RODNEY STEVENS ACOUSTICS

REPORT R241080R1

Revision 0

Noise Impact Assessment
Proposed Child Care Centre
2 Collinson Street, Tenambit

PREPARED FOR:

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26 June 2025

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Noise Impact Assessment

Proposed Child Care Centre

2 Collinson Street, Tenambit

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R241080R1	Revision 0	26 June 2025	Mark Detera	Desmond Raymond	Desmond Raymond

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1 INTRODUCTION

Rodney Stevens Acoustics Pty Ltd (RSA) has been engaged by SS Estate Pty Ltd to prepare a Noise Impact Assessment Report for the proposed Child Care Centre to be located at 2 Collinson Street, Tenambit.

This report details the results of a noise survey and assesses the likely impact of noise (principally from traffic noise) incident upon the proposed Child Care Centre as well as noise from the proposed Child Care Centre upon nearby residential premises.

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

2 PROPOSED DEVELOPMENT

2.1 Development Site

The proposed Child Care Centre is to be located at 2 Collinson Street, Tenambit. The development site is bounded by residential dwellings to the west and east, Goodhugh Street & David Avenue to the to the west, Collinson Street to the south and vacant lot to the north. The development site and its surrounding environment are mainly influenced by traffic noise from Collinson Street.

Figure 2-1 shows an aerial image of the site area and the surrounding environment.

Figure 2-1 Site Location

Aerial image courtesy of Google Maps © 2025

The following figure presents the proposed Child Care Centre Layout:

Figure 2-2 Proposed Child Care Centre Layout – Lower Ground

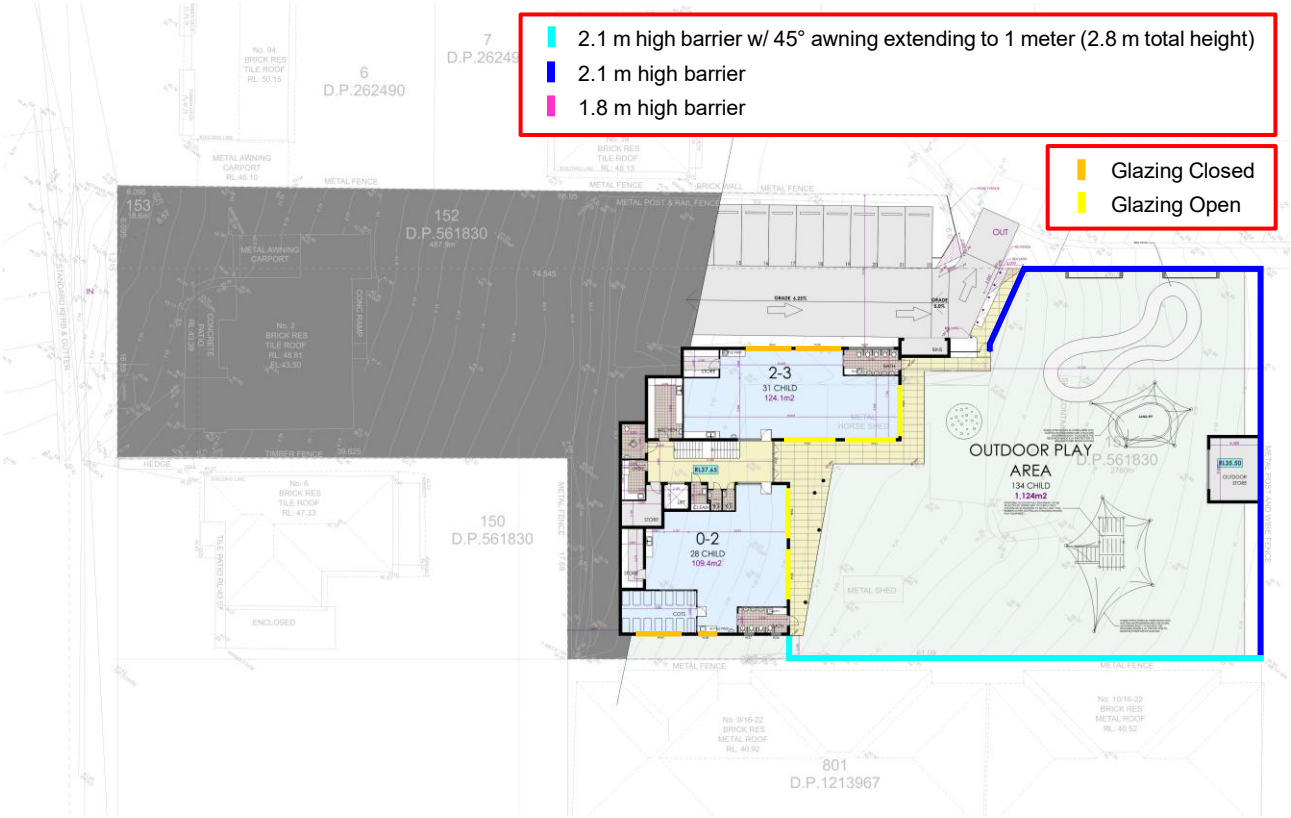
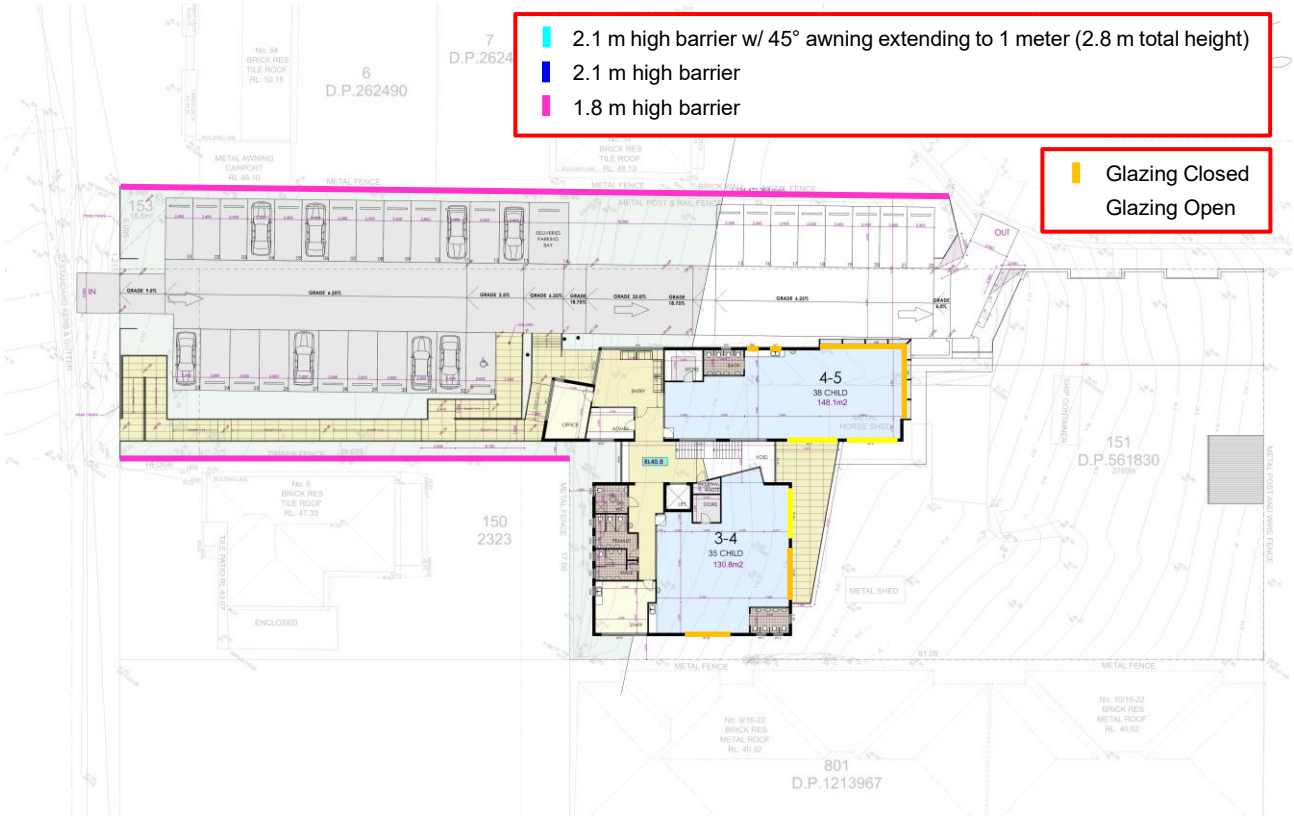


Figure 2-3 Proposed Child Care Centre Layout – Ground Floor



The proposal is to construct a double storey childcare centre. The building will have 1 outdoor play area as well as a ground level carpark.

2.2 Hours of Operation

The following hours of operation are proposed:

- Monday to Friday 7:00 am until 6:00 pm

2.3 Enrolment Numbers

The proposed Child Care Centre plans to cater for up to 132 children between the ages of 0 and 5 years of age. The number of children and their age groups are as follows:

- 0-2 years old - 28 Children
- 2-3 years old - 31 Children
- 3-4 years old - 35 Children
- 4-5 years old - 38 Children

2.4 Outdoor Play Activities

In RSA's experience with Child Care Centres, potential noise issues occur primarily when children are engaged in outdoor play activities, in terms of intrusive environmental noise to the play areas and play area noise to nearby sensitive receivers.

3 BASELINE NOISE SURVEY

3.1 Unattended Noise Monitoring

In order to characterise the existing acoustical environment of the area, unattended noise monitoring was conducted between Thursday 13th March and Thursday 20th March 2025 at the logging location shown in Figure 2-1. Logger 1 was located on the back yard of the site. The noise monitoring at this location is representative of the ambient noise of the area.

Logger 2 was located in the front yard of the site. The noise monitoring at this location is representative traffic noise from Collinson Street.

Logger locations were selected with consideration to other noise sources which may influence readings, security issues for noise monitoring equipment and gaining permission for access from other landowners.

Instrumentation for the survey comprised of 2 RION NL-42EX environmental noise loggers (serial numbers 00441418 and 003227761) fitted with microphone windshields. Calibration of the loggers was checked prior to and following measurements. Drift in calibration did not exceed ±0.5 dB(A). All equipment carried appropriate and current NATA (or manufacturer) calibration certificates. Upon consultation with historical weather reports provided by the Bureau of Meteorology, no measured data was affected by adverse weather.

The logger determines L_{A1}, L_{A10}, L_{A90} and L_{Aeq} levels of the ambient noise. L_{A1}, L_{A10}, L_{A90} are the levels exceeded for 1%, 10% and 90% of the sample time respectively (see Glossary for definitions in Appendix A). Detailed results at the monitoring location are presented in graphical format in Appendix B. The graphs show measured values of L_{A1}, L_{A10}, L_{A90} and L_{Aeq} for each 15-minute monitoring period.

3.2 Data Processing

3.2.1 Noise Emissions (Noise Policy for Industry)

In order to assess noise emission from the proposed child care centre, the data obtained from the noise logger has been processed in accordance with the procedures contained in the NSW Environmental Protection Authority's (EPA) *Noise Policy for Industry* (NPfI, 2017) to establish representative noise levels that can be expected in the residential vicinity of the site. The monitored baseline noise levels are detailed in Table 3-1.

Table 3-1 Measured Baseline Noise Levels Corresponding to Defined NPfI Periods

Location	Measurement Descriptor	Measured Noise Level – dB(A) re 20 µPa		
		Daytime 7 am - 6 pm	Evening 6 pm – 10 pm	Night-time 10 pm – 7 am
Logger at northwestern side of the site	L_{Aeq}	50	59	52
	RBL (Background)	37	38	34

Notes: All values expressed as dB(A) and rounded to nearest 1 dB(A);

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.

L_{A90} Noise level present for 90% of time (background level). The average minimum background sound level (in the absence of the source under consideration).

3.2.2 Traffic Noise Intrusion (*Road Noise Policy*)

To assess noise intrusion into the outdoor play areas and internal areas of the Child Care Centre, the data obtained from the logger location has been processed to establish representative ambient noise levels from Collinson Street.

The time periods used for this assessment are as defined in the EPA's *Road Noise Policy* (RNP, 2011). Results are presented below in Table 3-2.

