Architectural Testing

AAMA 501-05
TEST REPORT

Rendered to:

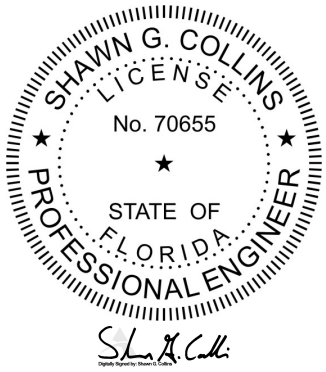
CORAL ARCHITECTURAL PRODUCTS

SERIES/MODEL: PW250
PRODUCT TYPE: Aluminum Curtain Wall System

Title	Summary of Results
Positive Design Pressure	3112 Pa (65.0 psf)
Negative Design Pressure	3112 Pa (65.0 psf)
Air Infiltration	<0.01 L/s/m^2 (<0.01 cfm/ft^2)
Water Penetration Resistance Test Pressure	622 Pa (13.0 psf)
Uniform Load Structural Test Pressure	±4668 Pa (±97.5 psf)

This report contains in its entirety:

Cover Page:	1 page
Report Body:	7 pages
Test Equipment:	1 page
Photographs:	1 page
Drawings:	7 pages
Sketches:	1 page



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Reference must be made to Report No. A5190.01-401-44, dated 01/14/11 for complete test specimen description and data.

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Architectural Testing

AAMA 501-05 TEST REPORT

Rendered to:

CORAL ARCHITECTURAL PRODUCTS
3010 Rice Mine Road
Tuscaloosa, Alabama 35406

Report No.:	A5190.01-401-44
Test Dates:	11/22/10
Through:	11/23/10
Report Date:	01/14/11
Test Record Retention End Date:	11/23/14

Project Summary: Architectural Testing, Inc. was contracted by Coral Architectural Products to perform testing on a Series PW250 aluminum curtain wall system at the Architectural Testing, Inc test facility in Tampa, Florida. The sample tested successfully met the performance requirements. Test specimen description and results are reported herein. The sample was provided by the client.

Test Specification: The test specimen was evaluated in accordance with AAMA 501-05, *Methods of Tests for Exterior Walls*

Test Specimen Description:

Series/Model: PW250

Product Type: Aluminum Curtain Wall System

Overall Size: 4635.5mm (182-1/2") wide by 3657.6 mm (144") high

Fixed Daylight Opening Size (3): 1460.5 mm (57-1/2") wide by 1028.7 mm (40-1/2") high

Fixed Daylight Opening Size (3): 1460.5 mm (57-1/2") wide by 2438.4 mm (96") high

Overall Area: 16.95 m^2 (182.5 ft^2)

Finish: All aluminum was bronze except for the sill and head extrusions which were mill finish.

Frame Construction: The frame consisted of extruded aluminum members. The intermediate horizontal and vertical mullions, head, and sill utilized a two piece assembly consisting of a primary extrusion and a trim cover. The jambs utilized a three piece assembly consisting of a primary extrusion, trim cover, and pocket filler.

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Test Specimen Description: (Continued)

Frame Construction: (Continued) The pocket filler was attached to the primary jamb extrusion using #12 x 3/4" hex washer head #3 self-tapping sheet metal screws located 1-1/2" from the ends with 9" on center spacing. All frame joints were secured using three #14 x 1" slotted hex washer head sheet metal screws through the extrusions into the corresponding screw spline. Butyl tape was used at all vertical joint locations on the exterior side of any primary horizontal member intersecting a vertical member; Dow 795 sealant was also used along the trim covers on the interior side. Plastic end dams were used at the intermediate horizontal members and were sealed with Dow 795 sealant. Plastic closure caps were used at the head of the vertical members which were set in Dow 795 sealant; metal closure caps were used at the bottom of the vertical members which were set in Dow 795 sealant and secured to the primary extrusion using two #8 x 1/2" pan head sheet metal screws.

Weatherstripping:

Description	Quantity	Location
Exterior glazing gasket	1 Row	Pressure bar and frame DLOs
Exterior perimeter gasket	1 Row	Pressure bar (Frame side only)
Pressure bar gasket (Isolator)	1 Row	Pressure bar

Glazing Details: A single sheet of 1/4" thick tempered transparent glass was utilized at each opening. The glazing bite was 1/2". Each sheet of glass was set on two rubber setting blocks measuring 4" wide by 7/16" high by 1/2" deep located 10-3/4" on center from each end of the daylight opening along the bottom. The glass was set against a rubber gasket located around the entire perimeter of the frame extrusions. This gasket was sealed to the extrusions and glass with Dow Corning 995 sealant approximately 4" out from each corner. A pressure bar was installed over the glass and attached to the frame extrusions using #12 x 1-1/4" hex washer head #3 self-tapping stainless steel sheet metal screws located 2-1/2" from the ends of the vertical members and 3/4" on the horizontal members; all members utilized 9" on center spacing.

