

# **ACTS CONSTRUCTION, LLC ACOUSTICAL PERFORMANCE TEST REPORT**

**SCOPE OF WORK**

ASTM E90 SOUND TRANSMISSION LOSS TESTING ON A ICF WALL SYSTEM

**REPORT NUMBER**

M6292.01-113-11-R0

**TEST DATE**

09/15/21

**ISSUE DATE**

10/28/21

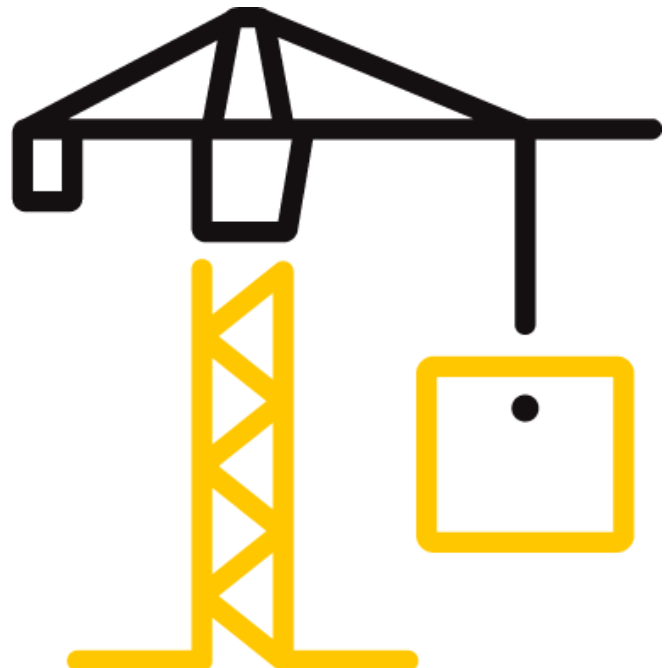
**PAGES**

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**DOCUMENT CONTROL NUMBER**

RT-R-AMER-Test-2758 (01/17/21)

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## TEST REPORT FOR ACTS CONSTRUCTION, LLC

Report No.: M6292.01-113-11-R0

Date: 10/28/21

### REPORT ISSUED TO

#### ACT CONSTRUCTION, LLC

7816 113<sup>TH</sup> Avenue

Pleasant Prairie, Wisconsin 53158

### SECTION 1

#### SCOPE

Architectural Testing, Inc. (an Intertek company) dba Intertek Building & Construction (B&C) was contracted by Acts Construction, LLC to conduct a sound transmission loss test. Results obtained are tested values and were secured by using the designated test methods. 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 York, Pennsylvania.

This report does not constitute certification of this product nor an opinion or endorsement by this laboratory. Intertek B&C will service this report for the entire test record retention period. The test record retention period ends four years after the test date. Test records, such as detailed drawings, datasheets, representative samples of test specimens, or other pertinent project documentation, will be retained for the entire test record retention period.

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For INTERTEK B&C:

<b>COMPLETED BY:</b>	Zachary P. Golden	<b>REVIEWED BY:</b>	Kurt A. Golden
<b>TITLE:</b>	Technician Team Leader	<b>TITLE:</b>	Project Lead
<b>SIGNATURE:</b>	Acoustical Testing	<b>SIGNATURE:</b>	Acoustical Testing
<b>DATE:</b>	10/28/21	<b>DATE:</b>	10/28/21

ZPG:jmcs

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### SECTION 2

#### SUMMARY OF TEST RESULTS

<b>TYPE</b>	ICF Wall System
<b>DATA FILE NO.</b>	M6292.01A
<b>STC</b>	47
<b>OITC</b>	42

### SECTION 3

#### TEST METHODS

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 (2020)**, *Standard Test Method for Determination of Decay Rates for Use in Sound Insulation Test Methods*

### SECTION 4

#### SPECIMEN INSTALLATION

The specimen was constructed in the laboratory. A sound transmission loss test was initially performed on a filler wall. The 96" wide by 96" high specimen plug was removed from the filler wall assembly. The specimen was placed on an isolation pad in the 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.

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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.

INSTRUMENT	MANUFACTURER	MODEL	DESCRIPTION	ASSET #	CAL DATE
Data Acquisition Card	National Instruments	PXI-4462	Data Acquisition Card	63763-3*	04/20
Data Acquisition Card	National Instruments	PXI-4462	Data Acquisition Card	65125*	05/20
Data Acquisition Card	National Instruments	PXI-4462	Data Acquisition Card	65126*	05/20
Source Room Microphone	PCB Piezotronics	378C20	Microphone and Preamplifier	64902	11/20
Source Room Microphone	PCB Piezotronics	378B20	Microphone and Preamplifier	INT02256	01/21
Source Room Microphone	PCB Piezotronics	378B20	Microphone and Preamplifier	65103	03/21
Source Room Microphone	PCB Piezotronics	378B20	Microphone and Preamplifier	64905	03/21
Source Room Microphone	PCB piezotronics	378B20	Microphone and Preamplifier	64906	03/21
Receive Room Microphone	PBC Piezotronics	378B20	Microphone and Preamplifier	64907	01/21
Receive Room Microphone	PCB Piezotronics	378C20	Microphone and Preamplifier	64908	01/21
Receive Room Microphone	PCB Piezotronics	378B20	Microphone and Preamplifier	64909	01/21
Receive Room Microphone	PCB Piezotronics	378B20	Microphone and Preamplifier	64910	01/21
Receive Room Microphone	PCB Piezotronics	378B20	Microphone and Preamplifier	64911	11/20
Receive Room Environmental Indicator	Comet	T7510	Receive Room	64915	01/21
Source Room Environmental Indicator	Comet	T7510	Source Room	64914	02/21
Microphone Calibrator	Norsonic	1251	Acoustical Calibrator	Y002919	04/21

