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URBAN SURFACES ACOUSTICAL PERFORMANCE TEST REPORT

SCOPE OF WORK
ASTM E90, ASTM E492, AND ASTM E2179 TESTING ON SURFACEGUARD

SPECIMEN TYPE
Concrete Slab - 152 mm

REPORT NUMBER
L3696.05-303-11-R0

TEST DATE
12/17/20

ISSUE DATE
01/04/21

RECORD RETENTION END
12/17/24

PAGES
15

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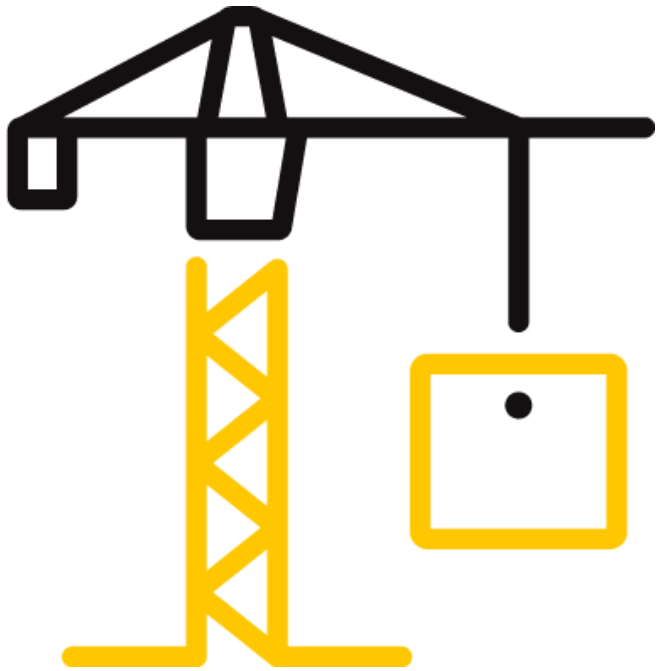

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TEST REPORT FOR URBAN SURFACES

Report No.: L3696.05-303-11-R0
Date: 01/04/21

REPORT ISSUED TO

URBAN SURFACES
1121 Olympic Drive
Corona, California 92881

SECTION 1

SCOPE

Intertek Building & Construction (B&C) was contracted by to perform testing in accordance with ASTM E90, ASTM E492, AND ASTM E2179 on SurfaceGuard. Results obtained are tested values and were secured by using the designated test method(s). Testing was conducted in the VT 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

DATA FILE NO.	L3696.05
SERIES/MODEL:	SurfaceGuard
STC	51
IIC	49
ΔIIC	21

COMPLETED BY:	Marco T. Santa Rosa	**COMPLETED BY:**	Leeland S. Hoover
TITLE:	Technician II - Acoustical Testing	**TITLE:**	Laboratory Manager - Acoustical Testing
SIGNATURE:	Marco Santa Rosa/AB Digitally Signed for: Marco Santa Rosa by Anabel Becerra	**SIGNATURE:**	Leeland O Hoover Digitally Signed by: Leeland Hoover
DATE:	01/04/21	**DATE:**	01/04/21

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SECTION 3
TEST METHOD(S)

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 E2179-03(2016), *Standard Test Method for Laboratory Measurement of the Effectiveness of Floor Coverings in Reducing Impact Sound Transmission Through Concrete Floors*

ASTM E989-06 (2012), *Classification for Determination of Impact Insulation Class (IIC)*

ASTM E2235-04 (2012), *Standard Test Method for Determination of Decay Rates for Use in Sound Insulation Test Methods*

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 (Concrete Slab - 152 mm) 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 4169.1 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.

