x 3" SMS placed at the right side of the unit 7" off mullion centerline each side of mullion.

Specimen 3

Door frame secured in a 2" x 12" Pine PT frame and to a 2 x 4 pine buck with hurricane clips. Each clip was 1.5" x 6.438" x 0.058" thick galvanized steel secured to the jamb with one (1) # 8 x .750" and one (1) # 8 x .625" P.H. SMS screws and wrapped at both sides of the buck and screwed to the buck with one (1) # 10 x 1.25" P.H. SMS screw each side.

Fixed panel head jambs: Secured with three (3) clips 4" from the corners and mid-span of each panel.

Double door head jamb: Secured with five (5) clips 4" from the corners and equally spaced across the head. In addition there was a clip placed on each side of each mullion 7" off the centerline and three (3) # 10 x 2.5" through the head strike plate into the buck..

Side jambs: Eight (8) clips 4" from the corners, and equally spaced (approximately 12.5" OC).

Fixed panel sills: Secured with three (3) # 10 x 3" Phillips F.H. SMS 4" from the corners and mid-span of each panel.

Double door sill: Secured with six (6) #10 x 3" Phillips F.H. SMS 4" from the corner, at each panel mid-span and 4" off each side of the door center. In addition there was a #10 x 3" SMS placed on each side of each mullion 7" off the centerline and three (3) # 10 x 2.5" through the sill strike plate into the buck..

Specimen 4,5.

Door frames secured in a 2" x 12" Pine PT frame and to a 2 x 4 pine buck with SMS screws.

Double door head jamb: Secured with five (5) #10 x 3" Phillips F.H. SMS 4" from the corners and equally spaced across the head. In addition there were three (3) # 10 x 2.5" through the head strike plate into the buck.

Side jambs: Eight (8) # 10 x 3 Phillips F.H. SMS 4" from the corners and equally spaced (approximately 12.5" O.C.).

Double door sill: Secured with six (6) #10 x 3" Phillips F.H. SMS 4" from the corners, at each panel mid-span and 4" off each side of the door center. In addition there were three (3) # 10 x 2.5" through the sill strike plate into the buck..

Specimen 4A.

Single fixed panel: Secured in a 2" x 12" Pine PT frame and to a 2 x 4 pine buck with hurricane clips. Each clip was 1.5" x 6.438" x 0.058" thick galvanized steel secured to the jamb with one (1) # 8 x .750" and one (1) # 8 x .625" P.H. SMS screws and wrapped at both sides of the buck

Fixed panel head and sill jambs: Secured with three (3) clips 4" from the corners and mid-span of each panel.

Side jambs: Eight (8) clips 4" from the corners and equally spaced (approximately 12.5" OC).

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Test Results:

Test Sequence: PA 202

1. Air Infiltration
2. 1/2 Test Pressure Positive
3. 1/2 Test Pressure Negative
4. Design Pressure Positive
5. Design Pressure Negative
6. Water Infiltration Positive
7. Full Test Pressure Positive
8. Full Test Pressure Negative

Air Infiltration test was conducted in accordance with DCBCCD PA 202

Specimens # 1,2,3.

	Measured	Allowed
Air at 1.57 psf Specimen # 1	.07 cfm/ft	.3cfm/ft
Specimen # 2	.00 cfm/ft	.3cfm/ft
Specimen # 3	.02 cfm/ft	.3cfm/ft

Specimens # 1,2,3.

Water Infiltration test was done in accordance with DCBCCD PA 202

	Measured	Allowed
5.0 gph/ft., Test Pressure 12 psf	No water infiltration	No water infiltration

Specimen # 1

Mullion

Mullion

O	X	Loc#2 X X	X
	Inactive	Active	
Loc # 1 X	o o	Loc# 3 X	Loc # 4o X

Location of CDI 5" dial indicators

STATIC AIR PRESSURE TEST Static tests were conducted in accordance with DCBCCD PA 202

Performance Test Results Specimen # 1 PA 202

Specimen # 1

Design Loads + 70 psf

	time	actual load	deflection		perm. Set			
			loc#1	loc#4	loc# 1	loc#2	loc# 3	loc# 4
Positive loads	(seconds)	psf						
1/2 Test	30 seconds	52.5						
Design	30 seconds	70.0	218"	.399"				
Test	30 seconds	105.0			.154"	.032"	.045"	.042"

