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CR LAURENCE CO, INC.

ACOUSTICAL PERFORMANCE TEST REPORT

SCOPE OF WORK
AAMA 1801 TESTING ON IT451, STOREFRONT WINDOW

REPORT NUMBER
H7645.02-303-11 R0

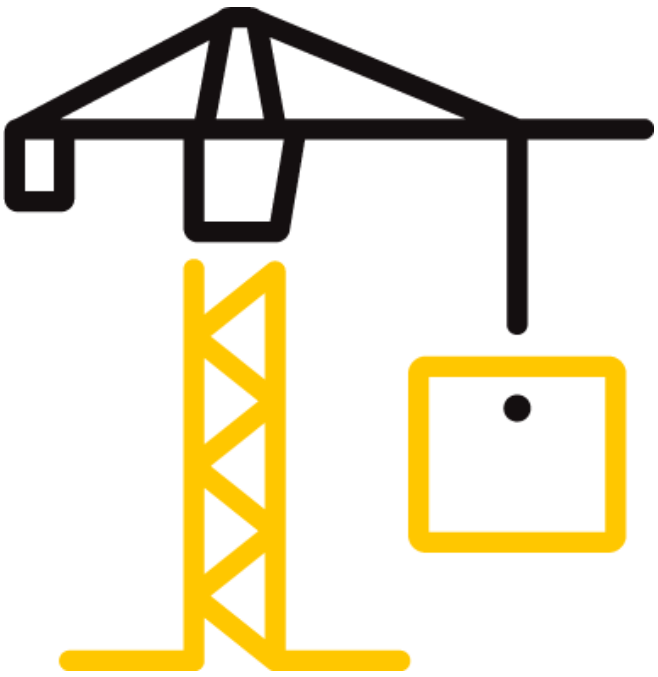
TEST DATE
11/03/17

ISSUE DATE
11/17/17

RECORD RETENTION END DATE
11/03/21

PAGES
13

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.: H7645.02-303-11 R0
Date: 11/17/17

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	IT451
TYPE	Storefront Window
GLAZING (Nominal Dimensions)	1-1/8" IG (1/4" Tempered Exterior, 1/2" Air Space, 3/8" Laminate Interior), Glass Temperature 75°
DATA FILE NO.	H7645.01B
STC	37
OITC	32
AIR INFILTRATION AT 1.57 PSF	0.01 cfm/ft^2

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:	11/17/17	**DATE:**	11/17/17

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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*

AAMA 1801-13, *Voluntary Specification for the Acoustical Rating of Exterior Windows, Doors, Skylights and Glazed Wall Sections*

ASTM E1425-14, *Standard Practice for Determining the Acoustical Performance of Windows, Doors, Skylight, and Glazed Wall Systems*

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.

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SECTION 5
EQUIPMENT

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

INSTRUMENTATION

INSTRUMENT	MANUFACTURER	MODEL	DESCRIPTION	ASSET #	CAL DATE
Data Acquisition Unit	National Instruments	PXI-4462	Input Card	INT00627	10/16 *
Data Acquisition Card	National Instruments	PXI-4462	Data Acquisition Card	INT00395	10/16
Data Acquisition Card	National Instruments	PXI-4462	Data Acquisition Card	INT00396	10/16
Data Acquisition Card	National Instruments	PXI-4462	Data Acquisition Card	INT00397	10/16
Source Room Microphone	PCB Piezotronics	378B20	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

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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

SECTION 7
TEST PROCEDURE

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 level measurements were made simultaneously at each of five microphone positions in the receive and source rooms. 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.

The specimen was returned per the client's 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	78-3/4" by 78-3/4"
THICKNESS	4-1/2"
CORNERS	Butted
FASTENERS	3/8" x 2" Lag Bolts (18" OC) Head and Sill
SEAL METHOD	DOW Corning 795
MATERIAL	Aluminum
REINFORCEMENT	N/A
THERMAL BREAK MATERIAL	Polyurethane
DAYLIGHT OPENING SIZE	74-3/8" by 36-3/8" (x2)

MEASURED OVERALL INSULATION GLASS UNIT THICKNESS	1.102"
SPACER TYPE	Aluminum

	EXTERIOR SHEET	GAP	INTERIOR SHEET
MEASURED THICKNESS	0.232"	0.470"	0.183", 0.030", 0.187"
MUNTIN PATTERN	N/A	N/A	N/A
MATERIAL	Tempered	Air*	Laminate
LAMINATE MATERIAL	N/A	N/A	PVB

