H2485.01-303-11-R0
ACOUSTICAL PERFORMANCE TEST REPORT
ASTM E 90 AND ASTM E 492

Rendered to

PROTECTO WRAP

Series/Model: Protecto Wrap Whisper Mat CS

Specimen Type: Open Web Truss - 457 mm

Overall Size: 3048 mm by 3658 mm

STC	**63**
IIC	**55**

Test Specimen Identification:
Floor Topping: 7.86 mm Daltile Porcelain Tile
Floor Underlayment: 3 mm Protecto Wrap Whisper Mat CS Underlayment
Subfloor Topping: 25.4 mm Hacker Industries, Inc. FIRM-FILL® Brand Gypsum Concrete
Subfloor: 18.8 mm Oriented Strand Board Sheathing
Insulation: 457.2 mm US Greenfiber Cellulose Insulation
Truss: 457.2 mm Stone Truss L/360 Open Web Truss
Ceiling Isolation: 12.7 mm ClarkDietrich RC Deluxe Resilient Channel
Ceiling: 15.9 mm USG SHEETROCK® Brand FIRECODE® C core Gypsum Panel

Reference should be made to Intertek-ATI Report H2485.01-303-11 for complete test specimen description. This page alone is not a complete report.

Architectural Testing

Acoustical Performance Test Report

PROTECTO WRAP
1955 South Cherokee Street
Denver, Colorado 80223

Report	H2485.01-303-11
Test Date	06/23/17
Report Date	07/26/17

Project Scope

Architectural Testing, Inc., an Intertek company (Intertek-ATI), was contracted to conduct airborne sound transmission loss and impact sound transmission tests. The complete test data is included as attachments to this report. The full test specimen was assembled on the day of testing by Intertek-ATI. All materials provided by the client were installed on an existing Intertek-ATI assembly (Open Web Truss - 457 mm) utilizing Intertek-ATI-supplied materials.

Test Methods

The acoustical tests were conducted in accordance with the following standards. The equipment listed in the attachments meets the requirements of the following standards.

ASTM E 90-09 (2016), Standard Test Method for Laboratory Measurement of Airborne Sound Transmission Loss of Building Partitions
ASTM E 413-10, Classification for Rating Sound Insulation
ASTM E 492-09(2016)e1, Standard Test Method for Laboratory Measurement of Impact Sound Transmission Through Floor-Ceiling Assemblies Using the Tapping Machine
ASTM E 989-06 (2012), Classification for Determination of Impact Insulation Class (IIC)
ASTM E 2235-04 (2012) Standard Test Method for Determination of Decay Rates for Use in Sound Insulation Test Methods

Test Procedure

All testing was conducted in the VT test chambers at Intertek-ATI located in Lake Forest, California. The microphones were calibrated before conducting the tests.

The airborne transmission loss test was conducted in accordance with the ASTM E 90 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.

Test Procedure (Continued)

The impact sound transmission test was conducted in accordance with the ASTM E 492 test method. Two background noise sound pressure level, two sound pressure level measurements with the tapping machine operating at each position specified by ASTM E 492, and five sound absorption measurements were conducted at each of five microphone positions.

The air temperature and relative humidity conditions were monitored and recorded during all measurements.

Test Conditions

Source Room		Receive Room	
Minimum Temperature	21.9°C	Minimum Temperature	22.6°C
Maximium Temperature	22.4°C	Maximium Temperature	22.8°C
Minimum Relative Humidity	51%	Minimum Relative Humidity	49%
Maxmimum Relative Humidity	52%	Maxmimum Relative Humidity	50%

Test Calculations

The STC (Sound Transmission Class) and IIC (Impact Insulation Class) ratings were calculated in accordance with ASTM E 413 and ASTM E 989, respectively.

