



REPORT R230179OC1

Revision 0

Acoustic Flooring Inspection Existing Residence

Unit 5, Sequoia Units – 15 Diggings Terrace, Thredbo

PREPARED FOR:

Kent Walker

30 March 2023



Acoustic Flooring Inspection

Existing Residence

Unit 5, Sequoia Units – 15 Diggings Terrace,
Thredbo

PREPARED BY:

Rodney Stevens Acoustics Pty Ltd

Telephone: 61 2 9943 5057 Facsimile 61 2 9475 1019

Email: info@rodneystevensacoustics.com.au

Web: www.rodneystevensacoustics.com.au

DISCLAIMER

Reports produced by Rodney Stevens Acoustics Pty Ltd are prepared for a particular Client's objective and are based on a specific scope, conditions and limitations, as agreed between Rodney Stevens Acoustics and the Client. Information and/or report(s) prepared by Rodney Stevens Acoustics may not be suitable for uses other than the original intended objective. No parties other than the Client should use any information and/or report(s) without first conferring with Rodney Stevens Acoustics.

The information and/or report(s) prepared by Rodney Stevens Acoustics should not be reproduced, presented or reviewed except in full. Before passing on to a third party any information and/or report(s) prepared by Rodney Stevens Acoustics, the Client is to fully inform the third party of the objective and scope and any limitations and conditions, including any other relevant information which applies to the material prepared by Rodney Stevens Acoustics. It is the responsibility of any third party to confirm whether information and/or report(s) prepared for others by Rodney Stevens Acoustics are suitable for their specific objectives.

DOCUMENT CONTROL

Reference	Status	Date	Prepared	Checked	Authorised
R230179OC1	Revision 0	30 March 2023	Rodney Stevens	-	Rodney Stevens



TABLE OF CONTENTS

1	INTRODUCTION	4
2	SITE REQUIREMENTS	4
2.1	National Construction Code (NCC)	4
3	NATIONAL CONSTRUCTION CODE (NCC) ASSESSMENT	5
4	DISCUSSION	5
5	RECOMMENDATIONS	5
6	CONCLUSION	6
	APPENDIX A – ACOUSTIC TERMINOLOGY	7



1 INTRODUCTION

Rodney Stevens Acoustics Pty Ltd (RSA) has been engaged by Kent Walker to prepare an assessment of the newly installed flooring system at Unit 5, Sequoia Units – 15 Diggings Terrace, Thredbo.

This assessment has been prepared in accordance with Part F5, sound transmission and insulation of the NCC (BCA).

Specific acoustic terminology is used in this report. An explanation of common acoustic terms is provided in Appendix A.

2 SITE REQUIREMENTS

2.1 National Construction Code (NCC)

It is necessary to safeguard future occupants from loss of amenity as a result of undue sound being transmitted between adjoining sole-occupancy premises and also from common spaces into sole-occupancy premises.

NCC (formerly BCA) section F5 provides insulation requirements for inter-tenancy walls and floors for Class 2 buildings are as follows:

FV5.1

Compliance with FP5.1 and FP5.3 to avoid the transmission of airborne and impact generated sound through floors is verified when it is measured in-situ that the separating floor has—

(b) impact: a weighted standardised impact sound pressure level with spectrum adaptation term ($L_{nT,w}$) not more than 62 when determined under AS/ISO 717.2.



3 NATIONAL CONSTRUCTION CODE (NCC) ASSESSMENT

NTEK – TPM Pro tapping machine was used to generate a standardized impact sound source. The transmitted sound was then characterized by measuring the one-third octave band spectrum of the average sound pressure level in the receiving room, produced by the sound sources. NTEK – TPM Pro tapping machine was used to generate a standardized impact sound source.

Reverberation time was measured in the receive room using the balloon source method and a Bruel & Kjaer 2250 sound level meter (serial number 3011625). Measurements were also taken in the receiver room without the noise source operating to determine the background level.

This testing procedure carried out in general accordance with the following Standards:

ISO 140 – 7: 1998 – “Acoustics – measurement of sound insulation in buildings and of building elements – Part 7: Field measurement of impact sound insulation of floors.”

The following table presents the LnT,w results for the intertenancy floors.

Table 3-1 Measured LnT,w Results

Source	Receiver	Measured LnT,w	Criteria LnT,w	Compliance
5 (living room)	3 (living room)	41	<62	Yes
5 (bed room)	3 (bed room)	57	<62	Yes
5 (staircase)	3 (living room)	69	<62*	No

*No specific criterion exists for staircases passing through multiple units within a residential development. RSA has selected the minimum NCC requirements for flooring for the staircase.

