

**TAS 202 and AAMA 501 TEST REPORT**

**Report No.:** C5555.01-550-44

**Rendered to:**

CARDINAL COMMERCIAL PRODUCTS  
Louisville, Kentucky

**PRODUCT TYPE:** Framing System – Storefront  
**SERIES/MODEL:** CF450 (Exterior Glazed)

**This report contains in its entirety:**

**Cover Page:** 1 page  
**Report Body:** 5 pages  
**Sketches:** 1 pages  
**Drawings:** 6 pages

**Test Dates:** 01/28/13  
**Through:** 01/31/13  
**Report Date:** 03/25/13  
**Test Record Retention End Date:** 03/25/17

**1.0 Report Issued To:** Cardinal Commercial Products  
4795 Shephersville Road  
Louisville, Kentucky 40218

**2.0 Test Laboratory:** Architectural Testing, Inc.  
1701 Westfork Drive, Suite 105-106  
Lithia Springs, Georgia 30122  
(770) 941-6916

**3.0 Project Summary:**

**3.1 Product Type:** Framing System – Storefront

**3.2 Series/Model:** CF450 (Exterior Glazed)

**3.3 Compliance Statement:** Results obtained are tested values and were secured by using the designated test method(s). The samples were tested per Florida Building Code, Test Protocols for High Velocity Hurricane Zone, Protocols TAS 202-94 and AAMA 501-05. The sample tested met the performance requirements for a  $\pm 60.00$  psf *Design Pressure* rating.

**3.4 Miami-Dade County Notification No.:** ATIGA13003

**3.5 Test Dates:** 01/28/13 – 01/31/13

**3.6 Test Location:** Architectural Testing, Inc.'s 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 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 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 Stratford	Cardinal Commercial Products
José Colón	Architectural Testing, Inc.
Ian McKenzie	Architectural Testing, Inc.
Joel Ivey	Architectural Testing, Inc.

#### 4.0 Test Specification(s):

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

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

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.*

#### 5.0 Test Specimen Description:

##### 5.1 Product Sizes:

<b>Overall Area:</b> 123.1 ft <sup>2</sup>	<b>Width (inches)</b>	<b>Height (inches)</b>
Overall size	146.5	121

##### 5.2 Frame Construction:

Frame Member	Material	Part #	Description
Head/Jambs	6063-T5 Aluminum	CF450-13	1.75" x 4.50" x 0.08"
Sill/Horizontal	6063-T5 Aluminum	CF450-2	1.75" x 4.46" x 0.08"
Vertical Mullion	6063-T5 Aluminum	CF450-1	1.75" x 4.50" x 0.08"
Sill Receptor Pan	6063-T5 Aluminum	CF450-6	2.188" x 4.80" x 0.08"
Mullion Pocket Filler	6063-T5 Aluminum	CF450-4	0.86" x 3.875" x 0.062"
Glass Stop	6063-T5 Aluminum	CF450-3	1.007" x 1.891" x 0.055"

	Joinery Type	Detail
All corners	Mechanical	All members were square cut and butted, then fastened through screw splines with two (2). #12-14 x 1" PH-SQDR fasteners.

### 5.3 Reinforcement:

Part Number	Location	Material
STL-1	Vertical Mullions	1.375" x 4.187" x 10-Ga. galvanized steel

### 5.4 Glazing:

Glass Type	Spacer Type	Interior Lite	Exterior Lite	Glazing Method
1" IG	1/2"	1/4" Tempered	1/4" Tempered	Exterior glazed with EPDM glazing gasket (Part # GSK-1) and Glass Stop. Interior Glazed with glazing gasket (Part # GSK-1)

Quantity	Daylight Opening	Glass Bite
3	46-1/4" (w) x 37-7/8" (h)	5/16"
3	46-14/4" (w) x 81-7/8" (h)	5/16"

### 5.5 Drainage:

Drainage Method	Size	Quantity	Location
Weep holes	1/4"	6	Two (2) at sill under each lite of glass located at each side of vertical mullion.

### 6.0 Installation:

The specimen was installed into a steel test buck. The rough opening allowed for a 1/4" shim space. The exterior and interior perimeter of the window was sealed with Dow Corning 795 silicone sealant.

Location	Anchor Description	Anchor Location
Head/Sill	1/4" x 1-1/2" Tek Screws	4" from jambs, and 4" on either side of vertical mullions
Jambs	1/4" x 1-1/2" Tek Screws	Geometric midpoint (horizontal)

**7.0 Test Results:** The temperature during testing was 66°F. The results are tabulated as follows:

<b>Title of Test</b>	<b>Results</b>
Air Infiltration at 1.57 psf (25 mph)	0.001 cfm/ft <sup>2</sup>
Air Infiltration at 6.24 psf (50 mph)	0.001 cfm/ft <sup>2</sup>
Water Infiltration (+12.00 psf)	PASS

