

**TEST REPORT**

**Report No.:** D6311.01-550-32

**Rendered to:**

CARDINAL COMMERCIAL PRODUCTS  
Louisville, Kentucky

**PRODUCT TYPE:** Curtain Wall  
**SERIES/MODEL:** CCW725 Blind Mullion Curtain Wall

<b>Title</b>	<b>Summary of Results</b>
Design Pressure	±60.00 psf
Air Infiltration	0.010 cfm/ft <sup>2</sup>
Water Penetration Resistance Test Pressure	+20.00 psf
Uniform Load Structural Test Pressure	±90.00 psf

Reference must be made to Report No. D6311.01-550-32, dated 6/4/14 for complete test specimen description and detailed test results.



**1.0 Report Issued To:** Cardinal Commercial Products  
4915 Heller Street  
Louisville, Kentucky 40218

**2.0 Test Laboratory:** Architectural Testing, Inc.  
1701 Westfork Drive, Suite 106  
Lithia Springs, Georgia 30122  
770-941-6916

**3.0 Project Summary:**

**3.1 Product Type:** Curtain Wall

**3.2 Series/Model:** CCW725 Blind Mullion Curtain Wall

**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:** 5/5/2014 – 5/6/2014

**3.5 Test Record Retention End Date:** All test records for this report will be retained until May 6, 2018.

**3.6 Test Location:** Architectural Testing Inc. test facility in Lithia Springs, Georgia.

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

**3.8 Drawing Reference:** The test specimen drawings have been reviewed by Architectural Testing and are representative of the test specimen(s) 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.

**3.9 List of Official Observers:**

<u>Name</u>	<u>Company</u>
J.D. Williams	Aluminum Fronts, LLC
Paul J. Stratford	Cardinal Commercial Products
Joel Ivey	Architectural Testing, Inc.
José Colón	Architectural Testing, Inc.
Ian J. McKenzie	Architectural Testing, Inc.

**4.0 Test Method(s):**

ASTM E 283-04, *Test Method for Determining Rate of Airflow Through Exterior Windows, Curtain Walls and Doors Under Specified Pressure Differences Across the Specimen.*

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

ASTM E 331-00, *Test Method for Water Penetration of Exterior Windows, Curtain Walls and Doors by Uniform Static Air Pressure Difference.*

AAMA 501-05, *Methods of Tests for Exterior Walls.*

**5.0 Test Specimen Description:****5.1 Product Sizes:**

<b>Overall Area:</b> (152.1 ft <sup>2</sup> )	<b>Width (inches)</b>	<b>Height (inches)</b>
Overall size	146.50	120.00

**5.2 Frame Construction:**

<b>Frame Member</b>	<b>Material</b>	<b>Part #</b>	<b>Description</b>
Head/sill	6063-T6 Aluminum	CCW725-3	6.17" x 2.40" x 0.09"
Jambs	6063-T6 Aluminum	CCW725-1	6.28" x 2.50" x 0.09"
Intermediate vertical mullions	6063-T6 Aluminum	CCW725-6	5.00" x 2.50" x 0.09"
Flat filler on jambs and vertical mullions	6063-T6 Aluminum	CCW725-2	6.28" x 2.50" x 0.09"
Intermediate Horizontal	6063-T6 Aluminum	CCW725-4	6.17" x 2.40" x 0.09"
Interior snap-on trim	6063-T6 Aluminum	CCW725-5	4.98" x 2.50" x 0.08"
Mullion pocket filler	6063-T6 Aluminum	CCW725-8	1.38" x 1.00" x 0.05"
Pressure bar	6063-T6 Aluminum	CCW200-1	2.39" x 0.45" x 0.13"
Face cap	6063-T6 Aluminum	CCW100-1	2.50" x 0.53" x 0.06"

**5.0 Test Specimen Description: (Continued)**

	<b>Joinery Type</b>	<b>Detail</b>
All corners	Mechanical	All members were square cut and butted, then fastened through screw splines with three #12-14 x 1-1/4" pan head square drive SMS fasteners.

