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CR LAURENCE CO., INC.

ACOUSTICAL PERFORMANCE TEST REPORT

SCOPE OF WORK
ASTM E90 SOUND TRANSMISSION LOSS TESTING ON A IW8100, FIXED WINDOW

REPORT NUMBER
I0167.01-303-11 R0

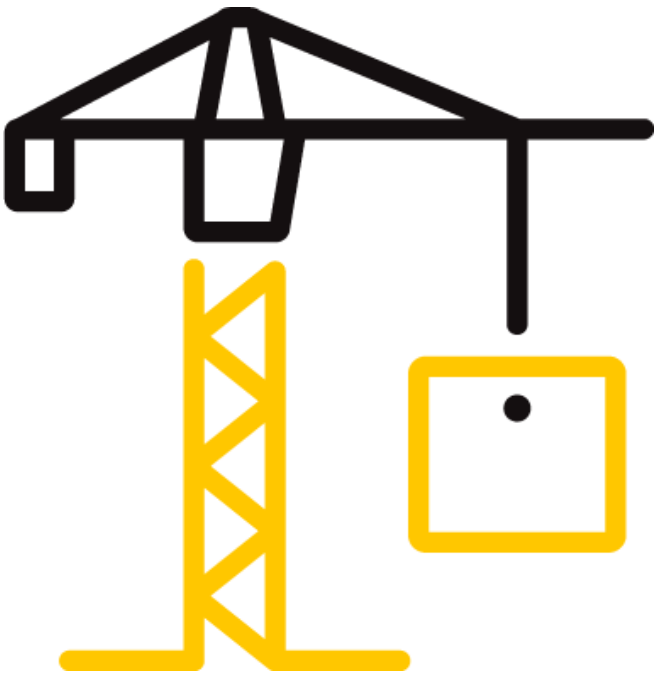
TEST DATE
02/01/18

ISSUE DATE
02/22/18

RECORD RETENTION END DATE
02/01/22

PAGES
14

DOCUMENT CONTROL NUMBER
ATI 00596 (07/24/17)
RT-R-AMER-Test-2761



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TEST REPORT FOR CR LAURENCE CO., INC.
Report No.: I0167.01-303-11 R0
Date: 02/22/18

REPORT ISSUED TO

CR LAURENCE CO, INC.
2503 East Vernon Avenue
Los Angeles, California 90058

SECTION 1

SCOPE

Intertek Building & Construction (B&C) was contracted by CR Laurence Co, Inc. to conduct a sound transmission loss test. Results obtained are tested values and were secured by using the designated test method(s). The complete test data is included herein. The client provided the test specimen. All measurements were conducted in the HT test chambers at Intertek B&C located in Lake Forest, California.

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

SECTION 2

SUMMARY OF TEST RESULTS

SERIES/MODEL	IW8100
TYPE	Fixed Window
GLAZING (Nominal Dimensions)	1-7/32" IG (1/4" Annealed Exterior, 1/2" Air Space, 0.1875" x 0.09325" SGP x 0.1875" Laminated Interior), Glass Temperature 75°F
DATA FILE NO.	I0167.01
STC	36
OITC	30
AIR INFILTRATION AT 1.57 PSF	0.04 cfm/ft²
AIR INFILTRATION AT 6.27 PSF	< 0.01 cfm/ft²

For INTERTEK B&C:

COMPLETED BY:	Ryan R. Lau	**REVIEWED BY:**	Bradlay D. Hunt
TITLE:	Technician II	**TITLE:**	Laboratory Manager
SIGNATURE:	Digitally Signed by: Ryan Lau	**SIGNATURE:**	Digitally Signed by: Bradlay Hunt
DATE:	02/22/18	**DATE:**	02/22/18

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SECTION 3
TEST METHOD(S)

The specimens were evaluated in accordance with the following:

ASTM E90-09 (2016), *Standard Test Method for Laboratory Measurement of Airborne Sound Transmission Loss of Building Partitions and Elements*

ASTM E413-16, *Classification for Rating Sound Insulation*

ASTM E1332-16, *Standard Classification for Rating Outdoor-Indoor Sound Attenuation*

ASTM E2235-04 (2012), *Standard Test Method for Determination of Decay Rates for Use in Sound Insulation Test Methods*

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*

SECTION 4
SPECIMEN INSTALLATION

A sound transmission loss test was initially performed on a filler wall.

