

December 19, 2019

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**AcoustiTECH a division of Fintech**  
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**Subject: Apparent Impact Insulation Class test reports floor/ceiling assemblies at 132 East Delaware Condominiums, Chicago, IL**

Dear Joyce:

Enclosed you will find the test report for the Apparent Impact Insulation Class (AIIC) test conducted by Soundscape Engineering LLC on December 17<sup>th</sup> between Unit 5102 and 5002 at the 132 East Delaware Place Condominiums in keeping with ASTM standard E 1007-16 and E989-06 (R 2012). We have included the test results from the October 16<sup>th</sup> testing for reference.

As is done for all apparent impact isolation class (AIIC) testing, the results are normalized so that results from different tests are comparable regardless of the amount of sound absorption in the receiving rooms.

**Table 1: Tests Conducted and Results Summary**

Test#	Source Room	Receiver Room	Result
1742-4	Unit 5102 Guest Bedroom [Bare 8-inch Concrete Slab]	Unit 5002 Bedroom	AIIC 32
1742-6	Unit 5102 Master Bedroom [AcoustiTECH SONOMAX Underlayment ]	Unit 5002 Bedroom	AIIC 59

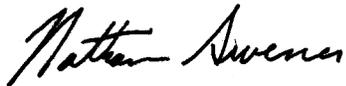
**Impact Insulation Class (IIC)** is a single number rating of the ability of a floor-ceiling assembly to block impact noise similar to that produced by people walking in hard soled shoes. It is measured using a "tapping machine" meeting standard specifications. The IIC is highly dependent on the type of floor finish. Floors that have a hard finish perform much poorer than those with a resilient finish. When measured in the field rather than in an acoustical laboratory, it is referred to as Apparent Impact Insulation Class (AIIC). AIIC replaces the older acronym Field Impact Insulation Class (FIIC).

Per the Construction Rules for the 132 East Delaware Place Condominium Association dated March 31, 2003 residents are required to meet or exceed an Apparent Impact Insulation Class (AIIC) of sixty (60).

Sincerely,

**Soundscape Engineering LLC**

Per:



Nathan Sevens, Principal Consultant  
PE, LEED AP, INCE Bd. Cert.

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Senior Consultant

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**Test 4**

**Apparent Impact Insulation Class (AIIC) Test Report**

Report Date: December 19, 2019  
Test Date: December 17, 2019  
Test Site: Unit 5102/5002 Guest Bedroom  
132 East Delaware Place, Chicago, IL  
Test Construction: Condominium to Condominium Floor-Ceiling Assembly – Bare 8-inch thick concrete slab (no suspended ceiling in Condo below)  
Soundscape Test#: 1742-4  
Conducted For: AcoustiTECH a division of Finitec Group

**Executive Summary**

Measurements performed on December 17<sup>th</sup> tested the Apparent Impact Insulation Class (AIIC) from the Unit 5102 to Unit 5002. The floor/ceiling assembly tested at **AIIC 32**.

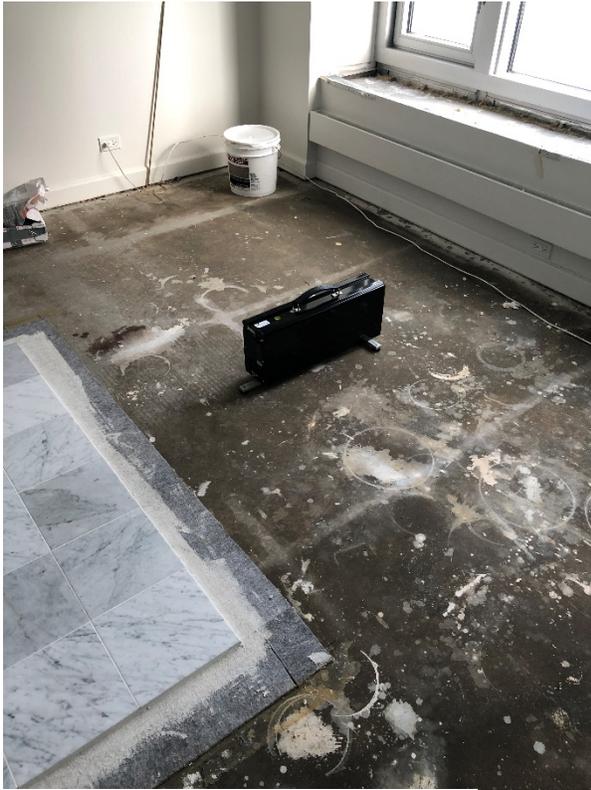
**Conformance to Standards**

Tests were conducted according to the ASTM Standard E 1007-16 *Standard Test Method for Field Measurement of Tapping Machine Impact Sound Transmission Through Floor/Ceiling Assemblies and Associated Support Structures*. AIIC was computed according to ASTM E 989-06 *Standard Classification for Determination of Impact Insulation Class (IIC)*

