



TEST REPORT

Report No.: E4231.01-301-47

Rendered to:

CR LAURENCE, CO., INC.
Vernon, California

PRODUCT TYPE: Curtain Wall
SERIES/MODEL: 4500TSG – Unit Glazed

Title	Summary of Results
Design Pressure	±1920 Pa (±40.10 psf)
Air Infiltration	0.1 L/s/m ² (0.01 cfm/ft ²)
Water Penetration Resistance Test Pressure	580 Pa (12.11 psf)
Uniform Load Structural Test Pressure	±2880 Pa (±60.15 psf)

Reference must be made to Report No. E4231.01-301-47, dated 01/15/2015 for complete test specimen description and detailed test results.

1.0 Report Issued To: CR Laurence Co., Inc.
2100 East 38th Street
Vernon, California 90058

2.0 Test Laboratory: Architectural Testing, Inc.
4 Rancho Circle
Lake Forest, California 92630
949-460-9600

3.0 Project Summary:

3.1 Product Type: Curtain Wall

3.2 Series/Model: 4500TSG – Unit Glazed

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 Dates: 12/30/2014

3.5 Test Record Retention End Date: All test records for this report will be retained until December 30, 2018.

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

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 A. Any deviations are documented herein or on the drawings.

3.9 List of Official Observers:

<u>Name</u>	<u>Company</u>
Garrett Osterode	CR Laurence Co., Inc.
Ron Wooten	CR Laurence Co., Inc.
Jarod S. Hardman	Architectural Testing, Inc.

4.0 Test Methods:

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: 12.59 m ² (135.54 ft ²)	Width		Height	
	millimeters	inches	millimeters	inches
Overall size	4604	181-1/4	2735	107-11/16
Panel size	1524	60	2735	107-11/16

5.2 Frame Construction:

Frame Member	Material	Description
Sill	Aluminum	Sub sill (see attached Part No. TW703) secured to buck with 3/8" x 2" zinc coated lag bolts 6" from each end and 18" on center spacing, sealed at top of interior leg with cap bead of silicone sealant full length of span.
Sill	Aluminum	Base unit extrusion (see attached Part No. TW747).
Head	Aluminum	Header extrusion (see attached Part No. TW744).
Jamb	Aluminum	Flush filler (see attached Part No. PS145).
Jamb	Aluminum	Vertical end mullion (see attached Part No. TW718).
Horizontal mullion	Aluminum	Horizontal mullion (see attached Part No. TW728).

5.0 Test Specimen Description: (Continued)

5.2 Frame Construction: (Continued)

Frame Member	Material	Description
Vertical mullion	Aluminum	Female vertical extrusion (see attached Part No. TW770) press fit over male vertical extrusion (Part No. TW771) exposed interior union joint was sealed at sill approximately 2" up from top of sub sill.
Vertical mullion	Aluminum	Male vertical extrusion (see attached Part No. TW771) press fit into female vertical extrusion (Part No. TW771), exposed interior union joint was sealed at sill approximately 2" up from top of sub sill.
Head, sill, horizontal mullions	Aluminum	Horizontal face cap (see attached Part No. TW917), press fit to exterior face of members and retained by trim mounting clips (Part No. NC900) 2" from ends and 6" on center spacing.
Jambs, vertical mullions	Aluminum	Vertical face cap (see attached Part No. TW912), press fit to exterior face of members and retained by trim mounting clips (Part No. NC900) 2" from ends and 6" on center spacing.
Sill	Aluminum	End dam (see attached Part No. EL680), slid into ends of sub sill (Part No. TW703), sealed with silicone sealant and secured with two zinc plated #8 x 5/8" Phillips oval head Tek screws.

	Joinery Type	Detail
All corners	Flush	Secured through vertical jamb members at head and sill joints into screw bosses with three #10 x 1" Phillips hex head screws.
Horizontal mullions	Flush	Secured through vertical members into screw bosses with four #10 x 1" Phillips hex head screws.
Vertical mullions	Snap fit	Secured at male female union with snap fit system.