The specimen plug was removed from the filler wall assembly. A filler wall-reducing element was used to adjust the test opening size to accommodate the test specimen. The reducing element consisted of a double 2x6 wood stud wall construction with three layers of 5/8" drywall on both sides. The stud cavities in the wall were insulated with two layers of R-19 fiberglass insulation. The specimen was placed on an isolation pad in the custom test opening. Duct seal was used to seal the perimeter of the specimen to the test opening on both sides. The interior side of the specimen, when installed, was approximately 1/4" from being flush with the receive room side of the filler wall. A stethoscope was used to check for any abnormal air leaks around the test specimen prior to testing. Operable portions of the test specimen, if any, were cycled at least five times prior to testing.

SECTION 5
EQUIPMENT

The equipment listed meets the requirements of the test methods stated in Section 3 of this report.

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INSTRUMENT	MANUFACTURER	MODEL	DESCRIPTION	ASSET #	CAL DATE
Data Acquisition Card	National Instruments	PXIe-4464	Data Acquisition Card	INT00627	10/17 *
Data Acquisition Card	National Instruments	PXIe-4464	Data Acquisition Card	INT00395	10/17 *
Data Acquisition Card	National Instruments	PXIe-4464	Data Acquisition Card	INT00396	10/17 *
Source Room Microphone	PCB Piezotronics	378C20	Microphone and Preamplifier	INT00239	04/17
Source Room Microphone	PCB Piezotronics	378C20	Microphone and Preamplifier	INT00240	04/17
Source Room Microphone	PCB Piezotronics	378C20	Microphone and Preamplifier	INT00241	04/17
Source Room Microphone	PCB Piezotronics	378C20	Microphone and Preamplifier	INT00242	04/17
Source Room Microphone	PCB piezotronics	378C20	Microphone and Preamplifier	INT00243	04/17
Receive Room Microphone	PBC Piezotronics	378C20	Microphone and Preamplifier	INT00244	04/17
Receive Room Microphone	PCB Piezotronics	378C20	Microphone and Preamplifier	INT00245	04/17
Receive Room Microphone	PCB Piezotronics	378C20	Microphone and Preamplifier	INT00246	04/17
Receive Room Microphone	PCB Piezotronics	378C20	Microphone and Preamplifier	INT00247	04/17
Receive Room Microphone	PCB Piezotronics	378C20	Microphone and Preamplifier	INT00228	04/17
Receive Room Environmental Indicator	Comet	T7510	Receive Room	INT00299	10/17
Source Room Environmental Indicator	Comet	T7510	Source Room	INT00300	10/17
Microphone Calibrator	Norsonic	1251	Pistonphone Calibrator	INT00288	06/17

**- Note: The calibration frequency for this equipment is every two years per the manufacturer's recommendation.*

TEST CHAMBER

	VOLUME	DESCRIPTION
RECEIVE ROOM	231 m^3	Rotating vane and stationary diffusers Temperature and humidity controlled Isolation pads under the floor
SOURCE ROOM	196 m^3	Stationary diffusers only Temperature and humidity controlled

	MAXIMUM SIZE	DESCRIPTION
TL TEST OPENING	4.27 m wide by 3.05 m high	Vibration break between source and receive rooms

N/A-Not Applicable

SECTION 6
LIST OF OFFICIAL OBSERVERS

NAME	COMPANY
Garrett Osterode	CR Laurence Co, Inc.
Ryan R. Lau	Intertek B&C
Leeland S. Hoover	Intertek B&C

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SECTION 7
TEST PROCEDURE

Air Infiltration

The air seal between the test specimen and the test wall. 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. Pressure was applied and the total air infiltration was measured. The specimen exterior was sealed with plastic sheet and duct tape. The extraneous air infiltration was measured. Environmental corrections were applied to the both airflow results. The airflow rate was calculated by subtracting the extraneous airflow from the total airflow and dividing the difference by the specimen area.