Test Specimen Materials and Installation Details

Material	Dimensions (mm)	Thickness (mm)	Manufacturer and Series	Quantity	Average Weight
Porcelain Tile	304.8 by 304.8	7.9	Daltile	11.15 m²	15.43 kg/m²
	Note: The tile was laid into a bed of mortar. The mortar was spread using a 1/4" by 1/4" trowel and allowed to cure per manufacturer's specifications. The 1/4" joints were filled with grout. The grout was allowed to cure per manufacturer's specifications.				
Underlayment	3048 by 914.4	3.0	Protecto Wrap Whisper Mat CS	11.15 m²	2.25 kg/m²
	Note: The 2 mil protective sheet was adhered to the subfloor topping with 3M Super 77 spray adhesive. The underlayment was adhered to the sheet with the manufacturer's adhesive backing.				
Gypsum Concrete	3632 by 3023	25.4	Hacker Industries, Inc. FIRM-FILL® Brand	11.15 m²	44.92 kg/m²
	Note: Poured directly on the subfloor, cured a minimum of 14 days. The gypsum panel had a closed cell foam perimeter isolation. The product name was specified by client.				
Oriented Strand Board Sheathing	1219 by 2438	18.8	N/A	11.15 m²	13.82 kg/m²
	Note: Adhered to the floor trusses with Loctite PL 400 Subfloor adhesive. Fastened with 9D nails on 203 mm centers along perimeter and 305 mm centers along trusses.				
Cellulose Insulation	520.7 by 3023	457.2	US Greenfiber	11.15 m²	1.32 kg/m²
	Note: Installed in the cavity between trusses flush with the OSB.				

Test Specimen Materials and Installation Details (Continued)

Material	Dimensions (mm)	Thickness (mm)	Manufacturer and Series	Quantity	Average Weight
Open Web Truss	88.9 by 2933.7	457.2	Stone Truss L/360	7 trusses	19.05 kg/truss
	Note: Installed on 610 mm centers using JUS414 hanger brackets.				
Resilient Channel	3454.4 by 50.8	12.7	ClarkDietrich RC Deluxe	27.6 lin m	0.23 kg/m
	Note: Installed on 406 mm centers perpendicular to the trusses. The measured thickness was 0.48 mm.				
Gypsum Panel	1219 by 3023	15.9	USG SHEETROCK® Brand FIRECODE® C core	11.15 m²	11.9 kg/m²
	Note: Fastened to the resilient channels on 305 mm centers with 25.4 mm Type S bugle head screws. The seams of the gypsum panels were sealed with Pecora AC-20 FTR caulk and covered with pressure sensitive tape.				

Comments

The total weight of the floor/ceiling assembly was 1139.3 kg. Intertek-ATI will store samples of the test specimen for four years. Photographs of the test specimen are included in the attachments. The client did not supply drawings of the test specimen.

Detailed test procedures, data for flanking limit tests, repeatability measurements, and reference specimen tests are available upon request.

Intertek-ATI 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 Intertek-ATI for the entire test record retention period. The test record retention period ends four years after the test date.

This report does not constitute certification of this product nor an opinion or endorsement by this laboratory. It is the exclusive property of the client so named herein and relates only to the specimen tested. This report is intended to help in the client's quality assurance program, but it does not represent a continuous or exhaustive evaluation of the specimen tested or of other products or materials that were not evaluated. The statements and data provided herein do not constitute approval, disapproval, certification, or acceptance of performance or materials.

FOR INTERTEK-ATI:

Digitally Signed by: Leeland Hoover

Leeland S. Hoover
Technician I - Acoustical Testing

Digitally Signed by: Bradlay Hunt

Bradlay D. Hunt
Laboratory Manager - Acoustical Testing

Attachments (6 pages): This report is complete only when all attachments listed are included.

