

# VULCRAFT/VERCO GROUP

## ACOUSTICAL PERFORMANCE TEST REPORT

### SCOPE OF WORK

ASTM E90 AND ASTM E492 TESTING ON  
ENGINEERED WOOD OVER 5 MM ECOSILENCE UNDERLAYMENT

### SPECIMEN TYPE

Vulcraft 20 Gage Dove Tail 2.00 Steel Deck with Gypsum Board Ceiling

### REPORT NUMBER

H7786.11-113-11-R1

### TEST DATE

02/11/18

### ISSUE DATE

03/22/18

### REVISED DATE

04/04/18

### RECORD RETENTION END

02/11/22

### PAGES

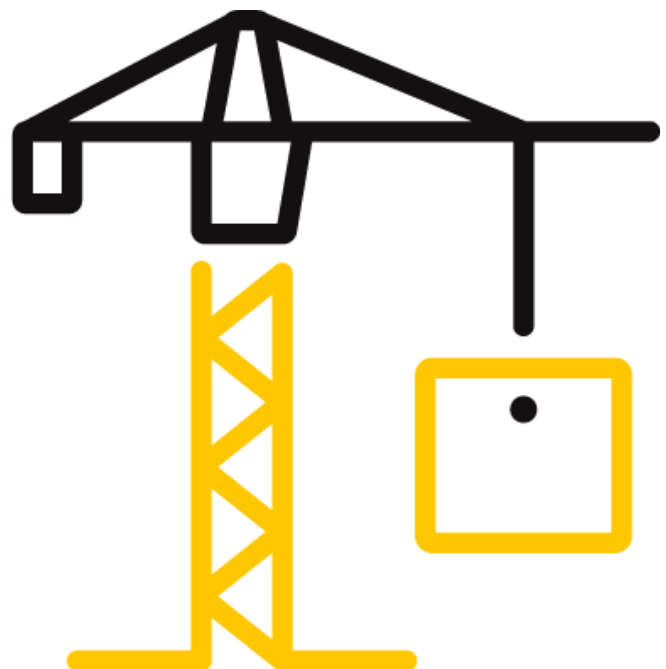
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### DOCUMENT CONTROL

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## TEST REPORT FOR VULCRAFT/VERCO GROUP

Report No.: H7786.11-113-11-R1

Date: 04/04/18

### REPORT ISSUED TO

#### VULCRAFT/VERCO GROUP

7205 Gault Avenue North  
Fort Payne, Alabama 35967

### SECTION 1

#### SCOPE

Intertek Building & Construction (B&C) was contracted by to perform testing in accordance with ASTM E90 AND ASTM E492 on Engineered Wood over 5 mm ECOsilence 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

<b>DATA FILE NO.</b>	H7786.11
<b>SERIES/MODEL:</b>	Engineered Wood over 5 mm ECOsilence Underlayment
<b>STC</b>	50
<b>IIC</b>	50

**COMPLETED BY:** Daniel B. Mohler  
Project Lead - Acoustical  
**TITLE:** Testing  
**SIGNATURE:**  
**DATE:** 04/04/18

**COMPLETED BY:** Jordan Strybos  
Project Manager - Acoustical  
**TITLE:** Testing  
**SIGNATURE:**  
**DATE:** 04/04/18

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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 E989-06 (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 (Vulcraft 20 Gage Dove Tail 2.00 Steel Deck with Gypsum Board Ceiling) 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 3126.1 kg. B&C will store samples of the test specimen for four years. Photographs of the test specimen are included in the attachments. A drawing of the test specimen is included in the attachments.

