



**TEST REPORT**

**Report No.:** G2223.01-301-47

**Rendered to:**

CR LAURENCE CO., INC.  
Vernon, California

**PRODUCT TYPE:** Fixed Lite Storefront  
**SERIES/MODEL:** OS451 & OS451SG

<b>Title</b>	<b>Summary of Results</b>
Design Pressure	±1200 Pa (±25.06 psf)
Air Infiltration	0.3 L/s/m <sup>2</sup> (0.06 cfm/ft <sup>2</sup> )
Water Penetration Resistance Test Pressure	300 Pa (6.24 psf)
Uniform Load Structural Test Pressure	±1800 Pa (±37.59 psf)

Reference must be made to Report No. G2223.01-301-47, dated 09/14/16 for complete test specimen description and detailed test results.

**1.0 Report Issued To:** CR Laurence Co., Inc.  
2503 East Vernon Avenue  
Vernon, California 90058

**2.0 Test Laboratory:** Architectural Testing, Inc., an Intertek company ("Intertek-ATI")  
25800 Commercentre Dr.  
Lake Forest, California 92630  
949-460-9600

**3.0 Project Summary:**

**3.1 Product Type:** Fixed Lite Storefront – Exterior Glazed

**3.2 Series/Model:** OS451 & OS451SG

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

**3.4 Test Date(s):** 08/19/16 – 08/24/16

**3.5 Test Record Retention End Date:** All test records for this report will be retained until August 24, 2020.

**3.6 Test Location:** CR Laurence Co., Inc. test facility in Vernon, California. Calibration of test equipment was performed by Intertek-ATI in accordance with AAMA 205-01 "In-Plant Testing Guidelines for Manufacturers and Independent Laboratories".

**3.7 Test Specimen Source:** The test specimen was provided by the client. Representative samples of the test specimen were retained by the customer.

**3.8 Drawing Reference:** The test specimen drawings have been reviewed by Intertek-ATI and are representative of the test specimen(s) reported herein.

**3.9 List of Official Observers:**

<u>Name</u>	<u>Company</u>
Garrett Osterode	CR Laurence Co., Inc.
Jarod S. Hardman	Intertek-ATI

**4.0 Test Method:**

AAMA 501-15, *Methods of Test for Exterior Walls*.

## 5.0 Test Specimen Description:

### 5.1 Product Sizes:

Overall Area: 12.01 m <sup>2</sup> (129.32ft <sup>2</sup> )	Width		Height	
	millimeters	inches	millimeters	inches
Overall size	4928	194	2438	96

### 5.2 Frame Construction:

Frame Member	Material	Description
Head	Aluminum	Stack head channel, part No. CS56811, see attached drawings.
Head	Aluminum	Head channel insert, part No. OG56611, snap fit into stack head channel, see attached drawings.
Horizontal	Aluminum	Horizontal mullion, part No. OG53311, see attached drawings.
Horizontal	Aluminum	Horizontal sheer blocks, part No. APK563, inserted into horizontal mullion, see attached drawings.
Horizontal	Aluminum	Horizontal insert, part No. OG53211, snap fit into horizontal mullion, see attached drawings.
Horizontal	Aluminum	Horizontal F-Cap, part No. OG53411, snap fit over exterior face of horizontal mullion, see attached drawings.
Sill	Aluminum	Stack sill channel, part No. OG57611, see attached drawings.
Sill	Aluminum	Sill insert, part No. OG57611, snap fit into stack sill channel, see attached drawings.
Sill	Aluminum	Sill F-Cap, part No. OG53911, snap fit into sill stack channel, see attached drawings.
Jamb	Aluminum	Jamb wall, part No. OG55211, see attached drawings.
Jamb	Aluminum	End dam, part No. EC450, secured to ends of jambs with #8 x 1/2" Phillips SMS screws.

## 5.0 Test Specimen Description: (Continued)

### 5.2 Frame Construction: (Continued)

Frame Member	Material	Description
Vertical	Aluminum	V-Mull, part No. OG55511, see attached drawings.
Vertical	Aluminum	Structurally sealed vertical mullion, part No. OG55111, see attached drawings.
Vertical	Aluminum	Expansion mullion M-half, part No. FF56111, see attached drawings.
Vertical	Aluminum	Expansion mullion F-half, part No. FF56911, see attached drawings.

