

METROFLOR CORPORATION ACOUSTICAL PERFORMANCE TEST REPORT

SCOPE OF WORK

ASTM E90, ASTM E492, AND ASTM E2179 TESTING ON
7.0 MM WPC - 4.0 MM CORE, 1.5 MM LVT TOP LAYER, 1.5 MM IXPE UNDERLAYMENT

SPECIMEN TYPE

Concrete Slab - 152 mm

REPORT NUMBER

I8876.01-113-11-R0

TEST DATE

09/25/18

ISSUE DATE

10/02/18

RECORD RETENTION END

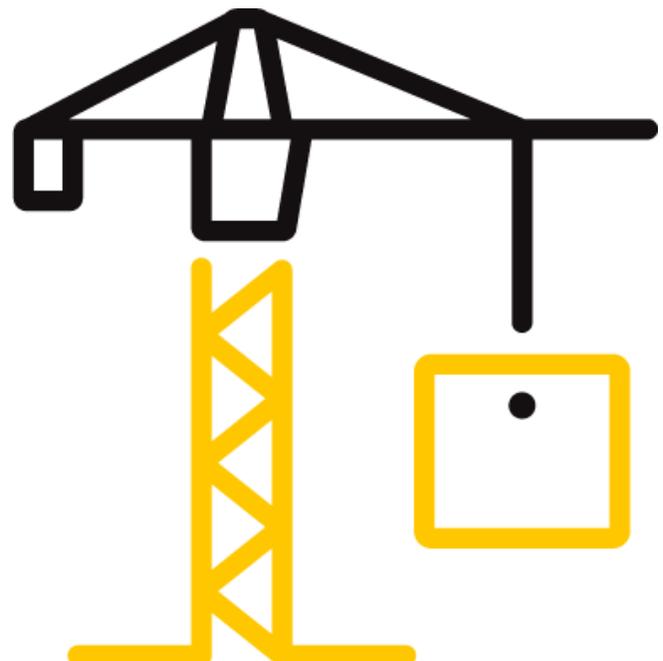
09/25/22

PAGES

15

DOCUMENT CONTROL

ATI 00629 (09/19/17)
RTTDS-R-AMER-Test-2844
© 2017 INTERTEK



TEST REPORT FOR METROFLOR CORPORATION

Report No.: I8876.01-113-11-R0

Date: 10/02/18

REPORT ISSUED TO

METROFLOR CORPORATION

15 Oakwood Avenue

Norwalk, Connecticut 06850

SECTION 1

SCOPE

Intertek Building & Construction (B&C) was contracted by Metroflor Corporation to perform testing in accordance with ASTM E90, ASTM E492, AND ASTM E2179 on 7.0 mm WPC - 4.0 mm Core, 1.5 mm LVT Top Layer, 1.5 mm IXPE Underlayment. 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.	I8876.01
SERIES/MODEL:	7.0 mm WPC - 4.0 mm Core, 1.5 mm LVT Top Layer, 1.5 mm IXPE Underlayment
STC	51
IIC	53
ΔIIC	24

COMPLETED BY: Michael K. Daniel
TITLE: Technician II - Acoustical Testing
SIGNATURE: 
Digitally Signed for: Michael Daniel by Janine Sobell
DATE: 10/02/18

COMPLETED BY: Jordan Strybos
TITLE: Project Manager - Acoustical Testing
SIGNATURE: 
Digitally Signed by: Jordan Strybos
DATE: 10/02/18

This report is for the exclusive use of Intertek's Client and is provided pursuant to the agreement between Intertek and its Client. Intertek's responsibility and liability are limited to the terms and conditions of the agreement. Intertek assumes no liability to any party, other than to the Client in accordance with the agreement, for any loss, expense or damage occasioned by the use of this report. Only the Client is authorized to permit copying or distribution of this report and then only in its entirety. Any use of the Intertek name or one of its marks for the sale or advertisement of the tested material, product or service must first be approved in writing by Intertek. The observations and test results in this report are relevant only to the sample(s) tested. This report by itself does not imply that the material, product, or service is or has ever been under an Intertek certification program.



TEST REPORT FOR METROFLOR CORPORATION

Report No.: I8876.01-113-11-R0

Date: 10/02/18

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) 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 4096.5 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.