Drainage:

Description	Quantity	Location
7/32" weep hole	2 per member	Pressure bars at 4" from each end Face covers at 8" from each end

Hardware: No hardware was utilized.

Test Specimen Description: (Continued)

Reinforcement: A C-shaped steel reinforcement was used at the vertical mullions. The steel measured 4-1/2" wide by 1-7/8" high by 1/4" thick and approximately 144" long. Each piece of reinforcement was held in place using three 1/4"-20 x 1-1/4" hex head bolts with washers and nuts located at the center of the horizontal members and approximately 1-1/4" from the ends of the vertical members.

Installation: The specimen was installed into an 8" steel channel frame and secured with 1/2"-13 x 1" hex washer head bolts through the sill extrusion and tapped into the steel channel. The head utilized 1/2"-13 x 2" hex washer head bolts with washers and nuts; the bolts ran through the head extrusion and steel buck. Bolt spacing at the head and sill was 4" from each side of the vertical members. The intermediate horizontals were secured to the steel buck using 1/2"-13 x 4" hex head bolts with washers and nuts; the bolts ran through the extrusions and steel buck. Bolts were located at the center of the horizontal member. Each fastener location at the head and sill was cap sealed with sealant. The interior and exterior perimeters of the test specimen were also sealed with sealant and 1/2" backer rod. All structural sealant was Dow Corning 795. Shim space between the rough opening and the frame perimeter was approximately 1/2" on all sides.

Test Results: The temperature during testing was 24°C (76°F). The results are tabulated as follows:

Paragraph	Title of Test - Test Method	Results	Allowed
2.2	Preload of 50% of Positive Design Pressure per ASTM E 330 (Load was held for 10 seconds)		
2.3	Air Leakage Resistance per ASTM E 283		
	75 Pa (1.57 psf)	<0.01 L/s/m^2 (<0.01cfm/ft^2)	0.30 L/s/m^2 (0.06 cfm/ft^2) max.
	300 Pa (6.27 psf)	<0.01 L/s/m^2 (<0.01cfm/ft^2)	0.30 L/s/m^2 (0.06 cfm/ft^2) max.
2.4	Water Penetration Resistance per ASTM E 331		
	622 Pa (13.0 psf)	No leakage	No leakage
2.9	100% of Design Pressure per ASTM E 330 (Loads were held for 10 seconds)		
	Deflection of the vertical mullion		
	3112 Pa (65.0 psf) (positive)	20.57 mm (0.81")	20.32 mm (0.81") max.
	3112 Pa (65.0 psf) (negative)	19.81 mm (0.78")	20.32 mm (0.80") max.
	Deflection of the horizontal mullion		
	3112 Pa (65.0 psf) (positive)	2.54 mm (0.10")	7.87 mm (0.31") max.
	3112 Pa (65.0 psf) (negative)	3.05 mm (0.12")	7.87 mm (0.31") max.
	Deflection at sill anchor points		
	3112 Pa (65.0 psf) (positive)	0.25 mm (0.01")	6.86 mm (0.27") max.
	3112 Pa (65.0 psf) (negative)	<0.25 mm (<0.01")	6.86 mm (0.27") max.
2.10	Water Penetration Resistance per ASTM E 331		
	622 Pa (13.0 psf)	No leakage See Note #1	No leakage

Note #1: *Upon reaching water test pressure, water was observed at the lower left corner of the lower right lite (as viewed from the interior). The water was entering through the gasket at the corner. The quantity of the water remaining at the conclusion of the 15 minute test was less than 15ml as limited by AAMA 501.1-05 Section 5.5. Per the criteria of the test specification, the observed result is "No leakage".*

Test Results: (Continued)

Paragraph	Title of Test - Test Method	Results	Allowed
2.11	150% of Design Pressure per ASTM E 330 (Loads were held for 10 seconds)		
	Permanent set of the vertical mullion		
	4668 Pa (97.5 psf) (positive)	2.79 mm (0.11")	7.11 mm (0.28") max.
	4668 Pa (97.5 psf) (negative)	2.54 mm (0.10")	7.11 mm (0.28") max.
	Permanent set of the horizontal mullion		
	4668 Pa (97.5 psf) (positive)	0.25 mm (0.01")	2.79 mm (0.11") max.
	4668 Pa (97.5 psf) (negative)	0.25 mm (0.01")	2.79 mm (0.11") max.
	Permanent set at sill anchor points		
	4668 Pa (97.5 psf) (positive)	0.25 mm (0.01")	2.54 mm (0.10") max.
	4668 Pa (97.5 psf) (negative)	<0.25 mm (<0.01")	2.54 mm (0.10") max.

Tape and film were used to seal against air leakage during structural testing. In our opinion, the tape and film did not influence the results of the test.