Acoustical Tests

The sensitivity of the microphones was checked before measurements were conducted. The transmission loss values were obtained for a single direction of measurement. Two background noise sound pressure level and five sound absorption measurements were conducted at each of five microphone positions. Two sound pressure levels were made simultaneously in the receive and source rooms at each of five microphone positions. The air temperature and relative humidity conditions were monitored and recorded during all measurements. Data for flanking limit tests, repeatability measurements, and reference specimen tests are available upon request.

SECTION 8
ACOUSTICAL TEST CALCULATIONS

Transmission loss (TL) at each 1/3 octave frequency is the average source room sound pressure level minus the average receive room sound pressure level, plus, 10 times the log of the specimen area divided by the sound absorption of the receive room with the sample in place.

STC Rating

To obtain the Sound Transmission Class (STC), read the TL of the contour curve at 500 Hz. The sum of the deficiencies below the contour curve must not exceed 32. The maximum deficiency at any one frequency must not exceed 8.

OITC Rating

The Outdoor-Indoor Transmission Class (OITC) is calculated by subtracting the logarithmic summation of the TL values from the logarithmic summation of the A-weighted transportation noise spectrum stated in ASTM E1332.

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SECTION 9
SPECIMEN DESCRIPTION

	FRAME
SIZE	60" by 90"
THICKNESS	4-1/2"
CORNERS	Coped
FASTENERS	Screws
SEAL METHOD	Sealant
MATERIAL	Aluminum with Vinyl Isolator
REINFORCEMENT	N/A
THERMAL BREAK MATERIAL	Insulbar
DAYLIGHT OPENING SIZE	56" by 84-7/8"

MEASURED OVERALL INSULATION GLASS UNIT THICKNESS	1.206"
SPACER TYPE	Aluminum

	EXTERIOR SHEET	GAP	INTERIOR SHEET
MEASURED THICKNESS	0.221"	0.518"	0.181", 0.093", 0.193"
MUNTIN PATTERN	N/A	N/A	N/A
MATERIAL	Annealed	Air*	Laminated
LAMINATE MATERIAL	N/A	N/A	SGP

GLAZING METHOD	Exterior
GLAZING MATERIAL	Rubber Gasket
GLAZING BEAD MATERIAL	Aluminum

	TYPE	QUANTITY	LOCATION
WEATHERSTRIP	N/A	N/A	N/A
HARDWARE	N/A	N/A	N/A
DRAINAGE	Weep slot with cover (1-1/4" by 1/8")	2	Sill

TOTAL WEIGHT (lbs)	**AVERAGE WEIGHT** (lbs / ft^2)
470	12.48

** - Stated per Client/Manufacturer, N/A-Not Applicable*

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SECTION 10
TEST RESULTS

ASTM E90
AIRBORNE SOUND TRANSMISSION LOSS

ACCREDITED Testing Laboratory

TEST DATE	02/01/18				
DATA FILE NO.	I0167.01				
CLIENT	CR Laurence Co, Inc.				
DESCRIPTION	Series/Model: IW8100, Fixed Window with 1-7/32" IG (1/4" Annealed Exterior, 1/2" Air Space, 0.1875" x 0.09325" SGP x 0.1875" Laminated Interior), Glass Temperature 75°F				
SPECIMEN AREA	3.52 m^2	**RECEIVE TEMP.**	19.9 °C	**SOURCE TEMP**	19.6 °C
TECHNICIAN	Ryan R. Lau	**RECEIVE HUMIDITY**	55%	**SOURCE HUMIDIT**	52%

