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Australia Pty Ltd

FIELD IMPACT INSULATION TEST

UNIT 41 VIVA APARTMENTS FORTITUDE VALLEY

TEST REPORT

Commissioned by:	Decoline
Date:	09 September 2019
Project number:	4716
Version:	V.0
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DOCUMENT INFORMATION	
Author: Hasitha Gallage **Date**: 09 September 2019	**Approved by**: Roger Hawkins **Date**: 09 September 2019

VERSION HISTORY				
Version	**Description**	**Date**	**Author**	**Approved by**
V.0	Final	09-09-19	Hasitha Gallage	Roger Hawkins
V.1				

DOCUMENT DISTRIBUTION			
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TITLE	Field Impact Insulation Tests Unit 41 Viva Apartments, 38 Robertson Street, Fortitude Valley, QLD 4006. Test Report
TESTS BY	Hasitha Gallage Acoustic Engineer - Palmer Acoustics (Australia) Pty Ltd
REPORT DATE	09 September 2019
TEST DATE	06 September 2019
TEST LOCATION	Level 2 Unit 41 Living area to Level 1 Unit 23 Living area
FOR	Decoline

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1.0 INTRODUCTION

Palmer Acoustics have been engaged by Decoline to perform field impact insulation tests in U41 Viva Apartments, Fortitude Valley. The tests were conducted on De marque Collection Chevron Timber flooring samples installed in the living area of Unit 41. The measurements were conducted in the living area of Unit 23 directly beneath the living area of Unit 41. Floor system tested:

- Test 1: 21mm De marque Collection Chevron Timber flooring sample + BS-RFC-700 3mm underlay
- Test 2: 21mm De marque Collection Chevron Timber flooring sample + Regupol® 5512 5mm underlay
- Test 3: 21mm De marque Collection Chevron Timber flooring sample + Regupol® 4515 9mm underlay

2.0 PROCEDURES AND EQUIPMENTS

2.1 Measurement Procedures

Testing was conducted in conformance with ISO 16283-2:2015"Field measurement of impact sound insulation of floors". The evaluation of the results, to derive the single figure L'nT,w rating, was conducted to ISO 717-2:2013 "Rating of insulation in buildings and of building elements – Part 2 Impact Sound Insulation".

The De marque Collection Chevron Timber flooring samples installed in the living area were tapped in two (2) different orientations with the receiving space's sound measurements averaged over 2 × 30 seconds period - per test orientation.

Ambient sound levels were measured before 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 five locations throughout the space, with the results arithmetically averaged.

2.2 Instrumentation

The following instruments were used in the evaluation.

- Norsonics 140 Sound level meter (serial number 1403252)
- Look Line tapping machine EM50 (serial number TM.14031)
- B & K 4230 Calibrator (serial number 1638750)

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.

3.0 DESCRIPTION OF ROOMS

All windows and doors were closed in the source room and receiving room.

Transmitting Room

Test Floor: De marque Collection Chevron Timber flooring samples;
Walls: Plasterboard;
Enclosure: Windows and all doors were closed;
Room finish: Furnished.

Receiving Room

Floor: Carpet;
Ceiling: Exposed Concrete Slab;
Walls: Plasterboard;
Enclosure: Windows and all doors were closed;
Room finish: Furnished.

4.0 RESULT

Our test gave the following result:

Test System	L'nT,w	FIIC
Test 1: 21mm De marque Collection Chevron Timber flooring sample + BS-RFC-700 3mm underlay	51	54
Test 2: 21mm De marque Collection Chevron Timber flooring sample + Regupol® 5512 5mm underlay	49	56
Test 3: 21mm De marque Collection Chevron Timber flooring sample + Regupol® 4515 9mm underlay	49	56

Table 1: Test Result Summary – impact test

Test Certificates detailing the 1/3 octave band results are provided in Appendix B to this report in terms of L'nT,w, and FIIC spectrum adaptation terms in accordance with ISO 717 - 2: 2013 and ASTM E1007-97 & E989-89.

