**ASTM E 90 SOUND TRANSMISSION LOSS**
**TEST REPORT**

**Rendered to:**

**C.R. LAURENCE CO., INC.**

**SERIES/MODEL: 7200**

**TYPE: Project In Window**

| Summary of Test Results | | | |
|---|---|---|---|
| **Data File No.** | **Glazing (Nominal Dimensions)** | **STC** | **OITC** |
| E2483.01 | 1" IG (1/4" tempered, 1/2" air space, 1/4" tempered) | 34 | 28 |

Reference should be made to Architectural Testing, Inc. Report No. E2483.01-113-11 for complete test specimen description. The complete test results are listed in Appendix B.

# ACOUSTICAL PERFORMANCE TEST REPORT

Rendered to:

C.R. LAURENCE CO., INC.
2100 East 38th Street
Vernon, California 90058

| | |
|---|---|
| Report No: | E2483.01-113-11 |
| Test Date: | 12/31/14 |
| Report Date: | 01/30/15 |

**Test Sample Identification**:

**Series/Model**: 7200

**Type**: Project In Window

**Overall Size**: 59" by 23-5/8"

**Glazing (Nominal Dimensions)**: 1" IG (1/4" Tempered, 1/2" Air Space, 1/4" Tempered)

**Project Scope**: Architectural Testing, Inc. was contracted by C.R. Laurence Co., Inc. to conduct a sound transmission loss test on a Series/Model 7200, Project in window. A summary of the results is listed in the Test Results section, and the complete test data is included as Appendix B of this report. The sample was provided by the client.

**Test Methods**: The acoustical test was conducted in accordance with the following:

ASTM E 90-09, *Standard Test Method for Laboratory Measurement of Airborne Sound Transmission Loss of Building Partitions*.
ASTM E 413-10, *Classification for Rating Sound Insulation*.
ASTM E 1332-10a, *Standard Classification for Rating Outdoor-Indoor Sound Attenuation.*
ASTM E 2235-04 (Reapproved 2012), *Standard Test Method for Determination of Decay Rates for Use in Sound Insulation Test Methods*.

**Test Equipment**: The equipment used to conduct this test meets the requirements of ASTM E 90. The microphones were calibrated before conducting the sound transmission loss test. The test equipment and test chamber descriptions are listed in Appendix A.

**Sample Installation**: A double stud filler wall was constructed with 2-1/2" steel studs and 3-1/2" steel studs spaced 24" on center. Five layers of 5/8" Type "X" gypsum board were fastened to the receive side of the filler wall. Three layers of 1/2" cement board were fastened to the source side of the filler wall. The cavity was filled with two layers of R-13 fiberglass insulation. The perimeter and seams were sealed with acoustical sealant. A sound transmission loss test was then conducted on the filler wall. The filler wall achieved an STC rating of 71. The 60-1/2" by 48-1/2" filler wall plug was removed.

A filler wall-reducing element was built to adjust the test opening size to accommodate the test specimen. The reducing element consisted of a double 2x4 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-13 fiberglass insulation. The window system was placed on isolation pads in the test opening. Duct seal was used to seal the perimeter of the test specimen to the test opening on both sides. The interior side of the test specimen, when installed, was approximately 1/4" from being flush with the receiving room side of the filler wall. A stethoscope was used to check for any abnormal air leaks around the test specimen prior to testing. The vent was opened and closed at least five times prior to testing.

**Test Procedure**: The window was closed and locked for this test. The sound transmission loss tests were conducted in accordance with the ASTM E 90 test method using a single direction of measurement. The sound transmission loss test consisted of the following measurements: One background noise sound pressure level and five sound absorption measurements were conducted at each of the five microphone positions. Two sound pressure level measurements were made simultaneously in both rooms, at each of the five microphone positions. The air temperature and relative humidity conditions were monitored and recorded during the background, absorption, source, and receive room measurements.

