Architectural Testing

PERFORMANCE
TEST REPORT

Report No.: A2658.02-401-44

Rendered to:

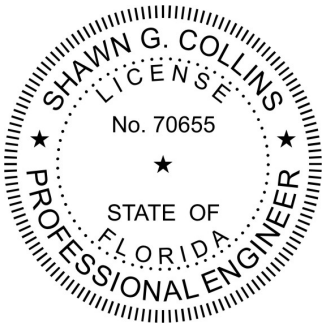
CORAL ARCHITECTURAL PRODUCTS
Tuscaloosa, Alabama

PRODUCT TYPE: Aluminum Curtain Wall with Transom, Stacked Side-lite and Blanked-out Double Doors
SERIES/MODEL: PW257

Title	Summary of Results
Design Pressure	±80.0 psf
Uniform Load Structural Test Pressure	±120.0 psf

This report contains in its entirety:

Cover Page: 1 page
Report Body: 10 pages
Photographs: 2 pages
Drawings: 16 pages
Sketches: 1 page



Digitally Signed by: Shawn G. Collins
2011.04.21 15:13:46
-04'00'

Reference must be made to Report No. A2658.02-401-44, dated 04/21/2011 for complete test specimen description and detailed test results.

1.0 Report Issued To: Coral Architectural Products
3010 Rice Mine Road
Tuscaloosa, Alabama 35406

2.0 Test Laboratory: Architectural Testing, Inc.
2250 Massaro Boulevard
Tampa, Florida 33619
813-628-4300

3.0 Project Summary:

3.1 Product Type: Aluminum Curtain Wall with Transom, Stacked Side-lite and Blanked-out Double Doors

3.2 Series/Model: PW257

3.3 Compliance Statement: Results obtained are tested values and were secured by using the designated test method(s). Test specimen description and results are reported herein.

3.4 Test Dates: 12/09/2010 - 12/10/2010

3.5 Test Location: Architectural Testing, Inc. test facility in Tampa, Florida.

3.6 Test Sample Source: The test specimen was provided by the client. Representative samples of the test specimen will be retained by Architectural Testing for a minimum of four years from the test completion date.

3.7 Drawing Reference: The test specimen drawings have been reviewed by Architectural Testing and are representative of the test specimen reported herein. Test specimen construction was verified by Architectural Testing per the drawings located in Appendix B. Any deviations are documented herein or on the drawings.

3.8 List of Official Observers:

Name	Company
William Smith	Coral Architectural Products
Scott Parker	Architectural Testing, Inc.
Shawn G. Collins, P.E.	Architectural Testing, Inc.

4.0 Test Method(s):

ASTM E 330-02, *Test Method for Structural Performance of Exterior Windows, Curtain Walls and Doors by Uniform Static Air Pressure Difference.*

ASTM E 1886-05, *Standard Test Method for Performance of Exterior Windows, Curtain Walls, Doors and Storm Shutters Impacted by Missile(s) and Exposed to Cyclic Pressure Differentials.*

ASTM E 1996-05, *Standard Specification for Performance of Exterior Windows, Glazed Curtain Walls, Doors and Storm Shutters Impacted by Wind Borne Debris in Hurricanes.*

5.0 Test Specimen Description:

5.1 Product Sizes:

Test Specimen #1:

Overall Area: 14.6 m^2 (157.3 ft^2)	**Width**		**Height**	
	millimeters	**inches**	**millimeters**	**inches**
Overall size	3835.4	151	3810	150

5.2 Frame Construction:

Frame Member	Material	Description
Head/ Sill	Extruded Aluminum	Drawing #23 (PW 613), #25 (PW652) & #16 (PW203) on sheet 13 of 15
Vertical Mullion	Extruded Aluminum	Drawing #24 (PW650)& #15 (PW202) on sheet 13 of 15
Horizontal Mullion	Extruded Aluminum	Drawing #26 (PW655) & #16 (PW203) on sheet 13 of 15
Jambs	Extruded Aluminum	Drawing #23 (PW613), #24(PW650) & #15 (PW202) on sheet 13 of 15

5.0 Test Specimen Description: (Continued)

5.2 Frame Construction:

	Joinery Type	Detail
All frame corners	Mechanical	The horizontal members were square cut, sealed with silicone and secured with three (3) #14 x 1" hex head screws; through the vertical members into the adjacent horizontal members screw spline.
Threshold to door jamb corners	Mechanical	The threshold was sealed and secured to the door jambs utilizing a threshold clip (#30 on Bill of Materials) with four (4) #12 X 1/2" flat head Phillips screws located two (2) through the threshold into the clip and two (2) through the door jamb into the clip.

5.3 Weatherstripping:

Description	Quantity	Location
Exterior glazing gasket (NG10)	2 rows	Interior side of pressure bars; outer edges.
Exterior perimeter gasket (NG11)	1 row	Interior side of pressure bars at the pocket filler on frame members.
Pressure bar gasket (NG12)	1 row	Interior side of pressure bars; center.
Interior spacer gasket (NG14)	1 row	Exterior side of vertical and horizontal mullions; glazing perimeter.

5.0 Test Specimen Description: (Continued)

5.4 Glazing:

Glass Type	Spacer Type	Interior Lite	Exterior Lite	Glazing Method
1-5/16" IG	Silicone Foam	1/4" heat strengthened -0.090" Sentry Glass Plus®- 1/4" heat strengthened	1/4" heat strengthen	The unit was exterior glazed onto a foam silicone spacer at the perimeter, back bedded with Dow Corning 995 and secured with pressure bar utilizing #12 x 1-1/4" hex washer head self drilling screws located 12" on center.

Location	Quantity	Daylight Opening		Glass Bite
		millimeters	inches	
Transom	1	2190 wide by 1200.2 high	86-1/4" wide by 47-1/4" high	19.1mm (3/4")
Lower side-lite	1	1462.1 wide by 2422.5 high	57-9/16" wide by 95-3/8" high	19.1mm (3/4")
Top side-lite	1	1462.1 wide by 1200.2 high	57-9/16" wide by 47-1/4" high	19.1mm (3/4")

5.5 Drainage:

Drainage Method	Size	Quantity	Location
Weeps	1/4" diameter	1	16" on center of the horizontal pressure bars; above center.
Weeps	1/4" diameter	1	8" from each end and one at the mid-span of the horizontal cover plates; bottom leg.
Mullion caps (SP211)	3"x 2.691"x 0.048"	1	Top and bottom of vertical mullions.
EVA Foam End dam (SP204)	1.287"x 1.787"x 0.745"	1	Each horizontal to vertical connection

5.0 Test Specimen Description: (Continued)

5.6 Hardware:

Description	Quantity	Location
3/8" x 2-1/2" long hexagon flush bolts	1	Top and bottom of active panel lock stile.
1/2" diameter x 4-1/8" long flush bolts.	1	Top and bottom of inactive panel lock stile.
4-3/4" x 4" hinges	3	8-1/2" from top and bottom of hinge stiles and one at the mid-span.

5.7 Reinforcement:

Drawing Number	Location	Material
Detail 317 on Sheet #11	Vertical mullion	4-1/2" wide by 1-7/8" deep by 1/4" thick steel channel with a 4" wide by 3/4" thick flat plate welded inside the channel.

6.0 Installation:

The specimen was installed into a C-10 steel buck. The rough opening allowed for a 1/2" shim space. The interior and exterior perimeter of the unit was sealed with Dow Corning 795.

Location	Anchor Description	Anchor Location
Sill to steel buck	1/2"-13 x 1" hex head bolts	4" and 6" from corner of vertical mullion and 4" from the jamb.
Head to steel buck	1/2"-13 x 2" hex head blots with washers and nuts.	4" and 6" each side of the vertical mullion, 4" from the jamb corners and one at the mid-span of the transom lite.
Door jamb through frame jamb to steel buck	1/2"-13 x 4-1/2" hex head bolts with washers and nuts.	2", 45-1/2", 50-1/2" and 68" from the bottom corner.
Frame jambs to steel buck	1/2"-13 x 4-1/2" hex head bolts with washers and nuts.	2" up from horizontal to jamb corners.
Door sub-frame jamb to frame jamb and vertical mullion	#12 x 3/4" hex head self drilling screws	4" up from the bottom corners, four (4) at 18" on center and one (1) 2" down from top corners. (Total 12)
Door sub-frame head to horizontal mullion	#12 x 3/4" hex head self drilling screws	4" from each corner and 18" on center. (Total 4)
Threshold to steel buck	#12 x 1-1/4" flat head screws	5-1/2" from each corner and 24" on center. (Total 4)
Vertical mullion to reinforcement	1/4-20 x 3" hex head bolt with washers and nuts.	Through bolted 1" from all horizontal connections.

7.0 Test Results: The temperature during testing was 69°F. The results are tabulated as follows:

7.1 ASTM E 330-02, *Structural Performance by Uniform Static Air Pressure Difference.*

Test Specimen #1:

Title of Test	Results	Allowed	Note
Uniform Load Deflection, per ASTM E 330 taken at vertical mullion +3828 Pa (-80.0 psf) -3828 Pa (-80.0 psf)	7.6 mm (0.60") max. 18.3 mm (0.72") max	21.1 mm (0.83")max 21.1 mm (0.83") max	1, 2, 3
Uniform Load Deflection, per ASTM E 330 taken at horizontal mullion at transom +3828 Pa (-80.0 psf) -3828 Pa (-80.0 psf)	5.6 mm (0.22") max. 7.11 mm (0.28") max	12.5 mm (0.49") max 12.5 mm (0.49") max	1, 2, 3
Uniform Load Structural, per ASTM E 330 taken at vertical mullion +5742 Pa (+120.0 psf) -5742 Pa (-120.0 psf)	2.3 mm (0.09") max. 1.3 mm (0.05") max	14.7 mm (0.58") max 14.7 mm (0.58") max	1, 2, 3
Uniform Load Structural, per ASTM E 330 taken at horizontal mullion at transom +5742 Pa (+120.0 psf) -5742 Pa (-120.0 psf)	0.5 mm (0.02") max. 0.5 mm (0.02") max	8.6 mm (0.34") max. 8.6 mm (0.34") max	1, 2, 3

7.0 Test Results: (Continued)

7.2 ASTM E 1886, *Large Missile Impact*

Conditioning Temperature: 14.4°C (58°F)
Missile Weight: 4196 g (9.25 lbs)
Missile Length: 2.4 m (7'11")
Muzzle Distance from Test Specimen: 5.2 m (17'0")

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

Impact #1: Missile Velocity: 15.2 m/s (49.8 fps)	
Impact Area:	**Mid-span of horizontal mullion at transom.**
Observations:	Missile hit target area, fractured outboard lite and dented aluminum cover cap and pressure plate.
Results:	Pass

Impact #2: Missile Velocity: 15.3 m/s (50.2 fps)	
Impact Area:	**Mid-span of vertical mullion.**
Observations:	Missile hit target area, dented aluminum cover cap and pressure plate.
Results:	Pass

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

7.0 Test Results: (Continued)

7.3 ASTM E 1886, *Air Pressure Cycling*

Test Unit #1
Design Pressure: ±3840 Pa (±80 psf)

POSITIVE PRESSURE

Pressure Range Pa (psf)	Number of Cycles	Average Cycle Time (seconds)	Maximum Deflection at Indicator mm (inches)					
			#1	#2	#3	#4	#5	#6
766 to 1915 (16 to 40)	3500	1.70	7.87 (0.31)	18.29 (0.72)	12.70 (0.50)	7.11 (0.28)	15.24 (0.60)	18.54 (0.73)
0 to 2298 (0 to 48)	300	6.54	10.92 (0.43)	20.83 (0.82)	14.99 (0.59)	8.13 (0.32)	17.78 (0.70)	21.34 (0.84)
1915 to 3064 (40 to 64)	600	2.07	13.46 (0.53)	25.91 (1.02)	18.03 (0.71)	10.41 (0.41)	22.86 (0.90)	26.16 (1.03)
1149 to 3830 (24 to 80)	100	4.91	16.00 (0.63)	31.24 (1.23)	20.32 (0.80)	12.19 (0.48)	27.69 (1.09)	31.50 (1.24)
			Permanent Set mm (inches)					
			8.64 (0.34)	9.40 (0.37)	12.19 (0.48)	4.32 (0.17)	6.35 (0.25)	9.65 (0.38)

NEGATIVE PRESSURE

Pressure Range Pa (psf)	Number of Cycles	Average Cycle Time (seconds)	Maximum Deflection at Indicator mm (inches)					
			#1	#2	#3	#4	#5	#6
1149 to 3830 (24 to 80)	50	6.20	13.21 (0.52)	30.23 (1.19)	14.73 (0.58)	11.43 (0.45)	26.67 (1.05)	27.69 (1.09)
1915 to 3064 (40 to 64)	1050	2.61	11.18 (0.44)	24.89 (0.98)	12.95 (0.51)	9.40 (0.37)	24.13 (0.95)	24.13 (0.95)
0 to 2298 (0 to 48)	50	6.26	10.16 (0.40)	21.84 (0.86)	12.19 (0.48)	6.86 (0.27)	18.54 (0.73)	18.54 (0.73)
766 to 1915 (16 to 40)	3350	3.12	8.13 (0.32)	19.56 (0.77)	11.43 (0.45)	6.10 (0.24)	15.49 (0.61)	15.75 (0.62)
			Permanent Set mm (inches)					
			1.02 (0.04)	0.51 (0.02)	3.81 (0.15)	0.76 (0.03)	1.78 (0.07)	1.78 (0.07)

***Observations**: Two (2) #12 x 1-1/4" flat head screws sheared at the threshold; no deglazing was observed.*

Result: Pass

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

***General Note**: All testing was performed in accordance with the referenced standard(s).*

Note 1: Loads were held for 30 seconds.