L'nT,w term is 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.

FIIC is an ASTM term which represents a floor/ceiling assembly's ability to resist the transmission of impact noise. A higher value represents greater performance.

5.0 CRITERIA

The Viva Apartments, Fortitude Valley Body Corporate require that any installed floor impact system provide an isolation rating of FIIC ≥ 50.

6.0 CONCLUSION

The De marque Collection Chevron Timber flooring samples installed in the living area of Unit 41 achieved an FIIC ≥ 54, which complies with the body corporate requirements.

In our experience, test samples are similar in performance to a fully laid floor ± 2dB.

The flooring system must be laid strictly in accordance with the suppliers recommended procedures.

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Approved by:

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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 16283 – 2***
  Acoustics – Field measurement of sound insulation in buildings and of building elements – Part 7: Default procedure for sound pressure level measurement

- ***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 (3)

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Member Firm: AAAC
Association of Australian Acoustical Consultants

FIELD IMPACT SOUND INSULATION - TEST CERTIFICATE

Test 1 of 3

21mm De marque Collection Chevron Timber sample
BS-RFC-700 3mm underlay

PROJECT:	U41 Viva Apartments Fortitude Valley LNT	**Meas. Date:**	6-Sep-19
Test Location:	Level 2 U41 Living Area to Level 1 U23 Living Area	**Meas. Parameter:**	LLeq
Test Surface:	21mm De marque Collection Chevron Timber sample	**Tapping Machine:**	Look Line EM50
Client:	Decoline	**Receiving Room Volume:**	91 m^3
Test Performed:	Hasitha Gallage		

DESCRIPTION OF FLOOR AND SPECIMEN		**No. of Source posn:**	4
Unit:	21mm De marque Collection Chevron Timber sample	**Mic. posn:**	4 sweeps
Product:	BS-RFC-700 3mm underlay	**RT meas:**	4 Imp.
Adhesive:	Loose laid	**SLM:**	Nor 140
Ceiling:	Exposed concrete slab		
Slab:	Concrete		

