

CLARKDIETRICH ACOUSTICAL PERFORMANCE TEST REPORT

SCOPE OF WORK

ASTM E90 AND ASTM E492 TESTING ON BARE GYPSUM CONCRETE

SPECIMEN TYPE

Open Web Truss with CDSC Sound Clips and Type C Drywall

REPORT NUMBER

P2294.03-113-11-R0

TEST DATE

09/22/22

ISSUE DATE

10/17/22

RECORD RETENTION END

09/22/26

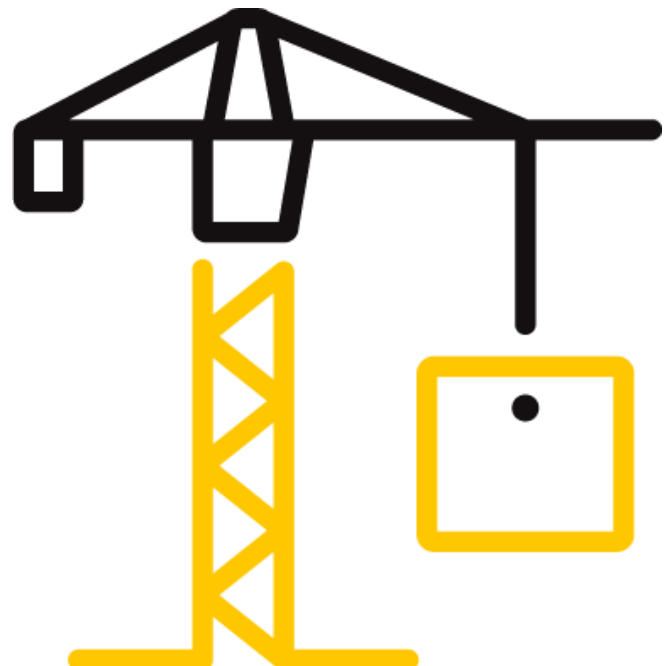
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DOCUMENT CONTROL

RTTDS-R-AMER-Test-2844 (03/23/22)

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TEST REPORT FOR CLARKDIETRICH BUILDING SYSTEMS, LLC

Report No.: P2294.03-113-11-R0

Date: 10/17/22

REPORT ISSUED TO

CLARKDIETRICH BUILDING SYSTEMS, LLC

9050 Centre Pointe Drive, Suite 400

West Chester, Ohio 45069

SECTION 1

SCOPE

Architectural Testing, Inc. (an Intertek company) dba Intertek Building & Construction (B&C) was contracted by ClarkDietrich Building Systems, LLC to perform testing in accordance with ASTM E90 AND ASTM E492 on Bare Gypsum Concrete. Results obtained are tested values and were secured by using the designated test methods. Testing was conducted in the VT 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.

SECTION 2

SUMMARY OF TEST RESULTS

DATA FILE NO.	P2294.03
SERIES/MODEL:	Bare Gypsum Concrete
STC	62
IIC	51
HIIC	50

COMPLETED BY:	Corey S. Kohler
TITLE:	Technician - Acoustical Testing
SIGNATURE:	
DATE:	10/17/22

COMPLETED BY:	Daniel B. Mohler
TITLE:	Manager - Acoustical Testing
SIGNATURE:	
DATE:	10/17/22

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SECTION 3**TEST METHODS**

The specimen was evaluated in accordance with the following:

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

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

ASTM E492-09(2016)e1, *Standard Test Method for Laboratory Measurement of Impact Sound Transmission Through Floor-Ceiling Assemblies Using the Tapping Machine*

ASTM E989-21, *Classification for Determination of Impact Insulation Class (IIC)*

ASTM E2235-04 (2020), *Standard Test Method for Determination of Decay Rates for Use in Sound Insulation Test Methods*

ASTM E3222-20, *Standard Classification for Determination of High-Frequency Impact Sound Ratings*

SECTION 4**MATERIAL SOURCE/INSTALLATION**

The full test specimen was assembled on the day of testing by B&C. All materials provided by the client were installed on an existing B&C assembly (Open Web Truss with CDSC Sound Clips and Type C Drywall) utilizing B&C-supplied materials. The assembly was installed in a steel test frame which was installed into the opening between the source and receive rooms in the test chamber. The test frame was isolated from the structure with dense neoprene gasket.