- Instrumentation (1)
- Airborne Sound Transmission Loss Data (2)
- Impact Sound Transmission Data (2)
- Photographs (1)

** Stated by Client/Manufacturer*
N/A - Non Applicable

Revision Log

Revision	Date	Page(s)	Description
R0	07/26/17	N/A	Original Report Issue

Attachments

Instrumentation

Instrument	Manufacturer	Model	ATI Number	Date of Calibration
Data Acquisition Unit	National Instruments	PXI-4462	INT00392	10/16 *
Microphone Calibrator	Norsonic	1251	INT00288	06/17
Receive Room Microphone	PCB Piezontronics	378B20	INT00239	03/17
Receive Room Microphone	PCB Piezotronics	378B20	INT00240	03/17
Receive Room Microphone	PCB Piezotronics	378B20	INT00241	03/17
Receive Room Microphone	PCB Piezotronics	378C20	INT00242	03/17
Receive Room Microphone	PCB Piezotronics	378B20	INT00243	03/17
Receive Room Environmental Indicator	Comet	T7510	INT00299	10/16
Source Room Microphone	PCB Piezotronics	378B20	INT00244	03/17
Source Room Microphone	PCB Piezotronics	378B20	INT00245	03/17
Source Room Microphone	PCB Piezotronics	378B20	INT00246	03/17
Source Room Microphone	PCB Piezotronics	378B20	INT00247	03/17
Source Room Microphone	PCB Piezotronics	378B20	INT00228	03/17
Source Room Environmental Indicator	Comet	T7510	INT00300	10/16
Tapping Machine	Look Line s.r.l.	EM50 (TM50)	INT00224	07/16

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

Test Chambers

VT Receive Room Volume	180.6 m³
VT Source Room Volume	129.4 m³

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AIRBORNE SOUND TRANSMISSION LOSS

ASTM E 90

Test Date	06/23/17
Data File No.	H2485.01
Client	Protecto Wrap
Description	7.86 mm Daltile Porcelain Tile, 3 mm Protecto Wrap Whisper Mat CS Underlayment, 25.4 mm Hacker Industries, Inc. FIRM-FILL® Brand Gypsum Concrete, 18.8 mm Oriented Strand Board Sheathing, 457.2 mm US Greenfiber Cellulose Insulation, 457.2 mm Stone Truss L/360 Open Web Truss, 12.7 mm ClarkDietrich RC Deluxe Resilient Channel, 15.9 mm USG SHEETROCK® Brand FIRECODE® C core Gypsum Panel
Specimen Area	11.15 m²
Technician	Leeland S. Hoover

Freq (Hz)	**Background SPL** (dB)	**Absorption** (m²)	**Source SPL** (dB)	**Receive SPL** (dB)	**Specimen TL** (dB)	**95% Confidence Limit**	**Number of Deficiencies**
80	23.6	7.4	101	60	43	2.80	-
100	22.2	6.9	103	63	42	2.90	-
125	28.3	5.6	101	64	40	1.50	7
160	17.0	5.8	100	58	45	1.30	5
200	11.2	6.3	100	54	49	0.60	4
250	10.4	6.0	99	49	53	1.20	3
315	9.3	7.1	102	46	58	1.20	1
400	4.9	7.1	101	46	57	0.80	5
500	7.8	6.3	100	43	59	0.70	4
630	4.4	6.1	96	34	65	0.50	0
800	5.1	6.6	96	31	67	0.40	0
1000	4.9	6.2	96	28	71	0.40	0
1250	3.9	6.5	98	28	72	0.40	0
1600	3.3	6.8	99	27	74	0.40	0
2000	3.1	7.7	99	30	71	0.20	0
2500	3.5	8.5	100	28	73	0.40	0
3150	4.2	9.0	100	23	78	0.40	0
4000	4.6	10.1	99	18	82	0.60	0
5000	5.2	12.0	96	12	84	0.40	-
6300	5.7	14.7	95	11	83	0.70	-
8000	6.1	19.7	95	9	84	0.60	-
10000	6.4	23.9	95	8	84	0.30	-

STC Rating **63** *(Sound Transmission Class)*

Deficiencies 29 *(Sum of Deficiencies)*

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.
2) Specimen TL levels listed in blue indicate the lower limit of the transmission loss.
3) Specimen TL levels listed in green indicate that there has been a filler wall correction applied

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AIRBORNE SOUND TRANSMISSION LOSS