	<b>Indicator Reading (inches)</b>	
	<b># 2</b>	<b># 5</b>
<b>Structural Loads 50% of Test Pressure (+45 psf)</b>		
Maximum Deflection	0.063	0.466
Permanent Set	0.003	0.002
% Recovery	96.00	99.57
<b>Design Pressure (+60 psf)</b>	<b># 2</b>	<b># 5</b>
Maximum Deflection	0.083	0.610
Permanent Set	0.004	0.005
% Recovery	95.75	99.17
<b>50% of Test Pressure (-45 psf)</b>	<b># 2</b>	<b># 5</b>
Maximum Deflection	0.076	0.442
Permanent Set	0	0.004
% Recovery	100.00	99.20
<b>Design Pressure (-60 psf)</b>	<b># 2</b>	<b># 5</b>
Maximum Deflection	0.080	0.592
Permanent Set	0.001	0.003
% Recovery	98.75	99.57
<b>Water Infiltration (+12.00 psf)</b>	PASS	
<b>Test Pressure (+90 psf)</b>	<b># 2</b>	<b># 5</b>
Maximum Deflection	0.146	0.921
Permanent Set	0.007	0.082
% Recovery	95.53	91.15
<b>Test Pressure (-90 psf)</b>	<b># 2</b>	<b># 5</b>
Maximum Deflection	0.126	1.431
Permanent Set	0.004	0.015
% Recovery	97.21	98.98

**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:** 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.

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

Upon completion of testing, specimens tested for TAS 202-94 met the requirements of Section 1620 of the Florida Building Code, Building (2007).

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.

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José E. Colón  
Director – Regional Operations

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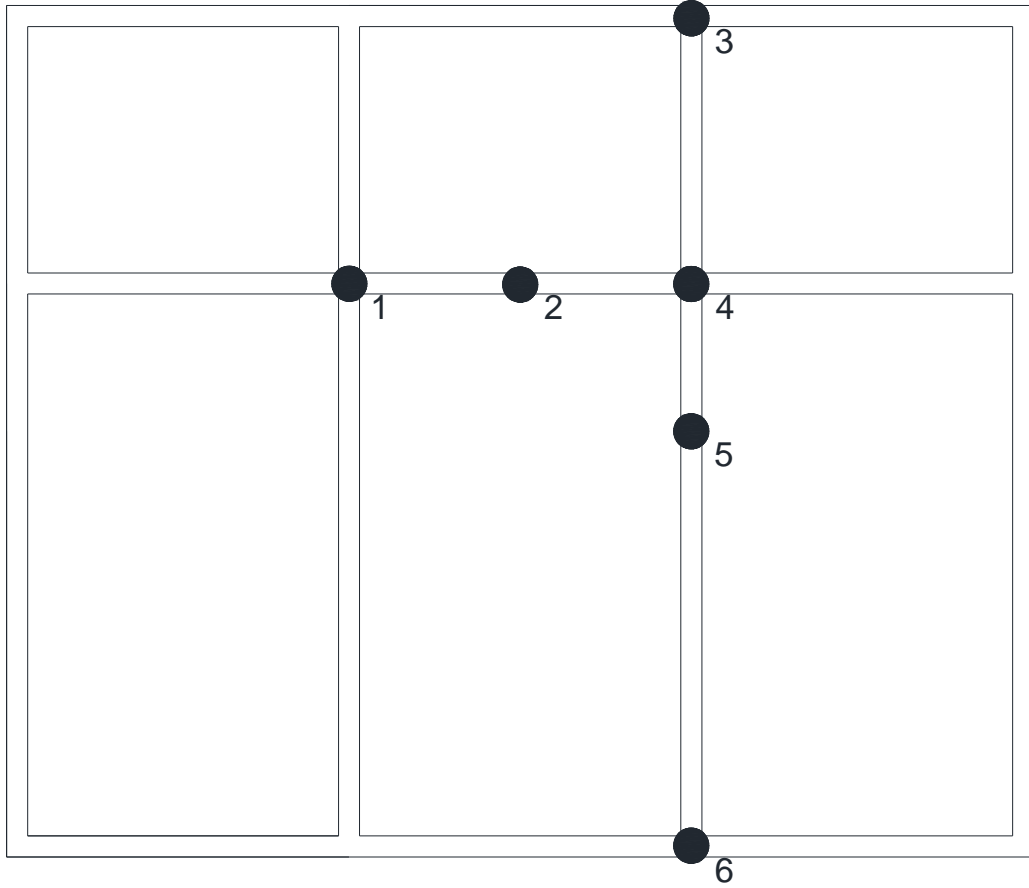
Vinu J. Abraham, P.E.  
Florida PE # 53820

Attachments (pages): This report is complete only when all attachments listed are included.  
Appendix-A: Sketches (1)  
Appendix-B: Drawings (6)

This report produced from controlled document template ATI 00501, issued 06/10/11.

## Appendix A

### Sketches



Sketch #1: Deflection Gage Locations



**Architectural Testing**

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## **Appendix B**

### **Drawings**



# ATI TEST - CF450 FRAMING SYSTEM - EXTERIOR GLAZED

DRAWING INDEX	
1	DRAWING INDEX AND NOTES
2	ELEVATION E2 WITH CF450-5 HEAVY MULLION
3	STANDARD FRAMING DETAILS
4	BILL OF MATERIALS/GLASS SCHEDULE
5	PROFILE DRAWINGS
6	SUB-SILL & SILL FABRICATION LAYOUT



**Architectural Testing**

Test sample complies with these details.

Deviations are noted.