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Design Loads - 60 psf

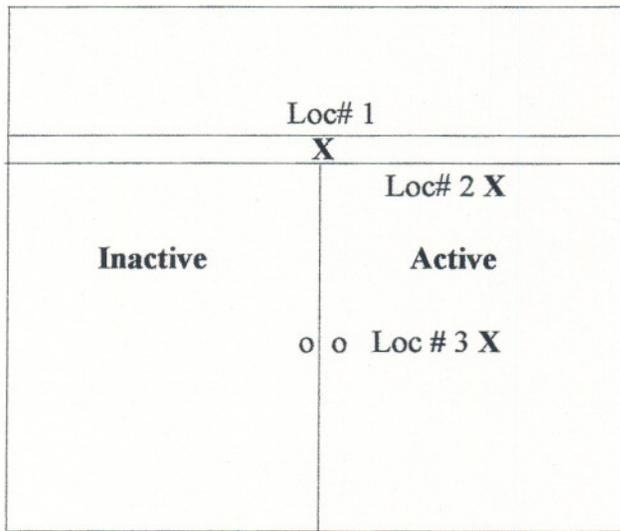
Range of test	time	actual load	deflection		perm. Set			
			loc#2	loc#7	loc# 2	loc#4	loc# 5	loc# 7
Negative loads	(seconds)	psf						
1/2 test	30 seconds	45.0						
Design	30 seconds	60.0	.443"	.173"				
Test	30 seconds	90.0			.163"	.072"	.083"	.081"

Deflection was measured with four (4) CDI 5" dial indicator SN971649614 and SN993413562 and SN002644133 SN002795666 Loc# 1 mid-span of mullion. Loc# 2 mid-span of top rail. Loc# 3 mid-span of panel. Loc# 4 mid-span of mullion.

- Mullion loc # 1- max allowable deflection at design is $(L / 180) 95.5" / 180 = 0.530"$
- Mullion loc # 4- max allowable deflection at design is $(L / 180) 95.5" / 180 = 0.530"$
- Door loc# 2 - max allowable set after test load is $(.4\% \times L) .004 \times 36.4375 = 0.146"$
- Door loc #3 - max allowable set after test load is $(.4\% \times L) .004 \times 95.5 = 0.382"$
- Mullion loc #1- max allowable set after test load is $(.4\% \times L) .004 \times 95.5 = 0.382"$
- Mullion loc #4- max allowable set after test load is $(.4\% \times L) .004 \times 95.5 = 0.382"$

Conclusion: After testing was concluded, visual inspection of the specimen revealed no local yielding or fastener loosening.

Specimen # 2



Location of CDI 5" dial indicators

STATIC AIR PRESSURE TEST Static tests were conducted in accordance with DCBCCD PA 202
Performance Test Results Specimen # 2 PA 202

Specimen # 2

Design Load + 70 psf

Range of test	time	actual load	deflection			perm. Set		
			loc#1	loc#2	loc#3	loc#1	loc#2	loc# 3
Positive loads	(seconds)	psf						
1/2 Test	30 seconds	52.5						
Design	30 seconds	70.0	.137"					
Test	30 seconds	105.0				.055"	.042"	.051"

loc #1, 2, 3
 10/21/01

Design Loads - 70 psf

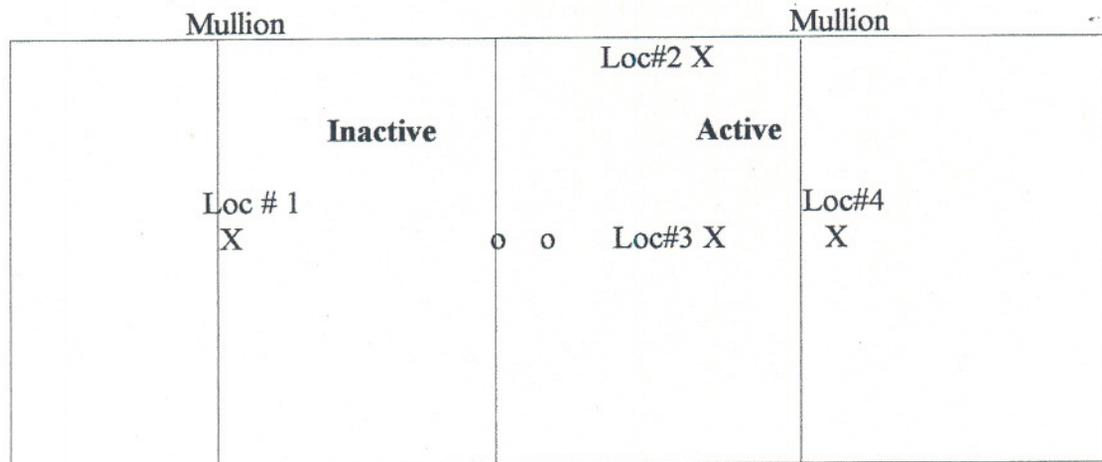
Range of test	time (seconds)	actual load psf	deflection			perm. Set		
			loc#1	loc#2	loc#3	loc#1	loc#2	loc#3
Negative loads								
1/2 test	30 seconds	52.5						
Design	30 seconds	70.0	.154"					
Test	30 seconds	105.0				.106"	.047"	.061"

Deflection was measured with Three (3) CDI 5" dial indicator SN971649614 and SN993413562 and SN002644133
 Loc# 1 mid-span of mullion. Loc# 2 mid-span of top rail. Loc# 3 mid-span of panel.