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SECTION 5
EQUIPMENT

INSTRUMENT	MANUFACTURER	MODEL	DESCRIPTION	ASSET #	CAL DATE	
Data Acquisition Unit	National Instruments	PXIe-4464	Data Acquisition Card	INT00396	10/19	*
Data Acquisition Unit	National Instruments	PXIe-4464	Data Acquisition Card	INT00837	11/19	*
Data Acquisition Unit	National Instruments	PXIe-4464	Data Acquisition Card	INT00393	11/19	*
Microphone Calibrator	Norsonic	1251	Pistonphone calibrator	INT00288	08/20	
Receive Room Microphone	PCB Piezotronics	378C20	Microphone and Preamplifier	INT00234	04/20	
Receive Room Microphone	PCB Piezotronics	378B20	Microphone and Preamplifier	INT00235	04/20	
Receive Room Microphone	PCB Piezotronics	378B20	Microphone and Preamplifier	INT00236	04/20	
Receive Room Microphone	PCB Piezotronics	378B20	Microphone and Preamplifier	INT00237	04/20	
Receive Room Microphone	PCB Piezotronics	378B20	Microphone and Preamplifier	INT00238	04/20	
Receive Room Environmental Indicator	Comet	T7510	Temperature and Humidity Transmitter	INT00302	08/20	
Source Room Microphone	PCB Piezotronics	378B20	Microphone and Preamplifier	INT00239	09/20	
Source Room Microphone	PCB Piezotronics	378B20	Microphone and Preamplifier	INT00240	09/20	
Source Room Microphone	PCB Piezotronics	378B20	Microphone and Preamplifier	INT00241	09/20	
Source Room Microphone	PCB Piezotronics	378B20	Microphone and Preamplifier	INT00242	09/20	
Source Room Microphone	PCB Electronics	378B20	Microphone and Preamplifier	INT00243	09/20	
Source Room Environmental Indicator	Comet	T7510	Temperature and Humidity Transmitter	INT00301	08/20	
Tapping Machine	Norsonic	Nor277	Tapping Machine	INT00224	11/20	

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

VT RECEIVE ROOM VOLUME	183.69 m^3
VT SOURCE ROOM VOLUME	129.4 m^3

SECTION 6
LIST OF OFFICIAL OBSERVERS

NAME	COMPANY
Marco T. Santa Rosa	Intertek B&C
Leeland S. Hoover	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 received 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 through 15.

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.

The delta impact insulation test was conducted in accordance with ASTM E2179 test method. In addition to the impact sound transmission test, two sound pressure level measurements with the tapping machine operating at each position specified by ASTM E492 with only the concrete slab installed 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 ΔIIC (Delta Impact Insulation Class) ratings were calculated in accordance with ASTM E413, ASTM E989, and ASTM E2179, respectively.

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SECTION 9

TEST SPECIMEN DESCRIPTION

MATERIAL	DIMENSIONS (mm/inch)	THICKNESS (mm/inch)	MANUFACTURER AND SERIES	QUANTITY	AVERAGE WEIGHT
LVT	1244.6 by 228.6	8.0	Urban Surfaces SurfaceGuard	11.15 m²	13.33 kg/m²
	Note: Loose laid				
Concrete Slab	3023 by 3632	152.4	5000 PSI	10.98 m²	366.18 kg/m²
	Note: Installed in a test frame flush to the source room. Mats of #5 reinforcing bars were placed 25.4 mm from both the top and bottom of the slab, with bars spaced on 305 mm centers in both directions. No noticeable shrinkage or cracking was visible on the specimen.				

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SECTION 10

TEST RESULTS - AIRBORNE SOUND TRANSMISSION LOSS

ACCREDITED Testing Laboratory

TEST DATE	12/17/2020				
DATA FILE NO.	L3696.05				
CLIENT	Urban Surfaces				
DESCRIPTION	8 mm Urban Surfaces SurfaceGuard LVT, 152.4 mm 5000 PSI Concrete Slab				
SPECIMEN AREA	11.15 m²	**Receive Temp.**	17.8°C	**Source Temp.**	17.5°C
TECHNICIAN	MTSR	**Receive Humidity**	45%	**Source Humidity**	45%

FREQ (Hz)	BACKGROUND SPL (dB)	ABSORPTION m²	SOURCE SPL (dB)	RECEIVE SPL (dB)	SPECIMEN TL (dB)	95% CONFIDENCE LIMIT	NUMBER OF DEFICIENCIES
80	33.6	6.5	101	64	39	2.8	-
100	25.9	6.6	106	70	38	1.9	-
125	24.1	4.9	104	71	36	1.6	0
160	18.7	5.5	104	69	38	0.6	0
200	13.5	6.9	103	67	38	0.8	3
250	10.8	7.6	100	61	40	1.4	4
315	9.6	7.6	102	59	45	0.7	2
400	8.7	7.3	102	62	42	0.8	8
500	7.8	6.4	101	57	46	0.5	5
630	5.8	6.4	96	50	48	0.5	4
800	5.6	6.4	95	45	53	0.4	0
1000	6.6	6.3	96	39	60	0.3	0
1250	6.5	6.6	99	38	63	0.3	0
1600	6.7	7.0	98	34	66	0.5	0
2000	3.5	8.0	99	30	70	0.4	0
2500	4.9	8.9	100	30	71	0.5	0
3150	5.3	9.8	99	28	72	0.4	0
4000	4.6	11.7	98	25	73	0.4	0
5000	5.2	14.5	95	21	73	0.4	-
6300	5.8	19.0	94	20	71	0.6	-
8000	6.3	25.3	94	18	72	0.8	-
10000	6.5	32.6	93	16	73	0.8	-
STC Rating	**51**	*(Sound Transmission Class)*			**Sum of Deficiencies**		**26**