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

List of Official Observers:

Name	Company
William Smith	Coral Architectural Products
Don Beltz	Architectural Testing, Inc.
John McClane	Architectural Testing, Inc.
Scott Parker	Architectural Testing, Inc.
Shawn G. Collins, P.E.	Architectural Testing, Inc.
Jack R. Hook	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 four years from the original test date. At the end of this retention period, such materials shall be discarded without notice and the service life of this report will expire.

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

For ARCHITECTURAL TESTING, INC.

Digitally Signed by: Jack R. Hook

Jack R. Hook
Technician I

Digitally Signed by: Shawn G. Collins

Shawn G. Collins, P.E.
Laboratory Support Engineer

JRH:ck

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

- Appendix-A: Test Equipment (1)
- Appendix-B: Photographs (1)
- Appendix-C: Drawings (6)
- Appendix-D: Sketches (1)

Revision Log

Rev. #	Date	Page(s)	Revision(s)
0	01/14/11	N/A	Original report issue

Appendix A

Test Equipment

Instrument	Manufacturer	Asset #
Control Panel	Architectural Testing, Inc.	004821
Control Panel	Architectural Testing, Inc.	62966
Weather Station	Davis	004330
Water Spray Rack	Architectural Testing, Inc.	004492-A
Water Spray Rack	Architectural Testing, Inc.	004492-B
Linear Transducer	Celesco	62507
Linear Transducer	Celesco	004282
Linear Transducer	Celesco	62348
Linear Transducer	Celesco	G1804203A
Linear Transducer	Celesco	005428
Linear Transducer	Celesco	004284
Linear Transducer	Celesco	005429
Linear Transducer	Celesco	004280
Linear Transducer	Celesco	004279
6" Digital Caliper	Cen-Tech	753-1

Appendix B

Photographs

Photo No. 1
Specimen # 1
Overall view of test specimen

Appendix C

Drawings

ATI PRODUCT APPROVAL
FOR PW250 CURTAIN WALL SYSTEM

GENERAL NOTES:
TEST STANDARDS
AIR ASTM E283
WATER ASTM E331
STATIC ASTM E330
AMMA 501-5
WATER INFILTRATION 13 PSF
AIR INFILTRATION 6.27 PSF
TYPICAL GLASS BITE 1/2" UNLESS OTHERWISE NOTED
1/2" MINIMUM SHIM SPACE @ PERIMETER UNLESS OTHERWISE NOTED
THIS PRODUCT HAS BEEN DESIGNED AND TESTED TO COMPLY WITH FLORIDA BUILDING CODE 2007 EDITION NON HVHZ ONLY
MATERIALS THAT COME IN CONTACT WITH OTHER DISSIMILAR MATERIALS SHALL MEET REQUIREMENTS OF 2007 FLORIDA BUILDING CODE SECTION 2003.8.4 SERIES 213 380 500 DOORS ARE UNDER SEPARATE APPROVAL SERIES

Architectural Testing

Test sample complies with these details.
Deviations are noted.

Report# A5190.01-401-44
Date 1-13-11 Tech JRH

ABBREVIATIONS:
DIA. = DIAMETER
D.L.O. = DAY LIGHT OPENING
EXT. = EXTERIOR
ELEVS. = ELEVATIONS
INT. = INTERIOR
MAX. = MAXIMUM
MIN. = MINIMUM
O.C. = ON CENTER
OPP. = OPPOSITE
TYP. = TYPICAL

