

**TAS 202 and AAMA 501 TEST REPORT**

**Report No.:** C5554.03-550-44

**Rendered to:**

CARDINAL COMMERCIAL PRODUCTS  
Louisville, Kentucky

**PRODUCT TYPE:** Framing System – Storefront  
**SERIES/MODEL:** CF451T (Interior Glazed)

**This report contains in its entirety:**

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

**Test Dates:** 01/29/13  
**Through:** 01/30/13  
**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:** CF451T (Interior 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  $\pm 35.00$  psf *Design Pressure* rating.

**3.4 Miami-Dade County Notification No.:** ATIGA13002

**3.5 Test Dates:** 01/29/13 – 01/30/13

**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:

Overall Area: 97.8 ft <sup>2</sup>	Width (inches)	Height (inches)
Overall size	146	96.5

##### 5.2 Frame Construction:

Frame Member	Material	Part #	Description
Head/Jambs	6063-T5 Aluminum	CF451-13T	2.00" x 4.50" x 0.08"
Sill/Horizontal	6063-T5 Aluminum	CF451-2T	2.00" x 4.46" x 0.08"
Vertical Mullion	6063-T5 Aluminum	CF451-1T	2.00" x 4.50" x 0.08"
Sill Receptor Pan	6063-T5 Aluminum	CF451-6T	2.50" x 4.80" x 0.08"
Mullion Pocket Filler	6063-T5 Aluminum	CF451-4T	0.86" x 3.875" x 0.062"
Glass Stop	6063-T5 Aluminum	CF451-3T	1.204" x 1.53" 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 Glazing:

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

Quantity	Daylight Opening	Glass Bite
6	46" (w) x 45" (h)	7/16"

### 5.4 Drainage:

Drainage Method	Size	Quantity	Location
Weep Holes	1/4"	6	At sill, two (2) each under each lite of glass located 2" on 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:

Title of Test	Results
Air Infiltration at 1.57 psf (25 mph)	0.005 cfm/ft <sup>2</sup>
Air Infiltration at 6.24 psf (50 mph)	0.024 cfm/ft <sup>2</sup>
Water Infiltration (+10.00 psf)	PASS

	Indicator Reading (inches)	
	# 2	# 4
Structural Loads 50% of Test Pressure (+26.25 psf)	# 2	# 4
Maximum Deflection	0.038	0.280
Permanent Set	0.033	0.002
% Recovery	93.40	99.50
Design Pressure (+35 psf)	# 2	# 4
Maximum Deflection	0.055	0.385
Permanent Set	0.001	0
% Recovery	98.20	100.00
50% of Test Pressure (-26.25 psf)	# 2	# 4
Maximum Deflection	0.033	0.283
Permanent Set	0	0
% Recovery	100.00	100.00
Design Pressure (-35 psf)	# 2	# 4
Maximum Deflection	0.053	0.393
Permanent Set	0.002	0
% Recovery	97.20	100.00
Water Infiltration (+10.00 psf)	PASS	
Test Pressure (+52.5 psf)	# 2	# 4
Maximum Deflection	0.074	0.612
Permanent Set	0.0045	0.0025
% Recovery	93.90	99.50
Test Pressure (-52.5 psf)	# 2	# 4
Maximum Deflection	0.089	0.583
Permanent Set	0.003	0.001
% Recovery	96.08	99.82

**Note # 1:** See Architectural Testing Sketch #1 for indicator locations. Location # 2 (middle horizontal), and Location # 4 (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

