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 3.50 Steel Deck with Gypsum Board Ceiling

REPORT NUMBER
H7787.11-113-11-R0

TEST DATE
02/17/18

ISSUE DATE
04/05/18

RECORD RETENTION END
02/17/22

PAGES
13

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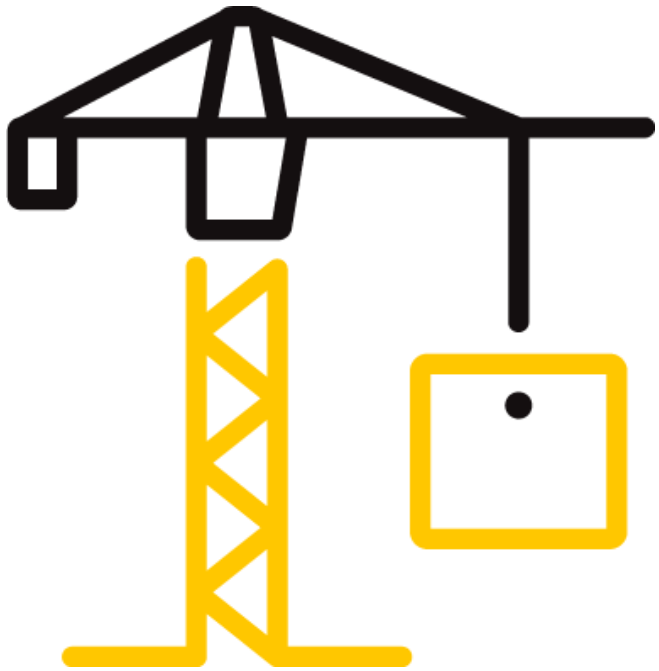

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TEST REPORT FOR VULCRAFT/VERCO GROUP
Report No.: H7787.11-113-11-R0
Date: 04/05/18

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

DATA FILE NO.	H7787.11
SERIES/MODEL:	Engineered Wood over 5 mm ECOsilence Underlayment
STC	55
IIC	52

COMPLETED BY:	Jason P. Taylor	**COMPLETED BY:**	Jordan Strybos
TITLE:	Technician II - Acoustical Testing	**TITLE:**	Project Manager - Acoustical Testing
SIGNATURE:	Digitally Signed by: Jason Taylor	**SIGNATURE:**	Digitally Signed by: Jordan Strybos
DATE:	04/05/18	**DATE:**	04/05/18

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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 3.50 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 3373.7 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
Jason P. Taylor	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 m²	6.59 kg/m²
	Note: Loose laid				
Rubber Underlayment	3023 by 1219	5.0	ECOsilence	10.98 m²	4.2 kg/m²
	Note: Loose laid				
Standard 4000 PSI Concrete	3023 by 3632	152.4	N/A	10.98 m²	270.63 kg/m²
	Note: Poured directly on the floor deck and allowed to cure for a minimum of 28 days.				
Steel Deck	3023 by 609.6	152.4	20 Gage Vulcraft Dove Tail 3.50	10.98 m²	12.01 kg/m²
	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	3023 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 m²	11.91 kg/m²
	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

ACCREDITED Testing Laboratory

TEST DATE	2/17/2018				
DATA FILE NO.	H7787.11				
CLIENT	Vulcraft/Verco Group				
DESCRIPTION	12.7 mm Armstrong Engineered Wood, 5 mm ECOsilence Rubber Underlayment, 152.4 mm Standard 4000 PSI Concrete, 152.4 mm 20 Gage Vulcraft Dove Tail 3.50 Steel Deck, 38.1 mm ClarkDietrich 25 Gage Furring Channel, 15.9 mm USG SHEETROCK® Brand FIRECODE® C Core Gypsum Panel				
SPECIMEN AREA	10.98 m²	**Receive Temp.**	18.9°C	**Source Temp.**	18.8°C
TECHNICIAN	JPT	**Receive Humidity**	57%	**Source Humidity**	57%

