NORTH ORBIT ACOUSTIC LABORATORIES

| | |
|---|---|
| **REPORT NUMBER** | NOAL 24-05004S |
| **TEST METHOD** | ASTM E90-23: Standard Test Method for Laboratory Measurement of Airborne Sound Transmission of Building Partitions and Elements |
| **TEST SPONSORS** | CEMCO, 13191 Crossroads Pkwy N., Ste 325, City of Industry, CA 91746<br>Trim-Tex, 3700 W. Pratt Ave, Lincolnwood, IL 60712 |
| **ISSUED TO** | CEMCO, 13191 Crossroads Pkwy N., Ste 325, City of Industry, CA 91746<br>Trim-Tex, 3700 W. Pratt Ave, Lincolnwood, IL 60712 |
| **TEST SPECIMEN** | Wall Assembly |
| **RESULT SUMMARY** | STC 50 |
| **TEST DATE** | May 7, 2024 |
| **REPORT DATE** | May 31, 2024 |
| **TEST SITE** | North Orbit Acoustic Laboratory Facility, 917 Rice Street, Saint Paul, MN 55117 |
| **TECHNICIAN** | D. Berg |

Test numbers ending in "S" indicates that the test report is a supplement to an existing report, the report includes the identical and original raw data but with proprietary or ancillary information excluded or altered.

CONTENTS



ELECTRONICALLY SIGNATURE

DAVID M. BERG –LABORATORY MANAGER

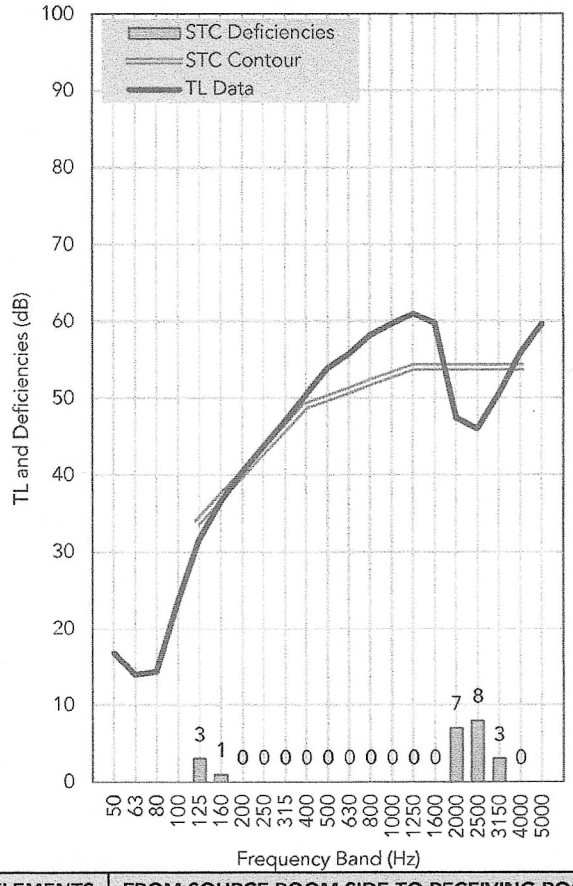
ELECTRONICALLY SIGNATURE

HEIDE GROSS – LABORATORY QUALITY MANAGER

ilac-MRA A2LA ACCREDITED

## SECTION A – DATA SUMMARY

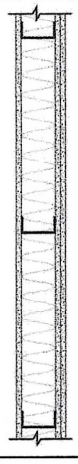
### STC 50




| FREQUENCY (Hz) | TL (dB) | DEFICIENCIES (dB) |
|---|---|---|
| 50 | 17 | - |
| 63 | 14 | - |
| 80 | 14 | - |
| 100 | 24 | - |
| 125 | 31 | 3 |
| 160 | 36 | 1 |
| 200 | 40 | 0 |
| 250 | 44 | 0 |
| 315 | 47 | 0 |
| 400 | 50 | 0 |
| 500 | 54 | 0 |
| 630 | 56 | 0 |
| 800 | 58 | 0 |
| 1,000 | 60 | 0 |
| 1,250 | 61 | 0 |
| 1,600 | 60 | 0 |
| 2,000 | 47 | 7 |
| 2,500 | 46 | 8 |
| 3,150 | 51 | 3 |
| 4,000 | 56 | 0 |
| 5,000 | 60 | - |
| **TOTAL DEFICIENCIES** | | **22** |

