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SHAW INDUSTRIES INC.
ACOUSTICAL PERFORMANCE TEST REPORT

SCOPE OF WORK
ASTM E90, ASTM E492, AND ASTM E2179 TESTING ON USFLOORS CORETEC® XRC-1

SPECIMEN TYPE
Concrete Slab - 203 mm (8")

REPORT NUMBER
H6838.31-113-11-R0

TEST DATE
03/06/18

ISSUE DATE
04/15/19

RECORD RETENTION END
03/06/22

PAGES
15

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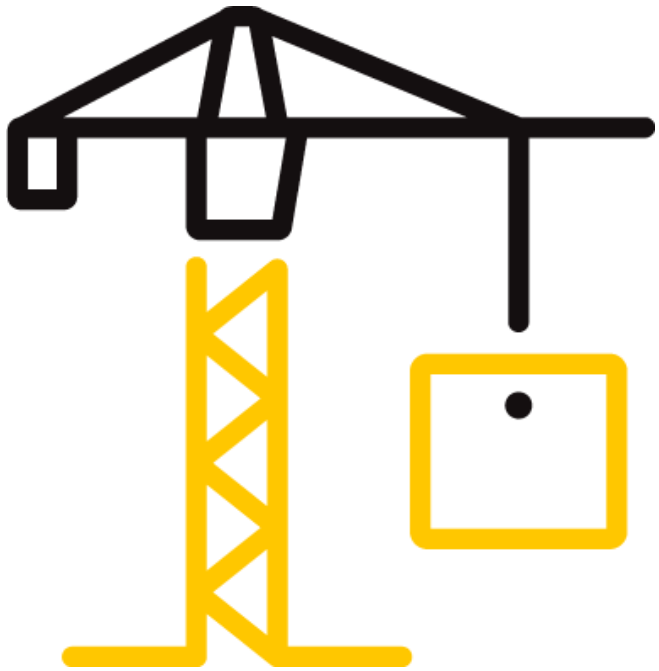

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TEST REPORT FOR SHAW INDUSTRIES INC.
Report No.: H6838.31-113-11-R0
Date: 04/15/19

REPORT ISSUED TO

SHAW INDUSTRIES INC.
616 East Walnut Avenue
Dalton, Georgia 30721

SECTION 1

SCOPE

Intertek Building & Construction (B&C) was contracted by Shaw Industries Inc. to perform testing in accordance with ASTM E90, ASTM E492, AND ASTM E2179 on USFloors COREtec® XRC-1. 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.	H6838.10
SERIES/MODEL:	USFloors COREtec® XRC-1
STC	53
IIC	53

COMPLETED BY:	Daniel B. Mohler	**COMPLETED BY:**	Jordan Strybos
TITLE:	Project Lead - Acoustical Testing	**TITLE:**	Project Manager - Acoustical Testing
SIGNATURE:	Digitally Signed by: Daniel Mohler	**SIGNATURE:**	Digitally Signed by: Jordan Strybos
DATE:	04/15/19	**DATE:**	04/15/19

