

CR LAURENCE CO., INC. TEST REPORT

SCOPE OF WORK

AIR / WATER / STRUCTURAL TESTING ON OST451, WINDOW WALL/STOREFRONT SYSTEM
(EXTERIOR GLAZE)

REPORT NUMBER

J9705.01-303-47

TEST DATE(S)

07/22/19 - 07/25/19

ISSUE DATE

11/19/19

REVISION DATE

12/16/19

RECORD RETENTION END DATE

07/25/23

PAGES

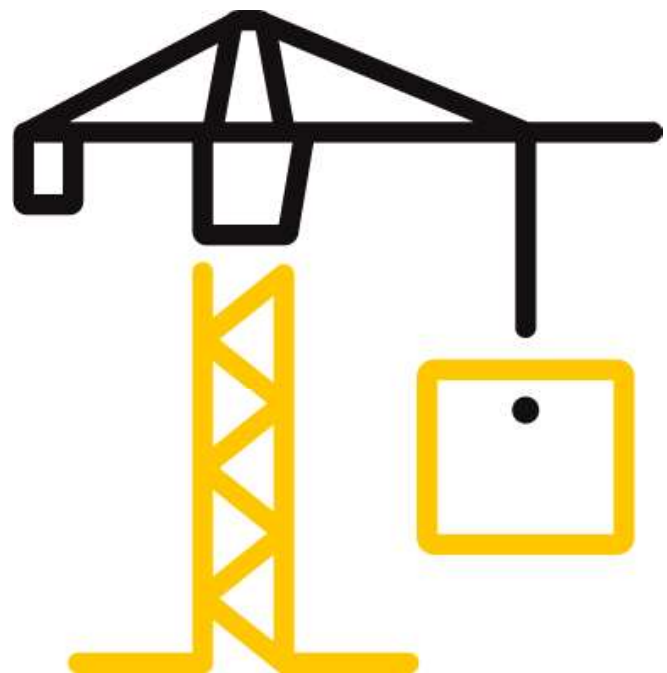
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DOCUMENT CONTROL NUMBER

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RT-R-AMER-Test-2805

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TEST REPORT FOR CR LAURENCE CO., INC.

Report No.: J9705.01-303-47

Date: 11/19/19

REPORT ISSUED TO

CR LAURENCE CO., INC.

2503 E. Vernon Avenue

Los Angeles, CA 90058

SECTION 1

SCOPE

Intertek Building & Construction (B&C) was contracted by CR Laurence Co., Inc., Los Angeles to perform testing in accordance with AAMA 501, *Methods of Test for Exterior Walls*, on their OST451, Storefront System (exterior glaze). Results obtained are tested values and were secured by using the designated test method(s). Testing was conducted at CR Laurence Co., Inc. test facility in Los Angeles, California.

This report does not constitute certification of this product nor an opinion or endorsement by this laboratory.

SECTION 2

SUMMARY OF TEST RESULTS

TITLE	RESULTS
Design Pressure	±1200 Pa (±25.06 psf)
Air Infiltration	0.3 L/s/m ² (0.06 cfm/ft ²)
Water Penetration Resistance Test Pressure	400 Pa (8.35 psf)
Uniform Load Structural Test Pressure	±1800 Pa (±37.59 psf)

For INTERTEK B&C:

COMPLETED BY:	Benjamin Johns	REVIEWED BY:	Jarod Hardman
TITLE:	Technician – Building & Construction	TITLE:	Operations Manager
SIGNATURE:	 Digitally Signed by: Benjamin Johns	SIGNATURE:	 Digitally Signed for: Jarod Hardman by Anabel Becerra
DATE:	12/16/19	DATE:	12/16/19

jsh:ab

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SECTION 3

TEST METHOD(S)

The specimens were evaluated in accordance with the following:

AAMA 205-15, *In-Plant Testing Guidelines for Manufacturers and Independent Laboratories*

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

AAMA 501.1-17, *Standard Test Method for Water Penetration of Windows, Curtain Walls and Doors using Dynamic Pressure*