**5.3 Glazing:**

<b>Glass Type</b>	<b>Spacer Type</b>	<b>Interior Lite</b>	<b>Exterior Lite</b>	<b>Glazing Method</b>
1" IG	1/2"	1/4" Tempered	1/4" Tempered	Exterior glazed with EPDM glazing gasket (Part # GSK-10) and pressure bar. Interior glazed with glazing gasket (Part # GSK-10)

<b>Location</b>	<b>Quantity</b>	<b>Daylight Opening</b>	<b>Glass Bite</b>
Top lites	3	45.5" (w) x 28.25" (h)	1/2"
Bottom lites	3	45.5" (w) x 83.5" (h)	1/2"

**5.4 Drainage:**

<b>Drainage Method</b>	<b>Size</b>	<b>Quantity</b>	<b>Location</b>
Weep holes	1/4"	18	Two weep holes located at the top of the horizontal pressure bars 8" from the edge of the mullions.

**5.5 Reinforcement:**

<b>Drawing Number</b>	<b>Location</b>	<b>Material</b>
STL725-1	Intermediate vertical mullions	A36 steel

**6.0 Installation:**

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

<b>Location</b>	<b>Anchor Description</b>	<b>Anchor Location</b>
Head/sill	1/2"-13 x 2" HWH Bolt	4" from jambs and 4" on either side of vertical mullions
Jambs		Intermediate (horizontal)



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

Title of Test	Results
Air Infiltration at 1.57 psf (25 mph)	0.006 cfm/ft <sup>2</sup>
Air Infiltration at 6.24 psf (50 mph)	0.010 cfm/ft <sup>2</sup>
Water Infiltration (+20.00 psf)	PASS

	Indicator Reading (inches)	
	# 2	# 5
Structural Loads		
50% of Test Pressure (+45.00 psf)		
Maximum Deflection	0.056	0.234
Permanent Set	0	0.011
% Recovery	100.00	95.51
Design Pressure (+60.00 psf)		
Maximum Deflection	0.042	0.314
Permanent Set	0.001	0.016
% Recovery	98.81	94.90
50% of Test Pressure (-45.00 psf)		
Maximum Deflection	0.018	0.243
Permanent Set	0	0.019
% Recovery	100	92.18
Design Pressure (-60 psf)		
Maximum Deflection	0.025	0.260
Permanent Set	0.002	0.008
% Recovery	92.00	96.92
Water Infiltration (+20.00 psf)	PASS	
Test Pressure (+90.00 psf)		
Maximum Deflection	0.324	0.474
Permanent Set	0.001	0.011
% Recovery	99.8	97.68
Test Pressure (-90.00 psf)		
Maximum Deflection	0.045	0.409
Permanent Set	0.003	0.016
% Recovery	93.33	96.21



## 7.0 Test Results: (Continued)

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

*Note 1: See Architectural Testing Sketch #1 for indicator locations. Location #2 (middle horizontal), and Location #5 (right vertical mullion) take account for support movement. Data shown is final*

*Note 2: Loads were held for 30 seconds.*

*Note 3: 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.*

Architectural Testing will service this report for the entire test record retention period. Test records that are retained such as detailed drawings, datasheets, representative samples of test specimens, or other pertinent project documentation will be retained by Architectural Testing, Inc. for the entire test record retention period.

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.

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Ian J. McKenzie  
Lab Manager

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José E. Colón  
Director – Regional Operations

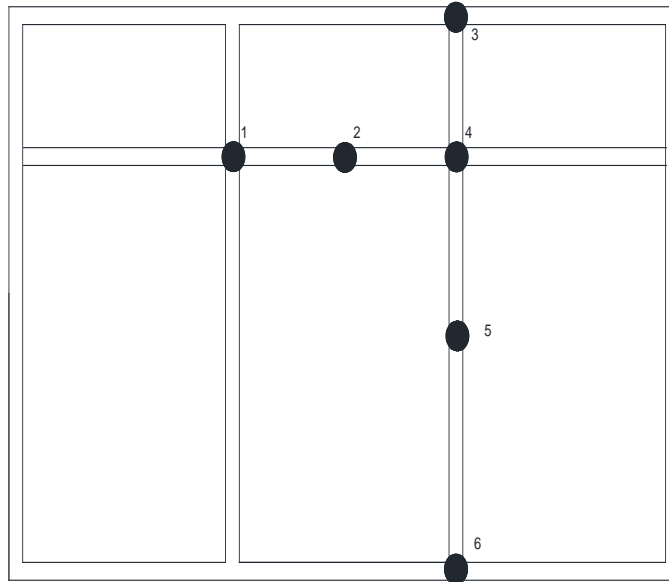
IJM:jab

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

Appendix-A: Sketches (1)