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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 - 203 mm (8")) 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 5449.9 kg / 12015 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	63763-5	06/16	*
Data Acquisition Unit	National Instruments	PXI-4462	Data Acquisition Card	65124	06/16	*
Data Acquisition Unit	National Instruments	PXI-4462	Data Acquisition Card	63763-1	06/16	*
Microphone Calibrator	Norsonic	Nor1251	Acoustical Calibrator	65105	03/17	
Receive Room Microphone	PCB Piezotronics	378C20	Microphone and Preamplifier	INT01089	05/17	
Receive Room Microphone	PCB Piezotronics	378B20	Microphone and Preamplifier	65586	05/17	
Receive Room Microphone	PCB Piezotronics	378B20	Microphone and Preamplifier	65969	05/17	
Receive Room Microphone	PCB Piezotronics	378B20	Microphone and Preamplifier	63746	09/17	
Receive Room Microphone	PCB Piezotronics	378B20	Microphone and Preamplifier	65968	05/17	
Receive Room Environmental Indicator	Comet	T7510	Temperature and Humidity Transmitter	63810	10/17	
				63811	10/17	
Source Room Microphone	PCB Piezotronics	378C20	Microphone and Preamplifier	INT01009	04/17	
Source Room Microphone	PCB Piezotronics	378C20	Microphone and Preamplifier	63739	04/17	
Source Room Microphone	PCB Piezotronics	378C20	Microphone and Preamplifier	63740	04/17	
Source Room Microphone	PCB Piezotronics	378C20	Microphone and Preamplifier	63742	04/17	
Source Room Microphone	PCB Electronics	378C20	Microphone and Preamplifier	63741	04/17	
Source Room Environmental Indicator	Comet	T7510	Temperature and Humidity Transmitter	INT00603	03/17	
Tapping Machine	Look Line s.r.l.	EM50 (TM50)	Tapping Machine	65351	02/18	

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

VT RECEIVE ROOM VOLUME	158.34 m^3 (5591.89 ft^3)
VT SOURCE ROOM VOLUME	190 m^3 (6709.79 ft^3)

SECTION 6
LIST OF OFFICIAL OBSERVERS

NAME	COMPANY
Daniel B. Mohler	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 Plank	610.1 by 469.9 24 by 18.5	5.5 / 0.22	USF COREtec® XRC-1	10.98 m² 118.19 ft²	8.1 kg/m² 1.66 lb/ft²
	Note: Loose laid				
Concrete Slab	3023 by 3632 119 by 143	203.2 / 8	N/A	10.98 m² 118.19 ft²	488.24 kg/m² 100 lb/ft²
	Note: The concrete slab was installed in a test frame flush to the source room.				

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SECTION 10

TEST RESULTS - AIRBORNE SOUND TRANSMISSION LOSS

ACCREDITED Testing Laboratory

TEST DATE	3/6/2018				
DATA FILE NO.	H6838.10				
CLIENT	Shaw Industries Inc.				
DESCRIPTION	5.5 mm (0.22") USF COREtec® XRC-1 Luxury Vinyl Plank, 203.2 mm (8") Concrete Slab				
SPECIMEN AREA	10.98 m²	**Receive Temp.**	20.6°C (69.1°F)	**Source Temp.**	19.1°C (66.3°F)
TECHNICIAN	DBM	**Receive Humidity**	41%	**Source Humidity**	41%

FREQ (Hz)	BACKGROUND SPL (dB)	ABSORPTION m²	SOURCE SPL (dB)	RECEIVE SPL (dB)	SPECIMEN TL (dB)	95% CONFIDENCE LIMIT	NUMBER OF DEFICIENCIES
50	42.8	26.5	103	64	35	4.1	-
63	38.8	32.7	101	64	32	4.9	-
80	40.0	17.9	109	68	38	4.7	-
100	35.4	14.2	105	67	37	2.3	-
125	31.0	10.2	104	67	37	1.9	0
160	28.6	10.1	108	73	35	2.0	5
200	23.8	10.2	106	64	42	1.3	1
250	22.2	9.9	105	61	45	0.9	1
315	23.5	9.7	107	63	45	0.8	4
400	19.6	8.5	105	59	47	0.6	5
500	21.5	7.6	103	59	46	0.7	7
630	23.5	7.1	104	55	51	0.7	3
800	21.5	6.9	104	52	54	0.6	1
1000	19.7	6.9	105	46	61	0.5	0
1250	16.7	7.0	104	42	65	0.4	0
1600	13.8	7.2	105	41	66	0.4	0
2000	12.5	8.1	104	39	66	0.4	0
2500	10.2	9.1	102	37	66	0.2	0
3150	10.0	10.4	103	33	70	0.3	0
4000	10.4	12.3	103	31	72	0.4	0
5000	9.7	14.9	103	27	74	0.5	-
6300	9.0	19.7	97	16	78	0.5	-
8000	9.2	26.9	96	11	81	0.6	-
10000	8.8	32.9	91	6	79	0.4	-
STC Rating	**53**	*(Sound Transmission Class)*			**Sum of Deficiencies**		**27**