ASTM E 90

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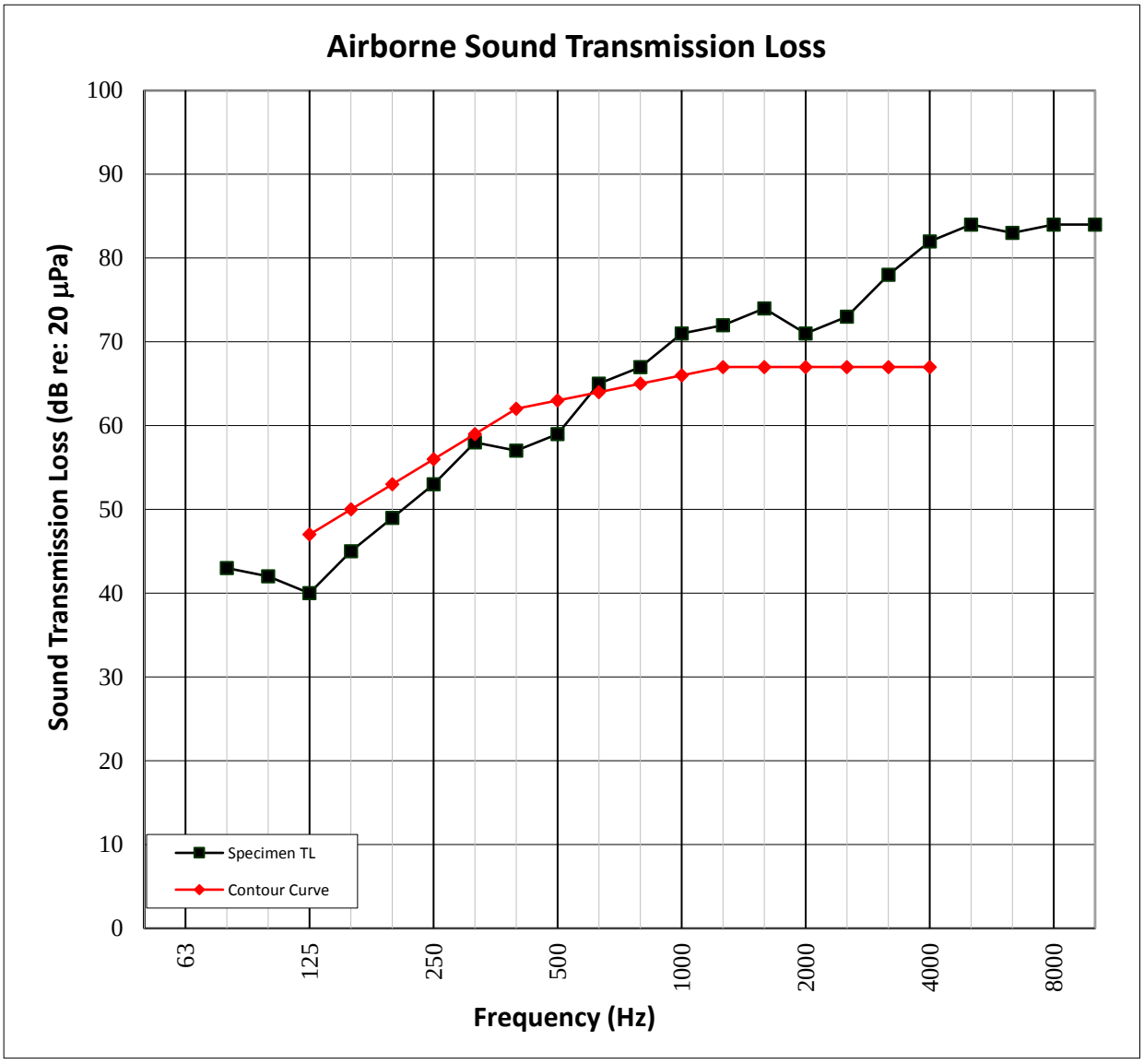
Specimen Area	11.15 m²
Technician	Leeland S. Hoover



