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FIELD FLOOR IMPACT INSULATION TEST REPORT

UNIT 204, 201 BRETON STREET COOPERS PLAINS, QLD 4108

Commissioned by:	Golden Elite Group
Date:	06 February 2025
Project number:	6581
Version:	V.1
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TITLE	Field Floor Impact Insulation Test - Sample Unit 204, 201 Breton Street Coopers Plains, QLD 4108, Test Report
TESTS BY	Emmanuel John Acoustic Emmanuel
TEST DATE	06 February 2026
REPORT DATE	06 February 2025
TEST LOCATION	Unit 204 to Unit 104 – Living room to living room
FOR	Golden Elite Group

This analysis and report are written with regard to the following Queensland Legislation:

The Registered Professional Engineers Act Queensland

Queensland

The Registered Professional Engineers Act Queensland 2024

"It is an offence under the Act for persons other than Registered Professional Engineers of Queensland (RPEQ) to provide professional engineering services (see section 115 of the Act). This means that if you are providing any professional engineering services, you must be registered as a RPEQ."

Professional engineering service means an engineering service that requires, or is based on, the application of engineering principles and data to a design, or to a construction, production, operation or maintenance activity, relating to engineering, and does not include an engineering service that is provided only in accordance with a prescriptive standard.

The testing provided in this report is provided under the terms of a "**prescriptive standard**", however any opinions, departures from the standard, analysis or advice are provided under the terms of The Registered Professional Engineer Act Queensland as supervised by an RPEQ engineer.

CONTENTS

1.0 INTRODUCTION

Golden Elite Group has engaged Palmer Acoustics to perform field impact insulation tests for sample flooring at Unit 204, 201 Breton Street Coopers Plains, QLD 4108. For these tests, we use an ISO 140 standard tapping machine (per ISO 16283-2: 2020(E)).

The following tests were carried out:

Test 1 - Unit 204 Living Room to Unit 104 Living Room – Concrete Slab
Test 2 - Unit 204 Living Room to Unit 104 Living Room – 3.5mm Vinyl Plank + 3mm GE Cork and Rubber Glued (sample 1)
Test 3 - Unit 204 Living Room to Unit 104 Living Room – 2.5mm Vinyl Plank + 3mm GE Cork and Rubber Glued (sample 2)
Test 4 - Unit 204 Living Room to Unit 104 Living Room – 6.5mm SPC Hybrid + 3mm GE Cork and Rubber Glued (sample 3)
Test 5 - Unit 204 Living Room to Unit 104 Living Room – 6.5mm SPC Hybrid loose laid(Sample 4)

2.0 EQUIPMENT AND PROCEDURES

2.1 Measurement Procedures

Testing conformed to ISO 16283-2:2020 "*Field measurement of impact sound insulation of floors*". Evaluation of the results to derive the single figure L'nT,w rating was conducted to ISO 717-2 2020 "*Rating of insulation in buildings and of building elements – Part 2 Impact Sound Insulation*".

The ambient sound levels were measured before testing.

The receiving room reverberation times were measured at various locations throughout the space, using the balloon-burst impulse test method, with the results averaged.

The receiving room tapping sound levels were measured for 30 seconds at various locations throughout the space, with the results averaged.

The test results were analysed per ISO 16283 and ISO 717.

2.2 Instrumentation

The following instruments were used:

- B & K Type 2250 1/3 octave band Sound Level Meter (Serial No. 2728498)
- B & K Tapping machine Type 3207 (serial number 2574503)
- B & K 4231 Calibrator (serial number 2153030)

Before and after each measurement session, the equipment was field-calibrated and was within 0.1dB of the reference signal. All instruments hold a current calibration certificate from a NATA-accredited calibration laboratory.