Table 3-2 Traffic Noise Levels Corresponding to Defined RNP Periods

Location	Period	External Noise Levels dB(A)
Southern Facade	1 Hour	$L_{Aeq(1hour)}$ 58 dB
Southern Facade	24 Hour	$L_{Aeq(24hour)}$ 54 dB

4 NOISE GUIDELINES AND CRITERIA

4.1 Operational Noise From Child Care Centre

A guideline for the assessment of noise from child care centres has been prepared by the Association of Australian Acoustical Consultants (AAAC). The document, *AAAC Technical Guideline Child Care Centre Noise Assessment V3.0*, provides criteria for the assessment of noise intrusion into and noise emissions from Child Care Centres and also provides recommendations for treatment to minimise acoustical impacts upon neighbouring premises.

Since the time in which children are involved in outdoor play can be limited, the potential impact associated with these noise emissions reduces. The AAAC considers a total limit of 4 hours outdoor play per day (typically 2 hours in the morning and 2 hours in the afternoon) reasonable to apply a criterion of $L_{Aeq(15minute)}$ noise level emitted from the outdoor play area not exceed the background noise level by more than 10 dB at the assessment location. However, if the proposed outdoor play time is more than 4 hours per day, the $L_{Aeq(15minute)}$ noise level emitted from the outdoor play area must not exceed the background noise level by more than 5 dB at the assessment location.

Where the measured ambient noise level of a particular area is below 40 dB(A), the AAAC provides a specific base criterion in Section 3.2.1 of the guidelines. A base criterion of a contributed $L_{eq,15min}$ 45 dB(A) for the assessment of outdoor play is recommended in locations where the background noise level is less than 40 dB(A). In this case the noise criteria for outdoor play area noise is **45 dB(A)**.

4.1.1 Road Noise Intrusion to Outdoor Playground

For the assessment of road traffic noise impact on the outdoor play areas, the Association of Australian Acoustical Consultants (AAAC). The document, *AAAC Technical Guideline Child Care Centre Noise Assessment V3.0* has been used to determine the appropriate noise level. In accordance with the AAAC, the noise criterion for outdoor play areas is as follow:

- Outdoor play areas – $L_{Aeq,(1hour)}$ 55 dB(A) (external).

4.1.2 Noise Intrusion to Indoor Areas

For the assessment of road traffic noise impact on the indoor play areas, the Association of Australian Acoustical Consultants (AAAC). The document, *AAAC Technical Guideline Child Care Centre Noise Assessment V3.0* has been used to determine the appropriate noise level. In accordance with the AAAC, the noise criterion for outdoor play areas is as follow:

- Indoor play areas – $L_{Aeq,(1hour)}$ 40 dB(A) (internal).
- Sleeping areas – $L_{Aeq,(1hour)}$ 35 dB(A) (internal)

4.1.3 Other Noise Emissions

Based on Section 3.2.2 of the AAAC guidelines, the cumulative $L_{eq,15\ minute}$ noise emission level resulting from the use and operation of the child care centre, with the exception of noise emission from outdoor play shall not exceed the background noise level by more than 5 dB at the assessment location. This includes the noise emission resulting from:

- Indoor play
- Mechanical plant
- Drop off and pick up
- Other activities/operations (not including outdoor play).

4.1.4 Other Sensitive Receivers

The NSW EPA's Noise policy for Industry (NPfI) provides noise criteria for non-residential sensitive receivers the specific noise criteria is presented below:

Table 4-1 Other Sensitive Receivers – Noise Criteria

Receiver	Time of Day	Recommended L_{Aeq}
School Classrooms – Internal	When in Use	35
Hospital Ward – Internal and External	Noisiest 1 Hour	35/50
Places of Worship – Internal	When in Use	40

The following table presents a summary of the noise criteria required for each activity generated by the childcare centre.

Table 4-2 Noise Criteria Summary

Activity	Noise Criteria $L_{Aeq(T)}$
External Noise	
Outdoor Play	45
Indoor Play	42
Carpark	42
Mechanical	42
Other activities/operations (not including outdoor play)	42
Internal Noise	
Indoor Play Areas	40
Sleeping Areas	35

5 NOISE IMPACT ASSESSMENT

5.1 Road Traffic Noise Intrusion into Centre

5.1.1 Outdoor Play Area

Based on the measured road traffic noise level of $L_{Aeq(1hour)}$ 58 dB(A) from Collinson Street, the predicted traffic noise impacts at the outdoor play areas are presented in Table 5-1.

The following assumptions have been made in the noise modelling of the road traffic noise impacts on the outdoor play areas:

- 2.1 meters high solid barrier with 45° awning extending to 1 meter (2.8 meters total height) and 2.1 meters high solid barrier are in place along the boundaries (Refer to Figure 2-2).
- The height of children between the ages of 0 and 3 years have an average height of 1 meter, children 3 and 5 have an average height of 1 metre;
- The outdoor play areas are located to the north of the site and it is shielded by the child care building.
- Road traffic noise impacts have been modelled from the centre line of the road to approximately the middle of the outdoor play areas.

Table 5-1 Predicted Road Traffic Noise Levels Into Outdoor Play Areas

Area	Predicted L_{Aeq} Road Traffic Noise Level – dB(A)	Noise Criterion L_{Aeq} – dB(A)	Compliance (Yes / No)
Outdoor Play Area – Lower Ground	49	55	Yes

Existing road traffic noise levels in the Outdoor Play areas are predicted to comply with the $L_{Aeq,(1hour)}$ 55 dB(A) (external) criterion stipulated in Section 4.1.1. Based on this assessment no additional no control measures will be required.

5.1.2 Indoor Areas

The typical outdoor to indoor noise reductions provided by most standard glazed facades (i.e. without special acoustical treatment) is generally accepted as being 10 dB(A) through an open window and in the order of 20 dB(A) with windows closed.

The facade road traffic noise at the proposed child care centre building is calculated to be $L_{Aeq(1hour)}$ 58 dB(A) on the southern facade. Taking into account the distance, shielding and glazing performance, the resultant indoor noise levels for opened and closed windows at the northern facade, corresponding to the typical noise reductions are as follow:

Table 5-2 Predicted Road Traffic Noise Levels Into Indoor Areas

Area	Predicted L_{Aeq} Road Traffic Noise Level – dB(A)		Noise Criterion L_{Aeq} – dB(A)	Compliance (Open / Closed)
	Windows Open	Windows Closed		
0-2 Room	30	20	40	Open
2-3 Room	34	24	40	Open
3-4 Room	32	22	40	Open
4-5 Room	44	34	40	Closed
COT	37	27	35	Closed

The predicted internal noise levels are likely to exceed the 40 dB(A) criteria as required by *AAAC Technical Guideline Child Care Centre Noise Assessment V2.0* with windows opened for some areas (Refer to Figure 2-2 and Figure 2-3). Therefore, the following glazing - W6, W7, W8, W9, W14, W18, W28, W38, W39 & W40 must remain closed in order to comply with the criteria.

5.2 Mechanical Plant Noise Assessment

Mechanical ventilation may be installed at the proposed childcare centre, the operation of such mechanical plant must be in accordance with the relevant regulations such as the Building Code of Australia (BCA Vol.1, Part 4.5 *Ventilation of rooms*) and AS1668.2-2002 *The use of ventilation and air conditioning in buildings* will be required.

A specific mechanical plant selection has not been supplied at this stage. It is anticipated that the building will be serviced by typical mechanical ventilation/air conditioning equipment.

It is likely that the relevant noise criteria may be met through the use of conventional noise control methods (e.g. selection of equipment on the basis of quiet operation and, where necessary, providing enclosures, localised barriers, silencers and lined ductwork).

An appropriately qualified acoustic consultant should review the mechanical plant associated with the development at the detailed design stage when final plant selections have been made.

5.3 Operational Noise Emissions to Nearby Residences

5.3.1 Outdoor Play Activities Noise Impact

Potential noise management issues occur primarily when children are engaged in outdoor play activities. Noise generated by the children in the outdoor play area will occur at limited times throughout the day, with numbers of children playing and periods of play managed by the Centre staff.

The Association of Australian Acoustical Consultants (AAAC) technical guideline for Child Care Centre Noise Assessment V3.0 provides the following sound power levels (L_W) for various age groups of children

Table 5-3 Effective Sound Power Levels ($L_{Aeq,\ 15min}$) for Groups of 10 Children Playing

Noise Descriptor	Noise Level (dB) at Octave Band Centre Frequency (Hz)								
	63	125	250	500	1 k	2 k	4 k	8 k	Overall dB(A)
0 to 2 Years	54	60	66	72	74	71	67	64	78
2 to 3 Years	61	67	73	79	81	78	74	70	85
3 to 5 Years	64	70	75	81	83	80	76	72	87

If applicable, an adjustment to the above sound power levels of -6 dB could be applied in each age group for children involved in passive play.

Calculations have been made based on the spectra above assuming all the children will be playing outside at the one time. The levels were scaled to reflect the overall sound power levels presented by the AAAC to determine the likely noise levels at nearby receivers due to 132 children playing in the Outdoor Play area of the proposed Child Care Centre.

The following assumptions have been made in the noise modelling of the Outdoor Play areas noise impacts on the neighbouring residences:

- All 28 children between the ages of 0 and 2 with total sound power level of 82 dB(A), all 31 children between the ages of 2 and 3 with total sound power level of 89 dB(A), all 35 children between the ages of 3 and 4 with total sound power level of 92 dB(A) and all 38 children between the ages of 4 and 5 with total sound power level of 92 dB(A) will be playing in the proposed outdoor play area at one time;
- The height of the residential receivers has been assumed to be 1.5 metres for residential buildings on their respective level;
- Source height in the outdoor play area, i.e. children height, have been taken to be 1 meter from the ground;
- The proposed 2.1 meters high solid barriers with 45° awning extending to 1 meter (2.8 meters total height) and 2.1 meters high solid barriers (Refer to Figure 2-2) along the boundaries of the outdoor play area have been taken into account in the noise model;
- Resulting noise levels have been calculated to the most affected point on the boundary of the affected receivers.

The following figure shows the receiver locations in relation to the proposed Child Care Centre. Table 5-4 shows the address of each affected receiver

Figure 5-1 Receiver Locations

Table 5-4 Sensitive Receivers

Receiver	Number of Levels	Sensitive Receiver's Address
R1	2	39 Goodhugh Street
R2	1	49 David Avenue
R3	1	22 Colinson Street
R4	1	4 Collinson Street
R5	1	1 Collinson Street

The predicted noise levels experienced by nearest residential receivers are presented in Table 5-5 below. Noise levels have been calculated at the most affected boundary heights. The noise levels presented below are representative of the worst-case scenarios for receiver.

Table 5-5 Predicted Outdoor Play Activities Noise Emission

Receiver	Predicted Outdoor Play Activities Noise at Neighbouring Residents – dB(A)	Criteria	Compliance
R1	45	45	Yes
R2	46	45	Yes*
R3	46	45	Yes*
R4	32	45	Yes
R5	34	45	Yes

* We note that an exceedance of 1 dB(A) is generally regarded as being acoustically insignificant

Noise from the outdoor play activities at the surrounding residences is predicted to comply with the 45 dB(A) criterion with scenario presented above.

Based on the above assessment of the outdoor play activities noise emissions, 2.1 meters high solid barriers with 45° awning extending to 1 meter (2.8 meters total height) and 2.1 meters high solid barriers must be implemented along the boundaries (Please refer to Section 6.4 for further details).

5.3.2 Noise Emissions from Indoor Activities

Calculations have been carried out to ascertain the noise breakout from indoor activities to the neighbouring premises. The predicted noise levels indicate that the noise criteria will not be exceeded if the windows are in the configuration shown in Figure 2-2 and Figure 2-3, the resulting noise levels are presented in Table 5-6 below. Noise levels have been calculated at the most affected boundary heights.

Table 5-6 Predicted Indoor Play Activities Noise Emission

Receiver	Predicted Indoor Play Activities Noise at Neighbouring Residents – dB(A)	Criteria	Compliance
R1	31	42	Yes
R2	30	42	Yes
R3	43	42	Yes*
R4	29	42	Yes
R5	25	42	Yes

* We note that an exceedance of 1 dB(A) is generally regarded as being acoustically insignificant

The assessment criterion for indoor play of 42 dB(A) can be achieved with the windows in the configuration shown in Figure 2-2 and Figure 2-3.