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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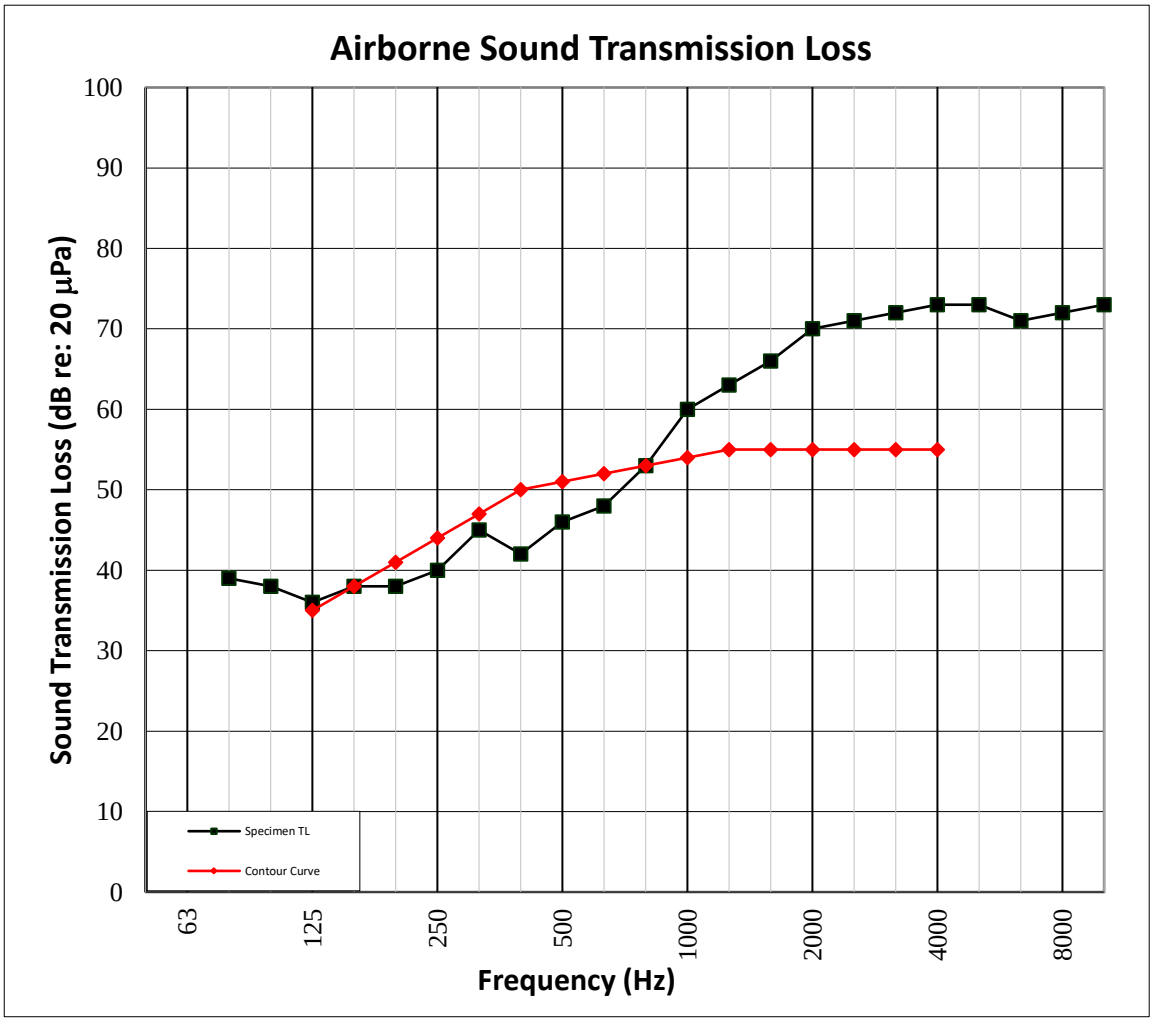
Date: 01/04/21