FREQ (Hz)	**BACKGROUND SPL** (dB)	**ABSORPTION** m²	**SOURCE SPL** (dB)	**RECEIVE SPL** (dB)	**SPECIMEN TL** (dB)	**95% CONFIDENCE LIMIT**	**NUMBER OF DEFICIENCIES**
80	33.4	18.7	109	70	37	2.9	-
100	32.2	16.9	105	69	35	1.7	-
125	31.2	11.8	104	68	36	1.3	3
160	24.5	11.7	108	71	37	1.2	5
200	22.2	12.0	105	67	38	1.7	7
250	30.0	11.1	104	62	42	0.9	6
315	17.6	10.6	105	60	45	0.7	6
400	19.4	8.8	104	57	49	1.0	5
500	25.3	7.6	103	50	55	0.4	0
630	15.1	7.4	104	47	59	0.5	0
800	14.8	7.2	104	44	62	0.5	0
1000	14.7	7.0	105	43	63	0.5	0
1250	14.0	7.2	104	41	65	0.4	0
1600	13.9	7.6	104	40	66	0.3	0
2000	12.7	8.7	104	40	65	0.5	0
2500	12.8	9.7	102	37	66	0.3	0
3150	14.7	10.8	103	34	70	0.4	0
4000	15.1	12.4	104	32	72	0.3	0
5000	12.0	14.7	104	29	74	0.5	-
6300	11.4	19.1	97	18	77	0.6	-
8000	11.8	25.6	97	13	80	0.7	-
10000	12.1	32.2	92	10	77	0.8	-
STC Rating	**55**	*(Sound Transmission Class)*			**Sum of Deficiencies**		**32**

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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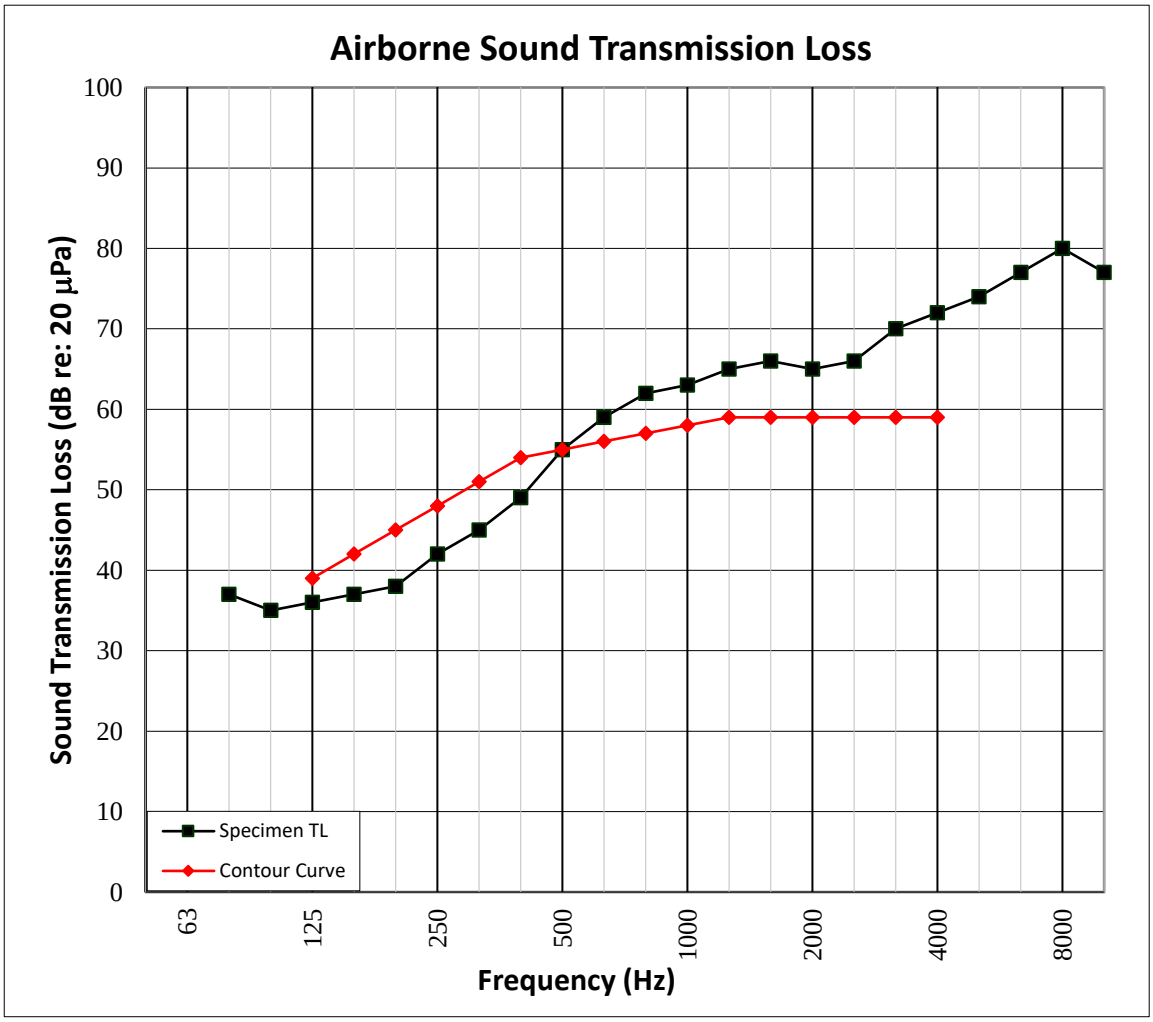
SECTION 11