Appendix-B: Drawings (8)

## Appendix A Sketches



Sketch #1 – Deflection Gage Locations



**Architectural Testing**

Test Report No.: D6311.01-550-32

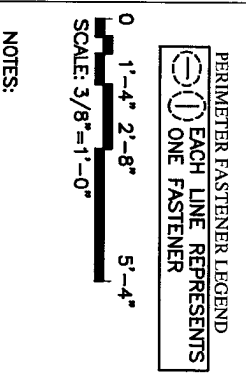
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## **Appendix B**

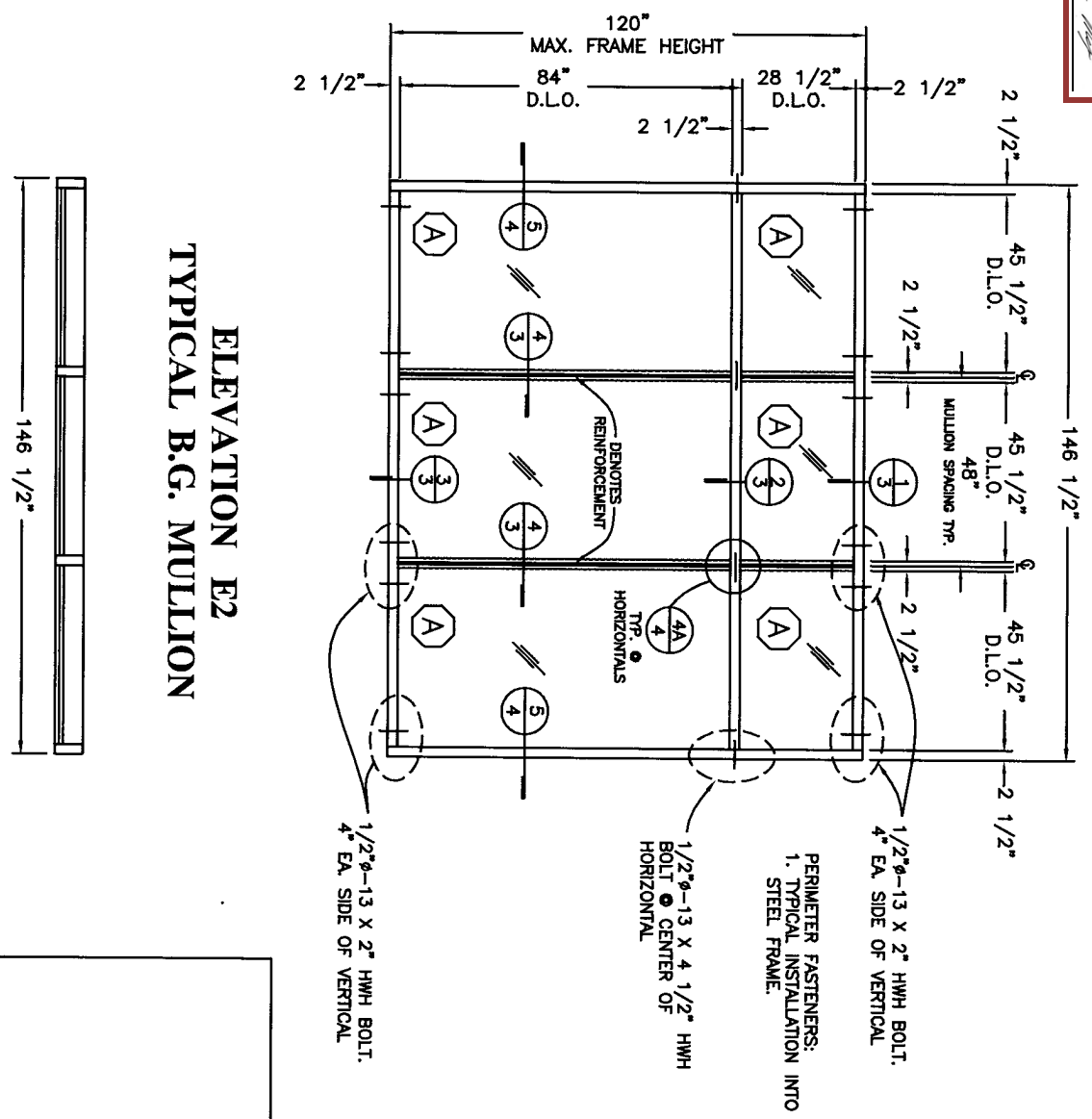
### **Drawings**







- NOTES:
1. D.L.O. = DAYLIGHT OPENING
  2. GLASS SIZE = D.L.O. + 1"
- TEST PARAMETERS:
1. DESIGN PRESSURE = +/-60 PSF
  2. AIR TEST AT 6.24 PSF
  3. WATER TEST AT 20 PSF
  4. MAXIMUM DEFLECTION L/175 = 0.686"



**ELEVATION E2**  
**TYPICAL B.G. MULLION**

AT1 TEST REPORT DRAWING FOR CCW725 BUTT GLAZED CURTAIN WALL		<b>CARDINAL COMMERCIAL PRODUCTS</b> PRODUCT DEVELOPMENT	
DATE: 5-6-14 DRAWN: AB CHECKED: JDM PROJECT NO.: CCW725_02 DRAWING NO.: CCW725_02 SHEET: 2 OF 7	ELEVATION SHEET		
REV BY DATE DESCRIPTION	(Empty table for revisions)		