The glazing for the following windows – W6, W7, W8, W9, W14, W18, W28, W38, W39 & W40 must have a minimum Rw 32, all remaining glazing can be standard, we note that the R_w rating is required for the complete glazing and frame assembly. The minimum glazing thicknesses will not necessarily meet the required R_w rating without an appropriate frame system. It will be therefore necessary to provide a window glass and frame system having a laboratory tested acoustic performance meeting the specified requirements.

Noise emissions from indoor activities will comply the specific noise criteria at the neighbouring residential receivers with the internal layout proposed.

5.3.3 Carpark Emission

The proposed car park is to be located on the western side of the site, it has a capacity of 33 car spaces, calculations of noise from the carpark have been based on typical noise generating events within a carpark such as, door slams, engine starts and cars driving away. We have assumed a scenario where 15 cars enter or leave the carpark in a span of 15 minutes.

The sound power levels of the vehicle movements have been sourced from RSA's noise spectra library and include the following:

Table 5-7 Carpark Sound Power Levels

Activity	Sound Power Level dB(A)
Door Slam	83
Engine Start	76
Vehicle Pass By	85

The calculated noise levels from the activities carried out within the carpark are presented in the table below:

Table 5-8 Calculated Carpark Noise Levels

Receiver	Predicted Carpark Activities Noise at Neighbouring Residents – dB(A)	Criteria	Compliance
R1	34	42	Yes
R2	24	42	Yes
R3	< 20	42	Yes
R4	26	42	Yes
R5	22	42	Yes

We note that 1.8 meters high solid barriers on the carpark boundaries have been used for calculation purposes, please refer to Section 6.4.

5.3.4 Cumulative Noise Emissions

The following table presents the cumulative noise emissions from indoor play area, mechanical plant and carpark. These results assume that all these noise generating activities are occurring simultaneously.

Table 5-9 Cumulative Child Care Centre Noise Levels

Receiver	Predicted Cumulative Noise at Neighbouring Residents – dB(A)	Criteria	Compliance
R1	35	42	Yes*
R2	31	42	Yes

Receiver	Predicted Cumulative Noise at Neighbouring Residents – dB(A)	Criteria	Compliance
R3	43	42	Yes*
R4	30	42	Yes
R5	27	42	Yes

6 RECOMMENDATIONS

The following recommendations must be implemented in order to achieve compliance with the criteria requirements from Association of Australian Acoustical Consultants (AAAC) guidelines.

6.1 Outdoor Play Areas

In order to achieve compliance with council's noise requirements for outdoor play, the following must be implemented:

- All children can engage in outdoor play at a time.
- No music is to be played in the outdoor areas.
- Playground equipment that allows a child to be more than 0.5 above the ground level should not be used.
- Children must be supervised at all times.

6.2 Indoor Play Areas

In order to achieve compliance with council's noise requirements for outdoor play, the following must be implemented:

- The windows must follow the configuration shown in Figure 2-2 and Figure 2-3.
- The glazing for the windows W6, W7, W8, W9, W14, W18, W28, W38, W39 & W40 must have a minimum Rw 32, all remaining glazing can be standard.

6.3 Car Park Noise Control Measures

The following noise control measures and management plan should be implemented for the carpark space:

- Parents and guardians should be informed of the importance of noise minimisation when entering or exiting the site, dropping off or picking up children. This includes avoiding raising your voice within the centre's carpark area or beeping car horn.

6.4 Acoustic Barrier and Awning Details

2.1 meters high solid barriers with 45° awning extending to 1 meter (2.8 meters total height), 2.1 meters and 1.8 meters high solid barriers along the boundaries must be implemented (Refer to Figure 2-2 and Figure 2-3).

Acoustic barrier is required to provide the adequate noise attenuation, the construction material of the barriers must have a surface density of 15 kg/m^2 and be free from holes and gaps. Some suitable materials include:

- 25 mm thick plywood timber panelling
- 9 mm thick fibre cement sheet
- 75mm thick Hebel Powerpanel
- 12 mm thick Perspex, polycarbonate or Danpalon
- 6 mm toughened laminated safety glass
- Any other approved material which meets the above surface density specification

A typical material used in childcare centres is Perspex, which is a polycarbonate material. The use of the 12 mm thick Perspex or 6 mm glass for this purpose which has a surface mass of 14.3 kg/m^2 will meet the mass requirements detailed above and be suitable for use as it is transparent and will not unduly restrict light or vision.

All barriers must be free of gaps and penetrations and it is particularly important to ensure that the gap at the bottom of the barrier is minimised as far as practicable. The base of the barriers should be well sealed at the junction where the barrier meets the floor, but still be designed to allow proper water drainage.

7 CONCLUSION

Rodney Stevens Acoustics has conducted a review of the proposed childcare centre at 2 Collinson Street, Tenambit. The assessment has comprised the establishment of noise criteria and assesses noise impacts regarding relevant statutory requirements.

Noise emissions from the outdoor area play activities to the nearest residential receivers have been calculated to comply with the noise criterion, where all children are playing outside at any given time. 2.1 meters high solid barriers with 45° awning extending to 1 meter (2.8 meters total height) and 2.1 meters high solid barriers along the boundaries must be implemented to minimise the noise impact from the outdoor areas (Refer to Section 6.4).

Noise emissions from the indoor play activities to the nearest residential receivers have been calculated to comply with the noise criterion, with the window configurations shown in Figure 2-2 and Figure 2-3.

Noise emissions from the carpark to the nearest residential receivers have been calculated to comply with the noise criterion. 1.8 meters high solid barriers along the carpark boundaries must be erected (Refer to Section 6.4).

Traffic noise intrusion into the indoor areas has been assessed to exceed the noise criteria as set out in Section 4.1.1. Based on this assessment, the windows indicated in Figure 2-2 and Figure 2-3 must remain closed.

Criteria for noise emissions from mechanical plant have been established, a further acoustic survey by a qualified acoustic consultant will be required once mechanical plant schedules have been selected.

Based on our assessment the proposed Child Care Centre at 2 Collinson Street, Tenambit complies with the noise criteria provided that the noise control measures recommended is implemented. It is therefore recommended that planning approval be granted for the proposed development on the basis of acoustics.

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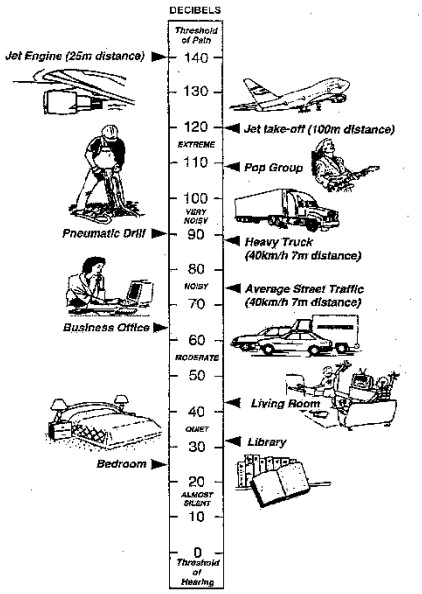
Director

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 '*A-weighting*' frequency filter is applied to the measured sound level *dB(A)* 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 dB(linear).
Ambient noise	The total noise in a given situation, inclusive of all noise source contributions in the near and far field.
Community annoyance	Includes noise annoyance due to: 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	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: 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 10th 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)	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 x 10-5 Pa. The picture below indicates typical noise levels from common noise sources.



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)*.

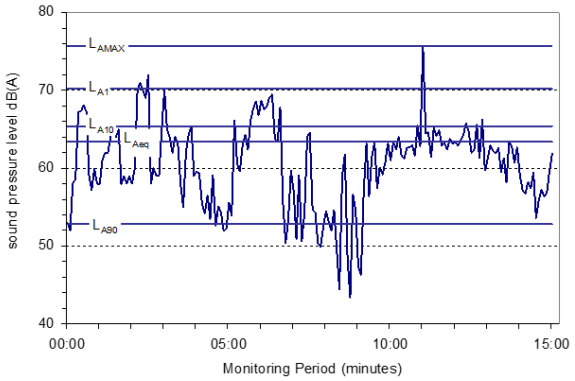
Sound Pressure Level (SPL)

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.

L_{A10} Noise level present for 10% of the 15 minute interval. Commonly referred to the average maximum noise level.

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.

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).

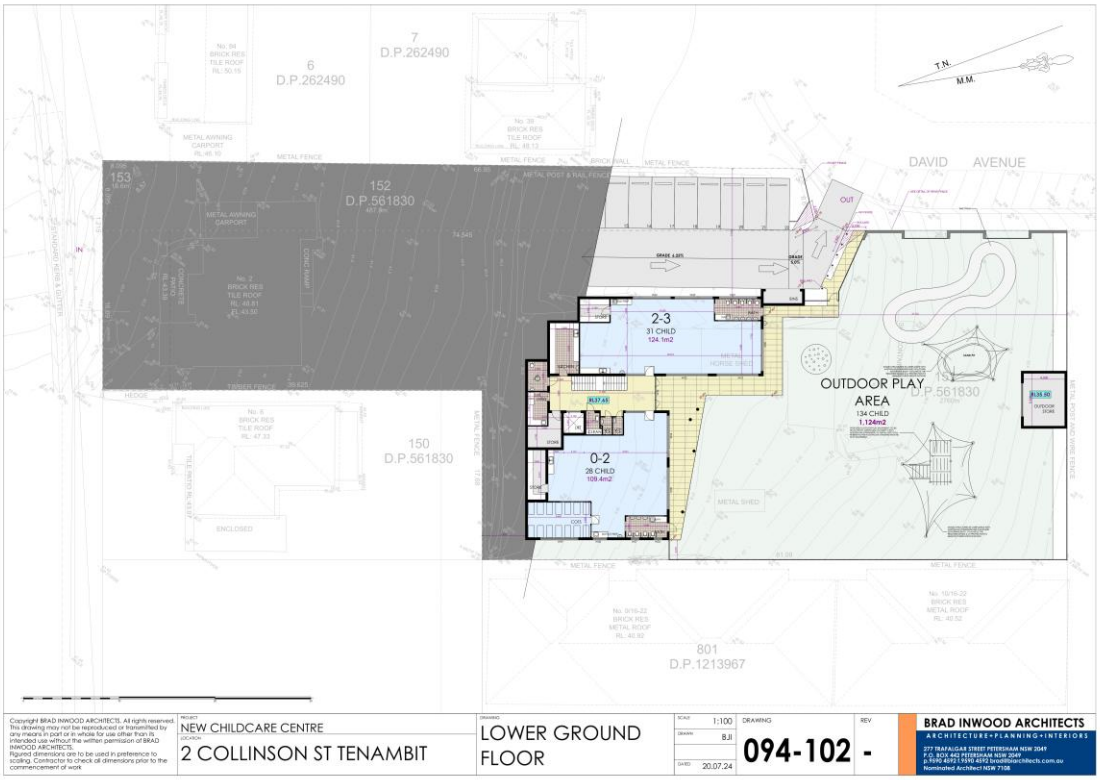
Threshold

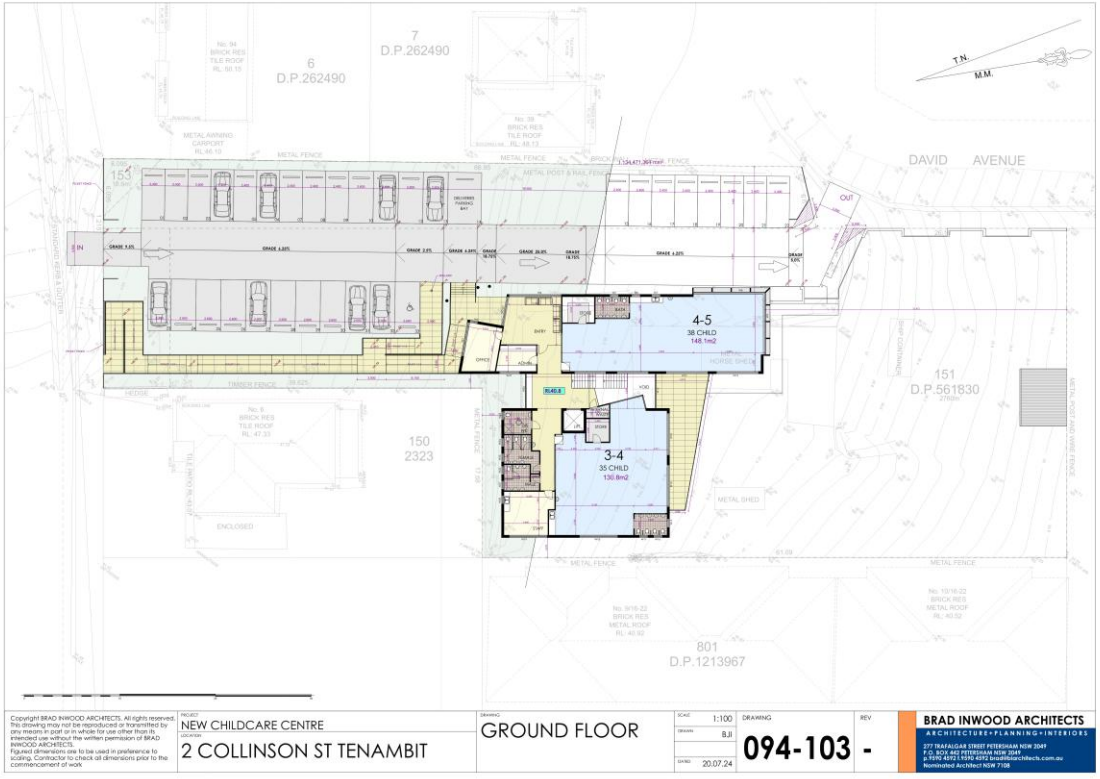
The lowest sound pressure level that produces a detectable response (in an instrument/person).

