

**Client:** Nordic Engineered Wood  
1100 Ave des Canadiens-de-Montreal  
Montreal QC H3B 2S2

**Specimen:** 38 mm precast concrete slab on 17 mm SonusWave™ placed on a OSB wood raft with sand on top of a CLT 5 ply (131 mm)

**Specimen ID:** A1-008253-26F

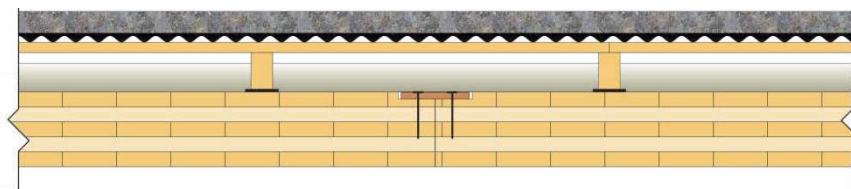
**Construction Date:** March 23, 2016

**Specimen Description**

Topping: A 38 mm (1-1/2") precast concrete slab was placed on 17 mm Regupol® SonusWave™ on top of OSB sheeting. The 18 mm (23/32") OSB sheeting was screwed down with the long side perpendicular to 38 mm x 64 mm (2x3) wood battens, with the narrow side down, using 50 mm (2") long #10 wood screws spaced 150 mm (6") o.c. along the edges and 200 mm (8") o.c in the field. Wood battens running along the short direction (3978 mm) and spaced at 610 mm (24") o.c. and glued to strips of 10 mm thick rubber membranes at the bottom.

Fill: A 6 mil polyethylene sheet was placed on the CLT and the wood battens with rubber membrane were installed directly on top (floating). 50 mm (2") of dry silica sand (#71) filled the cavity of the battens leaving a 12 mm (1/2") air gap between the sand and the OSB.

CLT Floor: The specimen was composed of two cross-laminated timber (CLT) 5 ply panels (131 mm thick x 1989 mm wide x 4872 mm long) with a butt joint in the middle of the floor. The combined panels filled the entire floor opening of the test frame. The two CLT panels were joined using a 120 mm wide x 12 mm thick plywood strip spanning the full joint (4.9 m). The plywood strip was nailed with common nails 75 mm (3") long spaced 305 mm (12") on centre along the joint with beads of PL premium adhesive between the plywood strip and the CLT panels. The CLT floor was resting on the lip of the test frame and was not fastened to the test frame. The air gaps between the edges of the CLT floor and the test frame were filled with glass fiber insulation and covered with cloth tape. Duct putty was installed around the lower perimeter of the test frame and the CLT.



**Cross-section of A1-008253-26F**

**Specimen Properties**

Element	Actual thickness (mm)	Mass (kg)	Mass/length, area or volume
38 mm Precast Concrete Slab	38	1 905	98.6 kg/m <sup>2</sup>
17 mm Regupol® SonusWave™	17	157	8.1 kg/m <sup>2</sup>
18 mm OSB Tongue and Groove Sheeting	18	202	10.5 kg/m <sup>2</sup>
38 mm x 64 mm Wood Battens	64	47	0.3 kg/m
10 mm Rubber Membrane	10	21	7.7 kg/m <sup>2</sup>
50 mm Silica Sand (#71)	*50	1 385	77.2 kg/m <sup>2</sup>
6 mil Polyethylene Sheeting	0	2	0.1 kg/m <sup>2</sup>
131 mm CLT 5 ply	131	1 343	69.3 kg/m <sup>2</sup>
<b>Total</b>	<b>278</b>	<b>5 062</b>	<b>262.0 kg/m<sup>2</sup></b>

\* The thickness of the sand is not included in the total specimen thickness.

**Test Specimen Installation**

- The exposed area of the floor specimen used for the calculations of the airborne sound transmission loss was  $17.85 \text{ m}^2$  (4.71 m x 3.79 m).
- The total area of the floor assembly resting on top of the lip was  $19.32 \text{ m}^2$  (4.88 m x 3.96 m).
- The mass per area of the elements above the lip was calculated using the total area ( $19.32 \text{ m}^2$ ).

