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STC
SOUND CONTROL
ACOUSTICAL PERFORMANCE TEST REPORT

SCOPE OF WORK
ASTM E90, ASTM E492, AND ASTM E2179 TESTING ON SHAW EXPO LUXURY VINYL TILE OVER USG STRUCTURAL PANELS CONCRETE SUBFLOOR WITH STC SOUND CONTROL ACOUSTIC SLEEPER PADS

SPECIMEN TYPE
Concrete Slab - 152 mm (6")

REPORT NUMBER
J1124.06-113-11-R0

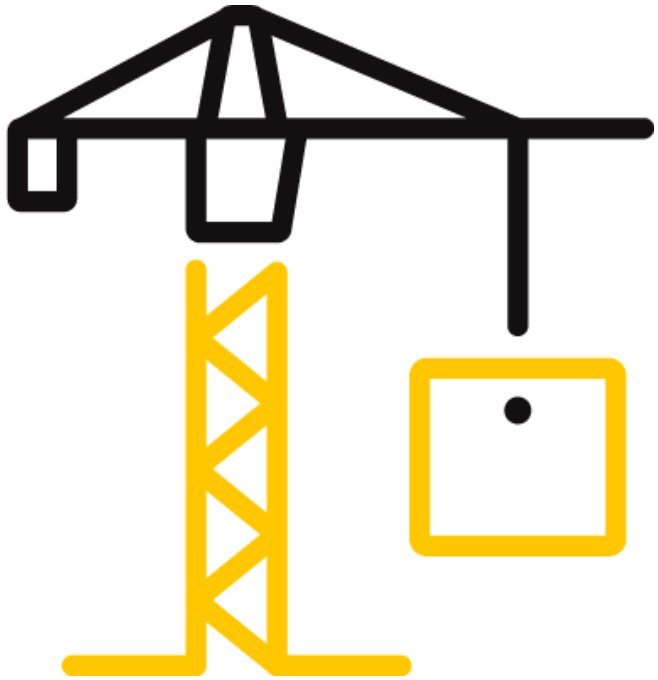
TEST DATE
12/18/18

ISSUE DATE
01/01/19

RECORD RETENTION END
12/18/22

PAGES
15

DOCUMENT CONTROL
ATI 00629 (03/21/18)
RTTDS-R-AMER-Test-2844



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TEST REPORT FOR STC SOUND CONTROL

Report No.: J1124.06-113-11-R0
Date: 01/01/19

REPORT ISSUED TO

STC SOUND CONTROL
1200 Northland Avenue
Buffalo, New York 14215

SECTION 1

SCOPE

Intertek Building & Construction (B&C) was contracted by STC Sound Control to perform testing in accordance with ASTM E90, ASTM E492, AND ASTM E2179 on Shaw Expo Luxury Vinyl Tile over USG Structural Panels Concrete Subfloor with STC Sound Control Acoustic Sleeper Pads. 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 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.	J1124.06
SERIES/MODEL:	Shaw Expo Luxury Vinyl Tile over USG Structural Panels Concrete Subfloor with STC Sound Control Acoustic Sleeper Pads
STC	52
IIC	51
ΔIIC	23

COMPLETED BY:	Cody R. Snyder	**COMPLETED BY:**	Jordan Strybos
TITLE:	Technician I - Acoustical Testing	**TITLE:**	Engineer, Team Lead - Acoustical Testing
SIGNATURE:	Digitally Signed by: Cody Snyder	**SIGNATURE:**	Digitally Signed by: Jordan Strybos
DATE:	01/01/19	**DATE:**	01/01/19

