RODNEY STEVENS ACOUSTICS
Acoustic Consultants

REPORT 200010R1

Revision 0

Noise Impact Assessment

Extension of Existing Child Care Centre

31 Blue Hills Drive, Glenmore Park NSW 2745

PREPARED FOR:

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10 February 2020

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DOCUMENT CONTROL

Reference	Status	Date	Prepared	Checked	Authorised
200010R1	Revision 0	10 February 2020	Thomas Carney	Desmond Raymond	Rodney Stevens

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1 INTRODUCTION

Rodney Stevens Acoustics Pty Ltd (here forth referred to as RSA) has been engaged by Designcorp Architects Pty Ltd to prepare a noise impact assessment report for an extension to the existing child care centre located at 31 Blue Hills Drive, Glenmore Park NSW 2745.

This report details the results of a noise survey and assesses the likely impact of noise (principally from traffic noise) incident upon the extension of the existing child care centre as well as noise from the extension 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 child care centre is located at 31 Blue Hills Drive, Glenmore Park NSW. The development site is bounded by residential dwellings to the north, east and south with community facilities (park, café etc.) to the west.

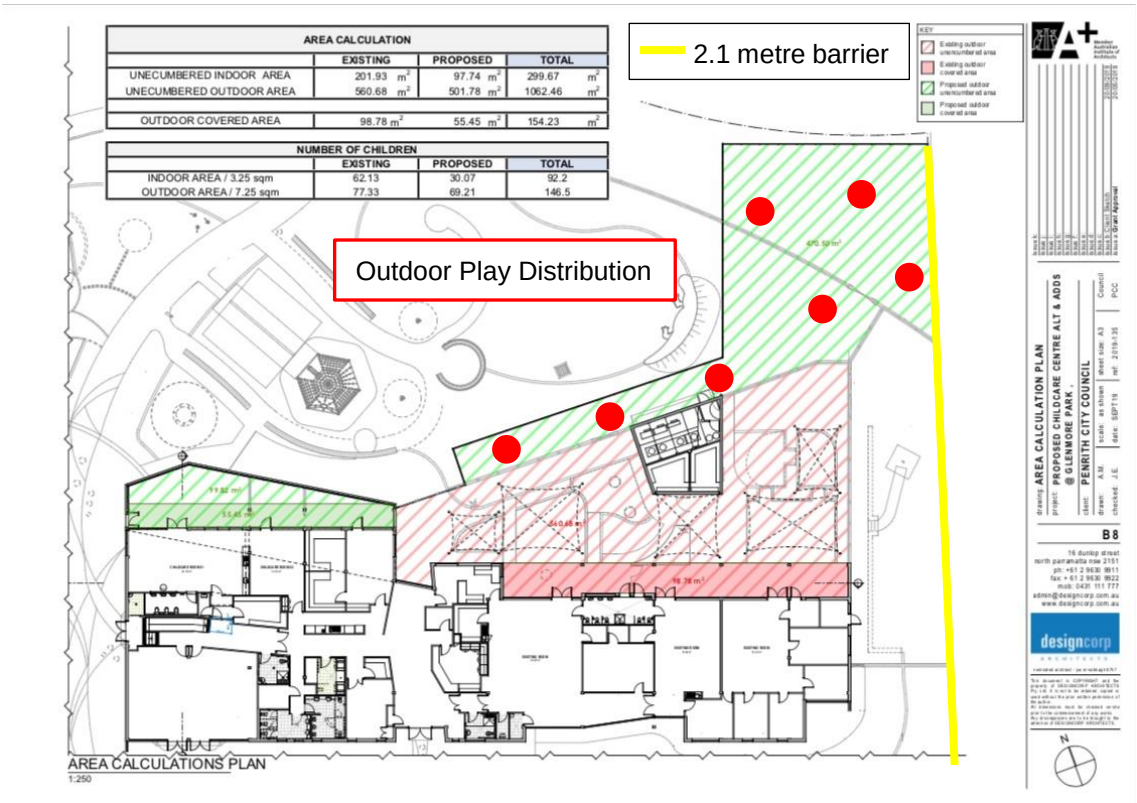
The development site and its surrounding environment are mainly influenced by traffic noise from Glenmore Parkway, Blue Hills Drive and Coolabah Crescent. Figure 2-1 shows an aerial image of the site area and the surrounding environment.

Figure 2-1 Site Location

Image Courtesy of Near Map © 2020.

The following figure presents the proposed extension to the child care centre:

Figure 2-2 Proposed Child Care Centre Layout



2.2 The Development

An existing child care centre operates at the proposed development site. The proposal is to extend the operations of the existing childcare centre. The extension involves minor internal works and the extension of the external play areas and increase in the number of children.

2.3 Hours of Operation

The following hours of operation are already in operation at the centre:

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

2.4 Enrolment Numbers

The existing centre caters for 60 children. The number of children and their age groups are as follows:

- 0-2 years old - 15 Children
- 2-3 years old - 15 Children
- 3-5 years old - 30 Children

The proposal is to increase the number of children to 80 children. The total number of children and their age groups are as follows:

- 0-2 years old - 16 Children (increased by 1 child)
- 2-3 years old - 20 Children (increased by 5 children)
- 3-5 years old - 44 Children (increased by 14 children)

2.5 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 the dates of Wednesday 29th January and Thursday 6th February 2020 at the logging locations shown in Figure 2-1**.**

Logger location was selected with consideration to other noise sources which may influence readings (including existing operations of the centre), security issues for noise monitoring equipment and gaining permission for access from residents and landowners.

Instrumentation for the survey comprised of one RION NL-42 environmental noise logger (serial number 546394) fitted with microphone windshields. Calibration of the logger 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. Measured data has been filtered to remove data measured during adverse weather conditions upon consultation with historical weather reports provided by the Bureau of Meteorology (BOM).

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 Emission (*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 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 on southern boundary (Rear of site)	L_{Aeq}	49	53	43
	RBL (Background)	37	36	33

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).

4 NOISE GUIDELINES AND CRITERIA

4.1 Penrith City Council DCP 2014 Criteria

Penrith City Council has specific acoustic requirements for child care centers in the DCP 2014, Part D5, Section 5.2 Child Care Centres, Control 6. The relevant excerpts are as follow:

6) Noise

a) Outside playing areas shall be designed and located to minimise noise impact on any noise sensitive adjacent properties. Separation between boundary fencing and areas occupied by the children may be required.

b) Where there may be noise impact on adjacent properties, fencing shall be of a height, design and material (e.g. masonry) suitable to contain noise generated by the children's activities. This ensures the children may play outside without time limitations in accordance with licensing requirements.

c) Where a site may be affected by traffic, rail or aircraft noise, the child care centre shall be designed to minimise any impact on the children and staff. A report from an acoustic consultant may be required to support the proposal. (Design elements may include double glazing, insulated walls, locating sleeping rooms in protected areas and solid fencing).

d) A noise impact assessment may be required for the development of a child care centre proposing to cater for 40 children or more, or where surrounding land uses may have an impact on the proposal.

The objectives should be to limit the impact of the child care centre on adjacent properties, and also to limit the impact noise from external sources may have on the child care centre. While noise can be measured, the intent is to also minimise nuisance which is subjective by nature. This may be achieved either by physical separation, design and layout of the centre or by implementing noise mitigation measures, such as acoustic treatments to buildings.

e) A noise impact assessment report should address the relevant provisions of the Noise and Vibration section of this Plan.