**ASTM E90 Test Results – Airborne Sound Transmission Loss**

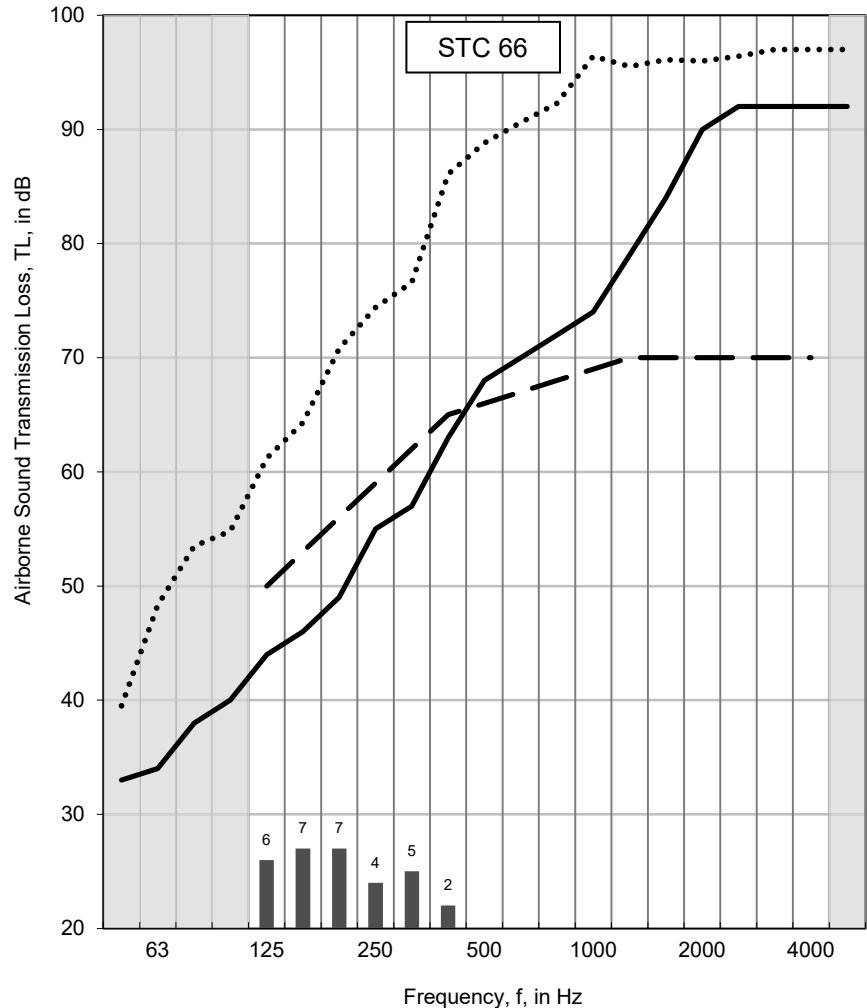
**Client:** Nordic Engineered Wood  
**Specimen ID:** A1-008253-26F

**Test ID:** TLF-16-018  
**Date of Test:** March 23, 2016

Room	Volume (m <sup>3</sup> )	Air Temperature (°C)	Humidity (%)
Upper	174.3	24.7 to 24.8	42.4 to 43.8
Lower	176.9	18.8 to 18.8	39.8 to 40.2

<b>Area S of test specimen:</b>	17.85 m <sup>2</sup>
<b>Mass per unit area:</b>	262.0 kg/m <sup>2</sup>

f (Hz)	Airborne TL (dB)
50	33
63	34
80	38
100	40
125	44
160	46
200	49
250	55
315	57
400	63
500	68
630	70
800	72
1000	74
1250	79
1600	84
2000	90 c
2500	92 *
3150	92 c
4000	92 c
5000	92 c
<b>Sound Transmission Class (STC)</b>	<b>66</b>



<b>Sum of Deficiencies (dB)</b>	31
<b>Max. Deficiency (dB)</b>	7 dB at 160 and 200 Hz

For a description of the test specimen and mounting conditions see text pages before. The results in this report apply only to the specific sample submitted for measurement. No responsibility is assumed for performance of any other specimen. **Airborne sound transmission loss measurements were conducted in accordance with the requirements of ASTM E90-09, “Standard Test Method for Laboratory Measurement of Airborne Sound Transmission Loss of Building Partitions and Elements”.**

**In the graph:**

The solid line is the measured sound transmission loss for this specimen. The dashed line is the STC contour fitted to the measured values according to ASTM E413-10. The dotted line (may be above the displayed range) is 10 dB below the flanking limit established for this facility. For any frequency band where the measured transmission loss is above the dotted line, the reported value is potentially limited by flanking transmission via laboratory surfaces, and the true value may be higher than that measured. Bars at the bottom of the graph show deficiencies where the measured data are less than the reference contour as described in the fitting procedure for the STC, defined in ASTM E413-10. The shaded cells in the table and areas in the graph are outside the STC contour range.

**In the table:**

Values marked “c” indicate that the measured background level was between 5 dB and 10 dB below the combined receiving room level and background level. The reported values have been corrected according to the procedure outlined in ASTM E90-09. Values marked “\*” indicate that the measured background level was less than 5 dB below the combined receiving room level and background level, in which case, the corrected values provide an estimate of the lower limit of airborne sound transmission loss.