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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 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 (6")) 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 4346.8 kg / 9581.5 lbs. 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	PXI-4462	Data Acquisition Card	INT00977	08/18	*
Data Acquisition Unit	National Instruments	PXI-4462	Data Acquisition Card	65124	05/18	*
Data Acquisition Unit	National Instruments	PXI-4462	Data Acquisition Card	63763-1	06/18	*
Microphone Calibrator	Norsonic	Nor1251	Acoustical Calibrator	65105	06/18	
Receive Room Microphone	PCB Piezotronics	378C20	Microphone and Preamplifier	65617	06/18	
Receive Room Microphone	PCB Piezotronics	378B20	Microphone and Preamplifier	63744	06/18	
Receive Room Microphone	PCB Piezotronics	378B20	Microphone and Preamplifier	63745	06/18	
Receive Room Microphone	PCB Piezotronics	378B20	Microphone and Preamplifier	63746	12/17	
Receive Room Microphone	PCB Piezotronics	378B20	Microphone and Preamplifier	63747	07/18	
Receive Room Environmental Indicator	Comet	T7510	Temperature and Humidity Transmitter	63810	10/18	
				63811	10/18	
Source Room Microphone	PCB Piezotronics	378C20	Microphone and Preamplifier	INT01009	02/18	
Source Room Microphone	PCB Piezotronics	378C20	Microphone and Preamplifier	63739	04/18	
Source Room Microphone	PCB Piezotronics	378C20	Microphone and Preamplifier	63740	04/18	
Source Room Microphone	PCB Piezotronics	378C20	Microphone and Preamplifier	63742	03/18	
Source Room Microphone	PCB Electronics	378C20	Microphone and Preamplifier	63741	04/18	
Source Room Environmental Indicator	Comet	T7510	Temperature and Humidity Transmitter	63812	10/18	
Tapping Machine	Norsonic	Nor277	Tapping Machine	INT00936	12/18	

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

VT RECEIVE ROOM VOLUME	158.86 m^3 (5610.1 ft^3)
VT SOURCE ROOM VOLUME	190 m^3 (6709.79 ft^3)

SECTION 6
LIST OF OFFICIAL OBSERVERS

NAME	COMPANY
Cody R. Snyder	Intertek B&C
Jordan Strybos	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
Luxury Vinyl Tile	1219 by 152.4 48 by 6	2 / 0.08	Shaw Expo	10.98 m² 118.19 ft²	3.47 kg/m² 0.71 lb/ft²
	Note: A sheet of 2 mil polyethylene plastic was adhered to the subfloor with Sprayway Fast Tack 85 spray adhesive. The floor topping was adhered to the sheeting with Shaw 200 TPS adhesive, which was spread using a 0.79 mm by 1.59 mm by 0.79 mm (0.03" by 0.06" by 0.03") trowel. Adhesive was allowed to cure per manufacturer's specifications.				
Concrete Subfloor	1219 by 2438 48 by 96	19 / 0.75	USG Structural Panels	10.98 m² 118.19 ft²	26.18 kg/m² 5.36 lb/ft²
	Note: Loose Laid with sleeper pads Installed				
Isolation Pad	38.1 by 38.1 1.5 by 1.5	6.4 / 0.25	STC Sound Control Acoustic Sleeper Pad	52 pads 559.72 ft²	0.01 kg/pad 0 lb/ft²
	Note: Installed to the subfloor panels on 610 mm (24") centers at joints, perimeter and field with 203 mm (8") centers at square edges				
Concrete Slab	3023 by 3632 119 by 143	152.4 / 6	5000 PSI	10.98 m² 118.19 ft²	366.18 kg/m² 75 lb/ft²
	Note: Installed in a test frame flush to the source room. Mats of #5 reinforcing bars were placed 25.4 mm (1") from both the top and bottom of the slab, with bars spaced on 305 mm (12") 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

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Testing Laboratory

TEST DATE	12/18/2018				
DATA FILE NO.	J1124.06				
CLIENT	STC Sound Control				
DESCRIPTION	2 mm (0.08") Shaw Expo Luxury Vinyl Tile, 19.05 mm (0.75") USG Structural Panels Concrete Subfloor, 6.4 mm (0.25") STC Sound Control Acoustic Sleeper Pad Isolation Pad, 152.4 mm (6") 5000 PSI Concrete Slab				
SPECIMEN AREA	10.98 m²	**Receive Temp.**	19.1°C (66.5°F)	**Source Temp.**	18.9°C (66°F)
TECHNICIAN	MSJK	**Receive Humidity**	47%	**Source Humidity**	47%