SECTION 11

TEST RESULTS - AIRBORNE SOUND TRANSMISSION LOSS GRAPH

ACCREDITED Testing Laboratory

TEST DATE	12/17/2020				
DATA FILE NO.	L3696.05				
CLIENT	Urban Surfaces				
DESCRIPTION	8 mm Urban Surfaces SurfaceGuard LVT, 152.4 mm 5000 PSI Concrete Slab				
SPECIMEN AREA	11.15 m²	**Receive Temp.**	17.8°C	**Source Temp.**	17.5°C
TECHNICIAN	MTSR	**Receive Humidity**	45%	**Source Humidity**	45%



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SECTION 12

TEST RESULTS - IMPACT SOUND TRANSMISSION

ACCREDITED Testing Laboratory

TEST DATE	12/17/2020				
DATA FILE NO.	L3696.05				
CLIENT	Urban Surfaces				
DESCRIPTION	8 mm Urban Surfaces SurfaceGuard LVT, 152.4 mm 5000 PSI Concrete Slab				
SPECIMEN AREA	11.15 m²	**Maximum Temp.**	17.8°C	**Minimum Temp.**	17.8°C
TECHNICIAN	MTSR	**Max. Humidity**	47%	**Min. Humidity**	44%

FREQ (Hz)	**BACKGROUND SPL** (dB)	**ABSORPTION** m²	**NORMALIZED IMPACT SPL** (dB)	**95% CONFIDENCE LIMIT**	**NUMBER OF DEFICIENCIES**
80	32.7	5.3	54	1.2	-
100	22.0	6.2	57	1.2	0
125	24.4	4.4	57	1.2	0
160	15.7	5.5	63	0.7	0
200	11.4	7.0	67	0.9	4
250	10.4	7.5	68	0.7	5
315	10.0	7.7	67	0.7	4
400	7.4	7.4	66	0.6	4
500	8.0	6.5	64	0.3	3
630	6.1	6.3	64	0.2	4
800	6.3	6.5	60	0.2	1
1000	5.5	6.4	54	0.3	0
1250	5.7	6.6	50	0.3	0
1600	7.2	7.0	46	0.5	0
2000	3.6	8.0	41	0.4	0
2500	5.2	8.9	35	0.3	0
3150	5.6	9.9	30	0.3	0
4000	4.6	11.8	27	0.6	-
5000	5.2	14.7	23	0.8	-
6300	5.8	19.0	19	1.1	-
8000	6.3	25.2	15	0.9	-
10000	6.6	32.6	13	0.7	-
IIC Rating	**49**	*(Impact Insulation Class)*		**Sum of Deficiencies**	**25**