GLAZING METHOD	Exterior
GLAZING MATERIAL	Rubber Gasket
GLAZING BEAD MATERIAL	Aluminum

	TYPE	QUANTITY	LOCATION
WEATHERSTRIP	Rubber gasket (1/2" by 3/8")	1	Perimeter of fixed panels
HARDWARE	N/A	N/A	N/A
DRAINAGE	N/A	N/A	N/A

TOTAL WEIGHT (lbs)	**AVERAGE WEIGHT** (lbs / ft^2)
436	10.19

** - 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	11/03/17				
DATA FILE NO.	H7645.01B				
CLIENT	CR Laurence Co., Inc.				
DESCRIPTION	Series/Model: IT451 Storefront with 1-1/8"IG (3/8" laminated interior, 1/2" air space, 1/4" tempered exterior) Glass Temperature 75F				
SPECIMEN AREA	4.03 m²	**RECEIVE TEMP.**	20.0 °C	**SOURCE TEMP**	20.6 °C
TECHNICIAN	Leeland S. Ho	**RECEIVE HUMIDITY**	59%	**SOURCE HUMIDIT**	62%

FREQ (Hz)	BACKGROUND SPL (dB)	ABSORPTION (m²)	SOURCE SPL (dB)	RECEIVE SPL (dB)	SPECIMEN TL (dB)	95% CONFIDENCE LIMIT	NUMBER OF DEFICIENCIES
80	44.4	4.5	104	76	29	1.22	-
100	34.3	4.4	105	80	26	1.95	-
125	38.9	4.9	105	80	24	0.95	0
160	43.8	5.2	104	76	27	1.01	0
200	36.5	5.9	105	80	24	0.68	3
250	24.8	6.9	106	76	27	0.55	3
315	18.6	6.8	106	72	31	0.69	2
400	20.7	5.9	105	68	35	0.59	1
500	19.3	5.3	105	65	38	0.35	0
630	20.4	5.6	106	66	39	0.35	0
800	21.7	5.7	106	65	39	0.22	0
1000	15.1	5.9	107	67	38	0.20	2
1250	14.3	6.0	105	65	38	0.29	3
1600	14.5	6.6	104	64	38	0.29	3
2000	11.9	7.6	101	61	37	0.22	4
2500	8.5	8.4	101	58	39	0.24	2
3150	7.4	9.6	100	55	42	0.28	0
4000	7.1	11.6	99	49	45	0.32	0
5000	7.2	14.6	98	44	49	0.41	-
STC RATING		37	*(Sound Transmission Class)*				
DEFICIENCIES		23	*(Sum of Deficiencies)*				
OITC RATING		32	*(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

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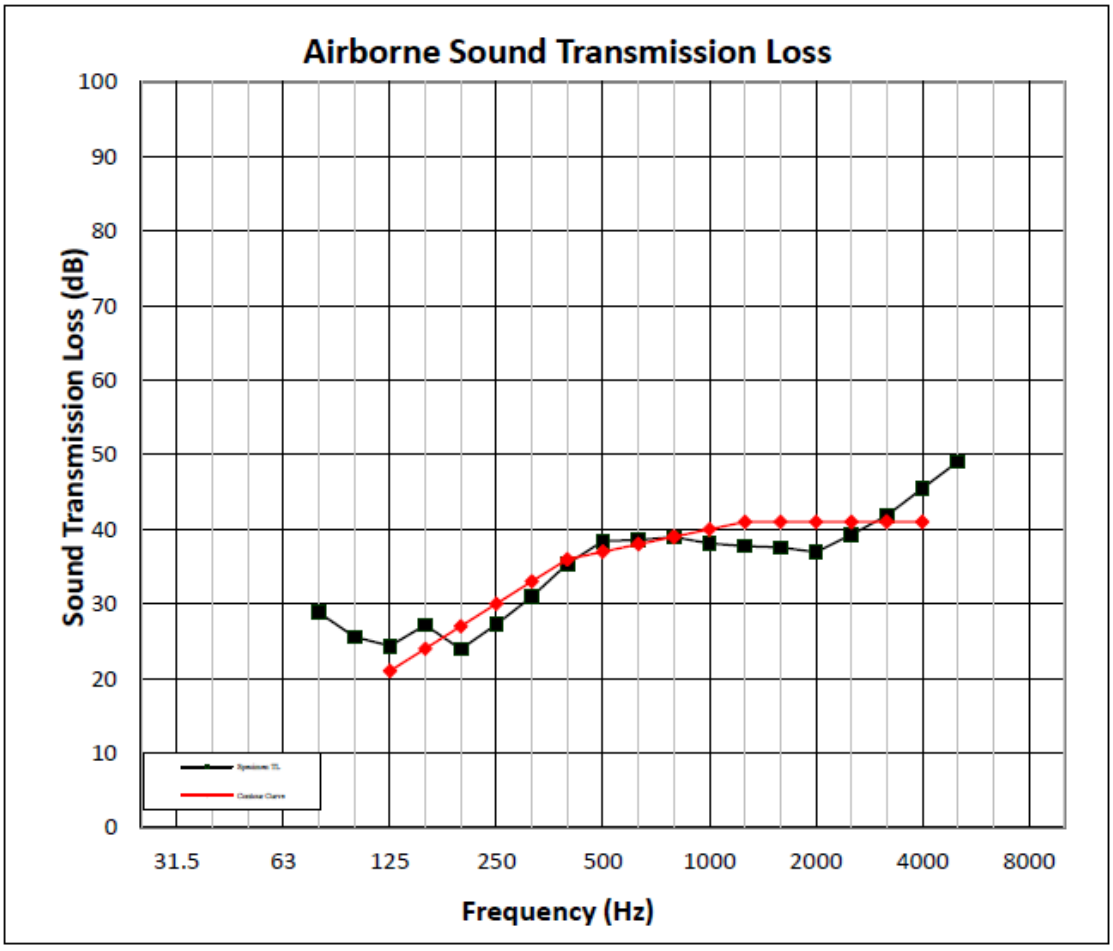