The total weight of the floor/ceiling assembly was 1014.3 kg. B&C will store samples of the test specimen for four years. Photographs of the test specimen are included in the report. A drawing of the test specimen is included in the report.

B&C 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 B&C for the entire test record retention period.

Unless differently required, Intertek reports apply the "Simple Acceptance" rule, also called "Shared Risk approach," of ILAC-G8:09/2019, Guidelines on Decision Rules and Statements of Conformity.

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**SECTION 5
EQUIPMENT**

INSTRUMENT	MANUFACTURER	MODEL	DESCRIPTION	ASSET #	CAL DATE	
2-Channel Analog Input	National Instruments	NI 9250	2-Channel Analog Input	INT02586	04/22	*
2-Channel Analog Input	National Instruments	NI 9250	2-Channel Analog Input	INT02587	04/22	*
2-Channel Analog Input	National Instruments	NI 9250	2-Channel Analog Input	INT02608	04/22	*
2-Channel Analog Input	National Instruments	NI 9250	2-Channel Analog Input	INT02609	04/22	*
2-Channel Analog Input	National Instruments	NI 9250	2-Channel Analog Input	INT02610	04/22	*
2-Channel Analog Input	National Instruments	NI 9250	2-Channel Analog Input	INT02612	04/22	*
Microphone Calibrator	Norsonic	34093	Acoustical Calibrator	65105	10/21	
Receive Room Microphone	PCB Piezotronics	378C20	Microphone and Preamplifier	63741	06/22	
Receive Room Microphone	PCB Piezotronics	378B20	Microphone and Preamplifier	63740	04/22	
Receive Room Microphone	PCB Piezotronics	378B20	Microphone and Preamplifier	64340	10/21	
Receive Room Microphone	PCB Piezotronics	378B20	Microphone and Preamplifier	63744	09/21	
Receive Room Microphone	PCB Piezotronics	378B20	Microphone and Preamplifier	65968	01/22	
Receive Room Environmental Indicator	Comet	T7510	Temperature and Humidity Transmitter	63810	10/21	
				63811	10/21	
Source Room Microphone	PCB Piezotronics	378C20	Microphone and Preamplifier	65103	02/22	
Source Room Microphone	PCB Piezotronics	378C20	Microphone and Preamplifier	64902	12/21	
Source Room Microphone	PCB Piezotronics	378C20	Microphone and Preamplifier	63739	07/22	
Source Room Microphone	PCB Piezotronics	378C20	Microphone and Preamplifier	63742	04/22	
Source Room Microphone	PCB Electronics	378C20	Microphone and Preamplifier	64906	04/22	
Source Room Environmental Indicator	Comet	T7510	Temperature and Humidity Transmitter	63812	10/21	
Tapping Machine	Norsonic	Nor277	Tapping Machine	INT00936	02/22	

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

VT RECEIVE ROOM VOLUME	155.77 m ³
VT SOURCE ROOM VOLUME	190 m ³

**SECTION 6
LIST OF OFFICIAL OBSERVERS**

NAME	COMPANY
Corey S. Kohler	Intertek B&C
Daniel B. Mohler	Intertek B&C

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SECTION 7**TEST PROCEDURE**

The microphones were calibrated before conducting the tests. The air temperature and relative humidity conditions were monitored and recorded during all measurements. The average temperature and humidity of both the source and receive rooms are listed in Sections 10 and 11. The maximum and minimum temperatures and humidities of the receive room from the duration of the test are listed in Sections 12 and 13.

The airborne transmission loss test was conducted in accordance with the ASTM E90 test method using the single direction method. 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 both rooms, at each of five microphone positions.

The impact sound transmission test was conducted in accordance with the ASTM E492 test method. Two background noise sound pressure level, two sound pressure level measurements with the tapping machine operating at each position specified by ASTM E492, and five sound absorption measurements were conducted at each of five microphone positions.

Detailed test procedures, data for flanking limit tests, repeatability measurements, and reference specimen tests are available upon request.

SECTION 8**TEST CALCULATIONS**

The STC (Sound Transmission Class), IIC (Impact Insulation Class), and HIIC (High-Frequency Impact Insulation Class) ratings were calculated in accordance with ASTM E413, ASTM E989, and ASTM E3222, respectively.