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IMPACT SOUND TRANSMISSION

ASTM E 492

Test Date	06/23/17
Data File No.	H2485.01
Client	Protecto Wrap
Description	7.86 mm Daltile Porcelain Tile, 3 mm Protecto Wrap Whisper Mat CS Underlayment, 25.4 mm Hacker Industries, Inc. FIRM-FILL® Brand Gypsum Concrete, 18.8 mm Oriented Strand Board Sheathing, 457.2 mm US Greenfiber Cellulose Insulation, 457.2 mm Stone Truss L/360 Open Web Truss, 12.7 mm ClarkDietrich RC Deluxe Resilient Channel, 15.9 mm USG SHEETROCK® Brand FIRECODE® C core Gypsum Panel
Specimen Area	11.15 m²
Technician	Leeland S. Hoover

Freq (Hz)	**Background SPL** (dB)	**Absorption** (m²)	**Normalized Impact SPL** (dB)	**95% Confidence Limit**	**Number of Deficiencies**
80	24.0	8.1	59	1.8	-
100	23.4	6.2	58	0.9	1
125	27.2	5.7	60	0.8	3
160	17.4	5.6	60	0.5	3
200	11.6	6.3	62	0.5	5
250	11.0	5.9	60	0.4	3
315	10.0	7.2	56	0.3	0
400	4.5	7.1	53	0.2	0
500	7.6	6.3	53	0.3	0
630	5.3	6.1	51	0.2	0
800	4.6	6.6	49	0.2	0
1000	4.1	6.1	46	0.2	0
1250	3.5	6.6	41	0.2	0
1600	2.6	6.8	40	0.2	0
2000	2.9	7.7	47	0.2	4
2500	3.4	8.5	47	0.2	7
3150	4.2	9.0	38	0.2	1
4000	4.7	10.1	34	0.2	-
5000	5.2	12.1	26	0.2	-
6300	5.7	14.9	18	0.4	-
8000	6.1	19.3	11	0.3	-
10000	6.4	24.3	9	0.2	-