TEST RESULTS - AIRBORNE SOUND TRANSMISSION LOSS GRAPH

ACCREDITED Testing Laboratory

TEST DATE	2/17/2018				
DATA FILE NO.	H7787.11				
CLIENT	Vulcraft/Verco Group				
DESCRIPTION	12.7 mm Armstrong Engineered Wood, 5 mm ECOsilence Rubber Underlayment, 152.4 mm Standard 4000 PSI Concrete, 152.4 mm 20 Gage Vulcraft Dove Tail 3.50 Steel Deck, 38.1 mm ClarkDietrich 25 Gage Furring Channel, 15.9 mm USG SHEETROCK® Brand FIRECODE® C Core Gypsum Panel				
SPECIMEN AREA	10.98 m²	**Receive Temp.**	18.9°C	**Source Temp.**	18.8°C
TECHNICIAN	JPT	**Receive Humidity**	57%	**Source Humidity**	57%



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SECTION 12

TEST RESULTS - IMPACT SOUND TRANSMISSION

ACCREDITED Testing Laboratory

TEST DATE	2/17/2018				
DATA FILE NO.	H7787.11				
CLIENT	Vulcraft/Verco Group				
DESCRIPTION	12.7 mm Armstrong Engineered Wood, 5 mm ECOsilence Rubber Underlayment, 152.4 mm Standard 4000 PSI Concrete, 152.4 mm 20 Gage Vulcraft Dove Tail 3.50 Steel Deck, 38.1 mm ClarkDietrich 25 Gage Furring Channel, 15.9 mm USG SHEETROCK® Brand FIRECODE® C Core Gypsum Panel				
SPECIMEN AREA	10.98 m²	**Maximum Temp.**	18.9°C	**Minimum Temp.**	18.9°C
TECHNICIAN	JPT	**Max. Humidity**	57%	**Min. Humidity**	56%

FREQ (Hz)	**BACKGROUND SPL** (dB)	**ABSORPTION** m²	**NORMALIZED IMPACT SPL** (dB)	**95% CONFIDENCE LIMIT**	**NUMBER OF DEFICIENCIES**
80	28.0	18.4	61	2.5	-
100	26.7	17.6	65	1.6	5
125	23.2	12.0	64	1.3	4
160	19.4	12.3	67	1.2	7
200	19.1	11.2	66	0.5	6
250	29.0	11.3	63	0.9	3
315	16.5	10.3	62	0.5	2
400	18.9	8.7	58	0.3	0
500	25.2	7.8	53	0.3	0
630	14.7	7.4	49	0.4	0
800	16.0	7.2	47	0.4	0
1000	13.9	6.9	41	0.3	0
1250	12.4	7.2	36	0.3	0
1600	10.8	7.6	32	0.2	0
2000	9.6	8.5	33	0.2	0
2500	7.9	9.6	31	0.2	0
3150	7.7	10.8	25	0.2	0
4000	8.2	12.7	21	0.4	-
5000	8.9	14.8	16	0.5	-
6300	9.7	19.0	13	0.5	-
8000	10.6	25.8	13	0.5	-
10000	11.4	32.4	15	0.6	-
IIC Rating	**52**	*(Impact Insulation Class)*		**Sum of Deficiencies**	**27**