TEST REPORT FOR METROFLOR CORPORATION

Report No.: I8876.01-113-11-R0

Date: 10/02/18

**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	10/17
				63811	10/17
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	INT00603	03/18
Tapping Machine	Norsonic	Nor277	Tapping Machine	INT00936	12/17

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

VT RECEIVE ROOM VOLUME	158.86 m ³
VT SOURCE ROOM VOLUME	190 m ³

**SECTION 6
LIST OF OFFICIAL OBSERVERS**

NAME	COMPANY
Daniel R. Deickman	Intertek B&C
Jordan Strybos	Intertek B&C

TEST REPORT FOR METROFLOR CORPORATION

Report No.: I8876.01-113-11-R0

Date: 10/02/18

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 Δ IIC (Delta Impact Insulation Class) ratings were calculated in accordance with ASTM E413, ASTM E989, and ASTM E2179, respectively.

TEST REPORT FOR METROFLOR CORPORATION

Report No.: I8876.01-113-11-R0

Date: 10/02/18

SECTION 9

TEST SPECIMEN DESCRIPTION

MATERIAL	DIMENSIONS (mm)	THICKNESS (mm)	MANUFACTURER AND SERIES	QUANTITY	AVERAGE WEIGHT
Waterproof Polymer Core (WPC) Flooring	1210 by 190	7.0	Engage Genesis™ 600	10.98 m ²	6.88 kg/m ²
	Note: Loose laid				
Concrete Slab	3023 by 3632	152.4	5000 PSI	10.98 m ²	366.18 kg/m ²
	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.				

TEST REPORT FOR METROFLOR CORPORATION

Report No.: I8876.01-113-11-R0

Date: 10/02/18

SECTION 10

TEST RESULTS - AIRBORNE SOUND TRANSMISSION LOSS



TEST DATE	9/25/2018				
DATA FILE NO.	I8876.01				
CLIENT	Metroflor Corporation				
DESCRIPTION	7 mm Engage Genesis™ 600 Waterproof Polymer Core (WPC) Flooring, 152.4 mm 5000 PSI Concrete Slab				
SPECIMEN AREA	10.98 m ²	Receive Temp.	20°C	Source Temp.	20.9°C
TECHNICIAN	DRD	Receive Humidity	78%	Source Humidity	78%

FREQ (Hz)	BACKGROUND SPL (dB)	ABSORPTION m ²	SOURCE SPL (dB)	RECEIVE SPL (dB)	SPECIMEN TL (dB)	95% CONFIDENCE LIMIT	NUMBER OF DEFICIENCIES
80	39.7	15.3	109	66	42	3.5	-
100	29.5	15.2	107	65	40	2.1	-
125	32.3	9.9	104	67	38	1.3	0
160	30.1	9.8	106	69	38	1.6	0
200	27.4	11.4	103	69	34	2.0	7
250	31.0	11.2	102	59	42	0.8	2
315	25.1	9.9	105	59	46	0.8	1
400	23.9	8.4	102	58	45	0.5	5
500	22.6	7.7	103	60	46	0.6	5
630	24.5	7.2	104	60	46	0.5	6
800	23.9	7.4	103	56	49	0.7	4
1000	23.1	7.2	103	50	55	0.6	0
1250	20.7	7.3	103	46	59	0.6	0
1600	18.8	7.4	103	42	63	0.6	0
2000	17.6	8.1	103	39	65	0.4	0
2500	14.4	8.9	101	37	66	0.3	0
3150	14.2	9.7	102	34	69	0.3	0
4000	12.3	11.0	104	32	72	0.3	0
5000	12.4	12.4	104	29	74	0.6	-
6300	11.8	15.2	97	19	77	0.7	-
8000	9.8	19.6	97	16	79	0.9	-
10000	8.1	24.3	92	9	80	0.5	-
STC Rating	51	<i>(Sound Transmission Class)</i>			Sum of Deficiencies	30	