AAMA 501.4-18, *Recommended Static Testing Method for Evaluating Curtain Wall and Storefront Systems Subjected to Seismic and Wind Induced Interstory Drift*

ASTM E283-04(2012), *Standard Test Method for Determining Rate of Air Leakage Through Exterior Windows, Curtain Walls, and Doors Under Specified Pressure Differences Across the Specimen*

ASTM E330/E330M-14, *Standard Test Method for Structural Performance of Exterior Windows, Doors, Skylights and Curtain Walls by Uniform Static Air Pressure Difference*

ASTM E331-00(2016), *Standard Test Method for Water Penetration of Exterior Windows, Skylights, Doors, and Curtain Walls by Uniform Static Air Pressure Difference*

ASTM E547-00(2016), *Standard Test Method for Water Penetration of Exterior Windows, Skylights, Doors, and Curtain Walls by Cyclic Static Air Pressure Difference*

SECTION 4

MATERIAL SOURCE/INSTALLATION

Test specimen was provided by the client. Representative samples of the test specimen were not retained by Intertek B&C.

The specimen was installed into a Spruce-Pine-Fir wood buck. The rough opening allowed for a 3/8" shim space. The interior and exterior perimeter of the system was sealed with sealant. Installation of the tested product was performed by the client.

LOCATION	ANCHOR DESCRIPTION	ANCHOR LOCATION
Through head and sill	1/4" – 3 1/2" anchor bolt	6" from center line of verticals and mid-span of each lite.

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SECTION 5 EQUIPMENT

Calibration of test equipment was performed by Intertek B&C in accordance with AAMA 205-15 "In-Plant Testing Guidelines for Manufacturers and Independent Laboratories"

SECTION 6 LIST OF OFFICIAL OBSERVERS

NAME	COMPANY
Chien Huang	CR Laurence Co., inc.
Benjamin Johns	Intertek B&C
Jarod Hardman	Intertek B&C

SECTION 7 TEST SPECIMEN DESCRIPTION

Product Type: Storefront System

Series/Model: OST451

Product Size(s):

OVERALL AREA:	WIDTH		HEIGHT	
	millimeters	inches	millimeters	inches
15.19 m ² (163.48 ft ²)				
Overall Size	5537	218	2743	108

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Frame Construction:

FRAME MEMBER	MATERIAL	DESCRIPTION
Jambs	Aluminum	Part No. OT652 (see attached drawings)
Head	Aluminum	Part No. OT668 (see attached drawings section 01)
Sill Insert	Aluminum	Part No. OT676 (see attached drawings section 08)
Sill Channel	Aluminum	Part No. OT662 (see attached drawings section 08)
Sill Face Plate	Aluminum	Part No. OG539 (see attached drawings section 08)
SSG Vertical Mullion	Aluminum	Part No. OT551 (see attached drawings section 03)
Vertical Mullion	Aluminum	Part No. OT655 (see attached drawings section 02)
Head Channel	Aluminum	Part No. OT668 (see attached drawings section 06)
Head Insert	Aluminum	Part No. OT666 (see attached drawings section 06)
Intermediate Horizontal	Aluminum	Part No. OT633 (see attached drawings section 07)
Intermediate Horizontal Face Plate	Aluminum	Part No. OG534 (see attached drawings section 07)
Insert Intermediate Horizontal	Aluminum	Part No. OG532 (see attached drawings section 07)
Female Expansion Mullion	Aluminum	Part No. FF569 (see attached drawings section 04)
Male Expansion Mullion	Aluminum	Part No. FF561(see attached drawings section 04)
	JOINERY TYPE	DETAIL
All Corners	Flush	2 #12 x2" hex head screws through frame members Part No. ST269

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Reinforcement:

DRAWING NUMBER	LOCATION	MATERIALS
03	Sill	Steel Part No. SS551 see attached drawings)

Weatherstripping:

DESCRIPTION	QUANTITY	LOCATION
Gasket	10 rows	Interior of IG
Vertical SSG Gasket	2 rows	Interior of SSG Vertical Mullion
"W" Edge Block	4 rows	Interior of Vertical mullion, Expansion mullion & Jamb