REV	BY	DATE	DESCRIPTION
1	MLL	1-14-20	REVISIONS

Coral
Architectural Products
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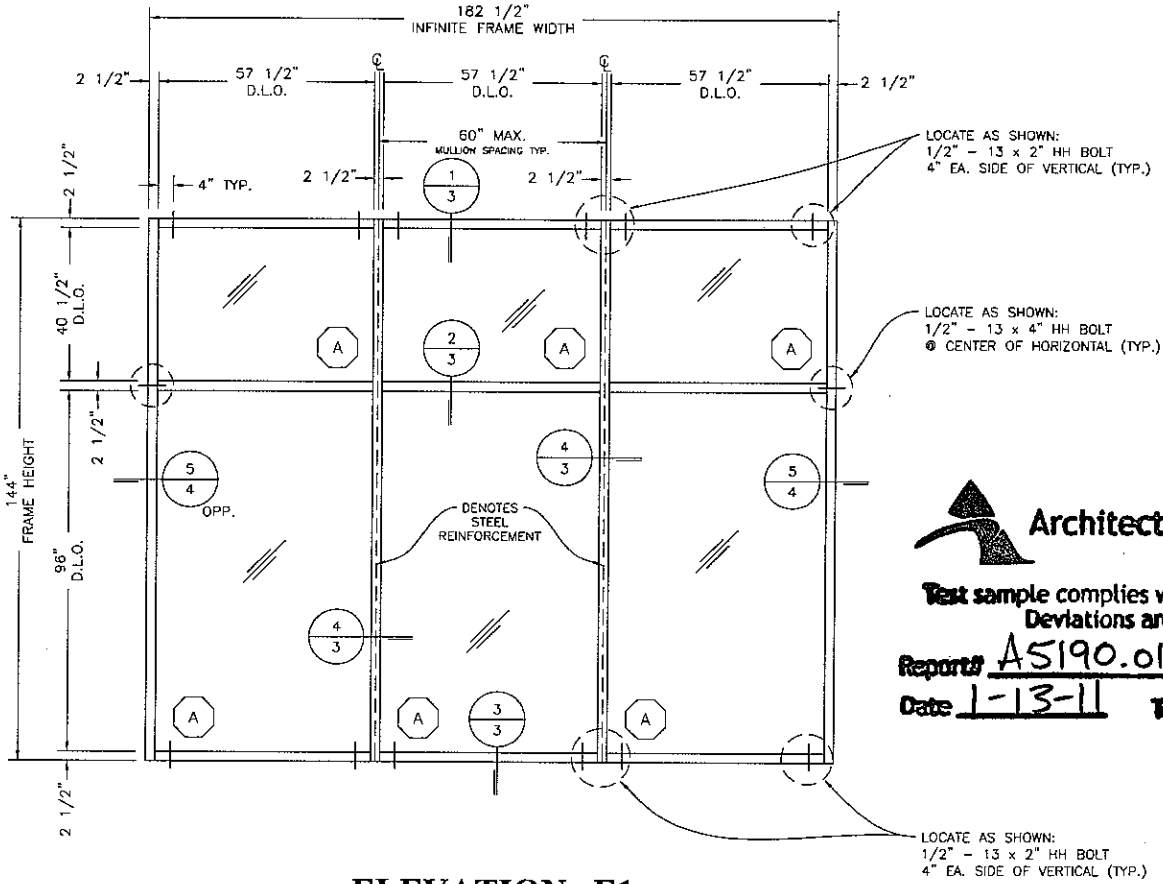
ATI PRODUCT APPROVAL
FOR PW250 CURTAIN WALL
SYSTEM

INDEX TO DRAWINGS AND NOTES

DATE 1/13/2011
DRAWN MLL | CHECKED DW | APPROVED DW
PROJECT NO.
DRAWING NO. PW250_01
SHEET 1 OF 6



ELEVATION E1
TYPICAL CAPTURED MULLION

Architectural Testing

Test sample complies with these details.
Deviations are noted.

Report# A5190.01-401-44

Date 1-13-11 Tech JKH

NOTES:
DESIGN PRESSURE = +65/-65 PSF
WATER @ 13 P.S.F.
AIR @ 6.27 P.S.F.
FBC NON-HVHZ
AAMA 501-05
ASTM E330-00
ASTM E283-04
ASTM E331-02

GLAZING SCHEDULE				
GLASS MARK SYMBOL	GLASS TYPE	MANUFACTURER	MAXIMUM D.L.O. SIZE	MAXIMUM SQUARE FEET
(A)	¼" TEMPERED GLASS	VARIES	57 1/2" x 96"	38.3

0 1'-4" 2'-8" 5'-4"
SCALE: 3/8"=1'-0"

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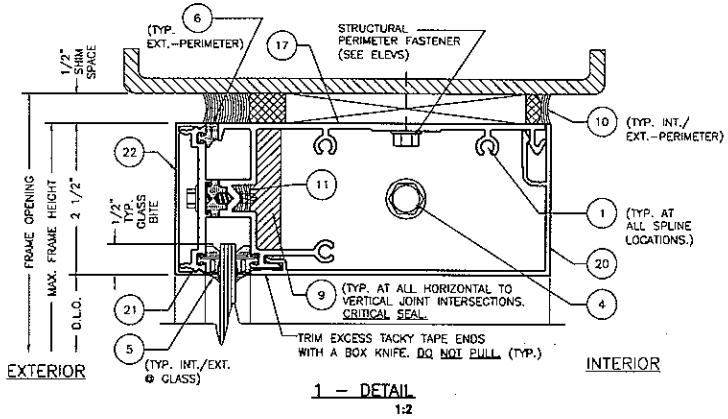
ATI PRODUCT APPROVAL
FOR PW250 CURTAIN WALL
SYSTEM

FRAMING ELEVATION

DATE 1/13/2011
DRAWN MLL | CHECKED DW | APPROVED DW
PROJECT NO.
DRAWING NO. PW250_01
SHEET 2 OF 6



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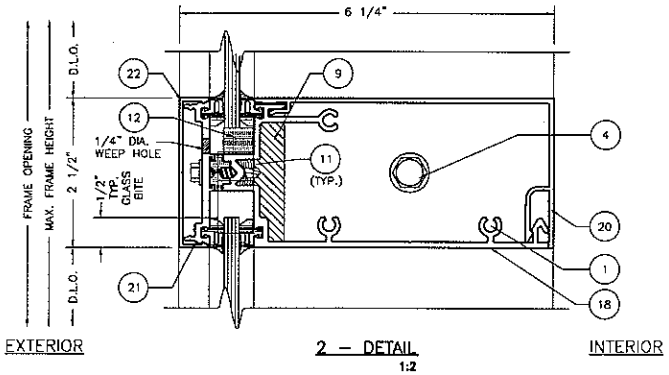