Note 2: 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.

Note 3. Allowable deflections are based on L/175

The service life of this report will expire on the stated Test Record Retention End Date, at which time such materials as drawings, data sheets, samples of test specimens, copies of this report, and any other pertinent project documentation, shall be discarded without notice.

If test specimen contains glazing, no conclusions of any kind regarding the adequacy or inadequacy of the glass in any glazed test specimen(s) 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: John C. McClane

John C. McClane
Laboratory Manager

Digitally Signed by: Shawn G. Collins

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

SP:sc/ck

Attachments (pages): This report is complete only when all attachments listed are included.
Appendix-A: Photographs (2)
Appendix-B: Drawings (16)
Appendix-C: Sketches (1)

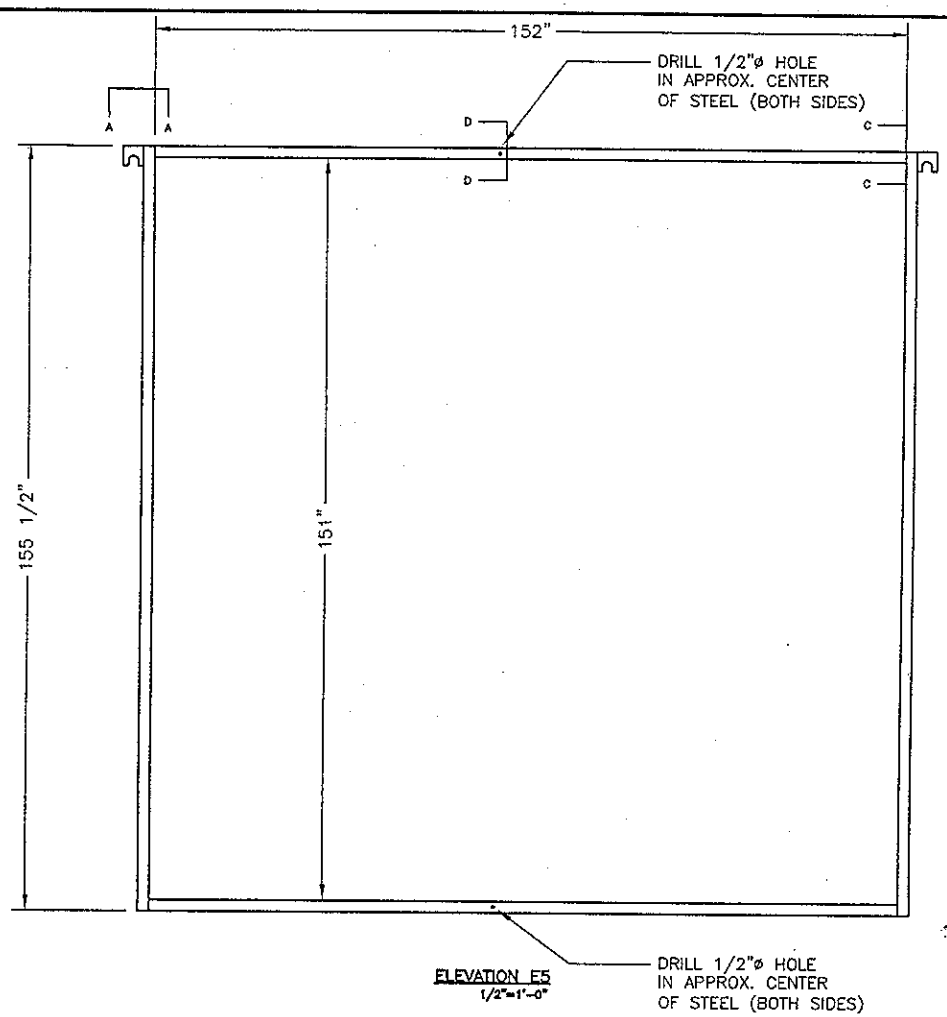
Appendix A

Photographs

Photo No. 1
Elevation E5
Reinforced Captured Mullion with Series 381 Entrance Door

Photo No. 2
Indicator locations for Elevation E5

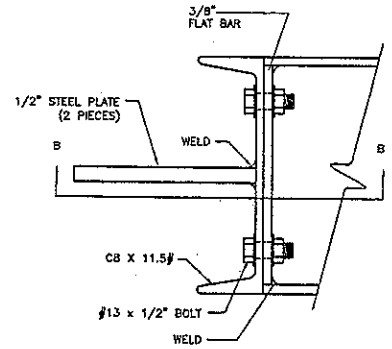
Appendix B
Drawings



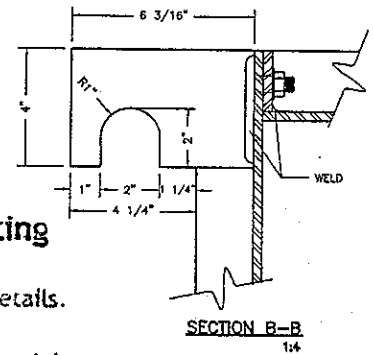
ELEVATION E5
1/2"=1'-0"

Coral Architectural Products

PART NAME	PW257_01 TEST BUCK	DRAWN	MLL	DATE	8/4/2010
PART NO.	ELEVATION E5	CHKD.	APP.	SCALE	VARIES



VIEW A-A
1:4



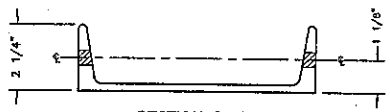
SECTION B-B
1:4

Architectural Testing

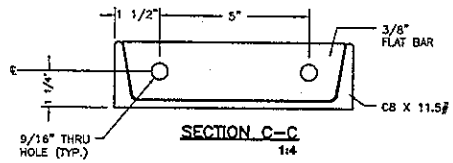
Test sample complies with these details.
Deviations are noted.

Report# A2658.02-401-44

Date 4/19/11 Tech 58



SECTION D-D
1:4



SECTION C-C
1:4

(TOP SHOWN, BOTTOM SIMILAR)

NOTE:
MAKE 1 AS SHOWN

NO	REVISION	BY	DATE
#	----------	---	--/--/--

TEST REPORT DRAWINGS
PW257 IMPACT-RESISTANT CURTAIN WALL SYSTEM
FOR USE IN HURRICANE ZONES REQUIRING LARGE MISSILE IMPACT PROTECTION

INDEX TO DRAWINGS	
1	INDEX TO DRAWINGS AND NOTES
2	~~FRAMING ELEVATION – E1 CAPTURED AND B.G. MULLIONS WITH STEEL –LONG SPAN–~~
3	~~FRAMING ELEVATION – E2 CAPTURED MULLION WITHOUT STEEL –SHORT SPAN–~~
4	~~FRAMING ELEVATION – E3 B.G. MULLION WITHOUT STEEL –SHORT SPAN–~~
5	~~FRAMING ELEVATION – E4 CAPTURED MULLION WITH STEEL –LONG SPAN – DRY GLAZE~~
6	FRAMING ELEVATION FOR DOORS – E5 CAPTURED MULLION WITH STEEL –LONG SPAN–
7	FRAMING DETAILS
8	FRAMING DETAILS
9	FRAMING DETAILS
10	DOOR AND FRAMING DETAILS
11	DOOR AND FRAMING DETAILS
12	FRAMING DETAILS
13	BILL OF MATERIALS
14	BILL OF MATERIALS AND GLAZING SCHEDULE
15	DIE DRAWINGS

ABBREVIATIONS:
D.L.O. = DAY LIGHT OPENING
D.O.H. = DOOR OPENING HEIGHT
D.O.W. = DOOR OPENING WIDTH
ELEVS = ELEVATIONS
EXT. = EXTERIOR
INT. = INTERIOR
MAX. = MAXIMUM
MIN. = MINIMUM
OPP. = OPPOSITE
TYP. = TYPICAL

Architectural Testing

Test sample complies with these details.
Deviations are noted.

Report# A2658.02-401-44
Date 4/19/11 Tech SP

Coral Architectural Products
3010 RIDGE MINE ROAD, TUSCALOOSA, AL 35406
PHONE: 800-722-2737 FAX: 800-255-7220

REV	BY	DATE	DESCRIPTION
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TEST REPORT DRAWINGS
PW257 IMPACT-RESISTANT
CURTAIN WALL SYSTEM