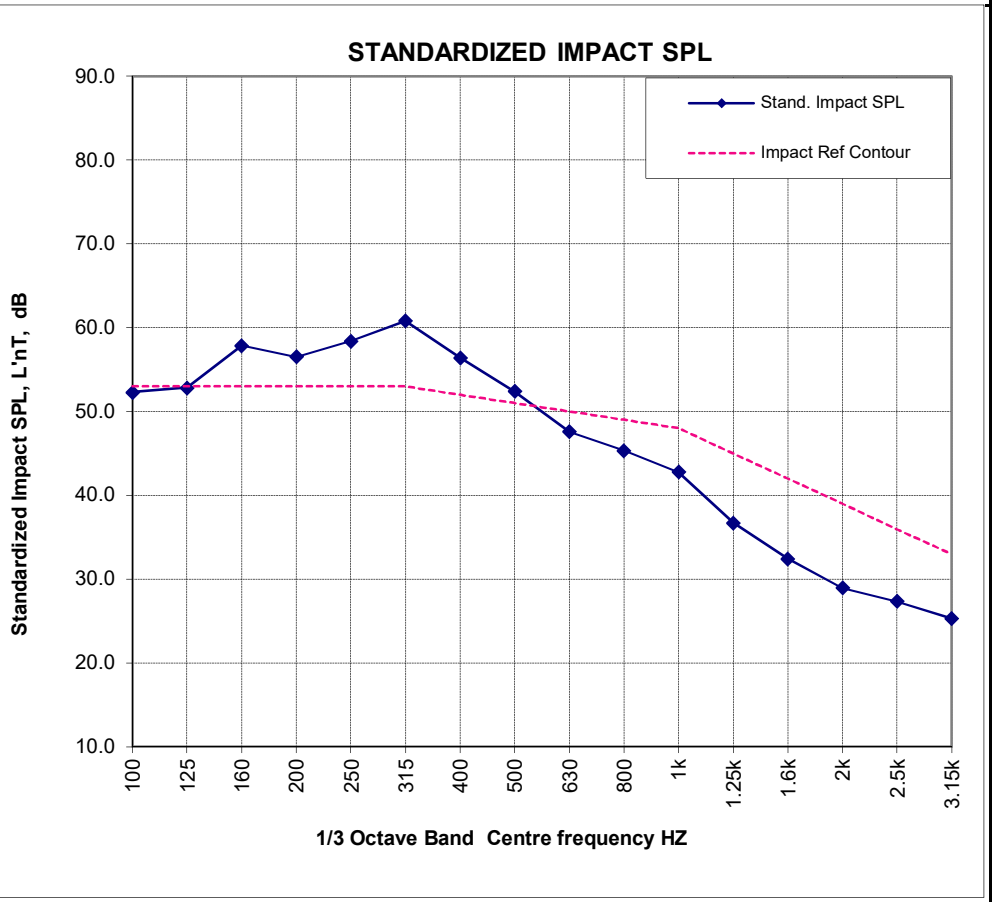
Weighted Standardized Impact SPL

Results standardized to a RT of 0.5 seconds

L'nT,w 51 — ISO 16283-2:2015 & 717-2:2013

FIIC 54 — ASTM E1007-97 & E989-89

Centre Frequency Hz	Stand. Impact SPL dB	Impact Ref Contour dB	Deficiencies dB
100	52.3	53	
125	52.8	53	
160	57.9	53	4.9
200	56.5	53	3.5
250	58.4	53	5.4
315	60.8	53	7.8
400	56.4	52	4.4
500	52.4	51	1.4
630	47.6	50	
800	45.3	49	
1k	42.8	48	
1.25k	36.7	45	
1.6k	32.4	42	
2k	28.9	39	
2.5k	27.3	36	
3.15k	25.3	33	
			Total
L'nT,w	51		27.4



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FIELD IMPACT SOUND INSULATION - TEST CERTIFICATE

Test 2 of 3

21mm De marque Collection Chevron Timber sample
Regupol® 5512 5mm underlay

PROJECT:	U41 Viva Apartments Fortitude Valley LNT	**Meas. Date:**	6-Sep-19
Test Location:	Level 2 U41 Living Area to Level 1 U23 Living Area	**Meas. Parameter:**	LLeq
Test Surface:	21mm De marque Collection Chevron Timber sample	**Tapping Machine:**	Look Line EM50
Client:	Decoline	**Receiving Room Volume:**	91 m^3
Test Performed:	Hasitha Gallage		

DESCRIPTION OF FLOOR AND SPECIMEN		**No. of Source posn:**	4	
Unit:	21mm De marque Collection Chevron Timber sample	**Mic. posn:**	4	sweeps
Product:	Regupol® 5512 5mm underlay	**RT meas:**	4	Imp.
Adhesive:	Loose laid	**SLM:**	Nor 140	
Ceiling:	Exposed concrete slab			
Slab:	Concrete			

