Acoustica Projects

The Noise Control Specialist

Child Care Centre
14 Lavender Close
Gillieston Heights NSW 2321

Child Care Centre Noise Impact Assessment

APLMC031

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The Noise Control Specialist

Project Details	
Report Title	Child Care Centre Noise Impact Assessment
Project Location	14 Lavender Close, Gillieston Heights NSW 2321
Project Title	Child Care Centre
Client	Surya Pingala

Reference	Date	Revision	Document Control	Prepared	Reviewed	Approved
APLMC031	31/07/2024	00	Issue	LC	DC	LC

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1 Introduction

Surya Pingala has engaged acoustic consultation to conduct a Noise Emission Assessment for the proposed Child Care Centre at 14 Lavender Close, Gillieston Heights NSW 2321. This assessment is designed to determine the environmental acoustic impacts of operational noise emissions from the child care centre as it pertains to the acoustic amenity of nearby noise sensitive residential receivers. The site is located within the Maitland City Council area and is proposed as a brand-new development within the Gillieston Grove Estate.

The existing site is currently undeveloped with a watercourse through the middle. New operations with the child care centre are proposed to develop the site over the watercourse with an elevating outdoor play area on a pylon platform. This assessment will assess the existing noise environment without the presence of the child care operations to determine the environmental impacts of the facility to the neighbouring residential developments.

This report aims to establish compliance for operational noise under the proposed development with the applicable criteria at local and state levels and to maintain the acoustic amenity at the surrounding residential environment. Noise emission criteria will be assessed under the following acoustic criteria and site planning documentation as detailed in Table 1.

Table 1 – Reviewed Documentation

Reference	Document Title	Author	Date/Version
116.23	Contour and Detail Plan	Rennie Golledge Pty Ltd	15.05.2023/-
DA00.00	Cover Page	ArtMade Architects	-.06.2024/A
DA02.01	Site Plan	ArtMade Architects	-.06.2024/A
DA03.01	Ground Floor Plan	ArtMade Architects	-.06.2024/A
DA03.02	Area Calculations	ArtMade Architects	-.06.2024/A
DA04.01	External Elevations	ArtMade Architects	-.06.2024/A
DA05.01	Sections & External Finishes	ArtMade Architects	-.06.2024/A
DA06.01	Shadow Diagrams & View from Sun	ArtMade Architects	-.06.2024/A
DA06.02	Outdoor Play Area Solar/Shade Calculations	ArtMade Architects	-.06.2024/A
PC/2023/1651	Section 10.7 Planning Certificate	Maitland City Council	05.06.2023/-
MC.DCP.2011	Maitland Citywide Development Control Plan 2011	Maitland City Council	-.12.2011/-
EPA.NPfI.2017	Noise Policy for Industry 2017 NSW	Environmental Protection Authority	-.10.2017/-
AS/NZS 2107	Australian Standard 2107:2016 Acoustics – Recommended design sound levels and reverberation times for building interiors	Standards Australia	24.10.2016/-
AAAC	Guideline for Child Care Centre Acoustics Assessment	Association of Australasian Acoustical Consultants	-.09.2020/3

2 Project Details

2.1 Child Care Centre Facility

The existing project site is a currently undeveloped at 14 Lavender Close, Gillieston Heights. A proposal has been developed for a child care centre facility to be constructed with the following provisions.

- 4 indoor playrooms
- 2 outdoor play areas
- staff office and rest room
- meeting room
- kitchen
- laundry
- sleeping rooms
- lavatories
- lobby area
- storage and ancillary rooms
- 10 visitor car parking spaces
- 10 staff parking spaces
- 1 disabled parking space
- A service lane wraps around the property along the eastern and northern boundaries