Report #: **C5555.01-550-44**

Date: **3/25/13**

Tech:

REV	BY	DATE	DESCRIPTION

MANUAL COMP

CARDINAL COMMERCIAL PRODUCTS  
4795 SHEPHERDSVILLE ROAD  
LOUISVILLE, KY. 40218  
TEL: 502-969-4059  
FAX: 800-313-4195

ATI TEST  
- CF450 FRAMING SYSTEM -  
EXTERIOR GLAZED  
  
DRAWING INDEX AND NOTES

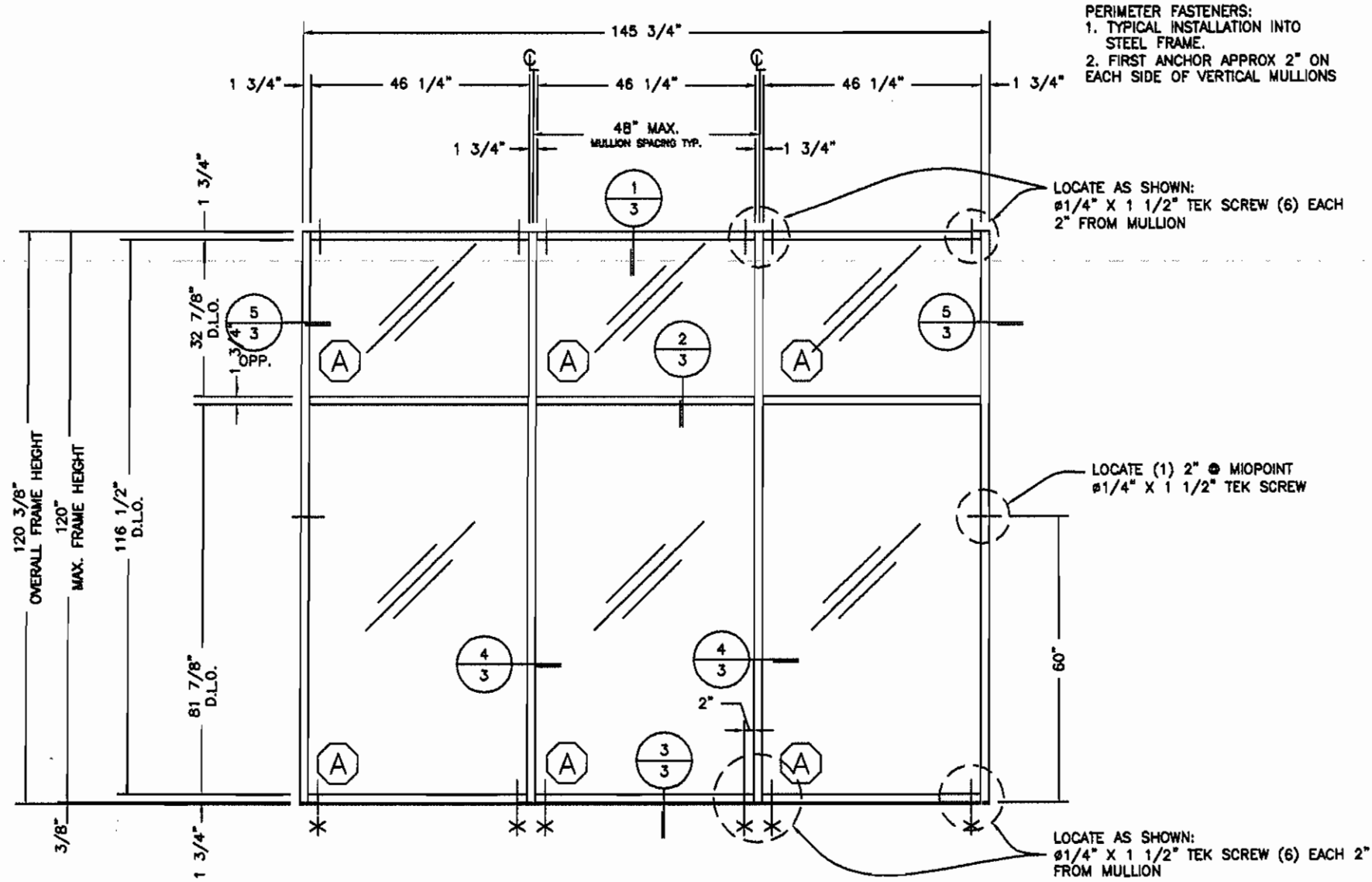
PROJECT  
PROJECT NO.