Mullion loc # 1 - max allowable deflection at design is $(L / 180) 95.5" / 180 = 0.530"$
 Door loc# 2 - max allowable set after test load is $(.4\% \times L) .004 \times 36.4375 = 0.146"$
 Door loc# 3 - max allowable set after test load is $(.4\% \times L) .004 \times 95.5 = 0.382"$
 Mullion loc #1 - max allowable set after test load is $(.4\% \times L) .004 \times 71.5 = 0.286"$

Conclusion: After testing was concluded, visual inspection of the specimen revealed no local yielding or fastener loosening.

Specimen # 3



O X X O
 Location of CDI 5" dial indicators

STATIC AIR PRESSURE TEST Static tests were conducted in accordance with DCBCCD PA 202

Performance Test Results Specimen # 3 PA 202

Specimen # 3

Design Loads + 60 psf

Range of test	time (seconds)	actual load psf	deflection		perm. Set			
			loc#1	loc#4	loc# 1	loc#2	loc# 3	loc# 4
Positive loads								
1/2 Test	30 seconds	45.0						
Design	30 seconds	60.0	.214"	.245"				
Test	30 seconds	90.0			.058"	.047"	.039"	.038"

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Design Loads - 60 psf

Range of test	time (seconds)	actual load psf	deflection		perm. Set		Allowed	
			loc#1	loc#4	loc# 1	loc#2	loc# 3	loc# 4
Negative loads	30 seconds	45.0						
1/2 Test	30 seconds	60.0	.319"	.262"				
Design	30 seconds	90.0			.057"	.036"	.049"	.044"
Test	30 seconds							

Deflection was measured with four (4) CDI 5" dial indicator SN971649614 and SN993413562 and SN002644133 SN002795666 Loc# 1 mid-span of mullion. Loc# 2 mid-span of top rail. Loc# 3 mid-span of panel. Loc# 4 mid-span of mullion.

- Mullion loc # 1- max allowable deflection at design is $(L / 180) 95.5" / 180 = 0.530"$
- Mullion loc # 4- max allowable deflection at design is $(L / 180) 95.5" / 180 = 0.530"$
- Door loc# 2 - max allowable set after test load is $(.4\% \times L) .004 \times 36.4375 = 0.146"$
- Door loc #3 - max allowable set after test load is $(.4\% \times L) .004 \times 95.5 = 0.382"$
- Mullion loc #1- max allowable set after test load is $(.4\% \times L) .004 \times 95.5 = 0.382"$
- Mullion loc #4- max allowable set after test load is $(.4\% \times L) .004 \times 95.5 = 0.382"$

Performance Test Results Specimen # 1 PA 201 (Large missile)

The specimen was impacted with a 8ft. long, 9lb., 2" x 4" at the following locations:

Loc# 7 X	Loc# 5 X o o	Loc#3 X	Loc# 1 X	Loc #1 Impacted at 51.6 ft per second, Mid-span of panel. No missile penetration. Loc #2 Impacted at 52.0 ft per second, Bottom left corner. No missile penetration. Loc #3 Impacted at 53.1 ft per second, Mid-span of panel. No missile penetration. Loc #4 Impacted at 51.8 ft per second, Bottom right corner. No missile penetration Loc #5 Impacted at 52.4 ft per second, Mid-span of panels. No missile penetration Loc #6 Impacted at 50.7 ft per second, Mid-span bottom rail. No missile penetration Loc #7 Impacted at 51.3 ft per second, Mid-span of mullion. No missile penetration
Loc# 6 X		Loc# 4 X	Loc# 2 X	

Note:

- X measurement from left edge of specimen.
- Y measurement from top edge of test specimen.

Specimen No.1	Impact No	Impact Loc.	Speed Ft/Sec.	X Meas.	Y Meas
	1	1	51.6	126.0"	47.0"
	2	2	52.0	114.0"	90.5"
	3	3	53.1	91.5"	46.75"
	4	4	51.8	102.3"	90.0"
	5	5	52.4	72.3"	47.25"
	6	6	50.7	53.5"	93.0"
	7	7	51.3	36.75"	46.75"

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Performance Test Results Specimen #2 PA 203

Cycle tests were conducted in accordance with DCBCCD PA 203

Design Load + 70.0 psf, - 70.0 psf

Range of test	actual load psf		# of cycles	cycles/min
Positive loads				
+ .2 - .5	14.0	35.0	3500	55
+ .0 - .6	0.0	42.0	300	55
+ .5 - .8	35.0	56.0	600	55
+ .3 - 1.0	21.0	70.0	100	55

DEF SET
 2.125" .0625"

Total: 4500 cycles

Negative Loads

Range of test	actual load psf		# of cycles	cycles/min
- .3 - 1.0	21.0	70.0	50	55
- .5 - .8	35.0	56.0	1050	55
- .0 - .6	0.0	42.0	50	55
- .2 - .5	21.0	70.0	3350	55

Completed: 9000 cycles

DEF SET
 2.0625" .375"

Specimen showed no resultant failure or duress after cycle test. No failure of fasteners and there were no cracks longer than 5" x 1/16" through which air could pass observed.