FIGURE #7  
TEMPORARY  
PRESSURE BAR  
MIN. 4 PER LITE

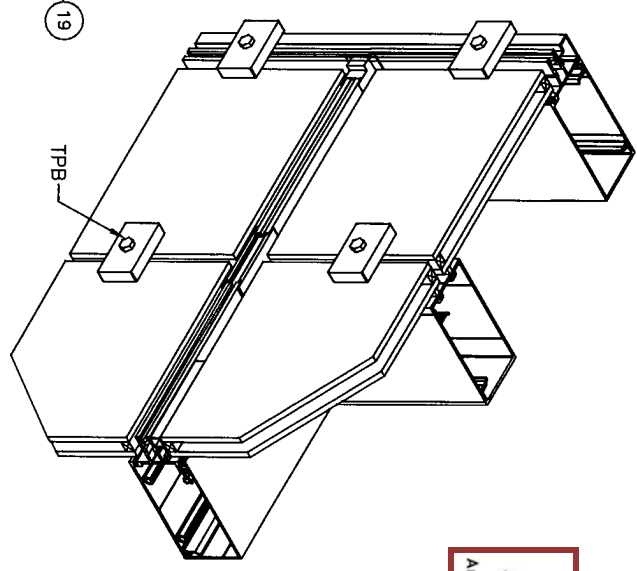


FIGURE #6

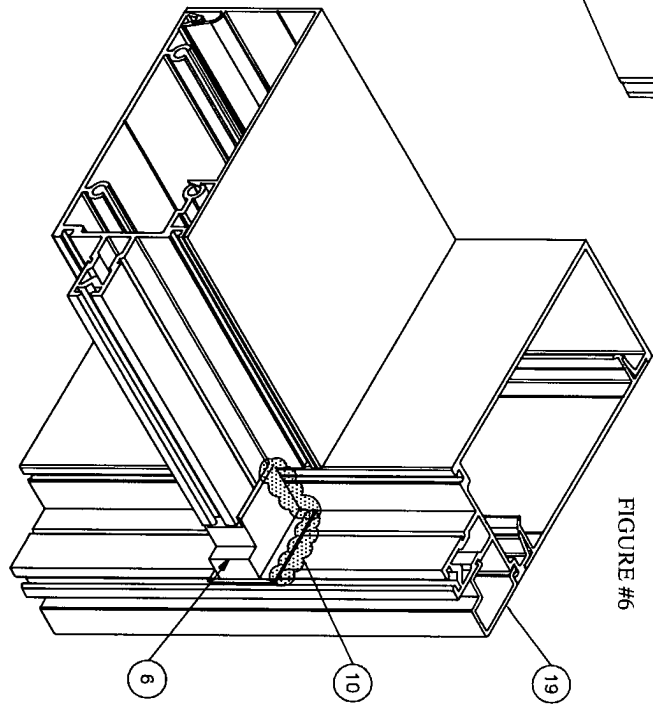
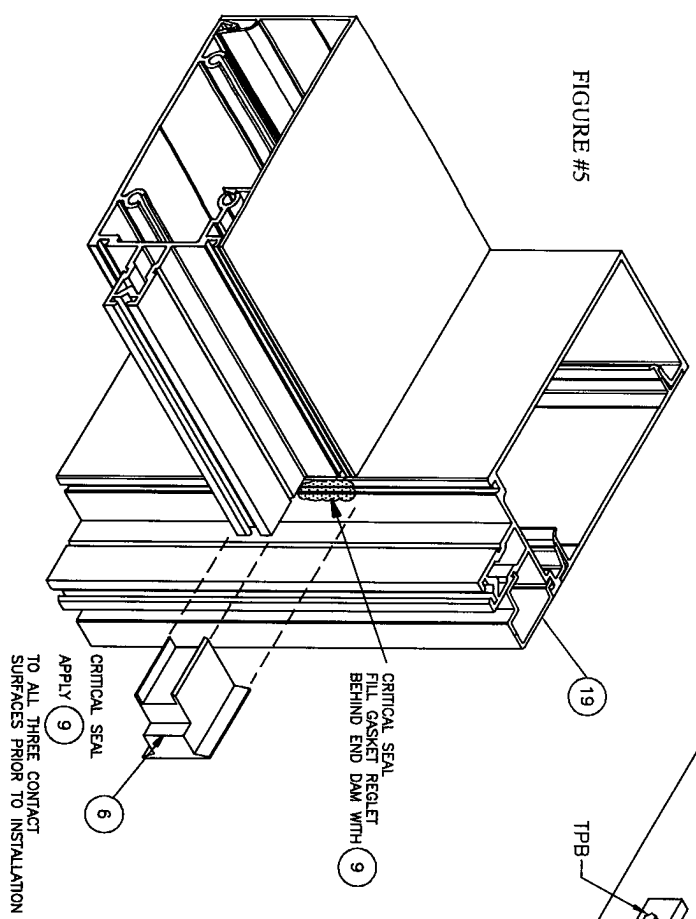


FIGURE #5



CRITICAL SEAL  
FILL GASKET REGLET  
BEHIND END DAM WITH 9

CRITICAL SEAL  
APPLY 9  
TO ALL THREE CONTACT  
SURFACES PRIOR TO INSTALLATION

Architectural Testing Verified by: 

Report #: D6311.01-550-32  
Date: 05/30/14

**END DAM INSTALLATION-BLIND GLAZED MULLION**  
NOTE: END DAMS ARE REQUIRED AT HOR./ HEAD/SILL  
FOR ALL WALL JAMBS

DATE: 5-6-14		<b>ATI TEST REPORT DRAWING FOR CCW725 BLIND MULLION CURTAIN WALL</b>	<b>CARDINAL COMMERCIAL PRODUCTS</b> PRODUCT DEVELOPMENT	REV	BY	DATE	DESCRIPTION
DESIGN	DRAWN						
AB	JDN						
PROJECT NO.	CCW725_02						
DRAWING NO.	CCW725_02						
SHEET	5 OF 7						