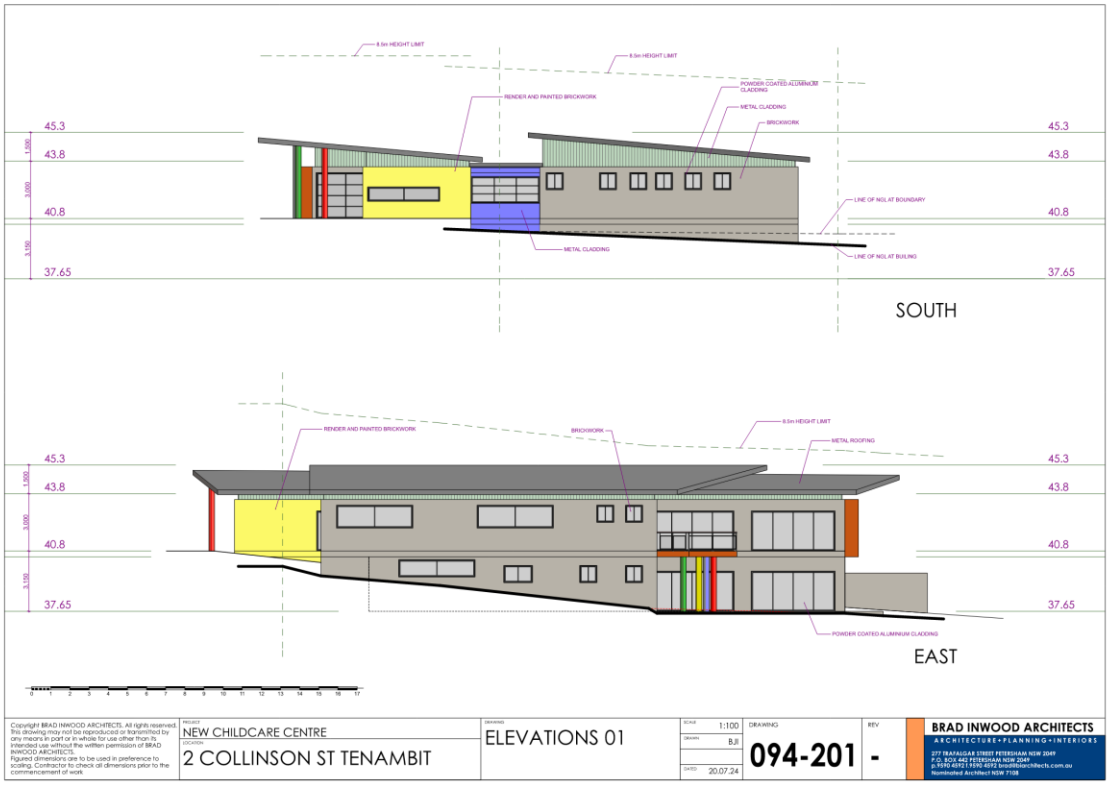
Tonality

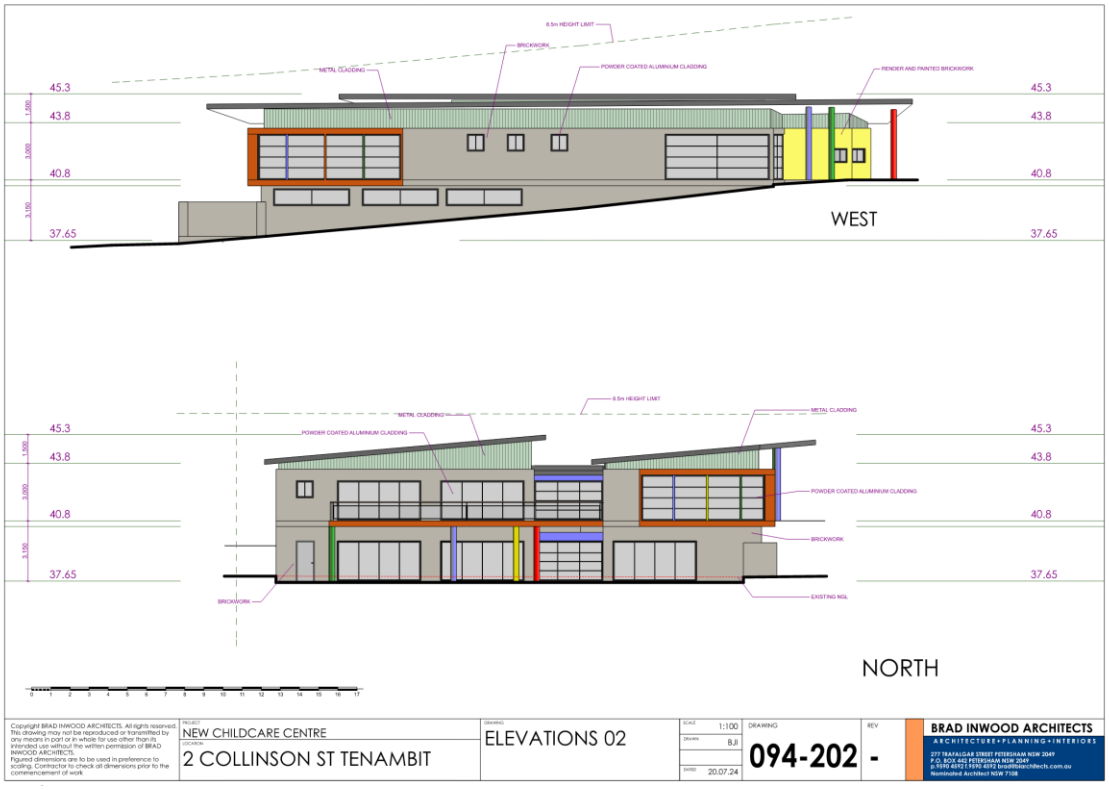
Tonal noise contains one or more prominent tones (and characterised by a distinct frequency components) and is considered more annoying. A 2 to 5 dB(A) penalty is typically applied to noise sources with tonal characteristics

Appendix B – Architectural Plans



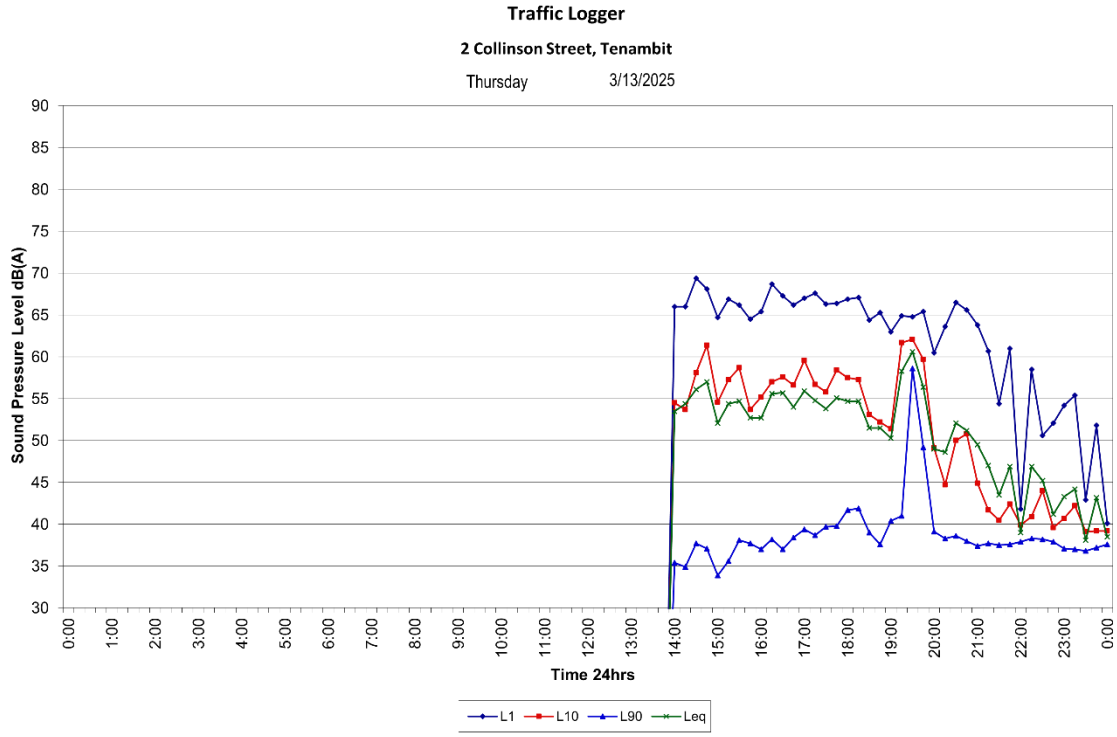


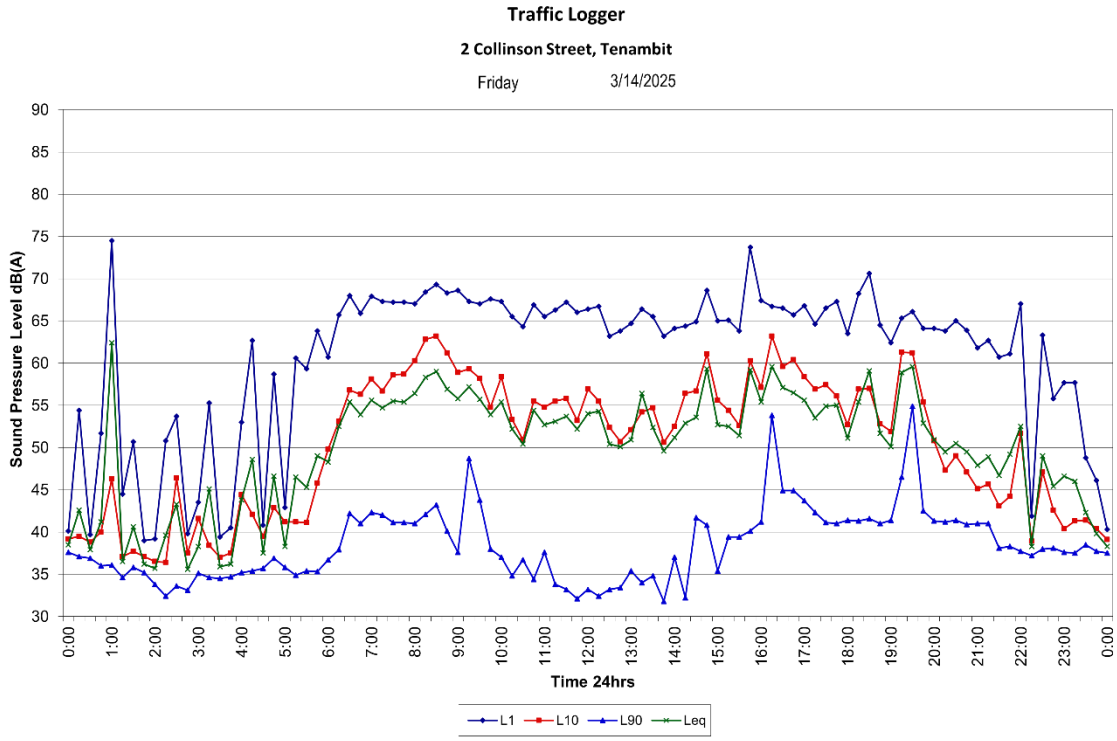

8.5m HEIGHT LIMIT
RENDER AND PAINTED BRICKWORK
POWDER COATED ALUMINIUM CLADDING
METAL CLADDING
BRICKWORK
LINE OF NGLAT BOUNDARY
LINE OF NGLAT BUILING
METAL CLADDING
45.3
43.8
40.8
37.65
1,500
3,000
3,150
SOUTH
RENDER AND PAINTED BRICKWORK
BRICKWORK
8.5m HEIGHT LIMIT
METAL ROOFING
POWDER COATED ALUMINIUM CLADDING
EAST
NEW CHILDCARE CENTRE
2 COLLINSON ST TENAMBIT
ELEVATIONS 01
1:100
8JI
20.07.24
094-201
-
BRAD INWOOD ARCHITECTS
ARCHITECTURE+PLANNING+INTERIORS