Performance Test Results Specimen # 3 PA 201 (Large missile)

The specimen was impacted with a 8ft. long, 9lb., 2" x 4" at the following locations:

Loc# 6 X	Loc# 5 X	Loc#3 X o o	Loc# 1 X	Loc #1 Impacted at 51.0 ft per second, Mid-span of panel. No missile penetration. Loc #2 Impacted at 51.6 ft per second, Bottom right corner. No missile penetration. Loc #3 Impacted at 52.1 ft per second, Mid-span of panels. No missile penetration. Loc #4 Impacted at 50.8 ft per second, Mid-span bottom rail. No missile penetration Loc #5 Impacted at 52.4 ft per second, Mid-span of mullion. No missile penetration Loc #6 Impacted at 50.7 ft per second, Mid-span of panel. No missile penetration Loc #7 Impacted at 51.3 ft per second, Bottom left corner. No missile penetration
Loc# 7 X	Loc# 4 X		Loc# 2 X	

Note:

X measurement from left edge of specimen.
 Y measurement from top edge of test specimen.

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Specimen No.3	Impact No	Impact Loc.	Speed Ft/Sec.	X Meas.	Y Meas
	1	1	51.0	90.0"	47.75"
	2	2	51.6	100.5"	82.75"
	3	3	52.1	71.75"	47.5"
	4	4	50.8	53.5"	90.25"
	5	5	52.4	36.5"	48.0"
	6	6	50.7	18.25"	47.5"
	7	7	51.3	14.0"	82.5"

Performance Test Results Specimen # 3 PA 203

Cycle tests were conducted in accordance with DCBCCD PA 203

Design Load + 60.0 psf, - 60.0 psf

Range of test actual load psf # of cycles cycles/min

Positive loads

+ .2 - .5	12.0	30.0	3500	55
+ .0 - .6	0.0	36.0	300	55
+ .5 - .8	30.0	48.0	600	55
+ .3 - 1.0	18.0	60.0	100	55

DEF SET
1.675" .125"

Total: 4500 cycles

Negative Loads

Range of test actual load psf # of cycles cycles/min

- .3 - 1.0	18.0	60.0	50	55
- .5 - .8	30.0	48.0	1050	55
- .0 - .6	0.0	36.0	50	55
- .2 - .5	12.0	30.0	3350	55

DEF SET
1.625" .125"

Completed: 9000 cycles

Specimen showed no resultant failure or duress after cycle test. No failure of fasteners and there were no cracks longer than 5" x 1/16" through which air could pass observed.

Performance Test Results Specimen # 4 PA 201 (Large missile)

The specimen was impacted with a 8ft. long, 9lb., 2" x 4" at the following locations:

Loc# 1 X	Loc#3 X	Loc #1 Impacted at 54.0 ft per second, Mid-span of panel. No missile penetration. Loc #2 Impacted at 53.2 ft per second, Bottom left corner of panel. No missile penetration Loc #3 Impacted at 51.5 ft per second, Mid-span of panels. No missile penetration. Loc #4 Impacted at 52.2 ft per second, Mid-span of bottom rail. No missile penetration
Loc#2 X	o o	
	Loc# 4 X	

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Note:

X measurement from left edge of specimen.
 Y measurement from top edge of test specimen.

Specimen No.4	Impact No	Impact Loc.	Speed Ft/Sec .	X Meas.	Y Meas
	1	1	54.0	19.0"	46.5"
	2	2	53.2	15.0"	80.0"
	3	3	51.5	34.5"	46.5"
	4	4	52.2	43.0"	90.0"

Performance Test Results Specimen # 4 PA 203

Cycle tests were conducted in accordance with DCBCCD PA 203

Design Load	+ 70.0 psf - 70.0 psf			
<u>Range of test</u>	<u>actual load psf</u>		<u># of cycles</u>	<u>cycles/min</u>
Positive loads				
+ .2 - .5	14.0	35.0	3500	55
+ .0 - .6	0.0	42.0	300	55
+ .5 - .8	35.0	56.0	600	55
+ .3 - 1.0	21.0	70.0	100	55
Total: 4500 cycles				DEF SET 1.875" 0.0625"
Negative Loads				
<u>Range of test</u>	<u>actual load psf</u>		<u># of cycles</u>	<u>cycles/min</u>
- .3 - 1.0	21.0	70.0	50	55
- .5 - .8	35.0	56.0	1050	55
- .0 - .6	0.0	42.0	50	55
- .2 - .5	14.0	35.0	3350	55
Completed: 9000 cycles				DEF SET 1.500" .125"

Specimen showed no resultant failure or duress after cycle test. No failure of fasteners and there were no cracks longer than 5" x 1/16" through which air could pass observed.