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-1033	Data Acquisition Card	63763-1	06/16 *
Data Acquisition Unit	National Instruments	PXI-4462	Input Card	63763-4	07/16 *
Data Acquisition Unit	National Instruments	PXI-4462	Input Card	63763-5	06/16 *
Microphone Calibrator	Norsonic	1251	Pistonphone calibrator	INT00127	03/17
Receive Room Microphone	PCB Piezotronics	378C20	Microphone and Preamplifier	65617	05/17
Receive Room Microphone	PCB Piezotronics	378B20	Microphone and Preamplifier	63744	05/17
Receive Room Microphone	PCB Piezotronics	378B20	Microphone and Preamplifier	63745	05/17
Receive Room Microphone	PCB Piezotronics	378B20	Microphone and Preamplifier	63746	09/17
Receive Room Microphone	PCB Piezotronics	378B20	Microphone and Preamplifier	63747	05/17
Receive Room Environmental Indicator	Comet	T7510	Temperature and Humidity Transmitter	63810	10/17
				63811	10/17
Source Room Microphone	PCB Piezotronics	378B20	Microphone and Preamplifier	63738	04/17
Source Room Microphone	PCB Piezotronics	378B20	Microphone and Preamplifier	63739	04/17
Source Room Microphone	PCB Piezotronics	378B20	Microphone and Preamplifier	63740	04/17
Source Room Microphone	PCB Piezotronics	378B20	Microphone and Preamplifier	63742	04/17
Source Room Microphone	PCB Electronics	378B20	Microphone and Preamplifier	63741	04/17
Source Room Environmental Indicator	Comet	T7510	Temperature and Humidity Transmitter	INT00603	03/17
Tapping Machine	Norsonic	Nor277	Tapping Machine	INT00936	12/17

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

<b>VT RECEIVE ROOM VOLUME</b>	158.86 m <sup>3</sup>
<b>VT SOURCE ROOM VOLUME</b>	190 m <sup>3</sup>

### 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 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. Four 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) and IIC (Impact Insulation Class) ratings were calculated in accordance with ASTM E413 and ASTM E989, respectively.

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### SECTION 9

#### TEST SPECIMEN DESCRIPTION

MATERIAL	DIMENSIONS (mm/inch)	THICKNESS (mm/inch)	MANUFACTURER AND SERIES	QUANTITY	AVERAGE WEIGHT
Engineered Wood	914.4 by 127	12.7	Armstrong	10.98 m <sup>2</sup>	6.59 kg/m <sup>2</sup>
	Note: Loose laid				
Rubber Underlayment	3023 by 1219	5.0	ECOsilence	10.98 m <sup>2</sup>	4.2 kg/m <sup>2</sup>
	Note: Loose laid				
Standard 4000 PSI Concrete	3023 by 3632	139.7	N/A	10.98 m <sup>2</sup>	248.08 kg/m <sup>2</sup>
	Note: Poured directly on the floor deck and allowed to cure for a minimum of 28 days.				
Steel Deck	3023 by 609.6	139.7	20 Gage Vulcraft Dove Tail 2.00	10.98 m <sup>2</sup>	12.01 kg/m <sup>2</sup>
	Note: Installed per manufacturer's specifications in a test frame with the top of the concrete flush with the source room. All seams and gaps underneath the deck were plugged with backer rod and sealed with Pecora AC-20 Acoustical Sealant.				
25 Gage Furring Channel	3022.6 by 63.6	38.1	ClarkDietrich	21.16 lin m	0.98 kg/m
	Note: The furring channels were attached directly to the bottom of the steel deck, spaced 610 mm on center. The measured steel thickness is 1.2 mm.				
Gypsum Panel	1219 by 3023	15.9	USG SHEETROCK® Brand FIRECODE® C Core	10.98 m <sup>2</sup>	11.91 kg/m <sup>2</sup>
	Note: Fastened with 25.4 mm fine thread drywall screws on 610 mm centers. Seams and perimeter sealed with Pecora AC-20® Acoustical Sealant and covered with pressure-sensitive tape.				