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

**TEST CHAMBER**

	VOLUME	DESCRIPTION
RECEIVE ROOM	234 m <sup>3</sup>	Rotating vane and stationary diffusers Temperature and humidity controlled Isolation pads under the floor
SOURCE ROOM	207 m <sup>3</sup>	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

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### SECTION 6

#### LIST OF OFFICIAL OBSERVERS

NAME	COMPANY
Zachary P. Golden	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 in 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.

Intertek B&C will store samples of test specimens for four years.

### 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

##### EXTERIOR SHEATHING (SOURCE SIDE)

MATERIAL	ACTUAL DIMENSIONS (inches)	ACTUAL THICKNESS (inches)	MANUFACTURER AND SERIES	QUANTITY	AVERAGE WEIGHT
JAMES HARDIE® BOARD	96 by 8.25	0.3125	James Hardie® fiber cement siding	13.75 sheets	1.48 lbs per linear ft
<i>Note: Fasteners spaced on 16" centers. Perimeter sealed with duct seal.</i>					

##### CORE

ICF THERMAL PANEL	96" by 96" by 11-1/4"	Each ICF form consisted of two EPS foam panels that were 16" by 48" by 2" thick with 6 plastic cross-ties placed 4" from each end 8" on center. The forms were adhered together with QSI Quad Tan Foam sealant and assembled to the test specimen size. Once assembled #4 rebar was placed every 32" on center vertically and horizontally. The cavity was filled with 7-1/4" of concrete (2500 PSI wall mix with a 3/4" aggregate poured at a 6-1/2" slump).			6,125 lbs
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##### INTERIOR SHEATHING (RECEIVE SIDE)

MATERIAL	ACTUAL DIMENSIONS (inches)	ACTUAL THICKNESS (inches)	MANUFACTURER AND SERIES	QUANTITY	AVERAGE WEIGHT
GYPSUM BOARD	48 by 96	0.625	National Gypsum Type X	2 sheets	2.25 lbs/ft <sup>2</sup>
<i>Note: Screws spaced on 16" centers. Perimeter sealed with duct seal and joints sealed with acoustical sealant and foil tape. Screw heads sealed with foil tape.</i>					

TOTAL WEIGHT (lbs)	AVERAGE WEIGHT (lbs/ft <sup>2</sup> )
6,431.80	100.50

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

Photographs are included in Section 11.

The client did not supply a report drawing of the test specimen.

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### SECTION 10

#### TEST RESULTS

#### M6292.01A DATA

<b>SPECIMEN AREA</b>	5.95 m <sup>2</sup>	<b>RECEIVE TEMP.</b>	22.3 °C	<b>SOURCE TEMP</b>	22.1 °C
<b>TECHNICIAN</b>	Zachary Gol	<b>RECEIVE HUMIDITY</b>	53%	<b>SOURCE HUMIDIT</b>	53%

FREQ (Hz)	BACKGROUND SPL (dB)	ABSORPTION (m <sup>2</sup> )	SOURCE SPL (dB)	RECEIVE SPL (dB)	SPECIMEN TL (dB)	95% CONFIDENCE LIMIT	NUMBER OF DEFICIENCIES
80	34.2	4.8	109	66	45	2.21	-
100	37.6	6.3	109	65	45	1.76	-
125	41.8	5.9	108	65	43	1.12	0
160	43.0	5.3	111	68	43	0.97	0
200	42.2	5.1	109	76	34	0.85	3
250	32.9	5.6	106	64	42	0.73	0
315	26.5	6.0	108	72	36	0.65	7
400	21.7	6.5	109	71	38	0.39	8
500	18.9	7.3	107	67	39	0.42	8
630	19.4	6.6	106	59	46	0.39	2
800	15.2	6.6	106	46	60	0.32	0
1000	11.8	6.6	107	41	66	0.25	0
1250	10.1	7.1	106	36	71	0.18	0
1600	9.1	7.5	105	33	72	0.35	0
2000	8.0	8.1	105	35	70	0.35	0
2500	7.6	9.0	105	33	72	0.21	0
3150	8.0	10.5	104	25	78	0.21	0
4000	8.6	12.8	102	17	83	0.29	0
5000	9.7	16.1	102	15	84	0.23	-
<b>STC RATING</b>	47 (Sound Transmission Class)						
<b>DEFICIENCIES</b>	28 (Sum of Deficiencies)						
<b>OITC RATING</b>	42 (Outdoor-Indoor Transmission Class)						