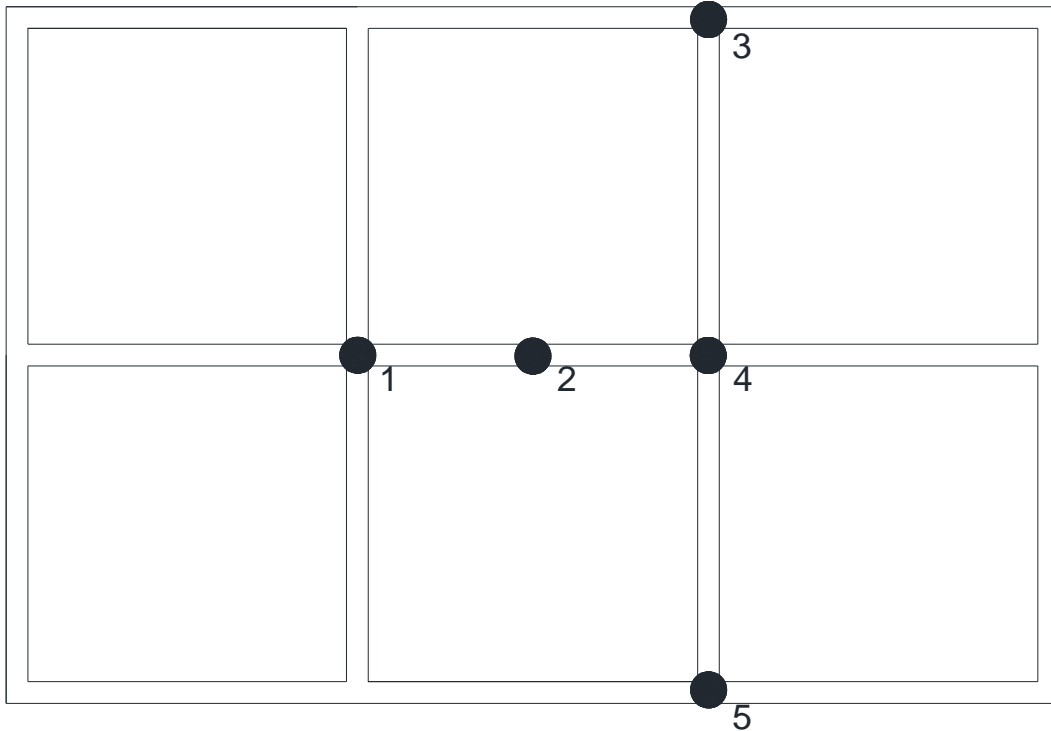
Attachments (pages): This report is complete only when all attachments listed are included.

Appendix-A: Sketches (1)

Appendix-B: Drawings (6)

## Appendix A

### Sketches



Sketch #1 – Deflection Gage Locations



**Architectural Testing**

Test Report No.: C5554.03-550-44  
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## **Appendix B**

### **Drawings**



# ATI TEST

## - CF451T THERMAL FRAMING SYSTEM - INTERIOR GLAZED

REV	BY	DATE	DESCRIPTION

**MANUAL COMP**

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

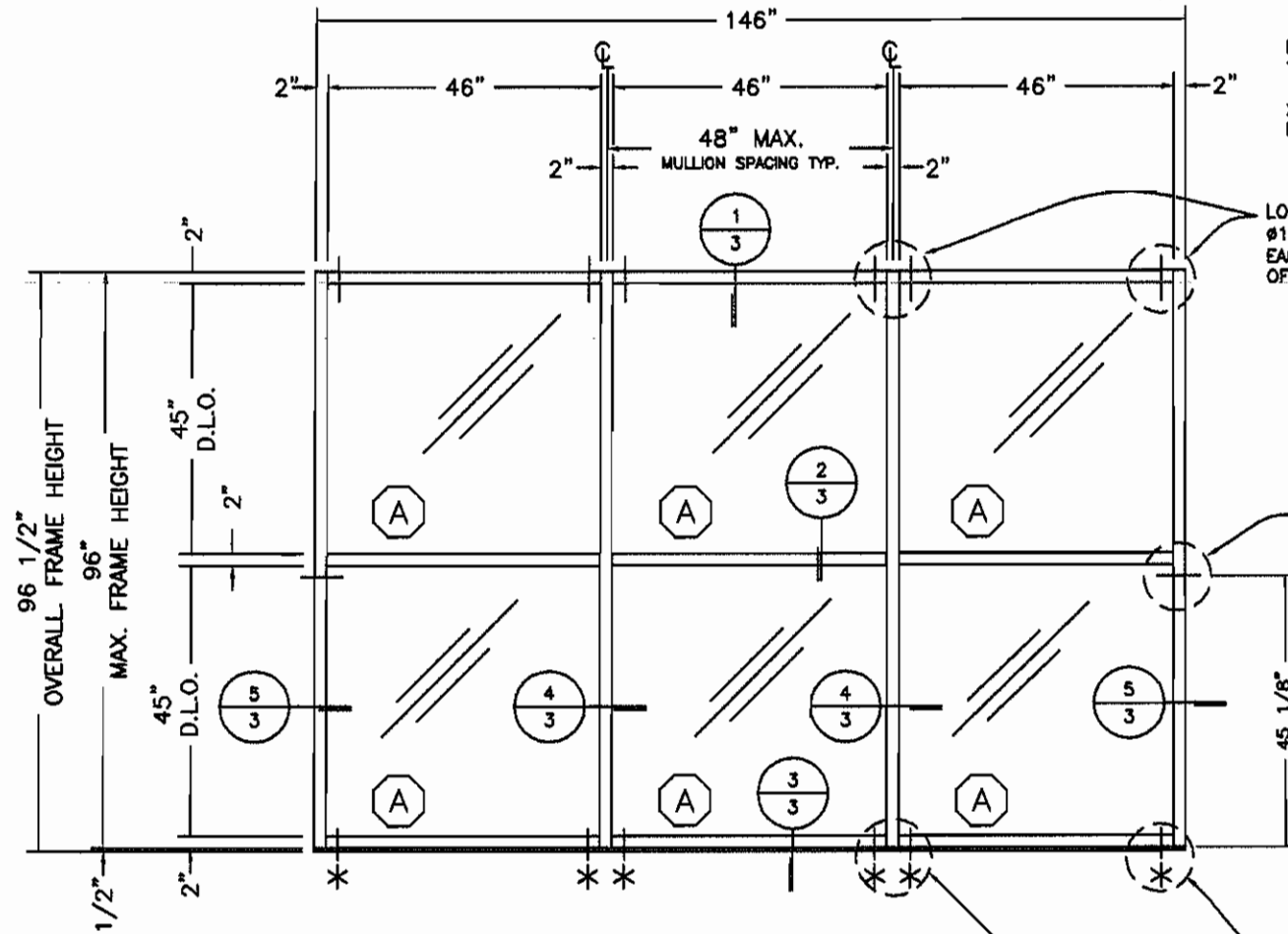
INDEX TO DRAWINGS	
1	DRAWING INDEX AND NOTES
2	ELEVATION E2 WITH CF451-1T VERTICAL MULLION
3	STANDARD FRAMING DETAILS
4	BILL OF MATERIALS/GLASS SCHEDULE
5	PROFILE DRAWINGS
6	SUB-SILL FABRICATION LAYOUT