**Test Environment & Specimen**

The test evaluated the noise reduction provided by the floor/ceiling assembly demising two residential condominiums of equal size. Each of the rooms was approximately 14.0 feet by 13.0 feet with a skim-coat plaster ceiling at approx. 8.44 feet above the floor. The volume of each room was approx. 1550 ft<sup>3</sup>.

For reference, we tested the bare 8-inch thick concrete slab (skim coat plaster ceiling in the residence below) separating Units 5102 and 5002. The walls and ceiling were painted gypsum board except for the areas of exterior windows. Refer to Figure 1.



Source – Unit 5102 Guest Bedroom



Receive – Unit 5002 Guest Bedroom

**Figure 1: Source and Receive Room Photos**

### **Test Procedure and Equipment**

The test was performed with a Look Line Electromagnetic tapping machine Model No. EM 50 that conforms to ASTM 1007 standards. The sound level was measured in third octave bands with an NTi Audio model XL2 acoustic analyzer with model MC230 microphone and model MA220 preamp. This system has Class 1 frequency response in accordance with IEC 61672 Type 1 and ANSI S1.4. Each measurement of steady sound was averaged over a period of at least 60 seconds as the microphone was scanned about the measurement space. Sensitivity of the instrument was checked before and after the measurements using a Bruel & Kjaer 4230 Sound Level Calibrator. Background sound was measured in the rooms using the same range setting.

Room and partition dimensions were measured, observations noted, and photos taken of the rooms and test specimen.

## **Test Results**

The detailed test results are shown on the following page. AIIC 32 was measured from Unit 5102 and Unit 5002. The AIIC is a single number rating based on the sound measured in a receiving room through operation of a standard tapping machine in the source room. The AIIC is computed by plotting the normalized impact SPL and raising the reference curve shown on the graph until the difference between the data and reference curve does not exceed 8 at any frequency, and the sum of the differences at all frequencies (called deficiencies) does not exceed 32.

Test Conducted By:

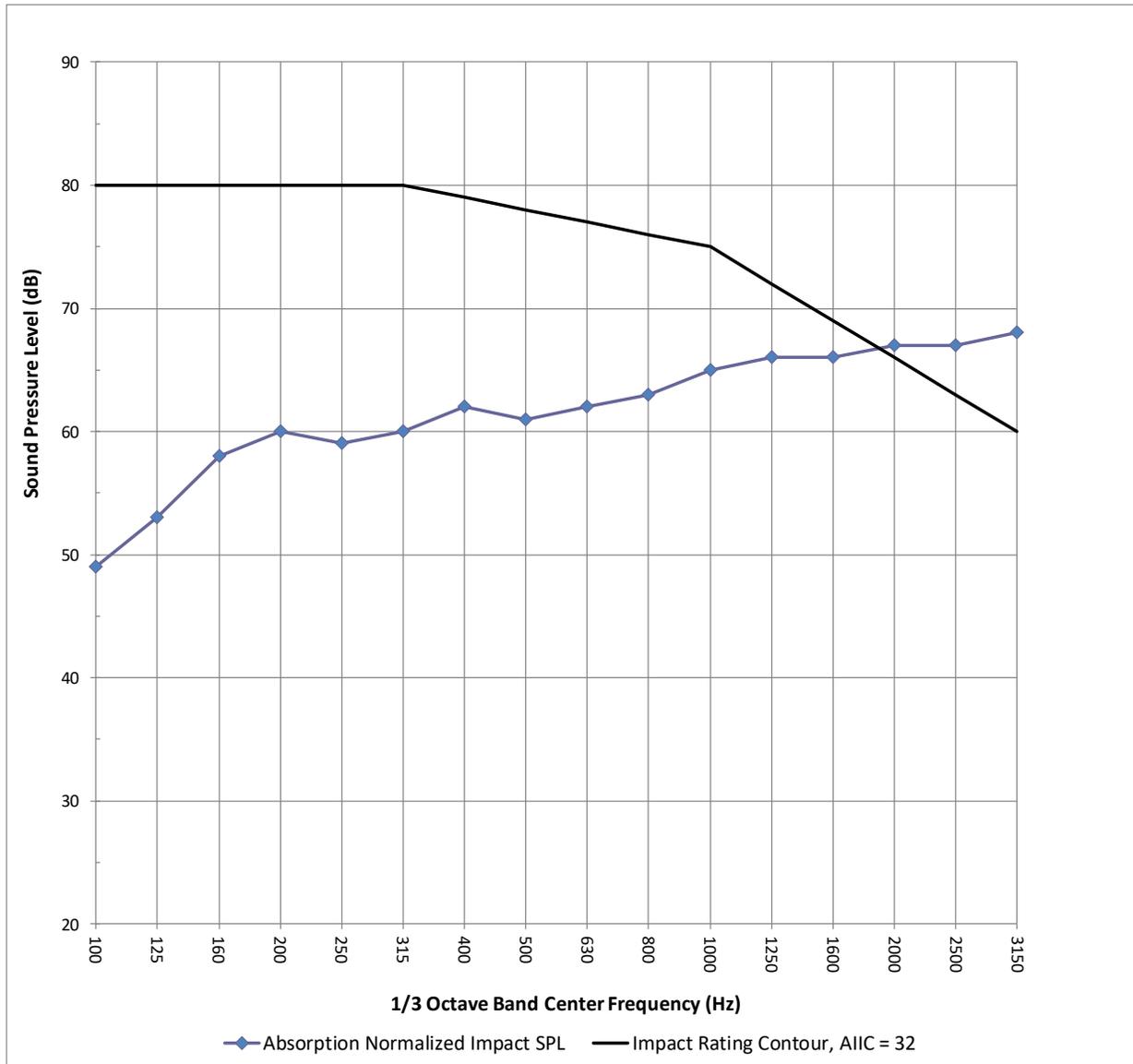
A handwritten signature in blue ink that reads "Luis N. Sunga, Jr." in a cursive style.