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SECTION 9

TEST SPECIMEN DESCRIPTION

MATERIAL	DIMENSIONS (mm)	THICKNESS (mm)	MANUFACTURER AND SERIES	QUANTITY	AVERAGE WEIGHT
Gypsum Concrete	3023 by 3632	19.1	Maxxon Gyp-Crete	10.98 m ²	53.8 kg/m ²
	Note: Poured directly onto the subfloor, cured a minimum of 14 days. The gypsum panel had a closed cell foam perimeter isolation. No noticeable shrinkage or cracking was visible on the specimen.				
Oriented Strand Board Sheathing	1219 by 2438	18.8	N/A	10.98 m ²	11.67 kg/m ²
	Note: Adhered to the floor trusses with Loctite PL 400 Subfloor adhesive. Fastened with 9D nails on 203 mm centers along perimeter and 305 mm centers along trusses.				
Fiberglass Insulation	520.7 by 3023	88.9	Johns Manville Unfaced R-13	10.98 m ²	1.32 kg/m ²
	Note: Installed in the cavity between trusses, stapled flush with the subfloor				
Open Web Truss	88.9 by 2933.7	457.2	York PB Truss L/360	7 trusses	19.05 kg/truss
	Note: Installed on 610 mm centers using JUS414 hanger brackets.				
Sound Clip	77 by 35.2	24.5	ClarkDietrich CDSC	36 clips	0.09 kg/clip
	Note: Fastened to the joist bottoms in a 610 mm by 1219 mm grid pattern				
Furring/Hat Channel	3657.6 by 76.2	22.3	ClarkDietrich 087F125-18	29.1 lin m	0.48 kg/m
	Note: Installed into the ceiling clips, 610 mm on center				
Gypsum Panel	1219 by 3023	15.9	USG SHEETROCK® Brand FIRECODE® C Core	10.98 m ²	11.91 kg/m ²
	Note: Fastened to the channels on 305 mm centers with 25.4 mm Type S bugle head screws. The seams of the gypsum panels were sealed with Pecora AC-20 FTR caulk and covered with pressure sensitive tape.				

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SECTION 10

TEST RESULTS - AIRBORNE SOUND TRANSMISSION LOSS



TEST DATE	9/22/2022				
DATA FILE NO.	P2294.03				
CLIENT	ClarkDietrich Building Systems, LLC				
DESCRIPTION	19.05 mm Maxxon Gyp-Crete Gypsum Concrete, 18.8 mm Oriented Strand Board Sheathing, 88.9 mm Johns Manville Unfaced R-13 Fiberglass Insulation, 457.2 mm York PB Truss L/360 Open Web Truss, 24.5 mm ClarkDietrich CDSC Sound Clip, 22.3 mm ClarkDietrich 087F125-18 Furring/Hat Channel, 15.9 mm USG SHEETROCK® Brand FIRECODE® C Core Gypsum Panel				
SPECIMEN AREA	10.98 m ²	Receive Temp.	22.3°C	Source Temp.	19.2°C
TECHNICIAN	CSK	Receive Humidity	77%	Source Humidity	77%

FREQ (Hz)	BACKGROUND SPL (dB)	ABSORPTION m ²	SOURCE SPL (dB)	RECEIVE SPL (dB)	SPECIMEN TL (dB)	95% SAMPLING LIMIT	NUMBER OF DEFICIENCIES
50	43.7	26.9	107	75	30	3.5	-
63	40.2	16.2	103	70	33	4.2	-
80	37.2	14.1	99	68	30	2.3	-
100	31.8	9.5	99	65	35	1.9	-
125	32.0	11.1	103	60	44	1.6	2
160	28.7	9.2	100	57	45	1.5	4
200	24.2	11.2	96	50	47	1.9	5
250	21.8	10.3	98	48	51	1.0	4
315	22.4	10.4	103	52	52	1.0	6
400	20.4	8.2	103	49	56	0.6	5
500	18.9	7.0	99	41	61	0.8	1
630	19.9	7.6	98	38	63	0.9	0
800	18.7	7.6	99	38	63	0.4	1
1000	20.2	7.5	99	36	64	0.3	1
1250	17.8	8.0	100	34	68	0.5	0
1600	14.9	7.8	100	33	69	0.5	0
2000	11.6	8.5	99	32	69	0.3	0
2500	10.2	9.3	95	28	69	0.5	0
3150	9.3	9.9	92	23	70	0.4	0
4000	8.9	10.9	93	19	75	0.5	0
5000	8.5	12.1	91	13	79	0.5	-
6300	8.9	14.3	89	9	80	0.6	-
8000	9.6	17.2	91	9	81	0.9	-
10000	10.0	17.2	89	9	80	1.1	-
STC Rating	62	<i>(Sound Transmission Class)</i>			Sum of Deficiencies	29	