INDEX TO DRAWINGS AND NOTES

DATE 8/24/2010
DRAWN MLL | CHECKED DCW | APPROVED DCW
PROJECT NO. TEST
DRAWING NO. PW257_01
SHEET 1 OF 15

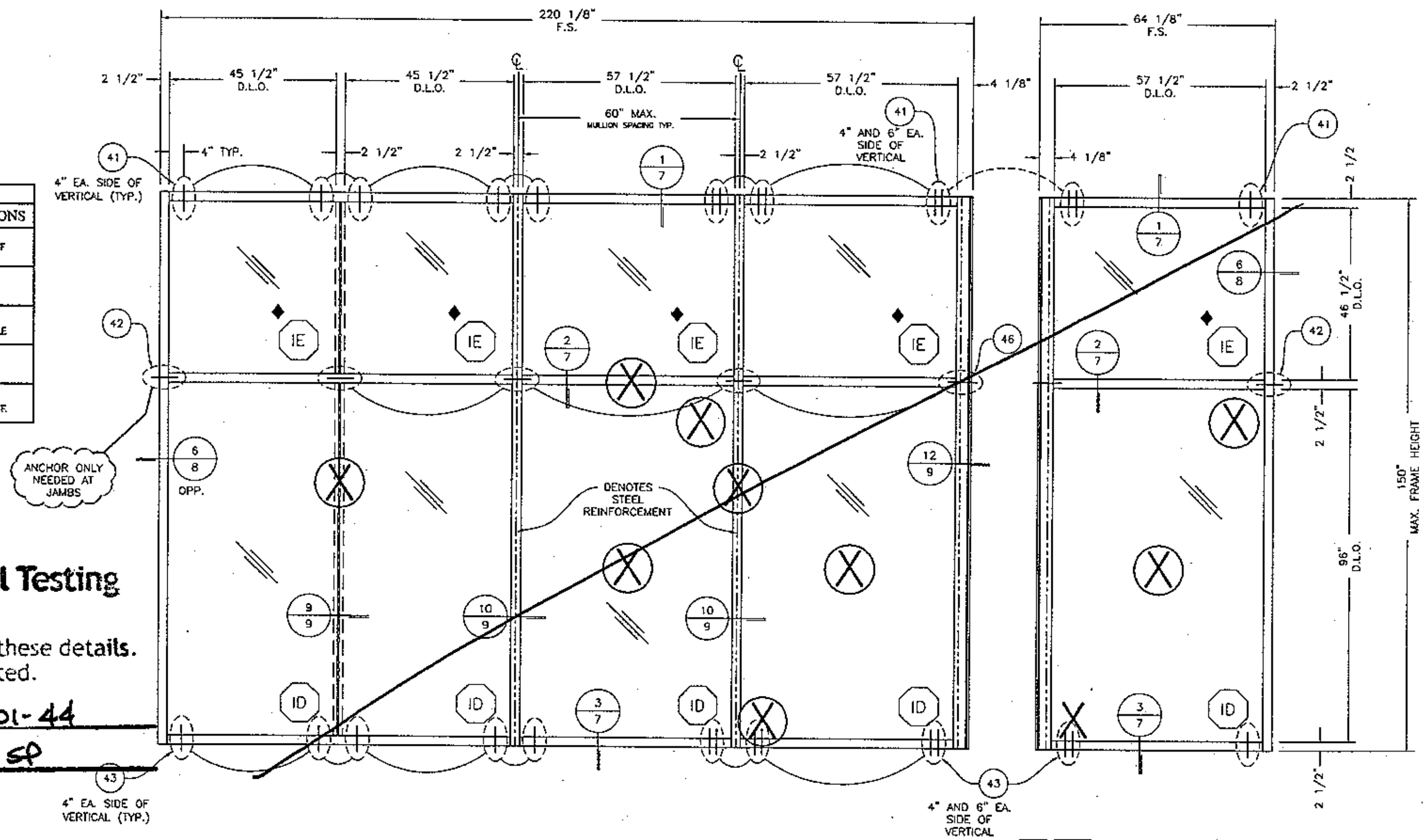
SPECIMEN #E1	
TEST METHOD	TEST CONDITIONS
AIR INFILTRATION TEST (ASTM E283 AND TAS 202)	1.57 PSF & 6.24 PSF
WATER INFILTRATION TEST (ASTM E331 AND TAS 202)	20.00 PSF
UNIFORM STATIC LOAD TEST (ASTM E330 AND TAS 202)	+/- 80 PSF DESIGN PRESSURE
LARGE MISSILE IMPACT TEST (ASTM E1886/E1996 AND TAS 201)	9-LB 4OZ, 2x4 @ 50FT/SEC
CYCLIC LOAD TEST (ASTM E1996 AND TAS 203)	+/- 80 PSF DESIGN PRESSURE

Architectural Testing

Test sample complies with these details. Deviations are noted.

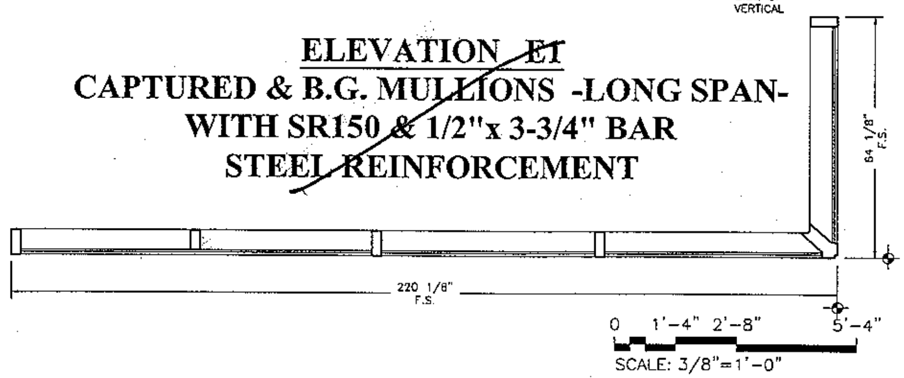
Report# A2658.02-401-44

Date 4/19/11 Tech SP



ELEVATION ~~E1~~

CAPTURED & B.G. MULLIONS -LONG SPAN- WITH SR150 & 1/2"x 3-3/4" BAR STEEL REINFORCEMENT



STEEL BUCK FRAME

TESTING:
AIR, WATER, STATIC, IMPACT, AND CYCLE

MAX. ALLOWABLE DEFLECTION (L/180)= 0.833

DESIGN PRESSURE = +/-80 PSF

(X) = LARGE MISSILE IMPACT LOCATIONS

◆ = INFILL ONLY (DO NOT IMPACT)

REV | BY | DATE | DESCRIPTION

Coral Architectural Products
3910 KAPE MINE ROAD, TUSCALOOSA, AL 35405
PHONE: 800-772-7737 FAX: 800-285-1320

TEST REPORT DRAWINGS
PW257 IMPACT-RESISTANT
CURTAIN WALL SYSTEM

FRAMING ELEVATION

DATE 3/24/2010

DRAWN MLL | CHECKED DCW | APPROVED DCW

PROJECT NO. TEST

DRAWING NO. PW257_01

SHEET 2 OF 15

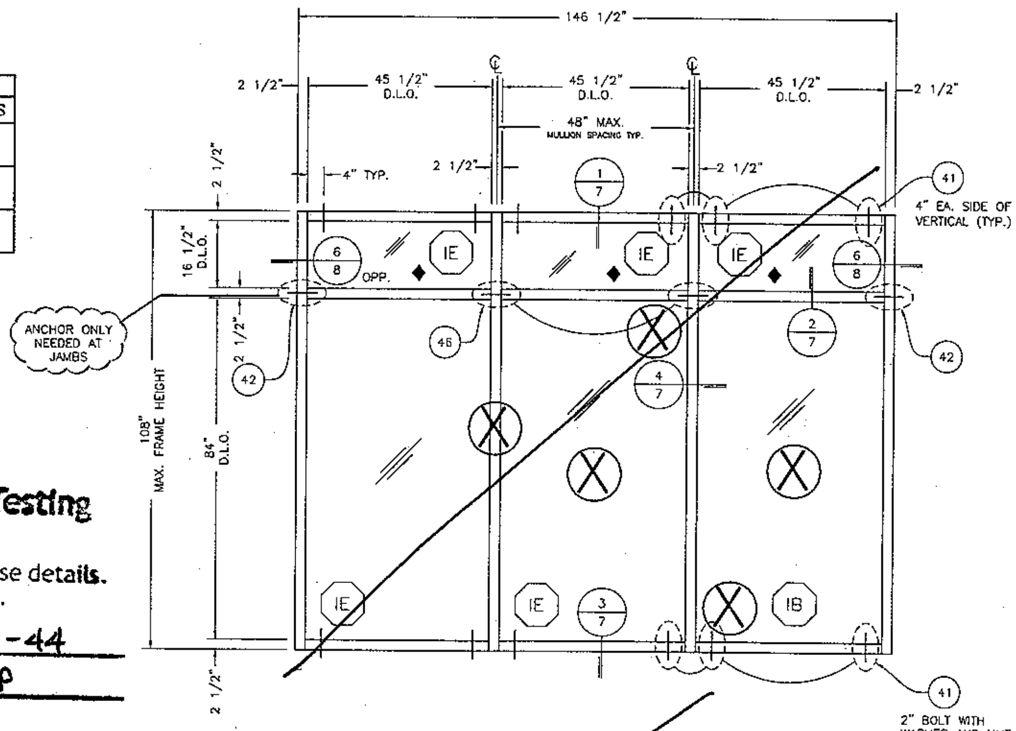
SPECIMEN #E2	
TEST METHOD	TEST CONDITIONS
UNIFORM STATIC LOAD TEST (ASTM E330 AND TAS 202)	+/- 65 PSF DESIGN PRESSURE
LARGE MISSILE IMPACT TEST (ASTM E1886/E1996 AND TAS 201)	9-LB 4OZ. 2x4 @ 50FT/SEC
CYCLIC LOAD TEST (ASTM E1996 AND TAS 203)	+/- 65 PSF DESIGN PRESSURE

Architectural Testing

Test sample complies with these details. Deviations are noted.

Report# A2658.02-401-44

Date 4/19/11 Tech SP



ELEVATION E2
CAPTURED MULLION -SHORT SPAN- WITHOUT REINFORCEMENT

STEEL BUCK FRAME

TESTING:
STATIC, IMPACT, AND CYCLE

MAX. ALLOWABLE DEFLECTION (L/180)= 0.600

DESIGN PRESSURE = +/-65 PSF

(X) = LARGE MISSILE IMPACT LOCATIONS

◆ = INFILL ONLY (DO NOT IMPACT)

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

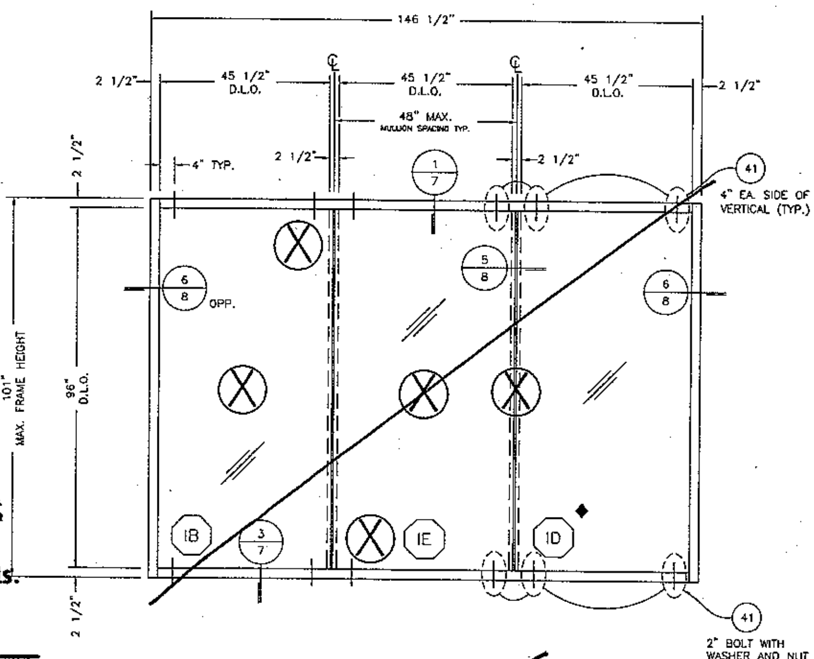
Coral Architectural Products

TEST REPORT DRAWINGS
PW257 IMPACT-RESISTANT CURTAIN WALL SYSTEM

FRAMING ELEVATION

DATE 3/24/2010		
DRAWN MLL	CHECKED DCW	APPROVED DCW
PROJECT NO. TEST		
DRAWING NO. PW257_01		
SHEET 3 OF 15		

SPECIMEN #E3	
TEST METHOD	TEST CONDITIONS
UNIFORM STATIC LOAD TEST (ASTM E330 AND TAS 202)	+/- 65 PSF DESIGN PRESSURE
LARGE MISSILE IMPACT TEST (ASTM E1886/E1996 AND TAS 201)	9-LB 4OZ, 2x4 @ 50FT/SEC
CYCLIC LOAD TEST (ASTM E1996 AND TAS 203)	+/- 65 PSF DESIGN PRESSURE



Architectural Testing

Test sample complies with these details. Deviations are noted.