| ELEMENTS | FROM SOURCE ROOM SIDE TO RECEIVING ROOM SIDE |
|---|---|
| Hardware | 1/2" x 1" Smoke and Sound Stop B (12 LF at bottom) |
| Hardware | 1/2" x 1" Smoke and Sound Stop B w/flat deflection bead (8+12+8 LF top and sides) |
| Sheathing | 5/8" Type X gypsum panels (v); #6 x 1" type S screws spaced 12" OC |
| Framing | 3-5/8" CEMCO 30 mil (20 GA) steel slotted top track |
| Framing | 3-5/8" CEMCO 18 mil (20 ga. EQ) steel studs spaced 24" OC |
| Framing | 3-5/8" CEMCO 18 mil (20 ga. EQ) steel bottom tracks |
| Insulation | 3-1/2" glass fiber batt insulation (R13) |
| Sheathing | 5/8" Type X gypsum panels (vs); #6 x 1" type S screws spaced 12" OC |
| Sheathing | 5/8" Type X gypsum panels (v); #6 x 1-5/8" type S screws spaced 24" OC |
| Hardware | 1" x 1" Smoke and Sound Stop B w/flat deflection bead (8+12+8 LF top and sides) |
| Hardware | 1" x 1" Smoke and Sound Stop B (12 LF at bottom) |

**SCHEMATIC**



See Section C on page 4 and 5 for a full specimen description.

## SECTION B – APPROACH

### INSTALLATION

The specimen is a wall assembly that was originally constructed on May 7, 2024, at the Saint Paul, MN acoustic laboratory facility. The assembly and building element descriptions can be found in Section C on pages 4 & 5 of this report. Some details of the specimen design are proprietary and have been withheld at the request of the test sponsor.

Qualified representatives from North Orbit Acoustic Laboratories observed or performed the installation and inspected all major building elements when completed and prior to testing.

### TEST METHODS

North Orbit Acoustic Laboratory (NOAL) is accredited through A2LA certificate number 4240.01 for this test method.

Test methods follow the published standards listed below.

**ASTM E90-23:** *Standard Test Method for Laboratory Measurement of Airborne Sound Transmission Loss of Building Partitions and Elements*

**ASTM E413-22:** *Classification for Rating Sound Insulation*

All results reported herein were derived from tests performed in full accordance with test method ASTM E90. The laboratory and measurement systems fully meet all requirements of the test standard and the requirements of ASTM E90 Annex A2: Qualification of room sound fields and microphone systems used for sampling. All values stated are derived from single-direction transmission loss measurements.

The standard deviation of reproducibility is stated in ASTM E90 as <2 dB for frequencies from 125 Hz to 4 kHz. Detailed test procedures for this test method, the flanking limit report, repeatability measurements and reference specimen tests are available upon request.

The Sound Transmission Class (STC) value was obtained by applying the Transmission Loss (TL) values to the STC reference contour of ASTM E413 which was used to calculate a single number rating.

### TEST REPORTS

This report does not constitute certification of the assembly or test item nor an opinion or endorsement by this laboratory. The report applies only to the specimen tested and may not be reproduced, except in full, without the permission of the client or test sponsor. It is the exclusive property of the test sponsor so named herein.

### CONFIDENTIALITY

The test sponsor has full control over this information. Any release of information will be only to the test sponsor. The specific testing results are deemed to be confidential exclusively for the test sponsor's use. Reproduction of this report, except in full, is prohibited.

## SECTION C – SPECIMEN DESCRIPTION

The test sponsor supplied Smoke and Sound Stop B, and the flat deflection bead. CertainTeed supplied the gypsum board panels. All other materials were purchased through regional retail or wholesale channels.