IIC Rating **55** *(Impact Insulation Class)*

Deficiencies 27 *(Sum of Deficiencies)*

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

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IMPACT SOUND TRANSMISSION

ASTM E 492

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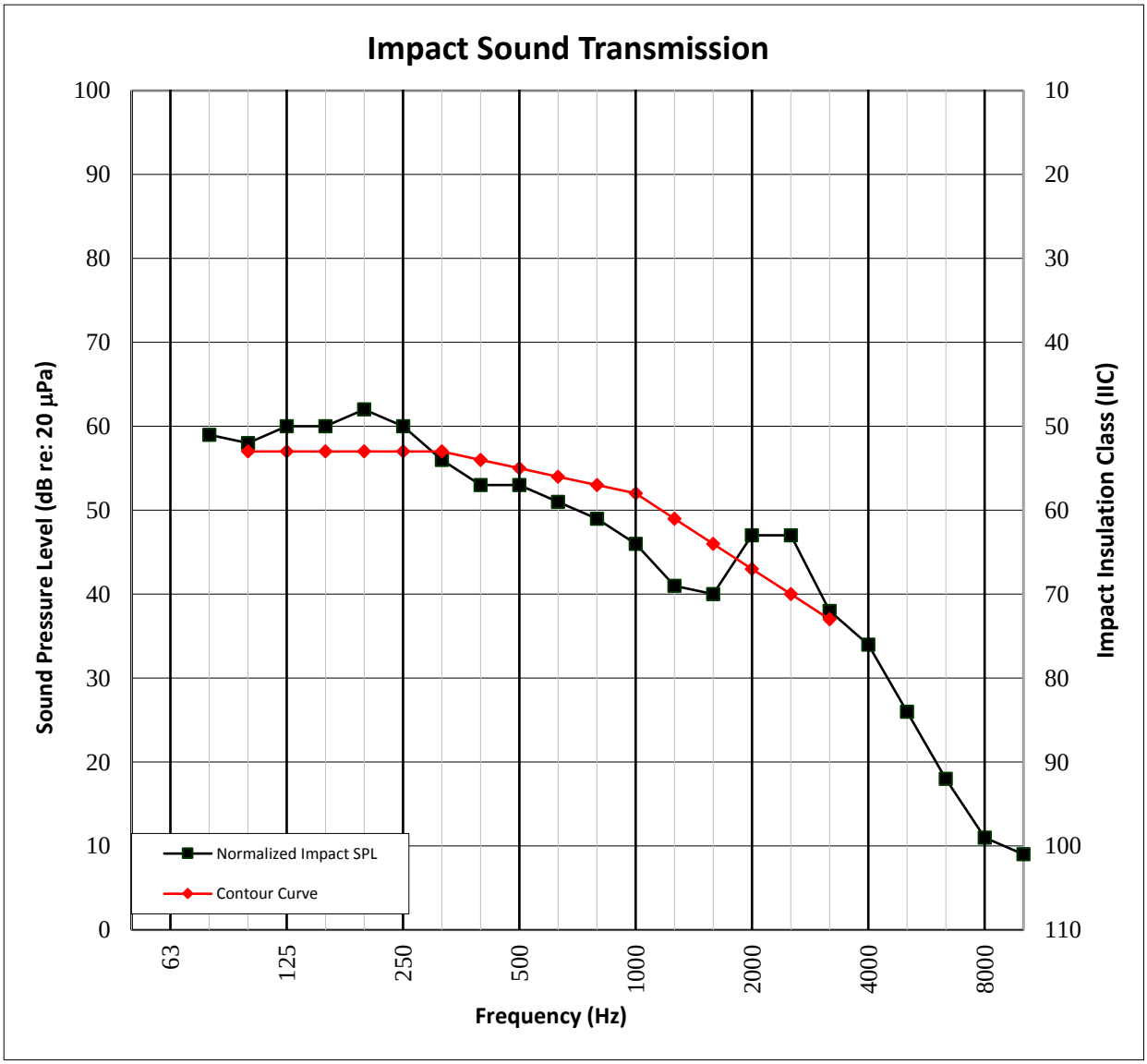
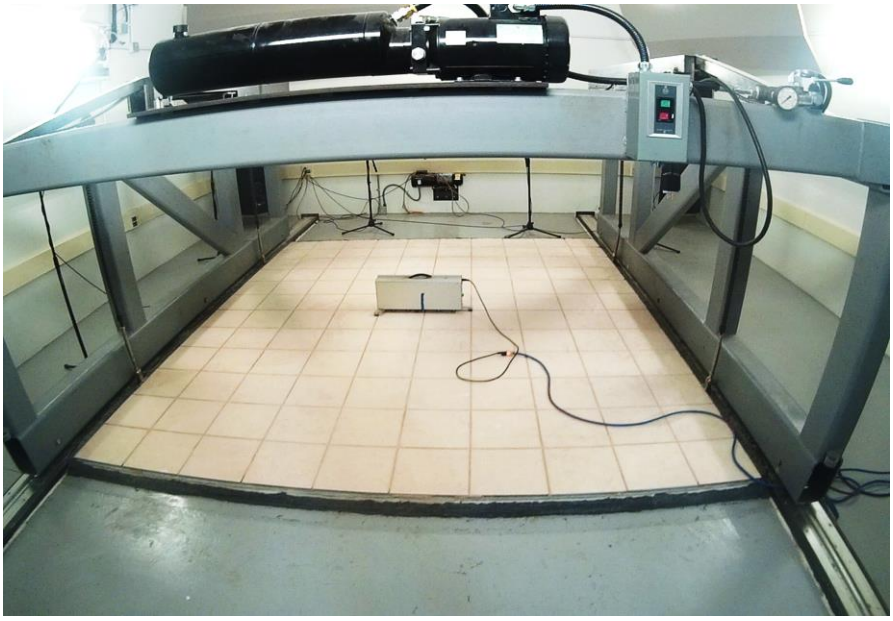
Technician	Leeland S. Hoover



Photographs



Source Room View of Test Specimen Installation

Receive Room View of Test Specimen Installation