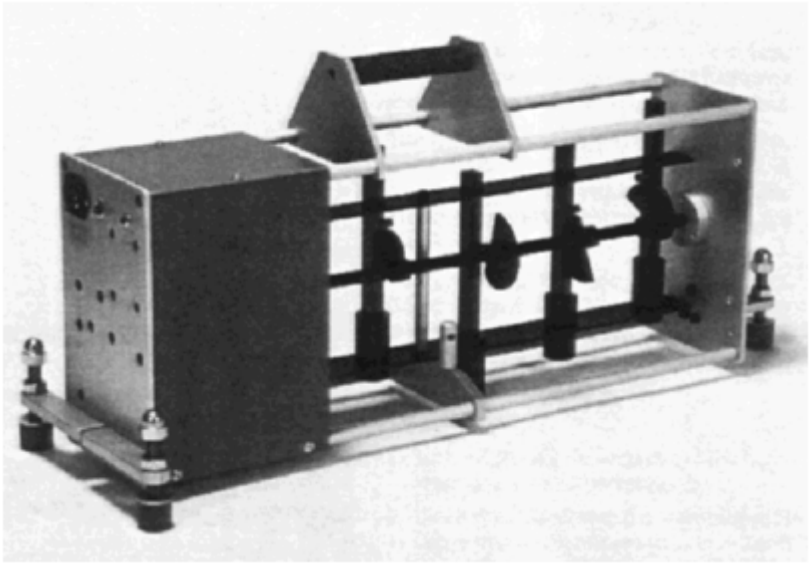
FIELD IMPACT INSULATION TESTS

UNIT603, 1231 SANDGATE ROAD, NUNDAH LNTW



TEST REPORT

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

CONTENTS

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 tests were conducted on a vinyl samples over the living room area of Unit 503. The flooring consisted of 5.3mm thick vinyl flooring on the following underlays:

- Sample 1: no underlay (loose lay); and;
- Sample 2: 2mm Damtec Acoustic underlay (loose lay).

Both vinyl floor samples were loosely lay on the concrete slab. 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
5.3mm vinyl planks	49	-4	58
5.3mm vinyl planks with 2mm Damtec Underlay	42	0	65

Table 1: Test Result Summary – impact tests

A Test Certificates detailing the 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 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 Rw + Ctr (airborne) not less than 50 and an L'nT,w + CI (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 floor samples show an impact insulation of 42 to 49. All two (2) vinyl samples installed on the living area of Unit 603 was under the criterion defined in the BCA 2013.

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Reviewed by:

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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 "L_{eq}" 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 tome 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 $10m^2$ 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 certificates (2)

Palmer Acoustics (Australia) Pty Ltd

Member Firm - Association of Australian Acoustical Consultants

FIELD IMPACT SOUND INSULATION - TEST CERTIFICATE

Test 1 of 2

5.3mm Vinyl Planks - Smartdrop -

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:	5mm loose lay Vinyl Planks	**Tapping Machine:**	NE Nor 211
Client:	Kenbrock Flooring Pty Ltd	**Receiving Room Volume:**	61 m^3
Test Performed:	Eric Huang		

DESCRIPTION OF FLOOR AND SPECIMEN

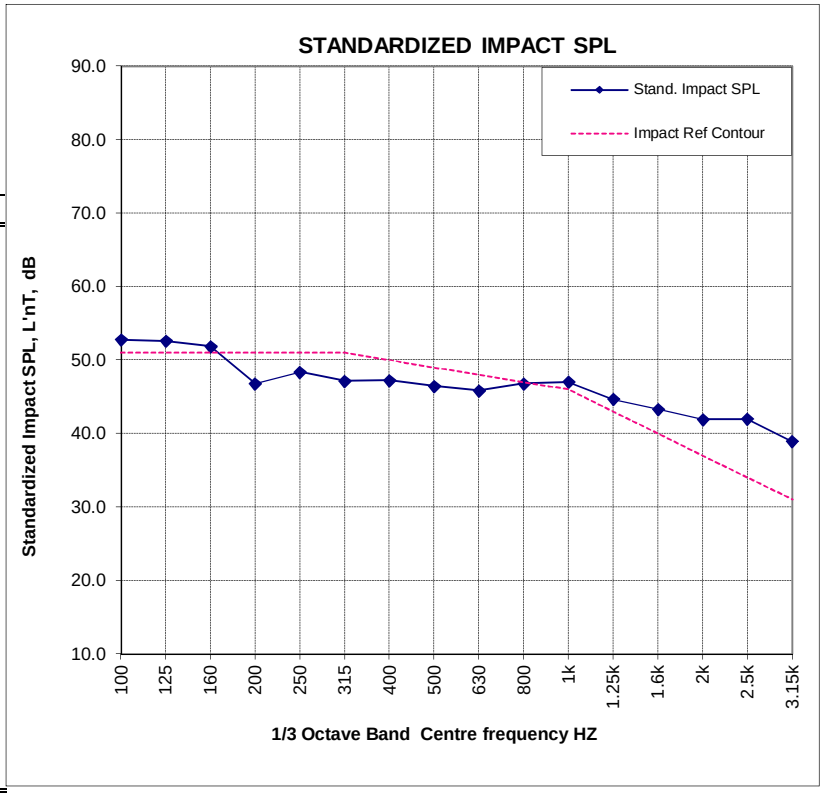
Unit:	5.3mm Vinyl Planks - Smartdrop	**No. of Source posn:**	4
Product:	-	**Mic. posn:**	4 sweeps
Adhesive:	-	**RT meas:**	4 Imp.
Ceiling:	Suspended ceiling (100mm airgap)	**SLM:**	Nor 140
Slab:	200mm Concrete Slab		