4.2 Operational Noise From Child Care Centre

Responsibility for the control of noise emissions in New South Wales is vested in Local Government and the EPA. The EPA oversees the Noise Policy for Industry (NPfI) October 2017 which provides a framework and process for deriving project trigger noise level. The NPfI project noise levels for industrial noise sources have two (2) components:

- Controlling the intrusive noise impacts for residents and other sensitive receivers in the short term; and
- Maintaining noise level amenity for particular land uses for residents and sensitive receivers in other land uses.

4.2.1 Intrusiveness Noise Levels

For assessing intrusiveness, the background noise generally needs to be measured. The intrusiveness noise level essentially means that the equivalent continuous noise level (LAeq) of the source should not be more than 5 dB(A) above the measured Rated Background Level (RBL), over any 15 minute period.

4.2.2 Amenity Noise Levels

The amenity noise level is based on land use and associated activities (and their sensitivity to noise emission). The cumulative effect of noise from industrial sources needs to be considered in assessing the impact. The noise levels relate only to other industrial-type noise sources and do not include road, rail or community noise. The existing noise level from industry is measured.

If it approaches the project trigger noise level value, then noise levels from new industrial-type noise sources, (including air-conditioning mechanical plant) need to be designed so that the cumulative effect does not produce total noise levels that would significantly exceed the project trigger noise level.

4.2.3 Area Classification

The NPfI characterises the "Suburban" noise environment as an area with an acoustical environment that:

- has local traffic with characteristically intermittent traffic flows or with some limited commerce or industry.
- This area often has the following characteristic: - evening ambient noise levels defined by the natural environment and human activity

The area surrounding the proposed development falls under the "Suburban" area classification.

4.2.4 Project Specific Trigger Noise Levels

Having defined the area type, the processed results of the attended noise monitoring have been used to determine project specific project trigger noise levels. The intrusive and amenity project trigger noise levels for nearby residential premises are presented in Table 4-1. These project trigger noise levels are nominated for the purpose of assessing potential noise impacts from the proposed development.

In this case, the ambient noise environment is not controlled by industrial noise sources and therefore the project amenity noise levels are assigned as per Table 2.2 of the NPfI (Recommended Amenity Noise Levels) and standardised as per Section 2.2 of the NPfI. For each assessment period, the lower (i.e. the more stringent) of the amenity or intrusive project trigger noise levels are adopted. These are shown in bold text in Table 4-1.

Table 4-1 Operational Project Trigger Noise Levels

Receiver	Time of Day	ANL [1] $L_{Aeq(15min)}$	Measured		Project Trigger Noise Levels	
			RBL [2] $L_{A90(15min)}$	Existing $L_{Aeq(Period)}$	Intrusive $L_{Aeq(15min)}$	Amenity $L_{Aeq(15min)}$
Residential	Day	55	37	49	**42**	58
	Evening	45	36	53	**41**	48
	Night	40	33	43	**38**	43

Note 1: ANL = "Amenity Noise Level" for residences in Suburban Areas.

Note 2: RBL = "Rating Background Level".

4.2.5 Noise Emissions from Children Play Activities

A guideline for the assessment of noise from child care centres has been prepared by the Association of Australian Acoustical Consultants (AAAC) as a result of a NSW Australian Acoustical Society (AAS) Technical Meeting held in September 2007 on Child Care Noise. The document, *AAAC Technical Guideline Child Care Centre Noise Assessment*, 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 2 hours outdoor play per day (typically 1 hour in the morning and 1 hour 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. A "background + 10 dB(A)" criterion has also been applied in other local government areas within the Sydney metropolitan area. However, if the proposed outdoor play time is more than 2 hours per day, the $L_{Aeq(15minute)}$ noise level emitted from the outdoor play area not exceed the background noise level by more than 5 dB at the assessment location.

We have assumed that the proposed child care center will operate more than 2 hours of outdoor play time per day, therefore, the noise criterion for noise emissions from outdoor activities to all surrounding residential receivers is (daytime L_{A90} 37 dB(A) + 5 dB(A) **$L_{Aeq(15minute)}$ 42 dB(A)**. This is based on a measured background noise level of $L_{A90(15minute)}$ 37 dB(A).

Criteria for community/park areas is **55 dB(A)** when in use.

4.2.6 Road Noise Intrusion to Outdoor Playground

Noise levels within outdoor play areas are not covered by the Penrith City Council's DCP 2014. For the assessment of road traffic noise impact on the outdoor play areas, the NSW EPA's *Road Noise Policy* (RNP) has been used to determine the appropriate noise level. In accordance with the RNP, the noise criterion for outdoor play areas is as follow:

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

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 $L_{Aeq(1hour)}$ 50 dB(A), the predicted traffic noise impacts at the outdoor play areas are presented in Table 5-1 below.

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

- A 2.1 meters high barrier are in place along the eastern boundary (Refer to Figure 2-2)
- The height of children between the ages of 0 and 3 years have an average height of 0.5 meters, children 3 and 5 have an average height of 0.7 metre;
- The outdoor play areas are located to the east 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 – Ground	45	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 4.2.6. Based on this assessment no additional no control measures will be required.

5.2 Operational Noise Emissions to Nearby Residences

5.2.1 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) provides a technical guideline for Child Care Centre Noise Assessment. Within this guideline it stipulates the following assumed sound power levels (Lw) for various age groups of children:

- 10 Children aged 0 to 2 years: 77 to 80 dB(A)
- 10 Children aged 2 to 3 years: 83 to 87 dB(A)
- 10 Children aged 3 to 5 years: 84 to 90 dB(A)

Spectra for energy-average noise levels (L_{Aeq}) have been measured by RSA of children at play at a similar facility, given below in Table 5-2**.** The measured spectra have been scaled based upon the overall sound power levels offered by the AAAC and the amount of children expected to be in the outdoor play area at any given time.

Table 5-2 Outdoor Free Play Activities Noise Spectrum Measured in a Typical Child Care Centre

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)
Leq	61	58	53	54	57	56	48	41	61

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 power levels presented by the AAAC to determine the likely noise levels at nearby receivers due to 80 children playing in the outdoor play areas 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:

- 16 children between the ages of 0 and 2 with total sound power level of 82 dB(A), 20 children between the ages of 2 and 3 with total sound power level of 90 dB(A) and 22 children (50%) between the ages of 3 and 5 with total sound power level of 93 dB(A) will be playing in the proposed outdoor play areas;
- 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 0.5 meters for children between the ages of 0 and 3, and heights of 0.7 metre for children between the ages of 3 and 5;
- The proposed 2.1 high solid barrier (Refer to Figure 2-2) along the eastern boundary of the outdoor play areas 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.

Figure 5-1 Receiver Locations

The predicted noise levels experienced by nearest residential and community receivers are presented in Table 5-3 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 5-3 Predicted Outdoor Play Activities Noise Emission

Receiver	Predicted Outdoor Play Activities Noise at Neighbouring Residents – dB(A)	Criteria	Compliance
R1	43	42	Yes*
R2	34	42	Yes
R3	42	42	Yes
CC1	50	55	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 42 dB(A) and 55 dB(A) criterion with scenario presented above.

Based on the above assessment of the outdoor play activities noise emissions, a 2.1 high solid barriers must be implemented along the eastern boundary. (Please refer to Figure 2-2 for further details)

6 RECOMMENDATIONS

The following recommendations must be implemented in order to achieve compliance with the criteria requirements from Penrith City Council.

6.1 Outdoor Play Areas

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

- Only 50% of the children aged 3-5 years 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 in the new area;
- Children must be supervised at all times.

6.2 Acoustic Barrier Details

A 2.1 meter high solid barriers along the eastern boundary must be implemented (Refer to Figure 2-2).