Performance Test Results Specimen # 5 PA 201 (Large missile)

The specimen was impacted with a 8ft. long, 9lb., 2" x 4" at the following locations:

Loc# 1 X	Loc#3 X	Loc #1 Impacted at 52.0 ft per second, Mid-span of panel. No missile penetration. Loc #2 Impacted at 51.2 ft per second, Bottom left corner of panel. No missile penetration Loc #3 Impacted at 51.5 ft per second, Mid-span of panels. No missile penetration. Loc #4 Impacted at 52.2 ft per second, Mid-span of bottom rail. No missile penetration
Loc#2 X		
	Loc# 4 X	

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 10/3/01

Note:

X measurement from left edge of specimen.
 Y measurement from top edge of test specimen.

Specimen No.5	Impact No	Impact Loc.	Speed Ft/Sec.	X Meas.	Y Meas
	1	1	52.0	17.5"	46.0"
	2	2	51.2	13.0"	79.5"
	3	3	51.5	33.0"	48.0"
	4	4	52.2	41.5"	90.0"

Performance Test Results Specimen #5 PA 203

Cycle tests were conducted in accordance with DCBCCD PA 203

Design Load + 70.0 psf , - 70.0 psf

Range of test	actual load psf		# of cycles	cycles/min
Positive loads				
+ .2 - .5	14.0	35.0	3500	55
+ .0 - .6	0.0	42.0	300	55
+ .5 - .8	35.0	56.0	600	55
+ .3 - 1.0	21.0	70.0	100	55

DEF SET
 1.625" .0625"

Total: 4500 cycles

Negative Loads

Range of test	actual load psf		# of cycles	cycles/min
- .3 - 1.0	21.0	70.0	50	55
- .5 - .8	35.0	56.0	1050	55
- .0 - .6	0.0	42.0	50	55
- .2 - .5	14.0	35.0	3350	55

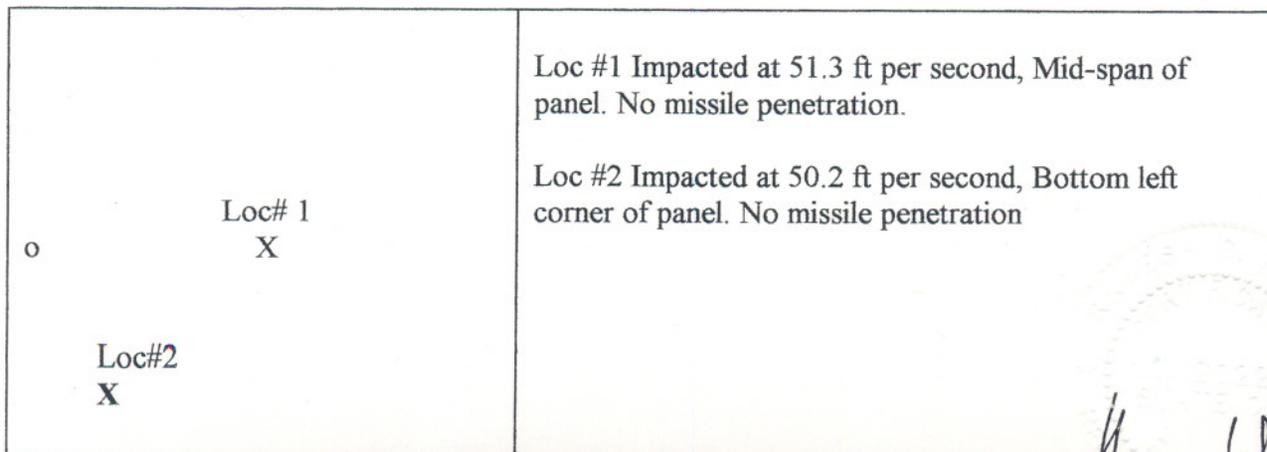
DEF SET
 1.750" .125"

Completed: 9000 cycles

Specimen showed no resultant failure or duress after cycle test. No failure of fasteners and there were no cracks longer than 5" x 1/16" through which air could pass observed.

Performance Test Results Specimen # 4A PA 201 (Large missile)

The specimen was impacted with a 8ft. long, 9lb., 2" x 4" at the following locations:



Loc #1 Impacted at 51.3 ft per second, Mid-span of panel. No missile penetration.

Loc #2 Impacted at 50.2 ft per second, Bottom left corner of panel. No missile penetration

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 10/3/09

Note:

X measurement from left edge of specimen.

Y measurement from top edge of test specimen.