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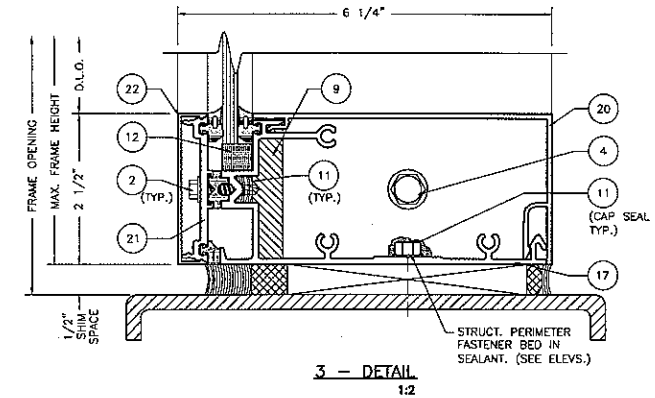

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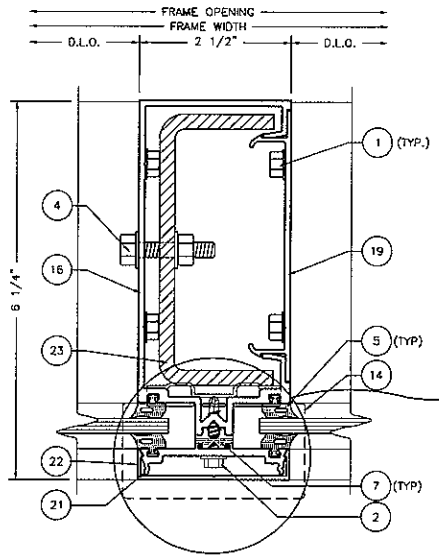

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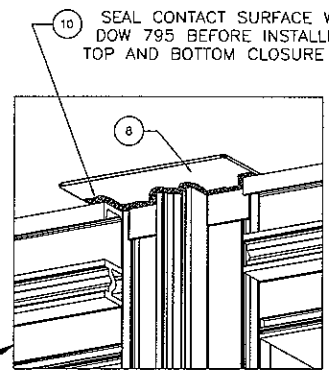

TOP SHOWN
CLOSURE CAP
(BOTTOM SIMILAR)

Architectural Testing

Test sample complies with these details.
Deviations are noted.

Report# A5190.01-401-44

Date 1-13-11 Tech JRH

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REV	BY	DATE	DESCRIPTION
-	-	-	-

ATI PRODUCT APPROVAL
FOR PW250 CURTAIN WALL
SYSTEM

FRAMING DETAILS

DATE 1/13/2011

DRAWN	CHECKED	APPROVED
MLL	DW	DW

PROJECT NO.