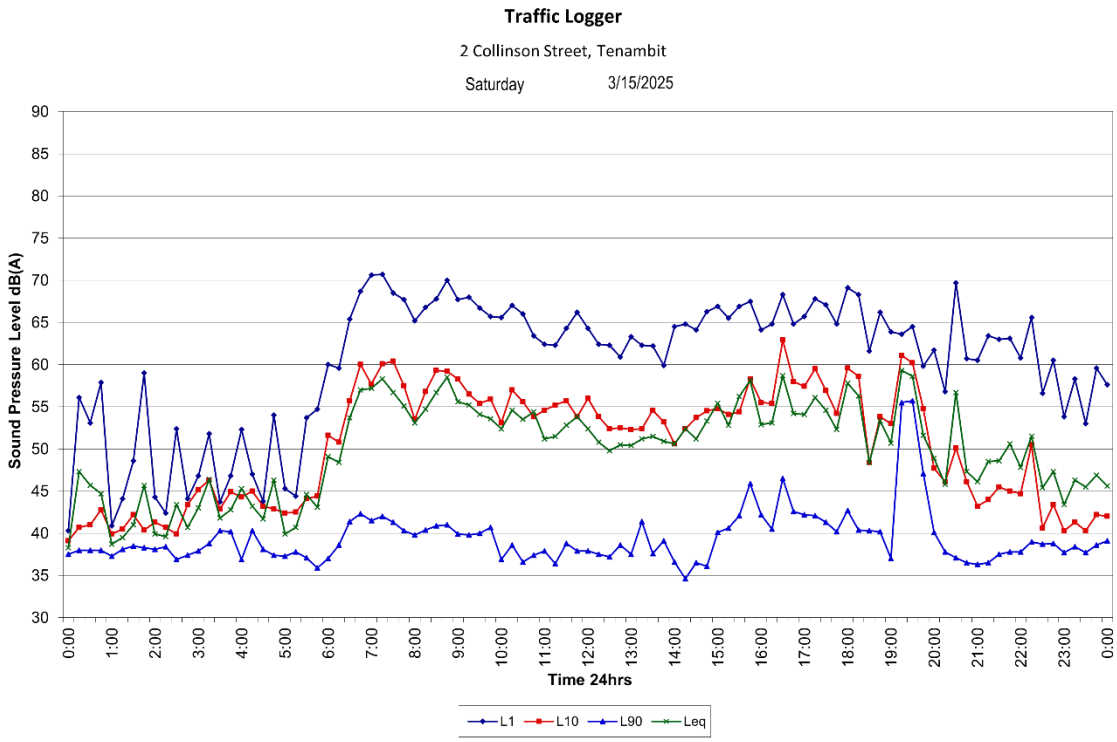

8.5m HEIGHT LIMIT
BRICKWORK
METAL CLADDING
POWDER COATED ALUMINIUM CLADDING
RENDER AND PAINTED BRICKWORK
45.3
43.8
40.8
37.65
1,500
3,000
3,150
WEST
8.5m HEIGHT LIMIT
METAL CLADDING
POWDER COATED ALUMINIUM CLADDING
METAL CLADDING
POWDER COATED ALUMINIUM CLADDING
BRICKWORK
BRICKWORK
EXISTING NGL
NORTH
NEW CHILDCARE CENTRE
2 COLLINSON ST TENAMBIT
ELEVATIONS 02
1:100
8JI
20.07.24
094-202
-
BRAD INWOOD ARCHITECTS
ARCHITECTURE+PLANNING+INTERIORS