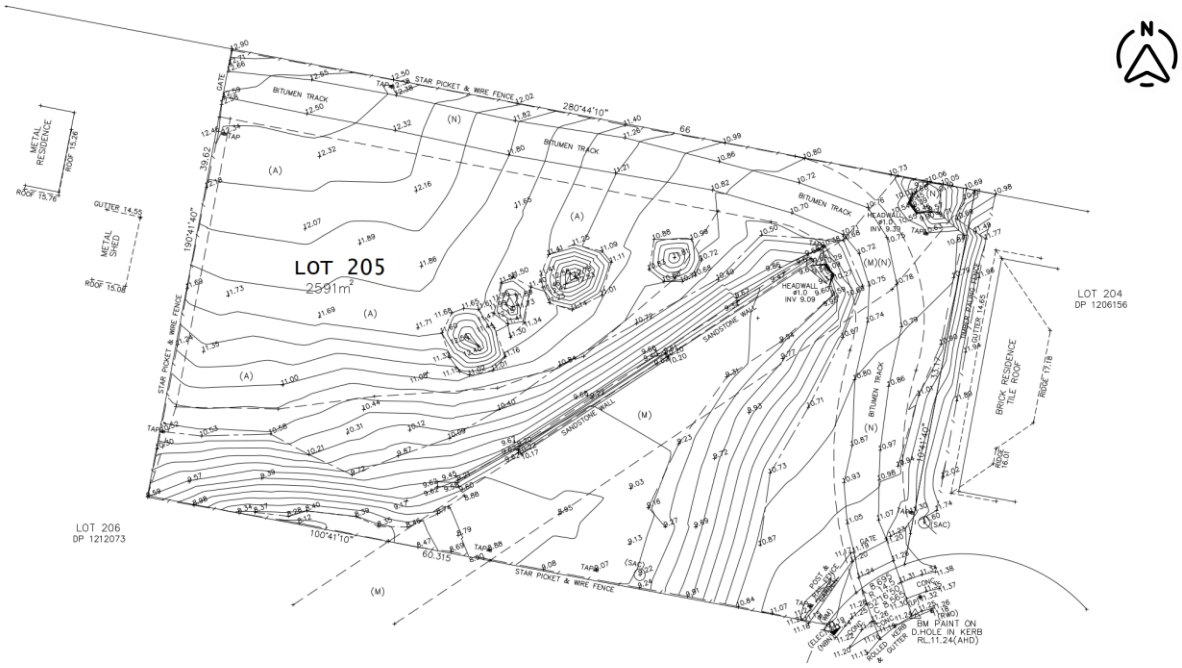
The development is proposed with a building envelope constructed with steel sheet roofing and cladded walls, with large windows and highlights in the playrooms. The on-site parking lot includes a turning bay, bin storage enclosure and ramp access to the lobby entrance. The child care facility is a single structure, 41 metres wide, 25 metres long and 5.5 metres high. Two outdoor play areas are proposed with shade cloth sails. Architectural plans of the proposed development are detailed in Figure 1.

Figure 1 – Child Care Centre Plans (ArtMade Architects)

2.2 Site Survey Plan

The site survey of the existing lot and the natural surface levels are shown below in Figure 2.

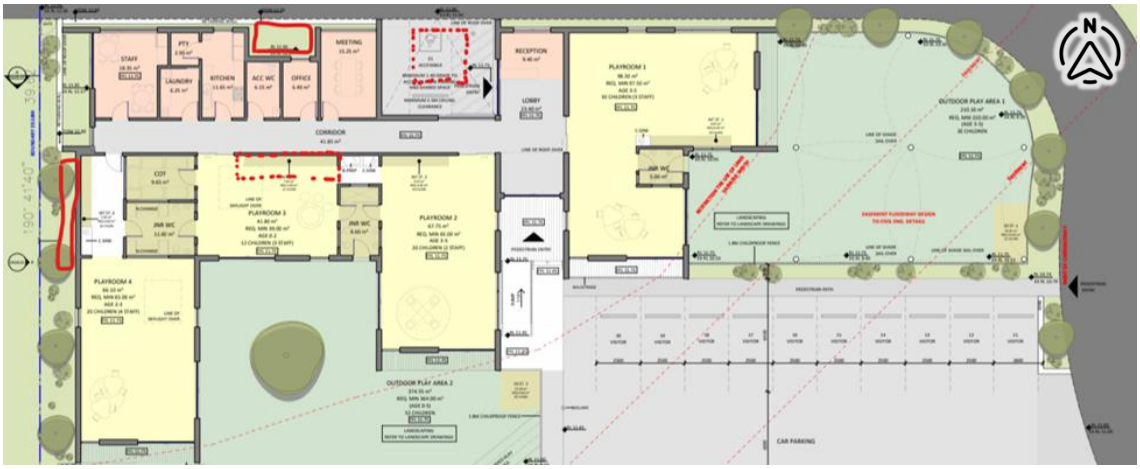
Figure 2 – Contour and Detail Plan (Rennie Golledge Pty Ltd)



2.3 Mechanical Equipment

Mechanical equipment selections have not been finalised for the development at this stage of the proposal; however, typical air conditioning condenser units have been modelled in designated locations. Laundry, kitchen and toilet exhaust fans are proposed above each respective room. A markup of the proposed mechanical equipment locations is shown in the Figure 3. Hatched markings represent small extraction fans located in the ceiling cavity or rooftop level, which are not significant to contribute to development noise emissions.