DRAWING NO. PW250_01

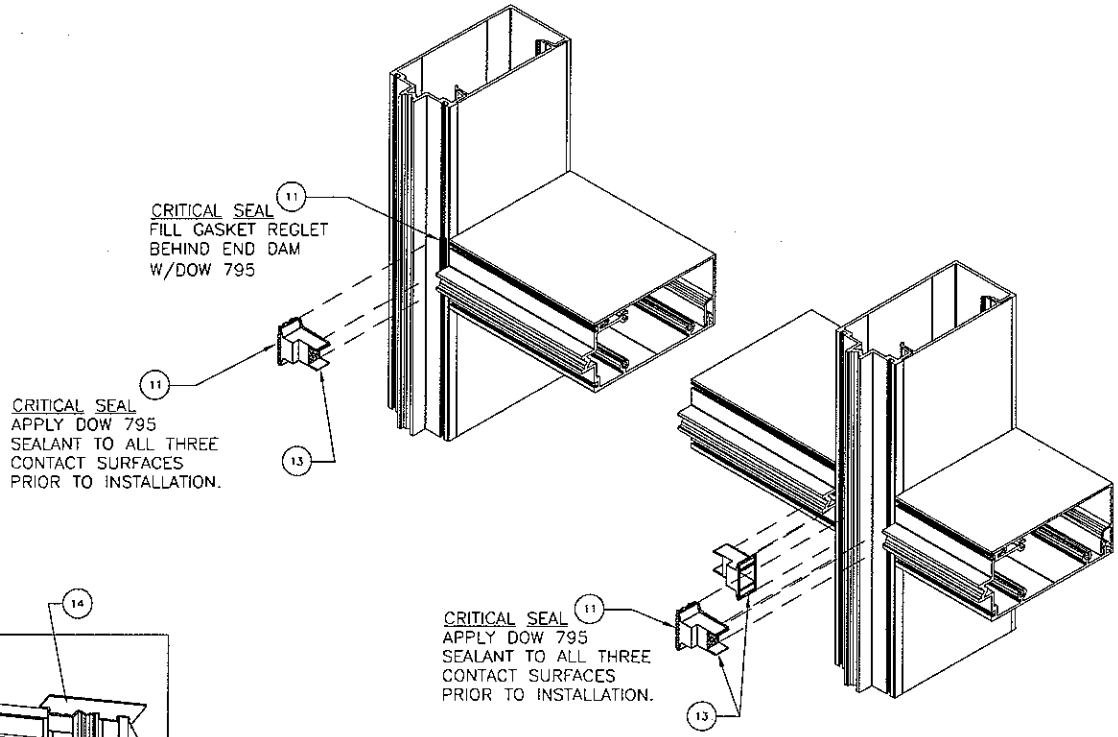
SHEET 3 OF 6

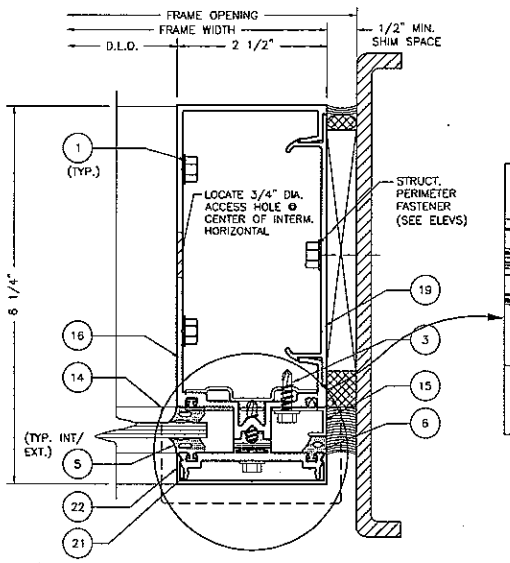
Architectural Testing

Test sample complies with these details.
Deviations are noted.

Report# A5190.01-401-44

Date 1-13-11 Tech JKH





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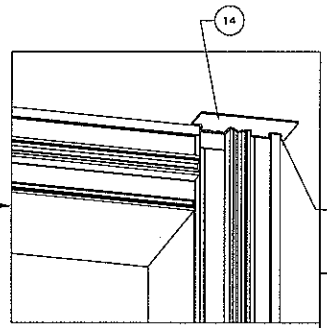
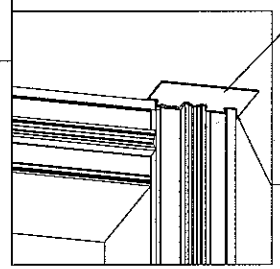


SEAL CONTACT SURFACE W/
DOW 795 BEFORE INSTALLING
TOP AND BOTTOM CLOSURE CAP

TOP SHOWN
(BOTTOM SIMILAR)



SEAL CONTACT SURFACE W/
DOW 795 BEFORE INSTALLING
TOP AND BOTTOM CLOSURE CAP

TOP SHOWN
(BOTTOM SIMILAR)

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REV	BY	DATE	DESCRIPTION

ATI PRODUCT APPROVAL
FOR PW250 CURTAIN WALL
SYSTEM

FRAMING DETAILS

DATE 1/13/2011

DRAWN	CHECKED	APPROVED
MLL	DW	DW

PROJECT NO.

