

VULCRAFT/VERCO GROUP ACOUSTICAL PERFORMANCE TEST REPORT

SCOPE OF WORK

ASTM E90 AND ASTM E492 TESTING ON
FUSION HYBRID OVER 2 MM ECOSILENCE UNDERLAYMENT

SPECIMEN TYPE

Vulcraft 20 Gage Dove Tail 2.00 Steel Deck

REPORT NUMBER

H7786.02-113-11-R1

TEST DATE

02/10/18

ISSUE DATE

03/22/18

REVISED DATE

04/03/18

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PAGES

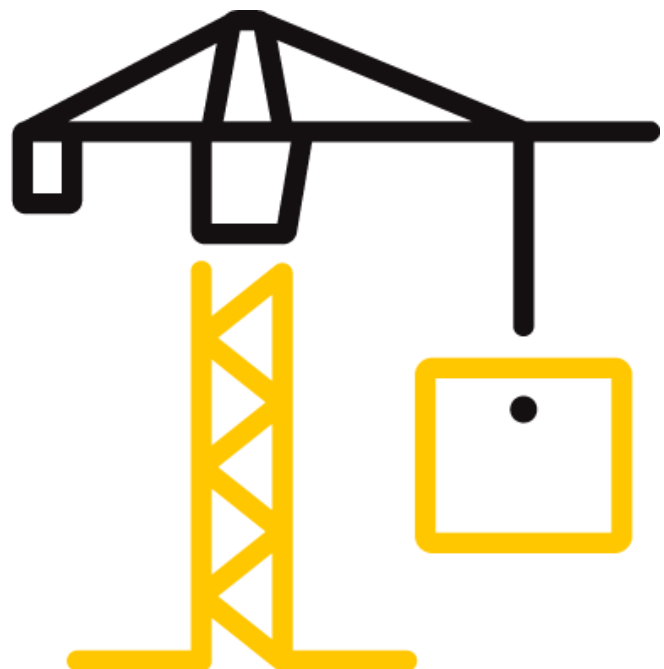
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TEST REPORT FOR VULCRAFT/VERCO GROUP

Report No.: H7786.02-113-11-R1

Date: 04/03/18

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 Fusion Hybrid over 2 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

DATA FILE NO.	H7786.02
SERIES/MODEL:	Fusion Hybrid over 2 mm ECOsilence Underlayment
STC	46
IIC	51

COMPLETED BY: Daniel B. Mohler
Project Lead - Acoustical
TITLE: Testing
SIGNATURE:
DATE: 04/03/18

COMPLETED BY: Jordan Strybos
Project Manager - Acoustical
TITLE: Testing
SIGNATURE:
DATE: 04/03/18

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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) 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 2950.7 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.

VT RECEIVE ROOM VOLUME	158.86 m ³
VT SOURCE ROOM VOLUME	190 m 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 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
Luxury Vinyl Plank	1219 by 177.8	4.0	Derr Flooring Fusion Hybrid	10.98 m ²	6.74 kg/m ²
	Note: Loose laid				
Rubber Underlayment	3023 by 1219	2.0	ECOsilence	10.98 m ²	1.86 kg/m ²
	Note: Loose laid				
Standard 4000 PSI Concrete	3023 by 3632	139.7	N/A	10.98 m ²	248.08 kg/m ²
	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 ²	12.01 kg/m ²
	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.				

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SECTION 10
TEST RESULTS - AIRBORNE SOUND TRANSMISSION LOSS


TEST DATE	2/10/2018				
DATA FILE NO.	H7786.02				
CLIENT	Vulcraft/Verco Group				
DESCRIPTION	4 mm Derr Flooring Fusion Hybrid Luxury Vinyl Plank, 2 mm ECOSilence Rubber Underlayment, 139.7 mm Standard 4000 PSI Concrete, 139.7 mm 20 Gage Vulcraft Dove Tail 2.00 Steel Deck				
SPECIMEN AREA	10.98 m ²	Receive Temp.	19.5°C	Source Temp.	19.8°C
TECHNICIAN	ZPG	Receive Humidity	41%	Source Humidity	41%