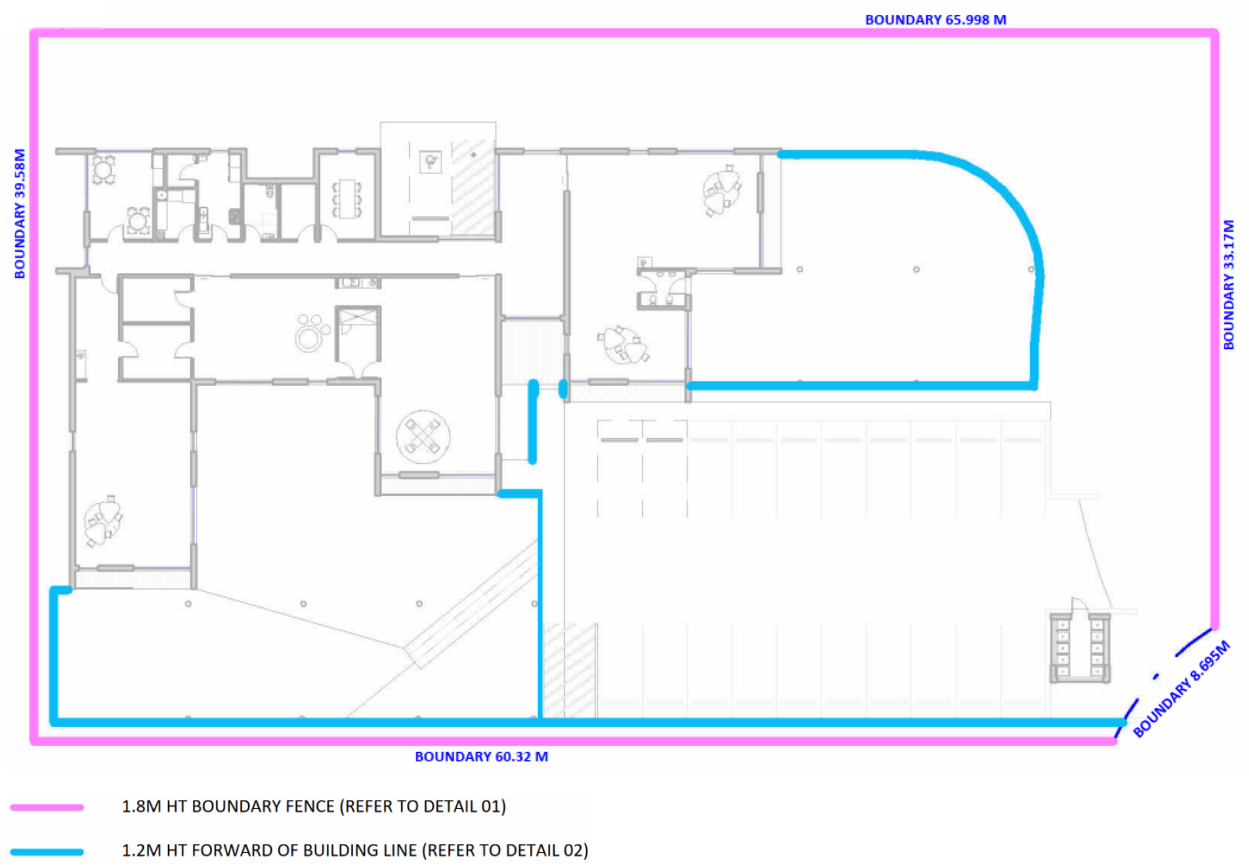
Figure 3 – Mechanical Equipment Location Markup (ArtMade Architects)



2.4 Acoustic Barriers

Solid construction boundary fencing is proposed to surround the entire property at 1.8m height following the natural surface level with an opening at the entrance to the carpark only, as detailed in the markup shown in Figure 4. Low set boundary fences are also located around outdoor play areas at a 1.2m height; it is the understanding of this office that these are also proposed as solid construction barriers, providing acoustic barrier effects. An acoustic barrier markup overlay on the architectural plans are detailed in Appendix C – Survey Plan Acoustic Barrier Markup.

Figure 4 – Acoustic Barriers Markup (ArtMade Architects)



2.5 Proposed Operational Schedule

The development application includes the proposed hours of operation as detailed in Table 2.

Table 2 – Operational Hours

Day	Operational Hours
Sunday	Closed
Monday	06:30 – 18:00
Tuesday	06:30 – 18:00
Wednesday	06:30 – 18:00
Thursday	06:30 – 18:00
Friday	06:30 – 18:00
Saturday	Closed

2.6 Play Area Configurations

Play areas have been designated for internal and external areas. Age groups for children and staffing are as detailed in Table 3.