DRAWN DATE  
WRD 9/11/12

SCALE  
1/2"=1'-0"

DRAWING NO.  
CF450\_01  
1 OF 6

\* = 1/4" Ø WEEP HOLE  
 ● 2" FROM EACH  
 SIDE OF MULLIONS



PERIMETER FASTENERS:  
 1. TYPICAL INSTALLATION INTO  
 STEEL FRAME.  
 2. FIRST ANCHOR APPROX 2" ON  
 EACH SIDE OF VERTICAL MULLIONS

LOCATE AS SHOWN:  
 #1/4" X 1 1/2" TEK SCREW (6) EACH  
 2" FROM MULLION

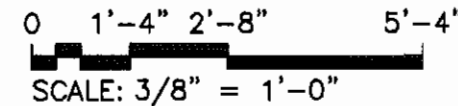
LOCATE (1) 2" Ø MIOPOINT  
 #1/4" X 1 1/2" TEK SCREW

LOCATE AS SHOWN:  
 #1/4" X 1 1/2" TEK SCREW (6) EACH 2"  
 FROM MULLION

- NOTES:  
 1. HORIZONTAL MULLION DETAIL 2/3 IS OPTIONAL IN ANY  
 BAY  
 2. D.L.O.= DAYLIGHT OPENING  
 3. GLASS SIZE = D.L.O. + 5/8"

- TEST PARAMETERS:  
 1. DESIGN PRESSURE = +60/-60 PSF  
 2. AIR TEST AT 6.24 PSF  
 3. WATER TEST AT 15 PSF  
 4. MAXIMUM DEFLECTION = L/180 OR .667

### E1 TYPICAL ELEVATION EXTERIOR GLAZED WITH CF450-1 MULLION AND STL-1 REINFORCING



Test sample complies with these details.

Deviations are noted.

Report #: **C5555.01-550-44**

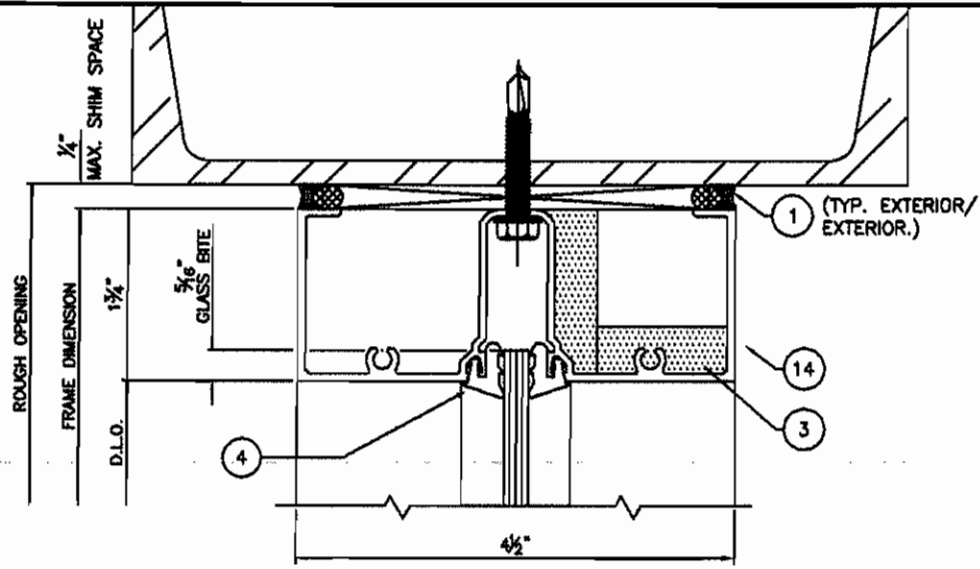
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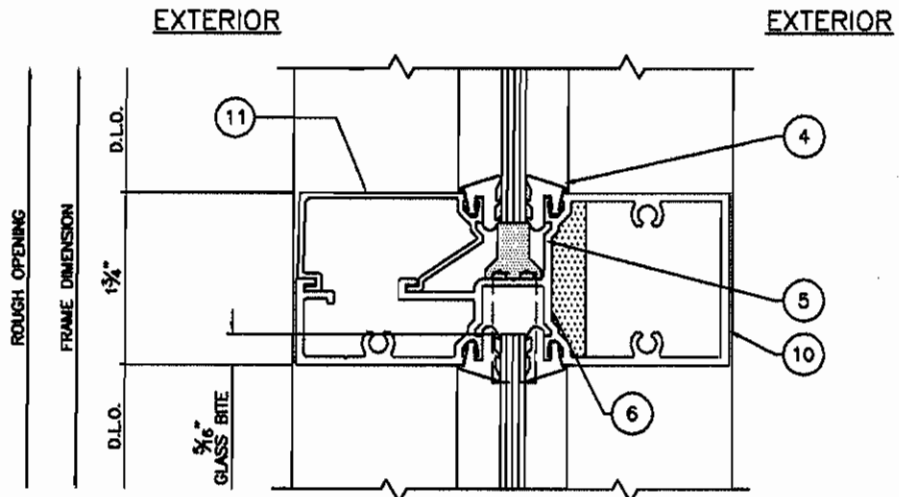
CARDINAL COMMERCIAL PRODUCTS  
 4795 SHEPHERDSVILLE ROAD  
 LOUISVILLE, KY. 40218  
 TEL: 502-969-4059  
 FAX: 800-313-4195