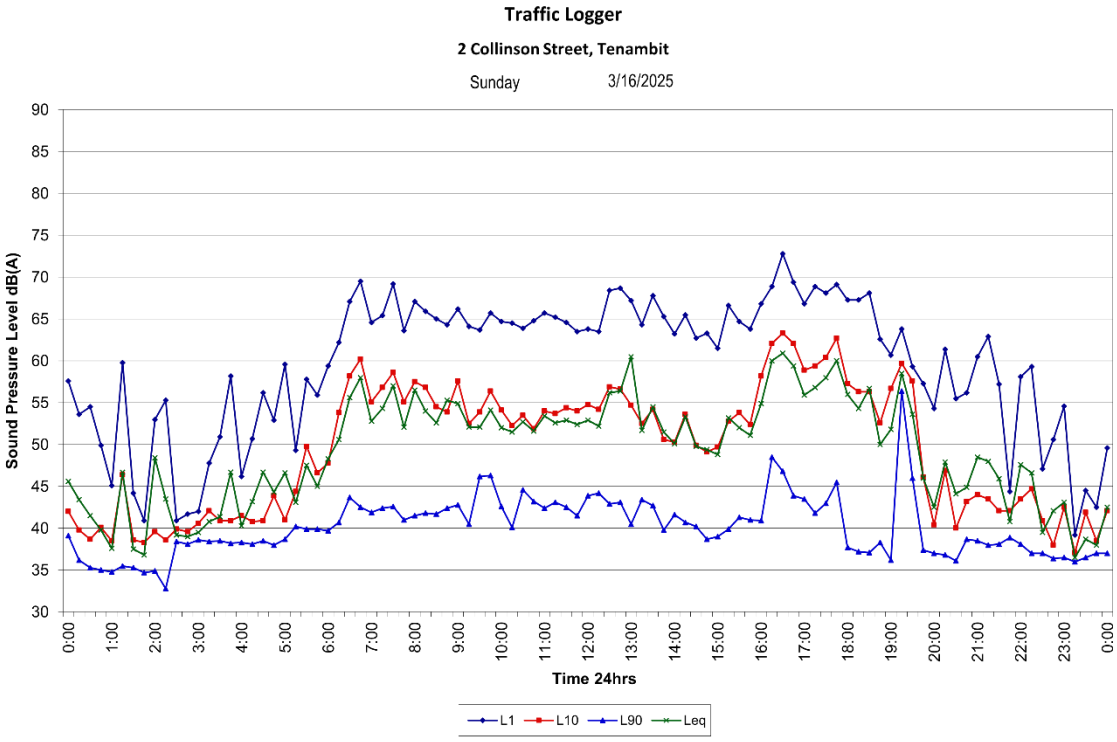
Appendix C – Logger Graphs

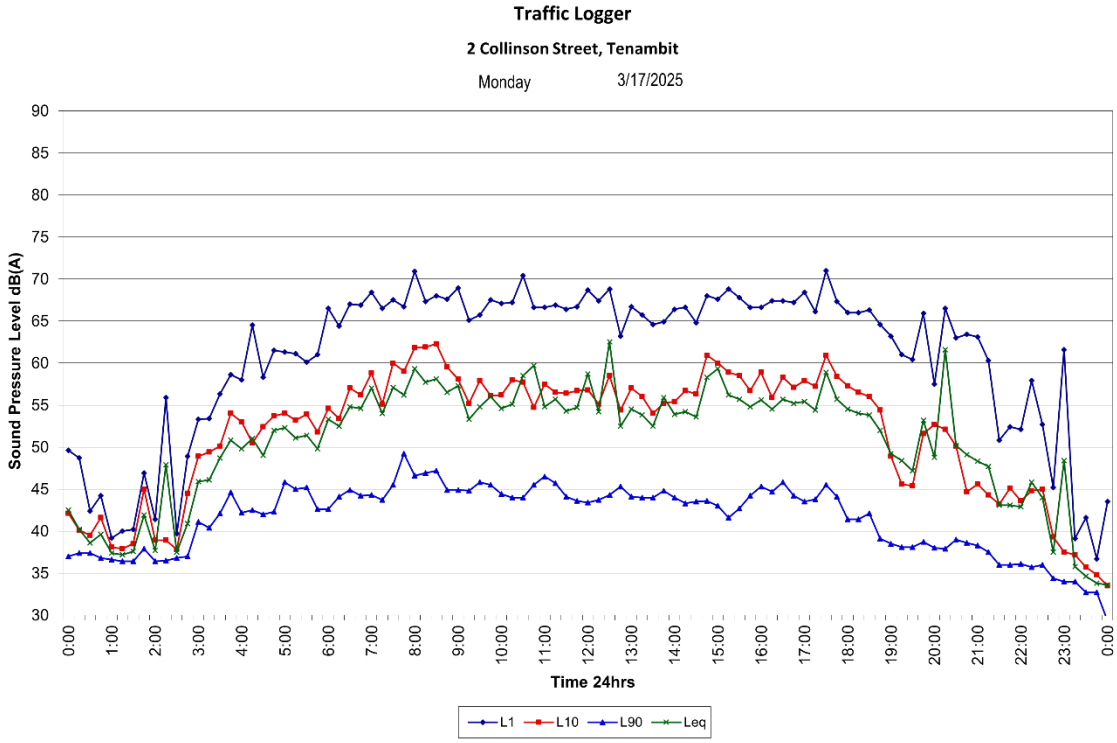
Traffic Logger

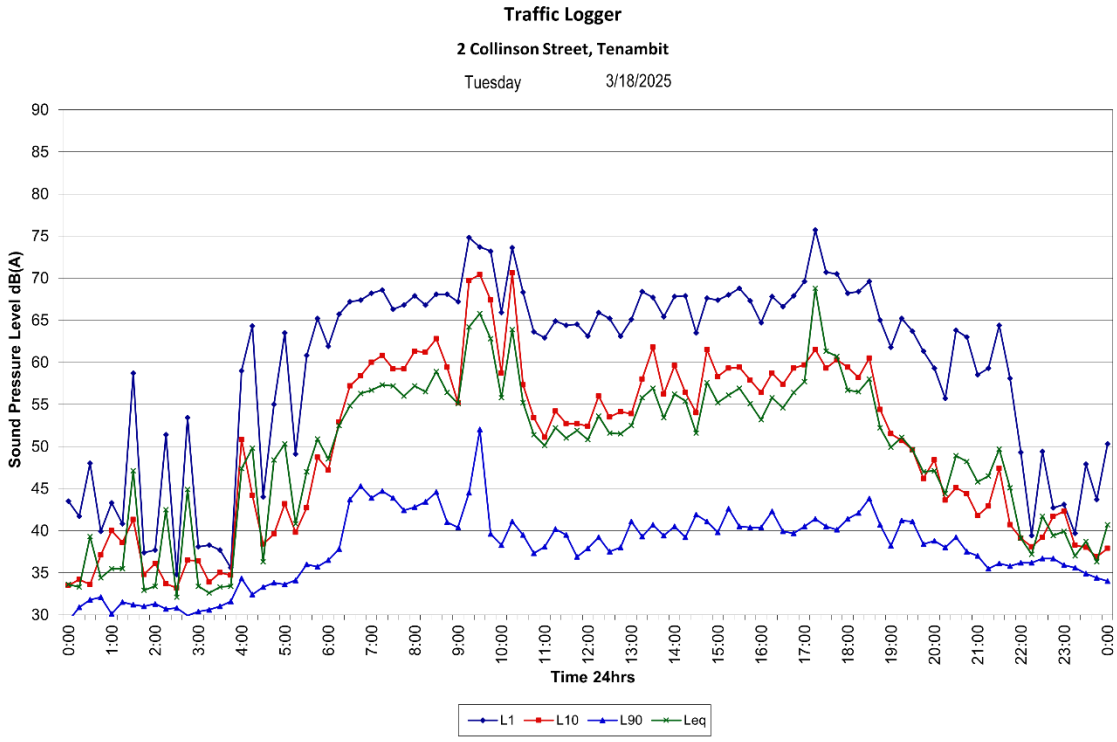


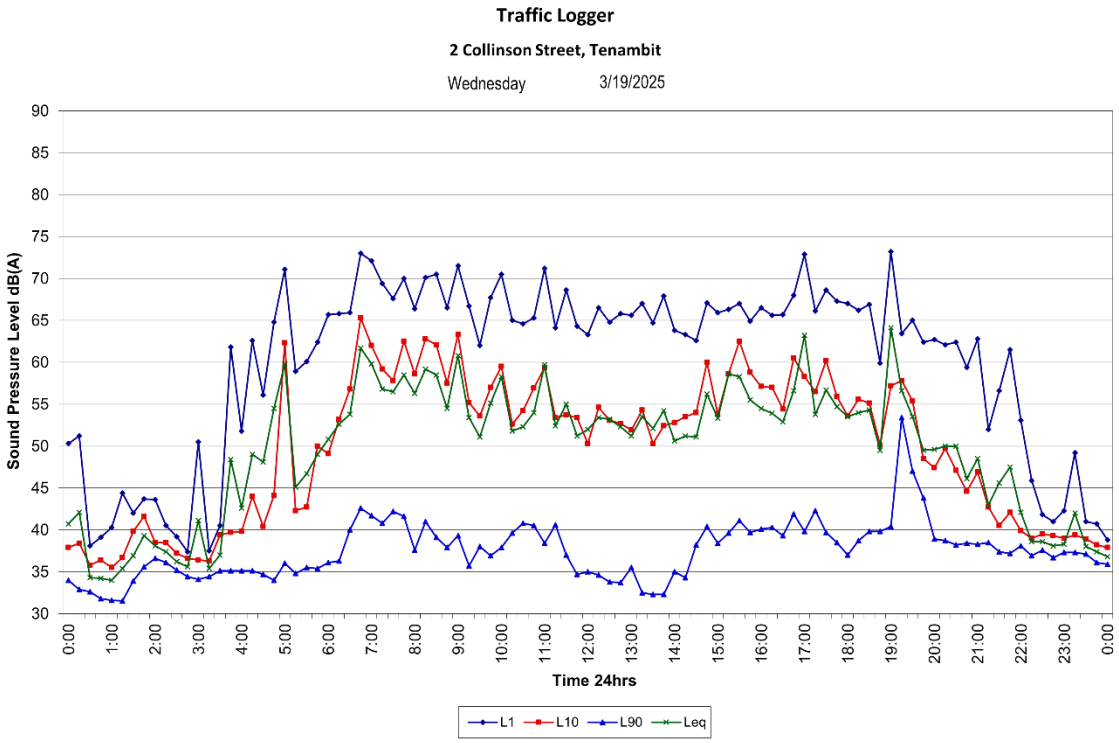



Traffic Logger
2 Collinson Street, Tenambit
Saturday 3/15/2025
Sound Pressure Level dB(A)
Time 24hrs
L1 L10 L90 Leq


Traffic Logger
2 Collinson Street, Tenambit
Sunday 3/16/2025
Sound Pressure Level dB(A)
Time 24hrs
L1 L10 L90 Leq


Traffic Logger
2 Collinson Street, Tenambit
Monday 3/17/2025
Sound Pressure Level dB(A)
Time 24hrs
L1 L10 L90 Leq


Traffic Logger
2 Collinson Street, Tenambit
Tuesday 3/18/2025
Sound Pressure Level dB(A)
Time 24hrs
L1 L10 L90 Leq


Traffic Logger
2 Collinson Street, Tenambit
Wednesday 3/19/2025
Sound Pressure Level dB(A)
90
85
80
75
70
65
60
55
50
45
40
35
30
0:00
1:00
2:00
3:00
4:00
5:00
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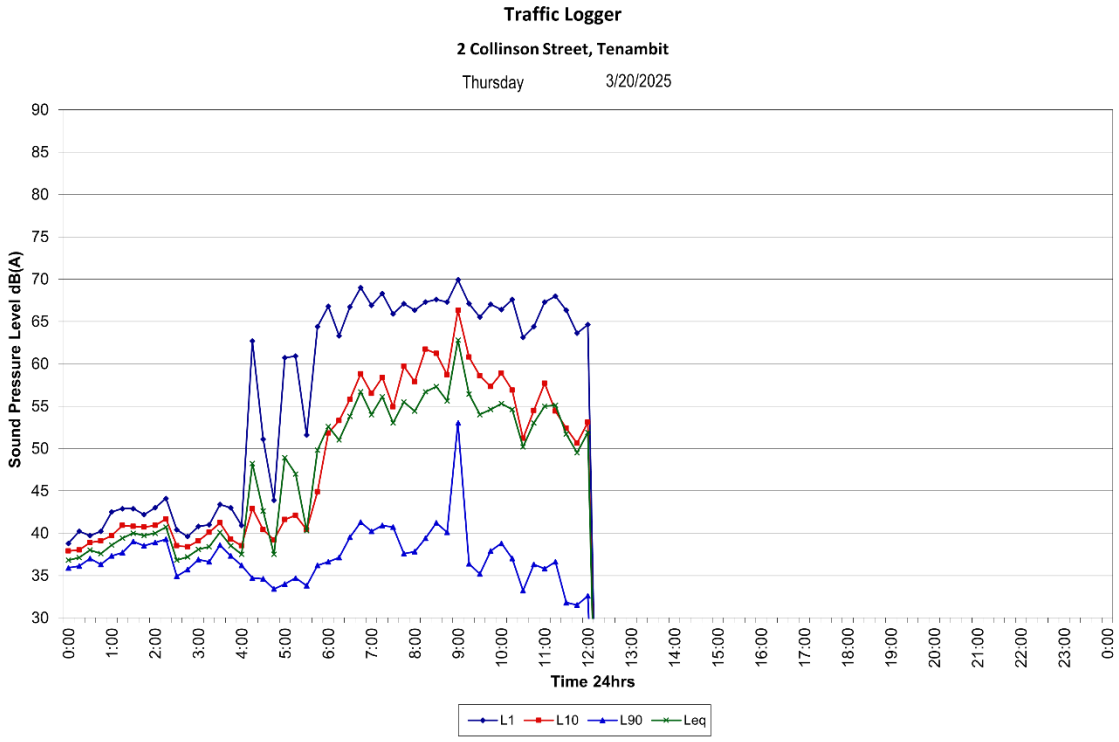
20:00
21:00
22:00
23:00
0:00
Time 24hrs
L1
L10
L90
Leq


Traffic Logger
2 Collinson Street, Tenambit
Thursday 3/20/2025
Sound Pressure Level dB(A)
90
85
80
75
70
65
60
55
50
45
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35
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0:00
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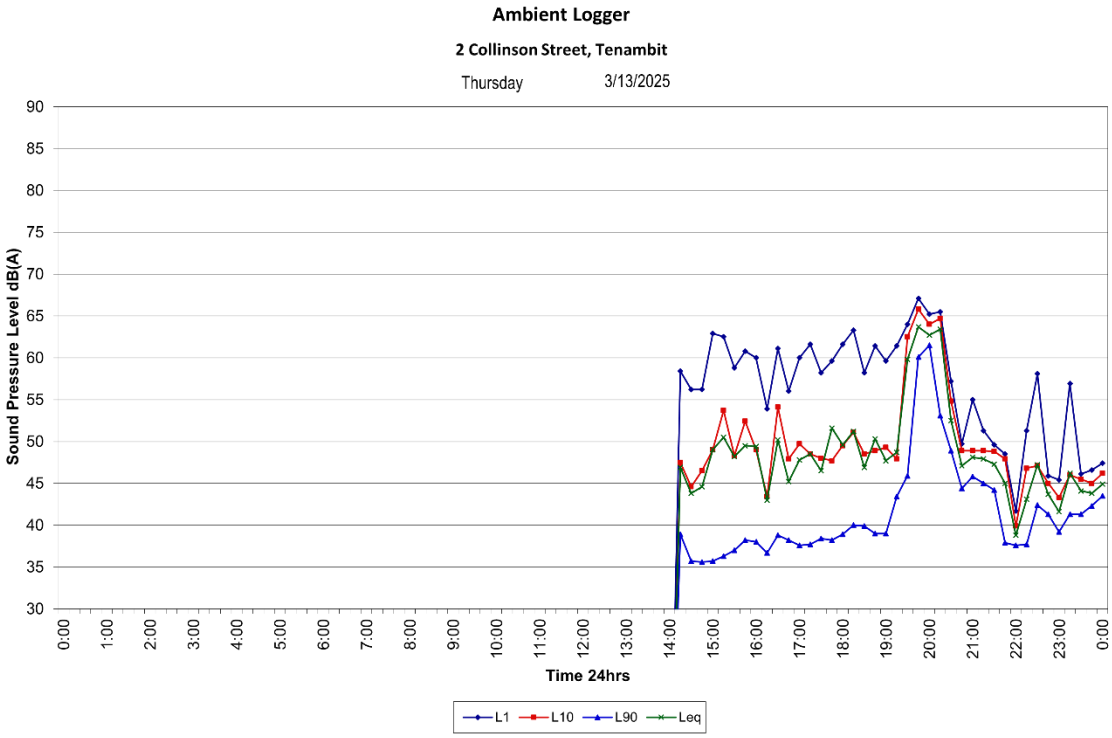
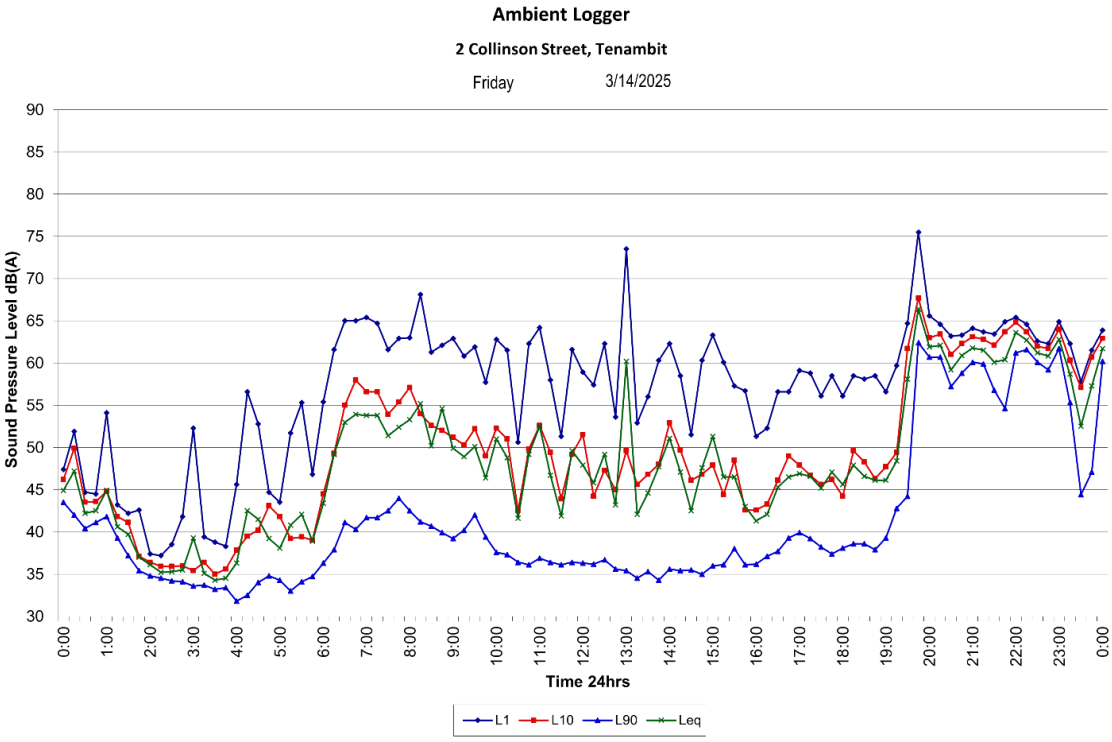
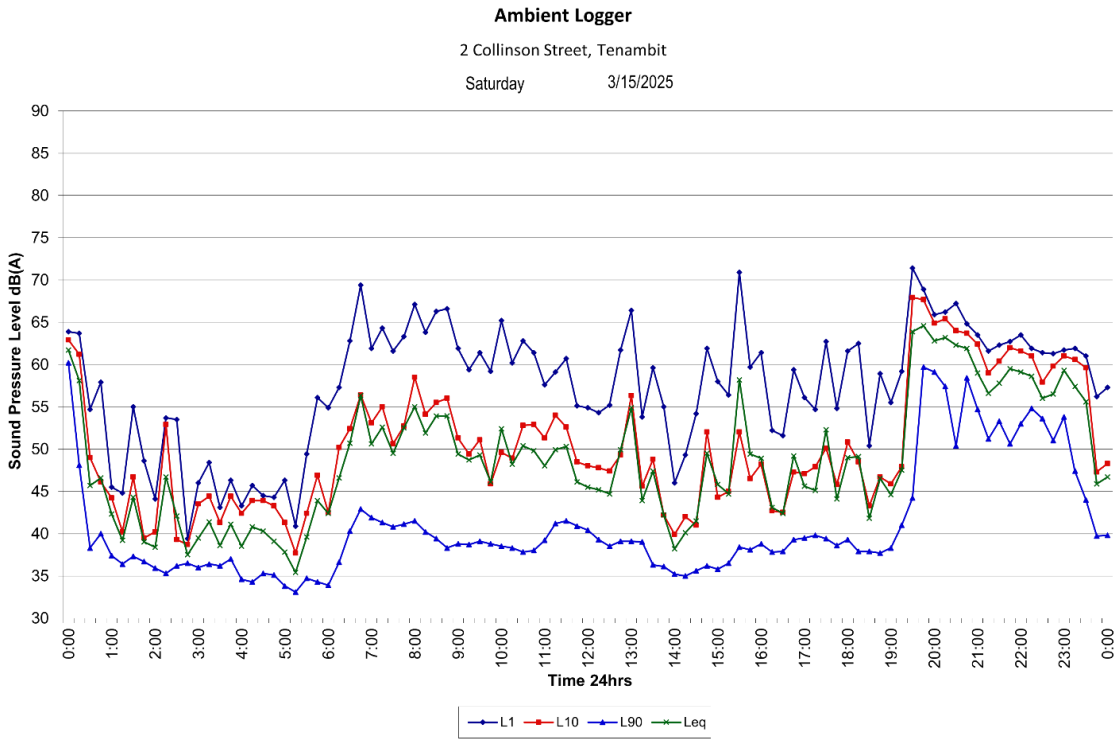
23:00
0:00
Time 24hrs
L1
L10
L90
Leq