FREQ (Hz)	BACKGROUND SPL (dB)	ABSORPTION (m^2)	SOURCE SPL (dB)	RECEIVE SPL (dB)	SPECIMEN TL (dB)	95% CONFIDENCE LIMIT	NUMBER OF DEFICIENCIES
80	41.4	5.3	104	78	26	0.93	-
100	38.9	4.6	105	80	25	1.21	-
125	46.2	4.7	105	80	24	1.33	0
160	46.2	4.9	104	79	23	1.03	0
200	37.0	6.4	105	80	23	0.71	3
250	27.2	6.9	106	76	27	0.54	2
315	22.6	6.9	106	74	29	0.62	3
400	24.3	6.1	106	69	34	0.39	1
500	17.4	5.4	105	68	35	0.28	1
630	16.1	5.8	106	67	37	0.30	0
800	19.7	5.8	106	65	39	0.34	0
1000	9.7	6.1	107	66	39	0.22	0
1250	8.9	6.2	105	66	36	0.13	4
1600	7.7	6.7	104	65	37	0.30	3
2000	6.1	7.7	101	61	37	0.22	3
2500	4.6	8.7	101	61	36	0.31	4
3150	4.6	9.8	100	58	38	0.27	2
4000	5.0	11.9	99	49	45	0.32	0
5000	5.6	15.0	98	43	49	0.35	-
STC RATING	36	*(Sound Transmission Class)*					
DEFICIENCIES	26	*(Sum of Deficiencies)*					
OITC RATING	30	*(Outdoor-Indoor Transmission Class)*					

Notes: *1) Receive Room levels less than 5 dB above the Background levels are red.*
2) Specimen TL levels listed in red indicate the lower limit of the transmission loss.
3) Specimen TL levels listed in green indicate that there has been a filler wall correction applied

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SECTION 11
RESULTS GRAPH

ASTM E90
AIRBORNE SOUND TRANSMISSION LOSS

ACCREDITED Testing Laboratory

TEST DATE	02/01/18				
DATA FILE NO.	I0167.01				
CLIENT	CR Laurence Co, Inc.				
DESCRIPTION	Series/Model: IW8100, Fixed Window with 1-7/32" IG (1/4" Annealed Exterior, 1/2" Air Space, 0.1875" x 0.09325" SGP x 0.1875" Laminated Interior), Glass Temperature 75°F				
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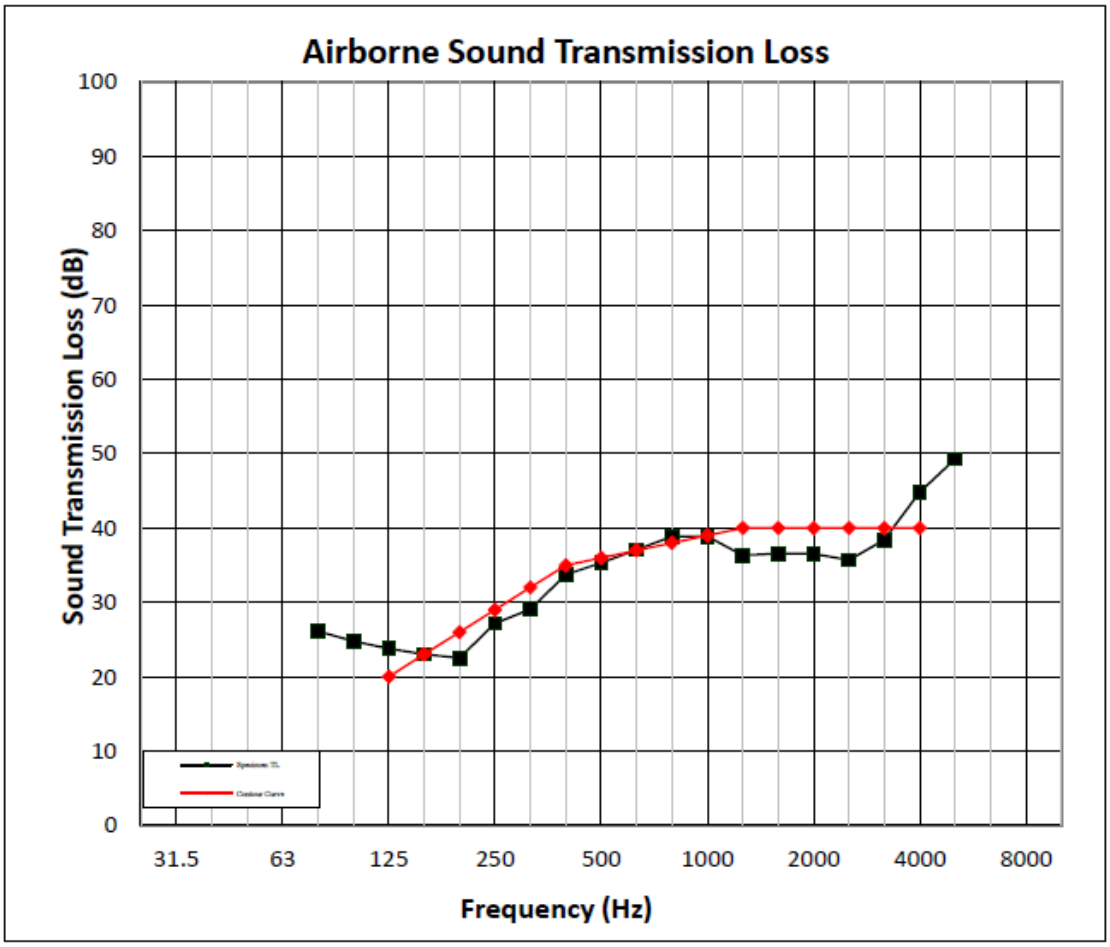