**Sample Descriptions**:

**Frame Construction**:

| | **Frame** |
|---|---|
| **Size** | 59" by 23-5/8" |
| **Thickness** | 2" |
| **Corners** | Coped |
| Fasteners | Screws |
| Seal Method | Sealant |
| **Material** | Aluminum |
| Reinforcement | None |
| Thermal Break Material | Urethane |

**Sample Descriptions**: (Continued)

**Vent Construction**:

| | | **Vent** |
|---|---|---|
| **Size** | | 57-1/2" by 22" |
| **Thickness** | | 2" |
| **Corners** | | Mitered |
| | Fasteners | Keyed and staked |
| | Seal Method | None |
| **Material** | | Aluminum |
| | Reinforcement | None |
| | Thermal Break Material | Urethane |
| **Daylight Opening Size** | | 53" by 17-1/2" |

**Vent Glazing**:

| | |
|---|---|
| **Measured Overall Insulation Glass Unit Thickness** | 0.943" |
| **Spacer Type** | Aluminum |

| | **Exterior Sheet** | **Gap** | **Interior Sheet** |
|---|---|---|---|
| **Measured Thickness** | 0.220" | 0.502" | 0.221" |
| **Muntin Pattern** | N/A | N/A | N/A |
| **Material** | Tempered | Air* | Tempered |
| **Laminate Material** | N/A | N/A | N/A |

| | |
|---|---|
| **Glazing Method** | Interior |
| **Glazing Material** | Flexible wedge gasket |
| **Glazing Bead Material** | Aluminum |

** - Stated per Client/Manufacturer, N/A-Non Applicable*

**Sample Descriptions**: (Continued)

**Components**:

| | TYPE | QUANTITY | LOCATION |
|---|---|---|---|
| **Weatherstrip** | | | |
| | 1/4" Foam-filled bulb gasket | Row | Perimeter of vent |
| | 1/4" Foam-filled bulb gasket | Row | Perimeter of frame |
| **Hardware** | | | |
| | Sweep Lock | 2 | Lock rail |
| | Hinge | 2 | Hinge jamb |
| | Keeper | 2 | Keeper jamb |
| **Drainage** | | | |
| | 1" by 3/16" Weep slot | 2 | Sill face |

**Comments**: The total weight of the sample was 66 lbs. The design drawings (included in Appendix C) supplied by the client, accurately describe the Series/Model 7200, Project in window. The dimensions on the drawings that are circled and/or checked were verified against the test specimen. The window was disassembled, and the components will be retained by Architectural Testing for four years. Photographs of the test specimen are included in Appendix D.

**Test Results**: The STC (Sound Transmission Class) rating was calculated in accordance with ASTM E 413. The OITC (Outdoor-Indoor Transmission Class) was calculated in accordance with ASTM E 1332. A summary of the sound transmission loss test results on the Series/Model 7200, Project in window is listed below.

| Summary of Test Results | | | |
|---|---|---|---|
| **Data File No.** | **Glazing (Nominal Dimensions)** | **STC** | **OITC** |
| E2483.01 | 1" IG (1/4" tempered, 1/2" air space, 1/4" tempered) | 34 | 28 |

The complete test results are listed in Appendix B. Flanking limit tests and reference specimen tests are available upon request.

Architectural Testing will service this report for the entire test record retention period. Test records, such as detailed drawings, datasheets, representative samples of test specimens, or other pertinent project documentation, will be retained by Architectural Testing for the entire test record retention period. The test record retention period ends four years after the test date.

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.

For ARCHITECTURAL TESTING, INC:

Digitally Signed by: Zachary Golden

Zachary Golden
Technician - Acoustical Testing

Digitally Signed by: Todd D. Kister

Todd D. Kister
Laboratory Supervisor - Acoustical Testing

ZPG:jmcs

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

- Appendix-A: Equipment description (1)
- Appendix-B: Complete test results (2)
- Appendix-C: Design drawings (3)
- Appendix-D: Photographs (1)

## Revision Log

| Rev. # | Date | Page(s) | Revision(s) |
|---|---|---|---|
| 0 | 01/30/15 | N/A | Original Report Issue |