Ambient Logger






Ambient Logger
2 Collinson Street, Tenambit
Saturday 3/15/2025
Sound Pressure Level dB(A)
90
85
80
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60
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50
45
40
35
30
0:00
1:00
2:00
3:00
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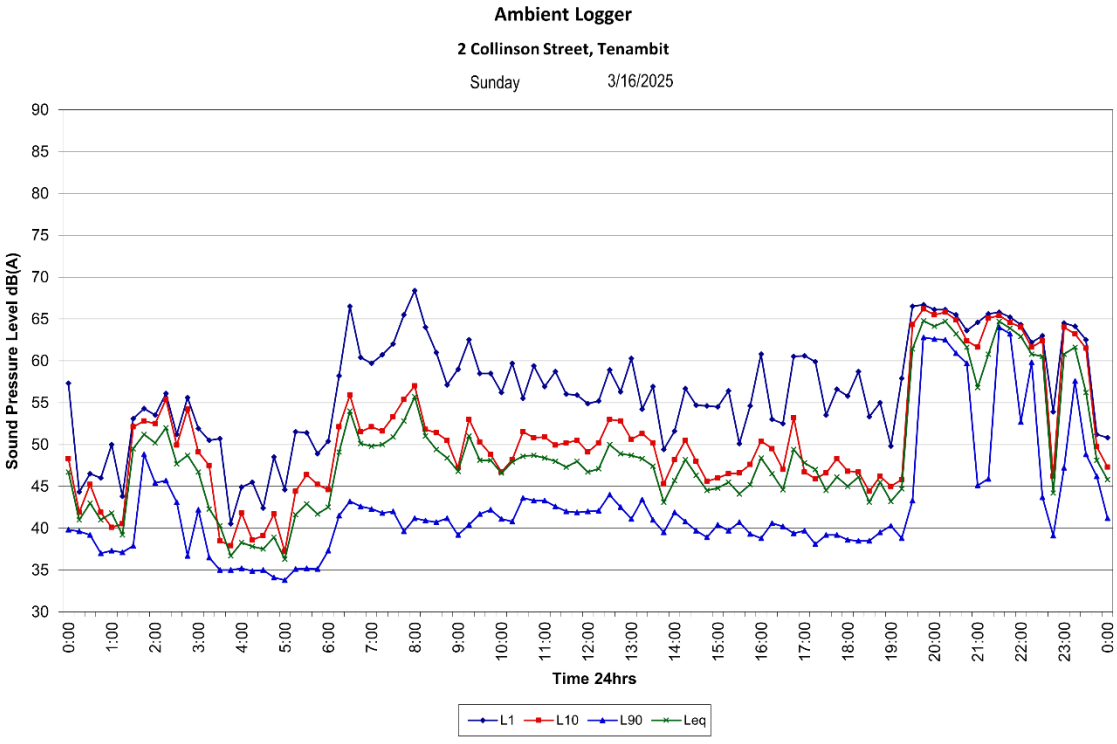
20:00
21:00
22:00
23:00
0:00
Time 24hrs
L1
L10
L90
Leq


Ambient Logger
2 Collinson Street, Tenambit
Sunday 3/16/2025
Sound Pressure Level dB(A)
90
85
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45
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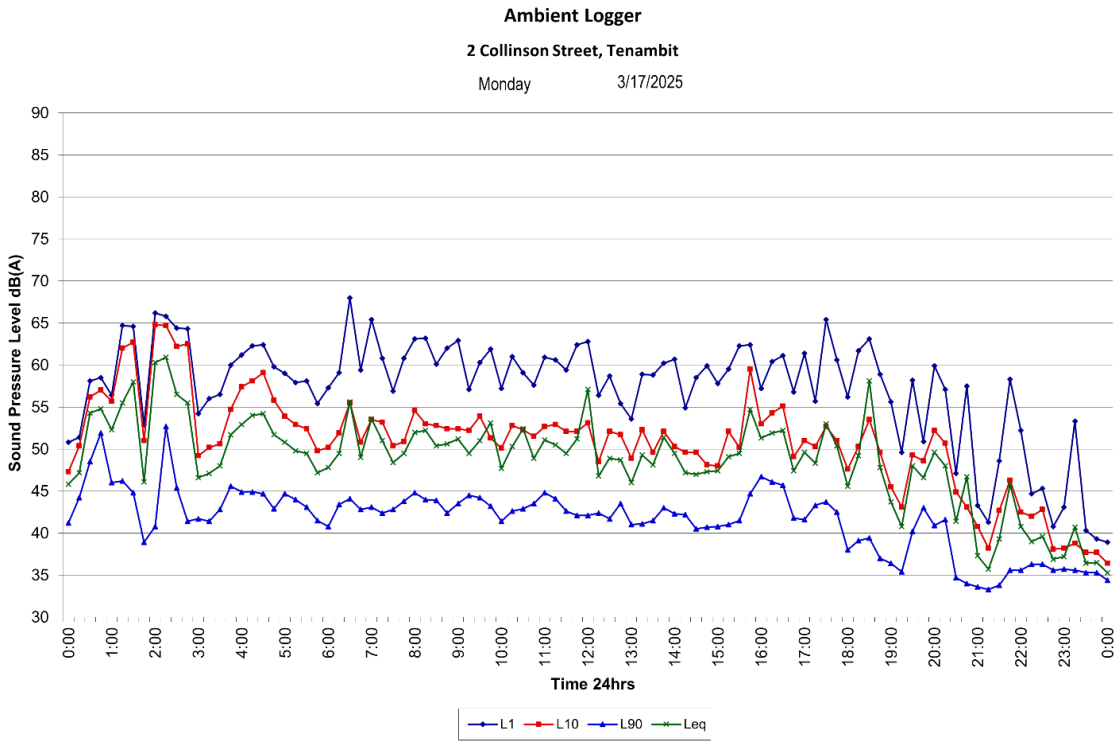
23:00
0:00
Time 24hrs
L1
L10
L90
Leq


Ambient Logger
2 Collinson Street, Tenambit
Monday 3/17/2025
Sound Pressure Level dB(A)
90
85
80
75
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45
40
35
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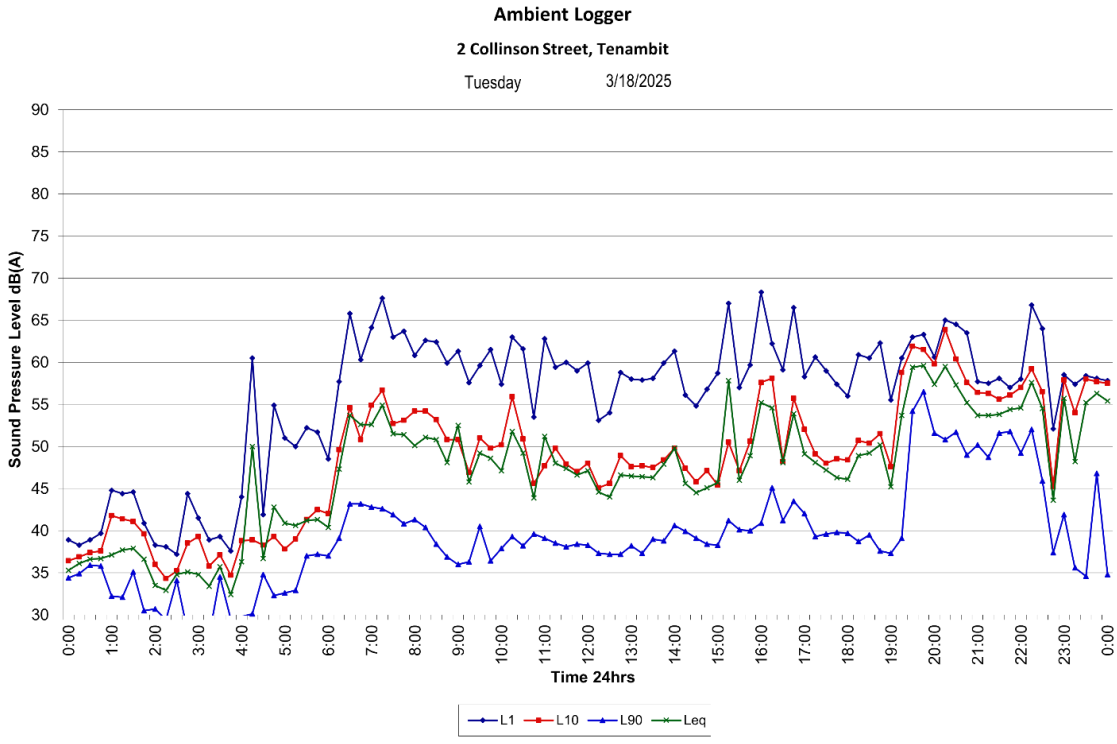
0:00 1:00 2:00 3:00 4:00 5:00 6:00 7:00 8:00 9:00 10:00 11:00 12:00 13:00 14:00 15:00 16:00 17:00 18:00 19:00 20:00 21:00 22:00 23:00 0:00
Time 24hrs
L1 L10 L90 Leq