3.0 DESCRIPTION OF ROOM

3.1 Living room

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

Transmitting Room (Unit 204)

Walls:	Plasterboard;
Floor:	Bare concrete slab ,Vinyl Flooring and Hybrid Flooring samples.
Underlay:	3mm Regupol underlay
Room finish:	Unfurnished.
Volume:	120m³

Receiving Room (Unit 104)

Slab:	Plasterboard;
Walls:	Plasterboard;
Ceiling:	150mm airgap +13mm Plasterboard
Floor:	Concrete.
Room finish:	Unfurnished.
Volume:	120m³

1. Concrete:

Figure 1 Testing Concrete Flooring in Living Room

2. **Sample 1:**

Figure 2 Testing Sample 1 (1500mm x 1080mm x 3.5mm) in Living Room

3. **Sample 2:**

Figure 3 Testing Sample 2 (1500mm x 1080mm x 2.5mm) in Living Room

4. **Sample 3:**

Figure 4 Testing Sample 3 (1500mm x 1080mm x 6.5 mm) in Living Room

5. **Sample 4:**

Figure 5 Testing Sample 4 (1500mm x 1080mm x 6.5mm) in Living Room

4.0 RESULTS

Our tests give the following results:

Table 1: Test Result Summary – Floor impact test

	Test System	**L'nT,w**
1.	Unit 204 Living Room to Unit 104 Living Room – Concrete Slab	55
2.	Unit 204 Living Room to Unit 104 Living Room – 3.5mm Vinyl Plank + 3mm GE Cork and Rubber Glued (sample 1)	35
3.	Unit 204 Living Room to Unit 104 Living Room – 2.5mm Vinyl Plank + 3mm GE Cork and Rubber Glued (sample 2)	34
4.	Unit 204 Living Room to Unit 104 Living Room – 6.5mm SPC Hybrid + 3mm GE Cork and Rubber Glued (sample 3)	34
5.	Unit 204 Living Room to Unit 104 Living Room – 6.5mm SPC Hybrid loose laid(Sample 4)	33

Appendix C contains the Test Certificates detailing the 1/3 octave band results for this report in terms of L'nT,w following ISO 717 - 2: 2020.

L'nT,w is a term used in the National Construction Code (NCC - see Appendix A) and represents a corrected room noise level, with a lower number showing better performance.

5.0 CRITERIA

Under de NCC 2022 – Volume one -**Part F7 Sound transmission and insulation,**

F7P1

Sound transmission through floors

A floor separating sole-occupancy units or a sole-occupancy unit from a plant room, lift shaft, stairway, public corridor, public lobby, or the like, or parts of a different classification, must minimise the transmission of airborne and impact generated sound such that the separating floor, including the effect of services and their penetrations, has—

A weighted standardised level difference with spectrum adaptation term (DnT,w + Ctr) not less than 45 for airborne sound; and

A weighted standardised impact sound pressure level ***(LnT,w)*** *not more than* ***62*** *for impact generated sound.*

6.0 CONCLUSION

The Concrete Slab, Vinyl samples floors and Hybrid sample floors as tested in the living room all comply with the NCC L'nT,w ≤ 62

It is our experience that a fully laid floor will normally perform within ± 1 dB of the test sample when tested on the same floor.

Qualification

The test results above are specific to this test and cannot be directly applied to any other building location or flooring system. When applied to another room, Palmer Acoustics can advise on the possible performance, based on previous data and testing results.

Author:

Emmanuel John MEng. MTRN

Acoustic Engineer

Reviewed by:

ROSS H. PALMER CPEng RPEQ 3534

Principal Engineer

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 normalised;

- $L'_{nT,w}$ – 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 Normalised 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}.

- ***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 a room with a reference reverberation time of 0.5 seconds.

- L'_n – ***Normalized Impact Sound Pressure Level*** – the impact sound pressure level normalised to reference absorption area of 10 metric sabins (108 sabins).

- ***RT - Reverberant sound RT 60*** -The time taken for a sound to drop 60 dB, usually measured from 500 to 2,000 Hz 1/3 octave band. Measured as per ISO 3382-2:2008 *Acoustics – Measurement of room acoustic parameters – Part 2: Reverberation time in ordinary rooms*.