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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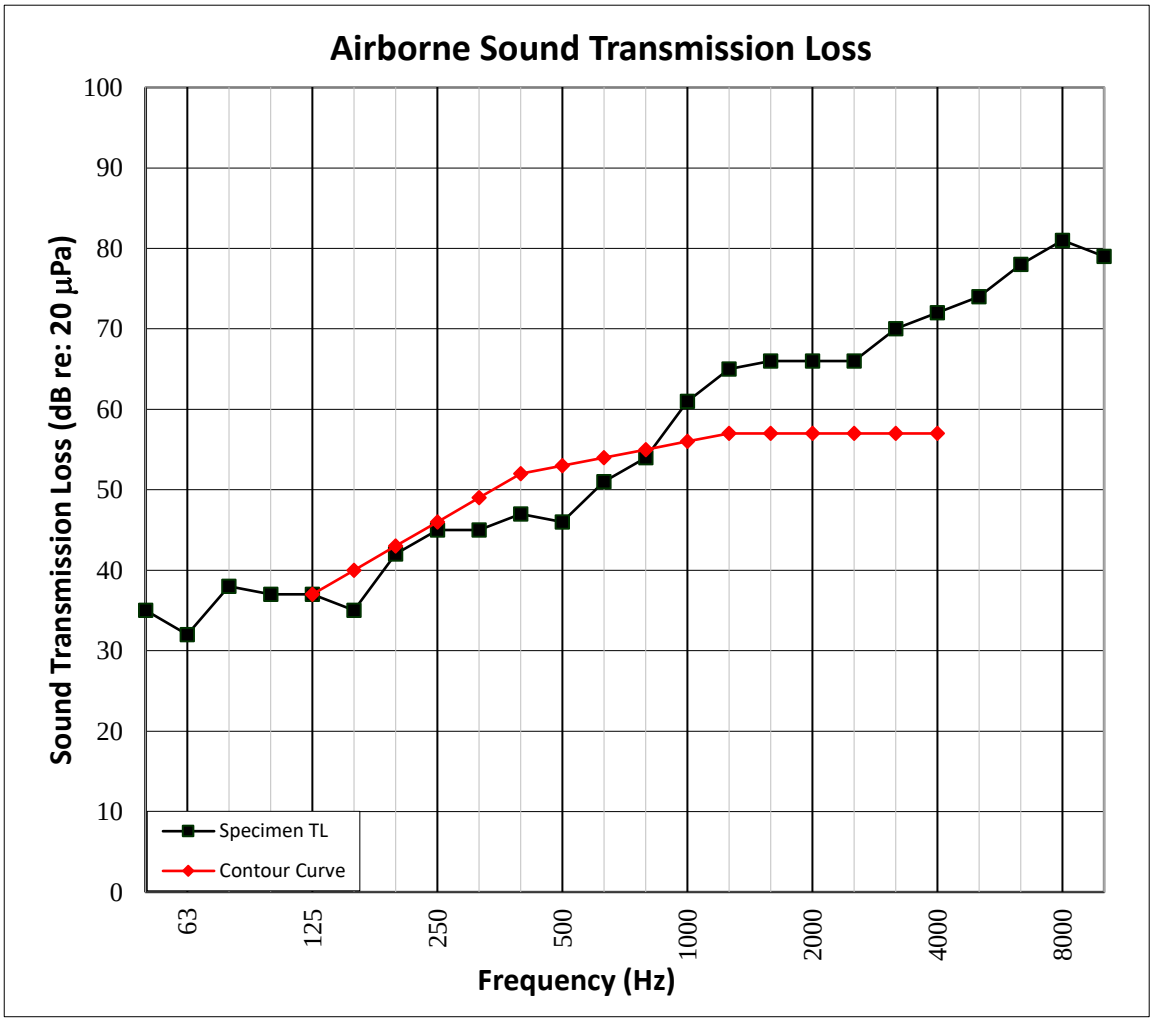
SECTION 11