FREQ (Hz)	**BACKGROUND SPL** (dB)	**ABSORPTION** m²	**SOURCE SPL** (dB)	**RECEIVE SPL** (dB)	**SPECIMEN TL** (dB)	**95% CONFIDENCE LIMIT**	**NUMBER OF DEFICIENCIES**
50	39.6	26.5	104	65	36	3.4	-
63	35.8	28.2	102	66	34	5.1	-
80	32.7	16.0	110	69	40	5.4	-
100	30.0	13.0	109	67	42	2.8	-
125	32.3	9.5	109	67	44	2.7	0
160	29.4	9.7	110	71	40	2.0	0
200	25.4	10.6	106	72	34	1.5	8
250	27.3	10.3	104	66	39	1.1	6
315	26.0	10.1	108	64	44	1.0	4
400	20.8	8.6	106	58	49	1.0	2
500	21.7	7.9	106	54	55	1.0	0
630	23.1	7.6	107	50	60	1.0	0
800	22.2	7.4	106	46	62	0.6	0
1000	24.3	7.3	105	44	64	0.6	0
1250	20.4	7.3	105	42	66	0.6	0
1600	16.6	7.7	105	41	66	0.4	0
2000	12.4	8.5	105	40	68	0.5	0
2500	8.7	9.3	103	38	67	0.3	0
3150	6.6	10.2	103	35	70	0.4	0
4000	5.9	11.9	104	33	72	0.4	0
5000	7.6	13.6	104	30	75	0.4	-
6300	7.2	17.0	97	20	77	0.5	-
8000	6.5	22.5	97	16	79	1.0	-
10000	6.9	22.5	92	8	81	0.8	-
STC Rating	**52**	*(Sound Transmission Class)*			**Sum of Deficiencies**		**20**

