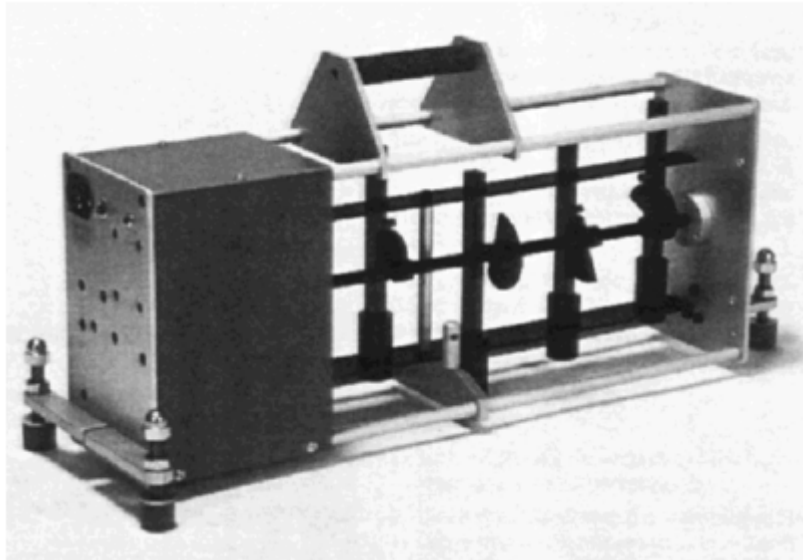


FIELD IMPACT INSULATION TEST

UNIT603, 1231 SANDGATE ROAD, NUNDAH LNTW



TEST REPORT

Commissioned by:	Kenbrock Flooring
Date:	17 October 2014
Project number:	3738
Version:	V.0
Author:	Eric Huang

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TITLE Field Impact Insulation Test
Unit 603 –1231 Sandgate Road, Nundah LnTw
Test Report

TESTS BY Eric Huang
Acoustic Engineer - Palmer Acoustics (Australia) Pty Ltd

REPORT DATE 17 October 2014

TEST DATE 30 September 2014

TEST LOCATION Level 6 Unit 603 Living room
to Level 5 Unit 503 Living room

FOR Kenbrock Flooring

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1.0 INTRODUCTION

Palmer Acoustics have been engaged by Kenbrock Flooring to perform a field impact insulation test at Unit 603, 1231 Sandgate Road, Nundah. The test was conducted on a vinyl sample over the living room area of Unit 503. The flooring consisted of 2mm thick vinyl flooring on the 2mm Damtec Acoustic underlay. The Unit 503 (level 5) living area is directly beneath the Unit 603 (level 6) living area. The layouts for both units are identical.

2.0 EQUIPMENT AND PROCEDURES

2.1 Instrumentation

The following instruments were used in the evaluation.

- Norsonics 140 Sound level meter (serial number 1403252)
- Norsonics tapping machine NOR-211A (serial number 25181)
- B & K 4231 Calibrator (serial number 2095146)

The operation of the sound level measuring equipment was field calibrated before and after each measurement session and was found to be within 0.2dB of the reference signal. All instrumentation used in this assessment holds a current calibration certificate from a certified NATA calibration laboratory.

2.2 Measurement Procedures

Testing was conducted in conformance with ISO 140/VII "Field measurement of impact sound insulation of floors". The evaluation of the results to derive the single figure ratings of FIIC and $L'_{nT,w}$ were conducted to:

- ISO 717-2 1996 "Rating of insulation in buildings and of building elements – Part 2 Impact Sound Insulation" and
- ASTM E989-1989 Standard Classification for Determination of Impact Insulation Class (IIC).

The floor sample was tapped in two (2) different orientations with the receiving spaces sound measurements averaged over a 1-minute period per test orientation.

Ambient sound levels were measured before and after the testing with the results included in the assessment as per standard.

Receiving room reverberation measurements were performed, utilising RT Software in the Norsonics 140 analyser, at four locations throughout the spaces with the results arithmetically averaged.

3.0 DESCRIPTION OF ROOMS

All windows and doors were closed in the source room and receiving room. The transmitting and receiving room was fully finished but not furnished.

Transmitting Room (Level 6 Unit 603 Living)

Test Floor: 200mm thick concrete slab, vinyl floor sample (loose lay);
 Walls: Plasterboard;
 Enclosure: Windows and all doors were closed;
 Room finish: Not furnished.



Receiving Room (Level 5 Unit 503 Living)

Floor: Carpet floor;
 Ceiling: 100mm gap with plasterboard ceiling
 Walls: Plasterboard;
 Enclosure: Windows and all doors were closed;
 Room finish: Not furnished.