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

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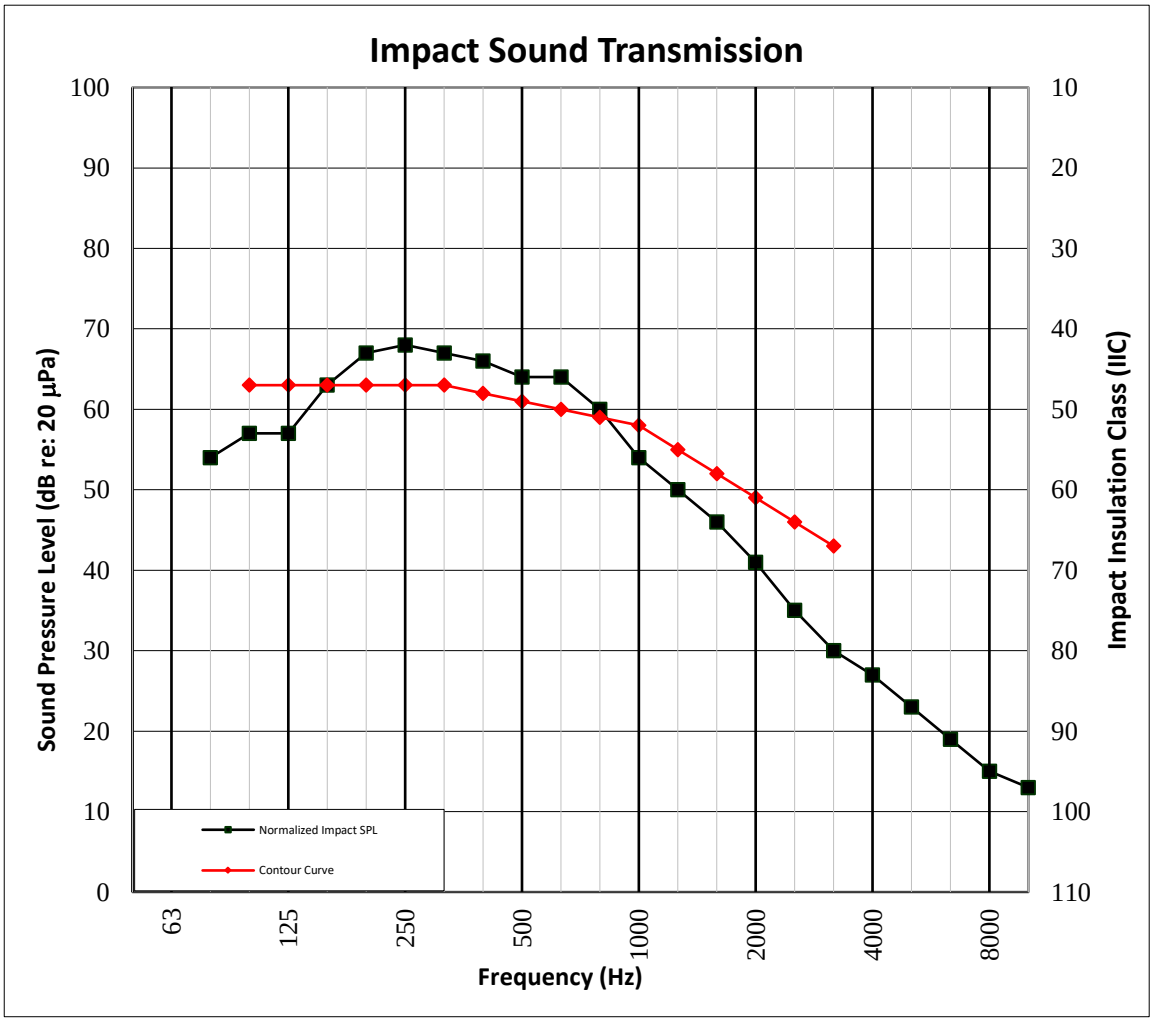
SECTION 13

TEST RESULTS - IMPACT SOUND TRANSMISSION GRAPH

ACCREDITED Testing Laboratory

TEST DATE	12/17/2020				
DATA FILE NO.	L3696.05				
CLIENT	Urban Surfaces				
DESCRIPTION	8 mm Urban Surfaces SurfaceGuard LVT, 152.4 mm 5000 PSI Concrete Slab				
SPECIMEN AREA	11.15 m²	**Maximum Temp.**	17.8°C	**Minimum Temp.**	17.8°C
TECHNICIAN	MTSR	**Max. Humidity**	47%	**Min. Humidity**	44%



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SECTION 14

TEST RESULTS - DELTA IMPACT INSULATION

ACCREDITED Testing Laboratory

TEST DATE	12/17/2020				
DATA FILE NO.	L3696.05				
CLIENT	Urban Surfaces				
DESCRIPTION	8 mm Urban Surfaces SurfaceGuard LVT, 152.4 mm 5000 PSI Concrete Slab				
SPECIMEN AREA	11.15 m²	**Maximum Temp.**	17.8°C	**Minimum Temp.**	17.8°C
TECHNICIAN	MTSR	**Max. Humidity**	47%	**Min. Humidity**	44%