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**SECTION 10**
**TEST RESULTS - AIRBORNE SOUND TRANSMISSION LOSS**


<b>TEST DATE</b>	2/11/2018				
<b>DATA FILE NO.</b>	H7786.11				
<b>CLIENT</b>	Vulcraft/Verco Group				
<b>DESCRIPTION</b>	12.7 mm Armstrong Engineered Wood, 5 mm ECOSilence Rubber Underlayment, 139.7 mm Standard 4000 PSI Concrete, 139.7 mm 20 Gage Vulcraft Dove Tail 2.00 Steel Deck, 38.1 mm ClarkDietrich 25 Gage Furring Channel, 15.9 mm USG SHEETROCK® Brand FIRECODE® C Core Gypsum Panel				
<b>SPECIMEN AREA</b>	10.98 m <sup>2</sup>	<b>Receive Temp.</b>	17.4°C	<b>Source Temp.</b>	19.5°C
<b>TECHNICIAN</b>	ZPG	<b>Receive Humidity</b>	59%	<b>Source Humidity</b>	59%

FREQ (Hz)	BACKGROUND SPL (dB)	ABSORPTION m <sup>2</sup>	SOURCE SPL (dB)	RECEIVE SPL (dB)	SPECIMEN TL (dB)	95% CONFIDENCE LIMIT	NUMBER OF DEFICIENCIES
80	32.8	17.0	109	70	37	4.0	-
100	29.7	15.0	106	67	37	1.8	-
125	29.1	14.0	105	68	35	1.6	0
160	26.5	12.3	106	71	34	1.2	3
200	22.5	12.0	103	71	32	1.3	8
250	29.9	11.2	103	63	40	0.7	3
315	20.9	11.0	104	62	42	0.9	4
400	19.9	9.0	102	57	46	0.7	3
500	23.9	8.4	102	48	55	0.5	0
630	21.8	7.8	103	46	58	0.4	0
800	20.1	7.4	103	44	61	0.4	0
1000	16.8	7.3	104	42	64	0.5	0
1250	13.8	7.5	103	40	65	0.6	0
1600	12.1	7.9	103	39	66	0.4	0
2000	9.1	8.8	103	37	67	0.4	0
2500	6.3	9.7	101	35	67	0.5	0
3150	5.2	10.6	102	32	71	0.5	0
4000	5.2	12.1	103	30	73	0.6	0
5000	5.4	14.2	103	27	75	0.4	-
6300	5.9	18.6	97	17	77	0.6	-
8000	6.3	24.3	97	13	80	0.7	-
10000	6.5	30.1	92	7	81	0.6	-
<b>STC Rating</b>	<b>50</b>	<i>(Sound Transmission Class)</i>			<b>Sum of Deficiencies</b>	<b>21</b>	