- 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

TEST REPORT FOR METROFLOR CORPORATION

Report No.: I8876.01-113-11-R0

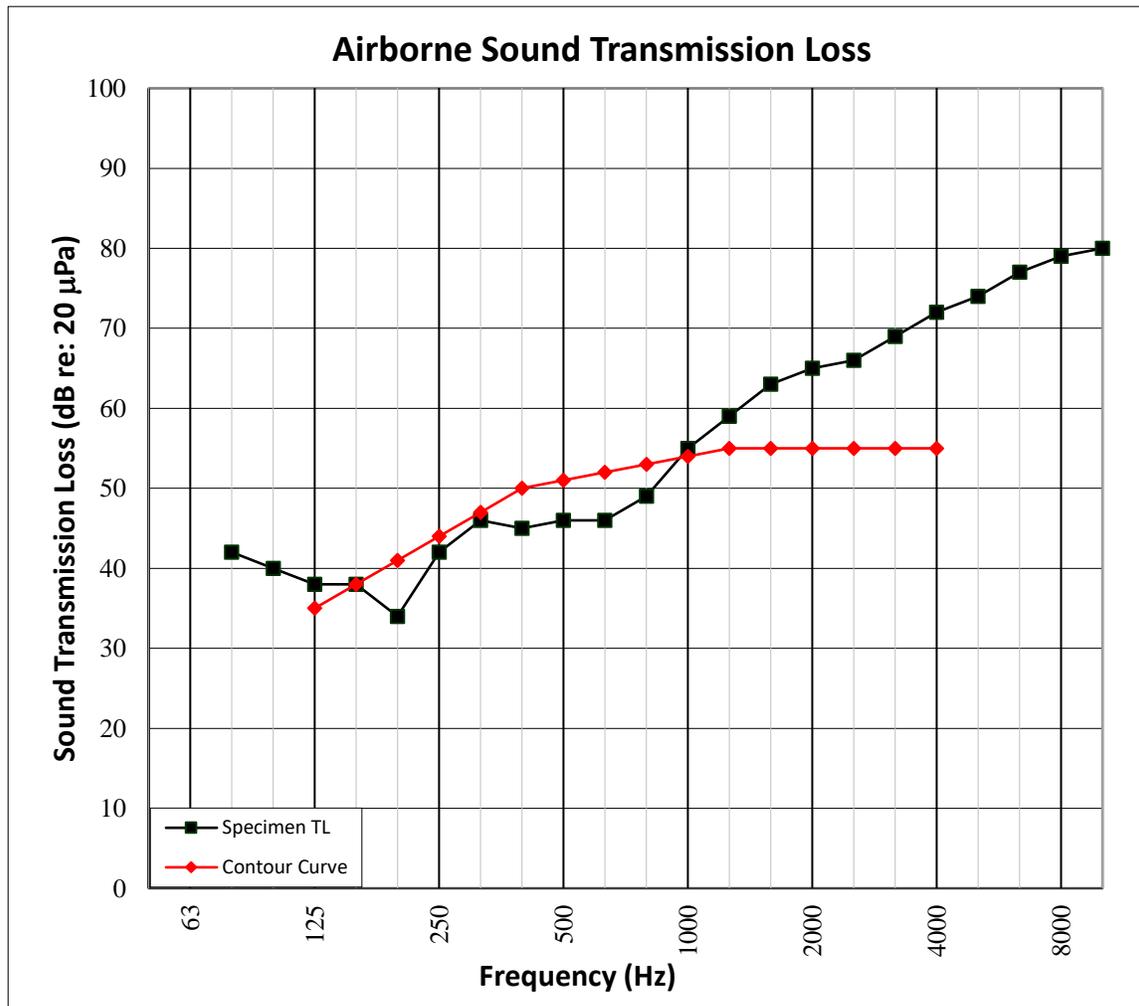
Date: 10/02/18

SECTION 11

TEST RESULTS - AIRBORNE SOUND TRANSMISSION LOSS GRAPH



TEST DATE	9/25/2018				
DATA FILE NO.	I8876.01				
CLIENT	Metroflor Corporation				
DESCRIPTION	7 mm Engage Genesis™ 600 Waterproof Polymer Core (WPC) Flooring, 152.4 mm 5000 PSI Concrete Slab				
SPECIMEN AREA	10.98 m ²	Receive Temp.	20°C	Source Temp.	20.9°C
TECHNICIAN	DRD	Receive Humidity	78%	Source Humidity	78%



TEST REPORT FOR METROFLOR CORPORATION

Report No.: I8876.01-113-11-R0

Date: 10/02/18

SECTION 12

TEST RESULTS - IMPACT SOUND TRANSMISSION



TEST DATE	9/25/2018				
DATA FILE NO.	I8876.01				
CLIENT	Metroflor Corporation				
DESCRIPTION	7 mm Engage Genesis™ 600 Waterproof Polymer Core (WPC) Flooring, 152.4 mm 5000 PSI Concrete Slab				
SPECIMEN AREA	10.98 m ²	Maximum Temp.	20°C	Minimum Temp.	19.9°C
TECHNICIAN	DRD	Max. Humidity	78%	Min. Humidity	78%