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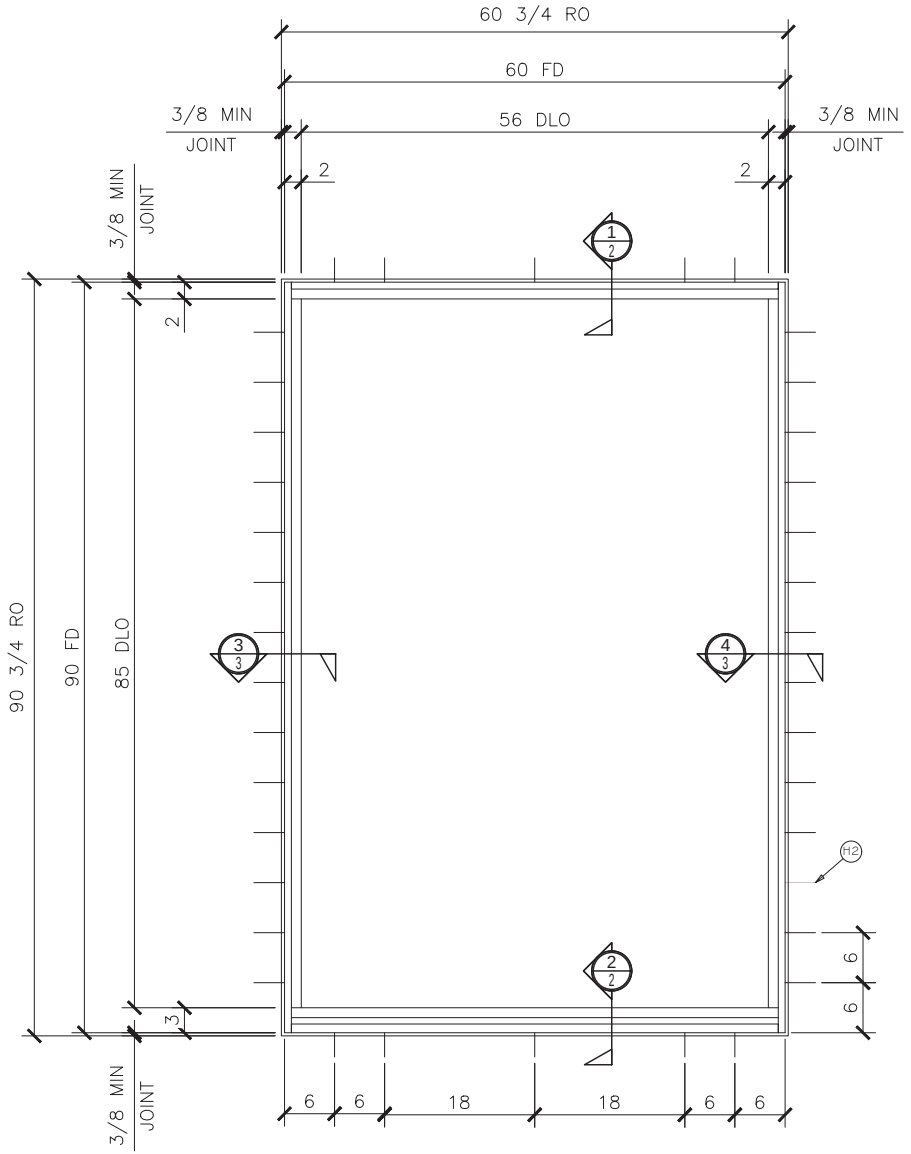
SECTION 12
DRAWINGS