ATI TEST  
 - CF450 FRAMING SYSTEM -  
 EXTERIOR GLAZED  
 FRAMING ELEVATIONS

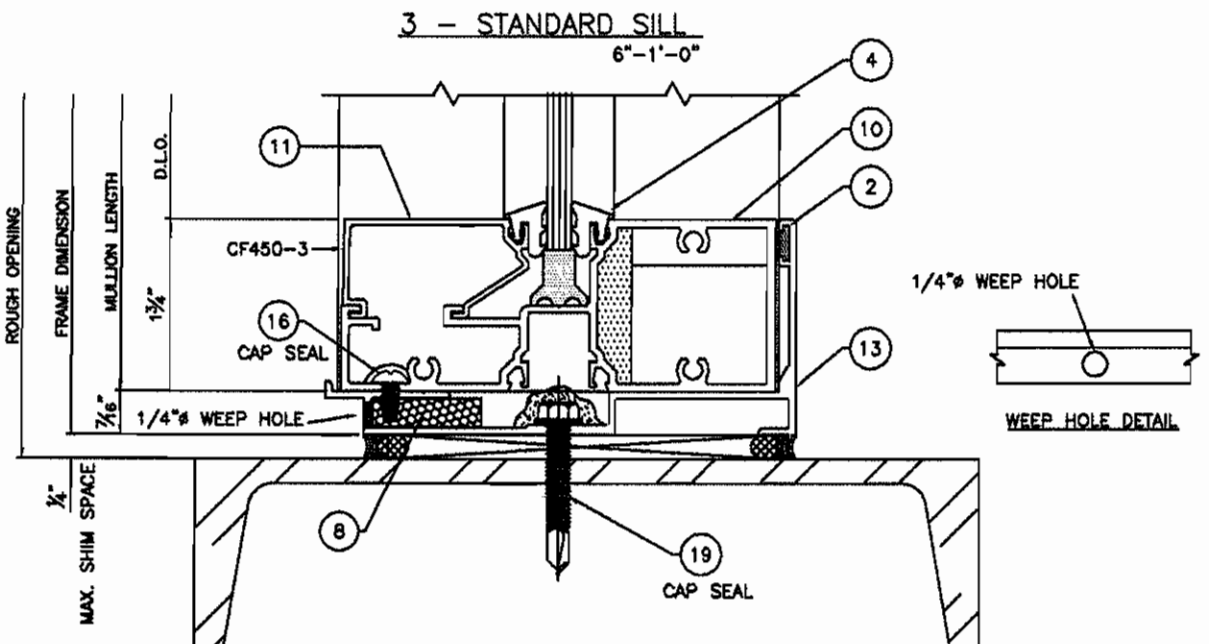
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WRD	9/11/12
SCALE	3/8" = 1'-0"
DRAWING NO.	CF450_01 2 OF 6



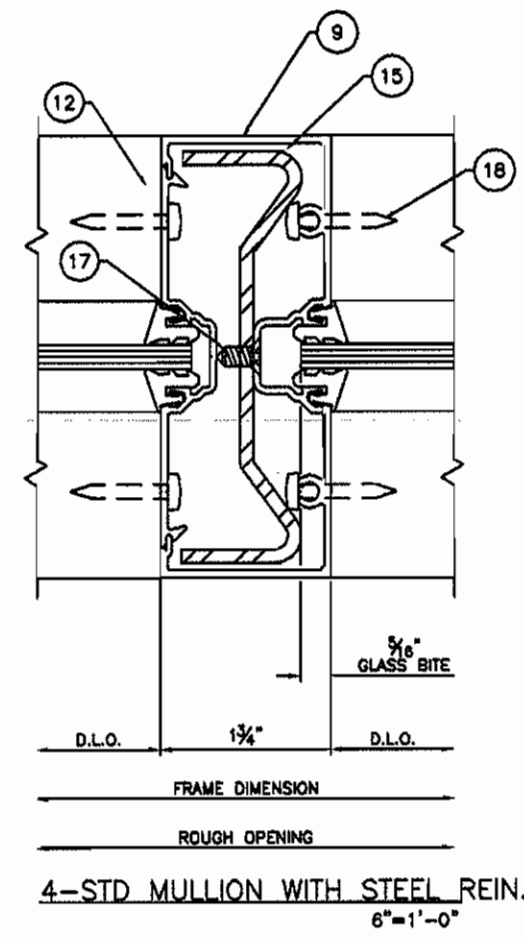
1 - STANDARD HEAD  
6"-1'-0"



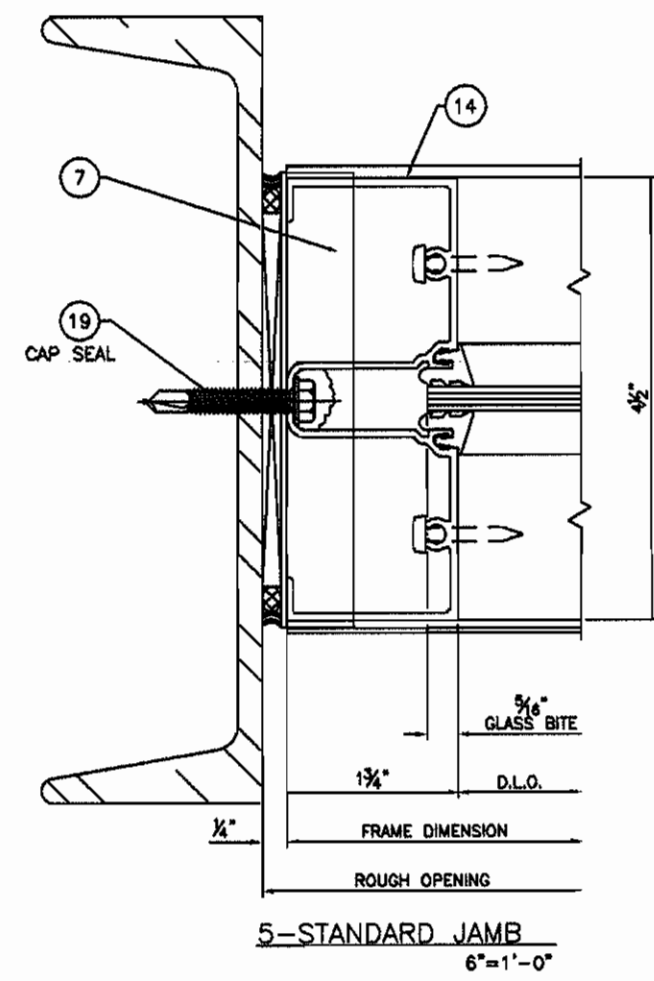
2 - STANDARD HORIZONTAL MULLION  
6"-1'-0"