FREQ (Hz)	BACKGROUND SPL (dB)	ABSORPTION m ²	NORMALIZED IMPACT SPL (dB)	95% CONFIDENCE LIMIT	NUMBER OF DEFICIENCIES
80	39.4	16.0	56	2.0	-
100	31.2	13.3	58	1.1	0
125	32.6	9.7	57	1.5	0
160	30.2	10.2	63	0.6	4
200	26.7	11.6	67	0.7	8
250	31.0	11.0	63	0.8	4
315	24.9	9.7	60	0.3	1
400	24.0	8.2	62	0.5	4
500	23.1	7.6	57	0.3	0
630	24.6	7.3	54	0.3	0
800	24.8	7.4	51	0.4	0
1000	23.4	7.1	46	0.4	0
1250	20.7	7.2	41	0.3	0
1600	18.6	7.4	38	0.5	0
2000	17.5	8.1	34	0.4	0
2500	14.1	9.0	31	0.5	0
3150	14.2	9.6	26	0.7	0
4000	12.2	11.0	21	0.8	-
5000	12.2	12.5	16	0.8	-
6300	11.8	15.2	12	0.5	-
8000	10.0	19.4	11	0.5	-
10000	8.3	23.8	10	0.5	-
IIC Rating	53	<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.

TEST REPORT FOR METROFLOR CORPORATION

Report No.: I8876.01-113-11-R0

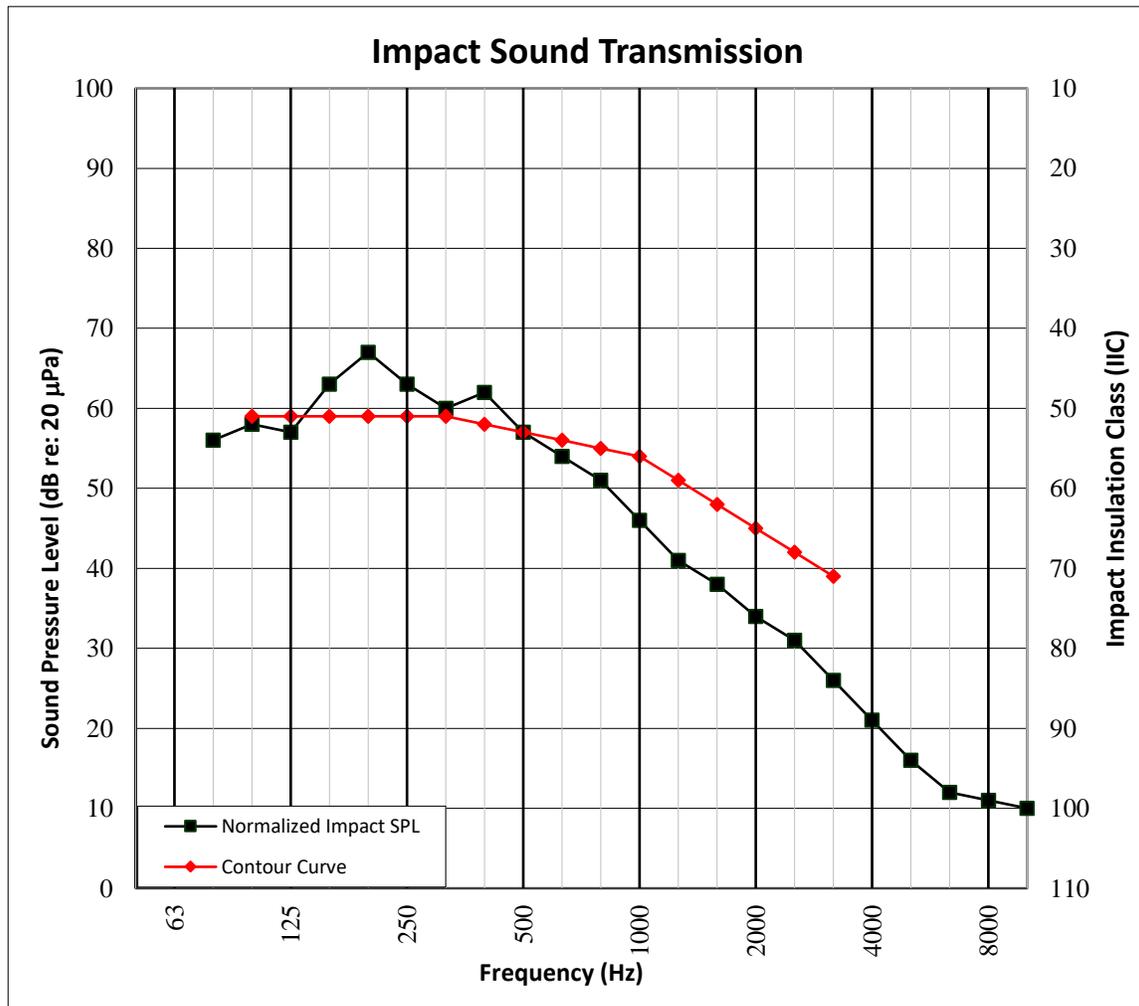
Date: 10/02/18

SECTION 13

TEST RESULTS - IMPACT SOUND TRANSMISSION GRAPH



TEST DATE	9/25/2018				
DATA FILE NO.	I8876.01				
CLIENT	Metroflor Corporation				
DESCRIPTION	7 mm Engage Genesis™ 600 Waterproof Polymer Core (WPC) Flooring, 152.4 mm 5000 PSI Concrete Slab				
SPECIMEN AREA	10.98 m ²	Maximum Temp.	20°C	Minimum Temp.	19.9°C
TECHNICIAN	DRD	Max. Humidity	78%	Min. Humidity	78%



TEST REPORT FOR METROFLOR CORPORATION