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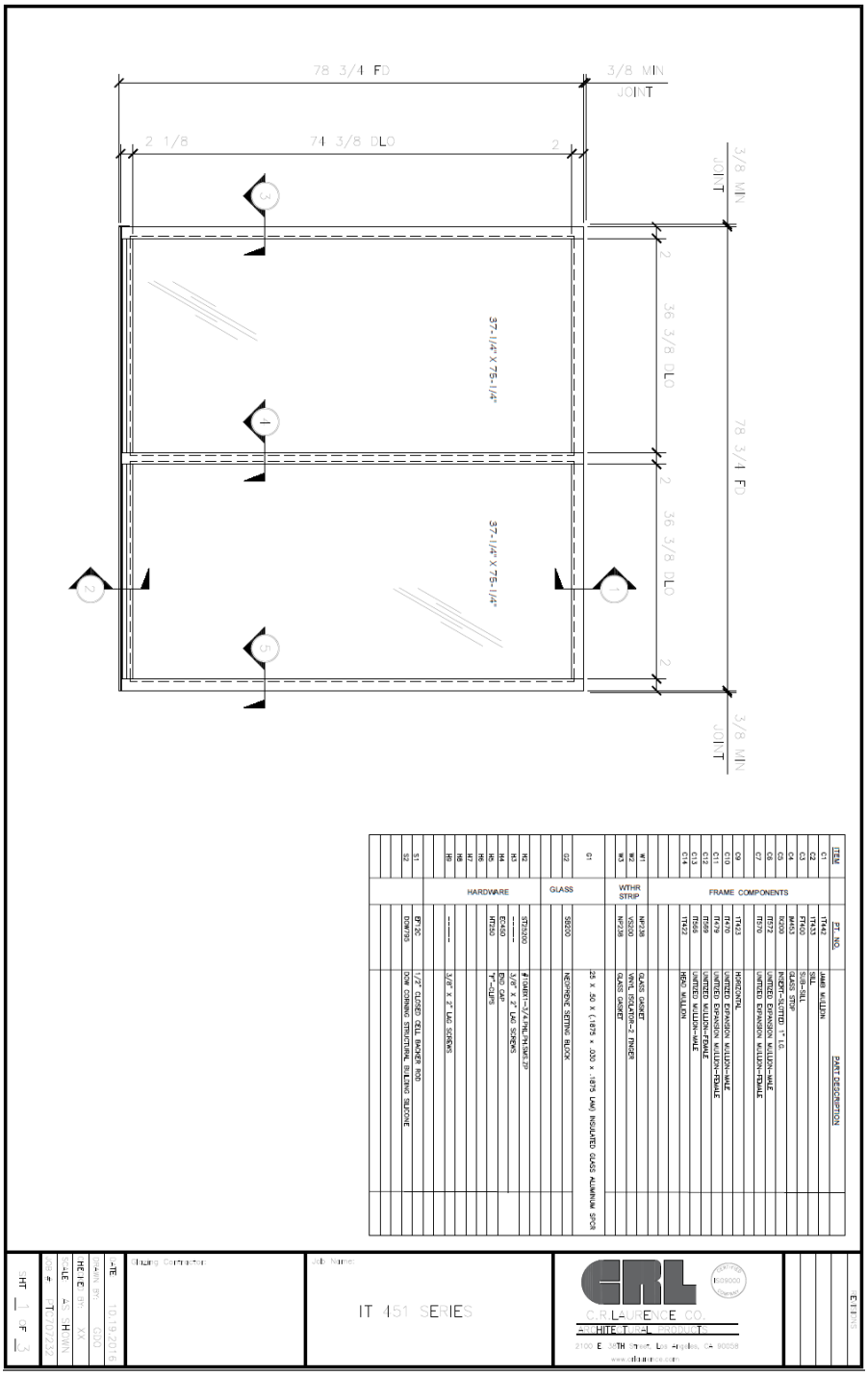
SECTION 12
DRAWINGS