DRAWING NO. PW250_01

SHEET 4 OF 6

BILL OF MATERIALS

ITEM NO.	P/N	DESCRIPTION	DIMENSIONS	MATERIAL	MANUFACTURER	NOTES
1	AS16	SELF-TAPPING FASTENER	#14 X 1" HHSTS	STEEL	VARIES	TYP. SPLINE SCREW VERTICAL/HORIZONTAL JOINTS
2	AS19	SELF-DRILLING FASTENER	#12 X 1" HWH #3	STEEL	VARIES	LOCATE 9" O.C. (USED ⊙ PRESSURE BAR)
3	AS25	SELF DRILLING FASTENER	#12 X 3/4" HWH #3	STEEL	VARIES	LOCATE 9" O.C. (USED ⊙ JAMB POCKET FILLER)
4	FASTENER	STEEL REINFORCEMENT ATTACHMENT BOLT	¼"-20 X 1 ¼" BOLT W/ WASHER & NUT	6063-T6 ALUMINUM	CORAL INDUSTRIES, INC.	LOCATE ⊙ HEAD, SILL, AND INTERMEDIATE HORIZONTAL
5	NG10	GLAZING GASKET	0.250 SPACE	EPDM	VARIES	USED ON EXTERIOR AND INTERIOR (GLASS TO GLASS)
6	NG11	EXTERIOR PERIMETER GASKET	0.300 SPACE	EPDM	VARIES	USED AT PERIMETER (METAL TO METAL)
7	NG12	PRESSURE BAR GASKET (ISOLATOR)	0.140 SPACE	EPDM	VARIES	USED ON PRESSURE BAR
8	FASTENER	PAN HEAD FASTENER	#8 X 1/2" PPH	STEEL	VARIES	
9	SM5601	JOINT SEALANT TAPE	0.500 X 0.125 X VARIES	BUTYL	SCHNEE-MOOREHEAD	
10	795	SILICONE - PERIMETER SEALANT	FILL SPACE	SILICONE	DOW CORNING	USED ⊙ PERIMETER
11	995	SILICONE - GLASS TO METAL	FILL SPACE	SILICONE	DOW CORNING	GLASS TO METAL AND INTERNAL
12	SB10	SETTING BLOCK	0.500 X 0.438 X 4.000	EPDM	VARIES	4" LONG (2 PER LITE OF GLASS)
13	SP201	HORIZONTAL END DAM ⊙ CAPTURED MULLION	1.498 X 4.000 X 0.437	INJECTION MOLDED PLASTIC	CORAL	LOCATE ONE (1) ⊙ EACH END OF INTERMEDIATE HORIZONTAL
14	SP216	VERTICAL MULLION CLOSURE CAP	3.000 X 2.352 X 0.550	INJECTION MOLDED PLASTIC	CORAL	LOCATE ⊙ TOP AND BOTTOM OF VERTICAL
15	PW013	JAMB POCKET FILLER	0.917 X 0.481 X 0.050	6063-T6 ALUMINUM	CORAL INDUSTRIES, INC.	
16	PW050	VERTICAL MULLION	2.500 X 5.531 X 0.094	6063-T6 ALUMINUM	CORAL INDUSTRIES, INC.	
17	PW052	HEAD/SILL	2.390 X 5.449 X 0.094	6063-T6 ALUMINUM	CORAL INDUSTRIES, INC.	
18	PW055	INTERMEDIATE HORIZONTAL	2.390 X 5.433 X 0.094	6063-T6 ALUMINUM	CORAL INDUSTRIES, INC.	
19	PW202	MULLION FILLER	0.681 X 4.484 X 0.094	6063-T6 ALUMINUM	CORAL INDUSTRIES, INC.	
20	PW203	HEAD/SILL/HORIZONTAL TRIM	2.500 X 4.980 X 0.078	6063-T6 ALUMINUM	CORAL INDUSTRIES, INC.	
21	PW204	PRESSURE BAR	2.443 X 0.433 X 0.125	6063-T6 ALUMINUM	CORAL INDUSTRIES, INC.	
22	PW205	VERTICAL/HORIZONTAL FACE COVER	0.500 X 2.500 X 0.062	6063-T6 ALUMINUM	CORAL INDUSTRIES, INC.	
23	SR150	STEEL REINFORCEMENT	4 ½" X 1 ⅞" X ¼" CHANNEL	A36 STEEL	VARIES	USED ⊙ VERTICAL MULLION
24	OPTMC	VERTICAL MULLION CLOSURE CAP	3.00 X2.5 X .040	6063-T6 ALUMINUM	VARIES	OPTION ONLY IN LIEU OF SP216 TOP AND BOTTOM VERTICAL MULLION

Architectural Testing

Test sample complies with these details.
Deviations are noted.

Report# A5190.01-401-44

Date 1-13-11 Tech JRH

REV	BY	DATE	DESCRIPTION

Coral
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ATI PRODUCT APPROVAL
FOR PW250 CURTAIN WALL
SYSTEM

BILL OF MATERIALS

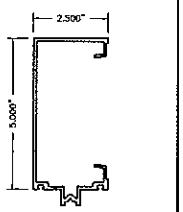
DATE 1/13/2011

DRAWN	CHECKED	APPROVED
MLL	DW	DW

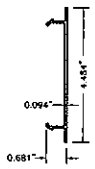
PROJECT NO.

DRAWING NO. PW250_01

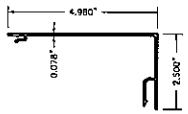
SHEET 5 OF 6



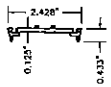
16 VERTICAL MULLION



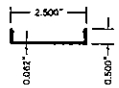
19 OPEN BACK MULLION FILLER



20 HEAD/SILL/HORIZONTAL TRIM

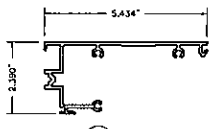


21 PRESSURE BAR

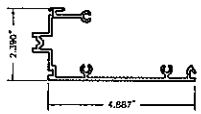


22 FACE COVER

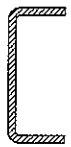
15 JAMB POCKET FILLER



17 HEAD/SILL MULLION

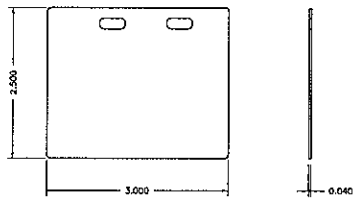


18 HORIZONTAL MULLION



23 STEEL REINFORCEMENT

24 MULLION CAP
HALF SCALE

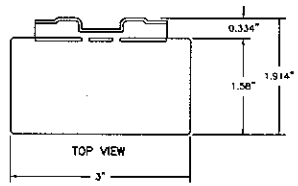


5 EXT. GLAZING GASKET — FULL SCALE

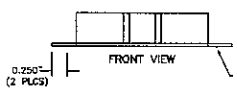
6 EXT. PERIMETER GASKET — FULL SCALE

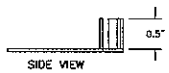
7 PRESSURE BAR GASKET (ISOLATOR) — FULL SCALE