- ***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

- ***ISO 717 – 2***
  Acoustics – Rating of sound insulation in building and of building elements – Part 2: Impact sound insulation

- ***ISO 3382-2:2008***
  Acoustics – Measurement of room acoustic parameters — Part 2: Reverberation time in ordinary rooms

- ***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)

- ***NCC F7P3 -*** *Sound transmission through floors in a residential care building*
  A floor separating sole-occupancy units must minimise the transmission of airborne and impact generated sound such that the separating floor, including the effect of services and their penetrations, has —

  b. a weighted standardised impact sound pressure level ($L_{nT,w}$) not more than 62 for impact generated sound.

APPENDIX B

CALCULATION METHODOLOGY - L'nT,w

Correction to the signal level for background noise – ISO 16283-2:2020

If $(L_{sb}- L_b) > 10$, then $L = L_{sb}$

If $10 > (L_{sb}- L_b) > 6$, then $L = 10 \log \left(10^{\frac{L_{sb}}{10}} - 10^{\frac{L_b}{10}}\right)$

If $6 > (L_{sb}- L_b)$, then $L = L_{sb} - 1.3$

L is the adjusted signal level, in decibels;
L_{sb} is the level of signal and background noise combined, in decibels;
L_b is the background noise level, in decibels.

Standardised impact sound pressure level – ISO 16283-2:2020

$$L'_{nT} = L_i - 10 \log \left(\frac{T}{T_0}\right)$$

L'_{nT} is the standardised impact sound pressure level;
L_i is the impact sound pressure level;
T is the reverberation time in the receiving room;
T_0 is the reference reverberation time in the receiving room; for dwellings, T_0 = 0.5 s.

Method of comparison – ISO 717-2:2020

To evaluate the results of a measurement of L'_{nT} in one-third-octave bands, the reference curve is shifted in increments of 1 dB towards the L'_{nT} curve until the sum of unfavourable deviations is as large as possible but not more than 32.0 dB.

An unfavourable deviation at a particular frequency occurs when the results of measurements exceed the reference value. Only the unfavourable deviations are taken into account.

The value, in decibels, of the reference curve at 500 Hz, after shifting in accordance with this procedure is $L'_{nT,w}$.

APPENDIX C

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FIELD IMPACT SOUND INSULATION - TEST CERTIFICATE

Test 1 of 5

Concrete

ADDRESS:	Unit 204, 201 Breton StCoopers Plains QLD 4108	**PN:**	6581	
Test Location:	Unit 204 Living Room to Unit 104 Living Room	**Meas. Date:**	5-Feb-2026	
		Meas. Parameter:	Leq	
Client:	Peter Hutchings	**Tapping Machine:**	B & K	
Test Performed:	Emmanuel John, Jasli Benevice	**Receiving Room Volume:**	100	m^3

DESCRIPTION OF FLOOR AND SPECIMEN

Test Surface:	Concrete	**No. of Source posn:**	2	
		Mic. posn:	2	sweeps
		RT meas:	3	Imp.
Underlay:		**SLM:**	B & K 2250	
Adhesive:		**Calibrator:**	B & K 4231	
Ceiling:	Plasterboard			
Slab:				