Compliance has been achieved the NCC requirements assuming that all the remaining floor constructions have the same quality of workmanship as those tested.

4 DISCUSSION

This assessment has been undertaken after complaints have been made by neighbouring Units regarding the level of noise coming from the new flooring installed in Unit 5. The flooring is currently comprised of tiles throughout the entire Unit.

Testing has been carried out in both living areas and bedrooms and the results show compliance in both these areas.

Further testing has also been done in relation to the stairs in Unit 5, adjacent to the living rooms of both Units 3 and 4. These stairs are currently tiled with no acoustic underlay. RSA recommends acoustic treatment for the staircase to reduce the negative impact on the amenity of nearby neighbours.

5 RECOMMENDATIONS

It is recommended that the stairs in Unit 5 are treated with minimum 5mm Regupol Sonus Core acoustic underlay and carpet. Other underlays may be used upon consultation with RSA. A LnT,w rating of minimum 45 is predicted after the underlay and carpet have been installed and no negative impact on the amenity of nearby neighbours is expected.



6 CONCLUSION

Rodney Stevens Acoustics Pty Ltd has carried out an inspection of the new flooring at Unit 5, Sequoia Units – 15 Diggings Terrace, Thredbo.

Measurements have been carried out of the performance of the newly installed flooring from Unit 5 into Unit 3 for both the bedrooms and living areas. While compliance was measured for the flooring, the staircase within Unit 5 was found to be causing excessive noise from it's use and acoustic treatment has been recommended within this report to reduce negative impact on the amenity of nearby neighbours.

Approved:-

Rodney Stevens

Manager/Principal

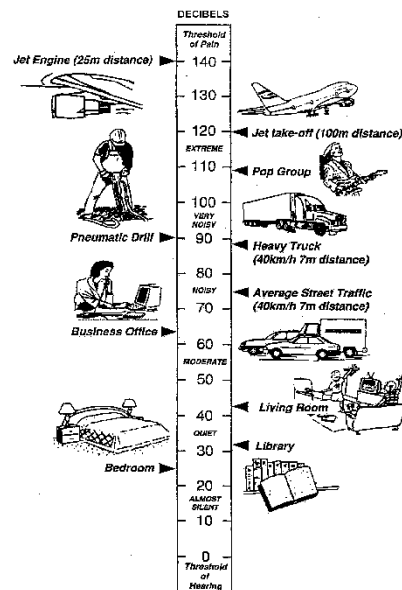


Appendix A – Acoustic Terminology

A-weighted sound pressure	The human ear is not equally sensitive to sound at different frequencies. People are more sensitive to sound in the range of 1 to 4 kHz (1000 – 4000 vibrations per second) and less sensitive to lower and higher frequency sound. During noise measurement an electronic ' <i>A-weighting</i> ' frequency filter is applied to the measured sound level <i>dB(A)</i> to account for these sensitivities. Other frequency weightings (B, C and D) are less commonly used. Sound measured without a filter is denoted as linear weighted <i>dB(linear)</i> .
Ambient noise	The total noise in a given situation, inclusive of all noise source contributions in the near and far field.
Community annoyance	<p>Includes noise annoyance due to:</p> <ul style="list-style-type: none">■ character of the noise (e.g. sound pressure level, tonality, impulsiveness, low-frequency content)■ character of the environment (e.g. very quiet suburban, suburban, urban, near industry)■ miscellaneous circumstances (e.g. noise avoidance possibilities, cognitive noise, unpleasant associations)■ human activity being interrupted (e.g. sleep, communicating, reading, working, listening to radio/TV, recreation).
Compliance	The process of checking that source noise levels meet with the noise limits in a statutory context.
Cumulative noise level	The total level of noise from all sources.
Extraneous noise	Noise resulting from activities that are not typical to the area. Atypical activities may include construction, and traffic generated by holiday periods and by special events such as concerts or sporting events. Normal daily traffic is not considered to be extraneous.
Feasible and reasonable measures	<p>Feasibility relates to engineering considerations and what is practical to build; reasonableness relates to the application of judgement in arriving at a decision, taking into account the following factors:</p> <ul style="list-style-type: none">■ Noise mitigation benefits (amount of noise reduction provided, number of people protected).■ Cost of mitigation (cost of mitigation versus benefit provided).■ Community views (aesthetic impacts and community wishes).■ Noise levels for affected land uses (existing and future levels, and changes in noise levels).
Impulsiveness	Impulsive noise is noise with a high peak of short duration or a sequence of these peaks. Impulsive noise is also considered annoying.