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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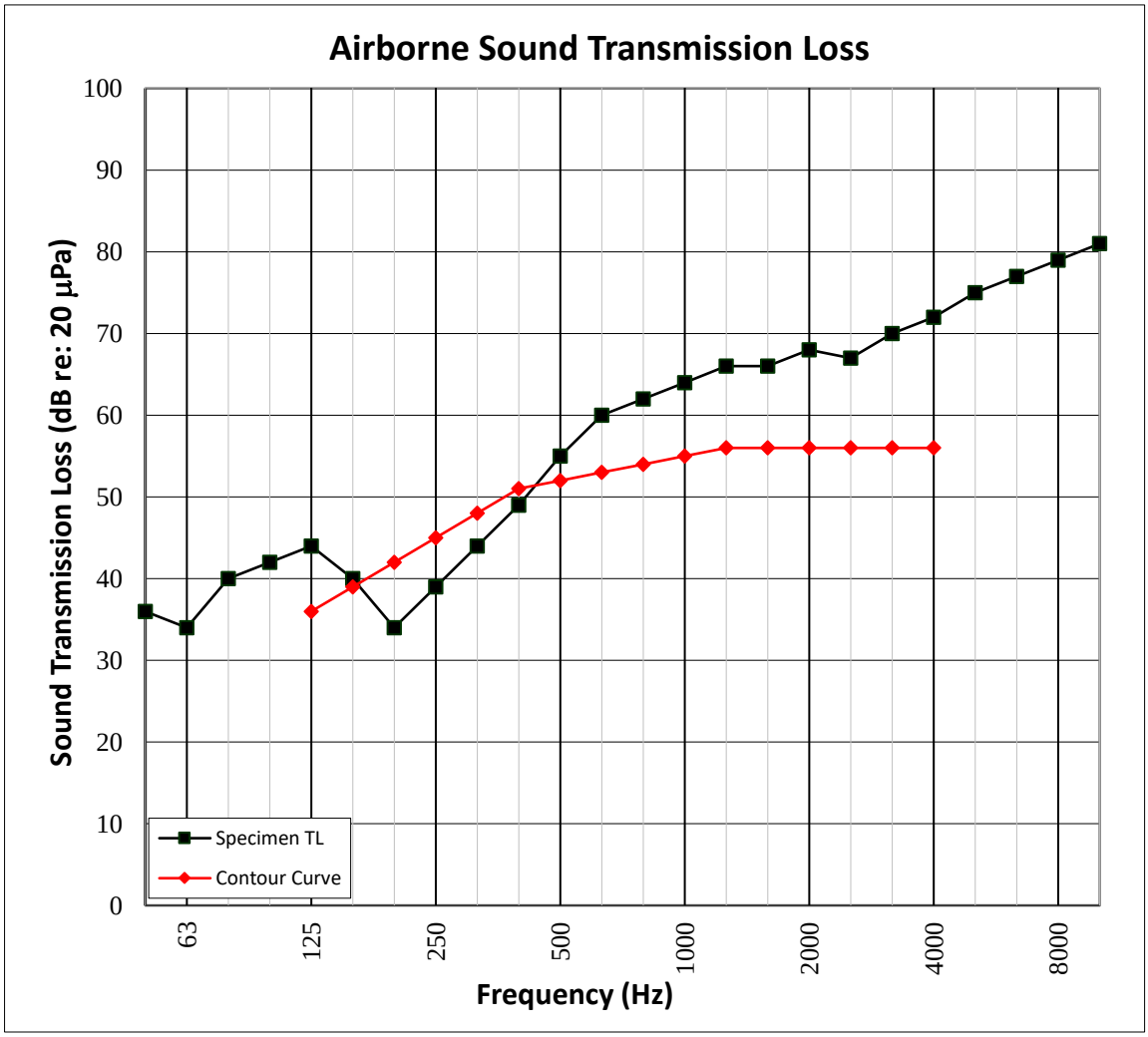
SECTION 11

TEST RESULTS - AIRBORNE SOUND TRANSMISSION LOSS GRAPH

ACCREDITED Testing Laboratory

TEST DATE	12/18/2018				
DATA FILE NO.	J1124.06				
CLIENT	STC Sound Control				
DESCRIPTION	2 mm (0.08") Shaw Expo Luxury Vinyl Tile, 19.05 mm (0.75") USG Structural Panels Concrete Subfloor, 6.4 mm (0.25") STC Sound Control Acoustic Sleeper Pad Isolation Pad, 152.4 mm (6") 5000 PSI Concrete Slab				
SPECIMEN AREA	10.98 m²	**Receive Temp.**	19.1°C (66.5°F)	**Source Temp.**	18.9°C (66°F)
TECHNICIAN	MSJK	**Receive Humidity**	47%	**Source Humidity**	47%



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SECTION 12

TEST RESULTS - IMPACT SOUND TRANSMISSION

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TEST DATE	12/18/2018				
DATA FILE NO.	J1124.06				
CLIENT	STC Sound Control				
DESCRIPTION	2 mm (0.08") Shaw Expo Luxury Vinyl Tile, 19.05 mm (0.75") USG Structural Panels Concrete Subfloor, 6.4 mm (0.25") STC Sound Control Acoustic Sleeper Pad Isolation Pad, 152.4 mm (6") 5000 PSI Concrete Slab				
SPECIMEN AREA	10.98 m²	**Maximum Temp.**	25.1°C (77.1°F)	**Minimum Temp.**	11.8°C (53.2°F)
TECHNICIAN	MSJK	**Max. Humidity**	61%	**Min. Humidity**	15%