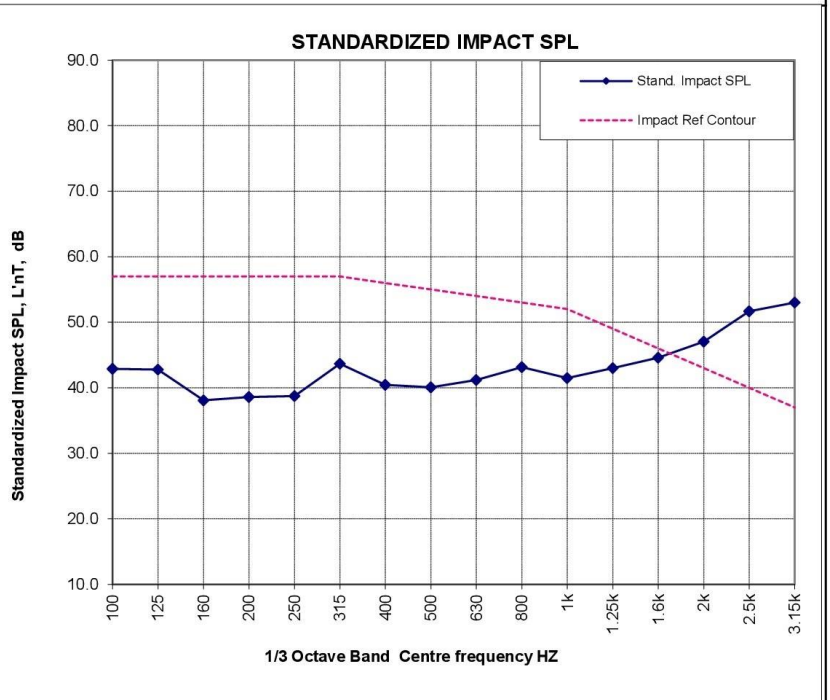
Weighted Standardized Impact SPL

Results standardized to a RT of 0.5 seconds

L'nT,w 55

ISO 16283-2:2020 & 717-2:2020

Centre Frequency	Stand. Impact SPL	Impact Ref Contour	Deficiencies
Hz	dB	dB	dB
100	42.9	57	
125	42.8	57	
160	38.1	57	
200	38.6	57	
250	38.7	57	
315	43.7	57	
400	40.5	56	
500	40.1	55	
630	41.2	54	
800	43.1	53	
1k	41.5	52	
1.25k	43.0	49	
1.6k	44.6	46	
2k	47.1	43	4.1
2.5k	51.7	40	11.7
3.15k	53.0	37	16.0
			Total
L'nT,w	55		31.8



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FIELD IMPACT SOUND INSULATION - TEST CERTIFICATE

Test 2 of 5

3.5mm Vinyl Plank

3mm GE Cork and Rubber

ADDRESS:	Unit 204, 201 Breton StCoopers Plains QLD 4108	**PN:**	6581	
Test Location:	Unit 204 Living Room to Unit 104 Living Room	**Meas. Date:**	5-Feb-2026	
		Meas. Parameter:	Leq	
Client:	Peter Hutchings	**Tapping Machine:**	B & K	
Test Performed:	Emmanuel John, Jasli Benevice	**Receiving Room Volume:**	100	m^3

DESCRIPTION OF FLOOR AND SPECIMEN

		No. of Source posn:	2	
Test Surface:	3.5mm Vinyl Plank	**Mic. posn:**	2	sweeps
		RT meas:	3	Imp.
Underlay:	3mm GE Cork and Rubber	**SLM:**	B & K 2250	
Adhesive:	Glued	**Calibrator:**	B & K 4231	
Ceiling:				
Slab:				