**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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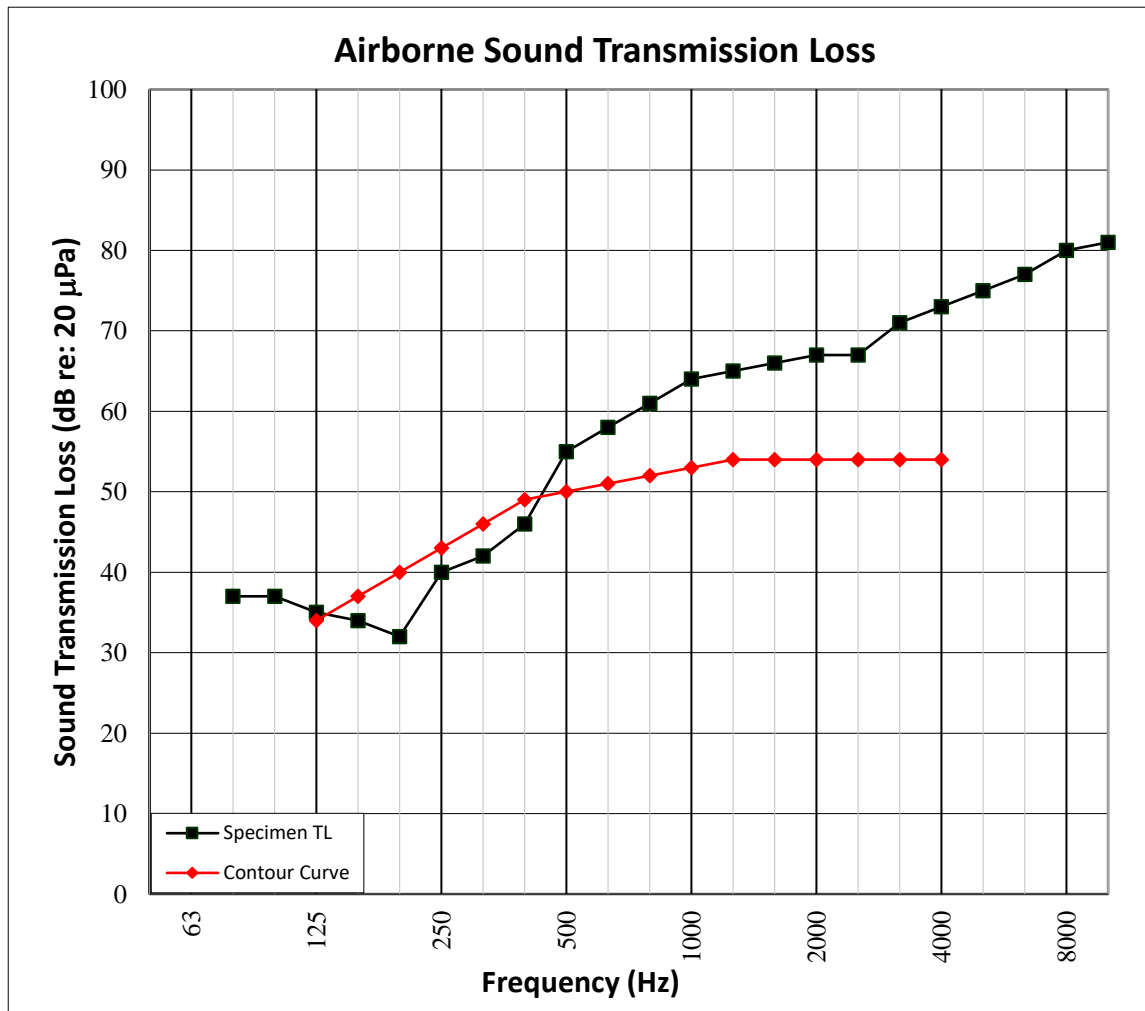
Date: 04/04/18

**SECTION 11**

**TEST RESULTS - AIRBORNE SOUND TRANSMISSION LOSS GRAPH**



<b>TEST DATE</b>	2/11/2018				
<b>DATA FILE NO.</b>	H7786.11				
<b>CLIENT</b>	Vulcraft/Verco Group				
<b>DESCRIPTION</b>	12.7 mm Armstrong Engineered Wood, 5 mm ECOSilence Rubber Underlayment, 139.7 mm Standard 4000 PSI Concrete, 139.7 mm 20 Gage Vulcraft Dove Tail 2.00 Steel Deck, 38.1 mm ClarkDietrich 25 Gage Furring Channel, 15.9 mm USG SHEETROCK® Brand FIRECODE® C Core Gypsum Panel				
<b>SPECIMEN AREA</b>	10.98 m <sup>2</sup>	<b>Receive Temp.</b>	17.4°C	<b>Source Temp.</b>	19.5°C
<b>TECHNICIAN</b>	ZPG	<b>Receive Humidity</b>	59%	<b>Source Humidity</b>	59%





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**SECTION 12**
**TEST RESULTS - IMPACT SOUND TRANSMISSION**


<b>TEST DATE</b>	2/11/2018				
<b>DATA FILE NO.</b>	H7786.11				
<b>CLIENT</b>	Vulcraft/Verco Group				
<b>DESCRIPTION</b>	12.7 mm Armstrong Engineered Wood, 5 mm ECOSilence Rubber Underlayment, 139.7 mm Standard 4000 PSI Concrete, 139.7 mm 20 Gage Vulcraft Dove Tail 2.00 Steel Deck, 38.1 mm ClarkDietrich 25 Gage Furring Channel, 15.9 mm USG SHEETROCK® Brand FIRECODE® C Core Gypsum Panel				
<b>SPECIMEN AREA</b>	10.98 m <sup>2</sup>	<b>Maximum Temp.</b>	17.4°C	<b>Minimum Temp.</b>	17.4°C
<b>TECHNICIAN</b>	ZPG	<b>Max. Humidity</b>	59%	<b>Min. Humidity</b>	59%