3 - STANDARD SILL  
6"-1'-0"



4 - STD MULLION WITH STEEL REIN.  
6"-1'-0"



5 - STANDARD JAMB  
6"-1'-0"

- ① TYPICAL PERIMETER SEALANT
- ② TYPICAL INTERIOR SEALANT
- ③ TYPICAL Ⓞ ALL JOINT INTERSECTIONS
- ④ TYPICAL EXTERIOR/INTERIOR GASKET
- ⑩ TYPICAL AT ALL SPLINES



Architectural Testing  
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ATI TEST  
 - CF450 FRAMING SYSTEM -  
 EXTERIOR GLAZED  
 STANDARD DETAILS

PROJECT	
PROJECT NO.	
DRAWN	DATE
WRD	9/11/12
SCALE	6" = 1'-0"
DRAWING NO.	CF450_01
	3 OF 6

### BILL OF MATERIAL

ITEM NO.	P/N	DESCRIPTION	DIMENSIONS	MATERIAL	MANUFACTURER	NOTES
1	795	SILICONE	VARIABLE SPACE	SILICONE	DOW CORNING	USED AT PERIMETER
2	995	SILICONE	VARIABLE SPACE	SILICONE	DOW CORNING	USED FOR INTERNAL SEALS
3	GT-1	SEALANT TAPE	0.125 X 0.500 X VARIES	BUTYL AAMA-807.3	SCHNEE-MOOREHEAD	HORIZONTAL/VERTICAL JOINT TAPE
4	GSK-1	GLAZING GASKET	.197 SPACE	EPDM ASTM-C-864	CARDINAL COMMERCIAL PRODUCTS	
5	SB-1	SETTING BLOCK	0.600 X 0.567 X 4" LONG	EPDM ASTM-C-864	CARDINAL COMMERCIAL PRODUCTS	
6	WD450	WATER DEFLECTOR	1.343 X 1.343 X .040 X .585 LONG	ABS PLASTIC	CARDINAL COMMERCIAL PRODUCTS	POSITION 1 AT EACH END OF ITEM #10
7	ED450-1	SILL END DAM	0.825 X 2.665 X 0.040	ABS PLASTIC	CARDINAL COMMERCIAL PRODUCTS	
8	WB-1	WEEP BAFFLE	30 PPI	URETHANE	CARDINAL COMMERCIAL PRODUCTS	1 AT EACH WEEP SLOT
9	CF450-1	VERTICAL MULLION	1.750 X 4.500 X 0.080	6063-T5 ALUM.	CARDINAL COMMERCIAL PRODUCTS	
10	CF450-2	SILL/HORIZONTAL	1.750 X 4.460 X 0.080	6063-T5 ALUM.	CARDINAL COMMERCIAL PRODUCTS	
11	CF450-3	GLASS STOP	1.007 X 1.891 X 0.055	6063-T5 ALUM.	CARDINAL COMMERCIAL PRODUCTS	
12	CF450-4	MULLION POCKET FILLER	0.562 X 3.750 X 0.062	6063-T5 ALUM.	CARDINAL COMMERCIAL PRODUCTS	
13	CF450-6	SILL RECEPTOR PAN	2.188 X 4.800 X 0.070	6063-T5 ALUM.	CARDINAL COMMERCIAL PRODUCTS	
14	CF450-13	WALL JAMB/HEAD	1.750 X 4.500 X 0.080	6063-T5 ALUM.	CARDINAL COMMERCIAL PRODUCTS	
15	STL-1	STEEL REINFORCING	1.375 X 4.187 X 10 GA.	GALVANIZED STL	VARIES	
16	AF10-4	ATTACH ITEM #10 TO ITEM #13	#10 X 3/8" PPH SMS	STEEL	VARIES	
17	AF8-6	ATTACH ITEM #15 TO ITEM #9	#8-36 X 3/8 UCPHH	STEEL	VARIES	AT 12" O.C.
18	AF12-4	SPLINE SCREW	#12-14 X 1 1/4" PH-SQDR	STEEL	VARIES	
19	FASTENER	ATTACH SILL FLASHING TO STL SUBSTRATE	#14" X 1 1/2" HWH SELF DRILL	STEEL	VARIES	