## BILL OF MATERIAL

ITEM	P/N	DESCRIPTION	UOM (INCHES)	MATERIAL	MANUFACTURER	NOTES
1	GSK-10	GLAZING GASKET (INTERIOR/EXTERIOR)	0.280 x 0.561	EPDM ASTM-C-864	VARIES	
2	GSK-9	PRESSURE BAR ISOLATOR	0.317 x 0.420	EPDM ASTM-C-864	VARIES	
3	GSK-11	BLIND MULL SPACER GASKET	0.194 x 0.250	EPDM ASTM-C-864	VARIES	
4	SR-9	SETTING BLOCK	1.498 x 0.438	EPDM ASTM-C-864	VARIES	
5	BD-1	BRIDGE DAM-1" GL.	2.875 x 1.281 x 0.745 x 0.050	ABS PLASTIC SWIC		4" LONG
6	ED-1	END DAM-1" GL.	1.500 x 1.125 x 0.745 x 0.050	ABS PLASTIC SWIC		
7	MC-7	TOP & BOTTOM MULL CAP	3.000 x 0.750 x 1.500 x 0.050	ABS PLASTIC SWIC		
8	795	SILICONE-INTERNAL SEALANT	FILL SPACE	SILICONE	DOW CORNING	PERIMETER SEALANT
9	995	SILICONE-PERIMETER SEALANT	FILL SPACE	SILICONE	DOW CORNING	INTERIOR JOINT SEALANT
10	STL725-1	STEEL REINFORCEMENT	4.500 x 1.875 x 0.250	A36 STEEL	VARIES	
11	CCW100-1	FACE CAP	2.500 x 0.531 x 0.062	6063-T6 AL	CARDINAL COMM PRODUCTS	
12	CCW200-1	PRESSURE BAR	2.385 x 0.453 x 0.125	6063-T6 AL	CARDINAL COMM PRODUCTS	
13	CCW725-1	CAPTURED VERTICAL MULL	6.281 x 2.500 x 0.094	6063-T6 AL	CARDINAL COMM PRODUCTS	
14	CCW725-2	FLAT FILLER	4.880 x 0.721 x 0.094	6063-T6 AL	CARDINAL COMM PRODUCTS	
15	CCW725-3	HEAD/SILL	6.168 x 2.405 x 0.094	6063-T6 AL	CARDINAL COMM PRODUCTS	
16	CCW725-4	INTERMEDIATE HORIZONTAL	6.168 x 2.405 x 0.094	6063-T6 AL	CARDINAL COMM PRODUCTS	
17	CCW725-5	INTERIOR SNAP-ON TRIM	4.982 x 2.500 x 0.078	6063-T6 AL	CARDINAL COMM PRODUCTS	
18	CCW725-6	BLIND GLAZED VERT. MULL	5.000 x 2.500 x 0.094	6063-T6 AL	CARDINAL COMM PRODUCTS	
19	CCW725-8	SNAP-IN GLZ POCKET FILLER	1.375 x 1.000 x 0.050	6063-T6 AL	CARDINAL COMM PRODUCTS	
20	AF8-7	FASTENER	#8-18 x 3/4 PHP #2 SD	ZP STEEL	VARIES	USED AT WALL JAMBS
21	AF12-4	FASTENER	#12-14 x 1 SQ DRIVE	ZP STEEL	VARIES	ATTACH MC-7 TOP/BTM MULL CAPS
22	AF12-10	FASTENER	#12-14 x 1-1/4 HWH SD	ZP STEEL	VARIES	SPLINE SCREW (VERT/HORIZ CONNECTIONS)
23	FASTENER	FASTENER	1/4-20 x 3 1/2" HH BOLT W/WASHER & NUT	ZP STEEL	VARIES	PRESSURE BAR SCREWS
24	FASTENER	FLAT WASHER	1 OD x 7/32" ID	ZP STEEL	VARIES	
25	FASTENER	NUT	1/4" x 7/16" x 7/32" HH NUT	ZP STEEL	VARIES	
26	FASTENER	STL REINFORCEMENT ATTACHMENT BOLT	1/4-20 x 1 1/4" HH BOLT W/WASHER & NUT	ZP STEEL	VARIES	LOCATE @ HEAD, SILL & INTERM/HORIZ

GLASS SCHEDULE			
GLASS MARK SYMBOL	GLASS TYPE	MANUFACTURER	DLO SIZE
A	3/4" TEMPERED OUTER SURFACE, 3/4" AIR SPACE, 3/4" TEMPERED INNER SURFACE	VARIES	47 1/2 X 96

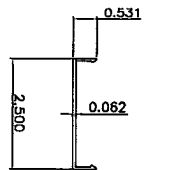
  
 Report #: D6311.01-550-32  
 Date: 05/30/14  
 Architectural Testing Verified by: [Signature]

DATE	5-6-14
DRAWN	AB
CHECKED	JDM
APPROVED	
PROJECT NO.	CCW725_02
DRAWING NO.	CCW725_02
SHEET	6 OF 7

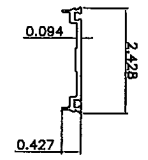
**ATI TEST REPORT DRAWING FOR**  
**CCW725 BLIND MULLION CURTAIN WALL**  
**BILL OF MATERIAL**