TEST RESULTS - AIRBORNE SOUND TRANSMISSION LOSS GRAPH

ACCREDITED Testing Laboratory

TEST DATE	3/6/2018				
DATA FILE NO.	H6838.10				
CLIENT	Shaw Industries Inc.				
DESCRIPTION	5.5 mm (0.22") USF COREtec® XRC-1 Luxury Vinyl Plank, 203.2 mm (8") Concrete Slab				
SPECIMEN AREA	10.98 m²	**Receive Temp.**	20.6°C (69.1°F)	**Source Temp.**	19.1°C (66.3°F)
TECHNICIAN	DBM	**Receive Humidity**	41%	**Source Humidity**	41%



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Date: 04/15/19

SECTION 12

TEST RESULTS - IMPACT SOUND TRANSMISSION

ACCREDITED Testing Laboratory

TEST DATE	3/6/2018				
DATA FILE NO.	H6838.10				
CLIENT	Shaw Industries Inc.				
DESCRIPTION	5.5 mm (0.22") USF COREtec® XRC-1 Luxury Vinyl Plank, 203.2 mm (8") Concrete Slab				
SPECIMEN AREA	10.98 m²	**Maximum Temp.**	21.1°C (69.9°F)	**Minimum Temp.**	20.2°C (68.4°F)
TECHNICIAN	DBM	**Max. Humidity**	42%	**Min. Humidity**	40%