# Appendix A

## Instrumentation:

| Instrument | Manufacturer | Model | Description | ATI Number | Date of Calibration |
|---|---|---|---|---|---|
| Data Acquisition Unit | National Instruments | PXI-1033 | Data Acquisition card | 65127 | 04/14 * |
| Source Room Microphone | PCB Piezotronics | 378B20 | Microphone and Preamplifier | 64902 | 12/14 |
| Source Room Microphone | PCB Piezotronics | 378B20 | Microphone and Preamplifier | 64903 | 12/14 |
| Source Room Microphone | PCB Electronics | 378B20 | Microphone and Preamplifier | 65103 | 05/14 |
| Source Room Microphone | PCB Piezotronics | 378B20 | Microphone and Preamplifier | 64905 | 12/14 |
| Source Room Microphone | PCB Piezotronics | 378B20 | Microphone and Preamplifier | 64906 | 12/14 |
| Receive Room Microphone | PBC Piezotronics | 378B20 | Microphone and Preamplifier | 64907 | 11/14 |
| Receive Room Microphone | PCB Piezotronics | 378B20 | Microphone and Preamplifier | 64908 | 11/14 |
| Receive Room Microphone | PCB Piezotronics | 378B20 | Microphone and Preamplifier | 64909 | 11/14 |
| Receive Room Microphone | PCB Piezotronics | 378B20 | Microphone and Preamplifier | 64910 | 11/14 |
| Receive Room Microphone | PCB Piezotronics | 378B20 | Microphone and Preamplifier | 64911 | 11/14 |
| Receive Room Environmental Indicator | Vaisala | HMW92 | Temperature Humidity Sensor | 64286 | 06/14 |
| Source Room Environmental Indicator | Vaisala | HMW60Y | Temperature and Humidity Sensor | Y002653 | 06/14 |
| Microphone Calibrator | Norsonic | 1251 | Pistonphone Calibrator | 65105 | 04/14 |

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

## Test Chamber:

| | Volume | Description |
|---|---|---|
| Receive Room | 234 $m^3$ (8291.3 $ft^3$) | Rotating vane and stationary diffusers<br>Temperature and humidity controlled<br>Isolation pads under the floor |
| Source Room | 206.6 $m^3$ (7296.3 $ft^3$) | Stationary diffusers only<br>Temperature and humidity controlled |

| | Maximum Size | Description |
|---|---|---|
| TL Test Opening | 4.27 m (14 ft) wide by<br>3.05 m (10 ft) high | Vibration break between source and receive rooms |

*N/A-Non Applicable*

# Appendix B

## Complete Test Results

Intertek | Architectural Testing

IAS ACCREDITED TL-144

# AIRBORNE SOUND TRANSMISSION LOSS

ASTM E 90

| | | | | | | |
|---|---|---|---|---|---|---|
| **Test Date** | 12/31/14 | | | | | |
| **Data File No.** | E2483.01 | | | | | |
| **Client** | C.R. Laurence Co., Inc. | | | | | |
| **Description** | Series/Model: 7200, Project in window with 1" IG (1/4" tempered, 1/2" air space, 1/4" tempered) | | | | | |
| **Specimen Area** | 0.90 m² | Receive Temp. | 21.1 °C | | Source Temp. | 21.8 °C |
| **Technician** | Zach Golden | Receive Humidity | 47% | | Source Humidity | 48% |

| **Freq** (Hz) | **Background SPL** (dB) | **Absorption** (m²) | **Source SPL** (dB) | **Receive SPL** (dB) | **Specimen TL** (dB) | **95% Confidence Limit** | **Number of Deficiencies** |
|---|---|---|---|---|---|---|---|
| 80 | 38.2 | 4.1 | 107 | 74 | 28.3 | 1.61 | - |
| 100 | 34.7 | 4.9 | 108 | 71 | 30.7 | 1.79 | - |
| 125 | 33.6 | 4.6 | 108 | 76 | 24.7 | 1.44 | 0 |
| 160 | 41.2 | 4.7 | 107 | 79 | 20.3 | 0.61 | 1 |
| 200 | 38.7 | 4.7 | 108 | 83 | 17.4 | 0.67 | 7 |
| 250 | 32.5 | 5.1 | 108 | 79 | 21.8 | 0.87 | 5 |
| 315 | 26.9 | 6.0 | 103 | 67 | 27.9 | 0.39 | 2 |
| 400 | 26.0 | 6.4 | 102 | 63 | 31.1 | 0.45 | 2 |
| 500 | 24.1 | 6.5 | 102 | 59 | 34.2 | 0.28 | 0 |
| 630 | 20.2 | 6.2 | 103 | 61 | 34.1 | 0.23 | 1 |
| 800 | 17.5 | 6.3 | 103 | 56 | 38.7 | 0.32 | 0 |
| 1000 | 13.0 | 6.5 | 102 | 53 | 40.1 | 0.25 | 0 |
| 1250 | 11.9 | 7.2 | 100 | 50 | 41.2 | 0.26 | 0 |
| 1600 | 9.5 | 7.5 | 103 | 57 | 36.7 | 0.38 | 1 |
| 2000 | 6.6 | 8.1 | 101 | 60 | 32.0 | 0.25 | 6 |
| 2500 | 6.0 | 9.1 | 100 | 55 | 34.4 | 0.18 | 4 |
| 3150 | 5.0 | 10.6 | 100 | 51 | 38.0 | 0.21 | 0 |
| 4000 | 5.2 | 12.9 | 99 | 46 | 41.9 | 0.25 | 0 |
| 5000 | 5.7 | 16.4 | 97 | 39 | 45.5 | 0.23 | - |