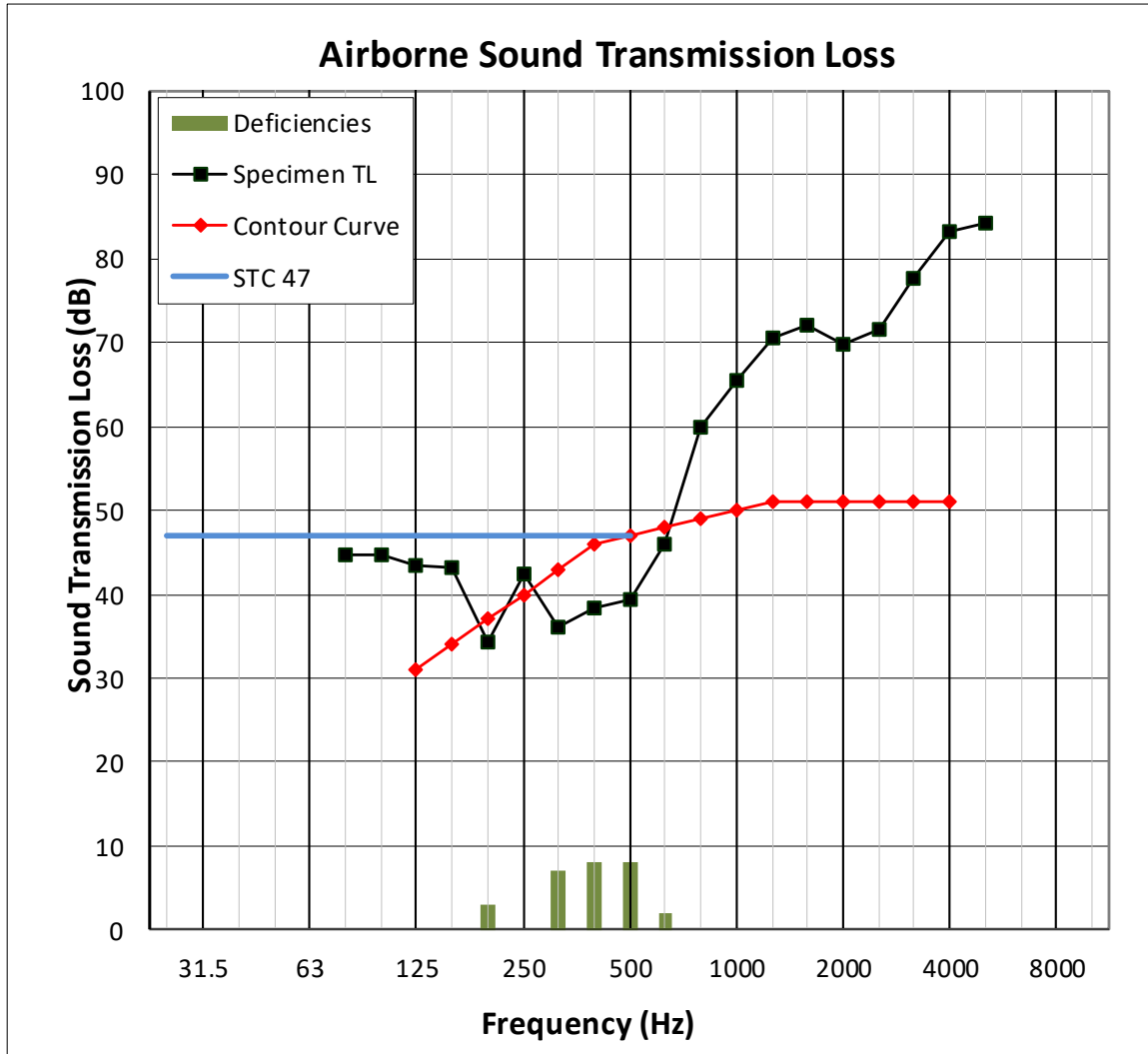
- Notes:**
- 1) Receive Room levels less than 5 dB above the Background levels are red.
  - 2) Specimen TL levels listed in red indicate the lower limit of the transmission loss.
  - 3) Specimen TL levels listed in green indicate that there has been a filler wall correction applied

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### M6292.01A GRAPH





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### SECTION 11

#### PHOTOGRAPHS



**Photo No. 1**  
**Receive Room View of Installed Test Specimen**



**Photo No. 2**  
**Source Room View of Installed Test Specimen**

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**Photo No. 3**

**View of Inside ICF Wall Before Concrete was Poured**



**Photo No. 4**

**View of Inside ICF Wall Before Concrete was Poured**

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**Photo No. 5**

**View of ICF Wall After Concrete was Poured**



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**SECTION 12**

**REVISION LOG**

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