Luis N. Sunga, Jr. Senior Consultant  
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**8-inch concrete slab between 5102 BR and 5002 BR**

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Frequency	100	125	160	200	250	315	400	500	630	800	1000	1250	1600	2000	2500	3150
Receiving Room SPL Average	48	51	55	58	57	57	60	58	59	60	62	63	64	65	65	66
Receiving Room Background Noise	34	35	35	31	28	26	24	20	19	16	16	13	12	11	10	9
Absorption Normalized Impact SPL	49	53	58	60	59	60	62	61	62	63	65	66	66	67	67	68
RT	0.56	0.42	0.35	0.40	0.51	0.39	0.43	0.41	0.36	0.37	0.42	0.39	0.43	0.45	0.45	0.44
Deficiencies	0	0	0	0	0	0	0	0	0	0	0	0	0	1	4	8
<b>AIIC = 32</b>							Total Deficiencies = 13					Maximum Deficiencies = 8				



Note: Receiving Room SPL presented in ghosted italics indicates Receiving Room Background Noise Level less than 10 dB below Level with tapping machine operating and correction was applied to receiving room level per ASTM E 1007-16, Paragraph 11.6.4

**Test 6**

**Apparent Impact Insulation Class (AIIC) Test Report**

Report Date: December 19, 2019  
Test Date: December 17, 2019  
Test Site: Unit 5102/5002 Master Bedroom  
132 East Delaware Place, Chicago, IL  
Test Construction: Condominium to Condominium Floor-Ceiling Assembly – Wood floor on AcoustiTECH SONOMAX Underlayment  
Soundscape Test#: 1742-6  
Conducted For: AcoustiTECH a division of Finitec Group

**Executive Summary**

Measurements performed on December 17<sup>th</sup> tested the Apparent Impact Insulation Class (AIIC) from the Unit 5102 to Unit 5002. The floor/ceiling assembly tested at **AIIC 59**.