**STC Rating** **34** *(Sound Transmission Class)*

Deficiencies 29 *(Sum of Deficiencies)*

**OITC Rating** **28** *(Outdoor-Indoor Transmission Class)*

***Notes:***

*1) Receive Room levels less than 5 dB above the Background levels are highlighted in yellow.*

*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*

Intertek | Architectural Testing

IAS ACCREDITED TL-144

# AIRBORNE SOUND TRANSMISSION LOSS

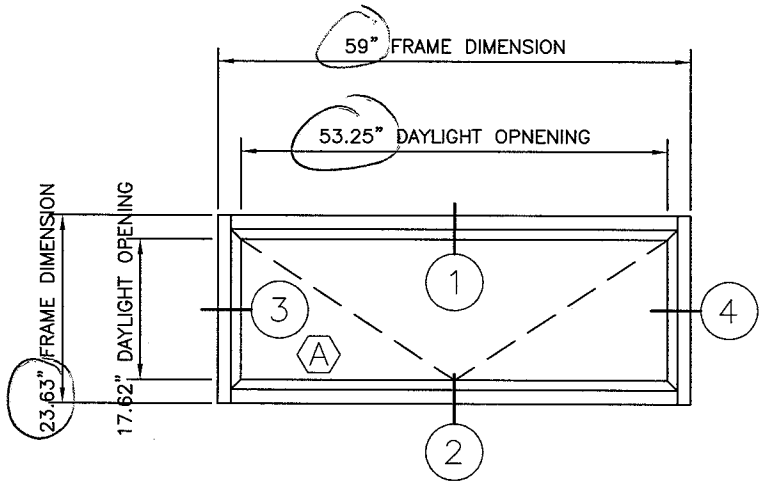
ASTM E 90

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| **Test Date** | 12/31/14 | | | | | | |
| **Data File No.** | E2483.01 | | | | | | |
| **Client** | C.R. Laurence Co., Inc. | | | | | | |
| **Description** | Series/Model: 7200, Project in window with 1" IG (1/4" tempered, 1/2" air space, 1/4" tempered) | | | | | | |
| **Specimen Area** | 0.90 m² | Receive Temp. | 21.1 °C | | Source Temp. | 21.8 °C | |
| **Technician** | Zach Golden | Receive Humidity | 47% | | Source Humidity | 48% | |

# Appendix C

## Design Drawings

MU2014-176-01




**Architectural Testing**

Test sample complies with these details.
Deviations are noted.

Report# E24830I-113-11

Date 1/22/15 Tech ZB

| SYMBOL KEY | | |
|---|---|---|
| SYMBOL | DESCRIPTION | QTY. |
| Ⓐ | 1" INSULATED GLASS 54.352 X 18.718<br>.250 CLR, TEMPERED<br>.500 MILL ALUM SPACER, AIR<br>.250 PPG SOLARBAN 70XL,<br>LOW-E #3 SURFACE, SILICONE | 1 |