Table 3 – Indoor and Outdoor Play Area Schedule

Room	Ages	No. of Children	No. of Staff	Area
Indoor Playroom Schedule				
Playroom 1	3-5 years	30	3	122.6m^2
Playroom 2	3-5 years	20	2	66.2m^2
Playroom 3	0-2 years	12	3	40.25m^2
Playroom 4	2-3 years	20	4	66.1m^2
Outdoor Play Area Schedule				
Outdoor Play Area 1	3-5 years	30	-	210.05m^2
Outdoor Play Area 2	0-5 years	52	-	374.55m^2

2.7 Project Locality

The site is located within the Maitland City Council area and lies within an (R1) General Residential zone area at the end of the cul-de-sac on Lavender Close in Gillieston Heights. The site is surrounded by residential dwellings within the same (R1) General Residential zoning as shown in Figure 5.

Figure 5 – Area Zoning Map (NSW Planning Portal)

A decommissioned railway line is located 150m to the west of the subject site across an (RU2) Rural Landscape land parcel. A service lane to the railway line is located on the subject site, which borders the eastern and northern site boundaries and is accessed via a common driveway to the subject site from Lavender Close.

2.8 Noise Sensitive Receivers

Noise sensitive residential receivers identified as most affected by the operations of the child care centre and subject to this noise emissions assessment are located on residential properties adjacent on the eastern boundary and to the south of the subject site, across the Lavender Close cul-de-sac. Figure 6 presents aerial imagery of the subject site, and the locations of the nearest and most affected noise sensitive receivers, as well as unattended long-term measurements conducted by this office. Table 4 details the nearest noise sensitive receivers for this assessment.

Figure 6 – Aerial Imagery of the Subject Site and Nearest Noise Sensitive Receivers (National Map)

Table 4 – Nearest Noise Affected Receivers

ID	Address	Zoning	Type	Distance to Receiver
R1	12 Lavender Cl, Gillieston Heights	R1	Residential	20m East
R2	11 Lavender Cl, Gillieston Heights	R1	Residential	60m Southeast

3 Ambient Noise Environment

3.1 Environmental Logging Location

Long-term noise monitoring data was recorded to determine the typical background noise levels of the area unaffected by the operations of the child care centre. Environmental noise logging was conducted during the period from Tuesday, 2nd July to Monday, 8th July 2024.

The noise logger was located at the southeast boundary of the subject site. The environmental logger microphone was elevated at 1.5 metres above the natural surface level and captured the ambient noise environment suitable for representation of the local acoustic background levels as shown in Figure 7. Background noise levels in the area were noted to be controlled by distant traffic movements on Cessnock Road, local wildlife and the nearby watercourse.

Figure 7 – Logger Installation at 14 Lavender Close, Gillieston Heights

3.2 Environmental Noise Assessment

Noise monitoring results were assessed based on NSW EPA's Rating Background Level (RBL) assessment procedure, which is defined as the median value of the tenth percentile of L_{90} ambient background noise levels for day, evening, and night-time periods, of the entire period of measurement. The measured background noise levels were corrected for meteorological conditions (such as wind or rain) as required by Section 3.4 of the EPA Industrial Noise Policy for Industry. The nearest weather station used to record data was the Maitland Airport all weather station (Station ID: 061428).

Table 5 summarises the measured background noise monitoring data from the subject noise environment and median Rating Background Noise Levels (RBLs) for the site. For detailed noise measurement data refer to graphical data in Appendix B – Noise Monitoring Data.

Table 5 – Background Noise Monitoring Data – Rating Background Noise Levels (RBL)

Date	Measured Background Noise Level (RBL), dB(A) L_{90}			
	Daytime (7:00am – 6:00pm)	Evening (6:00pm – 10:00pm)	Night (10:00pm – 7:00am)	Morning Shoulder (6:00am – 7:00am)
Tuesday, 2 July 2024	43	47	-	-
Wednesday, 3 July 2024	45	47	41	45
Thursday, 4 July 2024	45	45	41	44
Friday, 5 July 2024	46	45	40	43
Saturday, 6 July 2024	42	41	40	40
Sunday, 7 July 2024	38	43	39	38
Monday, 8 July 2024	41	46	38	38
Median	**43**	**45**	**40**	**41**

3.3 Acoustic Measurement Equipment

Noise logging was conducted with an NTi XL2-TA sound level meter (S/N:A2A-21460-E0) set on A-weighted and fast response mode and recording in 15-minute intervals. The sound level meter was equipped with a Type 1 NTi MA2330 microphone (S/N:009433). Short-term attended measurements were also conducted using this sound level meter and microphone with A-weighted, fast response modes under 1/1 octave band spectrum data recording.