FREQ (Hz)	**BACKGROUND SPL** (dB)	**ABSORPTION** m²	**NORMALIZED IMPACT SPL** (dB)	**95% CONFIDENCE LIMIT**	**NUMBER OF DEFICIENCIES**
50	44.0	30.5	57	3.1	-
63	44.6	27.4	54	3.1	-
80	40.8	17.8	52	1.9	-
100	34.9	12.6	53	1.2	0
125	33.8	10.1	59	1.8	0
160	29.9	9.1	60	1.2	1
200	26.1	9.7	63	1.1	4
250	23.0	10.0	65	0.8	6
315	24.1	9.7	62	0.5	3
400	20.6	8.3	59	0.4	1
500	22.7	7.6	60	0.6	3
630	23.2	7.0	57	0.4	1
800	22.9	7.1	59	0.6	4
1000	21.4	7.0	56	0.5	2
1250	17.2	7.0	51	0.4	0
1600	14.4	7.2	44	0.5	0
2000	12.7	8.1	37	0.4	0
2500	10.4	9.1	36	0.4	0
3150	10.0	10.6	31	0.7	0
4000	10.2	12.2	25	1.0	-
5000	9.6	15.0	21	1.0	-
6300	9.0	19.8	16	1.0	-
8000	9.1	26.8	13	1.1	-
10000	8.8	33.1	15	1.4	-
IIC Rating	**53**	*(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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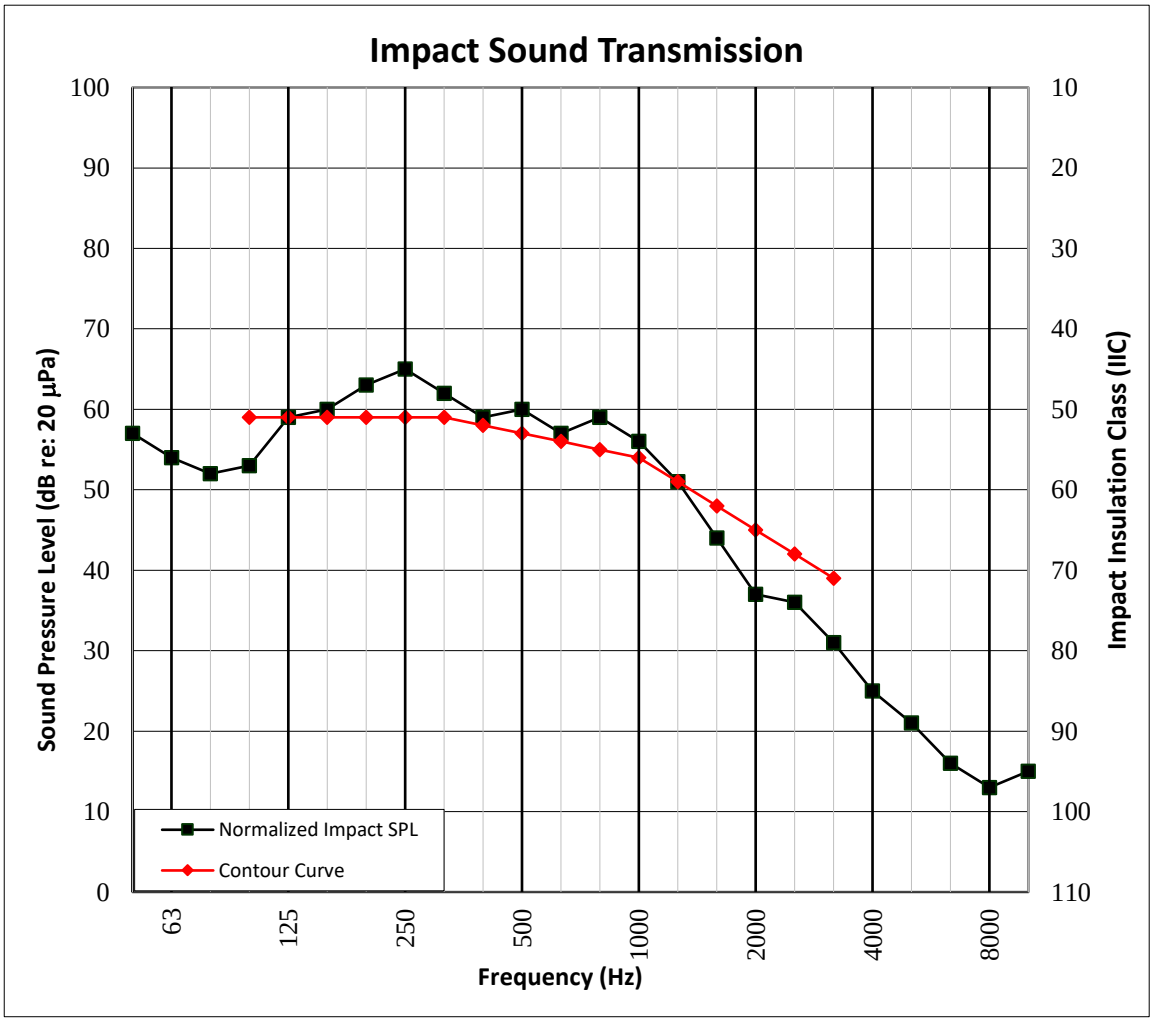
Date: 04/15/19

SECTION 13
TEST RESULTS - IMPACT SOUND TRANSMISSION GRAPH

ACCREDITED Testing Laboratory

TEST DATE	3/6/2018				
DATA FILE NO.	H6838.10				
CLIENT	Shaw Industries Inc.				
DESCRIPTION	5.5 mm (0.22") USF COREtec® XRC-1 Luxury Vinyl Plank, 203.2 mm (8") Concrete Slab				
SPECIMEN AREA	10.98 m²	**Maximum Temp.**	21.1°C (69.9°F)	**Minimum Temp.**	20.2°C (68.4°F)
TECHNICIAN	DBM	**Max. Humidity**	42%	**Min. Humidity**	40%