	Joinery Type	Detail
All corners	Flush	Secured through head and sill with #8 x 1/2" Phillips SMS Screws.

### 5.3 Reinforcement:

Part Number	Location	Material
SS55116	Inserted into structurally sealed vertical mullion part No. OG551111.	Steel

### 5.4 Weatherstripping:

Description	Quantity	Location
Silicone spacer gasket	2 rows	Kerf inserted into vertical mullion of structurally sealed mullion part No. OG55111.
Two finger vinyl isolator	2 rows	Inserted into exterior and interior leg of expansion mullion M-half part No. FF56111.

## 5.0 Test Specimen Description: (Continued)

**5.5 Glazing:** *No conclusions of any kind regarding the adequacy or inadequacy of the glass in any glazed test specimen(s) can be made.*

Glass Type	Spacer Type	Interior Lite	Exterior Lite	Glazing Method
1" IG	Aluminum spacer – dual seal	1/4" clear tempered	1/4" clear tempered	Dry glazed with EPDM press in gasket at interior and exterior face, part No. NP225.

Location	Quantity	Daylight Opening		Glass Bite
		millimeters	inches	
Upper fixed lite	4	1168 x 1553	46 x 61-1/8	7/16"
Lower fixed lite	4	1168 x 740	46 x 29-1/8	7/16"

**5.6 Drainage:** No drainage was utilized.

Drainage Method	Size	Quantity	Location
Weep hole	1" x 3/16"	8	2 per bay equal spacing.

**5.7 Hardware:** No hardware was utilized.

**5.8 Screen Construction:** No screen was utilized.

## 6.0 Installation:

The specimen was installed into a Pine wood buck. The rough opening allowed for a 1/4" shim space. The exterior and interior perimeter of the window was sealed with structural silicone sealant.

Location	Anchor Description	Anchor Location
Through head and sill stack channel	1/4" x 2" lag bolt	6" from ends of vertical members and center of each lite.

**7.0 Test Results:** The temperature during testing was 26°C (78°F). The results are tabulated as follows:

Title of Test	Results	Allowed	Note
<b>Air Leakage,</b> per ASTM E283 at 75 Pa (1.57 psf)	<0.1 L/s/m <sup>2</sup> (<0.01 cfm/ft <sup>2</sup> )	0.3 L/s/m <sup>2</sup> (0.06 cfm/ft <sup>2</sup> ) max.	1
<b>Air Leakage,</b> per ASTM E283 at 300 Pa (6.27 psf)	<0.1 L/s/m <sup>2</sup> (<0.01 cfm/ft <sup>2</sup> )	0.3 L/s/m <sup>2</sup> (0.06 cfm/ft <sup>2</sup> ) max.	1
<b>Water Penetration,</b> per ASTM E331 at 300 Pa (6.24 psf)	Pass	No leakage	1
<b>Uniform Load Preload,</b> per ASTM E330 Deflections taken at vertical mullion +600 Pa (+12.5 psf)	Pass	No damage	3, 4
<b>Air Leakage,</b> per ASTM E283 at 75 Pa (1.57 psf)	<0.1 L/s/m <sup>2</sup> (<0.01 cfm/ft <sup>2</sup> )	0.3 L/s/m <sup>2</sup> (0.06 cfm/ft <sup>2</sup> ) max.	2
<b>Air Leakage,</b> per ASTM E283 at 300 Pa (6.27 psf)	0.1 L/s/m <sup>2</sup> (0.01 cfm/ft <sup>2</sup> )	0.3 L/s/m <sup>2</sup> (0.06 cfm/ft <sup>2</sup> ) max.	2
<b>Water Penetration,</b> per ASTM E331 at 300 Pa (6.24 psf)	Pass	No leakage	2
<b>Uniform Load Deflection,</b> per ASTM E 330 Deflections taken at vertical mullion +1200 Pa (+25.06 psf) -1200 Pa (-25.06 psf)	9.4 mm (0.37") 8.4 mm (0.33")	13.2 mm (0.52") max. 13.2 mm (0.52") max.	3, 4
<b>Air Leakage,</b> per ASTM E283 at 75 Pa (1.57 psf)	0.2 L/s/m <sup>2</sup> (0.04 cfm/ft <sup>2</sup> )	0.3 L/s/m <sup>2</sup> (0.06 cfm/ft <sup>2</sup> ) max.	2
<b>Air Leakage,</b> per ASTM E283 at 300 Pa (6.27 psf)	0.3 L/s/m <sup>2</sup> (0.06 cfm/ft <sup>2</sup> ) max.	0.3 L/s/m <sup>2</sup> (0.06 cfm/ft <sup>2</sup> ) max.	2
<b>Water Penetration,</b> per ASTM E331 at 300 Pa (6.24 psf)	Pass	No leakage	2