FREQ (Hz)	BACKGROUND SPL (dB)	ABSORPTION m ²	SOURCE SPL (dB)	RECEIVE SPL (dB)	SPECIMEN TL (dB)	95% CONFIDENCE LIMIT	NUMBER OF DEFICIENCIES
80	31.6	22.0	109	67	39	3.4	-
100	29.1	15.2	106	66	39	1.7	-
125	29.0	11.1	105	65	40	1.3	0
160	27.5	11.2	105	67	38	1.6	0
200	22.6	12.1	104	67	36	1.1	0
250	30.2	11.6	103	64	39	0.6	0
315	20.1	10.2	105	64	41	0.7	1
400	21.4	8.7	104	60	45	0.7	0
500	24.1	8.3	102	62	41	0.7	5
630	19.6	7.9	103	66	39	0.7	8
800	20.0	7.4	103	56	48	0.5	0
1000	17.4	7.6	103	47	58	0.5	0
1250	13.5	7.7	103	42	62	0.4	0
1600	13.3	7.7	104	39	66	0.3	0
2000	9.6	8.4	103	38	67	0.3	0
2500	7.7	9.2	102	36	67	0.3	0
3150	5.0	10.2	103	33	70	0.4	0
4000	5.3	11.5	104	31	72	0.4	0
5000	6.1	13.5	103	29	74	0.3	-
6300	6.4	17.0	97	18	77	0.5	-
8000	6.5	22.0	97	14	80	0.6	-
10000	6.7	28.1	92	8	80	0.4	-
STC Rating	46	<i>(Sound Transmission Class)</i>			Sum of Deficiencies	14	

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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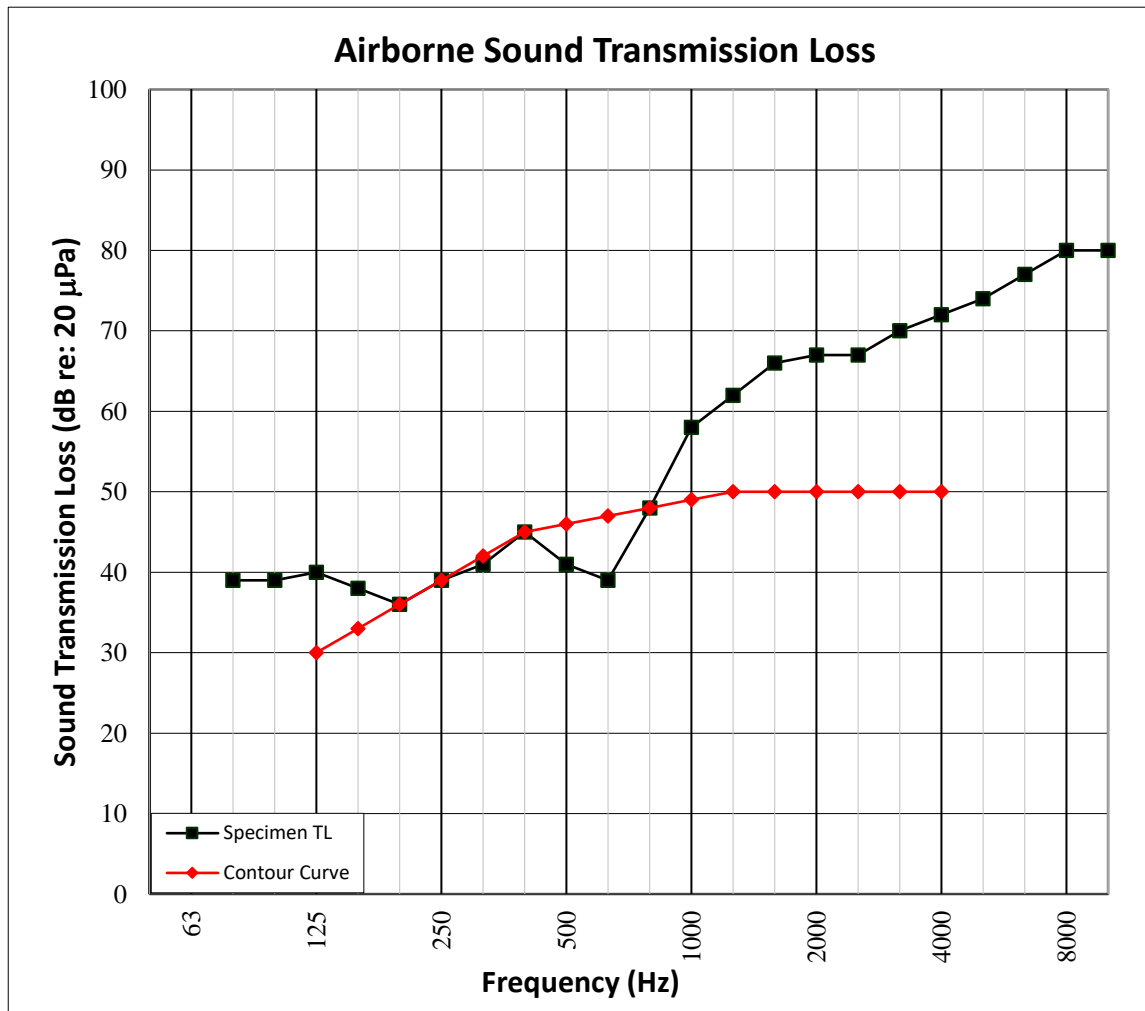
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SECTION 11