Instrument calibration was checked before and after measurements using a Larson Davis CAL200 Class 1 (S/N:18640), with variation in calibrated levels not exceeding ±0.5dB. The acoustic instrumentation employed was designed to comply with the requirements of AS IEC 61672.1—2004 – Electroacoustics—Sound level meters, Part 1: Specifications and carries current manufacturer calibration certificates.

4 Operational Noise Criteria

4.1 Maitland City Council

4.1.1 Development Control Plan Part C: Design Guidelines 2011

The Maitland City Council states within their Development Control Plan in *Section C.2 – Child Care Centres* that the chapter has been repealed in favour of the requirements under the *State Environmental Planning Policy (Educational Establishments and Child Care Facilities) 2017*, the *Education and Care Services National Regulations* and *Child Care Planning Guidelines*. No quantitative acoustic criteria are provided for Child Care Centres in these documents.

4.1.2 Section 10.7 Planning Certificate

The Maitland City Council has issued a planning document for the subject site, which contains no specific requirements for acoustic impacts.

4.2 NSW EPA Noise Policy for Industry 2017

The NSW Environmental Protection Authority has issued documentation entitled, *Noise Policy for Industry (NPfI) 2017* which has developed a method for determination of a Project Noise Trigger Level, such that exceedances of the trigger level require a management response. The Project Noise Trigger Level is determined by the most stringent output from the Intrusiveness and Amenity Criteria.

4.2.1 Intrusive Criterion

The intrusiveness guideline is intended to limit the degree of change that a new noise source introduces to an existing residential environment. It requires the noise emissions from a source (using the L_{Aeq} descriptor), measured over a 15-minute period, not to exceed the Rating Background Level (RBL) by more than 5dB. The resultant project intrusiveness criterion is stated in Table 6.

Table 6 – Project Intrusiveness Criterion

Receiver	Time of Day	Measured RBL, dB(A) L_{90}	Project Intrusiveness Criteria, dB(A) $L_{eq,15min}$
Residential Receivers R1 & R2	Daytime (7:00am – 6:00pm)	43	48

4.2.2 Amenity Criterion

Project amenity criterion is determined based on the land use in the area including commercial, industrial, residential uses, etc. to maintain adequate ambient noise levels within an area to achieve a Recommended Amenity Noise Level (RANL) that is consistent with the existing environment. Residential land uses are categorised as rural, urban or suburban. For the purposes of this assessment, the nearest residential dwellings will be considered as suburban within the R1 – General Residential land use zoning, determined by the measured RBL and their correlated receiver category according to Table 2.3 of the NPfI. The amenity noise criterion for each noise sensitive receiver is detailed in Table 7.

Table 7 – Project Amenity Criterion

Receiver	Time of Day	Recommended Amenity Noise Level, dB(A) L_{eq}	Project Amenity Noise Level, dB(A) $L_{eq,15min}$
Residential Receivers R1 & R2	Daytime (7:00am – 6:00pm)	55	53

4.2.3 Project Noise Trigger Levels

The project trigger noise level provides the noise criteria for the subject site, which is identified as the most stringent of the Intrusive and Amenity criteria. The resultant project trigger noise levels for each noise sensitive receiver are detailed in Table 8.

Table 8 – Project Noise Trigger Levels

Receiver	Time of Day	Project Trigger Noise Level, dB(A) $L_{eq,15min}$
Residential Receivers R1 & R2	Daytime (7:00am – 6:00pm)	48

4.2.4 Sleep Disturbance Criteria

Section 2.5 of the NPfI refers to the maximum external noise level event assessment during the night-time hours for sleep disturbance assessment as detailed below and summarised in Table 9.

> *A detailed maximum noise level event assessment should be undertaken where the subject development/premises night-time noise levels at a residential location exceed:*
>
> - *$L_{Aeq,15min}$ 40 dB(A) or the prevailing RBL plus 5 dB, whichever is the greater, and/or*
> - *L_{AFmax} 52 dB(A) or the prevailing RBL plus 15 dB, whichever is the greater*

Table 9 - Sleep Disturbance Noise Trigger Levels

Receiver	Time of Day	Continuous Trigger Noise Level, dB(A) $L_{eq,15min}$	Impulsive Trigger Noise Level, dB(A) L_{AFmax}
Residential Receivers R1 & R2	Morning Shoulder (6:00am – 7:00am)	46	56

4.3 AAAC Guideline for Child Centre Assessment

The Association of Australasian Acoustical Consultants identified a need to provide guidance in assessing noise impact from proposed child care centres consistently, accurately, and fairly. This guideline is not a statutory requirement but is advisory in relation to the assessment and management of child care centre noise. The intent of the guideline is to protect the acoustic privacy of nearby residents, provide noise goals and control recommendations such that adverse noise impacts do not occur and protect children from excessive noise exposure in high noise environments.