5.0 Test Specimen Description: (Continued)

5.3 Weatherstripping:

Description	Quantity	Location
15/32" EPDM Gasket (Part No. NP726)	2 rows	Press fit into interior side of vertical and sill face caps full length of span.
15/32" EPDM Gasket Part No. NP726)	2 rows	Press fit into interior side of horizontal mullion and head face caps full length of span with 10" spaces located 8" from each end of the underside of the caps.
11/32" EPDM Gasket (Part No. NP718)	1 row	Press fit into exterior face of head, sill, and jamb frame member full length of glazing pocket.
11/32" EPDM Gasket (Part No. NP718)	2 rows	Press fit into exterior face of horizontal and vertical mullion full length of glazing pocket.
Curtain Wall Gasket (Part No. NP503)	1 row	Press fit into male vertical extrusion (Part No. TW771) at exterior face, full length of member.
Vinyl Isolator (Part No. VS200000021)	1 row	Inserted into interior side of inner most leg of male vertical extrusion (Part No. TW771).

5.4 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 (A1-D)	1/4" tempered	1/4" tempered	Capture glazed with back bead of structural silicone sealant at the vertical mullion members. Secured in place at the horizontal mullions and head with snap in face caps.

Location	Quantity	Daylight Opening		Glass Bite
		millimeters	inches	
Upper lite	3	1470 x 1765	57-7/8 x 69-1/2	1/2"
Lower lite	3	1470 x 795	57-7/8 x 31-9/32	1/2"

5.0 Test Specimen Description: (Continued)

5.5 Drainage:

Drainage Method	Size	Quantity	Location
Weep hole	1/8" x 6"	12	8" from ends and 12" on center spacing through exterior face of base unit extrusion (Part No. TW747).
Weep hole	1/4" diameter	12	4" from ends of horizontal mullion and head face caps (Part No. TW917).

5.6 Hardware:

Description	Quantity	Location
Mounting clip head anchor	9	Located at the head of the specimen, three per panel, with 5" from each end and mid-span of each panel, each secured to buck with one 3/4" x 2" zinc coated lag bolt.
Trim mounting clip	132	Twist locked into exterior face of frame members 2" from each end of member and 6" on center spacing, 21 clips per jamb and 10 clips per horizontal member.

5.7 Reinforcement:

Part Number	Location	Material
TW700	Clip fit to interior side of male vertical extrusion (Part No. TW771)	Aluminum

6.0 Installation:

The specimen was installed into a Pine wood buck. The rough opening allowed for a 1/4" - 1/2" shim space. The interior and exterior perimeter of the window was sealed with silicone sealant.

Location	Anchor Description	Anchor Location
Through head clip	3/4" x 3" zinc coated lag bolt	One fastener per clip through provided predrilled hole.
Through sub sill	3/8" x 2" zinc coated lag bolt	6" from each end and 18" on center spacing.

7.0 Test Results: The temperature during testing was 17°C (63°F). The results are tabulated as follows:

Title of Test	Results	Allowed	Note
Air Leakage, per ASTM E 283 at 300 Pa (6.2 psf)	0.1 L/s/m ² (0.01 cfm/ft ²)	0.5 L/s/m ² (0.1 cfm/ft ²) max.	
Water Penetration, per ASTM E 331 at 580 Pa (12.11 psf)	Pass	No leakage	
Uniform Load Deflection, per ASTM E 330 taken at vertical mullion +1920 Pa (+40.10 psf) -1920 Pa (-40.10 psf)	9.4 mm(0.37") 11.7 mm(0.46")	15.2 mm (0.60") max. 15.2 mm (0.60") max.	1, 2
Uniform Load Structural, per ASTM E 330 taken at vertical mullion +2880 Pa (+60.15 psf) -2880 Pa (-60.15 psf)	0.2 mm (0.01") 1.5 mm (0.06")	5.6 mm (0.22") max. 5.6 mm (0.22") max.	1, 2

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

Note 1: Loads were held for 10 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.

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 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: Jarod Hardman

Jarod S. Hardman
Laboratory Manager



Digitally Signed by: Leaton Kirk

Leaton Kirk
Director – Regional Operations

JSH:ss

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

Appendix-A: Drawings (16)

Revision Log

<u>Rev. #</u>	<u>Date</u>	<u>Page(s)</u>	<u>Revision(s)</u>
0	1/12/15	N/A	Original Report Issue.
1	1/15/15	Cover, Page 1	Revised series/model name.