TEST RESULTS - AIRBORNE SOUND TRANSMISSION LOSS GRAPH



TEST DATE	2/10/2018				
DATA FILE NO.	H7786.02				
CLIENT	Vulcraft/Verco Group				
DESCRIPTION	4 mm Derr Flooring Fusion Hybrid Luxury Vinyl Plank, 2 mm ECOSilence Rubber Underlayment, 139.7 mm Standard 4000 PSI Concrete, 139.7 mm 20 Gage Vulcraft Dove Tail 2.00 Steel Deck				
SPECIMEN AREA	10.98 m ²	Receive Temp.	19.5°C	Source Temp.	19.8°C
TECHNICIAN	ZPG	Receive Humidity	41%	Source Humidity	41%



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SECTION 12
TEST RESULTS - IMPACT SOUND TRANSMISSION


TEST DATE	2/10/2018				
DATA FILE NO.	H7786.02				
CLIENT	Vulcraft/Verco Group				
DESCRIPTION	4 mm Derr Flooring Fusion Hybrid Luxury Vinyl Plank, 2 mm ECOSilence Rubber Underlayment, 139.7 mm Standard 4000 PSI Concrete, 139.7 mm 20 Gage Vulcraft Dove Tail 2.00 Steel Deck				
SPECIMEN AREA	10.98 m ²	Maximum Temp.	19.7°C	Minimum Temp.	19.3°C
TECHNICIAN	ZPG	Max. Humidity	42%	Min. Humidity	40%

FREQ (Hz)	BACKGROUND SPL (dB)	ABSORPTION m ²	NORMALIZED IMPACT SPL (dB)	95% CONFIDENCE LIMIT	NUMBER OF DEFICIENCIES
80	33.4	23.7	58	2.3	-
100	31.3	15.2	56	0.7	0
125	31.5	11.3	56	1.4	0
160	26.6	10.8	63	0.8	2
200	21.5	10.1	64	0.7	3
250	30.1	11.8	68	0.7	7
315	20.6	10.3	67	0.7	6
400	21.8	8.8	62	0.3	2
500	24.4	8.3	63	0.4	4
630	20.8	7.9	62	0.4	4
800	21.8	7.5	60	0.4	3
1000	20.0	7.8	54	0.4	0
1250	15.6	7.6	48	0.3	0
1600	15.5	7.7	40	0.3	0
2000	11.2	8.4	34	0.3	0
2500	8.6	9.2	27	0.2	0
3150	5.5	10.2	21	0.5	0
4000	5.4	11.6	17	0.7	-
5000	6.1	13.4	13	0.4	-
6300	6.5	17.2	10	0.4	-
8000	6.5	21.7	10	0.3	-
10000	6.7	27.9	11	0.3	-
IIC Rating	51	<i>(Impact Insulation Class)</i>		Sum of Deficiencies	31