ATI TEST  
- CF451T THERMAL FRAMING SYSTEM -  
INTERIOR GLAZED  
  
DRAWING INDEX AND NOTES



Test sample complies with these details.  
Deviations are noted.  
Report #: **C5554.03-550-44**  
Date: **3/25/13** Tech:

PROJECT	
PROJECT NO.	
DRAWN	DATE
WRD	9/12/12
SCALE	
12" = 1'-0"	
DRAWING NO.	
CF451T_02	
1 OF 6	



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 2" TEK SCREW (6)  
 EACH, 2" FROM EACH SIDE OF MULLION

LOCATE (1) 2" BELOW HORIZONTAL #1/4" X 2" TEK SCREW

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

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

PERIMETER FASTENER LEGEND

— | EACH LINE REPRESENTS ONE FASTENER

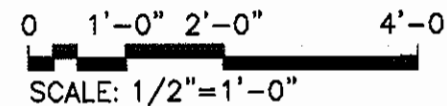
E2  
 TYPICAL ELEVATION  
 INTERIOR GLAZED  
 WITH CF451-1T VERTICAL  
 MULLION

NOTES:

1. TESTING AIR, WATER, AND STATIC
2. D.L.O.= DAYLIGHT OPENING
3. GLASS SIZE = D.L.O. + 7/8"

TEST PARAMETERS:

1. DESIGN PRESSURE = +35/-35 PSF
2. AIR TEST AT 6.24 PSF
3. WATER TEST AT 10 PSF
4. MAXIMUM DEFLECTION L/180=.533



Test sample complies with these details.

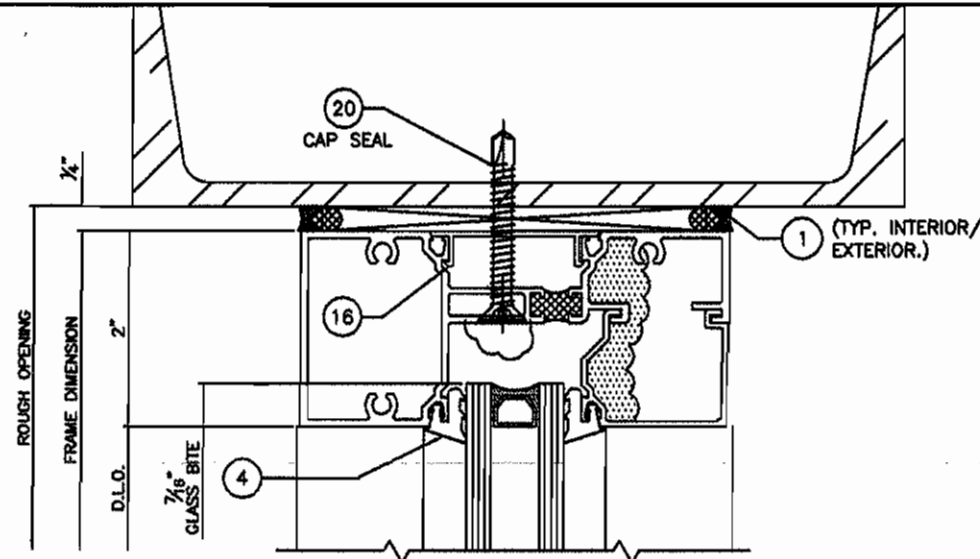
Deviations are noted.