FREQ (Hz)	**BACKGROUND SPL** (dB)	**ABSORPTION** m²	**NORMALIZED IMPACT SPL** BARE (dB)	**95% CONF LIMIT**	**NORMALIZED IMPACT SPL** SPEC (dB)	**95% CONF LIMIT**	**RESULT ARRAY** $L_{ref,c}$	**NUMBER OF DEFI-CIENCIES**
100	22.0	6.2	58.4	1.2	57.1	1.5	66.0	3
125	24.4	4.4	59.9	1.3	56.8	1.5	64.0	1
160	15.7	5.5	66.4	1.2	62.7	0.8	64.0	1
200	11.4	7.0	71.1	1.3	67.1	1.1	64.0	1
250	10.4	7.5	71.0	1.2	68.2	0.8	66.0	3
315	10.0	7.7	71.2	0.9	66.9	0.8	65.0	2
400	7.4	7.4	71.2	0.8	66.3	0.7	65.0	3
500	8.0	6.5	68.9	0.5	64.2	0.4	66.0	5
630	6.1	6.3	71.8	0.5	63.8	0.3	63.0	3
800	6.3	6.5	72.3	0.3	60.4	0.2	60.0	1
1000	5.5	6.4	73.1	0.3	54.4	0.3	53.0	0
1250	5.7	6.6	73.7	0.4	49.9	0.4	48.0	0
1600	7.2	7.0	75.0	0.5	45.9	0.6	43.0	0
2000	3.6	8.0	75.1	0.4	40.8	0.5	38.0	0
2500	5.2	8.9	75.4	0.4	35.3	0.4	32.0	0
3150	5.6	9.9	75.5	0.5	30.4	0.4	27.0	0

ΔIIC Rating	**21**	*(Delta Impact Insulation Class)*	**Sum of Deficiencies**	**23**

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

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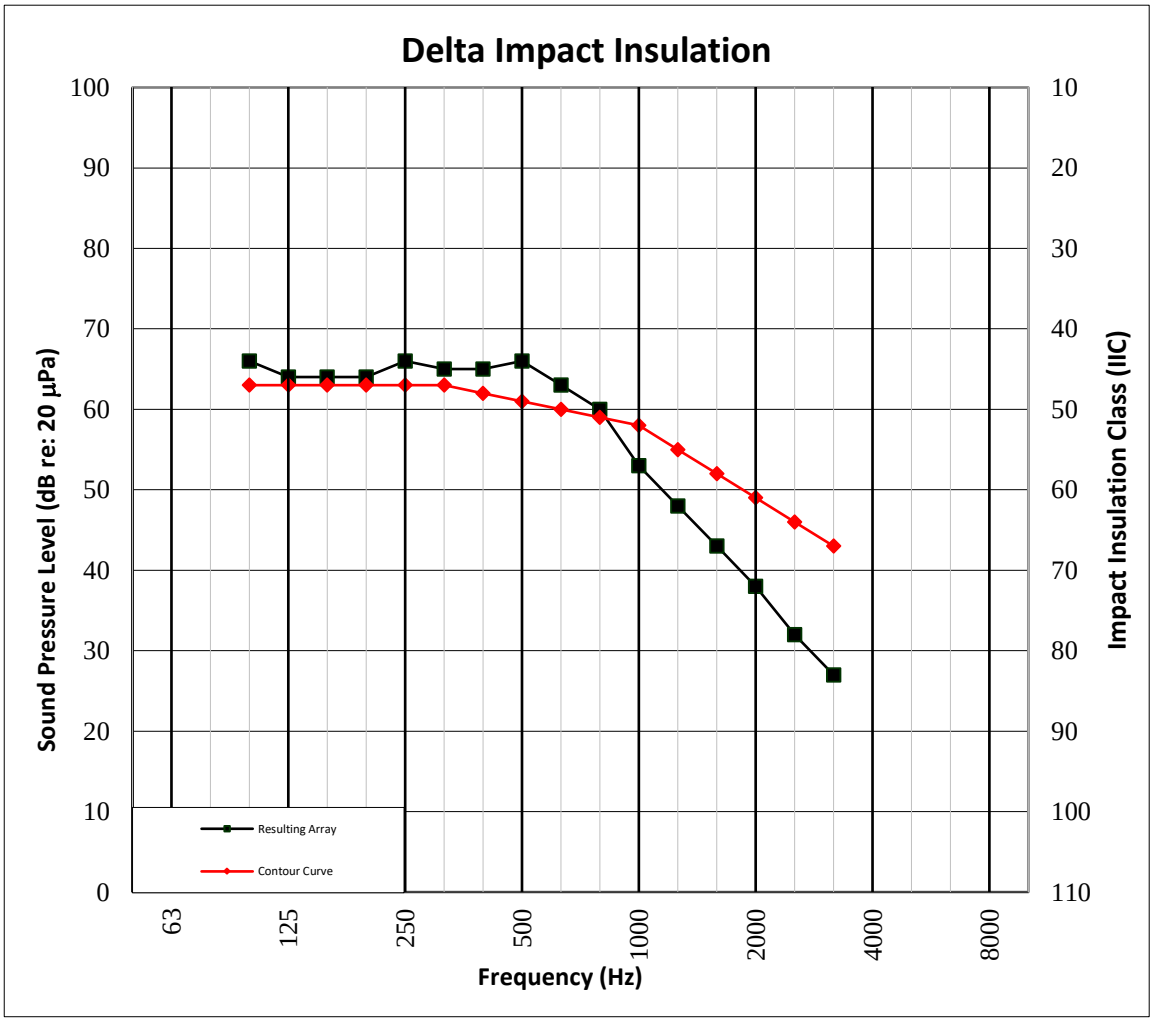
Date: 01/04/21