Report# A2658.02-401-44

Date 4/19/11 Tech SP

ELEVATION E3
B.G. MULLION -SHORT SPAN- WITHOUT REINFORCEMENT

STEEL BUCK FRAME

TESTING:
STATIC, IMPACT, AND CYCLE

MAX. ALLOWABLE DEFLECTION (L/180)= 0.561

DESIGN PRESSURE = +/-65 PSF

(X) = LARGE MISSILE IMPACT LOCATIONS

◆ = INFILL ONLY (DO NOT IMPACT)

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

REV | BY | DATE | DESCRIPTION

Coral Architectural Products

TEST REPORT DRAWINGS
PW257 IMPACT-RESISTANT
CURTAIN WALL SYSTEM

FRAMING ELEVATION

DATE 3/24/2010

DRAWN MLL | CHECKED DCW | APPROVED DCW

PROJECT NO. TEST

DRAWING NO. PW257_01

SHEET 4 OF 15

SPECIMEN #E1	
TEST METHOD	TEST CONDITIONS
AIR INFILTRATION TEST (ASTM E283 AND TAS 202)	1.57 PSF & 6.24 PSF
WATER INFILTRATION TEST (ASTM E331 AND TAS 202)	20.00 PSF
UNIFORM STATIC LOAD TEST (ASTM E330 AND TAS 202)	+/- 80 PSF DESIGN PRESSURE
LARGE MISSILE IMPACT TEST (ASTM E1886/E1996 AND TAS 201)	9-LB 4OZ, 2x4 @ 50FT/SEC
CYCLIC LOAD TEST (ASTM E1996 AND TAS 203)	+/- 80 PSF DESIGN PRESSURE

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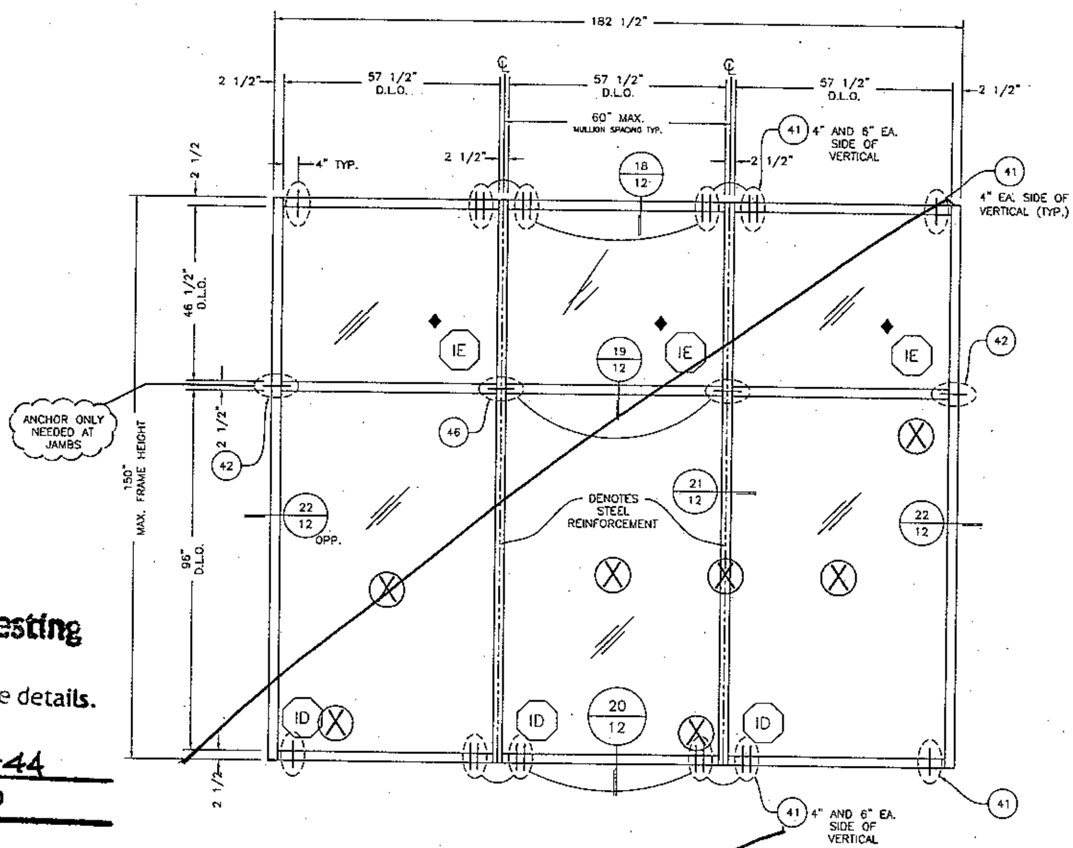
Date 4/19/11 Tech SP



ELEVATION E4 - DRY GLAZE CAPTURED MULLION -LONG SPAN- WITH SR150 & 1/2"X 3-3/4" BAR STEEL REINFORCEMENT

STEEL BUCK FRAME

TESTING: IMPACT, AND CYCLE

MAX. ALLOWABLE DEFLECTION (L/180)= 0.833

DESIGN PRESSURE = +/-80 PSF

(X) = SMALL MISSILE IMPACT LOCATIONS

◆ = INFILL ONLY (DO NOT IMPACT)

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

REV | BY | DATE | DESCRIPTION

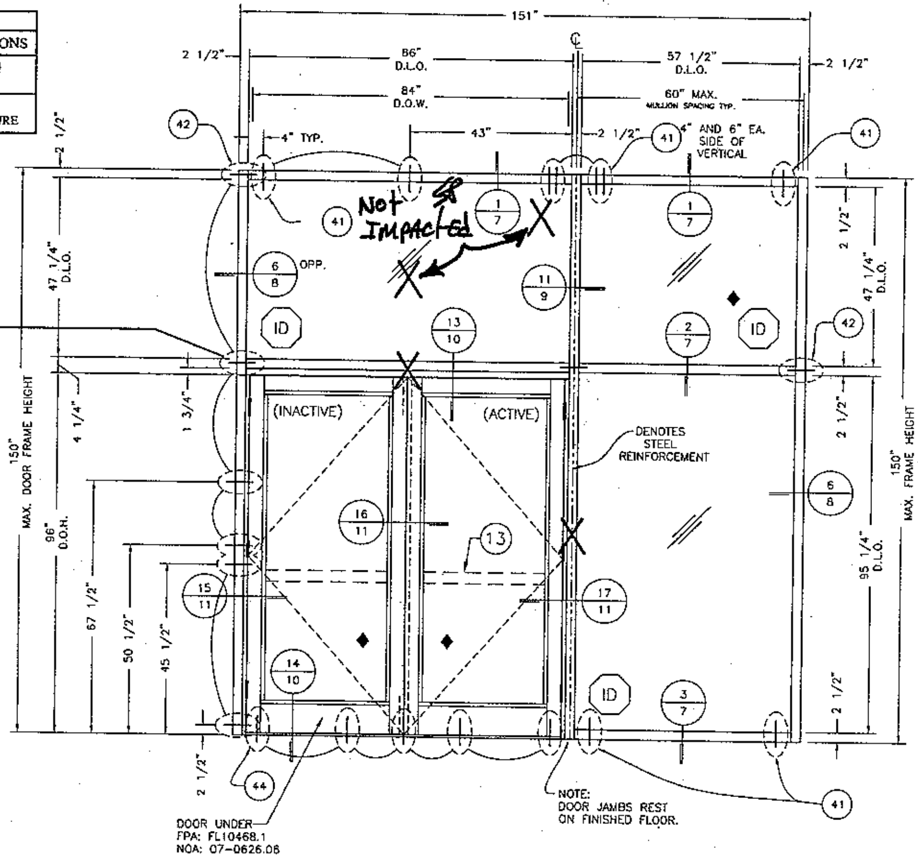
Coral Architectural Products
3010 RICE MINE ROAD, TUSCALOOSA, AL 35406
PHONE: 800-772-7727 FAX: 800-443-6263

TEST REPORT DRAWINGS
PW257 IMPACT-RESISTANT CURTAIN WALL SYSTEM

FRAMING ELEVATION

DATE 3/24/2010
DRAWN MLL | CHECKED DCW | APPROVED DCW
PROJECT NO.
DRAWING NO. PW257_01
SHEET 5 OF 15

SPECIMEN #E5	
TEST METHOD	TEST CONDITIONS
LARGE MISSILE IMPACT TEST (ASTM E1886/E1996 AND TAS 201)	9-LB 4OZ, 2x4 @ 50FT/SEC
CYCLIC LOAD TEST (ASTM E1996 AND TAS 203)	+/- 80 PSF DESIGN PRESSURE

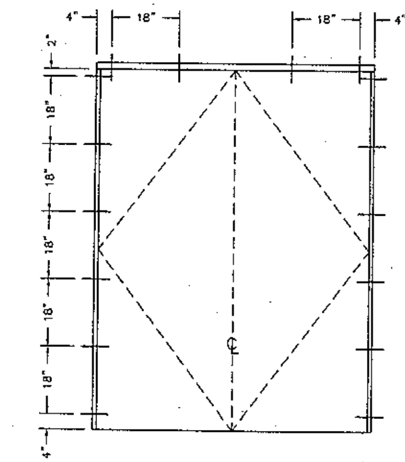


Architectural Testing

Test sample complies with these details. Deviations are noted.

Report# A2658.02-401-44

Date 4/19/11 Tech SP



LOCATIONS FOR DOOR SUB-FRAME ATTACHMENT TO CURTAIN WALL ALUMINUM

ELEVATION E5
CAPTURED MULLION -LONG SPAN- WITH SR150 & 3/4"x ~~3-3/4"~~ 4" BAR STEEL REINFORCEMENT FOR SERIES 381 ENTRANCE DOORS

STEEL BUCK FRAME

TESTING: IMPACT, AND CYCLE

MAX. ALLOWABLE DEFLECTION (L/180)= 0.833

DESIGN PRESSURE = +/-80 PSF

X = LARGE MISSILE IMPACT LOCATIONS

♦ = INFILL ONLY (DO NOT IMPACT)