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

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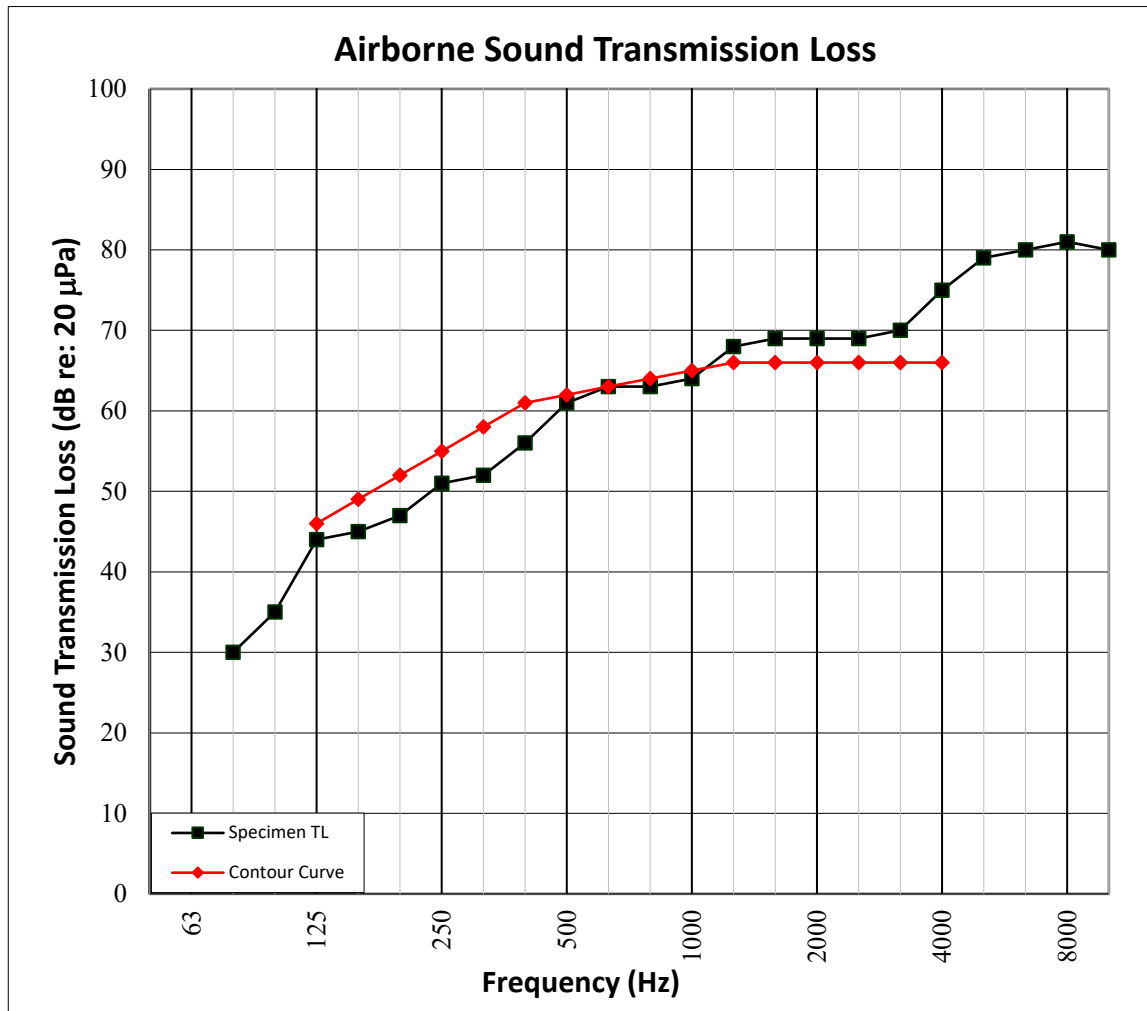
Date: 10/17/22