The guideline suggests the following noise criteria for child care centres in quieter residential neighbourhoods.

> *Base Criteria – With the development of child care centres in residential areas, the background noise level within these areas can at times, be low. Thus, 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).*
>
> *Background Greater Than 40 dB(A) – The contributed $L_{eq,15min}$ noise level emitted from an outdoor play and internal activity areas shall not exceed the background noise level by more than 5 or 10 dB at the assessment location, depending on the usage of the outdoor play area. AAAC members regard that a total time limit of approximately 2 hours outdoor play per morning and afternoon period should allow an emergence above the background of 10 dB (i.e. background +10 dB if outdoor play is limited to 2 hours in the morning and 2 hours in the afternoon).*
>
> *Up to 4 hours (total) per day – If outdoor play is limited to no more than 2 hours in the morning and 2 hours in the afternoon, the contributed $L_{eq,15\ minute}$ noise level emitted from the outdoor play shall not exceed the background noise level by more than 10 dB at the assessment location.*
>
> *More than 4 hours (total) per day – If outdoor play is not limited to no more than 2 hours in the morning and 2 hours in the afternoon, the contributed $L_{eq,15\ minute}$ noise level emitted from the outdoor play area shall not exceed the background noise level by more than 5 dB at the assessment location.*
>
> *The noise impact of staff arrivals, setup, cleaning or other on-site activities prior to 7am or during night-time hours should be assessed at nearby residential premises. The L_{Amax} noise level emitted from vehicles arriving and parking, depending on the requirements of the state or territory where the centre is located shall not exceed the background noise level by more than 15 dB outside the nearest habitable room window.*

4.4 Australian Standard 2107:2016

Noise emissions from the subject site affecting neighbouring receiver internal acoustic amenity refer to the Australian Standard *AS2107:2016 Acoustics - Recommended design sound levels and reverberation times for building interiors*. Design sound level ($L_{Aeq,t}$) ranges are provided for different types of occupancies and uses. Design sound levels for project receivers are repeated within Table 10.

Table 10 – Design Sound Levels for Areas of Occupancy in Buildings (AS2107:2016)

Type of Occupancy	Design Sound Level Range, $L_{Aeq,t}$ dB(A)
Residential – Houses and apartments in suburban areas or near minor roads	
Living areas	30 – 40
Sleeping areas (night-time)	30 – 35
Work areas	35 – 40

4.5 Operational Noise Criteria Summary

A summary of the noise emission criteria to be satisfied by the subject site to the nearest residential receivers is presented in Table 11 below.

Table 11 – Subject Site Operational Noise Criteria

Receiver	Operational Hours	Noise Criteria		
		NPfI	AS2107	AAAC
Residential Receivers R1 & R2	Morning Shoulder (6:30am – 7:am)	46 $L_{eq,15min}$ dB(A) 56 L_{AFmax} dB(A) (sleep disturbance)	35 $L_{eq,t}$ dB(A) (internal)	56 L_{AFmax} dB(A) (sleep disturbance)
	Daytime (7:00am – 6:00pm)	48 $L_{eq,15min}$ dB(A) (external)	40 $L_{eq,t}$ dB(A) (internal)	53 $L_{eq,15min}$ dB(A) (≤4hrs outdoor play) 48 $L_{eq,15min}$ dB(A) (>4hrs outdoor play)

5 Operational Noise Emission Assessment

5.1 Operational Noise Scenarios

Based on the summary of operational scheduling and noise source movements provided, noise scenarios are evaluated by the impacts to the noise sensitive receivers in accordance with the operational noise criteria established. The worst-case noise instances occur under one of the following conditions.