Specimen No.4A	Impact No	Impact Loc.	Speed Ft/Sec.	X Meas.	Y Meas
	1	1	51.3	17.0"	48.0"
	2	2	50.2	11.25"	80.5"

Performance Test Results Specimen #4A PA 203

Cycle tests were conducted in accordance with DCBCCD PA 203

Design Load + 70.0 psf, - 70.0 psf

Range of test	actual load psf		# of cycles	cycles/min
Positive loads				
+ .2 - .5	14.0	35.0	3500	55
+ .0 - .6	0.0	42.0	300	55
+ .5 - .8	35.0	56.0	600	55
+ .3 - 1.0	21.0	70.0	100	55

Total: 4500 cycles

DEF SET
1.750" .063"

Negative Loads

Range of test	actual load psf		# of cycles	cycles/min
- .3 - 1.0	21.0	70.0	50	55
- .5 - .8	35.0	56.0	1050	55
- .0 - .6	0.0	42.0	50	55
- .2 - .5	14.0	35.0	3350	55

Completed: 9000 cycles

DEF SET
3.125" .250"

Specimen showed no resultant failure or duress after cycle test. No failure of fasteners and there were no cracks longer than 5" x 1/16" through which air could pass observed.

Comment: Nominal 2 mil polyethylene film was used to seal against air leakage during structural loads. The film was used in a manner that did not influence the test results.

Submittal drawing as supplied by Hurd Millwork Co, Inc. signed and sealed by this laboratory, videotape of the testing,

Handwritten signature: Hurd P-E
 10/3/01

Remarks: A detailed drawing was available for Laboratory records and comparison to the tested specimens at the time of this report. A copy of this report along with representative sections of the test specimens will be retained for a period of ten (10) years. The results obtained and recorded apply only to the specimens tested.

This test report does not constitute certification of this product, but only that the above test results were obtained using the designated methods and they indicate compliance with the performance requirements (paragraphs as listed) of the above referenced specifications.

Certified Testing Laboratories assumes that all information provided by the client is accurate, and that the physical and chemical properties of the components are as stated by the manufacturer.

Observer

All tests witnessed by:
Ramesh Patel, P.E
Chris Bennett, CTL
Ted Scanlon, CTL


Ramesh Patel, P.E.
Florida Reg. #20224
Structural Engineer
10/3/01

Certified Testing Laboratories, Inc.

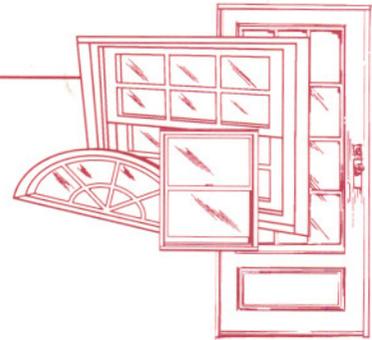


Christopher Bennett
Lab Manager
Architectural Division

CC: Hurd Millwork (2)
Dade County (1)
Warren Schaefer (2)
Ramesh Patel (1)
File

CERTIFIED TESTING LABORATORIES

Architectural Division • 7252 Narcoossee Rd. • Orlando, FL 32822
(407) 384-7744 • Fax (407) 384-7751
Web Site: www.ctlarch.com
E-mail: ctlarch.com



Report No.: CTLA-899WE

DC Not. 02019

Date: October 7, 2002

CTL Certification # 02-0429-03

Test Dates: May 13, 2002

Test Requested By - Hurd Millwork Co, Inc.
575 South Whelen Ave
Medford, WI 54451

Tests Conducted: PA 201, Large Missile PA 202 (Structural Only) PA 203, (with no deviations)

Design Pressures :

Specimen 3A	(PA 202) Structural Only	+ 70.0 psf.	- 70.0 psf.
Specimen 3B	(PA 201) and (PA 203)	+ 70.0 psf.	- 70.0 psf.

Addition to Hurd Millwork Co. N.O.A # 01-1012-03 Impact Outswing French Door

(1) DESCRIPTION OF SERIES:

Model Designation : Aluminum Clad Wood Double Outswing French Doors

Overall Size:

Specimen 3A,3B 71.5" wide x 95.5" high x 5.75" deep.

Configuration :

Specimen 3A,3B Double Doors

Frame Construction:

Specimen # 3A & 3B: The Aluminum clad wood frames measured 71.5" wide x 95.5" overall. The wooden portion of the main Ponderosa Pine frame as stated by manufacturer, measured 4.563" thick x 1.493" deep. Wood members are butt corner constructed and secured with two (2) # 8 x 3" SMS fasteners through head into side jambs and two (2) # 8 x 2.5" panhead fasteners through sill into side jambs. The aluminum clad is cope and butted and joined with a nylon corner key (Hurd part # OCPD 546) at head and a half nylon corner key (Hurd part # OCPD 547) at sill secured with two (2) # 6 x .625" phillips flat head SMS fasteners per corner.