## 7.0 Test Results: (Continued)

Title of Test	Results	Allowed	Note
<b>Uniform Load Overload,</b> per ASTM E 330 Deflections taken at vertical mullion +1800 Pa (+37.59 psf) -1800 Pa (-37.59 psf)	0.5 mm (0.02") 0.5 mm (0.02")	4.8 mm (0.18") max. 4.8 mm (0.18") max.	3, 4

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

*Note 1: Testing performed prior to structural preloading.*

*Note 2: Testing performed after structural preloading.*

*Note 3: Loads were held for 10 seconds.*

*Note 4: 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.*

Intertek-ATI will service this report for the entire test record retention period. Test records such as detailed drawings, datasheets, or other pertinent project documentation, will be retained by Intertek-ATI 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 tested. This report may not be reproduced, except in full, without the written approval of Intertek-ATI.

For ARCHITECTURAL TESTING, INC.:

---

Jarod S. Hardman  
Laboratory Manager

JSH:ss/ms

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

Appendix A: Location of air seal (1)

Appendix B: Drawings (4)

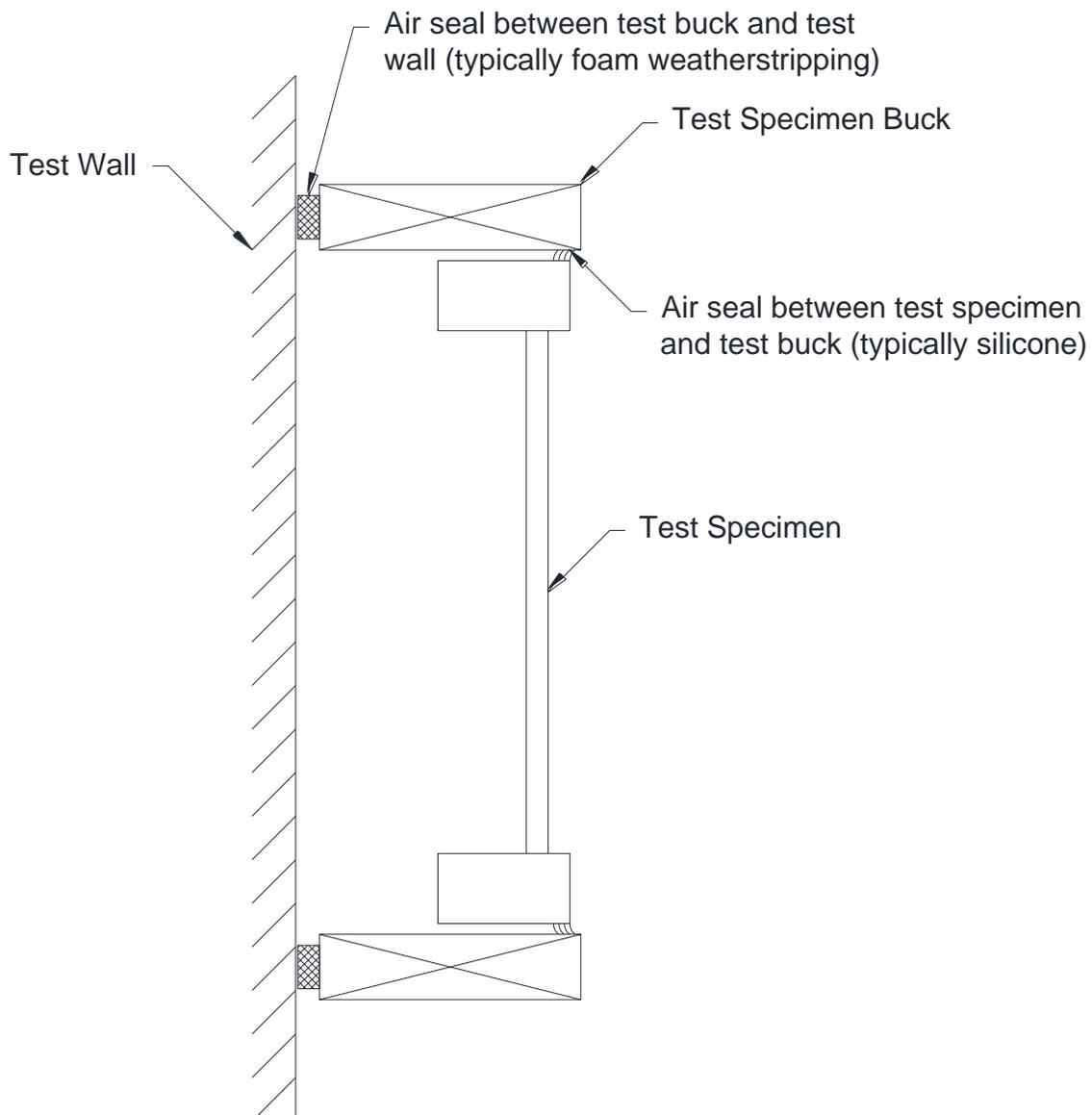
### Revision Log

<u>Rev. #</u>	<u>Date</u>	<u>Page(s)</u>	<u>Revision(s)</u>
0	09/14/16	N/A	Original report issue.
1	09/14/16	1	Revised company address.
2	09/14/16	1	Revised company address.

This report produced from controlled document template ATI 00479, revised 06/19/15.