- Noise Scenario 1 – Early morning period operations (<7:00am)
  - Up to 5 staff arrivals in the worst 15-minute period
  - Up to 10 vehicles drop off occurrences in the worst 15-minute period
  - All air conditioning condenser units under maximum loading
  - Indoor use only, with no outdoor play areas in use prior to 7:00am
  - Car door slamming is assessed as the worst-case impulsive noise for sleep disturbance
- Noise Scenario 2 – Daytime outdoor active playtime
  - All air conditioning condenser units under maximum loading
  - Up to 30 children aged 3-5yrs in Outdoor Play Area 1 (full capacity)
  - Up to 52 children aged 0-5yrs in Outdoor Play Area 2 (full capacity)
- Noise Scenario 3 – Peak pickup time
  - Up to 15 client vehicles pickup occurrences in the worst 15-minute period
  - All air conditioning condenser units under maximum loading
  - Outdoor Play Areas 1 and 2 operating at 50% capacity each
  - Indoor playrooms do not contribute to acoustic impacts at residential receivers

5.2 Summary of Assumptions

Predicted noise emission levels from the proposed child care operations at the nearest noise sensitive receivers are detailed in accordance with the following list of assumptions under the worst-case scenarios. Compliance using these assumptions will ensure compliance under all other conditions or scenarios. The following noise emission sources are detailed below, with predicted SWL spectrums in octave bands for mechanical and active children group play noise sources are provided in Table 12:

- 18kW air conditioning condenser units mounted to the western and northern external façades at ground level of the facility with a Sound Power Level (SWL) of L_W 74 dB(A) each
- Outdoor play areas are assessed with SWLs presented in the AAAC Guideline for Child Care Centre Acoustic Assessment document, and proportionately assessed under the worst-case use
- Light vehicle movements at 10km/hr plus idle are assessed at 60 sec with L_W 88 dB(A) each.
- Car door slamming events are assessed for sleep disturbance with L_{AFmax} 92 dB(A)

Table 12 – Sound Power Levels of Noise Sources from the Child Care Centre

Noise Source	Sound Power Level, dBA	Octave Band Spectrum, Hz							
		63	125	250	500	1k	2k	4k	8k
18kW outdoor condenser unit	**74**	70	71	72	68	68	68	64	57
10 children – 0 to 2 years	**78**	54	60	66	72	74	71	67	64
10 children – 2 to 3 years	**85**	61	67	73	79	81	78	74	70
10 children – 3 to 5 years	**87**	64	70	75	81	83	80	76	72

Note: If applicable, an adjustment to sound power levels of -6dB could be applied for children involved in passive play.

Transmission losses occur through building envelopes where noise sources are located inside the child care centre, with predicted TL spectrums in octave bands for building material types provided in Table 13.

- Boundary fence lines and barriers are assessed as per the markup in Appendix C – Survey Plan Acoustic Barrier Markup and assumed to be constructed of a solid construction without airgaps at 1.8m in height demarcated in pink, and 1.2m in height as demarcated in blue. Solid constructions may include 'Colorbond' style sheet metal fencing, or 'Hebel' style sound barrier for boundaries and transparent acrylic barriers for outdoor play area partitions. Connections are to be acoustically sealed in order to maintain barrier performance.
- The Child Care facility is proposed to be built with concrete slab floors, fibre cement cladding walls and a steel sheet roof with glazed windows as detailed in Section 2.1.
- Glazed windows are assumed to be the weakest element of receiver façades where noise can transmit internally to noise sensitive receivers. Large format 6mm float glass is assumed as the minimum construction for windows.

Table 13 – Transmission Loss of Building Elements

Building Element	Sound Level Reduction Index	Transmission Loss, Octave Band Spectrum, Hz							
		63	125	250	500	1k	2k	4k	8k
6mm float glass	**R_w 30**	17	21	25	29	33	30	36	48

Transmission loss through façade constructions has been estimated using acoustic calculation tools including Strutt v5.24.02 and first principles to determine the noise levels at critical noise sensitive receivers.

5.3 Operational Noise Emissions

Noise source emissions were calculated to the nearest noise sensitive receivers according to the worst-case scenarios prepared within Sections 5.1 and 5.2. The following assessment summarises the calculated noise levels from the Child Care facility at the worst affected noise sensitive receivers using acoustic calculation tools including Strutt v5.24.02 and first principles, as detailed within Figure 8 and Table 4.

Figure 8 – Noise Sensitive Receiver Prediction Locations (National Map)

5.3.1 Operational Noise Impact – Receiver 1

Receiver 1 is located at 12 Lavender Close, directly adjacent to the east with the nearest receiver façade exposed to noise emissions from Outdoor Play Area 1 and the Car Park as detailed in Table 14.