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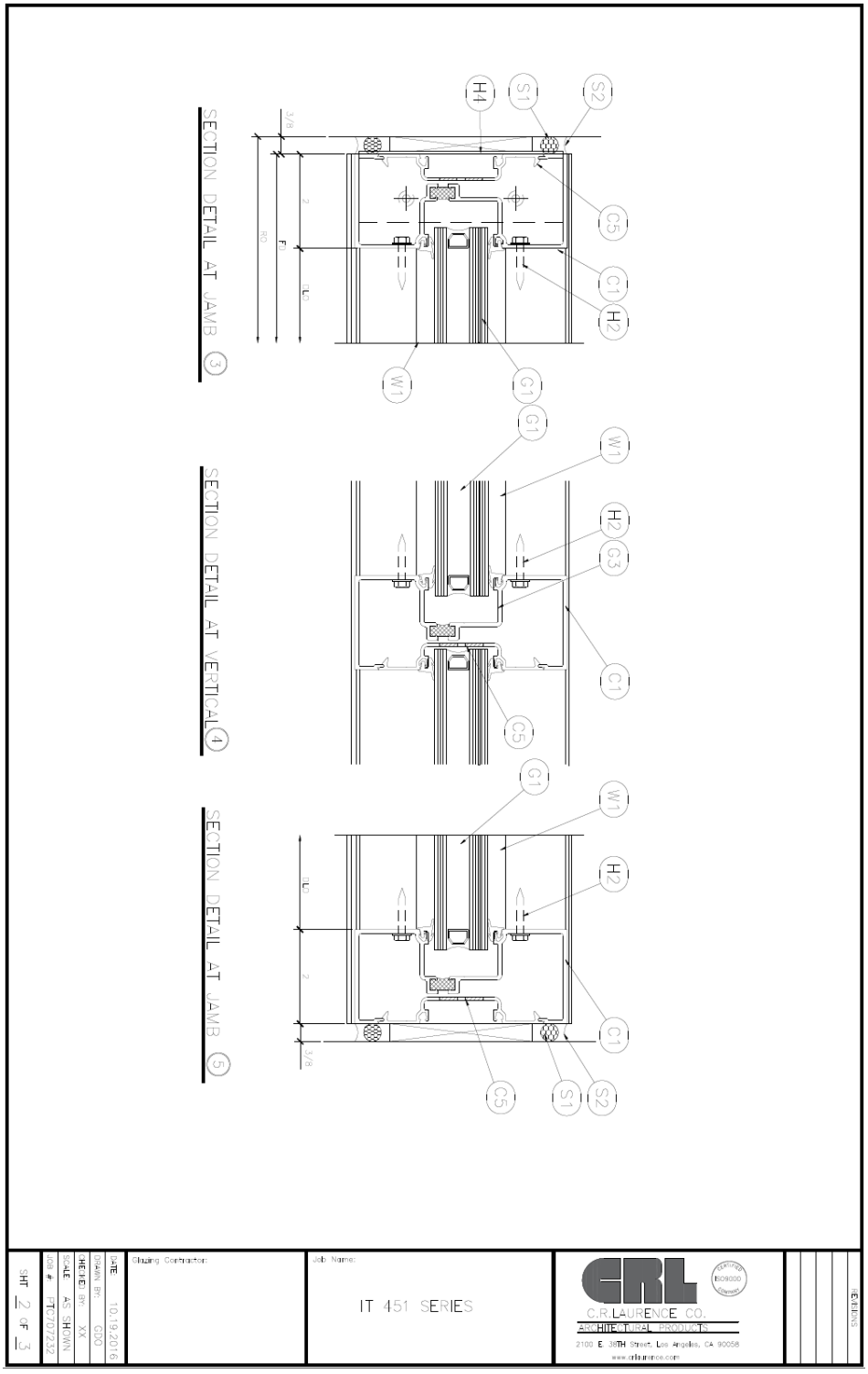