Low frequency	Noise containing major components in the low-frequency range (20 to 250 Hz) of the frequency spectrum.
Noise criteria	The general set of non-mandatory noise levels for protecting against intrusive noise (for example, background noise plus 5 dB) and loss of amenity (e.g. noise levels for various land use).
Noise level (goal)	A noise level that should be adopted for planning purposes as the highest acceptable noise level for the specific area, land use and time of day.
Noise limits	Enforceable noise levels that appear in conditions on consents and licences. The noise limits are based on achievable noise levels, which the proponent has predicted can be met during the environmental assessment. Exceedance of the noise limits can result in the requirement for either the development of noise management plans or legal action.
Performance-based goals	Goals specified in terms of the outcomes/performance to be achieved, but not in terms of the means of achieving them.
Rating Background Level (RBL)	The rating background level is the overall single figure background level representing each day, evening and night time period. The rating background level is the 10 th percentile min L _{A90} noise level measured over all day, evening and night time monitoring periods.
Receptor	The noise-sensitive land use at which noise from a development can be heard.
Sleep disturbance	Awakenings and disturbance of sleep stages.
Sound and decibels (dB)	<p>Sound (or noise) is caused by minute changes in atmospheric pressure that are detected by the human ear. The ratio between the quietest noise audible and that which should cause permanent hearing damage is a million times the change in sound pressure. To simplify this range the sound pressures are logarithmically converted to decibels from a reference level of 2×10^{-5} Pa.</p> <p>The picture below indicates typical noise levels from common noise sources.</p>



dB is the abbreviation for decibel – a unit of sound measurement. It is equivalent to 10 times the logarithm (to base 10) of the ratio of a given sound pressure to a reference pressure.

Sound power Level (SWL)

The sound power level of a noise source is the sound energy emitted by the source. Notated as SWL, sound power levels are typically presented in $dB(A)$.

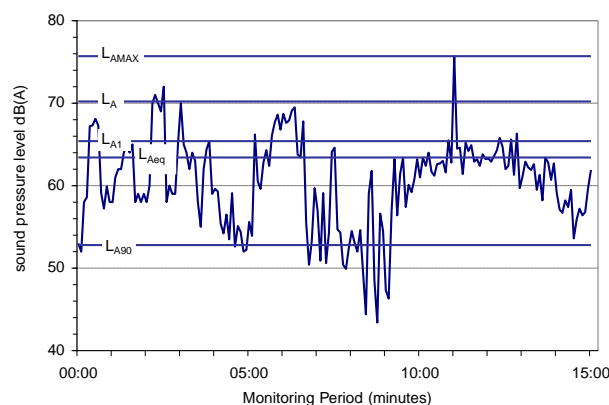
Sound Pressure Level (SPL)

The level of noise, usually expressed as SPL in $dB(A)$, as measured by a standard sound level meter with a pressure microphone. The sound pressure level in $dB(A)$ gives a close indication of the subjective loudness of the noise.

Statistic noise levels

Noise levels varying over time (e.g. community noise, traffic noise, construction noise) are described in terms of the statistical exceedance level.

A hypothetical example of A weighted noise levels over a 15 minute measurement period is indicated in the following figure:



Key descriptors:

L_{Amax} Maximum recorded noise level.

L_{A1} The noise level exceeded for 1% of the 15 minute interval.



	<p>L_{A10} Noise level present for 10% of the 15 minute interval. Commonly referred to the average maximum noise level.</p> <p>L_{Aeq} Equivalent continuous (energy average) A-weighted sound pressure level. It is defined as the steady sound level that contains the same amount of acoustic energy as the corresponding time-varying sound.</p> <p>L_{A90} Noise level exceeded for 90% of time (background level). The average minimum background sound level (in the absence of the source under consideration).</p>
Threshold	<p>The lowest sound pressure level that produces a detectable response (in an instrument/person).</p>
Tonality	<p>Tonal noise contains one or more prominent tones (and characterised by a distinct frequency components) and is considered more annoying. A 2 to 5 dB(A) penalty is typically applied to noise sources with tonal characteristics</p>