4.0 RESULTS

Our test gave the following result:

Test System	L'nT,w	CI	FIIC
2mm vinyl with 2mm Damtec Underlay (loose lay)	43	0	64

Table 1: Test Result Summary – impact test

A Test Certificates detailing the $\frac{1}{3}$ octave band results are provided in Appendix B to this report in terms of L'nT,w, and related spectrum adaptation terms in accordance with ISO 717 - 2: 1996

L'nT,w and C_I are terms used in the Building Code of Australia (BCA), see also Appendix A. It should be noted that L'nT,w is a weighted room noise level and that a lower number represents better performance.

5.0 CRITERIA

The current Building Code of Australia (BCA) 2013 sets the following conditions:

F5.4 Sound insulation rating of floors

A floor in a Class 2 or 3 building must have an $R_w + C_{tr}$ (airborne) not less than 50 and an $L'nT,w + C_I$ (impact) not more than 62 if it separates—

- (i) sole-occupancy units; or
- (ii) a sole-occupancy unit from a plant room, lift shaft, stairway, public corridor, public lobby or the like, or parts of a different classification.

6.0 CONCLUSION

The tested sample shows an impact insulation of 43. The 2mm thick vinyl sample with 2mm thick Damtec underlay installed on the living area of Unit 603 was under the criterion defined in the BCA 2013.

Author:



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Engineer

Reviewed by:



ROSS H. PALMER CPEng RPEQ
Principal

APPENDIX A

GLOSSARY

IMPACT MEASUREMENT AND ASSESSMENT DESCRIPTORS

- $L_{Aeq,T}$ – Time average A-weighted sound pressure level is the average energy equivalent level of the A Weighted sound over a period "T".
- L_{Aeq} – Equivalent Continuous Noise Level. The noise level in dB(A) which if present for the entire measurement period would produce the same sound energy to be received as was actually received as a result of a signal which varied with time. Normally abbreviated to "Leq" or " L_{Aeq} ", often followed by a specification of the time period (such as 1 hour or 8 hours) indicating the period of time to which the measured value has been normalized;
- $L'_{nT,w}$ – Weighted Standardised impact sound pressure level; a measurement of impact sound transmission between rooms. Lower values denote better performance. The single figure measure is derived by adapting a standard response curve to measured 1/3 octave band sound pressure levels. Measured results are adjusted based upon a reverberation time of 0.5 sec in receiving room. Normally derived from a field test.
- $L'_{n,w}$ – Weighted Normalized impact sound pressure level; a laboratory measurement of impact sound transmission between rooms. Lower values denote better performance. The single figure measure is derived by adapting a standard response curve to measured 1/3 octave band sound pressure level measurements. Measured results are adjusted based on the absorption of 10m² in the receiving room. Normally derived from a laboratory test.
- C_I – A spectrum adaptation term compensating for the effect of floor coverings when applied to bare floors under test. The usually negative value, in decibels, is added to the single-number quantity, L'_{nw} or L'_{nTw} .
- **Field Impact Insulation Class (FIIC)** – a single-number rating derived from measured values of normalized one-third octave band impact sound pressure levels in accordance with Eq 4 and the reference contours in Classification E 989. It provides an estimate of the sound insulating performance of a floor-ceiling assembly and associated support structures under tapping machine excitation.
- **Impact Insulation Class (IIC)** – This classification covers the determination of a single-figure rating that can be used for comparing floor-ceiling assemblies for general building design purposes.
- **Impact Sound Pressure Level (L)** – the average sound pressure level in a specified frequency band produced in the receiving room by the operation of the standard tapping machine on the floor assembly, averaged over each of the specified machine positions.
- L'_{nT} – **Standardised Impact Sound Pressure Level** – the impact sound pressure level standardised to room with a reference reverberation time of 0.5 seconds.

- *L'_n* – **Normalized Impact Sound Pressure Level** – the impact sound pressure level normalized to reference absorption area of 10 metric sabins (108 sabins).
- **Receiving Room** – a room below or adjacent to the floor specimen under test in which the impact sound pressure levels are measured.
- **Source Room** – the room containing the tapping machine.