FREQ (Hz)	**BACKGROUND SPL** (dB)	**ABSORPTION** m²	**NORMALIZED IMPACT SPL** (dB)	**95% CONFIDENCE LIMIT**	**NUMBER OF DEFICIENCIES**
50	34.9	24.0	55	2.6	-
63	32.6	25.8	52	2.9	-
80	31.0	16.7	54	1.7	-
100	26.4	14.1	57	2.3	0
125	30.5	9.9	60	1.8	0
160	26.8	9.5	64	0.6	3
200	23.3	10.6	69	0.7	8
250	27.1	10.3	68	0.7	7
315	23.4	10.2	65	0.4	4
400	21.0	8.6	61	0.5	1
500	22.0	8.0	57	0.9	0
630	22.4	7.6	55	0.4	0
800	20.4	7.4	51	0.5	0
1000	23.3	7.3	46	0.2	0
1250	17.4	7.3	42	0.2	0
1600	11.4	7.7	38	0.3	0
2000	10.2	8.4	30	0.4	0
2500	6.9	9.3	26	0.5	0
3150	5.7	10.3	24	0.5	0
4000	5.4	11.8	21	0.6	-
5000	5.5	13.5	18	0.5	-
6300	6.0	17.1	12	0.7	-
8000	6.7	22.6	10	0.4	-
10000	7.3	22.6	9	0.4	-
IIC Rating	**51**	*(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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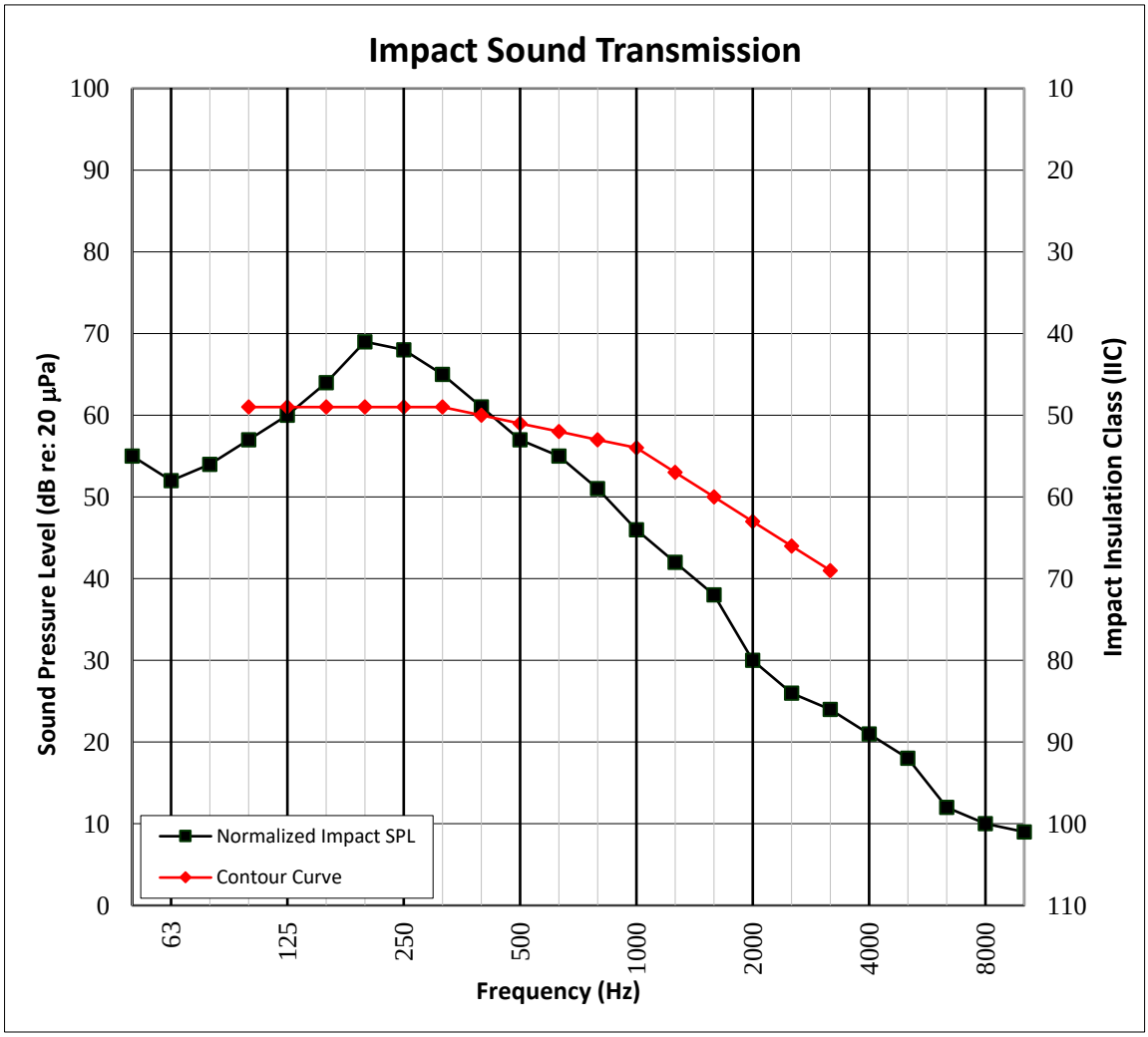
SECTION 13
TEST RESULTS - IMPACT SOUND TRANSMISSION GRAPH