Acoustic barrier is required to provide the adequate noise attenuation, the construction material of the barriers must have a surface density of 10-15 kg/m' and be free from holes and gaps. Some suitable materials include:

- 9 mm thick fibre cement sheet
- Masonry
- 75mm thick Hebel Powerpanel
- Any other approved material which meets the above surface density specification

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

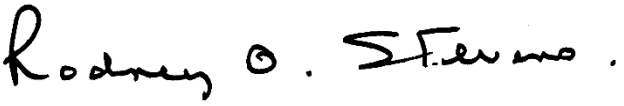
7 CONCLUSION

RSA has conducted a noise impact assessment of the proposed additions and alterations to the existing child care centre at 31 Blue Hills Drive, Glenmore Park NSW. The assessment has comprised the establishment of noise criteria and assesses noise impacts with regard to relevant statutory requirements.

Noise emissions from the outdoor area play activities to the nearest sensitive receivers have been calculated to comply with the noise criterion, where 50% of 3-5 year old children are playing outside at any given time. A 2.1 high solid barriers along the eastern boundary must be implemented to minimise the noise impact from the outdoor areas (Refer to Figure 2-2).

Based on our assessment the proposed additions and alterations to the existing child care centre at 31 Blue Hills Drive, Glenmore Park NSW is deemed to not cause "Offensive Noise" to neighbouring sensitive receivers 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.

Approved:-



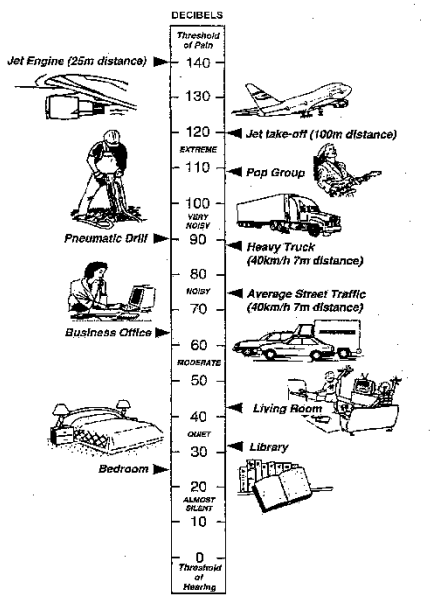
Rodney Stevens

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 '*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)*.

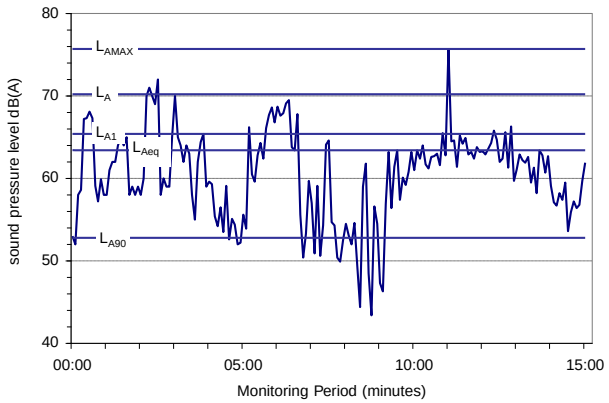
Sound Pressure Level (SPL)

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:



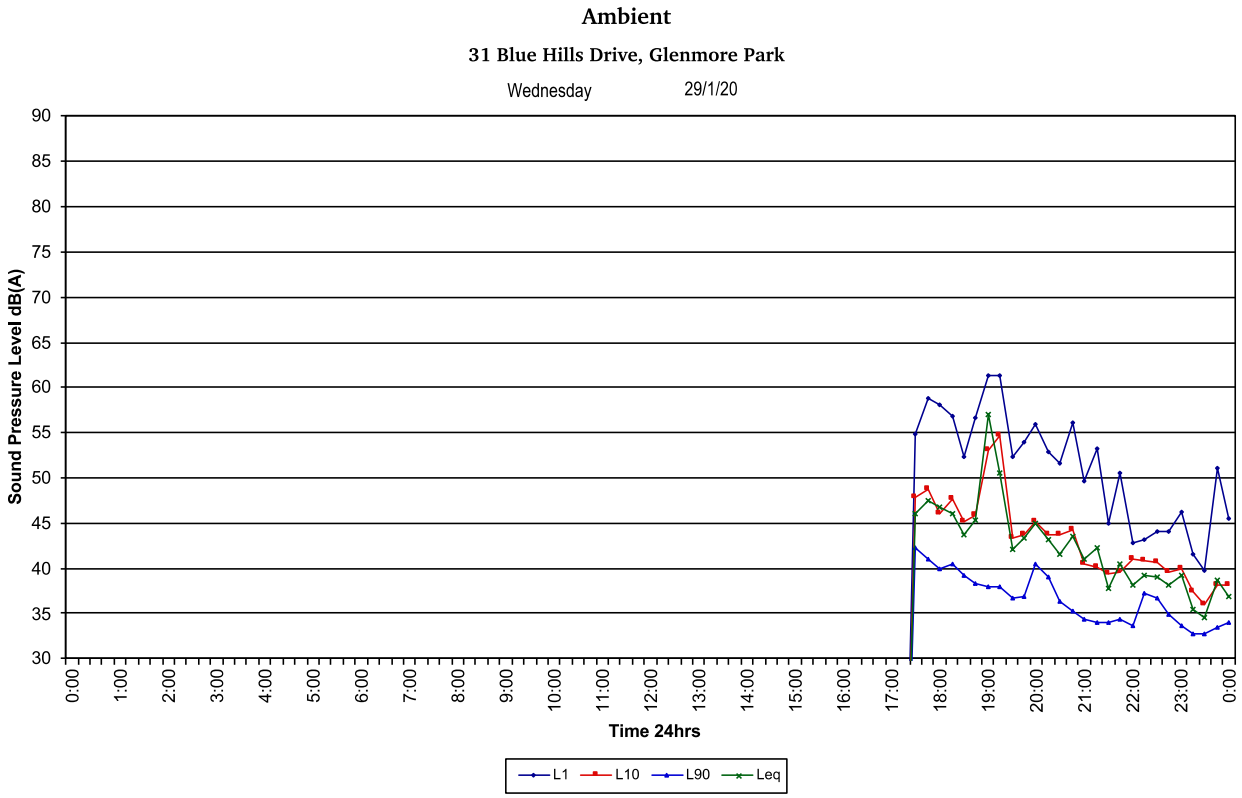
Key descriptors:

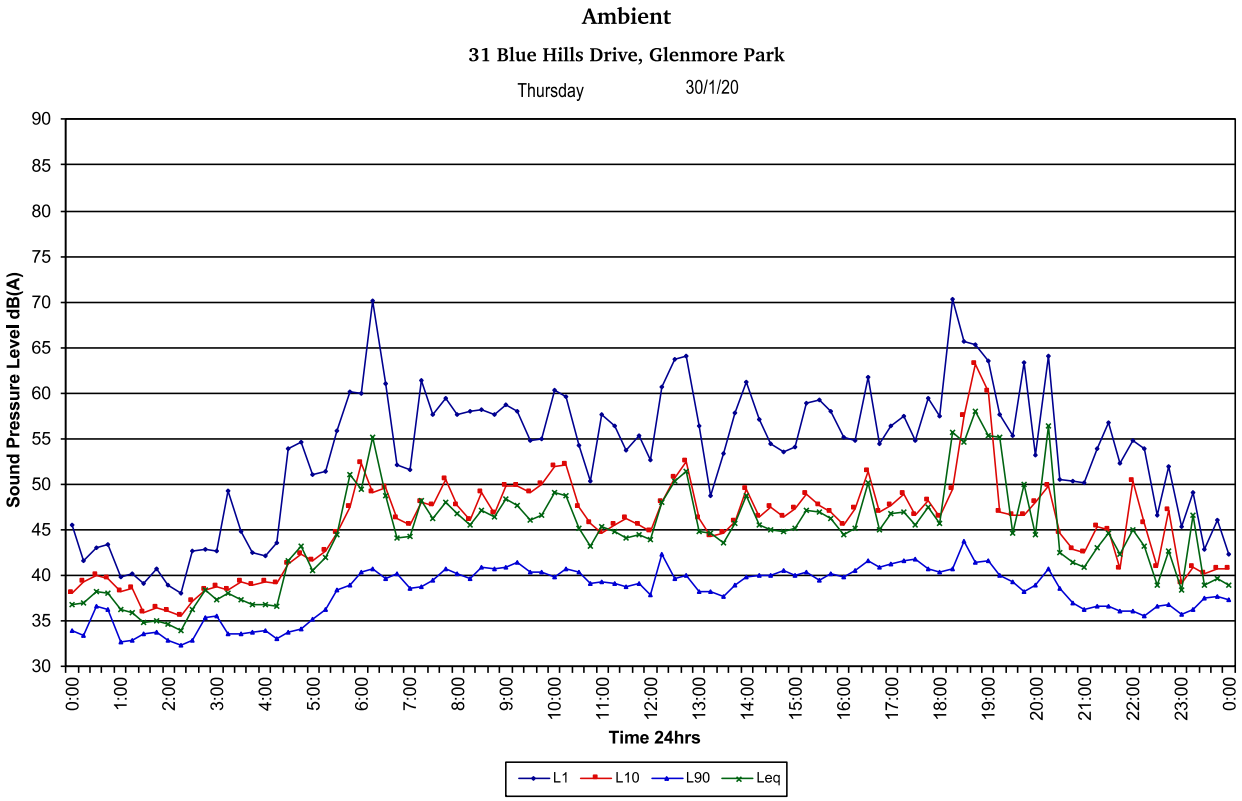
L_{Amax} Maximum recorded noise level.

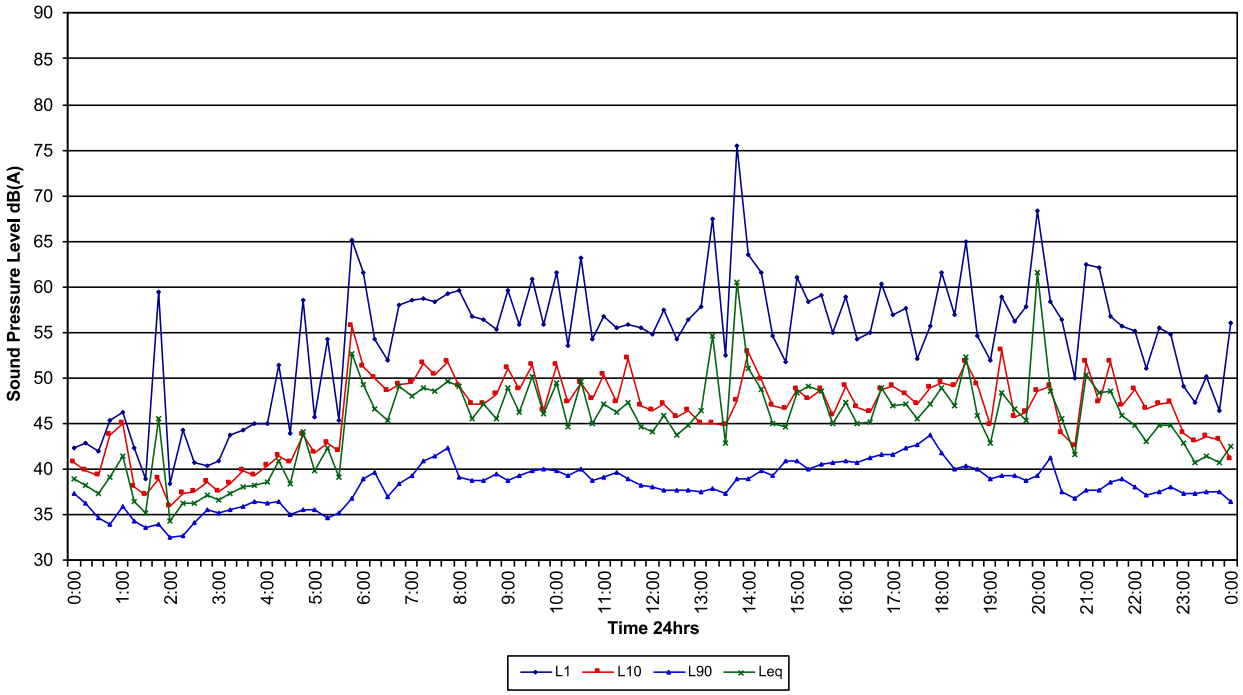
L_{A1} The noise level exceeded for 1% of the 15 minute interval.

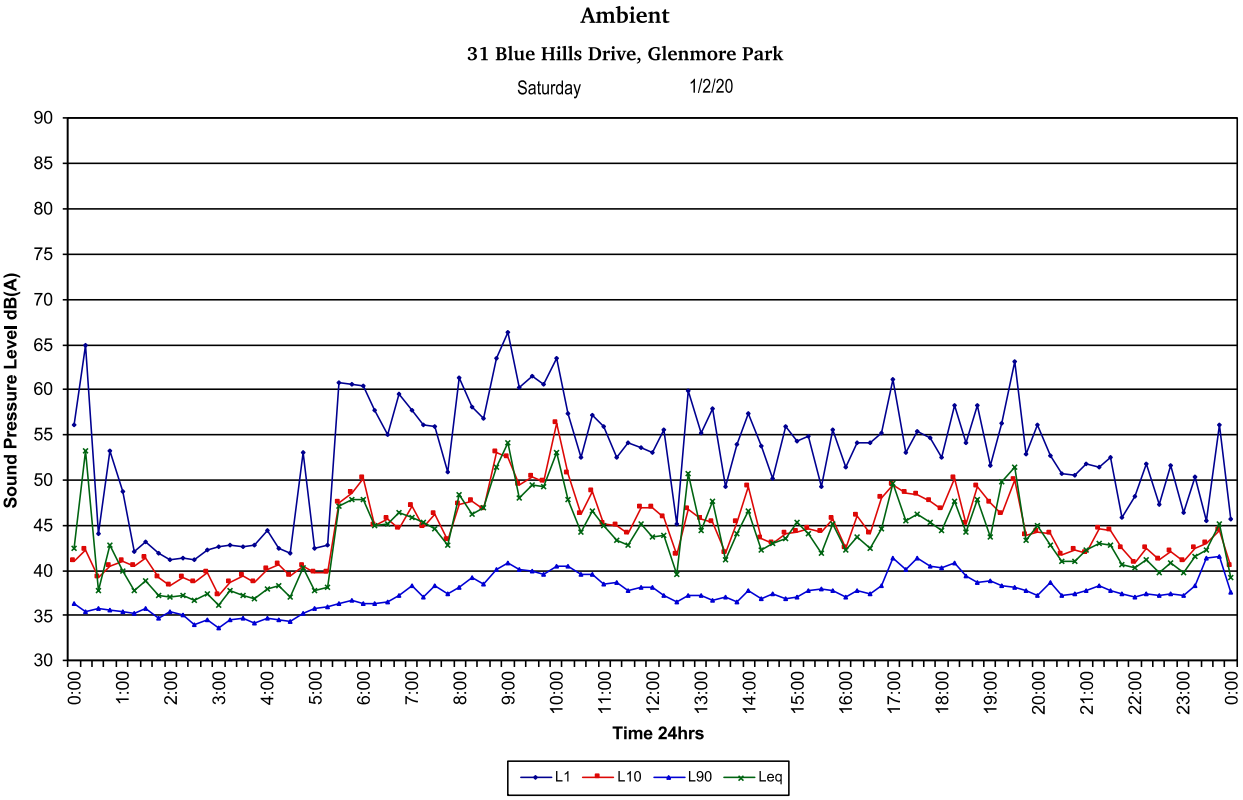
	L_{A10} Noise level present for 10% of the 15 minute interval. Commonly referred to the average maximum noise level. L_{Aeq} Equivalent continuous (energy average) A-weighted sound pressure level. It is defined as the steady sound level that contains the same amount of acoustic energy as the corresponding 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