SECTION 11

TEST RESULTS - AIRBORNE SOUND TRANSMISSION LOSS GRAPH



TEST DATE	9/22/2022				
DATA FILE NO.	P2294.03				
CLIENT	ClarkDietrich Building Systems, LLC				
DESCRIPTION	19.05 mm Maxxon Gyp-Crete Gypsum Concrete, 18.8 mm Oriented Strand Board Sheathing, 88.9 mm Johns Manville Unfaced R-13 Fiberglass Insulation, 457.2 mm York PB Truss L/360 Open Web Truss, 24.5 mm ClarkDietrich CDSC Sound Clip, 22.3 mm ClarkDietrich 087F125-18 Furring/Hat Channel, 15.9 mm USG SHEETROCK® Brand FIRECODE® C Core Gypsum Panel				
SPECIMEN AREA	10.98 m ²	Receive Temp.	22.3°C	Source Temp.	19.2°C
TECHNICIAN	CSK	Receive Humidity	77%	Source Humidity	77%



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SECTION 12

TEST RESULTS - IMPACT SOUND TRANSMISSION



TEST DATE	9/22/2022				
DATA FILE NO.	P2294.03				
CLIENT	ClarkDietrich Building Systems, LLC				
DESCRIPTION	19.05 mm Maxxon Gyp-Crete Gypsum Concrete, 18.8 mm Oriented Strand Board Sheathing, 88.9 mm Johns Manville Unfaced R-13 Fiberglass Insulation, 457.2 mm York PB Truss L/360 Open Web Truss, 24.5 mm ClarkDietrich CDSC Sound Clip, 22.3 mm ClarkDietrich 087F125-18 Furring/Hat Channel, 15.9 mm USG SHEETROCK® Brand FIRECODE® C Core Gypsum Panel				
SPECIMEN AREA	10.98 m ²	Maximum Temp.	22.3°C	Minimum Temp.	22.3°C
TECHNICIAN	CSK	Max. Humidity	77%	Min. Humidity	77%

FREQ (Hz)	BACKGROUND SPL (dB)	ABSORPTION m ²	NORMALIZED IMPACT SPL (dB)	95% SAMPLING LIMIT	NUMBER OF DEFICIENCIES
80	32.3	13.9	63	1.7	-
100	24.5	8.2	60	1.7	0
125	23.9	11.4	60	0.8	0
160	22.9	9.6	61	1.0	0
200	18.9	11.0	61	0.5	0
250	14.4	10.7	60	0.6	0
315	16.7	10.0	62	0.5	1
400	14.7	8.3	60	0.8	0
500	16.6	7.3	59	0.6	0
630	17.4	7.8	58	0.4	0
800	17.1	7.6	59	0.3	2
1000	19.5	7.4	55	0.3	0
1250	19.0	7.9	53	0.2	0
1600	14.4	7.8	50	0.2	0
2000	11.7	8.5	52	0.2	5
2500	11.6	9.3	52	0.2	8
3150	11.4	10.0	46	0.2	5
4000	9.5	10.8	41	0.3	-
5000	8.9	12.1	36	0.3	-
6300	8.9	14.1	30	0.4	-
8000	9.5	17.1	28	0.3	-
10000	10.0	17.1	25	0.4	-
IIC Rating	51	<i>(Impact Insulation Class)</i>		Sum of Deficiencies	21

Notes: Receive Room levels less than 5 dB above the Background levels are highlighted in yellow.