**Conformance to Standards**

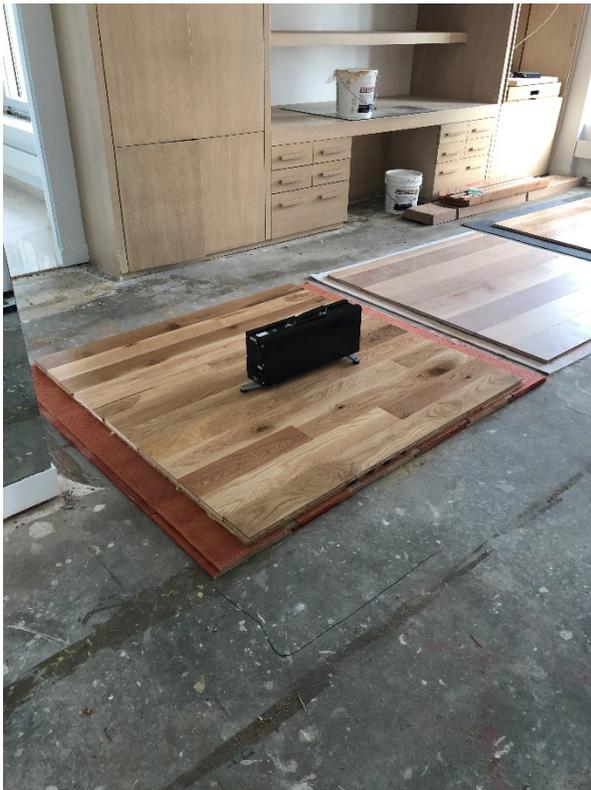
Tests were conducted according to the ASTM Standard E 1007-16 *Standard Test Method for Field Measurement of Tapping Machine Impact Sound Transmission Through Floor/Ceiling Assemblies and Associated Support Structures*. AIIC was computed according to ASTM E 989-06 *Standard Classification for Determination of Impact Insulation Class (IIC)*

**Test Environment & Specimen**

The test evaluated the noise reduction provided by the floor/ceiling assembly demising two residential condominiums of equal size. Each of the rooms was approximately 18.8 feet by 14.5 feet with a skim-coat plaster ceiling at approx. 8.44 feet above the floor. The volume of each room was approx. 2415 ft<sup>3</sup>. The walls and ceiling were painted gypsum board except for the areas of exterior windows. Refer to Figure 1.

The 5 foot by 5 foot floor ceiling assembly tested consisted of:

- 5/8” thick wood flooring glued to plywood sub-floor using AD-844MS adhesive applied using a 1/8”x1/4”x1/4” square notched trowel. The flooring should be installed perpendicular to the direction of the SNOMAX panels.
- 5/8” thick plywood sub-floor screwed to plywood using 1 1/4” screws.
- Float the 1” thick AcoustiTECH SONOMAX underlayment on top of the concrete slab.
- 8-inch thick concrete slab with skim-coat plaster on the underside of slab.
- Refer to Figure 2.



Source – Unit 5102 Master Bedroom



Receive – Unit 5002 Master Bedroom

**Figure 1: Source and Receive Room Photos**



**Figure 2: Floor Assembly**

### **Test Procedure and Equipment**

The test was performed with a Look Line Electromagnetic tapping machine Model No. EM 50 that conforms to ASTM 1007 standards. The sound level was measured in third octave bands with an NTi Audio model XL2 acoustic analyzer with model MC230 microphone and model MA220 preamp. This system has Class 1 frequency response in accordance with IEC 61672 Type 1 and ANSI S1.4. Each measurement of steady sound was averaged over a period of at least 60 seconds as the microphone was scanned about the measurement space. Sensitivity of the instrument was checked before and after the measurements using a Bruel & Kjaer 4230 Sound Level Calibrator. Background sound was measured in the rooms using the same range setting.

Room and partition dimensions were measured, observations noted, and photos taken of the rooms and test specimen.

### **Test Results**

The detailed test results are shown on the following page. AIIIC 59 was measured from Unit 5102 and Unit 5002. The AIIIC is a single number rating based on the sound measured in a receiving room through operation of a standard tapping machine in the source room. The AIIIC is computed by plotting the normalized impact SPL and raising the reference curve shown on the graph until the difference between the data and reference curve does not exceed 8 at any frequency, and the sum of the differences at all frequencies (called deficiencies) does not exceed 32.