Report #: C5554.03-550-44

Date: 3/25/13 Tech: [Signature]

PROJECT	DESCRIPTION
CF451T THERMAL FRAMING SYSTEM - INTERIOR GLAZED	MANUAL COMP
ATI TEST	
FRAMING ELEVATION	
PROJECT NO.	
DRAWN	DATE
WRD	9/12/12
SCALE	
3/8"=1'-0"	
DRAWING NO.	
CF451T_02	
2 OF 6	

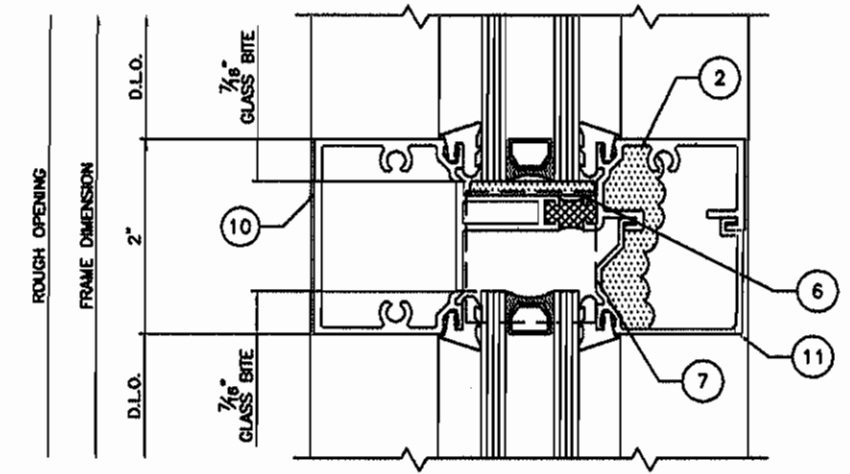
CARDINAL COMMERCIAL PRODUCTS  
 4795 SHEPHERDSVILLE ROAD  
 LOUISVILLE, KY. 40218  
 TEL: 502-969-4059  
 FAX: 800-313-4195