ACCREDITED Testing Laboratory

TEST DATE	12/18/2018				
DATA FILE NO.	J1124.06				
CLIENT	STC Sound Control				
DESCRIPTION	2 mm (0.08") Shaw Expo Luxury Vinyl Tile, 19.05 mm (0.75") USG Structural Panels Concrete Subfloor, 6.4 mm (0.25") STC Sound Control Acoustic Sleeper Pad Isolation Pad, 152.4 mm (6") 5000 PSI Concrete Slab				
SPECIMEN AREA	10.98 m²	**Maximum Temp.**	25.1°C (77.1°F)	**Minimum Temp.**	11.8°C (53.2°F)
TECHNICIAN	MSJK	**Max. Humidity**	61%	**Min. Humidity**	15%



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SECTION 14

TEST RESULTS - DELTA IMPACT INSULATION

ACCREDITED
Testing Laboratory

TEST DATE	12/18/2018				
DATA FILE NO.	J1124.06				
CLIENT	STC Sound Control				
DESCRIPTION	2 mm (0.08") Shaw Expo Luxury Vinyl Tile, 19.05 mm (0.75") USG Structural Panels Concrete Subfloor, 6.4 mm (0.25") STC Sound Control Acoustic Sleeper Pad Isolation Pad, 152.4 mm (6") 5000 PSI Concrete Slab				
SPECIMEN AREA	10.98 m²	**Maximum Temp.**	25.1°C (77.1°F)	**Minimum Temp.**	11.8°C (53.2°F)
TECHNICIAN	MSJK	**Max. Humidity**	61%	**Min. Humidity**	15%

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	26.4	14.1	59.6	2.8	57.2	2.9	65.0	4
125	30.5	9.9	60.5	2.0	59.6	2.2	67.0	6
160	26.8	9.5	65.9	1.1	63.7	0.7	66.0	5
200	23.3	10.6	72.7	1.3	69.4	0.9	65.0	4
250	27.1	10.3	69.8	0.9	68.3	0.8	68.0	7
315	23.4	10.2	68.0	0.4	65.0	0.5	66.0	5
400	21.0	8.6	70.9	0.6	61.4	0.6	60.0	0
500	22.0	8.0	68.4	0.8	57.5	1.1	60.0	1
630	22.4	7.6	70.9	0.3	55.1	0.5	55.0	0
800	20.4	7.4	72.3	0.8	50.5	0.6	50.0	0
1000	23.3	7.3	72.1	0.6	45.8	0.3	46.0	0
1250	17.4	7.3	72.0	0.5	41.8	0.3	42.0	0
1600	11.4	7.7	74.0	0.6	38.5	0.4	36.0	0
2000	10.2	8.4	73.9	0.8	30.2	0.5	28.0	0
2500	6.9	9.3	73.2	0.8	26.4	0.6	25.0	0
3150	5.7	10.3	72.3	0.8	23.6	0.6	23.0	0
ΔIIC Rating	**23**	*(Delta Impact Insulation Class)*			**Sum of Deficiencies**		**32**	