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

Coral Architectural Products

TEST REPORT DRAWINGS PW257 IMPACT-RESISTANT CURTAIN WALL SYSTEM

FRAMING ELEVATION FOR DOORS

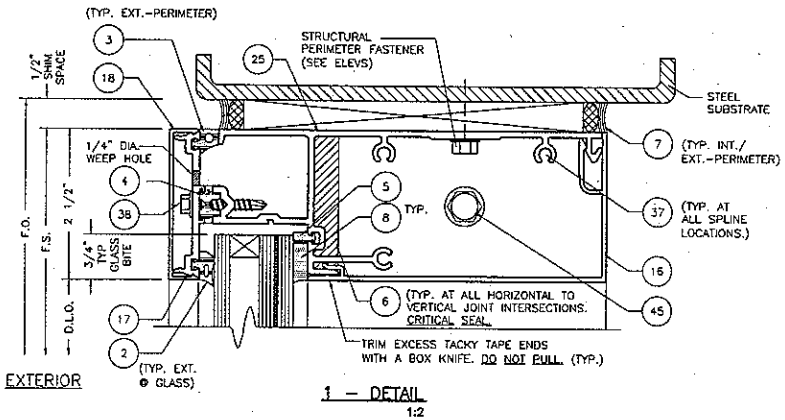
DATE 3/24/2010

DRAWN MLL | CHECKED DCW | APPROVED DCW

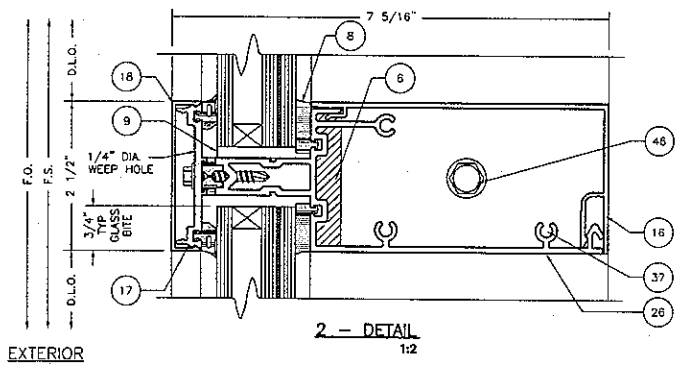
PROJECT NO. TEST

DRAWING NO. PW257_01

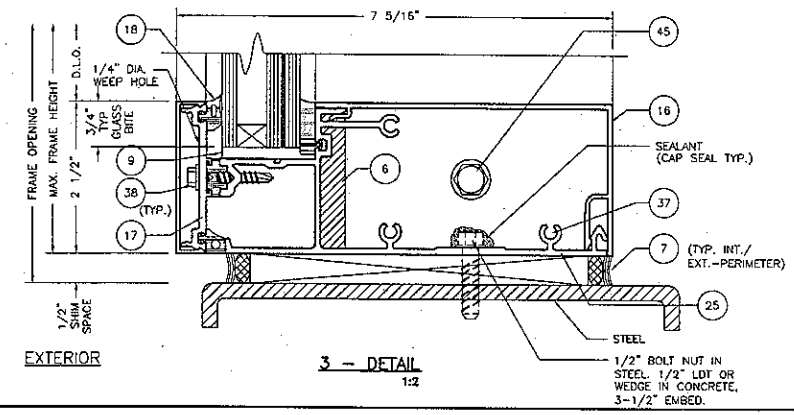
SHEET 6 OF 15



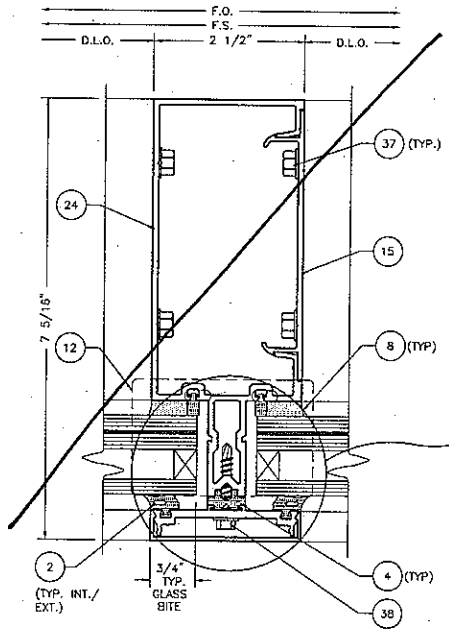
1 – DETAIL
1:2



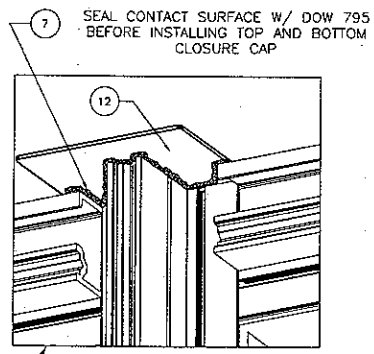
2 – DETAIL
1:2



3 – DETAIL
1:2



4 – DETAIL
1:2



TOP SHOWN
CLOSURE CAP
(BOTTOM SIMILAR)

Architectural Testing

Test sample complies with these details.
Deviations are noted.

Report# 42658.02-401-44

Date 4/19/11 Tech SP

Coral
Architectural Products
3810 PICE MINE ROAD, TUSCALOOSA, AL 35406
PHONE: 800-772-7737 FAX: 800-443-4261

REV	BY	DATE	DESCRIPTION

TEST REPORT DRAWINGS
PW257 IMPACT-RESISTANT
CURTAIN WALL SYSTEM

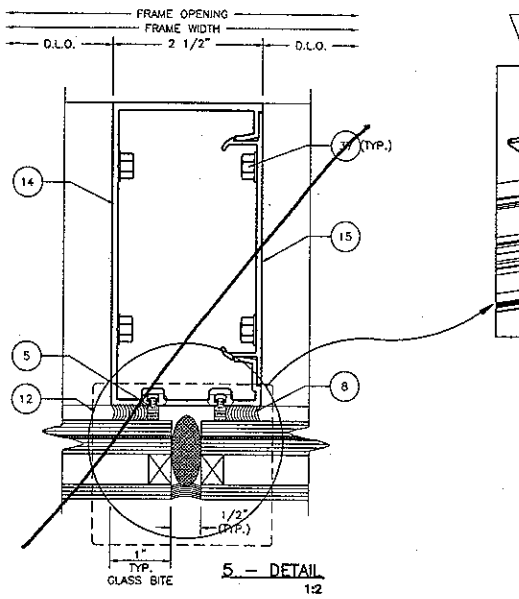
FRAMING DETAILS

DATE	8/24/2010		
DRAWN	CHECKED	APPROVED	
MLL	DCW	DCW	

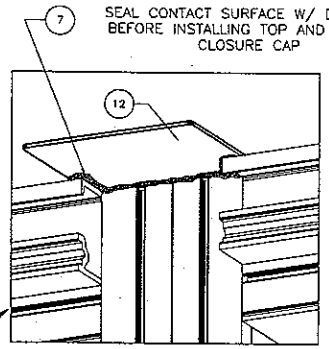
PROJECT NO.

DRAWING NO.
PW257_01

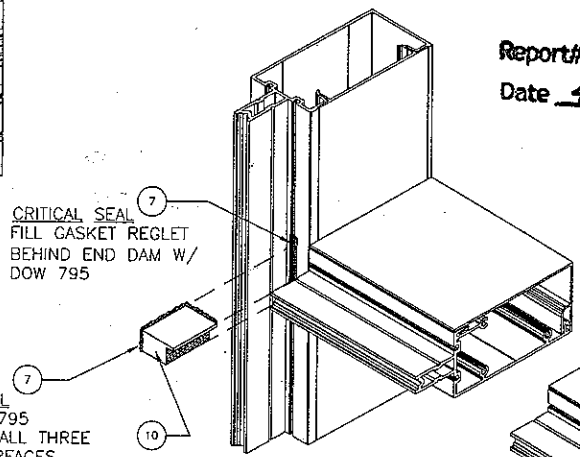
SHEET 7 OF 15

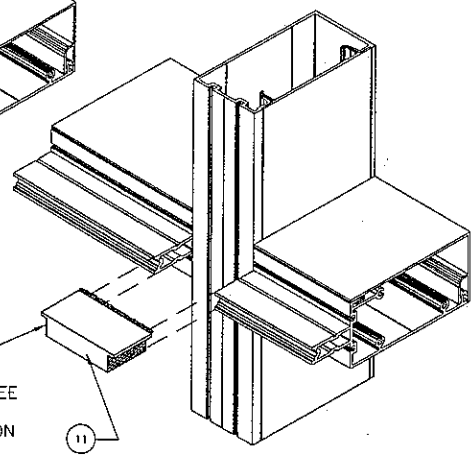


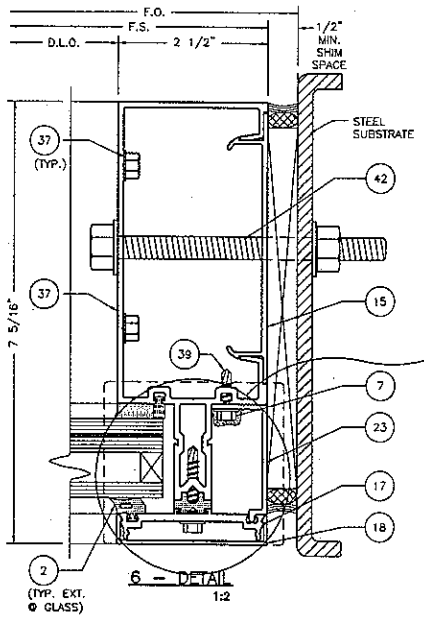
5 – DETAIL
1:2



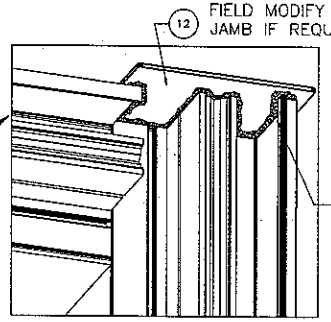
TOP SHOWN
CLOSURE CAP
(BOTTOM SIMILAR)







6 – DETAIL
1:2



TOP SHOWN
CLOSURE CAP
(BOTTOM SIMILAR)

Architectural Testing

Test sample complies with these details.
Deviations are noted.

Report# 42658.02-401-44

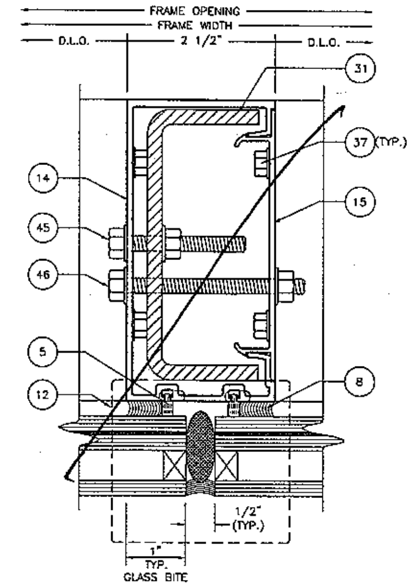
Date 4/19/11 Tech SP

Corral
Architectural Products
3010 RICE MINE ROAD, TUSCALOOSA, AL 35406
PHONE: 800-772-7737 FAX: 800-443-6761

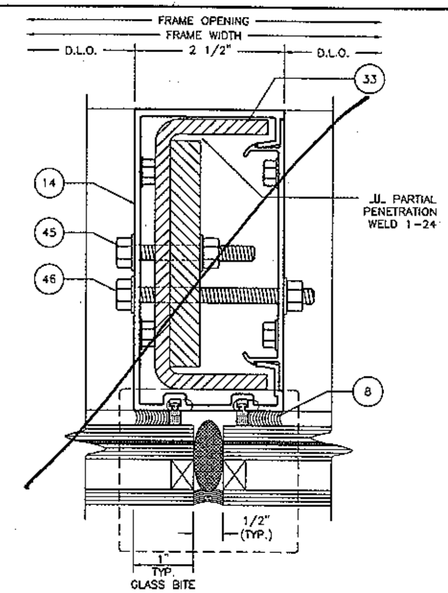
TEST REPORT DRAWINGS
PW257 IMPACT-RESISTANT
CURTAIN WALL SYSTEM

FRAMING DETAILS

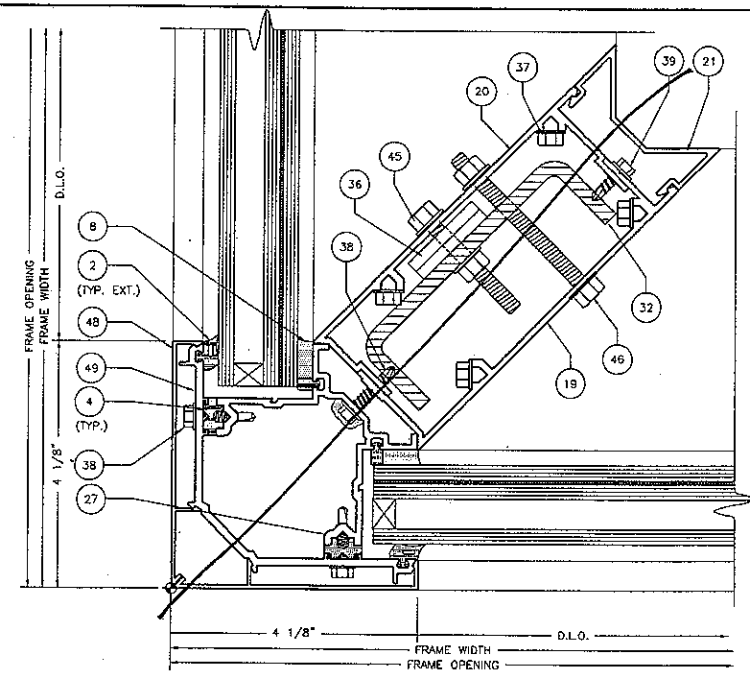
DATE	8/24/2010		
DRAWN	CHECKED	APPROVED	
MLL	DCW	DCW	
PROJECT NO.			
DRAWING NO.	PW257_01		
SHEET	8 OF 15		



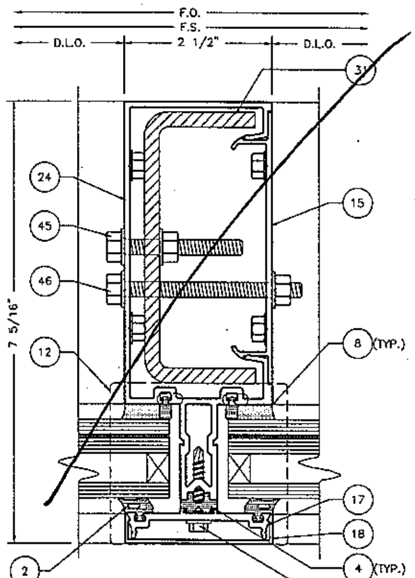
7 – DETAIL
1:2



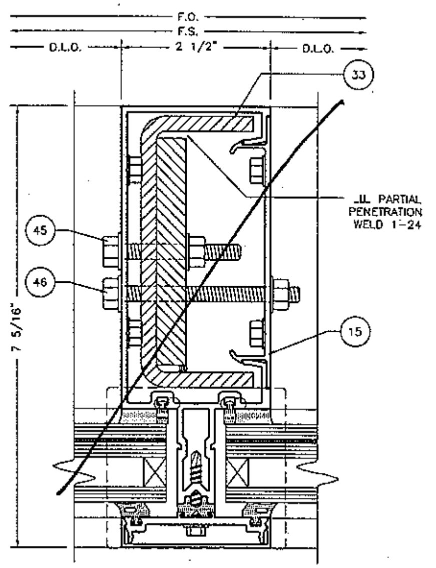
9 – DETAIL
1:2



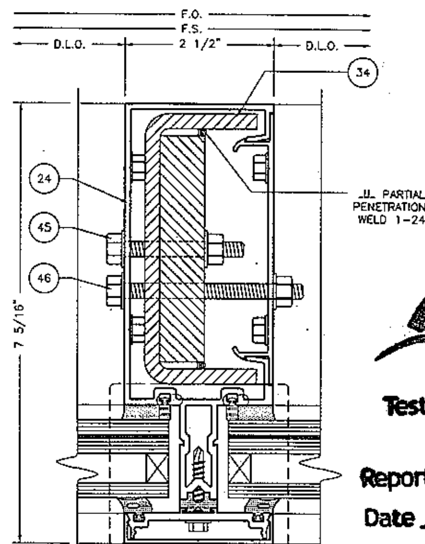
12 – DETAIL
1:2



8 – DETAIL
1:2



10 – DETAIL
1:2



11 – DETAIL
1:2

Architectural Testing

Test sample complies with these details.
Deviations are noted.