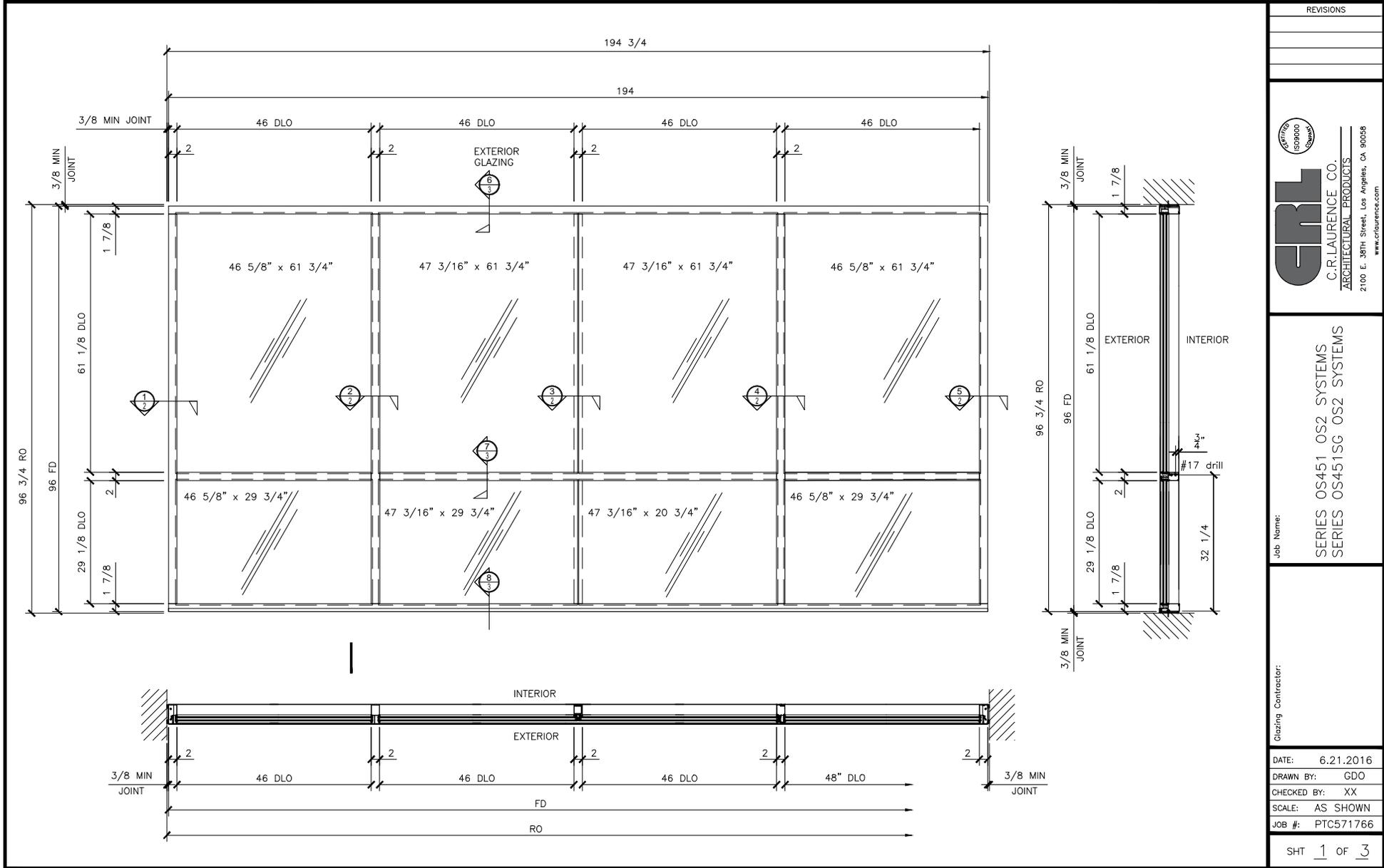
## Appendix A

**Location of Air Seal:** The air seal between the test specimen and the test wall is detailed below. The seal is made of foam weatherstripping and is attached to the edge of the test specimen buck. The test specimen buck is placed against the test wall and clamped in place, compressing the weatherstripping and creating a seal.

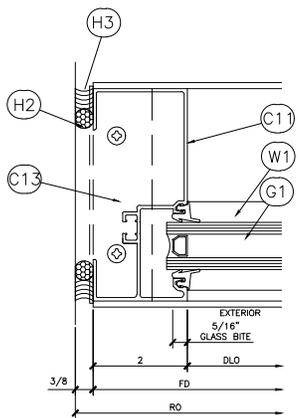


## **Appendix B**

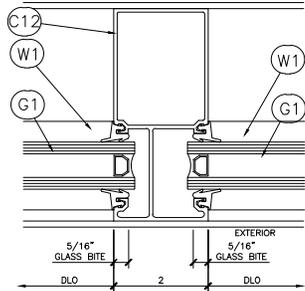
### **Drawings**



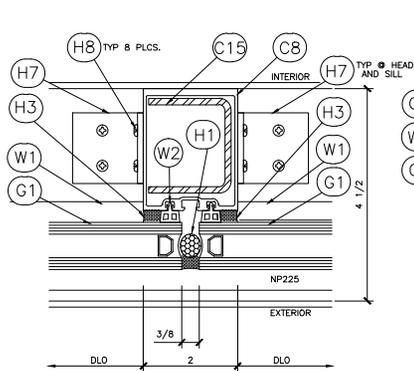