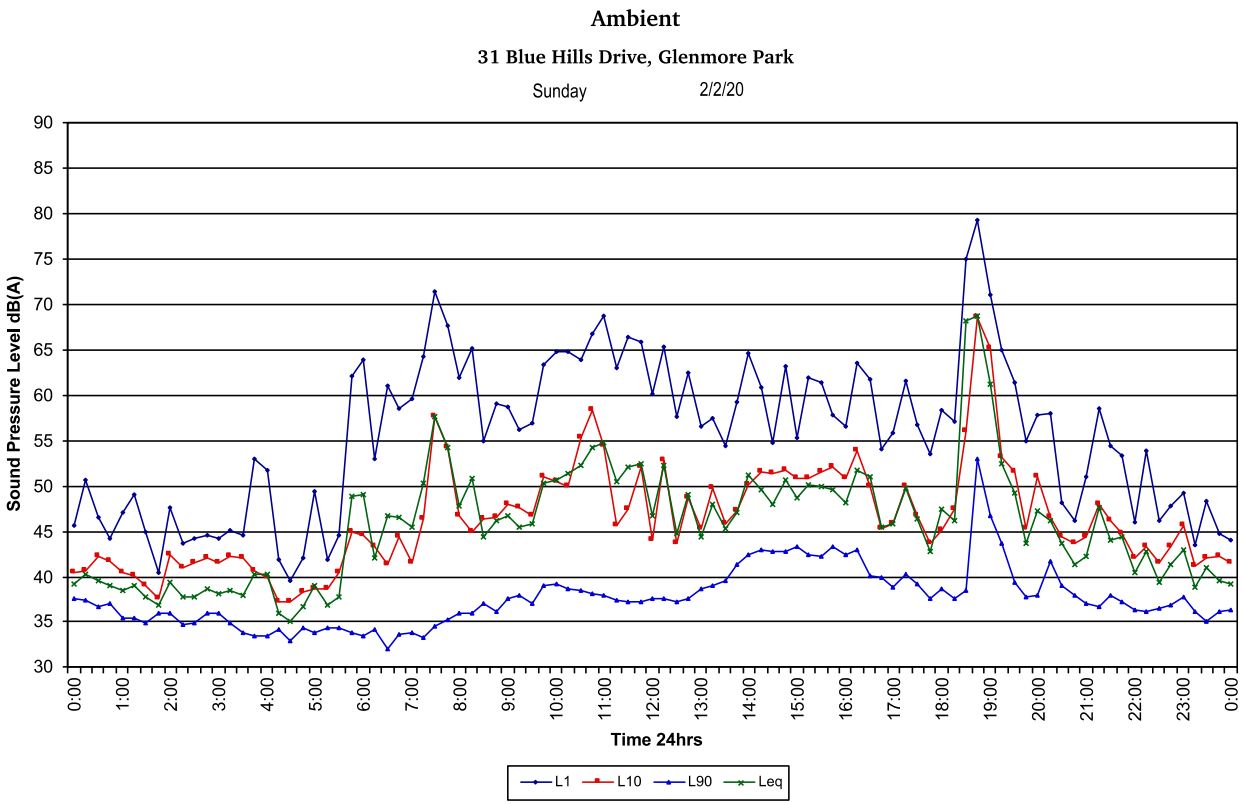
Appendix B – Logger Graphs

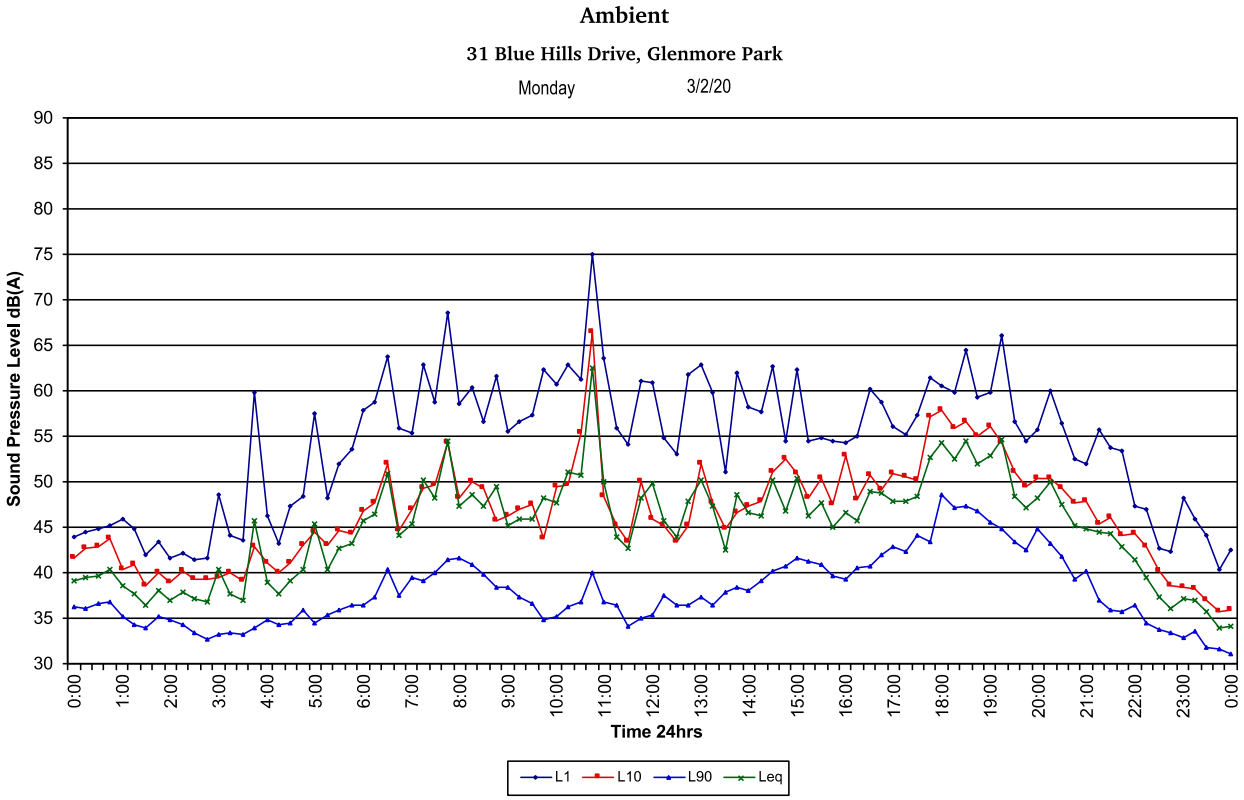


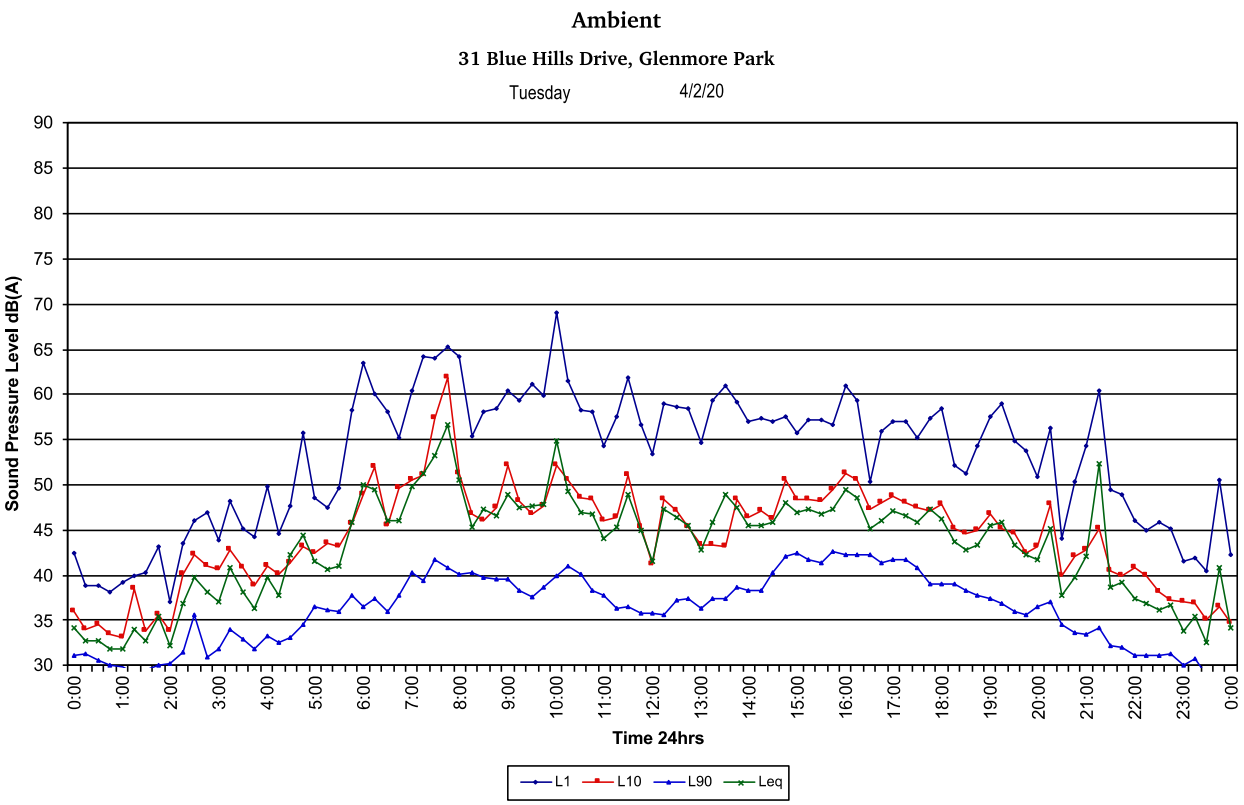


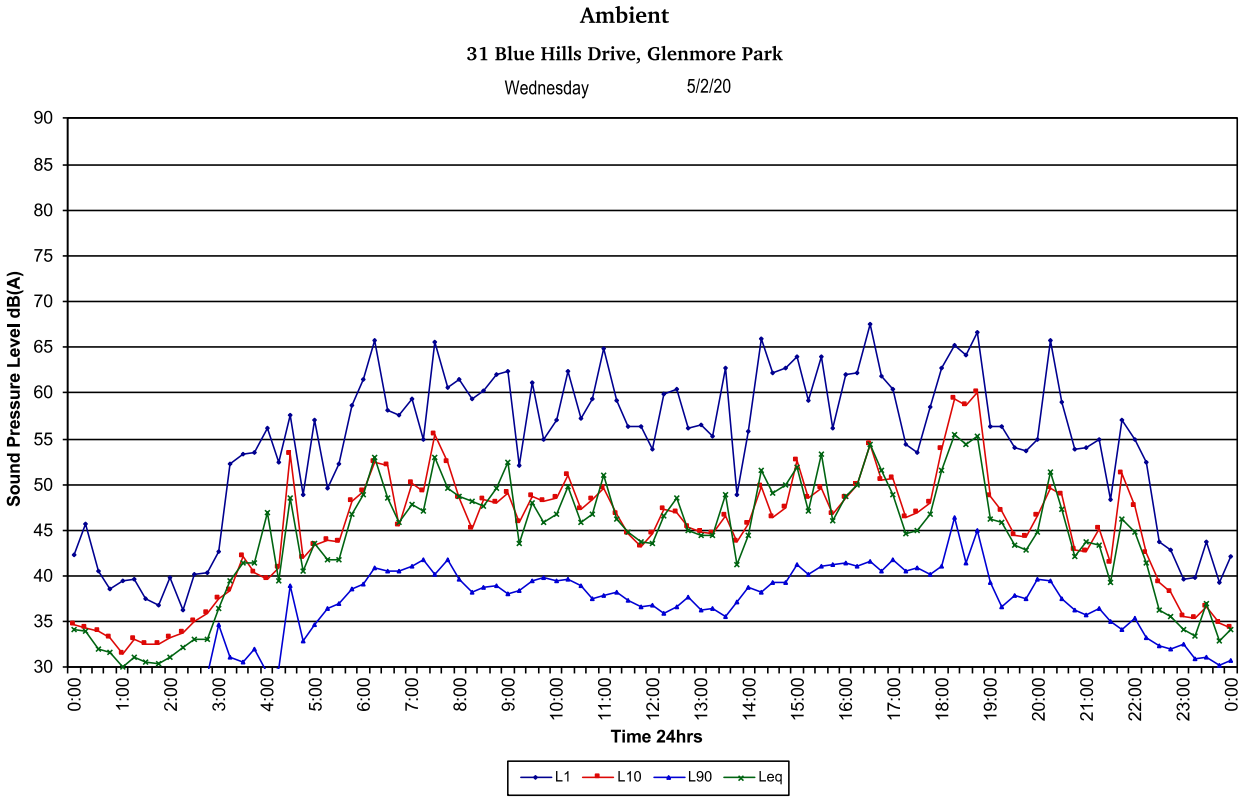


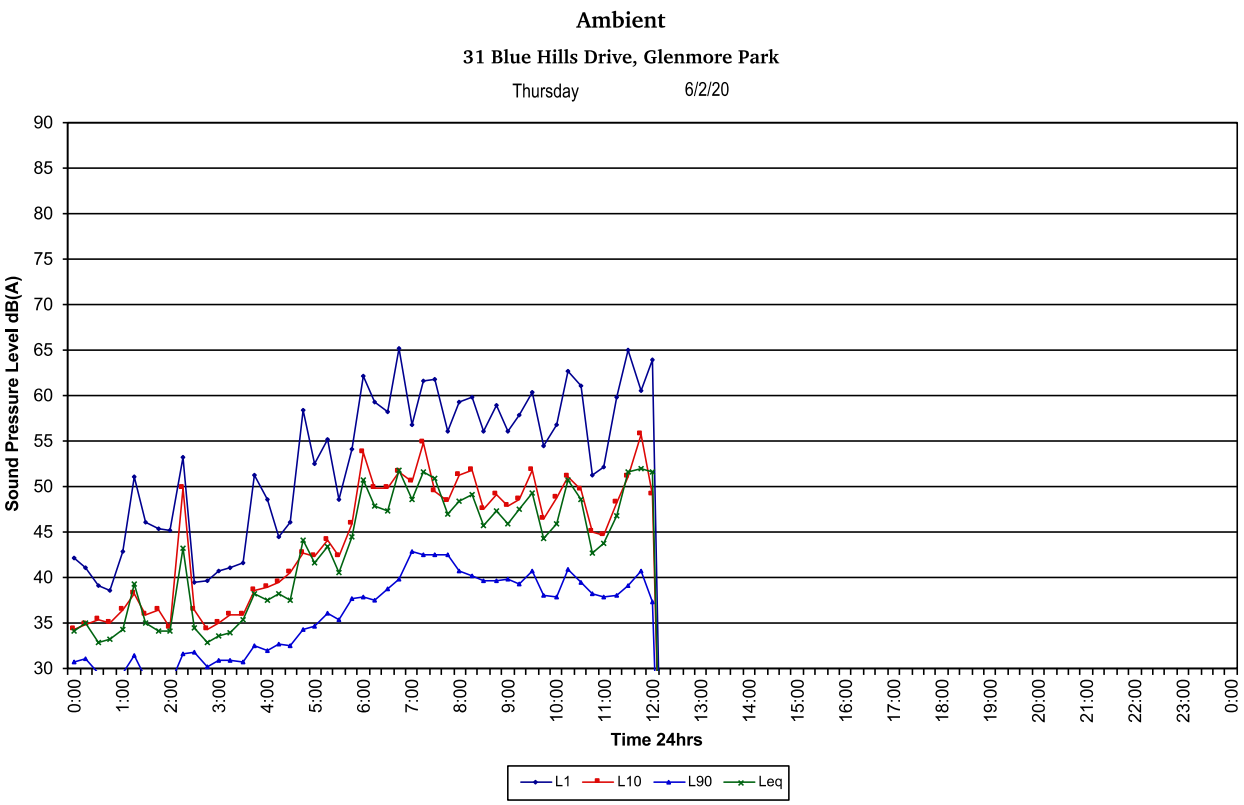












Appendix C – Calibration Certificates

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Sound Level Meter
IEC 61672-3.2013
Calibration Certificate

Calibration Number C18582

Client Details	Rodney Stevens Acoustics Pty Ltd 1 Majura Close St Ives Chase NSW 2075
Equipment Tested/ Model Number :	Rion NL-42EX
Instrument Serial Number :	00546394