SERIES IW8100 FIXED WINDOW ELEVATION

ITEM		PT. NO.	PART DESCRIPTION	
C1	FRAME & SASH COMPONENTS	PW954	HEAD/JAMB EXTRUSION	
C2		PW801	SILL EXTRUSION	
C3		PW803	PICTURE WINDOW COVER	
C4		SH884	GLAZING STOP	
C5		WH809	VINYL ISOLATOR	
C6		PW804	SILL INSERT	
G1	GLAZING		.25 H.S. X .50 X (.1875 X .090 SGP X .1875) INSULATED GLASS H.S. (HEAT STRENGTHENED) ALUMINUM SPACER DUAL GLAZED	
G2		NP881	SPONGE GASKET–EDPM	
G3		WH334	WEDGE GASKET–EDPM	
G4		SB883	SETTING BLOCK	
G5		WB507	WEDGE BLOCK	
G6				
G7				
H1	HARDWARE	10X1HWSMS	#10 X 1" HEX WASHER HEAD SCREWS	
H2		10X312FHPWS	#10 X 3–1/2" FLAT HEAD PHILLIPS WOOD SCREWS	
H3		--------	1/4" X 5" LAG BOLTS	
H4				
H5				
S1		EF12C	CRL 3/8" CLOSED CELL BACKER ROD	
S2		795BL	DOW CORNING–795 SILICONE BUILDING SEALANT	

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TEST REQUIREMENTS

AIR INFILTRATION:
<0.30 CFM/SQ.FT. @1.57 CFM

STATIC WATER:
15 PSF

DEFLECTION:
DP100

STRUCTURAL OVERLOAD:
150 PSF

TAS-201-94 LMI, LEVEL D *WIND ZONE 4*

TAS-202-94 Uniform Static Air Pressure ±100.0psf DP, 15.0psf water

TAS 203-94 Cyclic Pressure loading ±100.0psf DP

REVISIONS

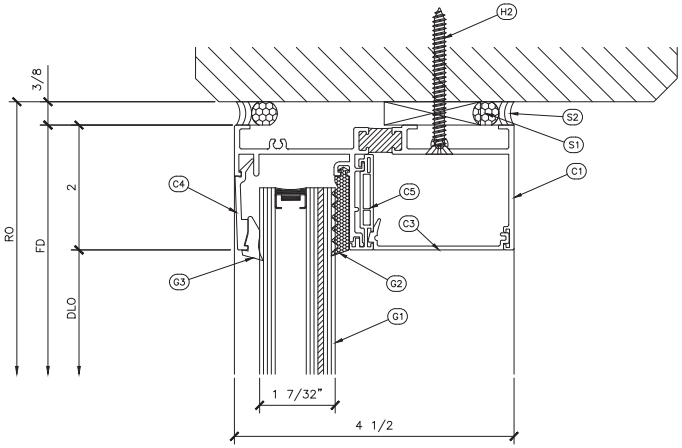
C.R.LAURENCE CO.
ARCHITECTURAL PRODUCTS
2100 E. 38TH Street, Los Angeles, CA 90058
www.crlaurence.com

Job Name:
SERIES IW8100
HURRICANE RESISTANT
FIXED WINDOW

Glazing Contractor:

DATE: 01.02.2018
DRAWN BY: GDO
CHECKED BY: XX
SCALE: AS SHOWN
JOB #: PTC464018

SHT 1 OF 3



1 SECTION DETAIL AT HEAD

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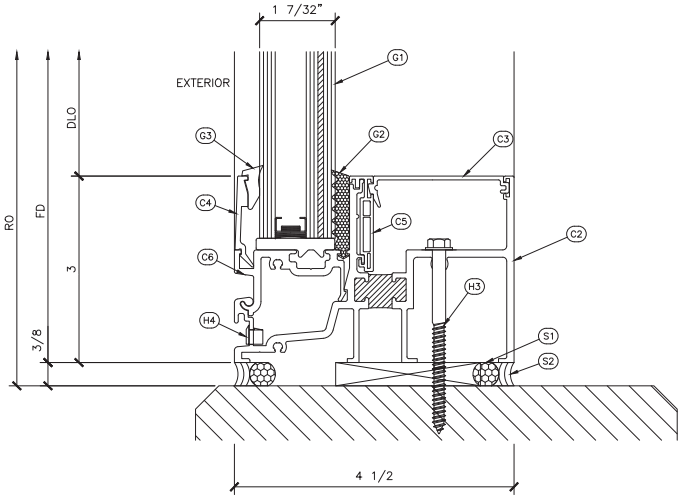

2 SECTION DETAIL AT SILL

ARCH REF: N/A 1'-0"=1'-0"

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CERTIFIED ISO9000

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

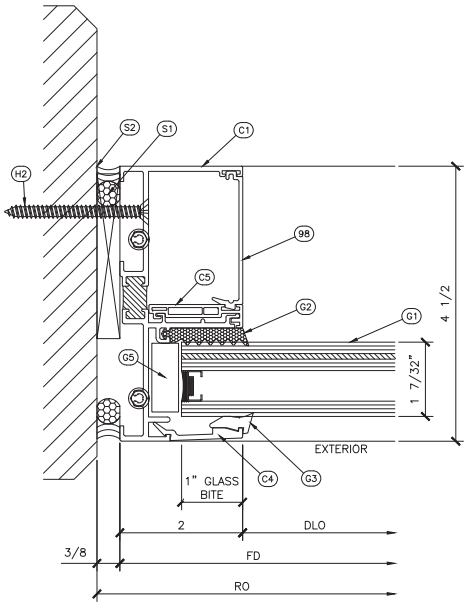
Job Name:

SERIES IW8100
HURRICANE RESISTANT
FIXED WINDOW

Glazing Contractor:

DATE:	01.02.2018
DRAWN BY:	GDO
CHECKED BY:	XX
SCALE:	AS SHOWN
JOB #:	PTC464018

SHT 2 OF 3



3 SECTION DETAIL AT JAMB

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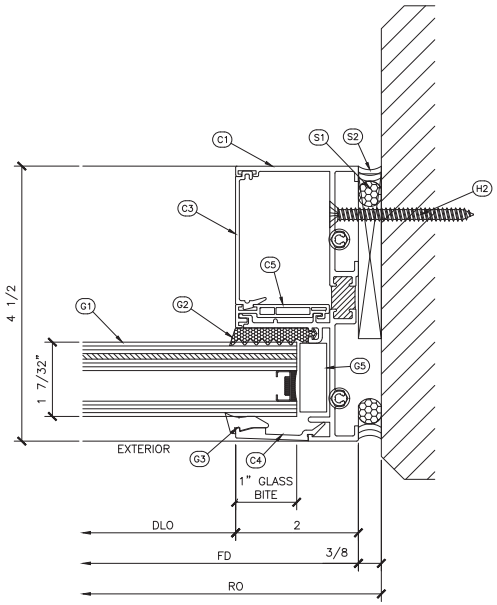

4 SECTION DETAIL AT JAMB

ARCH REF: N/A 1'-0"=1'-0"

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Date:	02/15/18
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CRL C.R.LAURENCE CO. ARCHITECTURAL PRODUCTS

2100 E. 38TH Street, Los Angeles, CA 90058

www.crlaurence.com

Job Name: SERIES IW8100 HURRICANE RESISTANT FIXED WINDOW

Glazing Contractor:

DATE:	01.02.2018
DRAWN BY:	GDO
CHECKED BY:	XX
SCALE:	AS SHOWN
JOB #:	PTC464018

SHT 3 OF 3

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SECTION 13
PHOTOGRAPHS

Photo No. 1
Source Room View of Test Specimen

Photo No. 2
Receive Room View of Test Specimen

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SECTION 14
REVISION LOG

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0	02/22/18	N/A	Original Report Issue