REVISIONS	
	
<b>C.R. LAURENCE CO.</b> ARCHITECTURAL PRODUCTS 2100 E. 38TH Street, Los Angeles, CA 90058 www.crlaurence.com	
Job Name: SERIES OS451 OS2 SYSTEMS SERIES OS451SG OS2 SYSTEMS	Glazing Contractor:
DATE: 6.21.2016 DRAWN BY: GDO CHECKED BY: XX SCALE: AS SHOWN JOB #: PTC571766	SHT 1 OF 3



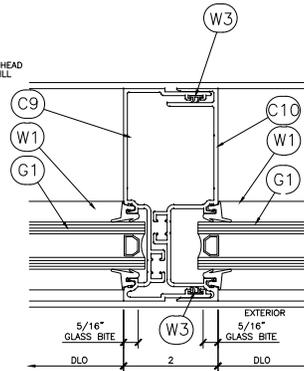
① SECTION DETAIL AT JAMB  
 ARCH REF: N/A 1'-0"=1'-0"



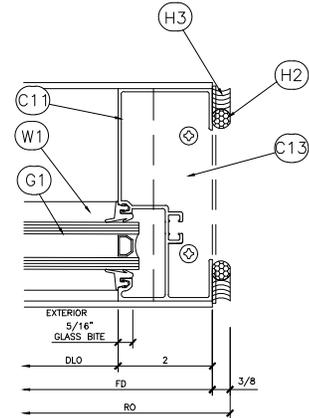
② SECTION DETAIL AT VERTICAL  
 ARCH REF: N/A 1'-0"=1'-0"