Microphone Serial Number :	172450
Pre-amplifier Serial Number :	46606

Pre-Test Atmospheric Conditions		Post-Test Atmospheric Conditions	
Ambient Temperature :	22.5°C	**Ambient Temperature :**	22.5°C
Relative Humidity :	49.2%	**Relative Humidity :**	48.2%
Barometric Pressure :	98.94kPa	**Barometric Pressure :**	98.92kPa

Calibration Technician : Lucky Jaiswal
Calibration Date : 5 Nov 2018
Secondary Check: Lewis Boorman
Report Issue Date : 5 Nov 2018

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	*Pass*
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.

Least Uncertainties of Measurement -

Acoustic Tests		Environmental Conditions	
31.5 Hz to 8kHz	*±0.15dB*	*Temperature*	*±0.2°C*
12.5kHz	*±0.21dB*	*Relative Humidity*	*±2.4%*
16kHz	*±0.29dB*	*Barometric Pressure*	*±0.015kPa*
Electrical Tests			
31.5 Hz to 20 kHz	*±0.12dB*		

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 Australian/national standards.

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.

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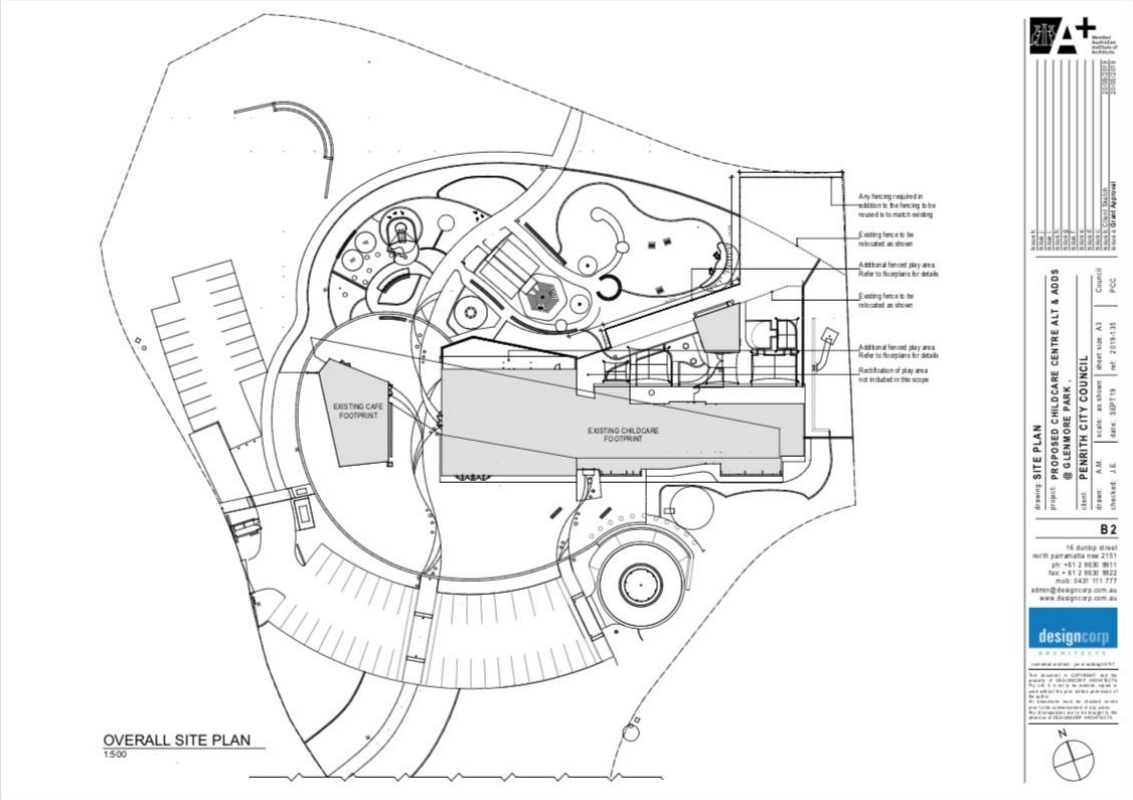
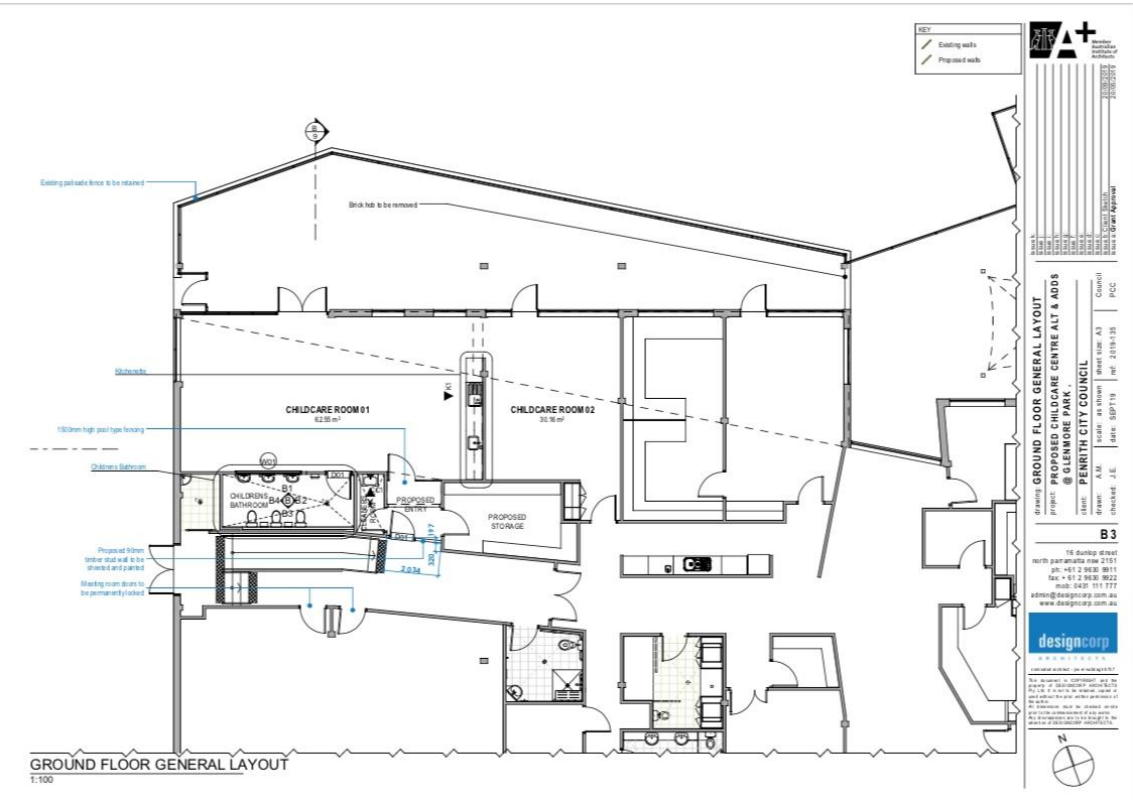
Appendix D – Architectural Plans