Report# A2658.02-401-44
Date 4/19/11 Tech [signature]

REV	BY	DATE	DESCRIPTION

Coral
Architectural Products
3010 RICE MINE ROAD, TUSCALOOSA, AL 35406
PHONE: 800-772-7737 FAX: 800-443-6261

TEST REPORT DRAWINGS
PW257 IMPACT-RESISTANT
CURTAIN WALL SYSTEM

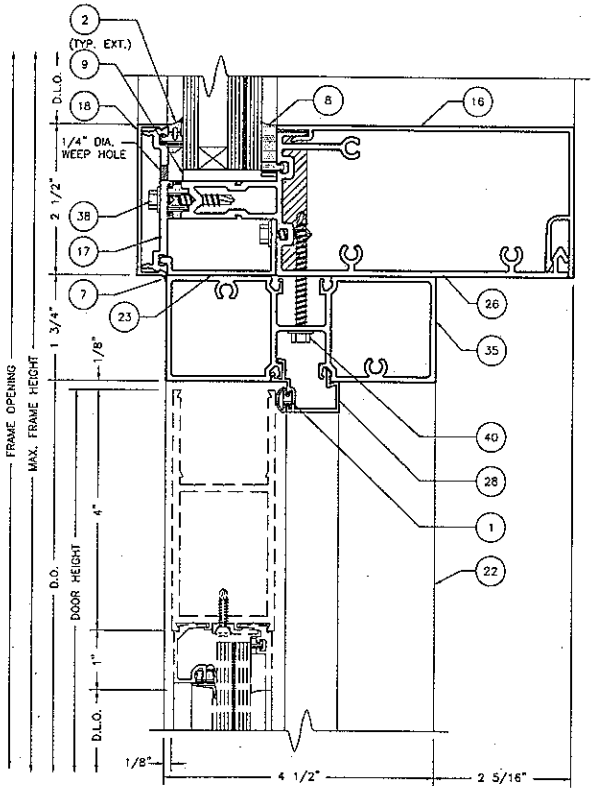
FRAMING DETAILS

DATE 8/24/2010		
DRAWN MLL	CHECKED DCW	APPROVED DCW

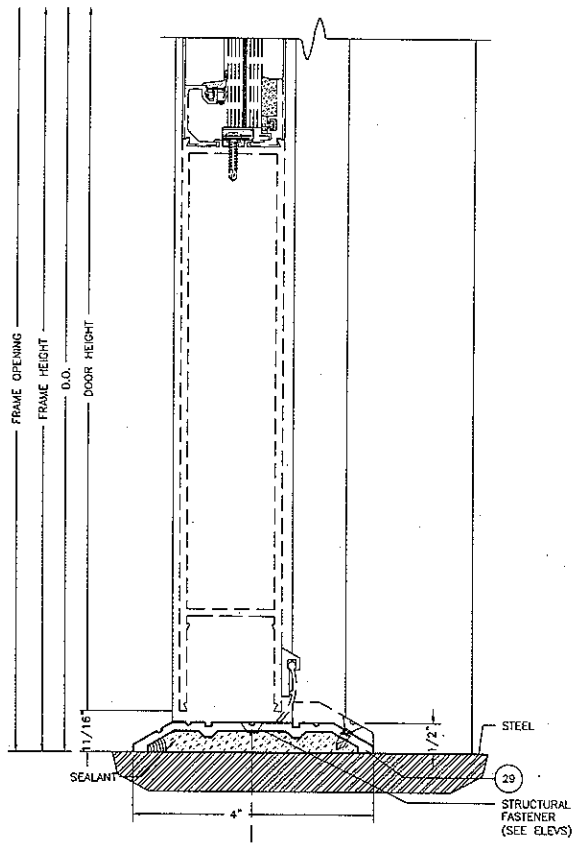
PROJECT NO.

DRAWING NO. PW257_01

SHEET 9 OF 15



13 – DETAIL
1:2



14 – DETAIL
1:2

Architectural Testing

Test sample complies with these details.
Deviations are noted.

Report# A2658.02-401-44

Date 4/19/11 Tech SP

REV	BY	DATE	DESCRIPTION
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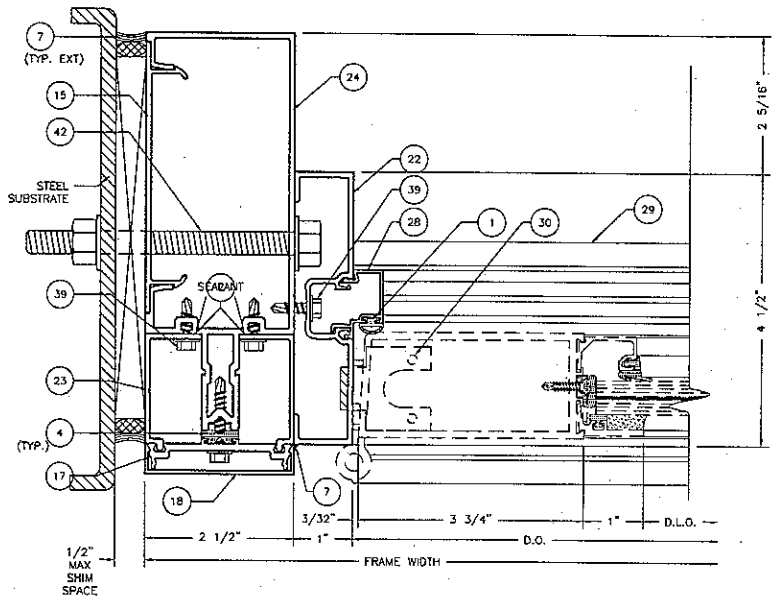
Coral
Architectural Products
3010 RICE MINE ROAD, TUSCALOOSA, AL 35406
PHONE: 800-772-7737 FAX: 800-443-6761

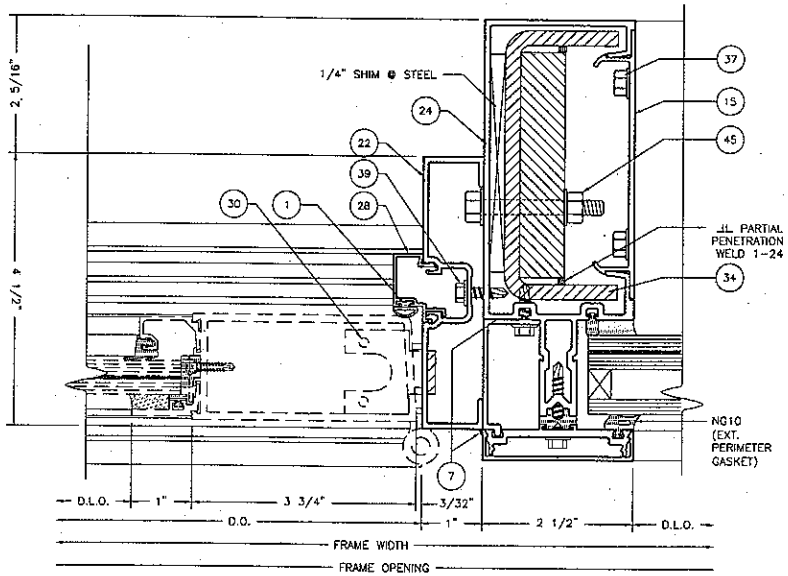
TEST REPORT DRAWINGS
PW257 IMPACT-RESISTANT
CURTAIN WALL SYSTEM

DOOR AND FRAMING DETAILS

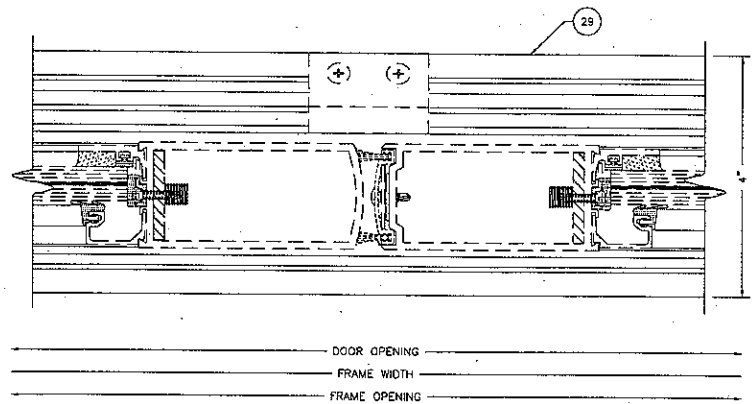
DATE 8/24/2010		
DRAWN MLL	CHECKED DCW	APPROVED DCW
PROJECT NO.		
DRAWING NO. PW257_01		
SHEET 10 OF 15		



15 – DETAIL
1:2



17 – DETAIL
1:2



16 – DETAIL
1:2

Architectural Testing

Test sample complies with these details.
Deviations are noted.

Report# A2658.02-401-44

Date 4/19/11 Tech SP

REV	BY	DATE	DESCRIPTION

Coral
Architectural Products
3010 RICE MINE ROAD, TUSCALOOSA, AL 35406
PHONE 800-773-7737 FAX 800-443-6261

TEST REPORT DRAWINGS
PW257 IMPACT-RESISTANT
CURTAIN WALL SYSTEM

DOOR AND FRAMING DETAILS

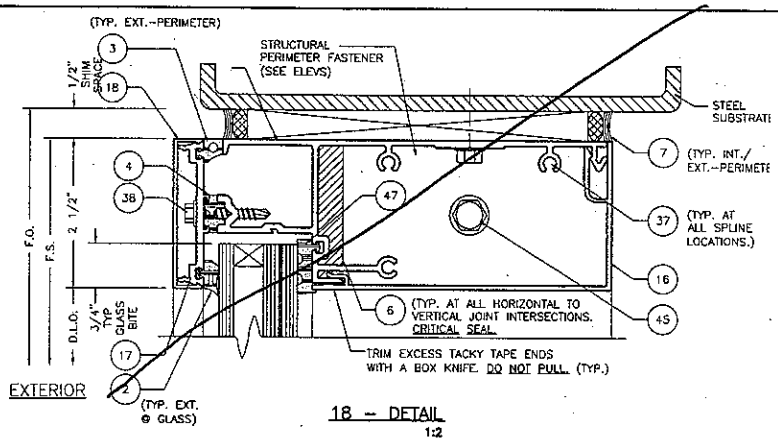
DATE 8/24/2010

DRAWN	CHECKED	APPROVED
MLL	DCW	DCW

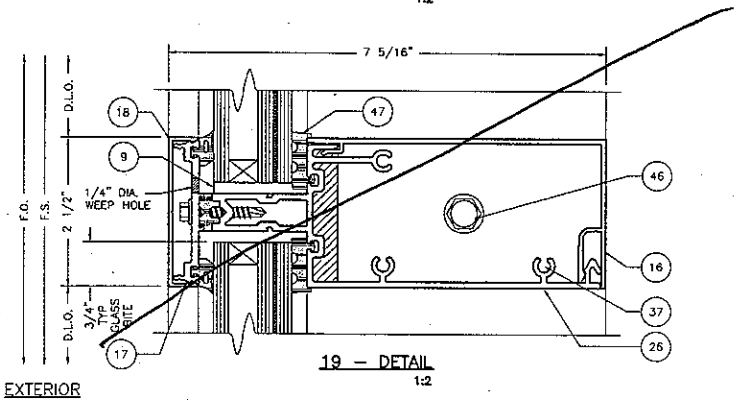
PROJECT NO.