12 SETTING BLOCK — FULL SCALE

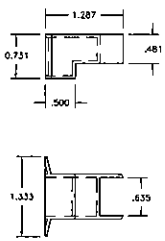


14 MULLION CAP
HALF SCALE





13 END DAM
HALF SCALE



Architectural Testing

Test sample complies with these details.
Deviations are noted.

Report# A5190.01-401-44

Date 1-13-11 Tech JRH

Coral
Architectural Products
3010 RICE MINE ROAD, TUSCALOOSA, AL 35406
PHONE: 800-772-7727 FAX: 800-443-6261

REV	BY	DATE	DESCRIPTION

ATI PRODUCT APPROVAL
FOR PW250 CURTAIN WALL
SYSTEM

DIE DRAWINGS

DATE 1/13/2011

DRAWN	CHECKED	APPROVED
MLL	DW	DW

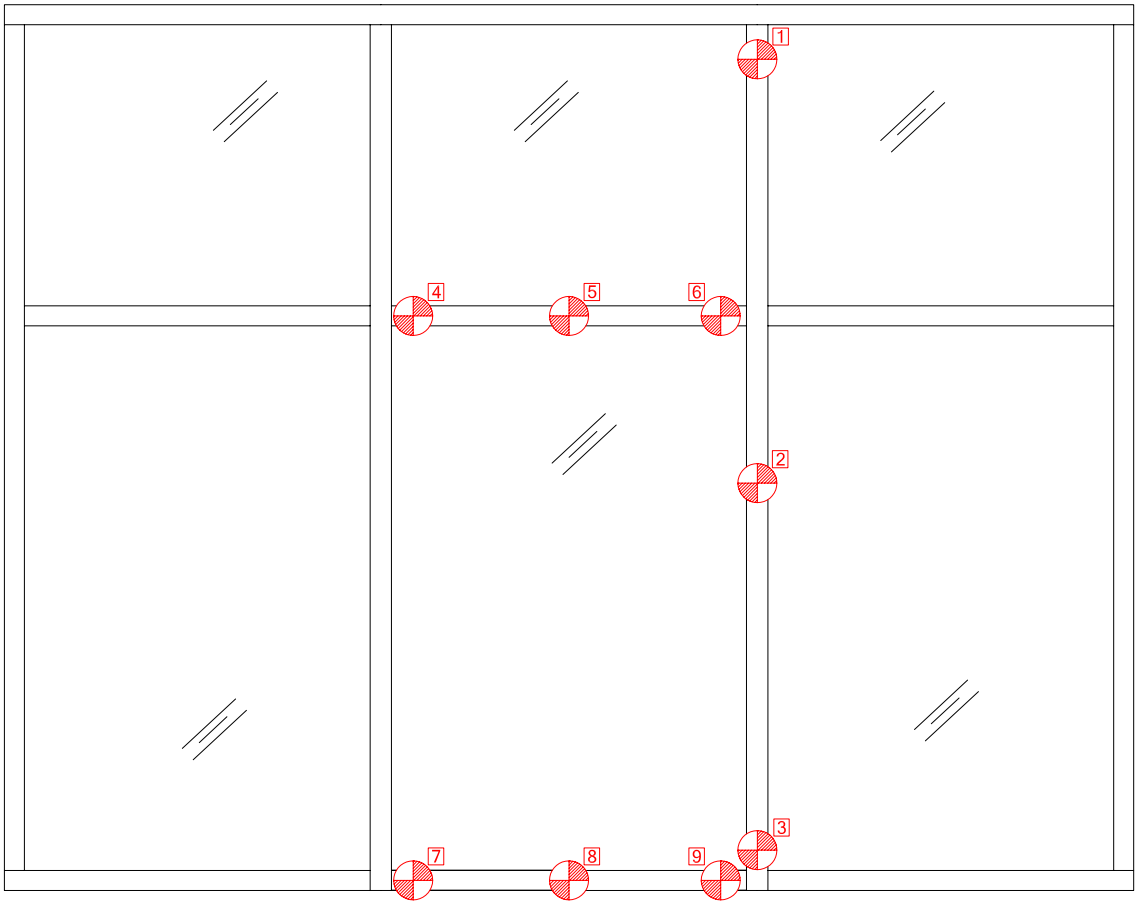
PROJECT NO.

DRAWING NO. PW250_01

SHEET 6 OF 6

Appendix D

Sketches



#

INDICATES INDICATOR LOCATION

PW250 INDICATOR LOCATIONS

SCALE:NTS