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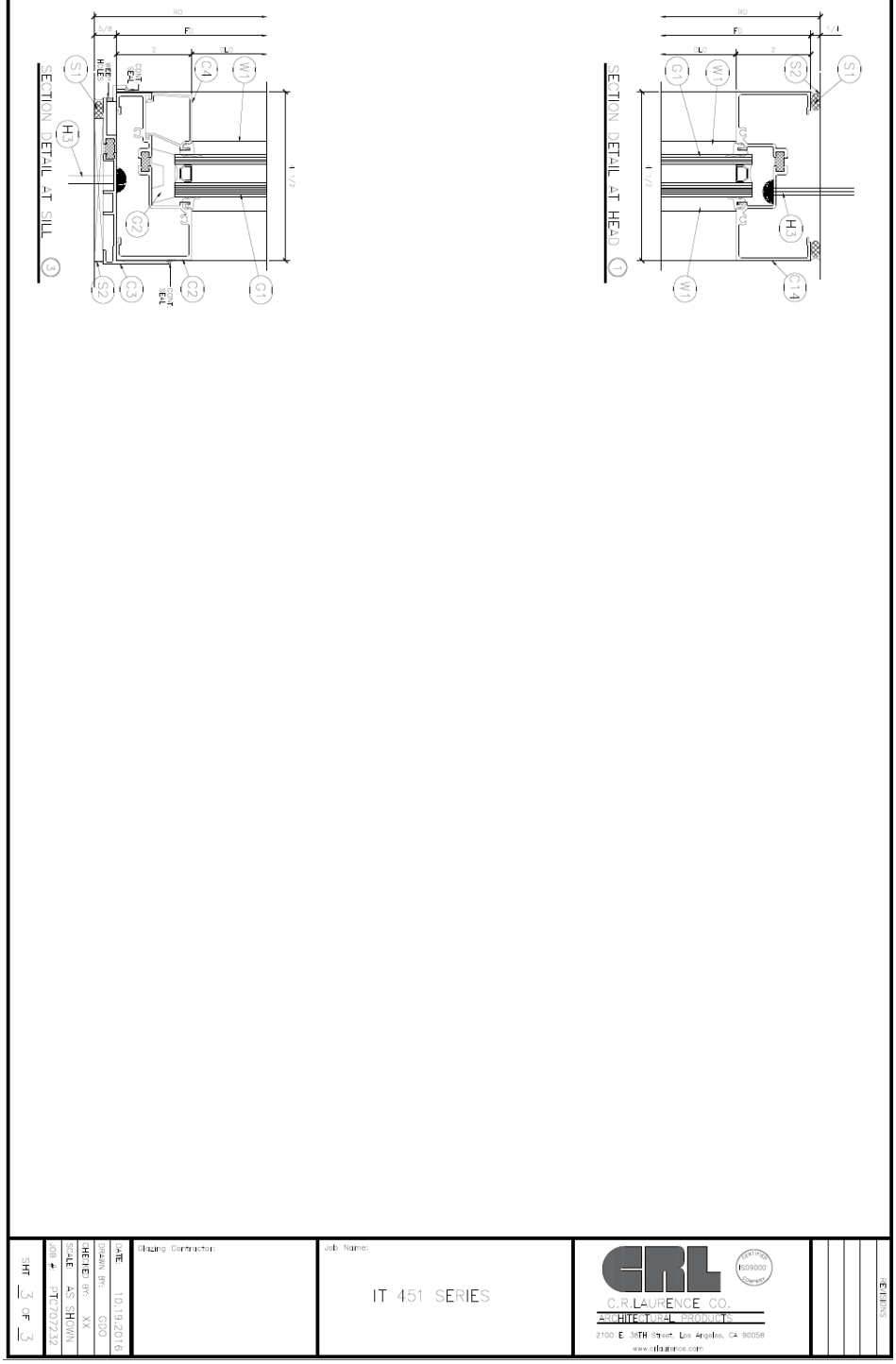

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SECTION 13
PHOTOGRAPHS

Receive Room View of Test Specimen

Source Room View of Test Specimen

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SECTION 14
REVISION LOG

REVISION #	DATE	PAGES	REVISION
0	11/17/17	N/A	Original Report Issue