### FRAMING

Framing was constructed on May 6, 2024, and was retained for subsequent tests in the series.

A steel stud frame was constructed within the perimeter of the laboratory test specimen opening. The frame consisted of 30 mil designated thickness (20 ga.) 3-5/8" x 2-1/2" steel slotted top track, 18 mil designated thickness (20 EQ) 3-5/8" x 1-1/4" steel bottom track and seven 18 mil designated thickness (20 EQ.) 3-5/8" x 1-7/16" steel studs installed vertically 24" on centers (OC). The tracks and outer studs were fastened together with two #8 x 1/2" type S screws at each intersection. The perimeter of the frame was sealed at the specimen opening with non-hardening acoustic sealant.

| | |
|---|---|
| Top Track: | CEMCO 362 CST250-30 20 GA 33 KSI |
| Bottom Track: | CEMCO 362 VXT125-18 NS 57 KSI |
| Studs: | CEMCO 362 VXS144-18 NS 57 KSI |

### INSULATION

Glass fiber insulation batts were friction fit into the stud cavities. The batts were 24" wide and 3-1/2" thick with an R-Value of R-13.

### SHEATHING

**Source Side:** One layer of 5/8" Type X gypsum panels was applied parallel to the studs. The panels were attached to the frame with #6 x 1" type S drywall screws at 12" OC.

**Receiving Side:** Two layers of gypsum panels were applied to the framing.

Base layer: 5/8" gypsum panels were applied parallel to the studs. The panels were attached to the frame with #6 x 1" type S drywall screws, spaced 12" OC. Joints were staggered one stud cavity to offset each side.

Face layer: 5/8" gypsum panels were applied parallel to the studs. The panels were attached to the frame with #6 x 1-5/8" type S drywall screws spaced 24" OC. Joints were staggered one stud cavity to offset each layer.

All fasteners in the assembly installation were mechanically installed.

The panels were shimmed at installation so equal ½" gaps were maintained on all four edges. Shims were removed after the panels were fastened and the seams were sealed on the source and receiving room sides with non-hardening acoustical sealant. The entire perimeter of both sides of the specimen were sealed with drywall accessories as noted below.

### DRYWALL ACCESSORIES

Smoke and Sound Stop B was installed along the bottom of both the source side and receiver sides. Smoke and Sound Stop B was installed along the top and side perimeter of the source side and receiver sides. Products were 1/2" x 1" for the source room side and 1"x1" for the receiver room side where two layers of gypsum board were installed. The seals were friction-fit into the gap at the perimeter of the test specimen.

1-1/2" Trim-Tex flat deflection bead was installed at the top and sides and fastened with staples every 3"-6". The Trim-Tex was finished with joint compound.

| SPECIMEN DETAIL | |
|---|---|
| Specimen Face Dimensions | 12.0' [3.66 m] x 8.00' [2.44 m] |
| Specimen Thickness | 5.50" [14.0 cm] |
| Specimen Face Area | 96.0 SF [8.92 m²] |
| Overall Mass | 696 lb [316 kg] |
| Overall Surface Density | 7.25 PSF [35.4 kg/m²] |

Mass of fasteners, tape and sealant is not represented in the above totals.