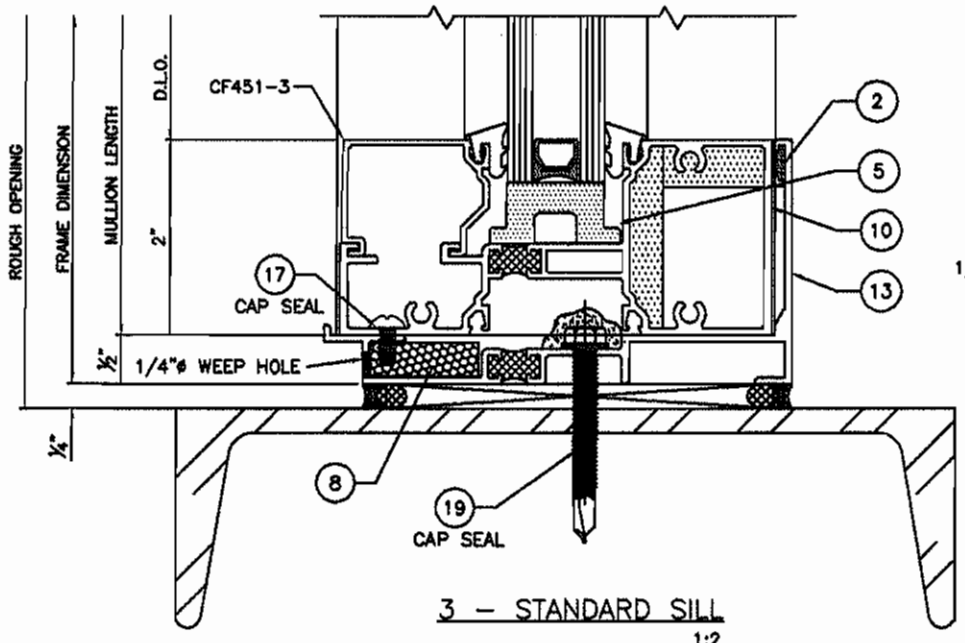
1 - STANDARD HEAD  
1:2

EXTERIOR

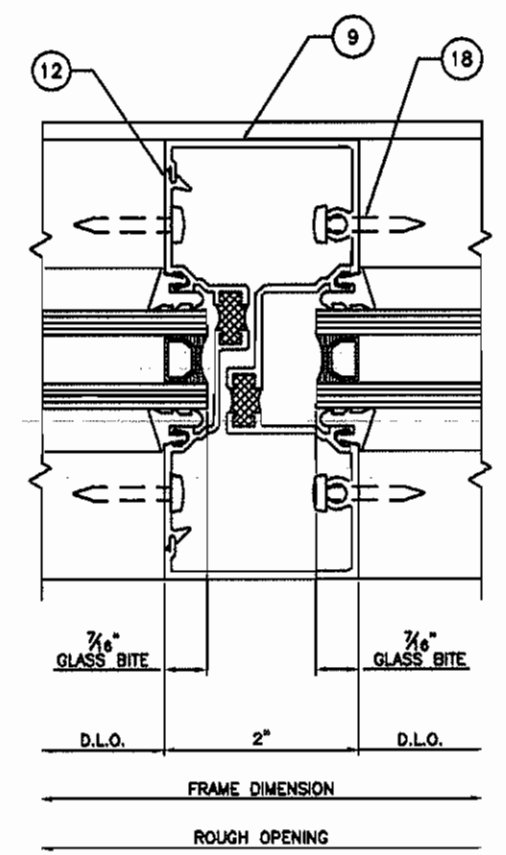
INTERIOR



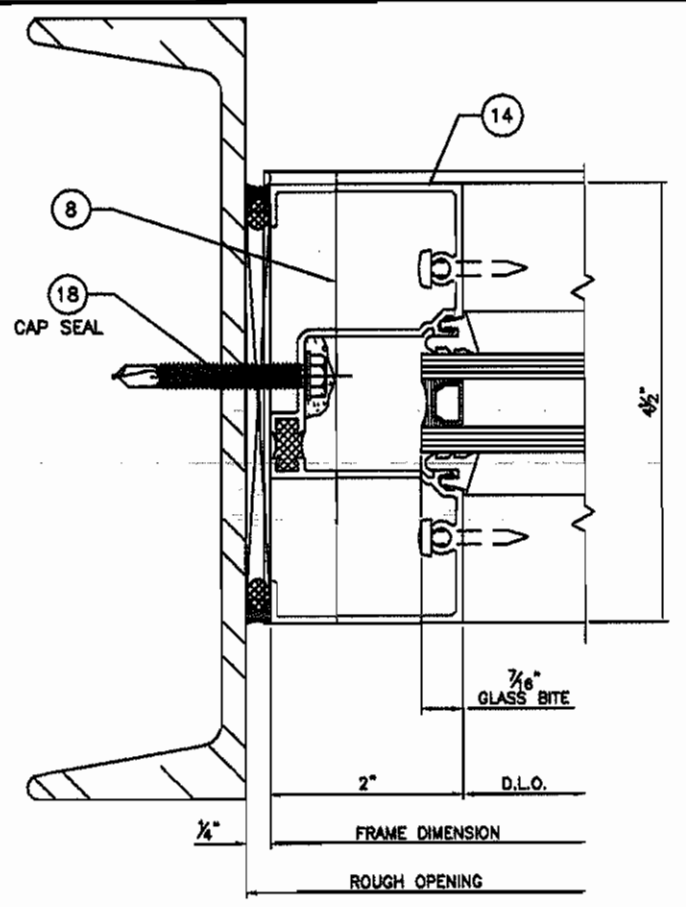
2 - STANDARD HORIZ. MULLION  
1:2



3 - STANDARD SILL  
1:2

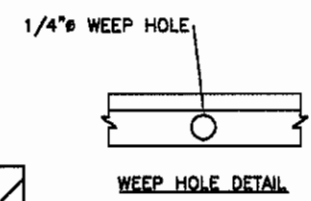



4 - STANDARD VERTICAL MULLION  
1:2



5 - STANDARD JAMB  
1:2

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



Architectural Testing  
Test sample complies with these details.  
Deviations are noted.  
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PROJECT NO.	
DRAWN	WRD
DATE	9/12/12
SCALE	6" = 1'-0"
DRAWING NO.	CF451T_02
	3 OF 6
MANUAL COMP	
REV BY	
DATE	
DESCRIPTION	
CARDINAL COMMERCIAL PRODUCTS 4795 SHEPHERDSVILLE ROAD LOUISVILLE, KY. 40218 TEL: 502-969-4059 FAX: 800-313-4195	
ATI TEST STANDARD DETAILS	