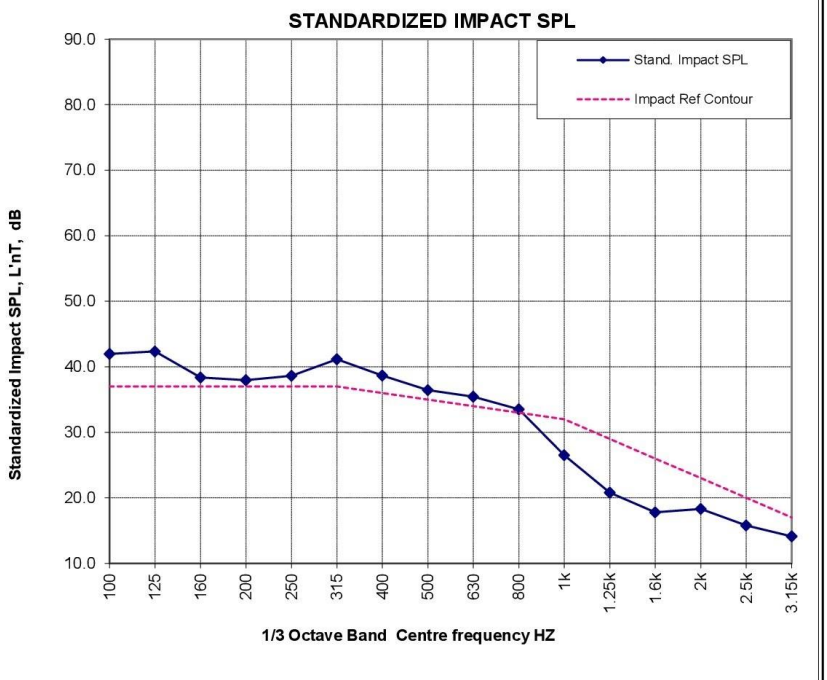
Weighted Standardized Impact SPL

Results standardized to a RT of 0.5 seconds

L'nT,w 35

ISO 16283-2:2020 & 717-2:2020

Centre Frequency		Stand. Impact SPL	Impact Ref Contour	Deficiencies
Hz		dB	dB	dB
100		42.0	37	5.0
125		42.4	37	5.4
160		38.4	37	1.4
200		38.0	37	1.0
250		38.6	37	1.6
315		41.2	37	4.2
400		38.7	36	2.7
500		36.4	35	1.4
630		35.4	34	1.4
800		33.5	33	0.5
1k		26.5	32	
1.25k	<	20.8	29	
1.6k	<	17.8	26	
2k	<	18.3	23	
2.5k	<	15.8	20	
3.15k	<	14.1	17	
				Total
L'nT,w		35		24.5



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FIELD IMPACT SOUND INSULATION - TEST CERTIFICATE

Test 3 of 5

2.5mm Vinyl Plank

3mm GE Cork and Rubber

ADDRESS:	Unit 204, 201 Breton StCoopers Plains QLD 4108	**PN:**	6581	
Test Location:	Unit 204 Living Room to Unit 104 Living Room	**Meas. Date:**	5-Feb-2026	
		Meas. Parameter:	Leq	
Client:	Peter Hutchings	**Tapping Machine:**	B & K	
Test Performed:	Emmanuel John, Jasli Benevice	**Receiving Room Volume:**	100	m^3

DESCRIPTION OF FLOOR AND SPECIMEN

		No. of Source posn:	2	
Test Surface:	2.5mm Vinyl Plank	**Mic. posn:**	2	sweeps
		RT meas:	3	Imp.
Underlay:	3mm GE Cork and Rubber	**SLM:**	B & K 2250	
Adhesive:	Glued	**Calibrator:**	B & K 4231	
Ceiling:				
Slab:				