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

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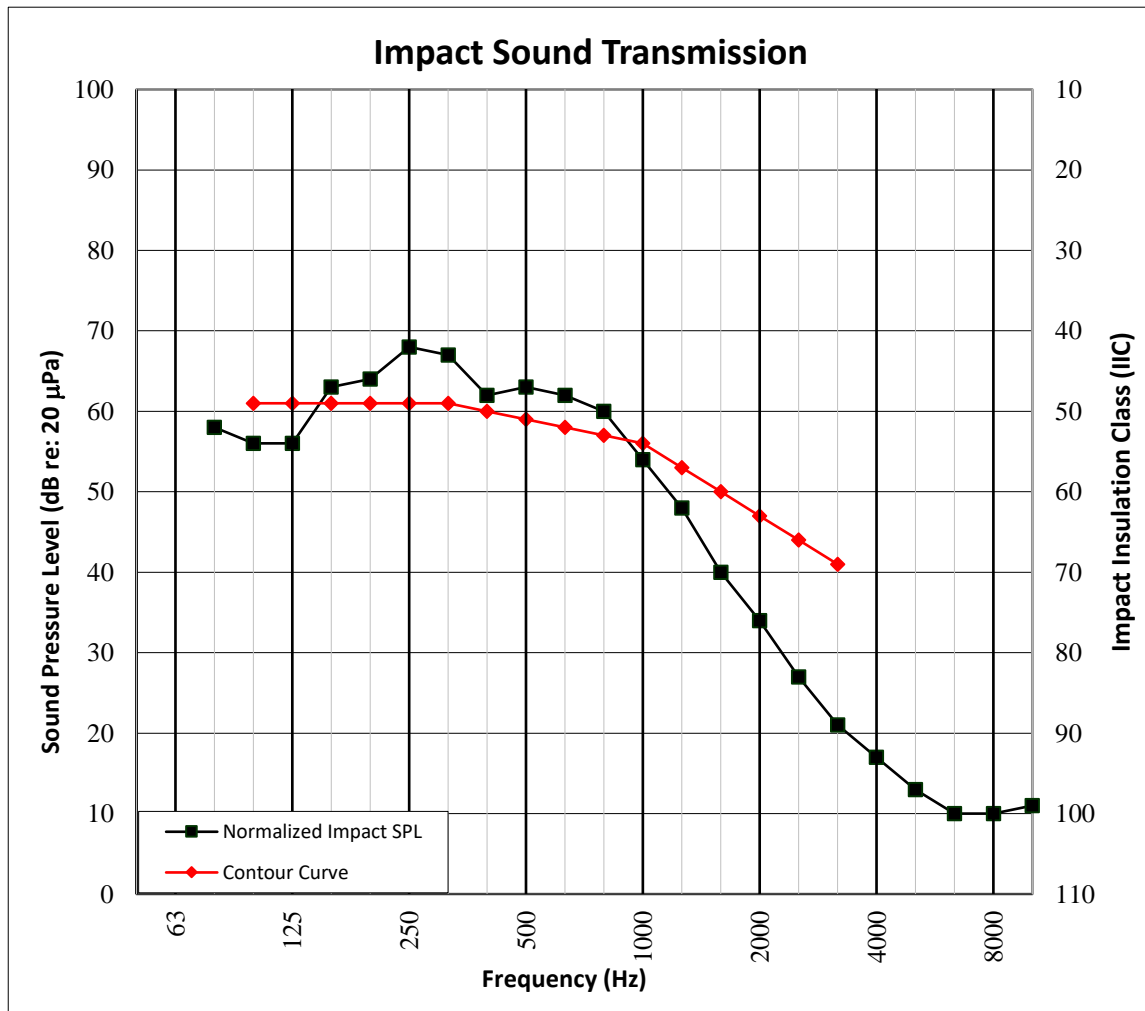
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SECTION 13