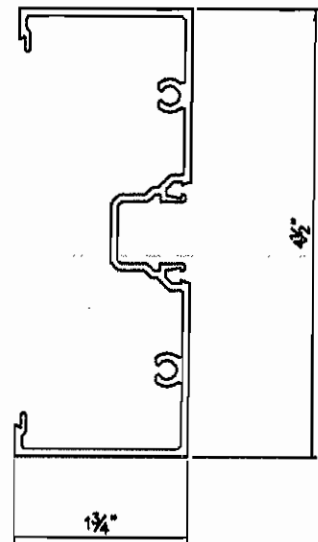
GLASS MARK SYMBOL	GLASS TYPE	MANUFACTURER	MAXIMUM DLO SIZE	MAXIMUM SQUARE FEET
A	1/4" TEMPERED GLASS	VARIES	46 1/4" X 81 7/8"	26.3



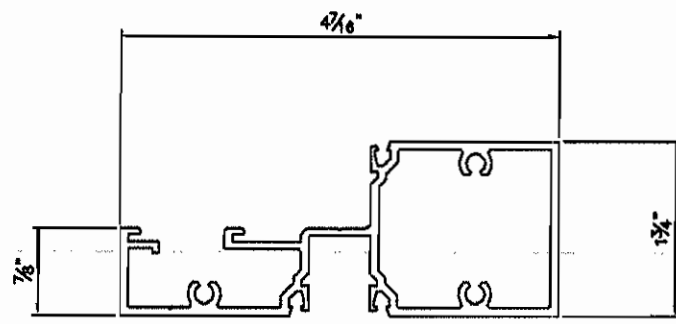
Test sample complies with these details.  
 Deviations are noted.  
 Report #: **C5555.01-550-44**  
 Date: **3/25/13** Tech:

<b>ATI TEST</b> - CF450 FRAMING SYSTEM - EXTERIOR GLAZED BILL OF MATERIALS/GLASS LEGEND	CARDINAL COMMERCIAL PRODUCTS 4795 SHEPHERDSVILLE ROAD LOUISVILLE, KY. 40218 TEL: 502-969-4059 FAX: 800-313-4195
PROJECT	DESCRIPTION
PROJECT NO.	REV. BY
DRAWN	DATE
WRD	9/11/12
SCALE	6"=1'-0"
DRAWING NO.	DATE
CF450_01	4 OF 6

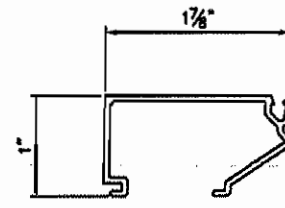




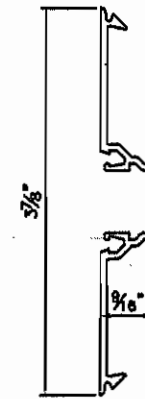
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CF450-1  
VERTICAL MULLION



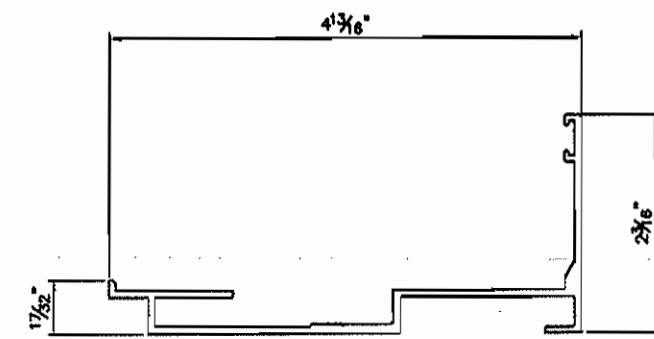
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CF450-2  
SILL/HORIZONTAL



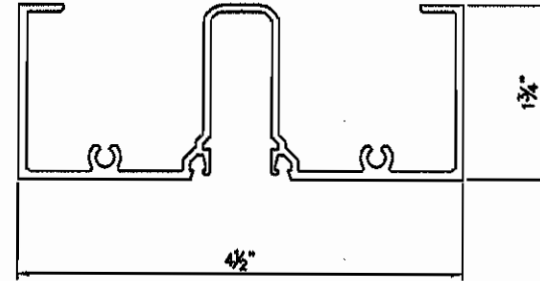
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CF450-3  
GLASS STOP



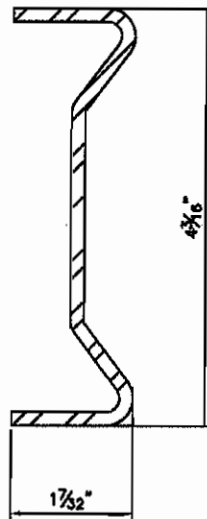
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CF450-4  
MULLION POCKET  
FILLER



13  
CF450-6  
SILL RECEPTOR PAN



14  
CF450-13  
WALL JAMB/HEAD



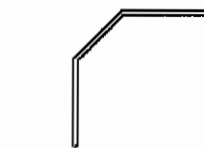
15  
STL-1  
STEEL REINFORCING



4  
GSK-1  
GLAZING  
GASKET



5  
SB-1  
SETTING  
BLOCK



6  
WD450  
WATER DEFLECTOR



7  
ED450-1  
SILL END DAM



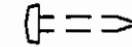
8  
WEEP BAFFLE



16  
AF10-6  
FASTENER



17  
AF8-6  
FASTENER



18  
AF12-4  
FASTENER



Architectural Testing

Test sample complies with these details.