Report No.: I8876.01-113-11-R0

Date: 10/02/18

SECTION 14

TEST RESULTS - DELTA IMPACT INSULATION



TEST DATE	9/25/2018				
DATA FILE NO.	I8876.01				
CLIENT	Metroflor Corporation				
DESCRIPTION	7 mm Engage Genesis™ 600 Waterproof Polymer Core (WPC) Flooring, 152.4 mm 5000 PSI Concrete Slab				
SPECIMEN AREA	10.98 m ²	Maximum Temp.	20°C	Minimum Temp.	19.9°C
TECHNICIAN	DRD	Max. Humidity	78%	Min. Humidity	78%

FREQ (Hz)	BACKGROUND SPL (dB)	ABSORPTION m ²	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	31.2	13.3	59.2	1.0	57.6	1.4	65.0	5
125	32.6	9.7	59.1	1.9	57.0	1.9	65.0	5
160	30.2	10.2	65.1	0.7	63.3	0.7	66.0	6
200	26.7	11.6	70.7	1.0	67.2	0.9	65.0	5
250	31.0	11.0	68.0	0.9	63.2	1.0	64.0	4
315	24.9	9.7	66.4	0.3	59.7	0.4	63.0	3
400	24.0	8.2	70.1	0.5	61.9	0.6	62.0	3
500	23.1	7.6	68.3	0.4	56.5	0.3	59.0	1
630	24.6	7.3	70.4	0.5	53.7	0.4	54.0	0
800	24.8	7.4	70.8	0.4	50.9	0.6	52.0	0
1000	23.4	7.1	71.2	0.4	45.8	0.5	47.0	0
1250	20.7	7.2	72.2	0.4	41.2	0.3	41.0	0
1600	18.6	7.4	72.8	0.6	37.6	0.6	37.0	0
2000	17.5	8.1	73.6	0.5	34.4	0.6	33.0	0
2500	14.1	9.0	73.1	0.6	30.8	0.6	30.0	0
3150	14.2	9.6	72.2	0.8	25.8	0.8	26.0	0
ΔIIC Rating	24	<i>(Delta Impact Insulation Class)</i>			Sum of Deficiencies	32		