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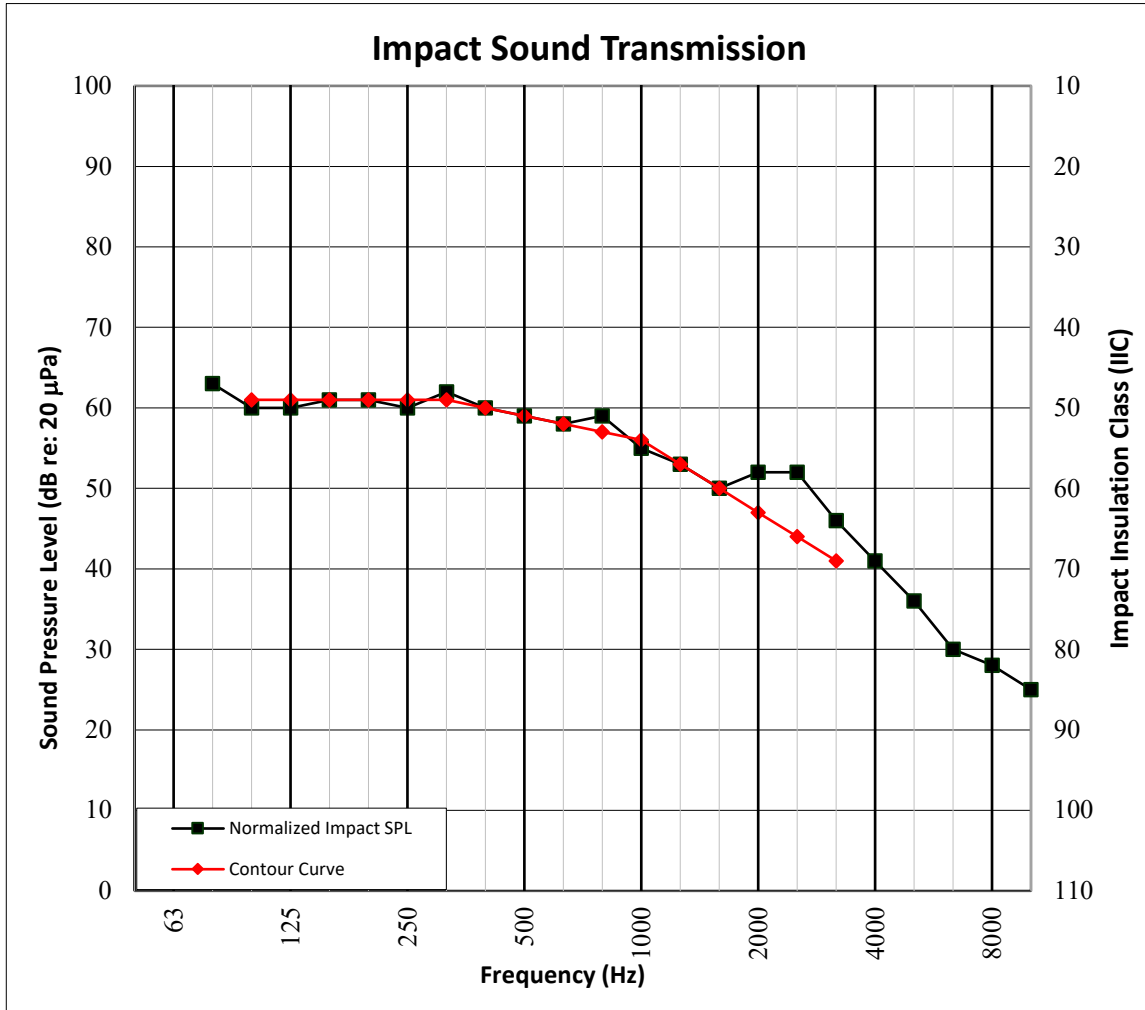
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SECTION 13

TEST RESULTS - IMPACT SOUND TRANSMISSION GRAPH



TEST DATE	9/22/2022				
DATA FILE NO.	P2294.03				
CLIENT	ClarkDietrich Building Systems, LLC				
DESCRIPTION	19.05 mm Maxxon Gyp-Crete Gypsum Concrete, 18.8 mm Oriented Strand Board Sheathing, 88.9 mm Johns Manville Unfaced R-13 Fiberglass Insulation, 457.2 mm York PB Truss L/360 Open Web Truss, 24.5 mm ClarkDietrich CDSC Sound Clip, 22.3 mm ClarkDietrich 087F125-18 Furring/Hat Channel, 15.9 mm USG SHEETROCK® Brand FIRECODE® C Core Gypsum Panel				
SPECIMEN AREA	10.98 m ²	Maximum Temp.	22.3°C	Minimum Temp.	22.3°C
TECHNICIAN	CSK	Max. Humidity	77%	Min. Humidity	77%