Test Conducted By:

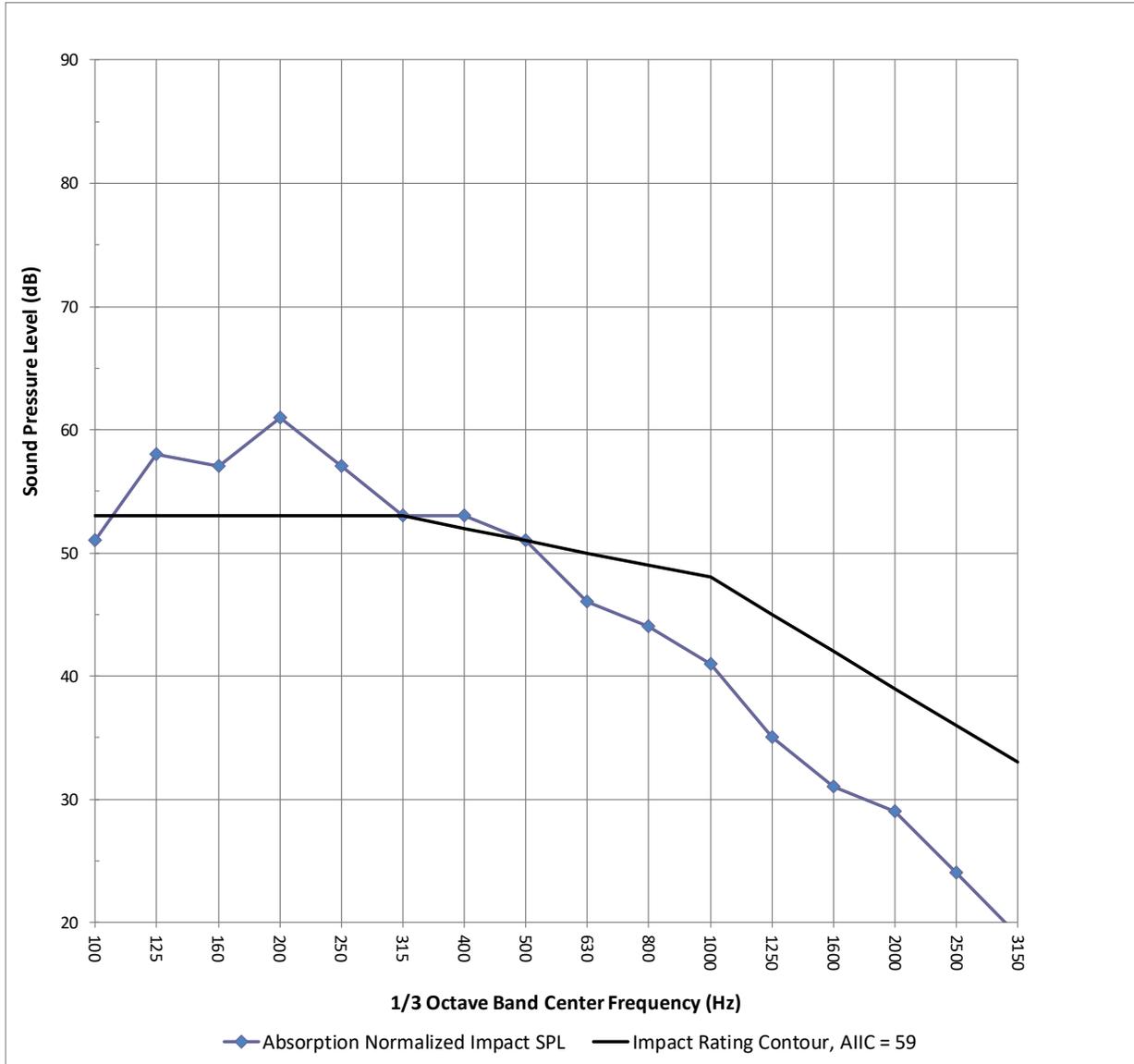


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**Wood floor with AcoustiTECH SONOMAX on 8-inch concrete slab between 5102 MBR and 5002 MBR**

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Frequency	100	125	160	200	250	315	400	500	630	800	1000	1250	1600	2000	2500	3150
Receiving Room SPL Average	48	54	58	56	52	48	47	46	42	39	36	30	26	24	19	15
Receiving Room Background Noise	31	33	35	32	27	25	21	19	18	17	15	11	10	9	7	7
Absorption Normalized Impact SPL	51	58	57	61	57	53	53	51	46	44	41	35	31	29	24	19
RT	0.47	0.38	1.45	0.34	0.35	0.38	0.30	0.32	0.39	0.33	0.36	0.34	0.34	0.36	0.37	0.36
Deficiencies	0	5	4	8	4	0	1	0	0	0	0	0	0	0	0	0
<b>AIIC = 59</b>							Total Deficiencies = 22					Maximum Deficiencies = 8				



Note: Receiving Room SPL presented in ghosted italics indicates Receiving Room Background Noise Level less than 10 dB below Level with tapping machine operating and correction was applied to receiving room level per ASTM E 1007-16, Paragraph 11.6.4