TEST RESULTS - IMPACT SOUND TRANSMISSION GRAPH



TEST DATE	2/10/2018				
DATA FILE NO.	H7786.02				
CLIENT	Vulcraft/Verco Group				
DESCRIPTION	4 mm Derr Flooring Fusion Hybrid Luxury Vinyl Plank, 2 mm ECOsilence Rubber Underlayment, 139.7 mm Standard 4000 PSI Concrete, 139.7 mm 20 Gage Vulcraft Dove Tail 2.00 Steel Deck				
SPECIMEN AREA	10.98 m ²	Maximum Temp.	19.7°C	Minimum Temp.	19.3°C
TECHNICIAN	ZPG	Max. Humidity	42%	Min. Humidity	40%



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SECTION 14

PHOTOGRAPHS



Photo No. 1

Source Room View of Test Specimen Installation

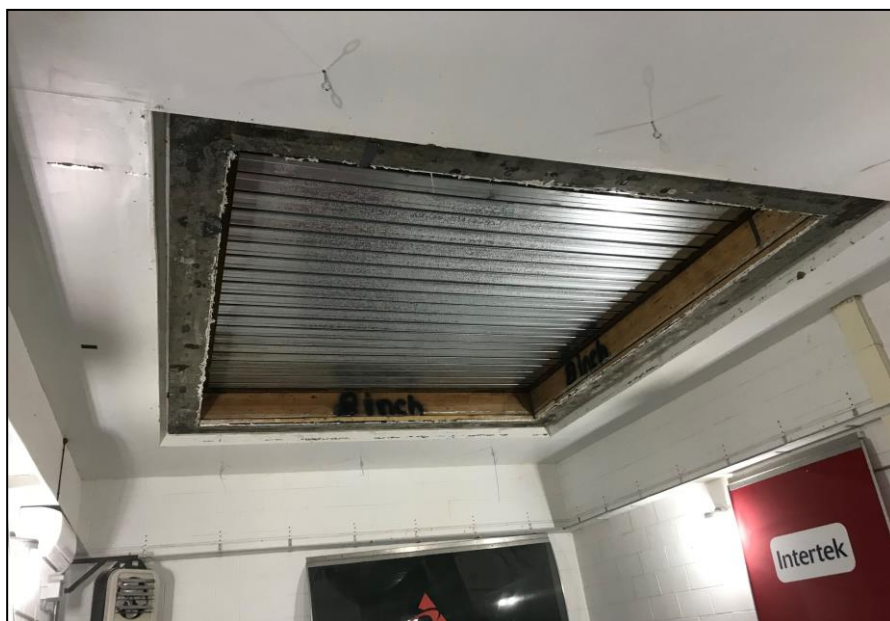


Photo No. 2

Receive Room View of Test Specimen Installation

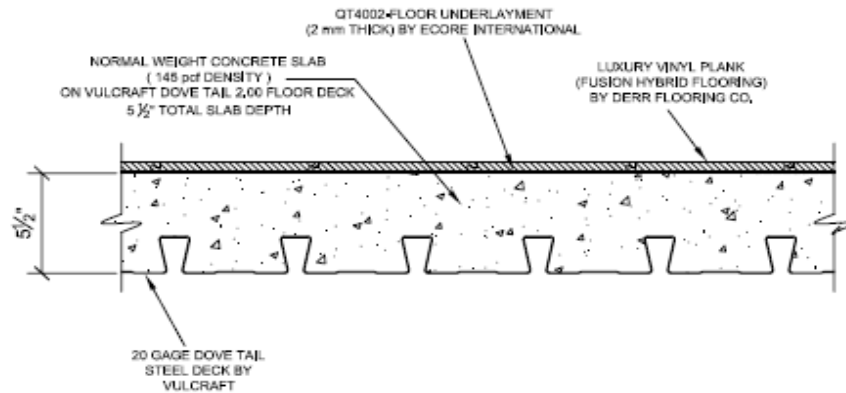
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SECTION 15

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	04/03/18	1, 6-10, 12	Steel deck name adjusted and drawing updated per client's request