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-3	SETTING BLOCK	0.825 X 1.188 X 4" LONG	EPDM ASTM-C-864	CARDINAL COMMERCIAL PRODUCTS	
6	SB-4	SETTING BLOCK (INTERIOR GLAZED HORI.)	0.141 X 1.282 X 4" LONG	EPDM ASTM-C-864	CARDINAL COMMERCIAL PRODUCTS	
7	WD451	WATER DEFLECTOR	1.343 X 1.343 X .040 X 1.335 LONG	ABS PLASTIC	CARDINAL COMMERCIAL PRODUCTS	POSITION 1 AT EACH END OF ITEM #10
8	ED450-1	SILL END DAM	0.825 X 2.665 X 0.040	ABS PLASTIC	CARDINAL COMMERCIAL PRODUCTS	
9	WB-1	WEEP BAFFLE	30 PPI	URETHANE	CARDINAL COMMERCIAL PRODUCTS	1 AT EACH WEEP SLOT
10	CF451-1T	VERTICAL MULLION	2.000 X 4.500 X 0.080	6063-T5 ALUM.	CARDINAL COMMERCIAL PRODUCTS	
11	CF451-2T	SILL/HORIZONTAL	2.000 X 4.460 X 0.080	6063-T5 ALUM.	CARDINAL COMMERCIAL PRODUCTS	
12	CF451-3	GLASS STOP	1.204 X 1.530 X 0.055	6063-T5 ALUM.	CARDINAL COMMERCIAL PRODUCTS	
13	CF451-4T	MULLION POCKET FILLER	0.860 X 3.875 X 0.062	6063-T5 ALUM.	CARDINAL COMMERCIAL PRODUCTS	
14	CF451-6T	SILL RECEPTOR PAN	2.500 X 4.800 X 0.070	6063-T5 ALUM.	CARDINAL COMMERCIAL PRODUCTS	
15	CF451-13T	WALL JAMB/HEAD	2.000 X 4.500 X 0.080	6063-T5 ALUM.	CARDINAL COMMERCIAL PRODUCTS	
16	CF451-16	POCKET FILLER	1.749 X 0.358 X .050 X 6" LONG	6063-T5 ALUM.	CARDINAL COMMERCIAL PRODUCTS	
17	AF10-4	ATTACH ITEM #11 TO ITEM #14	#10 X 3/8" PPH SMS	STEEL	VARIES	2" FROM EACH END OF ITEM #11
18	AF12-4	SPLINE SCREW	#12-14 X 1 1/4" PH-SQDR	STEEL	VARIES	
19	FASTENER	PERMITER FASTENER	#14" X 2" HWH SELF DRILL	STEEL	VARIES	
20	FASTENER	PERMITER FASTENER	#14 X 2" PFH SELF DRILL	STEEL		

GLASS SCHEDULE				
GLASS MARK SYMBOL	GLASS TYPE	MANUFACTURER	DLO SIZE	SQUARE FEET
A	1/4" TEMPERED OUTER SURFACE, 1/2" AIR SPACE, 1/4" TEMPERED INNER SURFACE	VARIES	46 X 45	14.4



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 Date: **3/25/13** Tech:

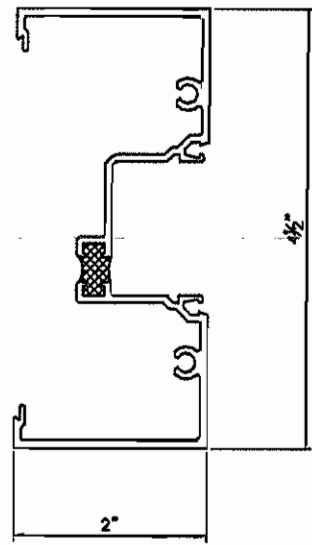
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MANUAL COMP