La. Subb. P. E.
10/24/02

Panel Construction: Wood members are lapped together and joined with fully glued wood dowels measuring .750" dia. x 3.5" long located two (2) in the head and three (3) in the sill. Each corner had two 0.08" dia. T-nails going through into dowels. Top rail measured 4.469" x 1.688" (ponderosa / sugar pine). Bottom rail measured 7.438" x 1.644" (ponderosa / sugar pine). The hinge and stationary stile measured 4.469" x 1.688" 1.3E Timberstrand LSL by Trussjoint Mac Millan as stated by manufacturer. The lock stile measured 4.469" x 1.688" (LVL by Pacific wood Laminates Inc) as stated by manufacturer. Each hinge stile had four (4) hinges secured to frame jamb with two (2) #12 x 2.500" SMS and two (2) # 12 x .750 SMS. And to the leaf with two (2) #12 x 2.500" SMS and two (2) # 12 x .750 SMS. The astragal cap was secured with # 6 x 3" SMS fasteners located 4" from each end 8" on center thereafter.

Glazing: Specimens # 3A, 3B. Specimen # 3A 12.54mm Solutia HP laminated glass, 5mm annealed / 0.100" PVB / 5mm annealed .

Glazing Method: Glazed with Schnee Moorhead SM-5731 silicone with 5625" bite on glass and captured with a wood glazing stop 0.685" x 0.842" and Neoprene shim pieces measuring .250" x .125" x .250" located both sides of glass 4" from each corner 18" on center thereafter. Glazing stop secured with one (1) row of 14 gage x 1.250" T-nails located 1" from each end 6" on center thereafter

Daylight Opening: Specimens # 3A, 3B. 24.875" x 81.125" Door Panels

Weatherstripping:

Quality	Description	Location
Four (4) strips	Amesbury; Santoprene Thurmo Plastic Rubber (Part # OCPD670)	All frame members
One (1) strip	Climatex; Rigid & Flexible PVC (Part # OCPD536H)	Panel top rails
One (1) strip	Climatex; UV Heat Resistant PVC (Part # OCPD536H)	Panel bottom rails
Two (2) strips	Amesbury; Santoprene Thurmo Plastic Rubber (Part # OCPD670)	Astragal Cap

Hardware & Location:

Quality	Description	Location
Specimens 3A, 3B. (4)	4" x 4" Hager 1191 Brass Hinges Located 9", 34.8, 60.6" and 86.4" measuring from top of panel	Each door Leaf
(1)	Mortise lock 5-point locking System (Hardware Technologies Ltd.)	Active door leaf
(1)	2- point gear activated bolt assembly Hardware Technologies Ltd.)	Inactive door leaf
(1)	Handle	Inactive and Active door leaves

Notes: None

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 10/24/02

Reinforcements:	<u>Quality</u>	<u>Description</u>	<u>Location</u>
	One (1)	1.0"x 10.250"x 0.188"Stainless steel bar corner reinforcement.	Each corner of panels
	One (1)	1.867" x 4.125"x 0.090"Stainless steel Sill strike reinforcement	Frame Sill
	One (1)	Head strike Stainless steel 1.3"x 6" x .125"	Frame Head

Installation:

Specimen 3A, 3B.

Door frames secured in a 2" x 12" Pine PT frame and to a 2 x 4 pine buck wit SM screws.

Double door head jamb: Secured with five (5) #10 x 3" Phillips F.H. SMS 4"from the corners and equally spaced across the head. In addition there were three (3)# 10 x 2.5" through the head strike plate into the buck.

Side jambs: Eight (8) # 10 x 3 Phillips F.H. SMS 4"from the corners and equally spaced (approximately 12.5" O.C.).

Double door sill: Secured with six (6) #10 x 3" Phillips F.H. SMS 4"from the corners, at each panel mid-span and 4" off each side of the door center. In addition there were three (3)# 10 x 2.5" through the sill strike plate into the buck..

Test Results:

Test Sequence: PA 202

1. Air Infiltration
2. 1/2 Test Pressure Positive
3. 1/2 Test Pressure Negative
4. Design Pressure Positive
5. Design Pressure Negative
6. Water Infiltration Positive
7. Full Test Pressure Positive
8. Full Test Pressure Negative

		Loc# 1
Inactive Panel		X
		Active Panel
		Loc# 2
		X

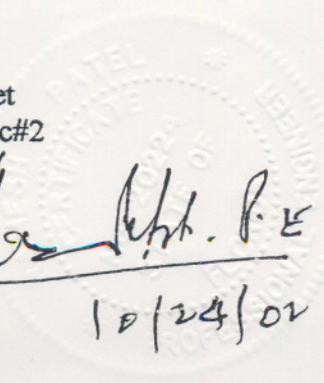
STATIC AIR PRESSURE TEST Static tests were conducted in accordance with DCBCCD PA 202

Performance Test Results Specimen # 3A PA 202

Specimen # 3A

Design Load + 70 psf

Range of test	time	actual load	deflection	perm. Set
Positive loads	(seconds)	psf	loc#1 loc#2	loc#1 loc#2
1/2 Test	30 seconds	52.5		
esign	30 seconds	70.0		
Test	30 seconds	105.0	.042" .051"	


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 10/24/02

Design Loads - 70 psf

Range of test	time actual load		deflection		perm. Set	
	(seconds)	psf	loc#1	loc#2	loc#1	loc#2
Negative loads	30 seconds	52.5				
1/2 test	30 seconds	70.0				
Design	30 seconds	105.0				
Test					.106"	.047"

Deflection was measured with two(2) CDI 5" dial indicator SN971649614 and SN993413562 and SN002644133
Loc# 1 mid-span of top rail. Loc# 2 mid-span of panel.