| REV. | DESCRIPTION | DATE | BY |
|---|---|---|---|
| | | | |
| | | | |
| | | | |
| | | | |
| | | | |



C.R. LAURENCE CO., INC.
CRL MANUFACTURING
2100 E. 38TH STREET
LOS ANGELES, CA 90058

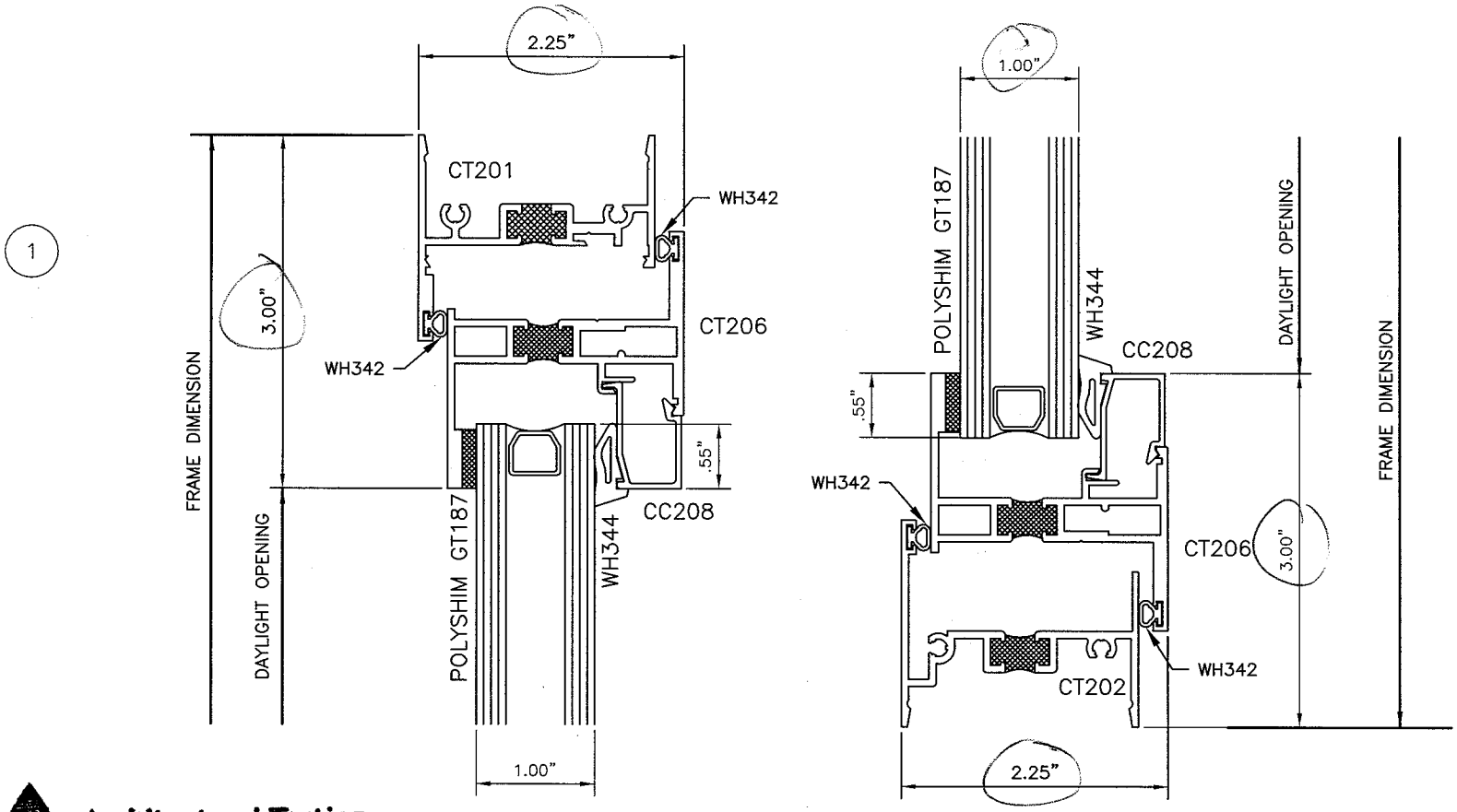
DRAWN BY: GHK
DATE: 06.25.14
SCALE: 3/4"=1'-0"

TITLE:
SOUND TRANSMISSION LOSS TEST
ELEVATION
PRODUCT: 7200 PROJECT IN WINDOW

DRAWING NO.
MU2014-176-01

Sheet No. 1 of 3 Sheets

MU2014-176-01




Architectural Testing

Test sample complies with these details.
Deviations are noted.