③ SECTION DETAIL AT STRUCTURAL SILICONE  
 ARCH REF: N/A 1'-0"=1'-0"

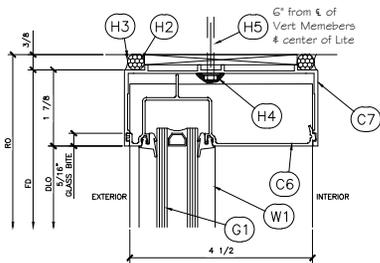


④ SECTION DETAIL AT EXPANSION MULLION  
 ARCH REF: N/A 1'-0"=1'-0"

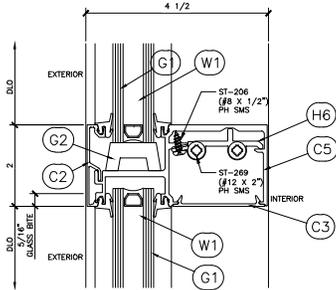


⑤ SECTION DETAIL AT JAMB  
 ARCH REF: N/A 1'-0"=1'-0"

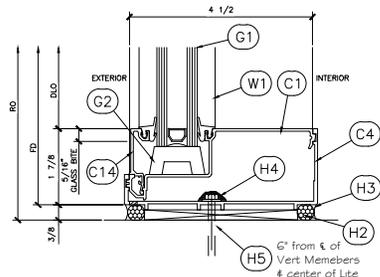
REVISIONS	
 <b>CRL</b> C.R. LAURENCE CO. ARCHITECTURAL PRODUCTS 2100 E. 38TH Street, Los Angeles, CA 90058 www.crlaurence.com	Job Name: SERIES OS451 OS2 SYSTEMS SERIES OS451SG OS2 SYSTEMS
Glazing Contractor: DATE: 6.21.2016 DRAWN BY: GDO CHECKED BY: XX SCALE: AS SHOWN JOB #: PTC571766	SHT 2 OF 3



**⑥ SECTION DETAIL AT HEAD**  
 ARCH REF: N/A EXTERIOR GLAZING 1-9-1-9



**⑦ SECTION DETAIL AT INTERMEDIATE HORIZONTAL**  
 ARCH REF: N/A EXTERIOR GLAZING 1-9-1-9



**⑧ SECTION DETAIL AT SILL**  
 ARCH REF: N/A EXTERIOR GLAZING 1-9-1-9

ITEM	PT. NO.	PART DESCRIPTION
C1	OG57811	INSERT, SILL, OS, 1" GL.
C2	OG53411	F-CAP, 2.0" X 0.449"
C3	OG53211	INSERT, FLAT, 3.020"
C4	CS56311	STACK-SILL CHANNEL
C5	OG53311	HORIZ, 1" GL, OS
C6	OG56811	INSERT, FOR CS568
C7	CS56811	STACK-HD CHANNEL
C8	OG55111	MULL, 1" GL
C9	FF58111	MULL, EXP, M-HALF, W/WS
C10	FF58911	MULL, EXP, F-HALF, 2" X 4.5"
C11	OG55211	JAMB, WALL, 1" GL, FF
C12	OG55511	V-MULL, 1" GL
C13	EC450	EXT, ALUM, END DAM, W/SCRS
C14	OG53911	F-CAP AT SILL
C15	SS55118	STL, 10GA, 2.187" X 1.75" - 16' 0"
W1	NP225	GSKT, PUSH-IN, STD, EPDMTL
W2	SP450	SILICONE SPACER GASKET
W3	VS200	VINYL ISOLATOR 2-FINGER
W4		
G1		.025 X .050 X .025 INSULATED GLASS (TEMPERED) ALUMINUM SPACER (DUAL GLAZED)
G2	SB230	NEOPRENE SETTING BLOCK
G3		
G4		
H1	EF14	CRL CLOSED CELL 1/4" DIA. BACKER ROD
H2	EF12	CRL CLOSED CELL 1/2" DIA. BACKER ROD
H3	795BL	DOW CORNING 795 SILICONE BUILDING SEALANT
H4	RTV408C	CRL CLEAR RTV408 NEUTRAL CURE SILICONE
H5	----	1/4" X 2" LAG BOLT ASME B15.2.1 ZINC COATED ASTM 153
H6	APK563	SHEAR BLOCKS W/SCREWS
H7	----	ALUM ANGLE 1/8" X 1-1/2" X 1-1/2"
H8	----	#8 X 1/2" PH SMS ZINC PLATED
WD1	WD210	WATER DEFLECTOR
WD2	WD280	WATER DEFLECTOR
WD3	WD270	WATER DEFLECTOR
WD4	WD200	WATER DEFLECTOR