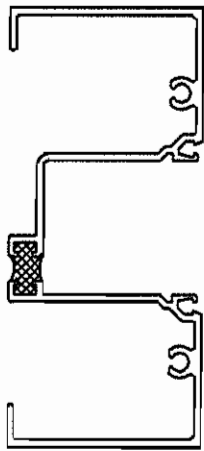
CARDINAL COMMERCIAL PRODUCTS  
 4795 SHEPHERDSVILLE ROAD  
 LOUISVILLE, KY. 40218  
 TEL: 502-969-4059  
 FAX: 800-313-4195

ATI TEST  
 - CF451T THERMAL FRAMING SYSTEM  
 INTERIOR GLAZED  
 BILL OF MATERIAL AND GLASS LEGEND

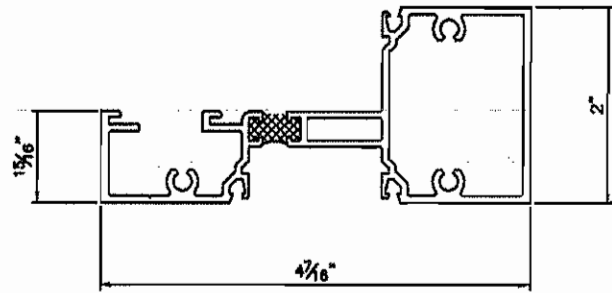
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 CF451T\_02  
 4 OF 6



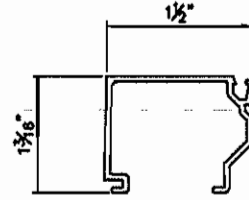
⑩  
CF451-1T  
VERTICAL  
MULLION



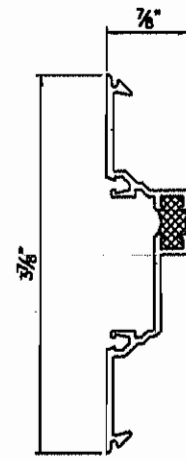
⑮  
CF451-13T  
WALL JAMB/HEAD



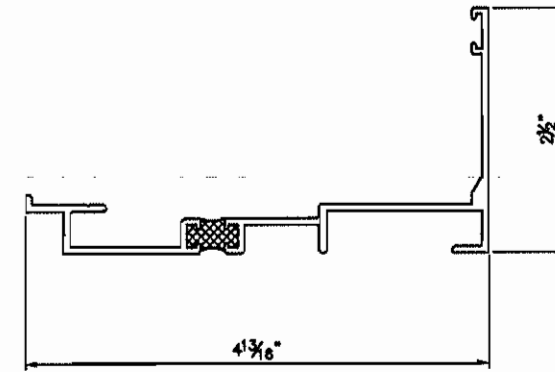
⑪  
CF451-2T  
SILL/HORIZONTAL



⑫  
CF451-3  
GLASS STOP



⑬  
CF451-4T  
MULLION POCKET  
FILLER



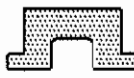
⑭  
CF451-6T  
SILL RECEPTOR  
PAN



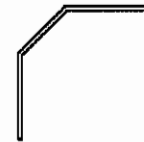
⑯  
CF451-16  
POCKET FILLER



④  
GSK-1  
GLAZING  
GASKET



⑤  
SB-3  
SETTING  
BLOCK



⑦  
WD451  
WATER DEFLECTOR



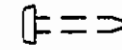
⑧  
ED450-1  
SILL END DAM



⑨  
WEEP  
BAFFLE



⑰  
AF10-4  
FASTENER



⑱  
AF12-4  
FASTENER



⑥  
SB-4  
SETTING  
BLOCK



Architectural Testing

Test sample complies with these details.

Deviations are noted.

Report #: **C5554.03-550-44**

Date: **3/25/13** Tech:

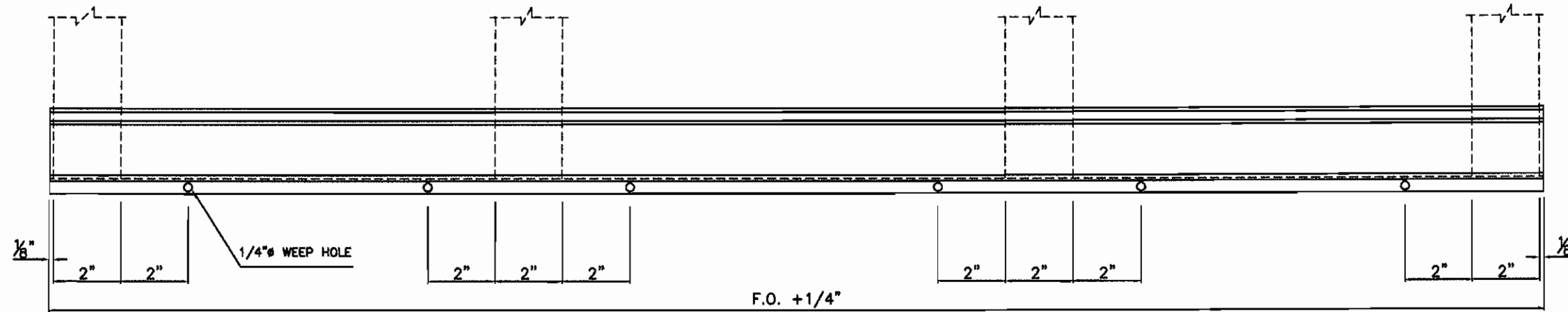
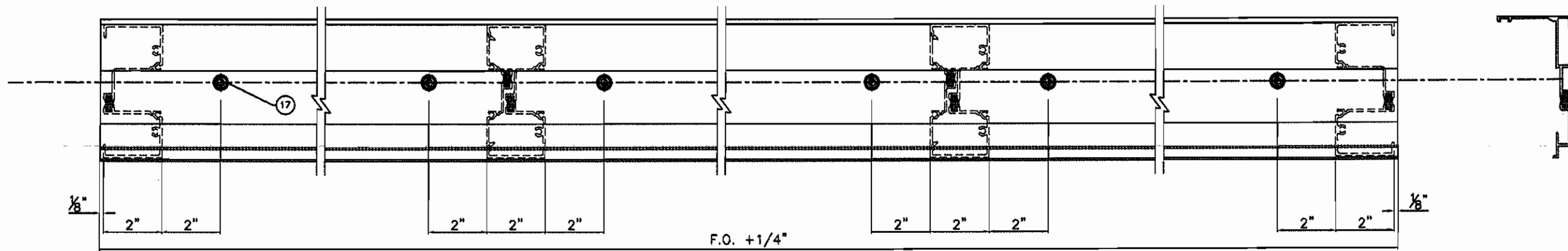
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MANUAL COMP

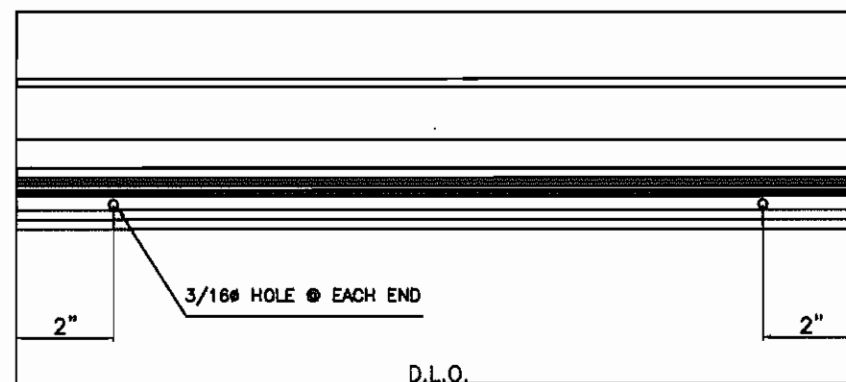
CARDINAL COMMERCIAL PRODUCTS  
4795 SHEPHERDSVILLE ROAD  
LOUISVILLE, KY. 40218  
TEL: 502-969-4059  
FAX: 800-313-4195

ATI TEST  
- CF451T THERMAL FRAMING SYSTEM -  
INTERIOR GLAZED  
PROFILE DRAWINGS

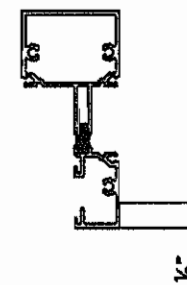
PROJECT NO. \_\_\_\_\_  
DRAWN BY: WRD DATE: 9/12/12  
SCALE: 6"=1'-0"  
DRAWING NO.: CF451T\_02  
5 OF 6



CF451-6T SUB-SILL FABRICATION LAYOUT



CF451-2T SILL FABRICATION LAYOUT



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Deviations are noted.

Report #: **C5554.03-550-44**

Date: **3/25/13**

Tech: 

REV	BY	DATE	DESCRIPTION

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ATI TEST  
 - CF451T THERMAL FRAMING SYSTEM  
 INTERIOR GLAZED  
 SUB-SILL FABRICATION LAYOUT

PROJECT	
PROJECT NO.	
DRAWN	DATE
WRD	9/12/12
SCALE	3"=1'-0"
DRAWING NO.	
CF451T_02	
6 OF 6	