Test Report No.: E4231.01-301-47

Report Date: 01/12/15

Revision 1 Date: 01/15/15

Appendix A

Drawings

REVISIONS

182 $\frac{1}{4}$

57 $\frac{3}{4}$ 57 $\frac{3}{4}$ 57 $\frac{3}{4}$

2 $\frac{1}{4}$ 2 $\frac{1}{4}$ 2 $\frac{1}{4}$

PANEL "A"

PANEL "B"

PANEL "C"

4 $\frac{2}{2}$ 1 $\frac{2}{2}$ 5 $\frac{2}{2}$ 6 $\frac{2}{2}$ 7 $\frac{2}{2}$ 2 $\frac{2}{2}$ 3 $\frac{2}{2}$

108

31 $\frac{1}{3}$ 2 $\frac{1}{4}$

4500 SSG UNIT GLAZE

Job Name:

Glazing Contractor:

DATE: 12-31-2014
DRAWN BY: GDO
CHECKED BY: XX
SCALE: AS SHOWN
JOB #: PTC428835

SHT 1 OF 3



Report #: E4231-301-47
Date: 01/12/2015
Verified by: *[Signature]*



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



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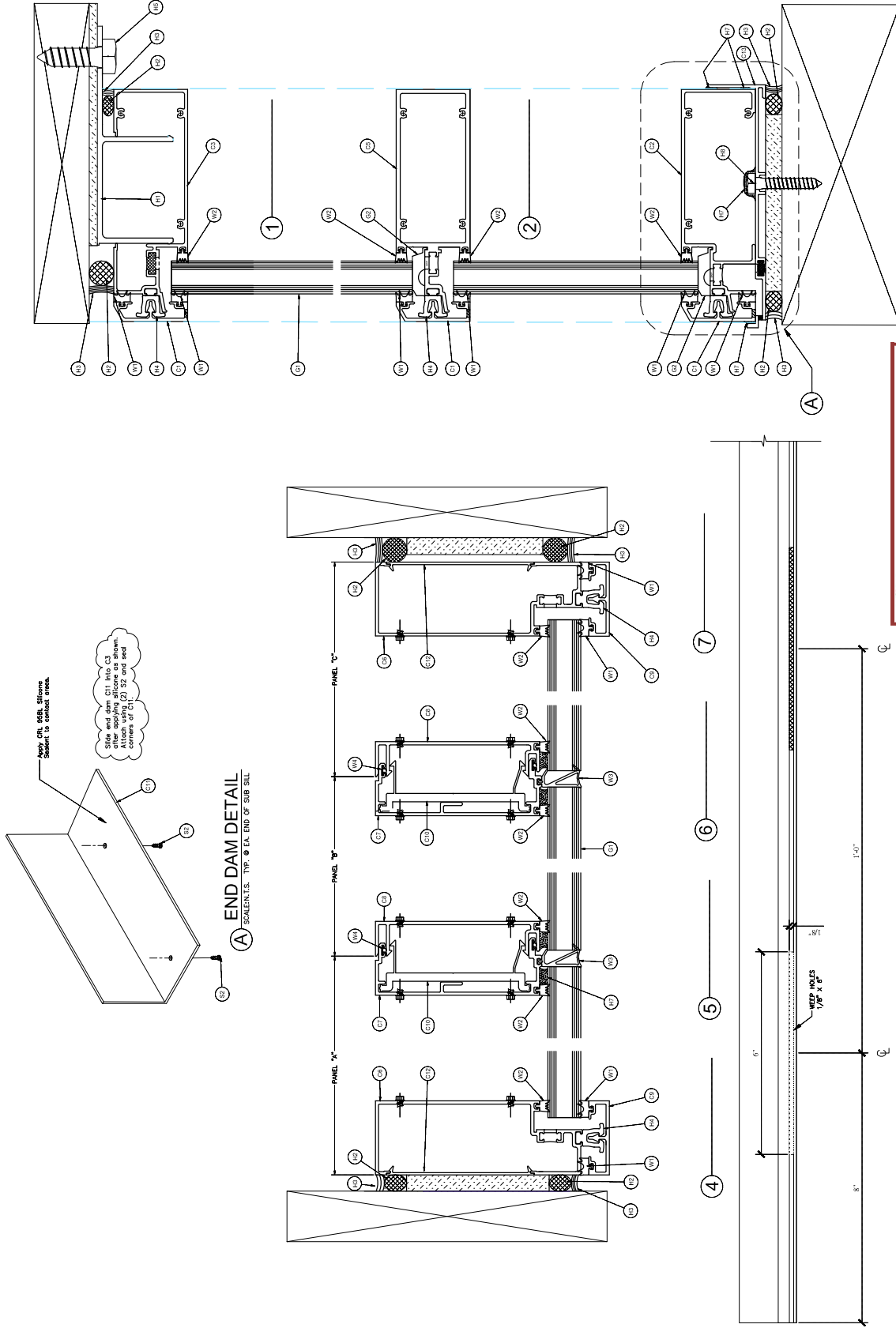
4500 SSG UNIT GLAZE