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SECTION 14

TEST RESULTS - DELTA IMPACT INSULATION

IAS ACCREDITED Testing Laboratory

TEST DATE	3/6/2018				
DATA FILE NO.	H6838.10				
CLIENT	Shaw Industries Inc.				
DESCRIPTION	5.5 mm (0.22") USF COREtec® XRC-1 Luxury Vinyl Plank, 203.2 mm (8") Concrete Slab				
SPECIMEN AREA	10.98 m²	**Maximum Temp.**	21.1°C (69.9°F)	**Minimum Temp.**	20.2°C (68.4°F)
TECHNICIAN	DBM	**Max. Humidity**	42%	**Min. Humidity**	40%

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 DEFICIENCIES**
100	34.9	12.6	54.1	1.6	52.8	1.5	66.0	3
125	33.8	10.1	60.7	2.6	59.4	2.2	66.0	3
160	29.9	9.1	61.2	1.4	59.6	1.5	66.0	3
200	26.1	9.7	65.3	1.4	62.7	1.3	66.0	3
250	23.0	10.0	67.5	1.1	64.6	1.0	66.0	3
315	24.1	9.7	66.5	0.7	62.5	0.6	65.0	2
400	20.6	8.3	64.2	0.5	59.2	0.5	65.0	3
500	22.7	7.6	67.6	0.7	59.6	0.7	62.0	1
630	23.2	7.0	65.9	0.6	57.2	0.6	62.0	2
800	22.9	7.1	69.2	0.8	58.7	0.8	61.0	2
1000	21.4	7.0	69.6	0.4	56.1	0.6	59.0	1
1250	17.2	7.0	69.8	0.4	50.8	0.5	53.0	0
1600	14.4	7.2	71.0	0.5	44.3	0.6	45.0	0
2000	12.7	8.1	71.2	0.4	37.2	0.5	38.0	0
2500	10.4	9.1	70.6	0.4	35.7	0.5	37.0	0
3150	10.0	10.6	69.8	0.8	31.5	0.8	34.0	0
ΔIIC Rating	**21**	*(Delta Impact Insulation Class)*			**Sum of Deficiencies**		**26**	