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

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SECTION 15

TEST RESULTS - DELTA IMPACT INSULATION GRAPH

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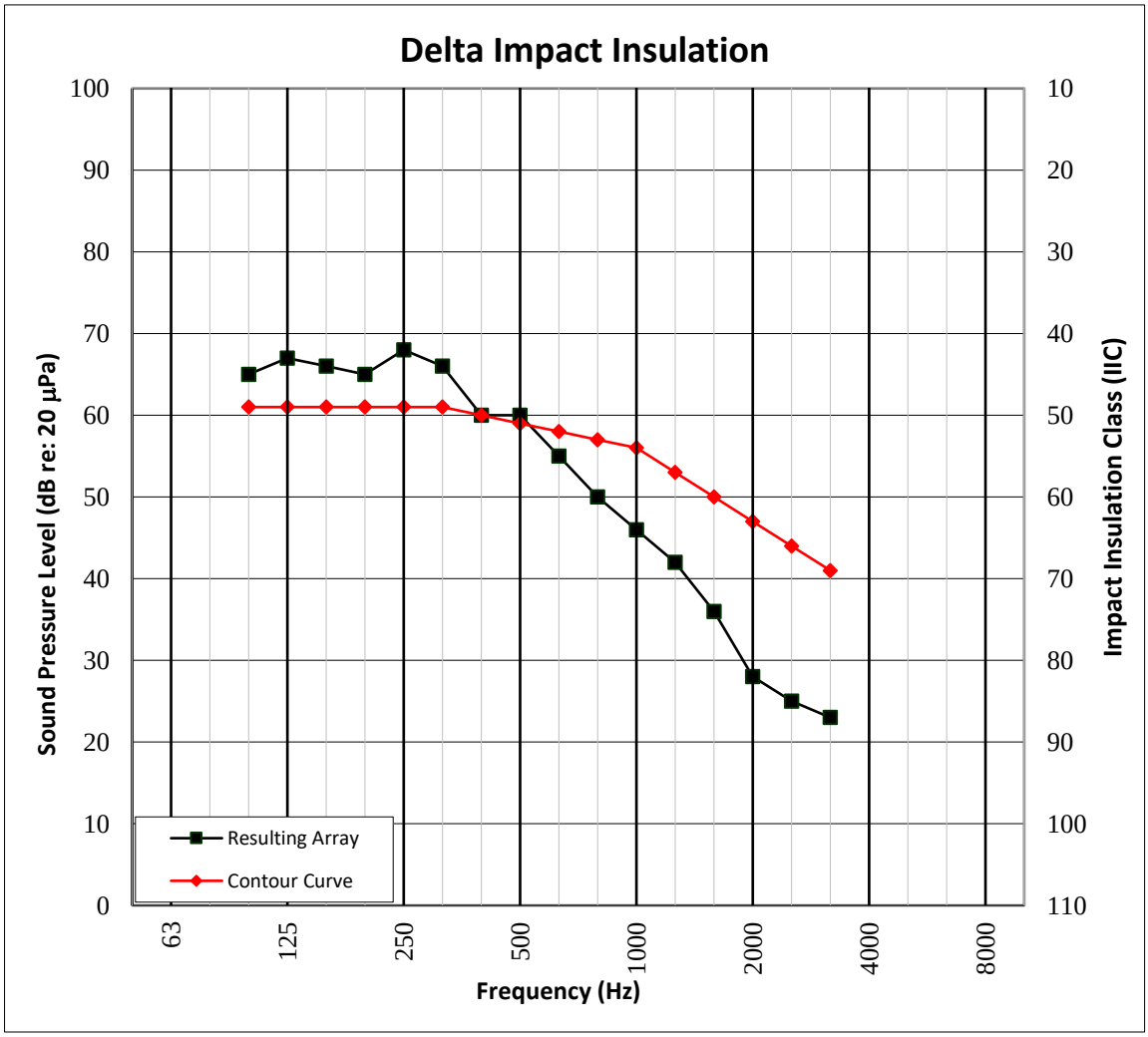
TEST DATE	12/18/2018				
DATA FILE NO.	J1124.06				
CLIENT	STC Sound Control				
DESCRIPTION	2 mm (0.08") Shaw Expo Luxury Vinyl Tile, 19.05 mm (0.75") USG Structural Panels Concrete Subfloor, 6.4 mm (0.25") STC Sound Control Acoustic Sleeper Pad Isolation Pad, 152.4 mm (6") 5000 PSI Concrete Slab				
SPECIMEN AREA	10.98 m²	**Maximum Temp.**	25.1°C (77.1°F)	**Minimum Temp.**	11.8°C (53.2°F)
TECHNICIAN	MSJK	**Max. Humidity**	61%	**Min. Humidity**	15%