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

TEST REPORT FOR METROFLOR CORPORATION

Report No.: I8876.01-113-11-R0

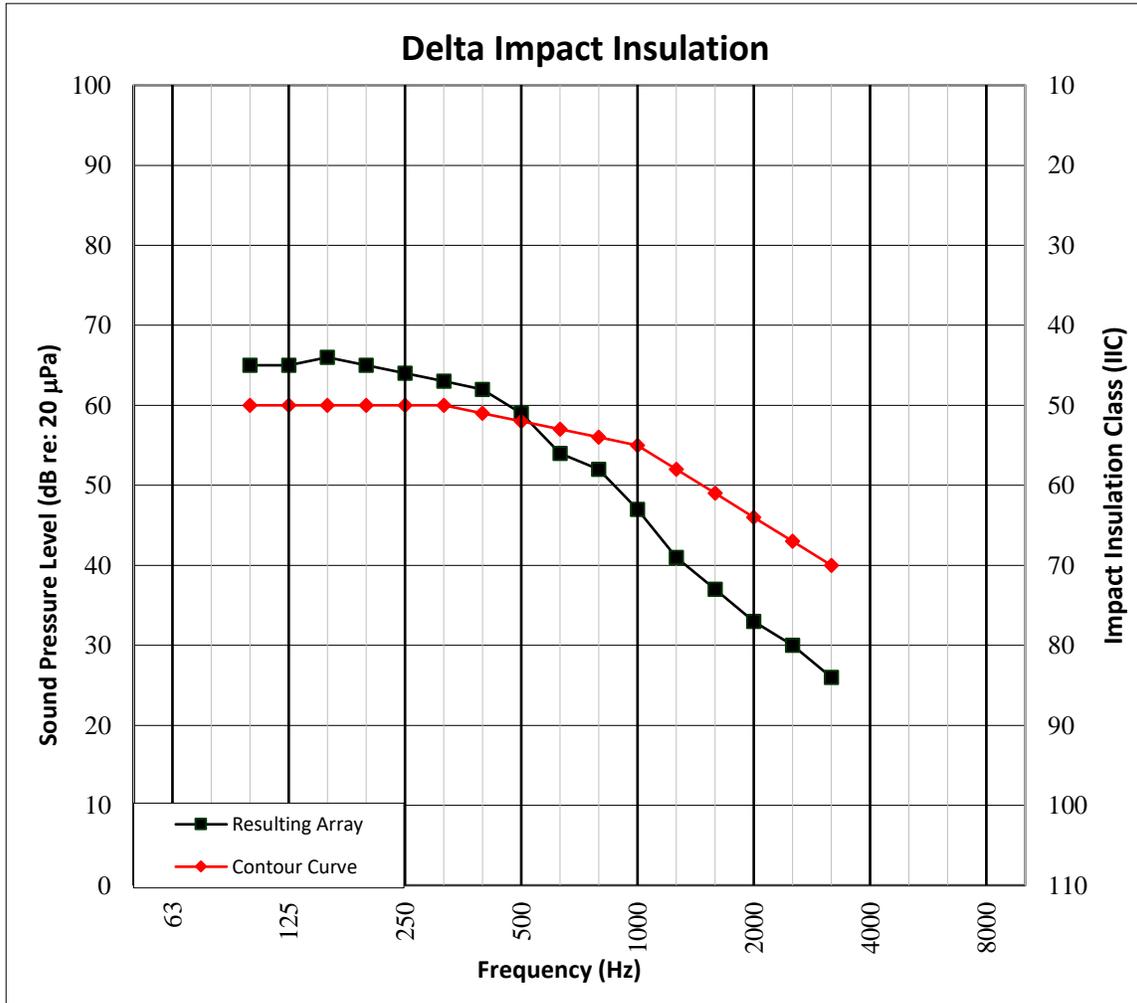
Date: 10/02/18

SECTION 15

TEST RESULTS - DELTA IMPACT INSULATION GRAPH



TEST DATE	9/25/2018				
DATA FILE NO.	I8876.01				
CLIENT	Metroflor Corporation				
DESCRIPTION	7 mm Engage Genesis™ 600 Waterproof Polymer Core (WPC) Flooring, 152.4 mm 5000 PSI Concrete Slab				
SPECIMEN AREA	10.98 m ²	Maximum Temp.	20°C	Minimum Temp.	19.9°C
TECHNICIAN	DRD	Max. Humidity	78%	Min. Humidity	78%



TEST REPORT FOR METROFLOR CORPORATION

Report No.: I8876.01-113-11-R0

Date: 10/02/18

SECTION 16

PHOTOGRAPHS



Photo No. 1
Source Room View of Test Specimen Installation



Photo No. 2
Receive Room View of Test Specimen Installation

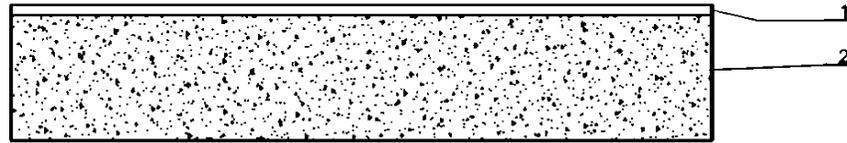
TEST REPORT FOR METROFLOR CORPORATION

Report No.: I8876.01-113-11-R0

Date: 10/02/18

SECTION 17

DRAWING



1-Floor Topping

2-Concrete Slab

TEST REPORT FOR METROFLOR CORPORATION

Report No.: I8876.01-113-11-R0

Date: 10/02/18

SECTION 18

REVISION LOG

REVISION #	DATE	PAGES	DESCRIPTION
R0	10/02/18	N/A	Original Report Issue