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DRAWN BY: GDO
CHECKED BY: XX
SCALE: AS SHOWN
JOB #: PTC428835

SHT 2 OF 3



Report #: E4231-301-47
Date: 01/12/2015
Verified by: [Signature]
Architectural Testing

SUB SILL WEEP HOLE DETAIL TW 705



Report #:
Date:
Verified by:

E4231-301-47
01/12/2015



ITEM		PT. NO.	PART DESCRIPTION	
C1	FRAME COMPONENTS	TW917	CRL U.S. ALUMINUM HORIZONTAL FACE CAP	
C2		TW747	CRL U.S. ALUMINUM BASE UNIT EXTRUSION	
C3		TW744	CRL U.S. ALUMINUM HEADER EXTRUSION	
C5		TW728	CRL U.S. ALUMINUM HORIZONTAL MULLION	
C6		TW718	CRL U.S. ALUMINUM VERTICAL END MULLION	
C7		TW770	CRL U.S. ALUMINUM FEMALE VERTICAL EXTRUSION	
C8		TW771	CRL U.S. ALUMINUM MALE VERTICAL EXTRUSION	
C9		TW912	CRL U.S. ALUMINUM VERTICAL FACE CAP	
C10		TW700	CRL U.S. ALUMINUM STIFFENER PLATES	
C11		EL680	CRL U.S. ALUMINUM END DAMS	
C12		PS145	CRL U.S. ALUMINUM FLUSH FILLER	
C13		TW705	CRL U.S. ALUMINUM SUB SILL EXTRUSION	
W1	WTHR. STRIP	NP726	CRL 15/32" EPDM CURTAIN WALL EXT. GASKET	
W2		NP718	CRL 11/32" BLACK EPDM CURTAIN WALL INT. GASKET	
W3		NP503	CRL DOOR CURTAIN WALL GASKET	
W4		VS2000000021	CRL VINYL ISOLATOR	
G1	GLASS		.025 X .050 X .025 INSULATED GLASS (TEMPERED) DUAL SEAL	
G2		SB710-B	NEOPRENE SETTING BLOCK	
H1	HARDWARE	HC751	CRL MOUNTING CLIP HEAD ANCHOR	
H2		EF34	CRL CLOSED CELL 3/4" DIA. BACKER ROD	
H3		CRL 95BL	CRL BLACK STRUCTURAL NEUTRAL CURE SILICONE	
H4		NC900	CRL TRIM MOUNTING CLIP	
H5		----	3/4" X 2" LAG BOLT ASME B15.2.1 ZINC COATED ASTM 153	
H6				
H7		33SAL	CRL ALUMINUM 33S SILICONE SEALANT	
H8		----	3/8" X 2" LAG BOLT ASME B15.2.1 ZINC COATED ASTM 153	
S1		ST251	#10X1" PHILLIPS WASHER HEAD SMS TYPE AB	
S2		ST19011	#8X5/8" PHILLIPS OH. TEK. ZP.	

REVISIONS



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4500 SSG UNIT GLAZE

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CHECKED BY: XX
SCALE: NONE
JOB #: PTC428835