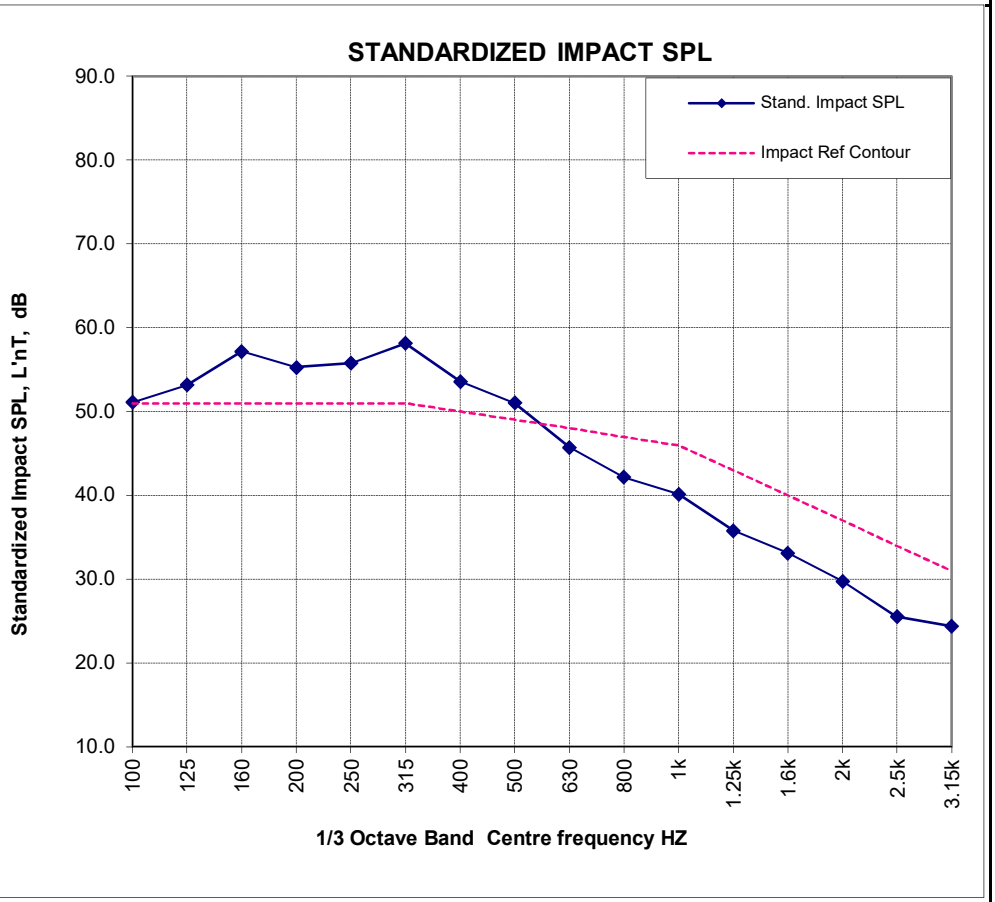
Weighted Standardized Impact SPL

Results standardized to a RT of 0.5 seconds

L'nT,w 49 — ISO 16283-2:2015 & 717-2:2013

FIIC 56 — ASTM E1007-97 & E989-89

Centre Frequency	Stand. Impact SPL	Impact Ref Contour	Deficiencies
Hz	dB	dB	dB
100	51.1	51	0.1
125	53.2	51	2.2
160	57.2	51	6.2
200	55.3	51	4.3
250	55.8	51	4.8
315	58.1	51	7.1
400	53.6	50	3.6
500	51.0	49	2.0
630	45.7	48	
800	42.2	47	
1k	40.1	46	
1.25k	35.8	43	
1.6k	33.1	40	
2k	29.8	37	
2.5k	25.5	34	
3.15k	24.4	31	
			Total
L'nT,w	49		30.3



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FIELD IMPACT SOUND INSULATION - TEST CERTIFICATE

Test 3 of 3

21mm De marque Collection Chevron Timber sample
Regupol® 4515 9mm underlay

PROJECT:	U41 Viva Apartments Fortitude Valley LNT	**Meas. Date:**	6-Sep-19
Test Location:	Level 2 U41 Living Area to Level 1 U23 Living Area	**Meas. Parameter:**	LLeq
Test Surface:	21mm De marque Collection Chevron Timber sample	**Tapping Machine:**	Look Line EM50
Client:	Decoline	**Receiving Room Volume:**	91 m^3
Test Performed:	Hasitha Gallage		

DESCRIPTION OF FLOOR AND SPECIMEN		**No. of Source posn:**	4	
Unit:	21mm De marque Collection Chevron Timber sample	**Mic. posn:**	4	sweeps
Product:	Regupol® 4515 9mm underlay	**RT meas:**	4	Imp.
Adhesive:	Loose laid	**SLM:**	Nor 140	
Ceiling:	Exposed concrete slab			
Slab:	Concrete			