**TEST REQUIREMENTS**

**AIR INFILTRATION:**  
 <.03 CFM/SQ.FT. @ 1.57 PSF  
 <.06 CFM/SQ.FT. @ 6.24 PSF

**STATIC WATER:**  
 8.15 PSF

**DESIGN PRESSURE:**  
 30 PSF

**STRUCTURAL OVERLOAD:**  
 45 PSF

**TESTING SEQUENCE:**  
 Pre-load 50% DP (15psf)  
 Air  
 Water  
 Dynamic  
 Design Pressure  
 Air  
 Water  
 Structural Overload

REVISIONS

C.R. LAURENCE CO.  
 ARCHITECTURAL PRODUCTS  
 2100 E. 38TH Street, Los Angeles, CA 90058  
 www.crlaurence.com

Job Name:  
 SERIES OS451 OS2 SYSTEMS  
 SERIES OS451SC OS2 SYSTEMS

Glazing Contractor:

DATE: 6.21.2016  
 DRAWN BY: GDO  
 CHECKED BY: XX  
 SCALE: AS SHOWN  
 JOB #: PTC571766

ITEM		PT. NO.	PART DESCRIPTION	
C1	FRAME COMPONENTS	OG57611	INSERT, SILL, OS, 1" GL.	
C2		OG53411	F-CAP, 2.0" X 0.449"	
C3		OG53211	INSERT, FLAT, 3.020"	
C4		CS56311	STACK-SILL CHANNEL	
C5		OG53311	HORIZ, 1" GL, OS	
C6		OG56611	INSERT, FOR CS568	
C7		CS56811	STACK-HD CHANNEL	
C8		OG55111	MULL, 1" GL	
C9		FF56111	MULL, EXP, M-HALF, W/WS	
C10		FF56911	MULL, EXP, F-HALF, 2" X 4.5"	
C11		OG55211	JAMB, WALL, 1" GL, FF	
C12		OG55511	V-MULL, 1" GL	
C13		EC450	EXT, ALUM, END DAM, W/SCRS	
C14		OG53911	F-CAP AT SILL	
C15		SS55116	STL, 10GA, 2.187" X 1.75" - 16' 0"	
W1	WTHR. STRIP	NP225	GSKT, PUSH-IN, STD, EPDMTL	
W2		SP450	SILICONE SPACER GASKET	
W3		VS200	VINYL ISOLATOR 2-FINGER	
W4				
G1	GLASS		.025 X .050 X .025 INSULATED GLASS (TEMPERED) ALUMINUM SPACER DUAL GLAZED	
G2		SB230	NEOPRENE SETTING BLOCK	
G3				
G4				
H1	HARDWARE	EF14	CRL CLOSED CELL 1/4" DIA. BACKER ROD	
H2		EF12	CRL CLOSED CELL 1/2" DIA. BACKER ROD	
H3		795BL	DOW CORNING 795 SILICONE BUILDING SEALANT	
H4		RTV408C	CRL CLEAR RTV408 NEUTRAL CURE SILICONE	
H5		----	1/4" X 2" LAG BOLT ASME B15.2.1 ZINC COATED ASTM 153	
H6		APK563	SHEAR BLOCKS W/SCREWS	
H7		----	ALUM ANGLE 1/8" X 1-1/2" X 1-1/2"	
H8		----	#8 X 1/2" PH SMS ZINC PLATED	
WD1	WTR. DIVRTR.	WD210	WATER DEFLECTOR	
WD2		WD280	WATER DEFLECTOR	
WD3		WD270	WATER DEFLECTOR	
WD4		WD200	WATER DEFLECTOR	