FREQ (Hz)	BACKGROUND SPL (dB)	ABSORPTION m <sup>2</sup>	NORMALIZED IMPACT SPL (dB)	95% CONFIDENCE LIMIT	NUMBER OF DEFICIENCIES
80	34.2	17.6	60	2.2	-
100	30.6	16.4	61	1.2	0
125	29.5	13.6	66	1.7	4
160	26.9	13.5	70	0.7	8
200	21.8	12.5	69	0.9	7
250	29.8	11.3	65	0.6	3
315	21.1	11.0	64	0.4	2
400	20.0	9.0	61	0.6	0
500	24.1	8.3	54	0.3	0
630	21.2	7.7	50	0.3	0
800	20.3	7.2	46	0.3	0
1000	17.7	7.2	40	0.3	0
1250	14.3	7.6	33	0.2	0
1600	12.5	7.8	30	0.2	0
2000	9.6	8.6	29	0.2	0
2500	6.8	9.7	27	0.2	0
3150	5.4	10.6	23	0.2	0
4000	5.2	12.0	16	0.3	-
5000	5.5	14.2	10	0.3	-
6300	6.0	18.6	8	0.2	-
8000	6.4	24.2	8	0.3	-
10000	6.6	30.4	9	0.4	-
<b>IIC Rating</b>	<b>50</b>	<i>(Impact Insulation Class)</i>		<b>Sum of Deficiencies</b>	<b>24</b>

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

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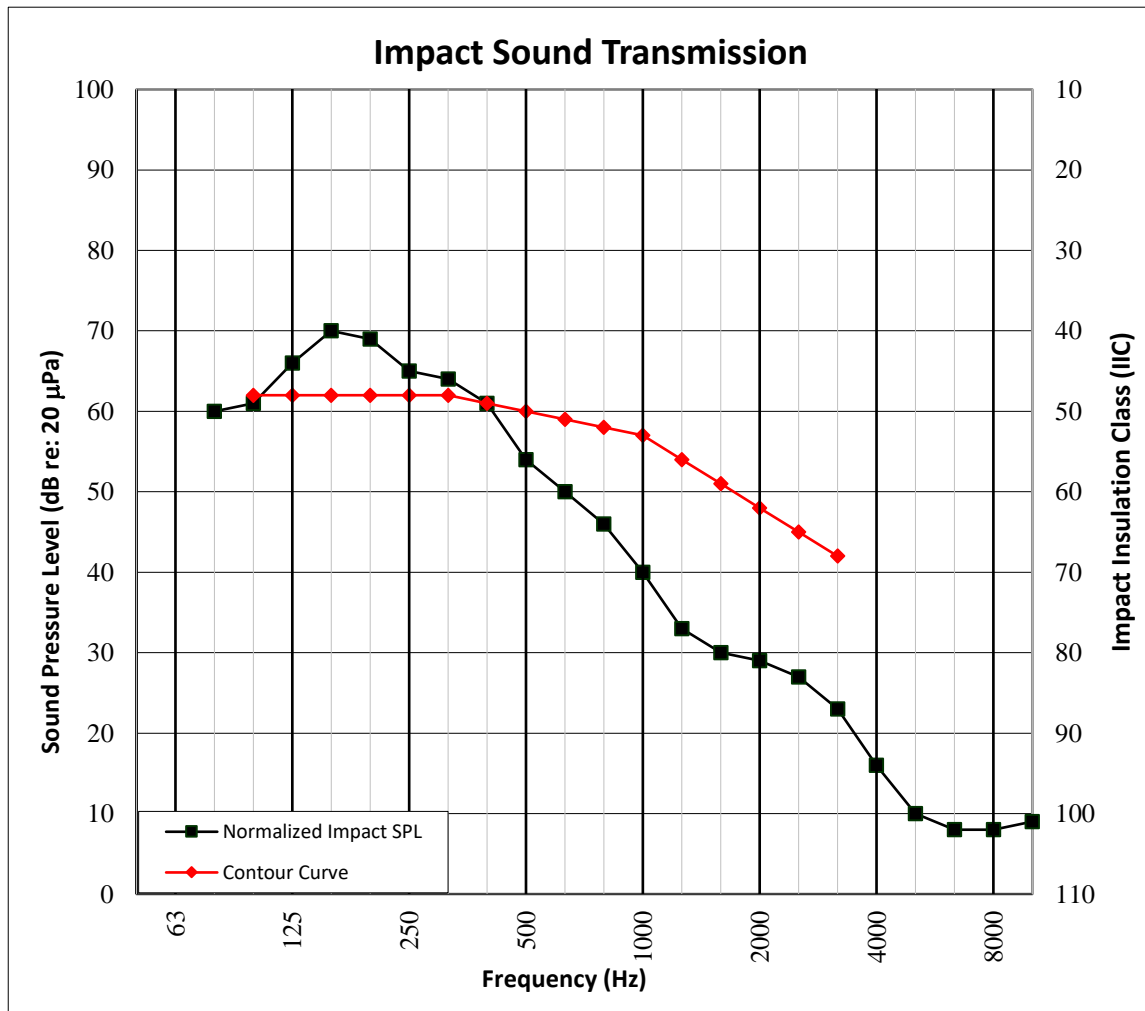
Date: 04/04/18