Door loc# 2 – max allowable set after test load is $(.4\% \times L) .004 \times 36.4375 = 0.146"$

Door loc# 3 – max allowable set after test load is $(.4\% \times L) .004 \times 95.5 = 0.382"$

Conclusion: After testing was concluded, visual inspection of the specimen revealed no local yielding or fastener loosening.

Performance Test Results Specimen # 3B PA 201 (Large missile)

The specimen was impacted with a 8ft. long, 9lb., 2" x 4" at the following locations:

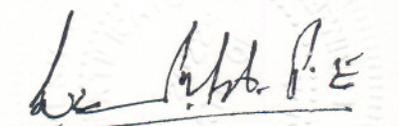
		Loc #1 Impacted at 50.5 ft per second, Mid-span of panel. No missile penetration Loc #2 Impacted at 50.0 ft per second, bottom right corner of panel. No missile penetration Loc #3 Impacted at 49.9 ft per second, Mid-span of panels at astragal. No missile penetration Loc #4 Impacted at 50.3 ft per second, Mid-span of bottom rail. No missile penetration
Loc# 3 X o o	Loc#1 X	
	Loc#2 X	
Loc# 4 X		

Note:

X measurement from left edge of specimen.

Y measurement from top edge of test specimen.

Specimen No.3B	Impact No	Impact Loc.	Speed Ft/Sec .	X Meas.	Y Meas
	1	1	50.5	53.0"	48.0"
	2	2	50.0	65.5 "	86.0"
	3	3	49.9	35.5"	43.0"
	4	4	50.3	17.5"	93.0"


 10/24/02

Performance Test Results Specimen # 3B PA 203

Cycle tests were conducted in accordance with DCBCCD PA 203

Design Load + 70.0 psf - 70.0 psf

<u>Range of test</u>	<u>actual load psf</u>		<u># of cycles</u>	<u>cycles/min</u>
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Positive loads

+ .2 - .5	14.0	35.0	3500	55
+ .0 - .6	0.0	42.0	300	55
+ .5 - .8	35.0	56.0	600	55
+ .3 - 1.0	21.0	70.0	100	55

DEF SET

1.500" 0.500"

Total: 4500 cycles

Negative Loads

<u>Range of test</u>	<u>actual load psf</u>		<u># of cycles</u>	<u>cycles/min</u>
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- .3 - 1.0	21.0	70.0	50	55
- .5 - .8	35.0	56.0	1050	55
- .0 - .6	0.0	42.0	50	55
- .2 - .5	14.0	35.0	3350	55

DEF SET

2.000" .625"

Completed: 9000 cycles

Specimen showed no resultant failure or duress after cycle test. No failure of fasteners and there were no cracks longer than 5" x 1/16" through which air could pass observed.

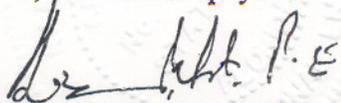
Comment: Nominal 2 mil polyethylene film was used to seal against air leakage during structural loads. The film was used in a manner that did not influence the test results.

Submittal drawing as supplied by Hurd Millwork Co, Inc. signed and sealed by this laboratory, videotape of the testing,

Remarks: A detailed drawing was available for Laboratory records and comparison to the tested specimens at the time of this report. A copy of this report along with representative sections of the test specimens will be retained for a period of ten (10) years. The results obtained and recorded apply only to the specimens tested.

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Dr. Robert P. E.
 12/24/02

Observer

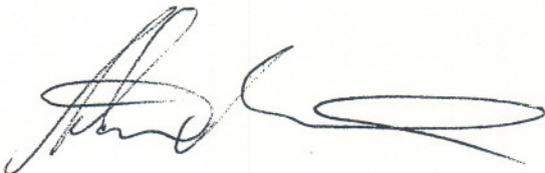
All tests witnessed by:

Ramesh Patel, P.E

Chris Bennett, CTL

Ted Scanlon, CTL

Certified Testing Laboratories, Inc.

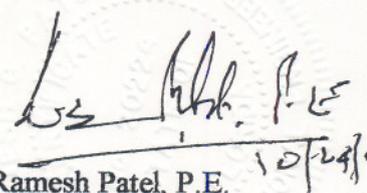


Christopher Bennett

Lab Manager

Architectural Division

CC: Hurd Millwork (2)
 Dade County (1)
 Warren Schaefer (2)
 Ramesh Patel (1)
 File



Ramesh Patel, P.E.
Florida Reg. #20224
Structural Engineer