Report# E2483.01-113-11

Date 1/27/15 Tech ZPG

| REV. | DESCRIPTION | DATE | BY |
|---|---|---|---|
| | | | |
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| | | | |



C.R. LAURENCE CO., INC.
CRL MANUFACTURING
2100 E. 38TH STREET
LOS ANGELES, CA 90058

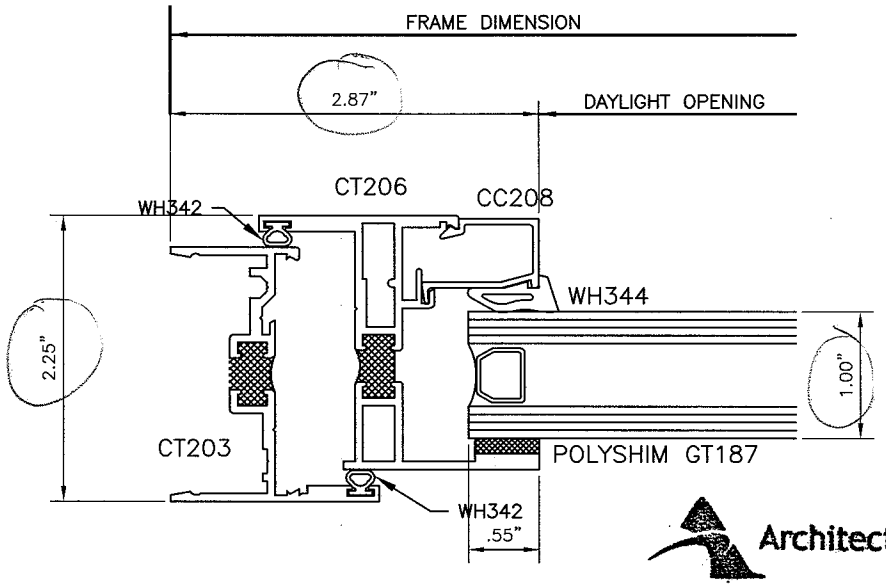
DRAWN BY: GHK
DATE: 06.25.14
SCALE: FULL

TITLE:
SOUND TRANSMISSION LOSS TEST
HORIZONTAL SECTION
PRODUCT: 7200 PROJECT IN WINDOW

DRAWING NO.
MU2014-176-01

MU2014-176-01

3

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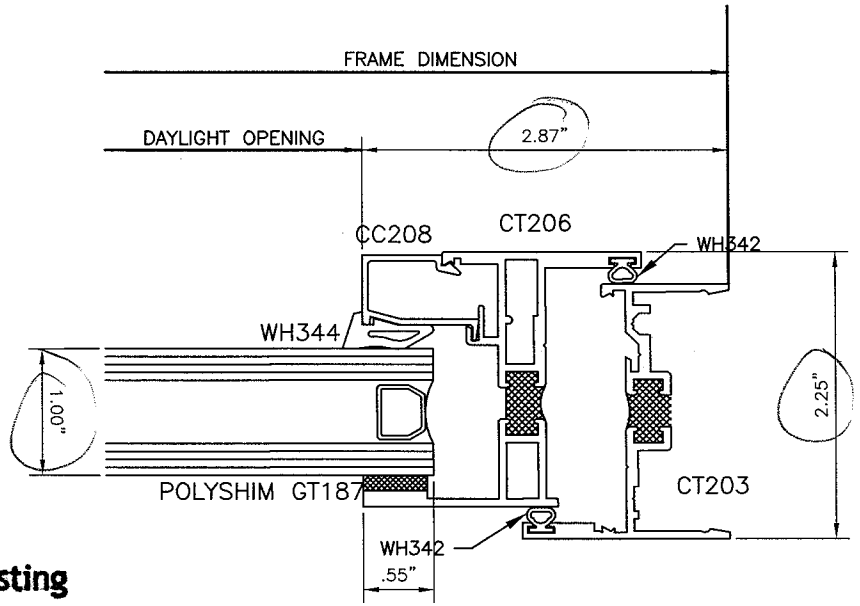


Architectural Testing

Test sample complies with these details.
Deviations are noted.

Report# E2483.01-113-11

Date 1/27/15 Tech ZP

| REV. | DESCRIPTION | DATE | BY |
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C.R. LAURENCE CO., INC.
CRL MANUFACTURING
2100 E. 38TH STREET
LOS ANGELES, CA 90058

DRAWN BY: GHK
DATE: 06.25.14
SCALE: FULL

TITLE: SOUND TRANSMISSION LOSS TEST
VERTICAL SECTION
PRODUCT: 7200 PROJECT IN WINDOW

DRAWING NO. MU2014-176-01

Sheet No. 3 of 3 Sheets

# Appendix D

## Photographs


**Receive Room View of Installed Specimen**

**Source Room View of Installed Specimen**