Weighted Standardized Impact SPL **L'nT,w** **49** ISO 140-7:1998 & 717-2:1996

Results standardized to a RT of 0.5 seconds **CI (L'nT,w)** **-4** ISO 140-7:1998 & 717-2:1996

Impact Insulation Class **FIIC** **58** ASTM E1007-97 & E989-89

Centre Frequency	Stand. Impact SPL	Impact Ref Contour	Deficiencies
Hz	dB	dB	dB
100	52.8	51	1.8
125	52.6	51	1.6
160	51.9	51	0.9
200	46.8	51	
250	48.4	51	
315	47.1	51	
400	47.2	50	
500	46.5	49	
630	45.8	48	
800	46.8	47	
1k	47.0	46	1.0
1.25k	44.7	43	1.7
1.6k	43.3	40	3.3
2k	41.9	37	4.9
2.5k	42.0	34	8.0
3.15k	38.9	31	7.9
			Total
L'nT,w	49		31.0



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FIELD IMPACT SOUND INSULATION - TEST CERTIFICATE

Test 2 of 2

5.3mm Loose lay 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:	5mm loose lay Vinyl Planks	**Tapping Machine:**	NE Nor 211
Client:	Kenbrock Flooring Pty Ltd	**Receiving Room Volume:**	61 m^3
Test Performed:	Eric Huang		

DESCRIPTION OF FLOOR AND SPECIMEN

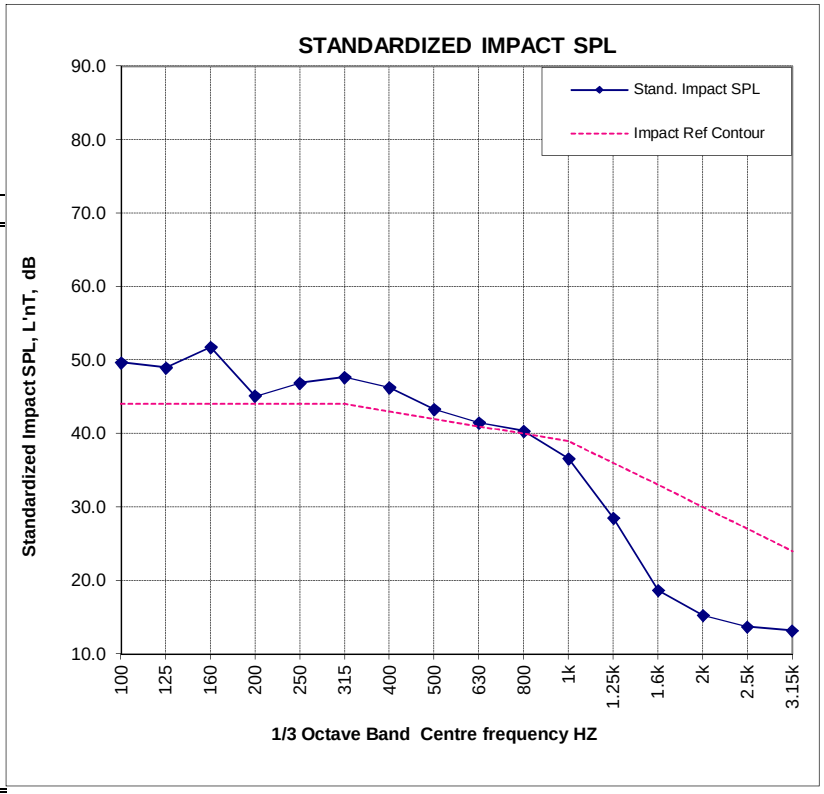
Unit:	5.3mm Loose lay Vinyl	**No. of Source posn:**	2
Product:	2mm Damtec underlay	**Mic. posn:**	2 sweeps
Adhesive:	-	**RT meas:**	4 Imp.
Ceiling:	Suspended ceiling (100mm airgap)	**SLM:**	Nor 140
Slab:	200mm Concrete Slab		

Weighted Standardized Impact SPL **L'nT,w** **42** 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** **65** ASTM E1007-97 & E989-89

Centre Frequency		Stand. Impact SPL	Impact Ref Contour	Deficiencies
Hz		dB	dB	dB
100		49.6	44	5.6
125		49.0	44	5.0
160		51.8	44	7.8
200		45.1	44	1.1
250		46.9	44	2.9
315		47.7	44	3.7
400		46.3	43	3.3
500		43.3	42	1.3
630		41.5	41	0.5
800		40.4	40	0.4
1k		36.6	39	
1.25k		28.5	36	
1.6k	<	18.6	33	
2k	<	15.2	30	
2.5k		13.7	27	
3.15k	<	13.2	24	
				Total
L'nT,w		42		31.6



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