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

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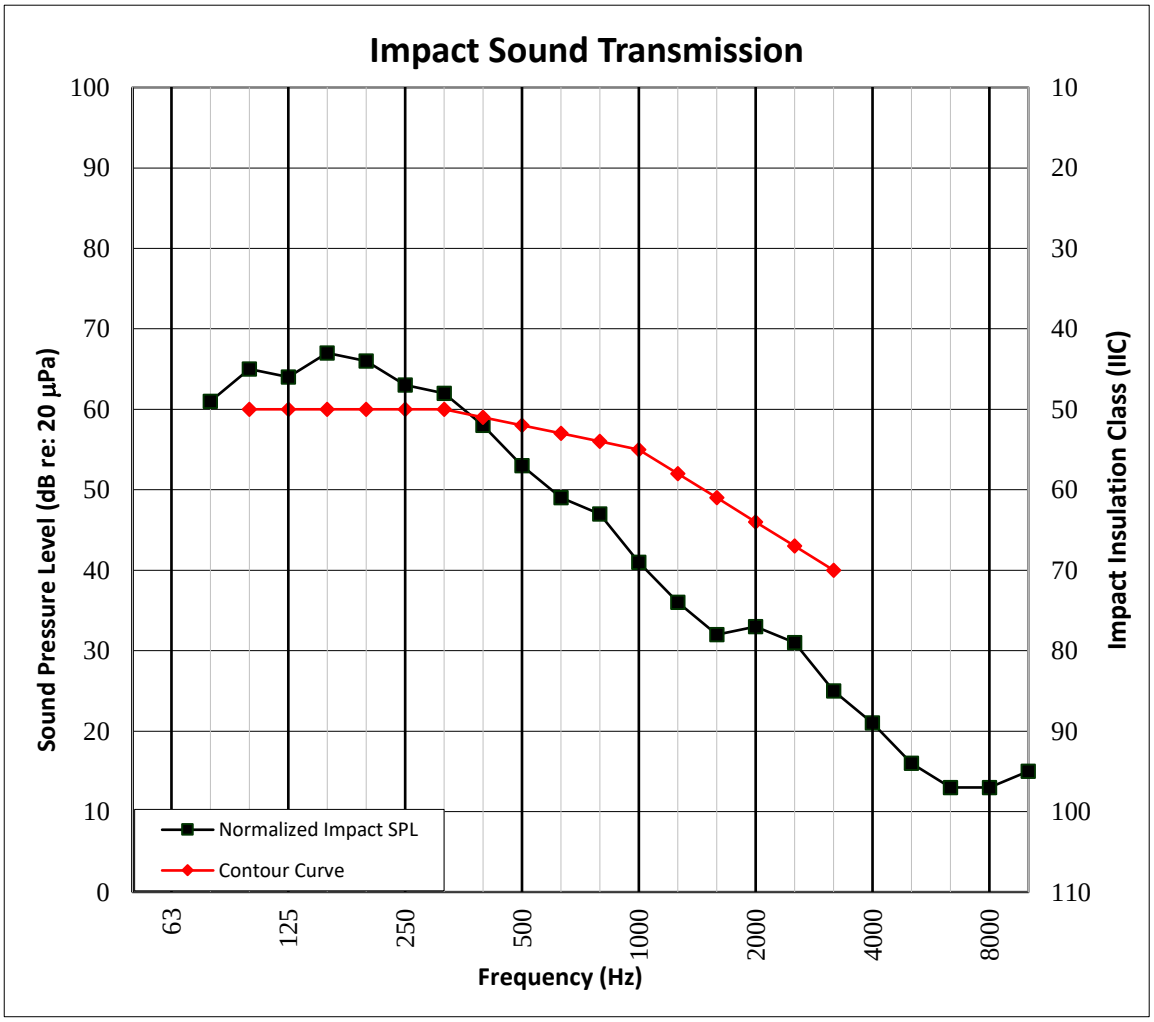
SECTION 13

TEST RESULTS - IMPACT SOUND TRANSMISSION GRAPH

ACCREDITED Testing Laboratory

TEST DATE	2/17/2018				
DATA FILE NO.	H7787.11				
CLIENT	Vulcraft/Verco Group				
DESCRIPTION	12.7 mm Armstrong Engineered Wood, 5 mm ECOsilence Rubber Underlayment, 152.4 mm Standard 4000 PSI Concrete, 152.4 mm 20 Gage Vulcraft Dove Tail 3.50 Steel Deck, 38.1 mm ClarkDietrich 25 Gage Furring Channel, 15.9 mm USG SHEETROCK® Brand FIRECODE® C Core Gypsum Panel				
SPECIMEN AREA	10.98 m²	**Maximum Temp.**	18.9°C	**Minimum Temp.**	18.9°C
TECHNICIAN	JPT	**Max. Humidity**	57%	**Min. Humidity**	56%



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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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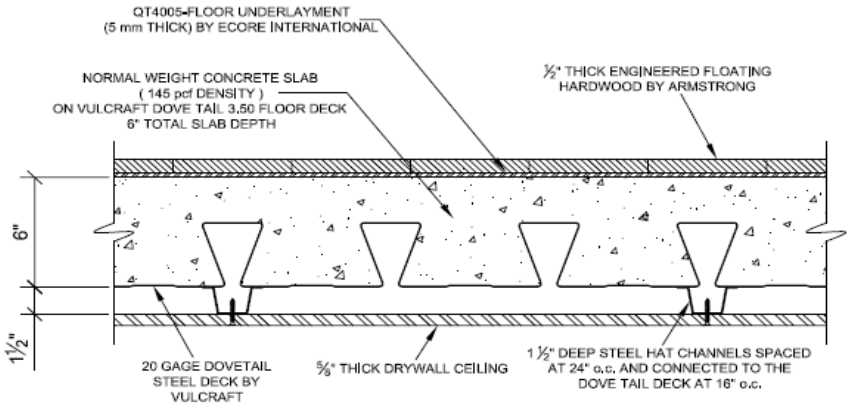
SECTION 15
DRAWING



Drawing of Test Specimen (supplied by Client)

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SECTION 16

REVISION LOG

REVISION #	DATE	PAGES	DESCRIPTION
R0	04/05/18	N/A	Original Report Issue