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	1/2" ALUM	1/4" Tempered	1/4" 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	1321 x 1778	52 x 70	7/16"
Lower Fixed Lite	4	1321 x 813	52 x 32	7/16"

Drainage:

DRAINAGE METHOD	SIZE	QUANTITY	LOCATION
Weep Hole	7/16" x 1/4"	8	2 per bay; equal spacing

Hardware:

DESCRIPTION	QUANTITY	LOCATION
Anchor Clip (Part No. AP563)	8	Intermediate Horizontal, 2 per bay.
1/4" - 3 1/2" Anchor Bolts	24	Head, Sill, Jamb
#12 x 2" HHS	16	Intermediate Horizontal
1/4" x 1/2" PH SMS Screws	8	Intermediate Horizontal

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**SECTION 8
TEST RESULTS**

The temperature during testing was 23°C (74°F). The results are tabulated as follows:

TITLE OF TEST	RESULTS	ALLOWED	NOTE
Uniform Load Preload, per ASTM E330 +600 Pa (+12.5 psf)	No damage	No damage	
Air Leakage, Infiltration per ASTM E283 at 75 Pa (1.57 psf)	0.1 L/s/m ² (0.01 cfm/ft ²)	0.3 L/s/m ² (0.06 cfm/ft ²) max.	1
Air Leakage, Infiltration per ASTM E283 at 300 Pa (6.27 psf)	0.3 L/s/m ² (0.05 cfm/ft ²)	0.3 L/s/m ² (0.06 cfm/ft ²) max.	1
Air Leakage, Exfiltration per ASTM E283 at 75 Pa (1.57 psf)	0.1 L/s/m ² (0.01 cfm/ft ²)	0.3 L/s/m ² (0.06 cfm/ft ²) max.	1
Air Leakage, Exfiltration per ASTM E283 at 300 Pa (6.27 psf)	<0.1 L/s/m ² (<0.01 cfm/ft ²)	0.3 L/s/m ² (0.06 cfm/ft ²) max.	1
Water Penetration, per ASTM E331 at 400 Pa (8.35 psf)	Pass	No leakage	
Water Penetration, per ASTM E547 at 400 Pa (8.35 psf)	Pass	No leakage	
Water Penetration, per AAMA 501.1 at 400 Pa (8.35 psf)	Pass	No leakage	
Interstory Drift – 1% Lateral Seismic, per AAMA 501.4	1.08", 3 cycles No damage	No damage	
Air Leakage, Infiltration per ASTM E283 at 75 Pa (1.57 psf)	0.1 L/s/m ² (0.01 cfm/ft ²)	0.3 L/s/m ² (0.06 cfm/ft ²) max.	1
Air Leakage, Infiltration per ASTM E283 at 300 Pa (6.27 psf)	0.1 L/s/m ² (0.02 cfm/ft ²)	0.3 L/s/m ² (0.06 cfm/ft ²) max.	1