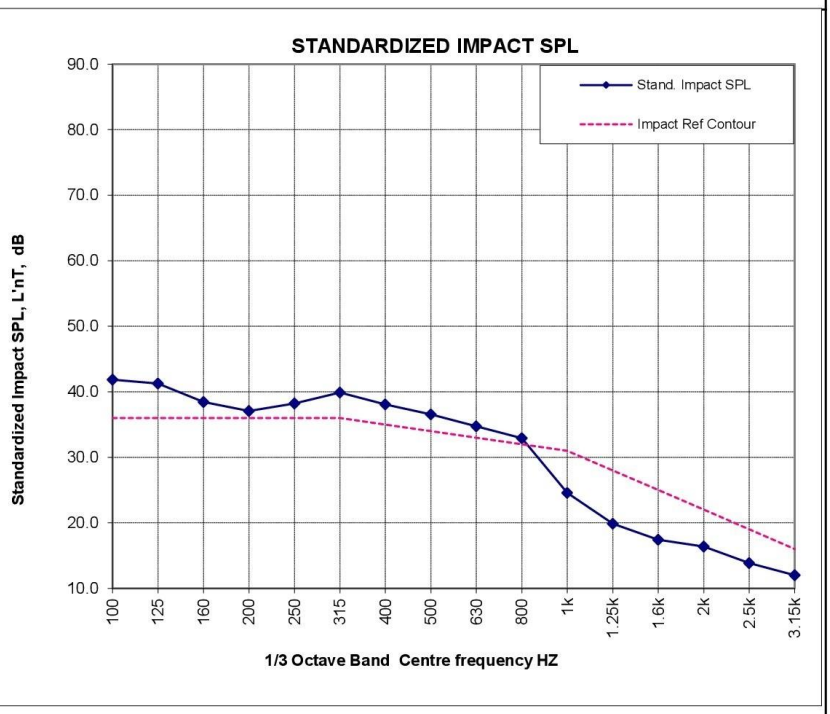
Weighted Standardized Impact SPL

Results standardized to a RT of 0.5 seconds

L'nT,w 34

ISO 16283-2:2020 & 717-2:2020

Centre Frequency		Stand. Impact SPL	Impact Ref Contour	Deficiencies
Hz		dB	dB	dB
100		41.9	36	5.9
125		41.3	36	5.3
160		38.4	36	2.4
200		37.1	36	1.1
250		38.2	36	2.2
315		39.9	36	3.9
400		38.1	35	3.1
500		36.5	34	2.5
630		34.7	33	1.7
800		32.9	32	0.9
1k		24.6	31	
1.25k	<	19.9	28	
1.6k	<	17.4	25	
2k	<	16.4	22	
2.5k	<	13.9	19	
3.15k	<	12.0	16	
				Total
L'nT,w		34		29.0



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FIELD IMPACT SOUND INSULATION - TEST CERTIFICATE

Test 4 of 5

6.5mm SPC Hybrid

3mm GE Cork and Rubber

ADDRESS:	Unit 204, 201 Breton StCoopers Plains QLD 4108	**PN:**	6581
Test Location:	Unit 204 Living Room to Unit 104 Living Room	**Meas. Date:**	5-Feb-2026
		Meas. Parameter:	Leq
Client:	Peter Hutchings	**Tapping Machine:**	B & K
Test Performed:	Emmanuel John, Jasli Benevice	**Receiving Room Volume:**	100 m^3

DESCRIPTION OF FLOOR AND SPECIMEN

		No. of Source posn:	2
		Mic. posn:	2 sweeps
Test Surface:	6.5mm SPC Hybrid	**RT meas:**	3 Imp.
Underlay:	3mm GE Cork and Rubber	**SLM:**	B & K 2250
Adhesive:		**Calibrator:**	B & K 4231
Ceiling:			
Slab:			

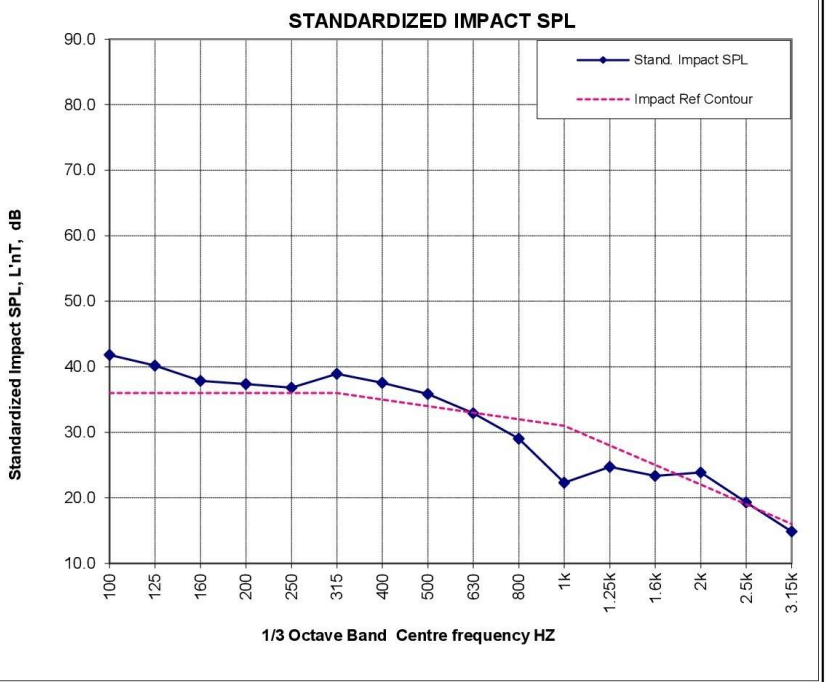
Weighted Standardized Impact SPL

Results standardized to a RT of 0.5 seconds

L'nT,w 34

ISO 16283-2:2020 & 717-2:2020

Centre Frequency		Stand. Impact SPL	Impact Ref Contour	Deficiencies
Hz		dB	dB	dB
100		41.8	36	5.8
125		40.2	36	4.2
160		37.8	36	1.8
200		37.4	36	1.4
250		36.8	36	0.8
315		38.9	36	2.9
400		37.5	35	2.5
500		35.8	34	1.8
630		32.9	33	
800		29.0	32	
1k	<	22.3	31	
1.25k		24.7	28	
1.6k		23.4	25	
2k		23.9	22	1.9
2.5k		19.3	19	0.3
3.15k	<	14.8	16	
				Total
L'nT,w		34		23.5