**CARDINAL**  
**COMMERCIAL**  
**PRODUCTS**  
 PRODUCT DEVELOPMENT

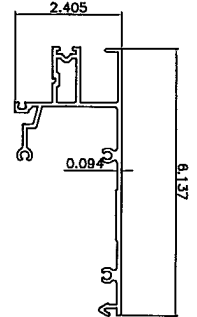
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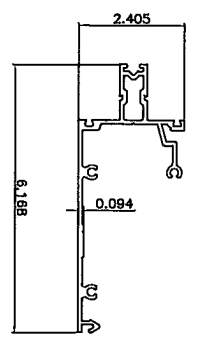
11 FACE COVER



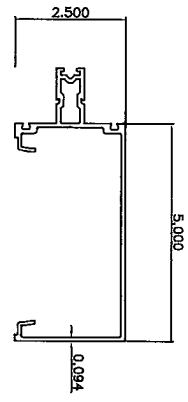
12 PRESSURE BAR



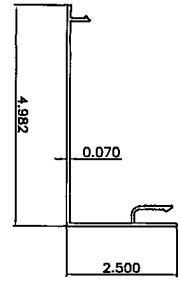
15 HEAD/SILL



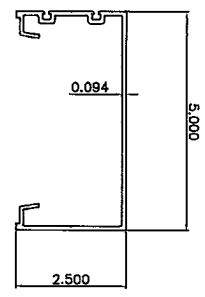
16 INTERMEDIATE HOR.



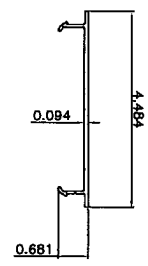
13 WALL JAMB-1" GL



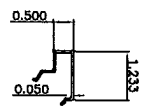
17 INTERIOR TRIM



18 B.C. MULLION





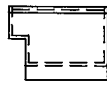





14 FLAT FILLER



19 POCKET FILLER

  
 Report #: D6311.01-550-32  
 Date: 05/30/14  
 Architectural Testing Verified by: *[Signature]*

	<p>1 EXTERIOR GLAZING GASKET (FULL SIZE)</p>		<p>2 PRESSURE BAR ISOLATOR (FULL SIZE)</p>		<p>3 SPACER GASKET (FULL SIZE)</p>		<p>4 SETTING BLOCK (FULL SIZE)</p>
	<p>6 END DAM FOR 1" GL (HALF SIZE)</p>		<p>7 MULLION END CAP (HALF SIZE)</p>		<p>10 STEEL REINFORCING</p>		<p>5 BRIDGE DAM FOR 1" GL (HALF SIZE)</p>

ATI TEST REPORT DRAWING FOR  
 CCW725 BLIND MULLION CURTAIN WALL  
 PROFILE DRAWINGS

**CARDINAL  
 COMMERCIAL  
 PRODUCTS**  
 PRODUCT DEVELOPMENT

REV	BY	DATE	DESCRIPTION

DATE: 5-6-14  
 DRAWN: ASB  
 CHECKED: JLDW  
 PROJECT NO: CCW725\_02  
 DRAWING NO: CCW725\_02  
 SHEET: 7 OF 7



# FABRICATION

## BLIND GLAZE PRESSURE BAR

Fabricate Pressure Bars for Blind Glazing as shown in Fig. 30.2.