**SECTION 13**

**TEST RESULTS - IMPACT SOUND TRANSMISSION GRAPH**



<b>TEST DATE</b>	2/11/2018			
<b>DATA FILE NO.</b>	H7786.11			
<b>CLIENT</b>	Vulcraft/Verco Group			
<b>DESCRIPTION</b>	12.7 mm Armstrong Engineered Wood, 5 mm ECOSilence Rubber Underlayment, 139.7 mm Standard 4000 PSI Concrete, 139.7 mm 20 Gage Vulcraft Dove Tail 2.00 Steel Deck, 38.1 mm ClarkDietrich 25 Gage Furring Channel, 15.9 mm USG SHEETROCK® Brand FIRECODE® C Core Gypsum Panel			
<b>SPECIMEN AREA</b>	10.98 m <sup>2</sup>	<b>Maximum Temp.</b>	17.4°C	<b>Minimum Temp.</b> 17.4°C
<b>TECHNICIAN</b>	ZPG	<b>Max. Humidity</b>	59%	<b>Min. Humidity</b> 59%



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**SECTION 14**

**PHOTOGRAPHS**



**Photo No. 1**

**Source Room View of Test Specimen Installation**



**Photo No. 2**

**Receive Room View of Test Specimen Installation**

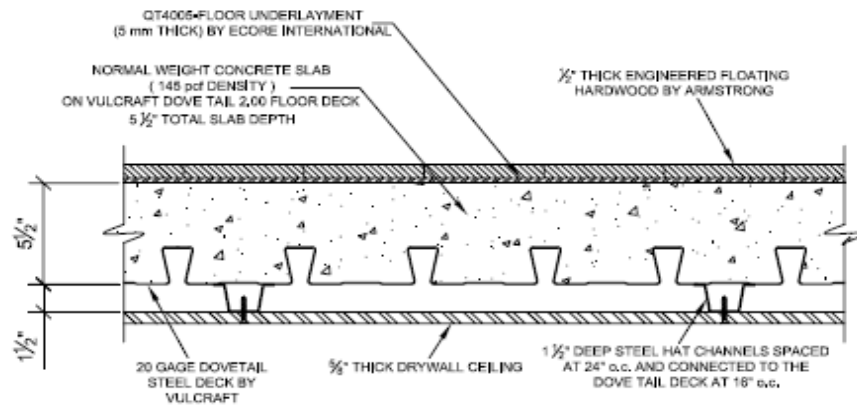
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### SECTION 15

### DRAWING



**Drawing of Test Specimen (supplied by Client)**

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**SECTION 16****REVISION LOG**

REVISION #	DATE	PAGES	DESCRIPTION
R0	03/22/18	N/A	Original Report Issue
R1	04/04/18	1, 6-10, 12	Steel deck name adjusted and drawing updated per client's request