SECTION 15

TEST RESULTS - DELTA IMPACT INSULATION GRAPH

ACCREDITED Testing Laboratory

TEST DATE	12/17/2020				
DATA FILE NO.	L3696.05				
CLIENT	Urban Surfaces				
DESCRIPTION	8 mm Urban Surfaces SurfaceGuard LVT, 152.4 mm 5000 PSI Concrete Slab				
SPECIMEN AREA	11.15 m²	**Maximum Temp.**	17.8°C	**Minimum Temp.**	17.8°C
TECHNICIAN	MTSR	**Max. Humidity**	47%	**Min. Humidity**	44%



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SECTION 16
PHOTOGRAPHS

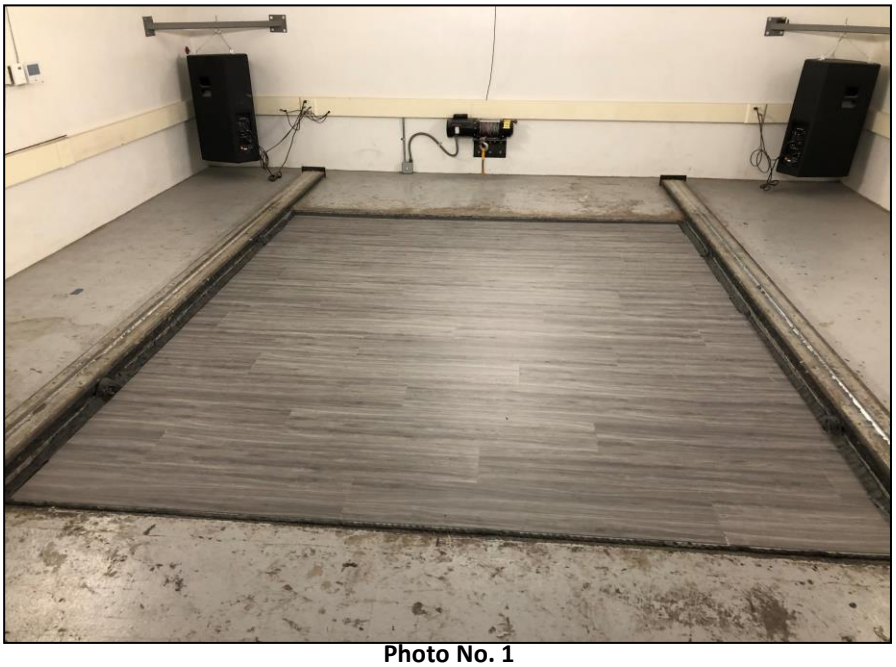

Photo No. 1
Source Room View of Test Specimen Installation

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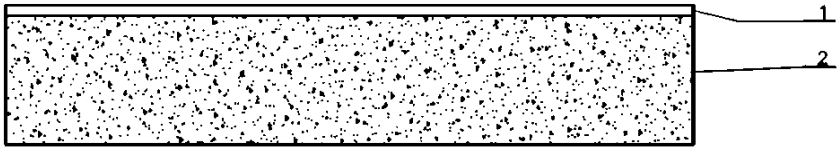
SECTION 17
DRAWING



1-Floor Topping
2-Concrete Slab

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SECTION 18
REVISION LOG

REVISION #	DATE	PAGES	DESCRIPTION
R0	01/04/21	N/A	Original Report Issue