Ambient Logger
2 Collinson Street, Tenambit
Tuesday 3/18/2025
Sound Pressure Level dB(A)
90
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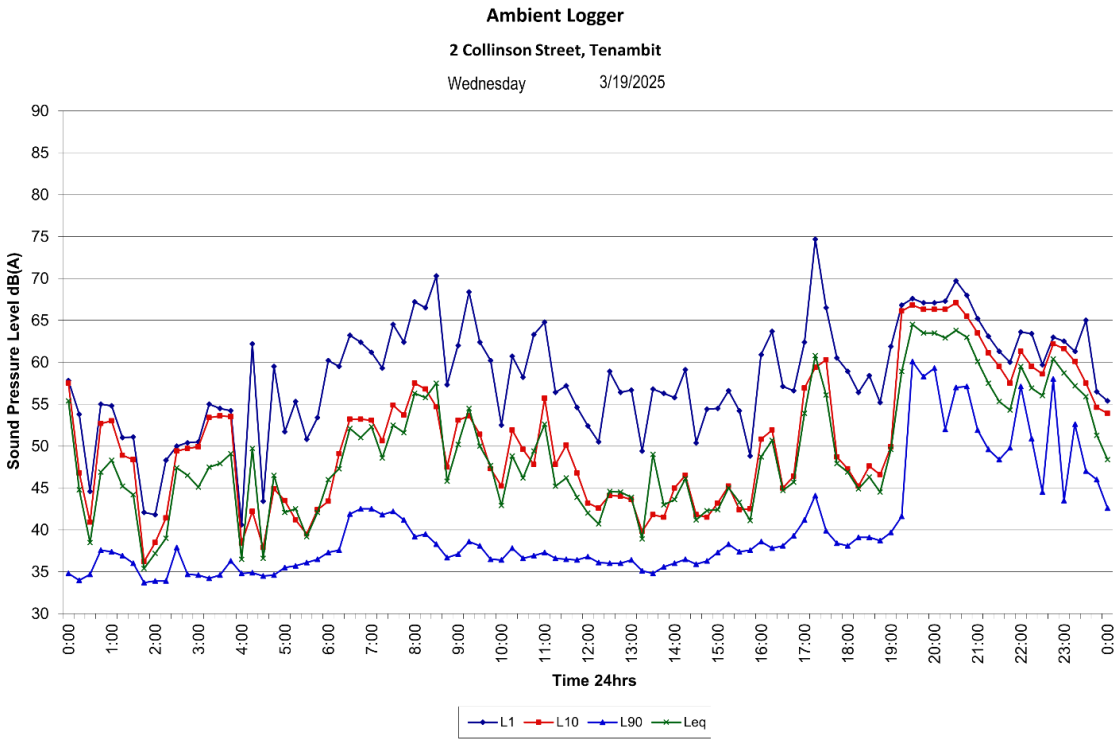
0:00 1:00 2:00 3:00 4:00 5:00 6:00 7:00 8:00 9:00 10:00 11:00 12:00 13:00 14:00 15:00 16:00 17:00 18:00 19:00 20:00 21:00 22:00 23:00 0:00
Time 24hrs
L1 L10 L90 Leq


Ambient Logger
2 Collinson Street, Tenambit
Wednesday 3/19/2025
Sound Pressure Level dB(A)
90
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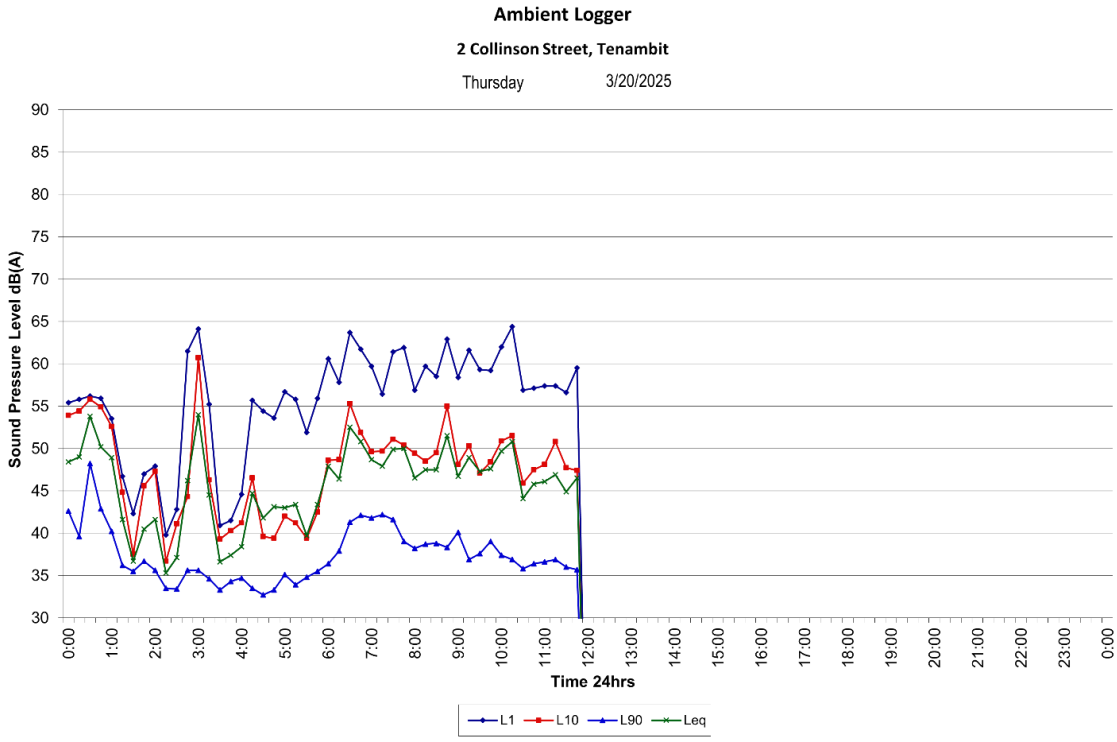
0:00 1:00 2:00 3:00 4:00 5:00 6:00 7:00 8:00 9:00 10:00 11:00 12:00 13:00 14:00 15:00 16:00 17:00 18:00 19:00 20:00 21:00 22:00 23:00 0:00
Time 24hrs
L1 L10 L90 Leq


Ambient Logger
2 Collinson Street, Tenambit
Thursday 3/20/2025
Sound Pressure Level dB(A)
90
85
80
75
70
65
60
55
50
45
40
35
30
0:00 1:00 2:00 3:00 4:00 5:00 6:00 7:00 8:00 9:00 10:00 11:00 12:00 13:00 14:00 15:00 16:00 17:00 18:00 19:00 20:00 21:00 22:00 23:00 0:00
Time 24hrs
L1 L10 L90 Leq

Appendix D – Calibration Certificates

Acoustic Research Labs Pty Ltd
Unit 36/14 Loyalty Rd
North Rocks NSW AUSTRALIA 2151
Ph: +61 2 9484 0800 A.B.N. 65 160 399 119
www.acousticresearch.com.au

Sound Level Meter
IEC 61672-3:2013

Calibration Certificate

Calibration Number C24526

Client Details	Rodney Stevens Acoustics Pty Ltd PO Box 522 Wahroonga NSW, 2076
Equipment Tested/ Model Number :	NL-42AEX
Instrument Serial Number :	003227761
Microphone Serial Number :	196485
Pre-amplifier Serial Number :	15493
Firmware Version :	v1.1

Pre-Test Atmospheric Conditions		Post-Test Atmospheric Conditions	
Ambient Temperature :	22 °C	**Ambient Temperature :**	21.8 °C
Relative Humidity :	51.2 %	**Relative Humidity :**	52.1 %
Barometric Pressure :	101.48 kPa	**Barometric Pressure :**	101.41 kPa

Calibration Technician :	Peter Elters	**Secondary Check:**	Cooper Sallway
Calibration Date :	8 Jul 2024	**Report Issue Date :**	8 Jul 2024

Approved Signatory : Ken Williams

Clause and Characteristic Tested	Result	Clause and Characteristic Tested	Result
12: Acoustical Sig. tests of a frequency weighting	*Pass*	17: Level linearity incl. the level range control	*N/A*
13: Electrical Sig. tests of frequency weightings	*Pass*	18: Toneburst response	*Pass*
14: Frequency and time weightings at 1 kHz	*Pass*	19: C Weighted Peak Sound Level	*Pass*
15: Long Term Stability	*Pass*	20: Overload Indication	*Pass*
16: Level linearity on the reference level range	*Pass*	21: High Level Stability	*Pass*

The sound level meter submitted for testing has successfully completed the class 2 periodic tests of IEC 61672-3:2013, for the environmental conditions under which the tests were performed.

However, no general statement or conclusion can be made about conformance of the sound level meter to the full requirements of IEC 61672-1:2013 because evidence was not publicly available, from an independent testing organisation responsible for pattern approvals, to demonstrate that the model of sound level meter fully conformed to the requirements in IEC 61672-1:2013 and because the periodic tests of IEC 61672-3:2013 cover only a limited subset of the specifications in IEC 61672-1:2013.

Uncertainties of Measurement -

Acoustic Tests		Environmental Conditions	
125Hz	*±0.13 dB*	*Temperature*	*±0.1 °C*
1kHz	*±0.13 dB*	*Relative Humidity*	*±1.9 %*
8kHz	*±0.14 dB*	*Barometric Pressure*	*±0.11 kPa*
Electrical Tests	*±0.13 dB*		

All uncertainties are derived at the 95% confidence level with a coverage factor of 2.

This calibration certificate is to be read in conjunction with the calibration test report.

Acoustic Research Labs Pty Ltd is NATA Accredited Laboratory Number 14172.
Accredited for compliance with ISO/IEC 17025 - Calibration.

The results of the tests, calibrations and/or measurements included in this document are traceable to SI units.

NATA is a signatory to the ILAC Mutual Recognition Arrangement for the mutual recognition of the equivalence of testing, medical testing, calibration and inspection reports.

PAGE 1 OF 1

Acoustic Research Labs Pty Ltd
Unit 36/14 Loyalty Rd
North Rocks NSW AUSTRALIA 2151
Ph: +61 2 9484 0800 A.B.N. 65 160 399 119
www.acousticresearch.com.au

Sound Level Meter
IEC 61672-3:2013
Calibration Certificate

Calibration Number C24757

Client Details	Rodney Stevens Acoustics PO Box 522 Wahroonga NSW, 2076
Equipment Tested/ Model Number :	NL-43EX
Instrument Serial Number :	00441418
Microphone Serial Number :	206888
Pre-amplifier Serial Number :	34176
Firmware Version :	v1.02

Pre-Test Atmospheric Conditions		Post-Test Atmospheric Conditions	
Ambient Temperature :	21.3 °C	**Ambient Temperature :**	21.5 °C
Relative Humidity :	53.5 %	**Relative Humidity :**	53 %
Barometric Pressure :	101.34 kPa	**Barometric Pressure :**	101.32 kPa

Calibration Technician :	Peter Elters	**Secondary Check:**	Cooper Sallway
Calibration Date :	15 Oct 2024	**Report Issue Date :**	16 Oct 2024

Approved Signatory : Ken Williams

Clause and Characteristic Tested	Result	Clause and Characteristic Tested	Result
12: Acoustical Sig. tests of a frequency weighting	*Pass*	17: Level linearity incl. the level range control	*N/A*
13: Electrical Sig. tests of frequency weightings	*Pass*	18: Toneburst response	*Pass*
14: Frequency and time weightings at 1 kHz	*Pass*	19: C Weighted Peak Sound Level	*Pass*
15: Long Term Stability	*Pass*	20: Overload Indication	*Pass*
16: Level linearity on the reference level range	*Pass*	21: High Level Stability	*Pass*

The sound level meter submitted for testing has successfully completed the class 2 periodic tests of IEC 61672-3:2013, for the environmental conditions under which the tests were performed.

However, no general statement or conclusion can be made about conformance of the sound level meter to the full requirements of IEC 61672-1:2013 because evidence was not publicly available, from an independent testing organisation responsible for pattern approvals, to demonstrate that the model of sound level meter fully conformed to the requirements in IEC 61672-1:2013 and because the periodic tests of IEC 61672-3:2013 cover only a limited subset of the specifications in IEC 61672-1:2013.

Uncertainties of Measurement -

Acoustic Tests		Environmental Conditions	
125Hz	*±0.13 dB*	*Temperature*	*±0.1 °C*
1kHz	*±0.13 dB*	*Relative Humidity*	*±1.9 %*
8kHz	*±0.14 dB*	*Barometric Pressure*	*±0.11 kPa*
Electrical Tests	*±0.13 dB*		

All uncertainties are derived at the 95% confidence level with a coverage factor of 2.

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PAGE 1 OF 1