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

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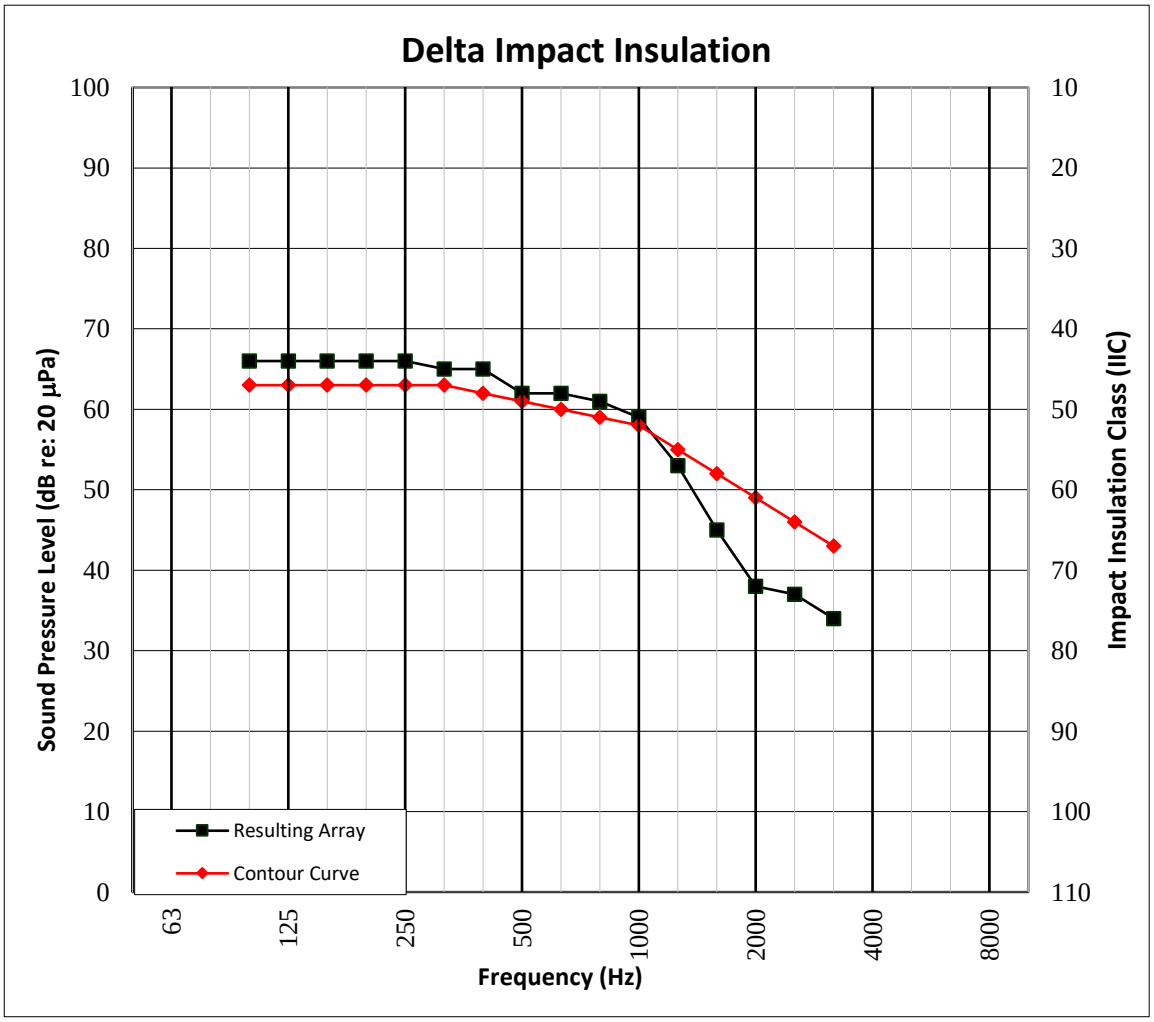
SECTION 15
TEST RESULTS - DELTA IMPACT INSULATION GRAPH

ACCREDITED Testing Laboratory

TEST DATE	3/6/2018				
DATA FILE NO.	H6838.10				
CLIENT	Shaw Industries Inc.				
DESCRIPTION	5.5 mm (0.22") USF COREtec® XRC-1 Luxury Vinyl Plank, 203.2 mm (8") Concrete Slab				
SPECIMEN AREA	10.98 m²	**Maximum Temp.**	21.1°C (69.9°F)	**Minimum Temp.**	20.2°C (68.4°F)
TECHNICIAN	DBM	**Max. Humidity**	42%	**Min. Humidity**	40%



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SECTION 16
PHOTOGRAPHS

Photo No. 1
Close-Up of Test Specimen

Photo No. 2
Receive Room View of Test Specimen Installation

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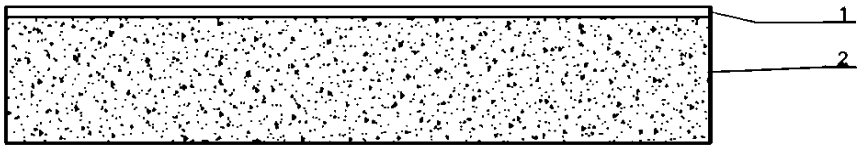
SECTION 17
DRAWING



1-Floor Topping
2-Concrete Slab

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SECTION 18

REVISION LOG

REVISION #	DATE	PAGES	DESCRIPTION
R0	04/15/19	N/A	Original Report Issue