DRAWING NO. PW257_01

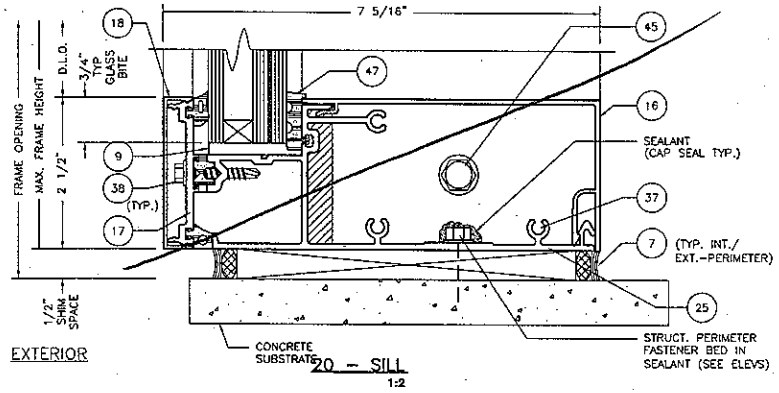
SHEET 11 OF 15



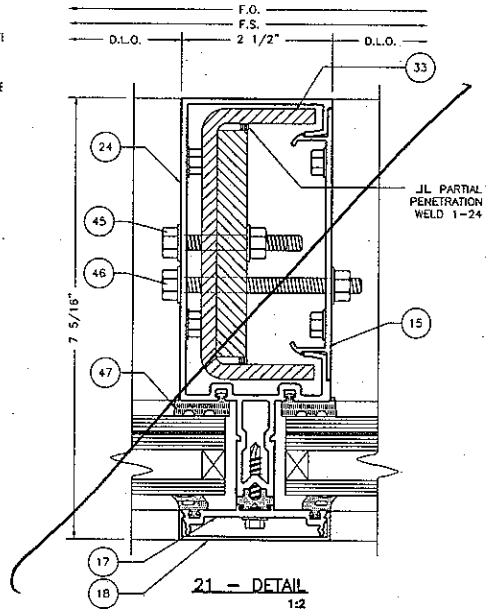
18 – DETAIL
1:2



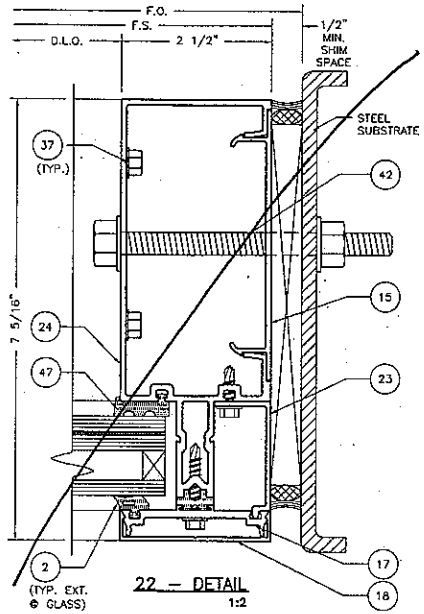
19 – DETAIL
1:2



20 – SILL
1:2



21 – DETAIL
1:2



22 – DETAIL
1:2

Architectural Testing

Test sample complies with these details.
Deviations are noted.

Report# A2658.02-401-44

Date 4/19/11 Tech SP

Coral
Architectural Products
3010 RICE MINE ROAD TUSCALOOSA, AL 35406
PHONE:800-772-7737 FAX:800-443-0261

REV	BY	DATE	DESCRIPTION

TEST REPORT DRAWINGS
PW257 IMPACT-RESISTANT
CURTAIN WALL SYSTEM

FRAMING DETAILS

DATE 8/24/2010

DRAWN	CHECKED	APPROVED
MLL	DCW	DCW

PROJECT NO.

DRAWING NO. PW257_01

SHEET 12 OF 15

BILL OF MATERIALS

ITEM NO.	P/N	DESCRIPTION	DIMENSIONS	MATERIAL	MANUFACTURER	3NOTES
1	NG5	BULB GASKET – DOORFRAME STOP	0.165 SPACE	EPDM	VARIES	
2	NG10	EXTERIOR GLAZING GASKET	0.250 SPACE	EPDM	VARIES	
3	NG11	EXTERIOR PERIMETER GASKET	0.300 SPACE	EPDM	VARIES	
4	NG12	PRESSURE BAR GASKET (ISOLATOR)	0.140 SPACE	EPDM	VARIES	
5	NG14	INTERIOR SPACER GASKET	0.250 SPACE	EPDM	VARIES	
6	SM5601	JOINT SEALANT TAPE	0.500 X 0.125 X VARIES	BUTYL	SCHNEE–MOOREHEAD	
7	795	SILICONE – PERIMETER SEALANT	FILL SPACE	SILICONE	DOW CORNING	USED @ PERIMETER
8	995	SILICONE – GLASS TO METAL	FILL SPACE	SILICONE	DOW CORNING	GLASS TO METAL AND INTERNAL
9	SB18	SETTING BLOCK @ SILL & HORIZONTAL	1.562 X 0.188 X 4.000	EPDM	VARIES	2 PER LITE
10	SP204	END DAM @ CAPTURED MULLION	1.287 X 1.787 X 0.745	EVA FOAM	CORAL INDUSTRIES, INC.	LOCATE 1 @ EACH END OF HORIZONTAL
11	~~SP208~~	~~BRIDGE DAM @ B.C. MULLION~~	~~3.123 X 1.562 X 0.745~~	~~EVA FOAM~~	~~CORAL INDUSTRIES, INC.~~	~~LOCATE 1 @ HORIZONTAL AND B.C. MULLION~~
12	SP211	MULLION CAP	3.000 X 2.691 X 0.048	6063–T6 ALUMINUM	CORAL INDUSTRIES, INC.	LOCATE @ TOP AND BOTTOM OF VERTICAL
13	~~2086~~	~~JACKSON 2086 PANIC~~	~~36.000 X 7.3125 X 3.000~~	~~ALUMINUM~~	~~JACKSON~~	
14	~~PW151~~	~~B.C. MULLION~~	~~2.500 X 5.000 X 0.094~~	~~6063–T6 ALUMINUM~~	~~CORAL INDUSTRIES, INC.~~	
15	PW202	OPEN BACK MULLION FILLER	0.681 X 4.484 X 0.094	6063–T6 ALUMINUM	CORAL INDUSTRIES, INC.	
16	PW203	HEAD/ SILL/ HORIZONTAL TRIM	2.500 X 4.980 X 0.078	6063–T6 ALUMINUM	CORAL INDUSTRIES, INC.	
17	PW204	PRESSURE BAR	2.443 X 0.433 X 0.125	6063–T6 ALUMINUM	CORAL INDUSTRIES, INC.	
18	PW205	FACE COVER	2.500 X 0.500 X 0.062	6063–T6 ALUMINUM	CORAL INDUSTRIES, INC.	
19	~~PW208~~	~~FEMALE HALF 90° CORNER~~	~~1.625 X 6.110 X 0.094~~	~~6063–T6 ALUMINUM~~	~~CORAL INDUSTRIES, INC.~~	
20	~~PW209~~	~~MALE HALF 90° CORNER~~	~~1.875 X 6.110 X 0.094~~	~~6063–T6 ALUMINUM~~	~~CORAL INDUSTRIES, INC.~~	
21	~~PW210~~	~~INTERIOR CORNER TRIM~~	~~2.500 X 1.288 X 0.078~~	~~6063–T6 ALUMINUM~~	~~CORAL INDUSTRIES, INC.~~	
22	PW214	SUB DOORFRAME	1.000 X 4.500 X 0.080	6063–T6 ALUMINUM	CORAL INDUSTRIES, INC.	
23	PW613	POCKET FILLER FOR PW650	0.937 X 1.943 X 0.078	6063–T6 ALUMINUM	CORAL INDUSTRIES, INC.	
24	PW650	VERTICAL MULLION	2.500 X 6.593 X 0.094	6063–T6 ALUMINUM	CORAL INDUSTRIES, INC.	
25	PW652	HEAD/SILL	2.390 X 6.495 X 0.094	6063–T6 ALUMINUM	CORAL INDUSTRIES, INC.	
26	PW655	INTERMEDIATE HORIZONTAL	2.390 X 6.495 X 0.094	6063–T6 ALUMINUM	CORAL INDUSTRIES, INC.	
27	~~PW656~~	~~GLAZING TEE – 90° CORNER~~	~~3.334 X 3.334 X 0.094~~	~~6063–T6 ALUMINUM~~	~~CORAL INDUSTRIES, INC.~~	
28	DS200	DOORFRAME STOP	0.882 X 1.149 X 0.050	6063–T6 ALUMINUM	CORAL INDUSTRIES, INC.	
29	TH4	THRESHOLD	0.500 X 4.000 X 0.125	6063–T6 ALUMINUM	CORAL INDUSTRIES, INC.	
30	TH403	THRESHOLD CLIP	1.390 X 1.516 X 1.909	STEEL	VARIES	

(CONTINUED ON SHEET 15)

Architectural Testing

Test sample complies with these details.
Deviations are noted.

Report# A2658.02-401-44

Date 4/19/11 Tech SP

REV	BY	DATE	DESCRIPTION

Coral
• Architectural Products •
3010 RICE MINE ROAD, TUSCALOOSA, AL 35406
PHONE:800-772-7737 FAX:800-443-6261

TEST REPORT DRAWINGS
PW257 IMPACT-RESISTANT
CURTAIN WALL SYSTEM

BILL OF MATERIALS

DATE 8/24/2010

DRAWN	CHECKED	APPROVED
MLL	DCW	DCW

PROJECT NO.