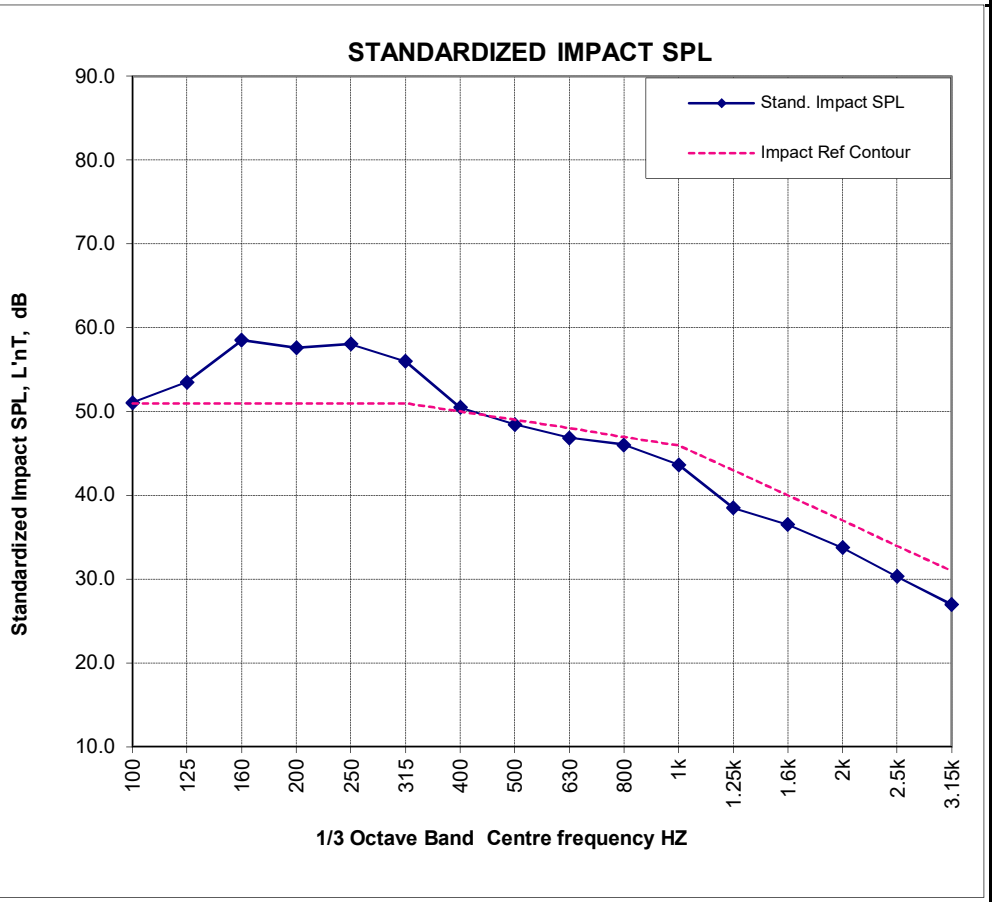
Weighted Standardized Impact SPL

Results standardized to a RT of 0.5 seconds

L'nT,w 49 — ISO 16283-2:2015 & 717-2:2013

FIIC 56 — ASTM E1007-97 & E989-89

Centre Frequency	Stand. Impact SPL	Impact Ref Contour	Deficiencies
Hz	dB	dB	dB
100	51.1	51	0.1
125	53.5	51	2.5
160	58.5	51	7.5
200	57.6	51	6.6
250	58.1	51	7.1
315	56.0	51	5.0
400	50.5	50	0.5
500	48.5	49	
630	46.9	48	
800	46.0	47	
1k	43.6	46	
1.25k	38.5	43	
1.6k	36.5	40	
2k	33.8	37	
2.5k	30.3	34	
3.15k	27.0	31	
			Total
L'nT,w	49		29.2



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