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TITLE OF TEST	RESULTS	ALLOWED	NOTE
Air Leakage, Exfiltration per ASTM E283 at 75 Pa (1.57 psf)	0.3 L/s/m ² (0.06 cfm/ft ²)	0.3 L/s/m ² (0.06 cfm/ft ²) max.	1
Air Leakage, Exfiltration per ASTM E283 at 300 Pa (6.27 psf)	0.3 L/s/m ² (0.06 cfm/ft ²)	0.3 L/s/m ² (0.06 cfm/ft ²) max.	1
Water Penetration, per ASTM E331 at 400 Pa (8.35 psf)	Pass	No leakage	
Uniform Load Deflection, per ASTM E330 Deflections taken at vertical +1200 Pa (+25.06 psf) -1200 Pa (-25.06 psf)	4.1 mm (0.16") 6.1 mm (0.24")	13.2 mm (0.52") max. 13.2 mm (0.52") max.	2, 3
Air Leakage, Infiltration per ASTM E283 at 75 Pa (1.57 psf)	<0.1 L/s/ m ² (<0.01 cfm/ ft ²)	0.3 L/s/m ² (0.06 cfm/ft ²) max.	1
Air Leakage, Infiltration per ASTM E283 at 300 Pa (6.27 psf)	<0.1 L/s/ m ² (<0.01 cfm/ ft ²)	0.3 L/s/m ² (0.06 cfm/ft ²) max.	1
Air Leakage, Exfiltration per ASTM E283 at 75 Pa (1.57 psf)	<0.1 L/s/ m ² (<0.01 cfm/ ft ²)	0.3 L/s/m ² (0.06 cfm/ft ²) max.	1
Air Leakage, Exfiltration per ASTM E283 at 300 Pa (6.27 psf)	<0.1 L/s/ m ² (<0.01 cfm/ ft ²)	0.3 L/s/m ² (0.06 cfm/ft ²) max.	1
Water Penetration, per ASTM E331 at 400 Pa (8.35 psf)	Pass	No leakage	
Uniform Load Structural, per ASTM E330 Permanent set taken at vertical +1800 Pa (+37.59 psf) -1800 Pa (-37.59 psf)	0.3 mm (0.01") 0.5 mm (0.02")	4.6 mm (0.18") max. 4.6 mm (0.18") max.	2, 3
Interstory Drift – 1.5% Lateral Seismic, per AAMA 501.4	1.75", 3 cycles No damage	No damage	

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TITLE OF TEST	RESULTS	ALLOWED	NOTE
Air Leakage, Infiltration per ASTM E283 at 75 Pa (1.57 psf)	<0.1 L/s/ m ² (<0.01 cfm/ ft ²)	0.3 L/s/m ² (0.06 cfm/ft ²) max.	1
Air Leakage, Infiltration per ASTM E283 at 300 Pa (6.27 psf)	<0.1 L/s/ m ² (<0.01 cfm/ ft ²)	0.3 L/s/m ² (0.06 cfm/ft ²) max.	1
Air Leakage, Exfiltration per ASTM E283 at 75 Pa (1.57 psf)	<0.1 L/s/ m ² (<0.01 cfm/ ft ²)	0.3 L/s/m ² (0.06 cfm/ft ²) max.	1
Air Leakage, Exfiltration per ASTM E283 at 300 Pa (6.27 psf)	<0.1 L/s/ m ² (<0.01 cfm/ ft ²)	0.3 L/s/m ² (0.06 cfm/ft ²) max.	1
Water Penetration, per ASTM E331 at 400 Pa (8.35 psf)	Pass	No leakage	

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

Note 1: Test Date 07/22/19 / Time: 08:00 AM

Note 2: Loads were held for 10 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.

TEST REPORT FOR CR LAURENCE CO., INC.