**ASTM E492 Test Results – Normalized Impact Sound Pressure Levels**

**Client:** Nordic Engineered Wood  
**Specimen ID:** A1-008253-26F

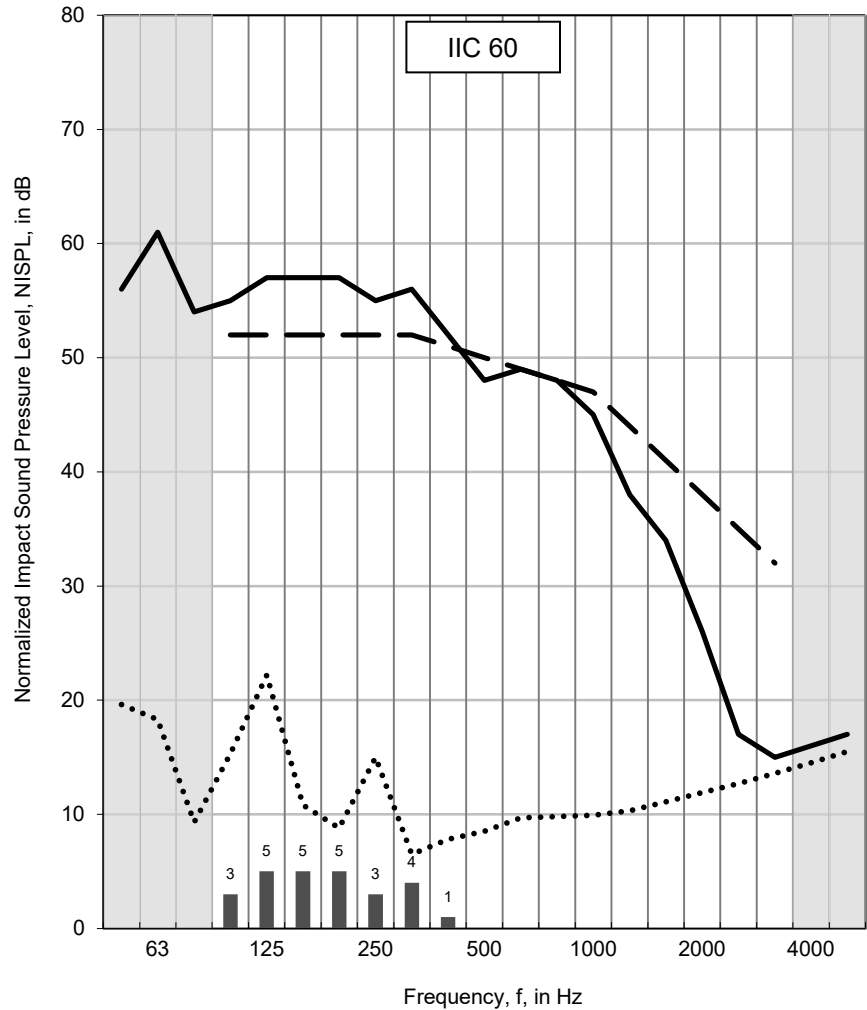
**Test ID:** IIF-16-019  
**Date of Test:** March 23, 2016

Room	Volume (m³)	Air Temperature (°C)	Humidity (%)
Upper	174.3	24.9 to 26.1	26.8 to 47.5
Lower	176.9	18.9 to 19.0	40.2 to 40.7

<b>Area S of test specimen:</b>	17.85 m²
<b>Mass per unit area:</b>	262.0 kg/m²

f (Hz)	NISPL (dB)
50	58
63	60
80	59
100	61
125	61
160	61
200	61
250	58
315	58
400	54
500	54
630	56
800	56
1000	55
1250	52
1600	54
2000	50
2500	47 *
3150	42 *
4000	40 *
5000	39 *
<b>Impact Insulation Class (IIC)</b>	<b>60</b>

<b>Sum of Positive Differences (dB)</b>	26
<b>Max. Positive Difference (dB)</b>	5 dB at 125, 160 and 200 Hz



For a description of the test specimen and mounting conditions see text pages before. The results in this report apply only to the specific sample submitted for measurement. No responsibility is assumed for performance of any other specimen. **Measurements of normalized impact sound pressure level (NISPL) were conducted in accordance with the requirements of ASTM E492-09, “Standard Laboratory Measurement of Impact Sound Transmission through Floor-Ceiling Assemblies Using the Tapping Machine”.**

**In the graph:**

The solid line is the measured normalized impact sound pressure level (NISPL) for this specimen. The dashed line is the IIC contour fitted to the measured values according to ASTM E989-06. The dotted line is the background sound level measured in the receiving room during this test (may be below the displayed range). For any frequency where the measured NISPL is less than 10 dB above the dotted line, the reported values were adjusted as noted below. Bars at the bottom of the graph show positive differences; where the measured data are greater than the reference contour as defined in ASTM E989-06. Shaded cells in the table and areas in the graph are outside the IIC contour range.

**In the table:**

Values marked “c” indicate that the measured background level was between 5 dB and 10 dB below the combined receiving room level and background level. Values marked “\*” indicate that the measured background level was less than 5 dB below the combined receiving room level and background level and the reported values of NISPL provide an estimate of the upper limit of normalized impact sound pressure level, according to the procedure outlined in ASTM E492-09. The reported values of NISPL have been corrected according to the procedure outlined in ASTM E492-09.