STANDARDS

- **ISO 140 – 6**
Acoustics – Measurement of sound Insulation in buildings and of building elements – Part 6: Laboratory measurements of impact sound insulation of floors
- **ISO 140 – 7**
Acoustics – Measurement of sound Insulation in buildings and of building elements – Part 7: Field measurements of impact sound insulation of floors
- **ISO 717 – 2**
Acoustics – Rating of sound insulation in building and of building elements – Part 2: Impact sound insulation
- **ASTM Classification E 1007 – 97**
Standard Test Method for Field Measurement of Tapping Machine Impact Sound Transmission Through Floor-Ceiling Assemblies and Associated Support Structures
- **ASTM Classification E 989 – 89**
Standard Classification for Determination of Impact Insulation Class (IIC)

APPENDIX B

Test certificate (1)

Palmer Acoustics (Australia) Pty Ltd

Member Firm - Association of Australian Acoustical Consultants

FIELD IMPACT SOUND INSULATION - TEST CERTIFICATE

Test 1 of 1

2mm LVT Vinyl

2mm Damtec underlay

PROJECT: PN 3738 Unit 603, 1231 Sandgate Road Nundah LNT **Meas. Date:** 30-September-2014
Test Location: L6 Unit 603 Living to L5 Unit 503 Living **Meas. Parameter:** LLeq
Test Surface: 2mm Vinyl **Tapping Machine:** NE Nor 211
Client: Kenbrock Flooring Pty Ltd **Receiving Room Volume:** 61 m³
Test Performed: Eric Huang

DESCRIPTION OF FLOOR AND SPECIMEN

Unit: 2mm LVT Vinyl
 Product: 2mm Damtec underlay
 Adhesive: -
 Ceiling: Suspended ceiling (100mm airgap)
 Slab: 200mm Concrete Slab

No. of Source posn: 2
Mic. posn: 2 sweeps
RT meas: 4 Imp.
SLM: Nor 140

Weighted Standardized Impact SPL

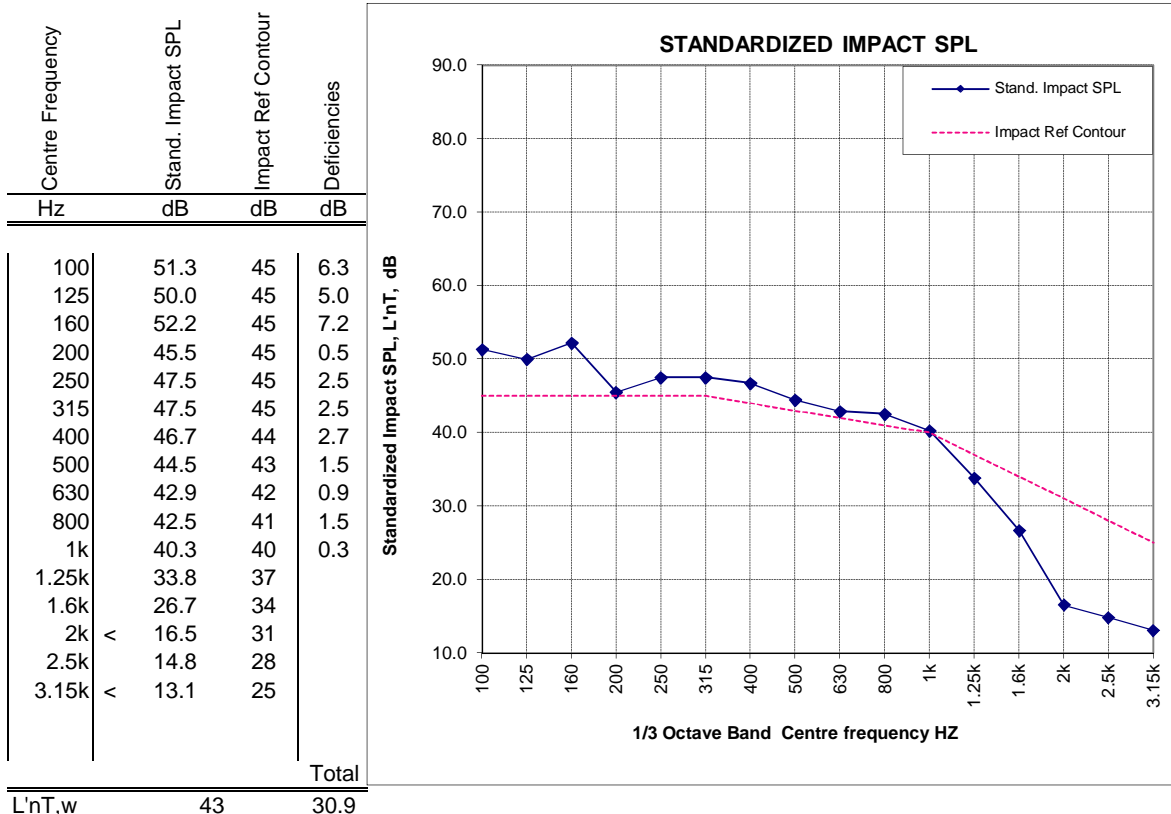
L'nT,w 43 ISO 140-7:1998 & 717-2:1996

Results standardized to a RT of 0.5 seconds

CI (L'nT,w) 0 ISO 140-7:1998 & 717-2:1996

Impact Insulation Class

FIIC 64 ASTM E1007-97 & E989-89



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