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SECTION 14

TEST RESULTS - HIGH-FREQUENCY IMPACT SOUND TRANSMISSION



TEST DATE	9/22/2022				
DATA FILE NO.	P2294.03				
CLIENT	ClarkDietrich Building Systems, LLC				
DESCRIPTION	19.05 mm Maxxon Gyp-Crete Gypsum Concrete, 18.8 mm Oriented Strand Board Sheathing, 88.9 mm Johns Manville Unfaced R-13 Fiberglass Insulation, 457.2 mm York PB Truss L/360 Open Web Truss, 24.5 mm ClarkDietrich CDSC Sound Clip, 22.3 mm ClarkDietrich 087F125-18 Furring/Hat Channel, 15.9 mm USG SHEETROCK® Brand FIRECODE® C Core Gypsum Panel				
SPECIMEN AREA	10.98 m ²	Maximum Temp.	22.3°C	Minimum Temp.	22.3°C
TECHNICIAN	CSK	Max. Humidity	77%	Min. Humidity	77%

FREQ (Hz)	BACKGROUND SPL (dB)	ABSORPTION m ²	NORMALIZED IMPACT SPL (dB)	95% SAMPLE CONFIDENCE LIMIT	NUMBER OF DEFICIENCIES
400	14.7	8.3	60	0.8	0.0
500	16.6	7.3	59	0.6	0.0
630	17.4	7.8	58	0.4	0.0
800	17.1	7.6	59	0.3	0.6
1000	19.5	7.4	55	0.3	0.0
1250	19.0	7.9	53	0.2	0.0
1600	14.4	7.8	50	0.2	0.0
2000	11.7	8.5	52	0.2	4.0
2500	11.6	9.3	52	0.2	7.1
3150	11.4	10.0	46	0.2	4.4
HIIC Rating	50	<i>(High-Frequency Impact Insulation Class)</i>		Sum of Deficiencies	16.1

Notes: Receive Room levels less than 5 dB above the Background levels are highlighted in yellow.

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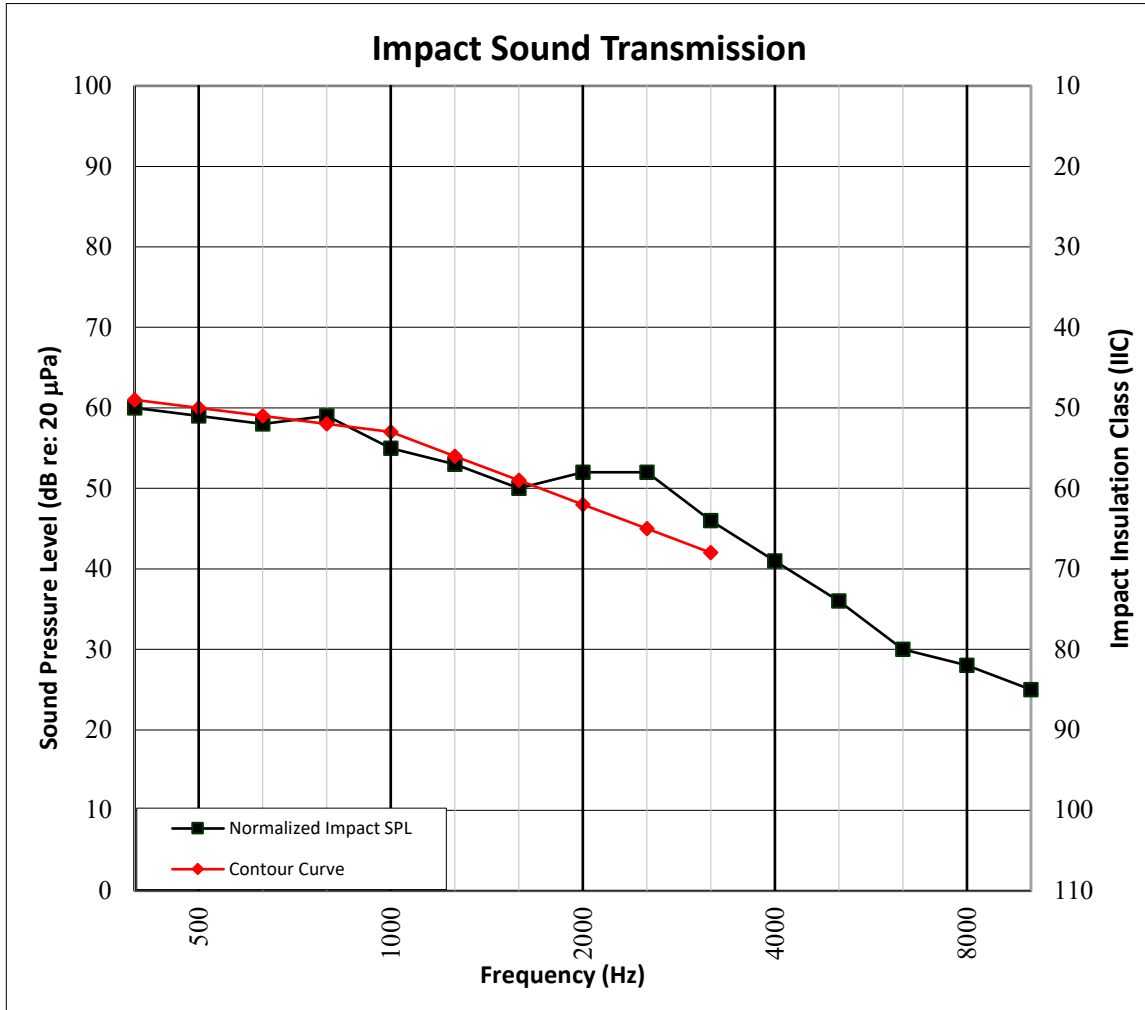
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SECTION 15