Deviations are noted.

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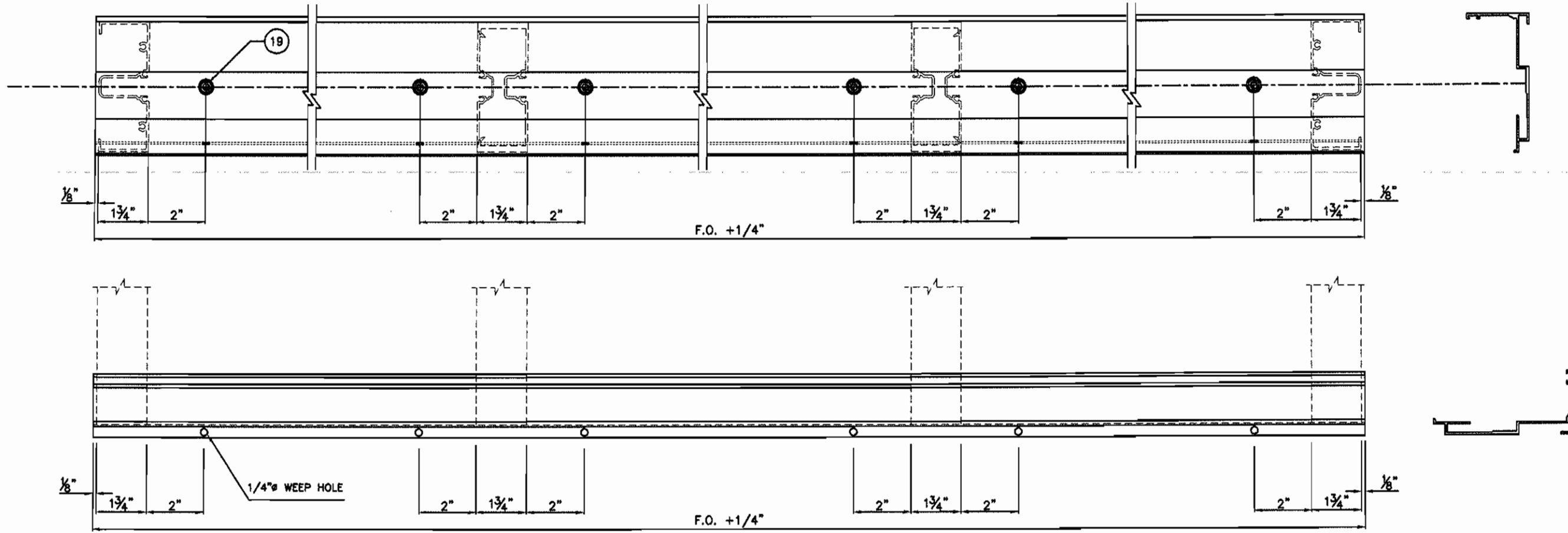
REV	BY	DATE	DESCRIPTION

MANUAL COMP

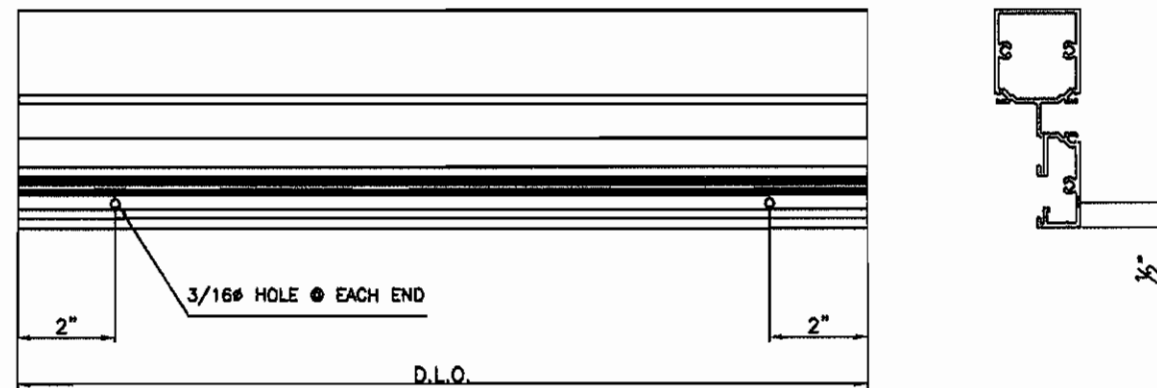
CARDINAL COMMERCIAL PRODUCTS  
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ATI TEST  
- CF450 FRAMING SYSTEM -  
EXTERIOR GLAZED  
PROFILE DRAWINGS

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CF450-6 SUB-SILL FABRICATION LAYOUT



CF450-2 SILL FABRICATION LAYOUT



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MANUAL COMP

CARDINAL COMMERCIAL PRODUCTS  
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ATI TEST  
 - CF450 FRAMING SYSTEM -  
 EXTERIOR GLAZED  
 SUB-SILL FABRICATION LAYOUT

PROJECT	
PROJECT NO.	
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DRAWING NO.	
CF450_01	
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