Fig. 30.1

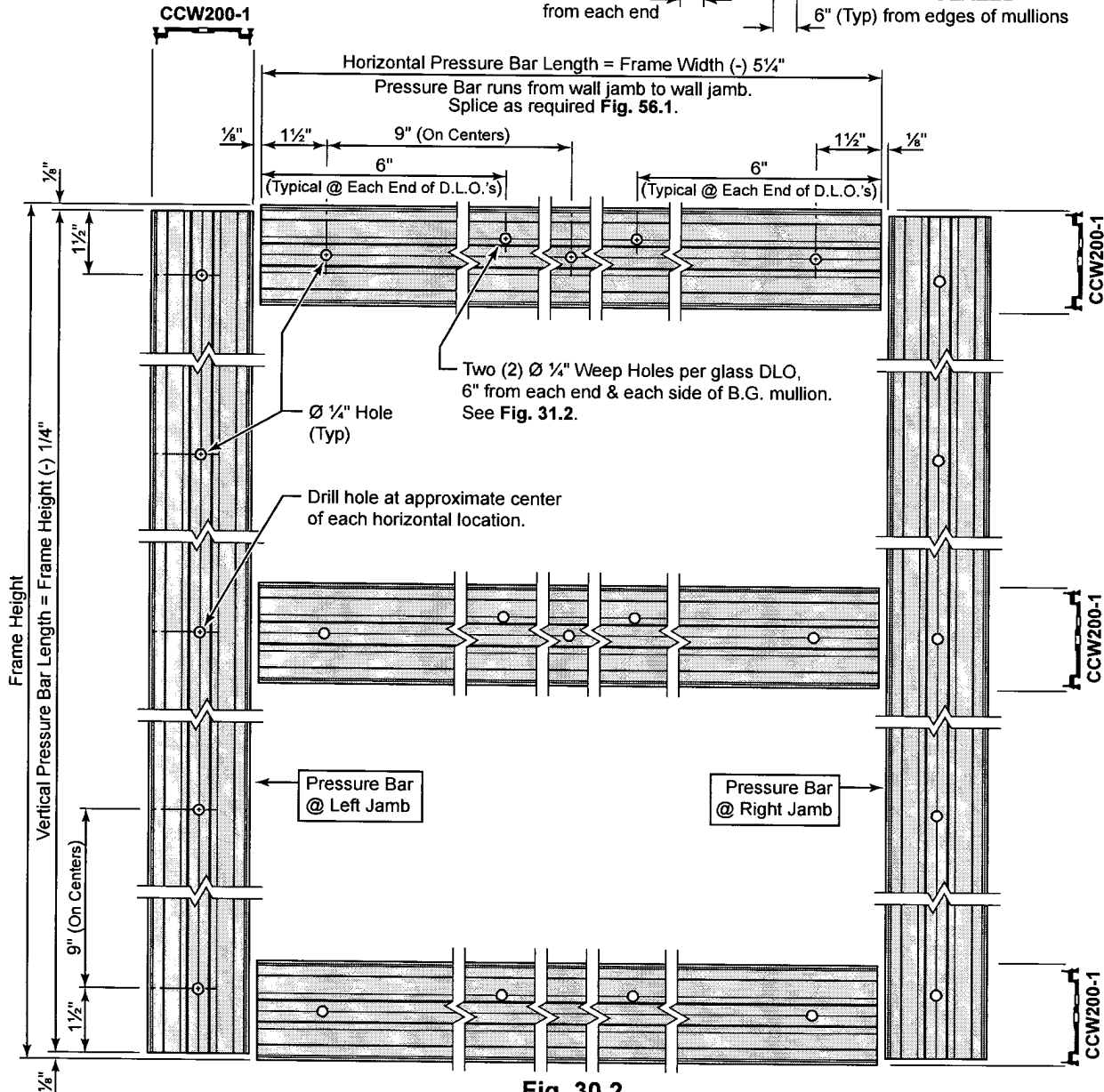
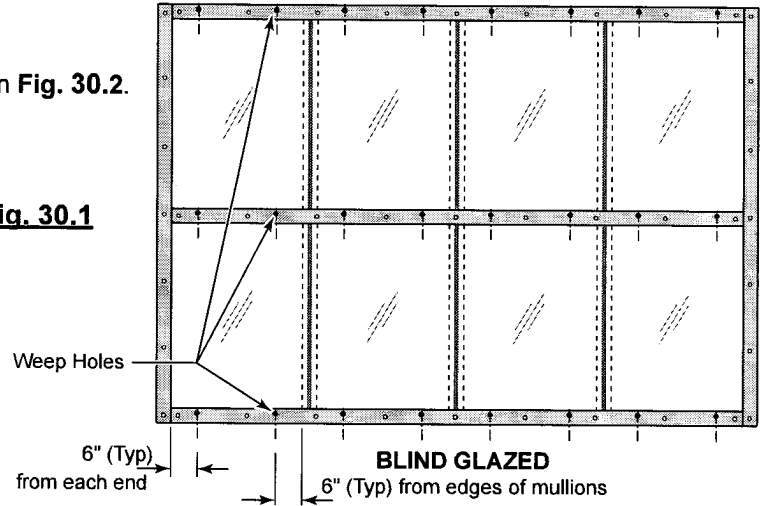


Fig. 30.2

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Date: 05/30/14