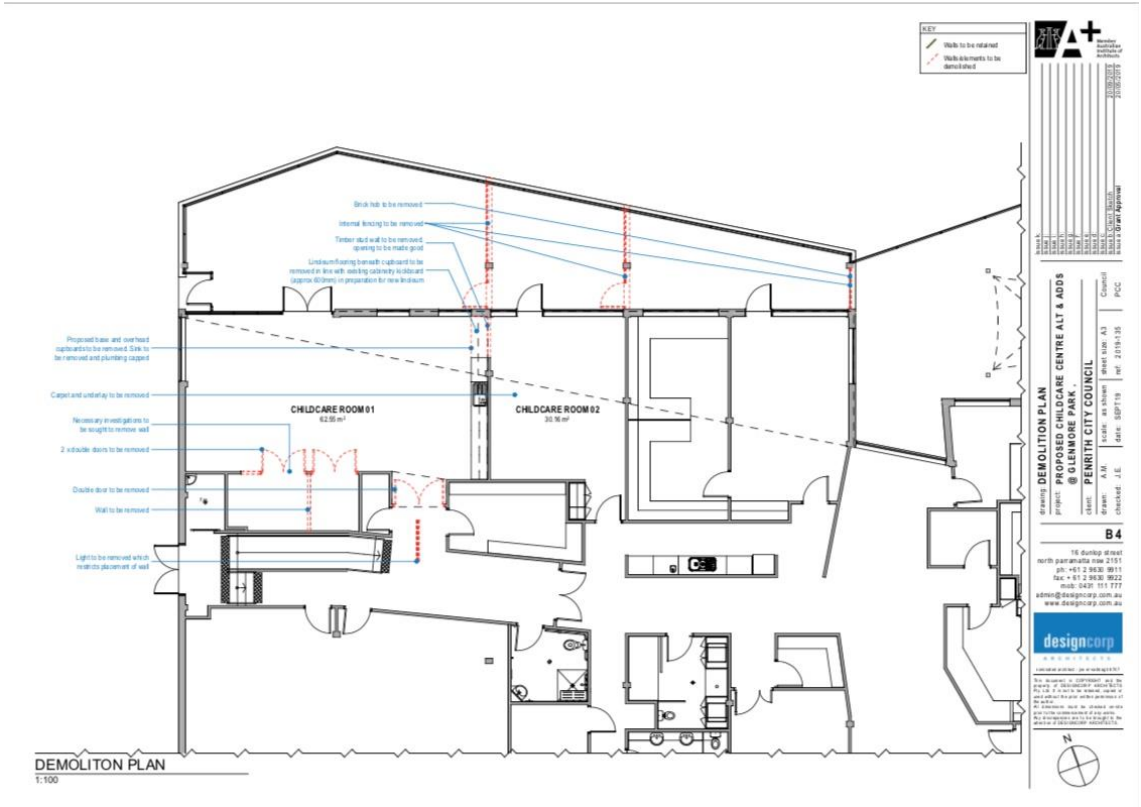
Overall Site Plan



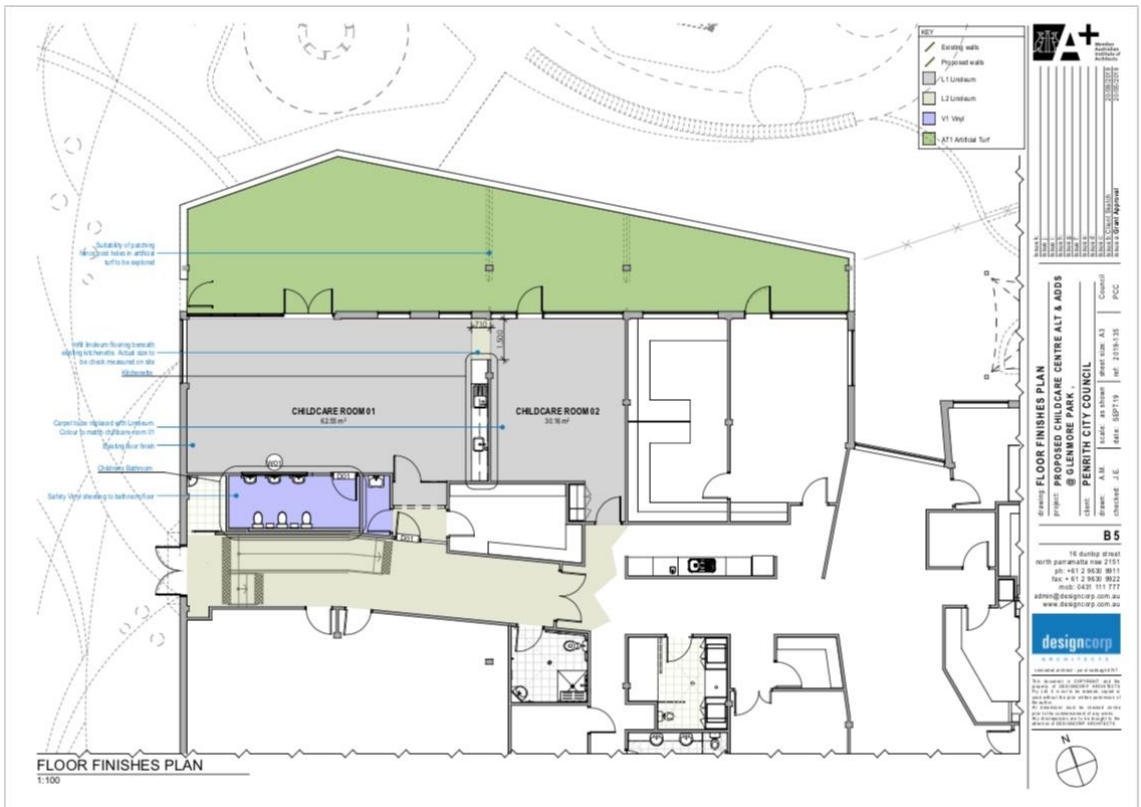
Ground Floor General Layout



Demolition Plan



Floor Finishes Plan



Area Calculation Plan