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Date: 01/01/19

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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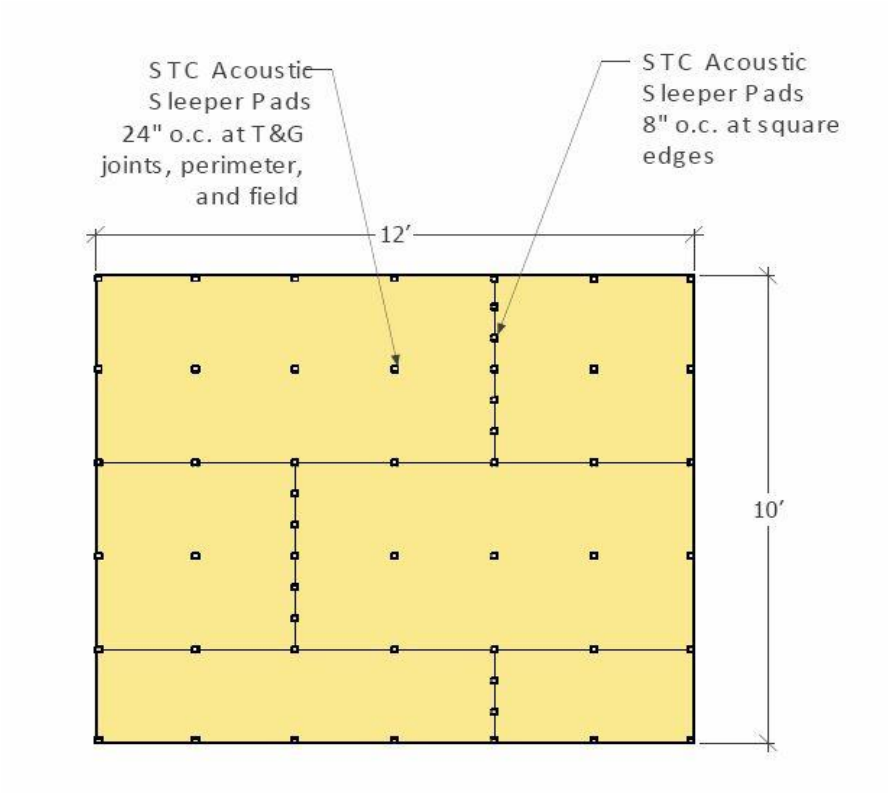
SECTION 17
DRAWING



Isolation Pad & Subfloor Layout

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SECTION 18

REVISION LOG

REVISION #	DATE	PAGES	DESCRIPTION
R0	01/01/19	N/A	Original Report Issue