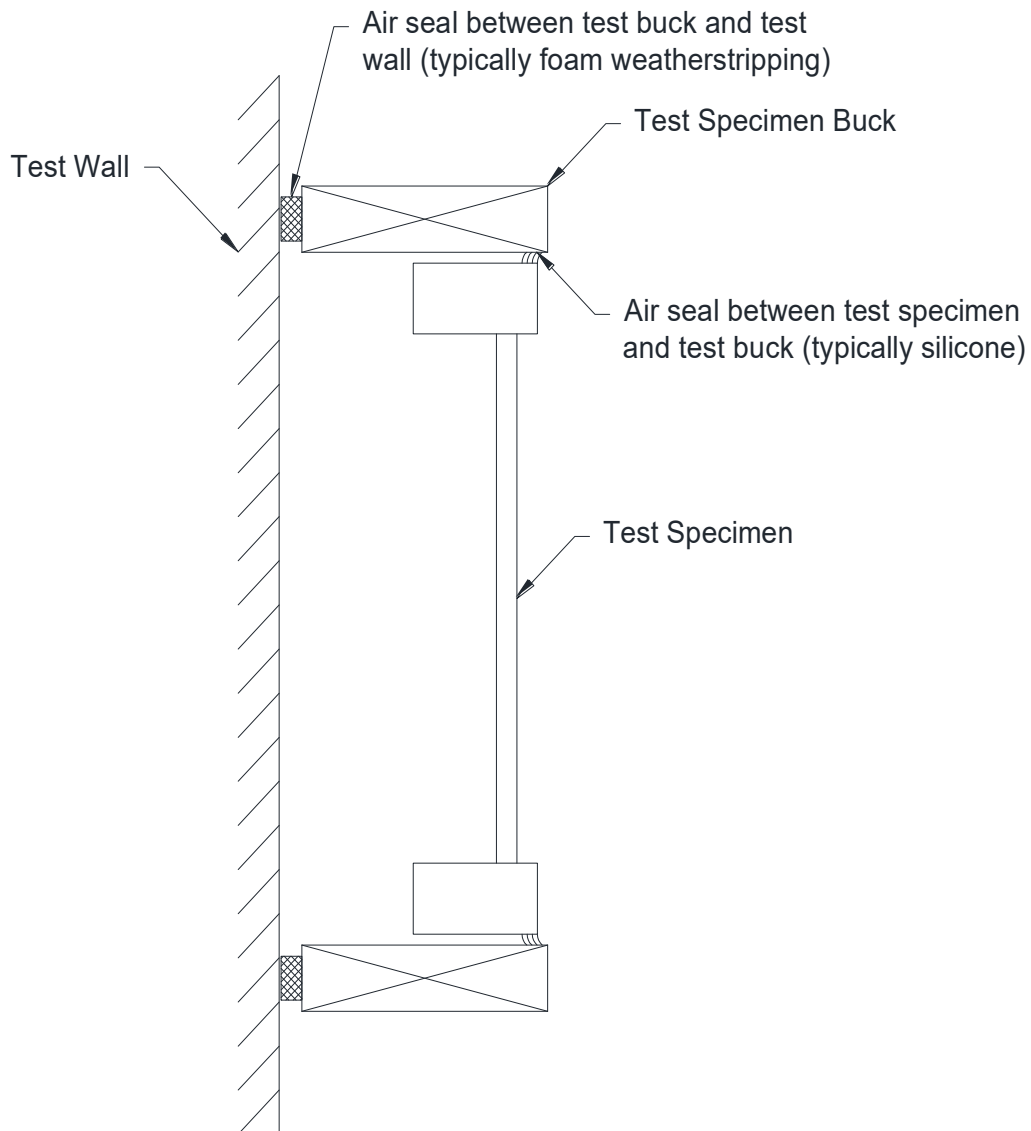
Report No.: J9705.01-303-47

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SECTION 9

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.





Total Quality. Assured.

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Lake Forest, California 92630

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Date: 11/19/19

SECTION 10
DRAWINGS

The test specimen drawings have been reviewed by Intertek B&C and are representative of the test specimen(s) reported herein.

REVISIONS



C.R. LAURENCE CO.
ARCHITECTURAL PRODUCTS
2100 E. 38TH Street, Los Angeles, CA 90008
www.crlaurence.com

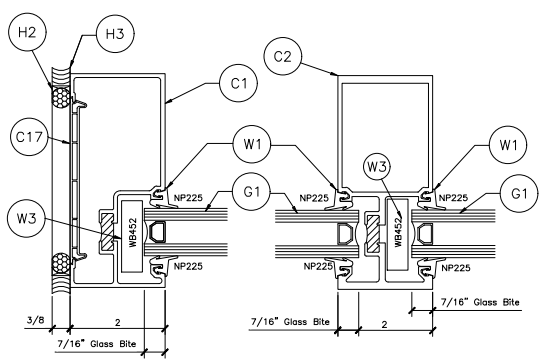
SERIES OST451
EXTERIOR GLAZED
STOREFRONT SYSTEM

JOB Number:

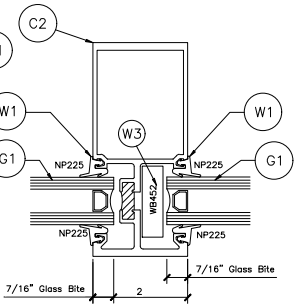
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CHECKED BY: RA
SCALE: AS SHOWN
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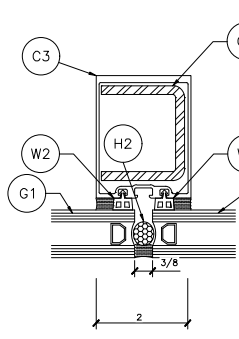
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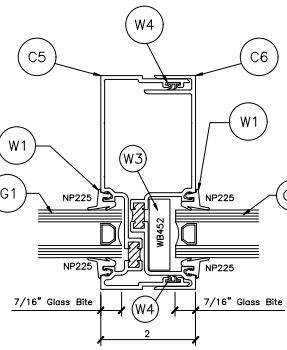
① SECTION DETAIL AT JAMB



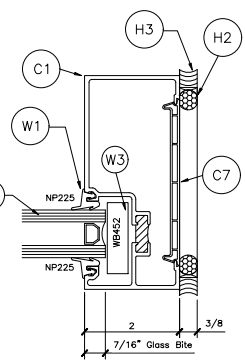
② SECTION DETAIL AT VERTICAL



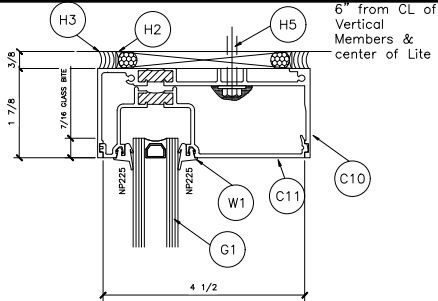
③ SECTION DETAIL AT STRUCTURAL SILICONE



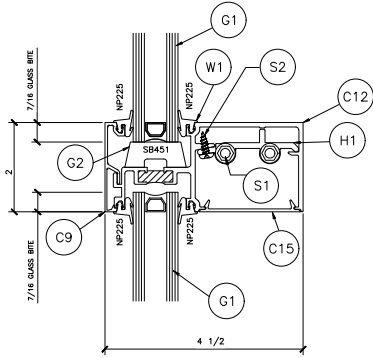
④ SECTION DETAIL AT EXPANSION MULLION



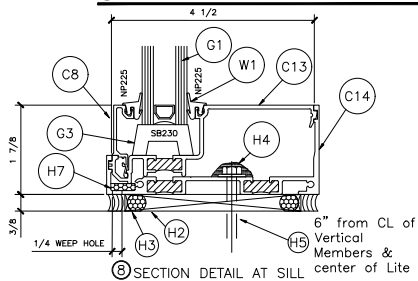
⑤ SECTION DETAIL AT JAMB



⑥ SECTION DETAIL AT HEAD



⑦ SECTION DETAIL AT INTERMEDIATE HORIZONTAL



⑧ SECTION DETAIL AT SILL

ITEM	PT. NO.	PART DESCRIPTION
C1	0T652	WALL JAMB
C2	0T625	VERTICAL MULLION
C3	0T551	SSG VERTICAL MULLION
C4	SS551	OPTIONAL STEEL STIFFENER
C5	FF561	MALE EXPANSION MULLION
C6	FF569	FEMALE EXPANSION MULLION
C7	PV100	PVC JAMB FILLER
C8	0G539	SILL FACE PLATE
C9	0G534	INTERMEDIATE HORIZONTAL FACE PLATE (EXT. GLAZE)
C10	0T668	HEAD CHANNEL (EXT. GLAZE)
C11	0T666	HEAD INSERT (EXT. GLAZE)
C12	0T633	INTERMEDIATE HORIZONTAL (EXT. GLAZE)
C13	0T676	SILL INSERT (EXT. GLAZE)
C14	0T662	SILL CHANNEL (EXT. GLAZE)
C15	0G532	INSERT INTERMEDIATE HORIZONTAL (EXT. GLAZE)
W1	NP225	GASKET
W2	SP450	VERTICAL SSG GASKET
W3	WB452	"W" EDGE BLOCK
W4	VS200	
G1		1/4" TEMPERED GLASS - 1/2" AIR FILLED ALUM SPACER - 1/4" TEMPERED GLASS
G2	SB451	SETTING BLOCK INTERMEDIATE (EXT. GLAZE)
G3	SB230	SETTING BLOCK SILL
H1	AP563	ANCHOR CLIP
H2	EF12C	1/2" CLOSED CELL BACKER ROD
H3	DC785BL	DOW CORNING 795
H4	RTV408C	CRL-RTV 408 CLEAR
H5	----	3/8"-16 x 6" ANCHOR BOLTS
H7	UB-635	URETHANE BAFFLE
S1	ST269	#12 x 2" HEX HEAD SCREWS
S2	ST206	1/4" x 1/2" PH SMS SCREWS