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FIELD IMPACT SOUND INSULATION - TEST CERTIFICATE

Test 5 of 5

6.5mm SPC Hybrid(Loose Laid)

ADDRESS:	Unit 204, 201 Breton StCoopers Plains QLD 4108	**PN:**	6581	
Test Location:	Unit 204 Living Room to Unit 104 Living Room	**Meas. Date:**	5-Feb-2026	
		Meas. Parameter:	Leq	
Client:	Peter Hutchings	**Tapping Machine:**	B & K	
Test Performed:	Emmanuel John, Jasli Benevice	**Receiving Room Volume:**	100	m^3

DESCRIPTION OF FLOOR AND SPECIMEN

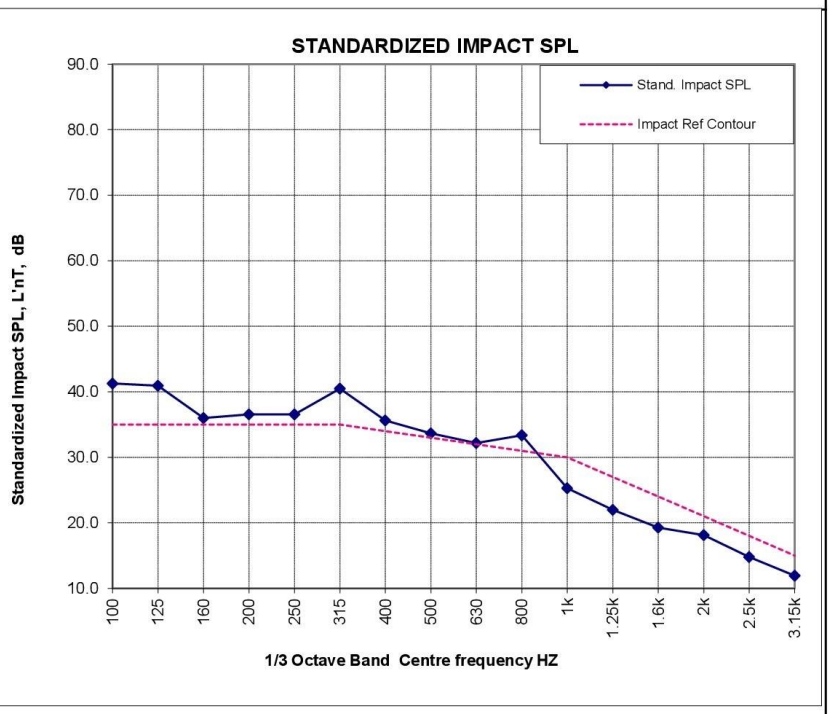
		No. of Source posn:	2	
Test Surface:	6.5mm SPC Hybrid(Loose Laid)	**Mic. posn:**	2	sweeps
		RT meas:	3	Imp.
Underlay:		**SLM:**	B & K 2250	
Adhesive:		**Calibrator:**	B & K 4231	
Ceiling:				
Slab:				

Weighted Standardized Impact SPL

Results standardized to a RT of 0.5 seconds

L'nT,w 33

Centre Frequency		Stand. Impact SPL	Impact Ref Contour	Deficiencies
Hz		dB	dB	dB
100		41.3	35	6.3
125		40.9	35	5.9
160		36.0	35	1.0
200		36.5	35	1.5
250		36.5	35	1.5
315		40.5	35	5.5
400		35.6	34	1.6
500		33.7	33	0.7
630		32.2	32	0.2
800		33.4	31	2.4
1k		25.3	30	
1.25k	<	22.0	27	
1.6k	<	19.3	24	
2k	<	18.1	21	
2.5k	<	14.8	18	
3.15k	<	11.9	15	
				Total
L'nT,w		33		26.6



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