## SECTION C – SPECIMEN DESCRIPTION (CONT.)

| | | | |
|---|---|---|---|
| **HARDWARE** | | | |
| Material | Smoke and Sound Stop B | | |
| Dimensions | 0.50" x 1.00" [1.3 cm x 2.5 cm] | Net Length | 12.0' [3.66 m] |
| Lengths | 1 @ 144.00" [365.8 cm] | | |
| **HARDWARE** | | | |
| Material | Smoke and Sound Stop B w/flat deflection bead | | |
| Dimensions | 0.50" x 1.00" [1.3 cm x 2.5 cm] | Net Length | 28.0' [8.53 m] |
| Lengths | 2 @ 96.00" [243.8 cm]<br>1 @ 144.00" [365.8 cm] | | |
| **SHEATHING** | **SOURCE SIDE BASE LAYER** | | |
| Material | Type X gypsum panels | Mass | 212 lb [96.2 kg] |
| Thickness | 0.63" [1.6 cm] | Net Area | 96.0 SF [8.92 $m^2$] |
| Face Dimensions | 3 @ 48.00" x 96.00" [121.9 cm x 243.8 cm] | Surface Density | 2.21 PSF [10.8 $kg/m^2$] |
| **FRAMING** | | | |
| Material | CEMCO 30 mil (20 GA) steel slotted top track | Mass | 9.60 lb [4.35 kg] |
| Steel Thickness | 0.0312" [792 µm] | Net Length | 12.0' [3.66 m] |
| Dimensions | 3.63" x 2.50" [9.2 cm x 6.4 cm] | Linear Density | 0.800 lb/ft [1.19 kg/m] |
| Lengths | 1 @ 144.00" [365.8 cm] | | |
| **FRAMING** | | | |
| Material | CEMCO 18 mil (20 ga. EQ) steel studs | Mass | 24.5 lb [11.1 kg] |
| Steel Thickness | 0.0188" [478 µm] | Net Length | 55.7' [17.0 m] |
| Dimensions | 3.63" x 1.44" [9.2 cm x 3.7 cm] | Linear Density | 0.440 lb/ft [0.654 kg/m] |
| Lengths | 7 @ 95.50" [242.6 cm] | | |
| **FRAMING** | | | |
| Material | CEMCO 18 mil (20 ga. EQ) steel bottom tracks | Mass | 4.90 lb [2.22 kg] |
| Steel Thickness | 0.0188" [478 µm] | Net Length | 12.0' [3.66 m] |
| Dimensions | 3.63" x 1.25" [9.2 cm x 3.2 cm] | Linear Density | 0.408 lb/ft [0.608 kg/m] |
| Lengths | 1 @ 144.00" [365.8 cm] | | |
| **INSULATION** | | | |
| Material | glass fiber batt insulation | Mass | 24.0 lb [10.9 kg] |
| Thickness | 3.50" [8.9 cm] | Net Volume | 28.0 CF [0.793 $m^3$] |
| Face Dimensions | 6 @ 24.00" x 96.00" [61.0 cm x 243.8 cm] | Density | 0.857 PCF [13.7 $kg/m^3$] |

## SECTION C – SPECIMEN DESCRIPTION (CONT.)

| | | | |
|---|---|---|---|
| **SHEATHING** | **RECEIVING SIDE BASE LAYER** | | |
| Material | Type X gypsum panels | Mass | 211 lb [95.7 kg] |
| Thickness | 0.63" [1.6 cm] | Net Area | 96.0 SF [8.92 m²] |
| Face Dimensions | 2 @ 48.00" x 96.00" [121.9 cm x 243.8 cm]<br>2 @ 24.00" x 96.00" [61.0 cm x 243.8 cm] | Surface Density | 2.20 PSF [10.7 kg/m²] |
| **SHEATHING** | **RECEIVING SIDE FACE LAYER** | | |
| Material | Type X gypsum panels | | 210 lb [95.3 kg] |
| Thickness | 0.63" [1.6 cm] | Net Area | 96.0 SF [8.92 m²] |
| Face Dimensions | 3 @ 48.00" x 96.00" [121.9 cm x 243.8 cm] | Surface Density | 2.19 PSF [10.7 kg/m²] |
| **HARDWARE** | | | |
| Material | Smoke and Sound Stop B w/flat deflection bead | | |
| Dimensions | 1.00" x 1.00" [2.5 cm x 2.5 cm] | Net Length | 28.0' [8.53 m] |
| Lengths | 2 @ 96.00" [243.8 cm]<br>1 @ 144.00" [365.8 cm] | | |
| **HARDWARE** | | | |
| Material | Smoke and Sound Stop B | | |
| Dimensions | 1.00" x 1.00" [2.5 cm x 2.5 cm] | Net Length | 12.0' [3.66 m] |
| Lengths | 1 @ 144.00" [365.8 cm] | | |

All materials were weighed prior to installation. The nominal dimensions and product information were provided by the test sponsor or obtained from manufacturer data sheets.