REVISIONS



C.R. LAURENCE CO.
 ARCHITECTURAL PRODUCTS
 2100 E. 38TH Street, Los Angeles, CA 90008
 www.crlaurence.com

Job Name:
 Glazing Contractor:
 DATE: 10/25/2011
 DRAWN BY: CH
 CHECKED BY: RA
 SCALE: AS SHOWN
 JOB #: PTC865216

SERIES 0ST451
 EXTERIOR GLAZED
 STOREFRONT SYSTEM

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<u>ITEM</u>		<u>PT. NO.</u>	<u>PART DESCRIPTION</u>
C1	FRAME & SASH COMPONENTS	OT652	WALL JAMB
C2		OT655	VERTICAL MULLION
C3		OT551	SSG VERTICAL MULLION
C4		SS551	OPTIONAL STEEL STIFFENER
C5		FF561	MALE EXPANSION MULLION
C6		FF569	FEMALE EXPANSION MULLION
C7		PV100	PVC JAMB FILLER
C8		OG539	SILL FACE PLATE
C9		OG534	INTERMEDIATE HORIZONTAL (EXT. GLAZE) FACE PLATE
C10		OT668	HEAD CHANNEL (EXT. GLAZE)
C11		OT666	HEAD INSERT (EXT. GLAZE)
C12		OT663	INTERMEDIATE HORIZONTAL (EXT. GLAZE)
C13		OT676	SILL INSERT (EXT. GLAZE)
C14		OT662	SILL CHANNEL (EXT. GLAZE)
C15		OG532	INSERT INTERMEDIATE HORIZONTAL (EXT. GLAZE)
	WEATHERSTRIP		
W1		NP225	GASKET
W2		SP450	VERTICAL SSG GASKET
W3		WB452	"W" EDGE BLOCK
W4		VS200	
	GLAZING		1/4 TEMPERED GLASS - 1/2" AIR FILLED ALUM SPACER - 1/4" TEMPERED GLASS
G2		SB451	SETTING BLOCK INTERMEDIATE (EXT. GLAZE)
G3		SB230	SETTING BLOCK SILL
	HARDWARE	AP563	ANCHOR CLIP
H1		EF12C	1/2" CLOSED CELL BACKER ROD
H2		DC795BL	DOW CORNING 795
H3		RTV408C	CRL-RTV 408 CLEAR
H4		----	3/8"-16 x 8" ANCHOR BOLTS
H5		UB-635	URETHANE BAFFLE
H7		ST269	#12 x 2" HEX HEAD SCREWS
S1		ST206	1/4" x 1/2" PH SMS SCREWS
S2			

TEST REPORT FOR CR LAURENCE CO., INC.

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Date: 11/19/19

SECTION 11 REVISION LOG

REVISION #	DATE	PAGES	REVISION
0	11/19/19	N/A	Original Report Issue
1	11/22/19	3	Update AAMA 501.4 to most current standard reference.
1	11/22/19	4	Correct product size value reference.
1	11/22/19	6	Correct weatherstripping count, DLO values, adjust drainage text formatting, and reinforcement formatting.
1	11/22/19	8-9	Correct superscript error in air reporting values.
2	12/16/19	12-14	Update overall drawings assembly and cross section drawings.