TEST RESULTS - HIGH-FREQUENCY IMPACT SOUND TRANSMISSION GRAPH



TEST DATE	9/22/2022				
DATA FILE NO.	P2294.03				
CLIENT	ClarkDietrich Building Systems, LLC				
DESCRIPTION	19.05 mm Maxxon Gyp-Crete Gypsum Concrete, 18.8 mm Oriented Strand Board Sheathing, 88.9 mm Johns Manville Unfaced R-13 Fiberglass Insulation, 457.2 mm York PB Truss L/360 Open Web Truss, 24.5 mm ClarkDietrich CDSC Sound Clip, 22.3 mm ClarkDietrich 087F125-18 Furring/Hat Channel, 15.9 mm USG SHEETROCK® Brand FIRECODE® C Core Gypsum Panel				
SPECIMEN AREA	10.98 m ²	Maximum Temp.	22.3°C	Minimum Temp.	22.3°C
TECHNICIAN	CSK	Max. Humidity	77%	Min. Humidity	77%



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SECTION 16

PHOTOGRAPHS



Photo No. 1

Source Room View of Test Specimen Installation



Photo No. 2

Receive Room View of Test Specimen Installation

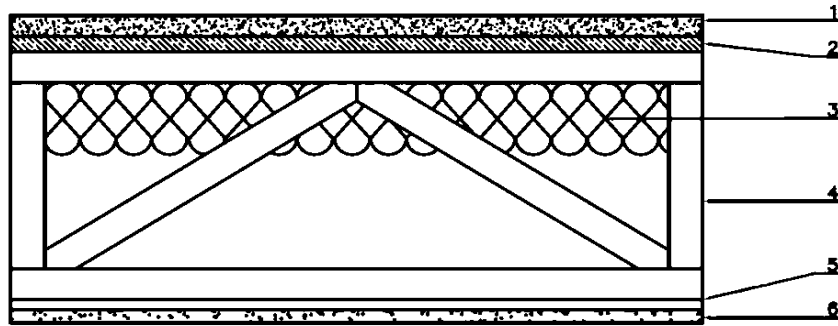
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SECTION 17

DRAWING



- 1-Subfloor Topping
- 2-Subfloor
- 3-Insulation
- 4-Truss
- 5-Ceiling Isolation
- 6-Ceiling



Total Quality. Assured.

130 Derry Court
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SECTION 18

REVISION LOG

REVISION #	DATE	PAGES	DESCRIPTION
R0	10/17/22	N/A	Original Report Issue