DRAWING NO. PW257_01

SHEET 13 OF 15

BILL OF MATERIALS

ITEM NO.	P/N	DESCRIPTION	DIMENSIONS	MATERIAL	MANUFACTURER	3NOTES
31	SR150	REINFORCEMENT CHANNEL	4.500 X 1.875 X 0.250	A36 STEEL	VARIES	STEEL REINFORCEMENT FOR (14) AND (24)
32	~~SR501~~	~~REINFORCEMENT CHANNEL~~	~~4.562 X 1.250 X 0.250~~	~~A36 STEEL~~	~~VARIES~~	~~STEEL REINFORCEMENT FOR (14) AND (24)~~
33		~~SR150 WITH REINFORCEMENT BAR~~	SP ~~3.750 X 0.500~~	~~A36 STEEL~~	~~VARIES~~	~~STEEL REINFORCEMENT FOR (14) AND (24)~~
34		SR150 WITH REINFORCEMENT BAR	4" ~~3.750~~ X 0.750	A36 STEEL	VARIES	STEEL REINFORCEMENT FOR (14) AND (24)
35	FL207	DOOR HEADER	1.750 X 4.500 X 0.085	6063-T6 ALUMINUM	CORAL INDUSTRIES, INC.	
36	AS13	SQUARE NUT	1.475 X1.475 X .180	STEEL	VARIES	
37	AS16	FASTENER	#14 X 1" HHSTS	STEEL	VARIES	TYP. SPLINE SCREW
38	AS32	FASTENER	#12 x 1-1/4" HWH #3 SELF DRILL	STEEL	VARIES	
39	AS25	FASTENER	#12 x 3/4" HWH SELF DRILL	STEEL	VARIES	
40	AS37	FASTENER	#12 X 2" HWH SELF DRILL	STEEL	VARIES	
41	FASTENER	PERIMETER ANCHOR TO STEEL SUBSTRATE	1/2"-13 X 2" BOLT WITH WASHER AND NUT	STEEL	VARIES	
42	FASTENER	PERIMETER ANCHOR TO STEEL SUBSTRATE	1/2"-13 X 4-1/2" BOLT WITH WASHER AND NUT	STEEL	VARIES	
43	FASTENER	PERIMETER ANCHOR TO CONCRETE SUBSTRATE	1/2"X3-1/2" MIN. EMBED WEDGE ANCHOR POWERS	STEEL	VARIES	
44	FASTENER	PERIMETER ANCHOR TO STEEL SUBSTRATE	#12 X 1-1/2" PFH SELF DRILL	STEEL	VARIES	
45	FASTENER	STEEL REINFORCEMENT ATTACHMENT	1/4-20 X 2" BOLT WITH WASHER AND NUT	STEEL	VARIES	
46	FASTENER	THROUGH BOLT	1/4-20 X 3" BOLT WITH WASHER AND NUT	STEEL	VARIES	USED @ HORIZONTALS
47	~~N616~~	~~DRY GLAZE INTERIOR SPACER GASKET~~	~~0.260 SPACE~~	~~EPDM~~	~~VARIES~~	
48	~~PW658~~	~~CORNER FACE COVER~~	~~4.064 X .500 X 0.078~~	~~6063-T6 ALUM~~	~~CORAL INDUSTRIES, INC.~~	
49	~~PW654~~	~~CORNER PRESSURE BAR~~	~~3.954 X 3.954 X .125~~	~~6063 T6 ALUM~~	~~CORAL INDUSTRIES, INC.~~	
50	~~SP214~~	~~CORNER MULLION CAP~~	~~4.000 X 3.826 X 0.048~~	~~6063-T6 ALUM~~	~~CORAL INDUSTRIES, INC.~~	LOCATE @ TOP AND BOTTOM OF VERTICAL CORNER MULLION

GLAZING SCHEDULE

GLASS MARK	GLASS DESCRIPTION	MANUFACTURER	MAXIMUM D.L.O. SIZE (INCHES)	SQUARE FEET	MAXIMUM DESIGN PRESSURE (PSF)
IC	1-5/16" INSULATED -1/4" H.S. -1/2" AIR SPACER -1/4" H.S. ~~-DUPONT BUTCITE .090 PBV INTERLAYER~~ N.O.A. #	~~DUPONT~~	~~57-1/2" X 96"~~	~~38.3~~	~~± 80~~
IB	1-5/16" INSULATED -1/4" H.S. -1/2" AIR SPACER -1/4" H.S. ~~-.090 SAFLEX PVB INTERLAYER~~ -1/4" H.S. N.O.A. #	SOLUTIA	~~45-1/2" X 96"~~	~~38.3~~	~~± 80~~
ID	1-5/16" INSULATED -1/4" H.S. -1/2" AIR SPACER -1/4" H.S. -SENTRY GLASS PWS .090 -1/4" H.S.	DUPONT	57-1/2" X 96"	38.3	± 80

Architectural Testing

Test sample complies with these details. Deviations are noted.

Report# A2658.02-401-44

Date 4/19/11 Tech SP

DESCRIPTION	DATE	BY	REV

Coral

Architectural Products

2610 RICE MINE ROAD, TUSCALOOSA, AL 35406
PHONE: 800-772-7737 FAX: 800-443-6361

TEST REPORT DRAWINGS
PW257 IMPACT-RESISTANT
CURTAIN WALL SYSTEM
BILL OF MATERIALS AND GLAZING SCHEDULE

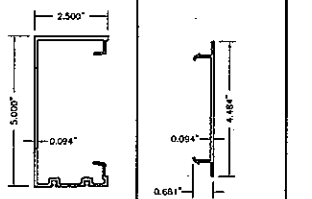
8/24/2010

DRAWN	CHECKED	APPROVED
MLL	DCW	DCW

PROJECT NO.

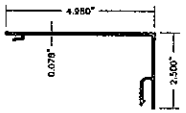
DRAWING NO. PW257_01

SHEET 14 OF 15

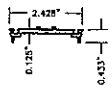


14 B.G. MULLION

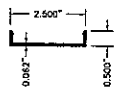
15 OPEN BACK MULLION FILLER



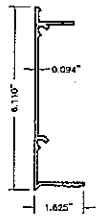
16 HEAD/SILL/HORIZONTAL TRIM



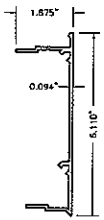
17 PRESSURE BAR



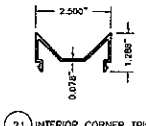
18 FACE COVER



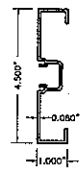
19 FEMALE HALF 90° CORNER



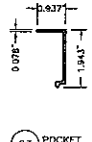
20 MALE HALF 90° CORNER



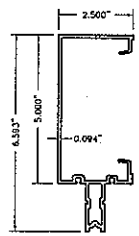
21 INTERIOR CORNER TRIM



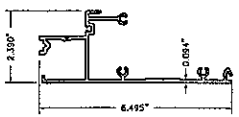
22 MALE HALF 90° CORNER



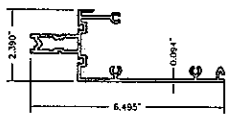
23 POCKET FILLER



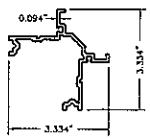
24 VERTICAL MULLION



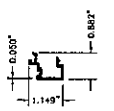
25 HEAD/SILL



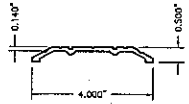
26 INTERMEDIATE HORIZONTAL



27 GLAZING TEE 90° CORNER

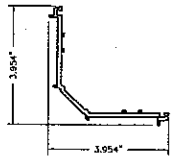


28 DOORFRAME STOP



29 THRESHOLD

48 CORNER FACE COVER



49 CORNER PRESSURE BAR

1 BULB GASKET — FULL SCALE

2 EXT. GLAZING GASKET — FULL SCALE

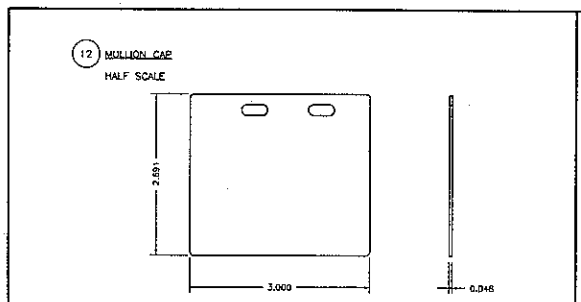
3 EXT. PERIMETER GASKET — FULL SCALE

4 PRESSURE BAR GASKET (ISOLATOR) — FULL SCALE

5 INT. SPACER GASKET — FULL SCALE

9 SETTING BLOCK — FULL SCALE

47 INT. SPACER GASKET — FULL SCALE



Architectural Testing

Test sample complies with these details.
Deviations are noted.

Report# A2658.02-401-44

Date 4/19/11 Tech SB

Corial
▪ Architectural Products ▪
3010 RICE MINE ROAD TUSCALOOSA, AL 35406
PHONE: 800-772-7737 FAX: 800-443-6361

REV	BY	DATE	DESCRIPTION
1			

TEST REPORT DRAWINGS
PW257 IMPACT-RESISTANT
CURTAIN WALL SYSTEM

DIE DRAWINGS

DATE	8/24/2010		
DRAWN	CHECKED	APPROVED	
MLL	DCW	DCW	

PROJECT NO.

DRAWING NO. PW257_01

SHEET 15 OF 15

Appendix C
Sketches

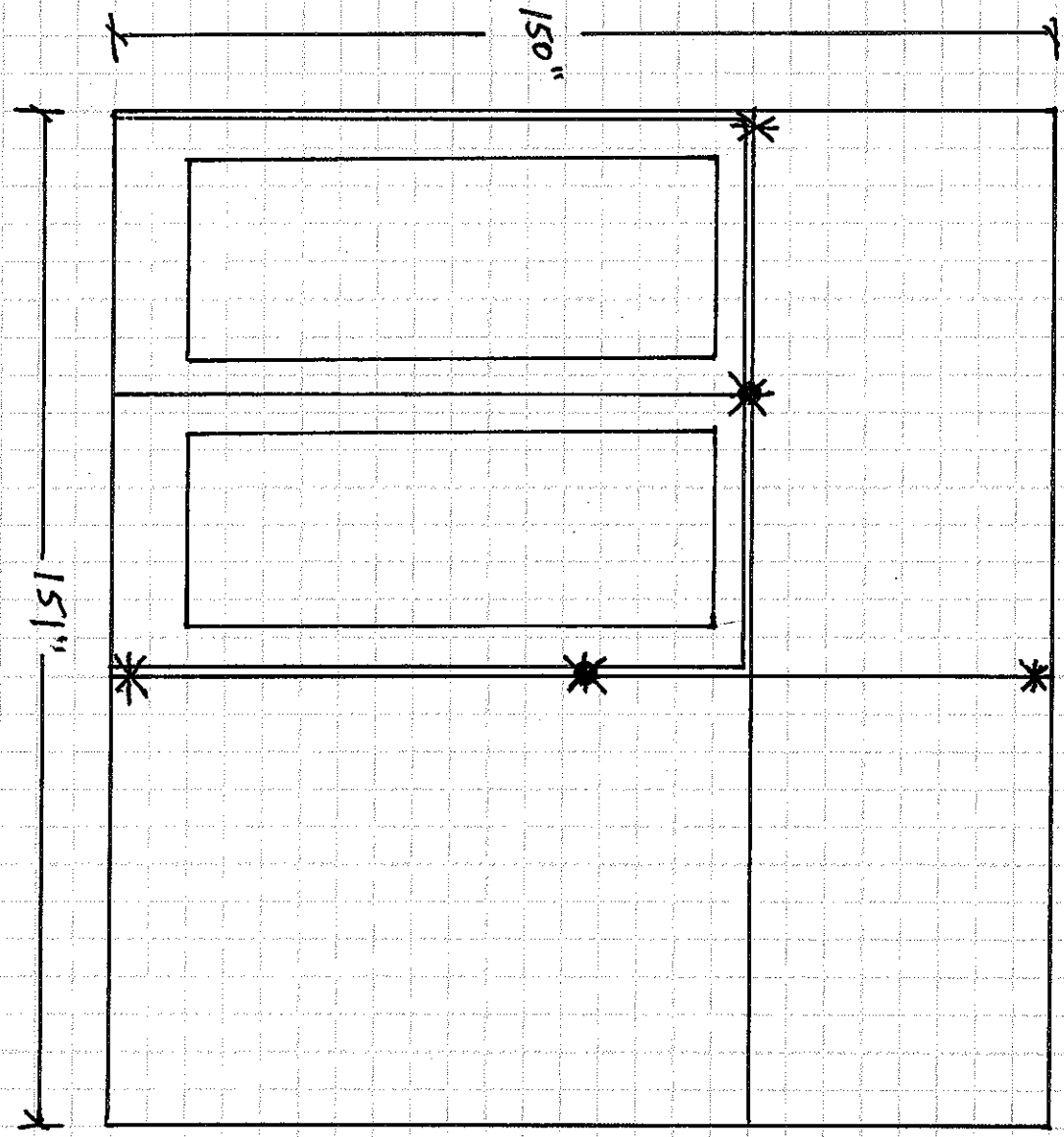
Architectural Testing

DATE: 01/03/2011

BY: SP

PROJECT NO. A2658.02-401-49 SHEET 1 OF 1

PROJECT NAME: Canal - Elevation ES



Sketch # 1

Elevation ES

* - Indicator locations

● - Impact locations