## SECTION D – MEASUREMENT SET-UP

| ENVIRONMENTAL CONDITIONS | |
|---|---|
| Source Room Temperature | 68.9 °F [20.5 °C] |
| Source Room Relative Humidity | 52.2% |
| Receiving Room Temperature | 69.7 °F [20.9 °C] |
| Receiving Room Relative Humidity | 55.3% |

| CHAMBER VOLUME | |
|---|---|
| Source Room | 7,694 CF [217.9 m³] |
| Receiving Room | 12,310 CF [348.5 m³] |
| Source Niche Depth | 17.0" [43.2 cm] |
| Receiving Niche Depth | 2.75" [6.99 cm] |

**INSTRUMENTATION**

| DESCRIPTION | BRAND | MODEL | SERIAL |
|---|---|---|---|
| Analyzer | Sinus | Apollo | 75110 |
| Software | Sinus | Samurai | ver. 2.8.3 |
| Microphone | Brüel & Kjær | 4166 | 1620281 |
| Microphone | Brüel & Kjær | 4166 | 1620312 |
| Preamplifier | Brüel & Kjær | 2669 | 2025373 |
| Preamplifier | Brüel & Kjær | 2669 | 2083679 |
| Calibrator | Brüel & Kjær | 4231 | 2314028 |
| Thermohygrometer | Kestrel | D2 | 2781724 |
| Thermohygrometer | Kestrel | 5200 | 2311344 |

## SECTION E – TEST RESULTS

| FREQUENCY BAND (Hz) | TL (dB) | DATA FLAGS (see below) | 95% C.I. (dB) | FLANKING LIMIT (dB) | DEFICIENCIES (dB) |
|---|---|---|---|---|---|
| 50 | 16.8 | | ±4.2 | 44.8 | - |
| 63 | 13.9 | | ±4.4 | 46.8 | - |
| 80 | 14.3 | | ±2.8 | 52.8 | - |
| 100 | 23.5 | | ±1.6 | 59.2 | - |
| 125 | 31.5 | | ±1.4 | 65.2 | 3 |
| 160 | 36.4 | | ±1.2 | 69.7 | 1 |
| 200 | 40.3 | | ±1.3 | 72.8 | 0 |
| 250 | 43.6 | | ±0.7 | 77.7 | 0 |
| 315 | 46.9 | | ±0.6 | 82.6 | 0 |
| 400 | 50.5 | | ±0.6 | 88.3 | 0 |
| 500 | 53.9 | | ±0.4 | 93.4 | 0 |
| 630 | 55.8 | | ±0.4 | 95.6 | 0 |
| 800 | 58.2 | | ±0.4 | 100.5 | 0 |
| 1,000 | 59.6 | | ±0.5 | 105.0 | 0 |
| 1,250 | 61.0 | | ±0.7 | 107.9 | 0 |
| 1,600 | 59.8 | | ±0.4 | 105.9 | 0 |
| 2,000 | 47.4 | | ±0.4 | 106.0 | 7 |
| 2,500 | 46.0 | | ±0.5 | 105.7 | 8 |
| 3,150 | 50.6 | | ±0.4 | 105.2 | 3 |
| 4,000 | 55.8 | | ±0.4 | 103.4 | 0 |
| 5,000 | 59.6 | | ±0.5 | 100.7 | - |
| | | | | **TOTAL DEFICIENCIES BELOW CONTOUR** [dB] | **22** |
| | | | | **STC RATING** [ASTM E413] | **50** |

Note: Composite 95% confidence intervals from room qualification testing. Extended frequency results below 80Hz and above 5000Hz are for reference only. Specimen TL rounded to 0.1 dB provided in this table for reference. Specimen TL rounded to whole decibels found on page 2.

NORTH ORBIT ACOUSTIC LABORATORIES

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| **TEST METHOD** | ASTM E90-23: Standard Test Method for Laboratory Measurement of Airborne Sound Transmission of Building Partitions and Elements |
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| **RESULT SUMMARY** | STC 50 |
| **TEST DATE** | May 7, 2024 |
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