Table 14 – Operational Noise Impact to Noise Sensitive Receiver 1 – 12 Lavender Close, Gillieston Heights

Noise Source Element	Noise Source Contribution, $L_{eq,15min}$ dB(A)
Noise Scenario 1 – Early morning period operations (<7:00am)	
Light vehicles x15 (Car door slam)	43 (53 L_{AFmax})
Air condenser unit M1	12
Air condenser unit M2	11
Cumulative noise contribution (external / internal)	43 / 11
Noise criteria (external / internal)	46 / 35
Compliance (Sleep Disturbance $L_{AFmax} \leq 56$)	Yes (Yes)
Noise Scenario 2 – Daytime outdoor active playtime	
Air condenser unit M1	12
Air condenser unit M2	11
Outdoor Play Area 1 (30 children 3-5yrs)	43
Outdoor Play Area 2 (52 children 0-5yrs)	37
Cumulative noise contribution (external / internal)	44 / 13
Noise criteria (external / internal)	46 / 35
Compliance	Yes
Noise Scenario 3 – Peak pickup time	
Light vehicles x15	43
Air condenser unit M1	12
Air condenser unit M2	11
Outdoor Play Area 1 (15 children 3-5yrs)	40
Outdoor Play Area 2 (26 children 0-5yrs)	34
Cumulative noise contribution (external / internal)	45 / 14
Noise criteria (external / internal)	46 / 35
Compliance	Yes

5.3.2 Operational Noise Impact – Receiver 2

Receiver 2 is located at 11 Lavender Close, adjacent to the southeast with the nearest receiver façade exposed to noise emissions from Outdoor Play Area 2 and the Car Park as detailed in Table 15.

Table 15 – Operational Noise Impact to Noise Sensitive Receiver 2 – 11 Lavender Close, Gillieston Heights

Noise Source Element	Noise Source Contribution, $L_{eq,15min}$ dB(A)
Noise Scenario 1 – Early morning period operations (<7:00am)	
Light vehicles x15 (Car door slam)	29 (46 L_{AFmax})
Air condenser unit M1	9
Air condenser unit M2	8
Cumulative noise contribution (external / internal)	29 / 0
Noise criteria (external / internal)	46 / 35
Compliance (Sleep Disturbance $L_{AFmax} \leq 56$)	Yes (Yes)
Noise Scenario 2 – Daytime outdoor active playtime	
Air condenser unit M1	9
Air condenser unit M2	8
Outdoor Play Area 1 (30 children 3-5yrs)	36
Outdoor Play Area 2 (52 children 0-5yrs)	40
Cumulative noise contribution (external / internal)	41 / 10
Noise criteria (external / internal)	46 / 35
Compliance	Yes
Noise Scenario 3 – Peak pickup time	
Light vehicles x15	29
Air condenser unit M1	9
Air condenser unit M2	8
Outdoor Play Area 1 (15 children 3-5yrs)	33
Outdoor Play Area 2 (26 children 0-5yrs)	37
Cumulative noise contribution (external / internal)	39 / 8
Noise criteria (external / internal)	46 / 35
Compliance	Yes

5.4 Operational Noise Compliance Summary

From the noise emission assessment of the proposed operations of the child care centre, it is noted that the current design is compliant with all acoustic criteria for noise impacts when in use at the nearest noise sensitive receivers. It is noted that the assumptions of solid construction boundary and partition fence materials and heights, and restricted use of the outdoor play areas prior to 7:00am are essential to achieve acoustic compliance at the nearest noise sensitive receivers.

6 Conclusion

A noise emission assessment has been conducted for the proposed Child Care Centre located at 14 Lavender Close, Gillieston Heights NSW 2321. The ambient noise environment has been examined to determine the relative impacts from the proposed Child Care Centre development to the acoustic environment and establishing the noise emission criteria for the nearest noise sensitive residential receivers, as detailed in Section 4 of this report.

Operational noise sources from the development are proposed in accordance with the development package provided, which include mechanical services, outdoor play areas and external carparking. It is noted that no significant noise contributions are made from the internal playrooms proposed given the facility design and construction methods proposed. Noise barrier locations have been proposed for the site and acoustically sealed barrier performance has been assumed to determine the compliance of noise source emissions to the nearest, and worst affected noise sensitive receivers at neighbouring residential properties.

The assessment concluded that the proposed Child Care Facility is compliant with all acoustic criteria at the nearest residential noise sensitive receivers in its current design form under the provisions detailed in Section 5.4 of this report. These can be summarised under solid construction barriers and the restriction of all outdoor play areas prior to 7:00am. No further acoustic treatments are required to achieve compliance. Variations from the designs detailed in this report must be approved by the author of this report to confirm compliance with acoustic noise criteria is maintained.

Kind regards,

Luke Curtis
Acoustic Engineer
BEng(Civil), MAAS

7 Appendix A – Glossary

Environmental noise constantly varies and to accurately determine it, 15-minute measurement interval measurements are utilised. Noise levels are monitored on a continuous basis and statistical and integrated techniques are used to determine noise description parameters.

For analysing environmental noise, the following descriptors are used.

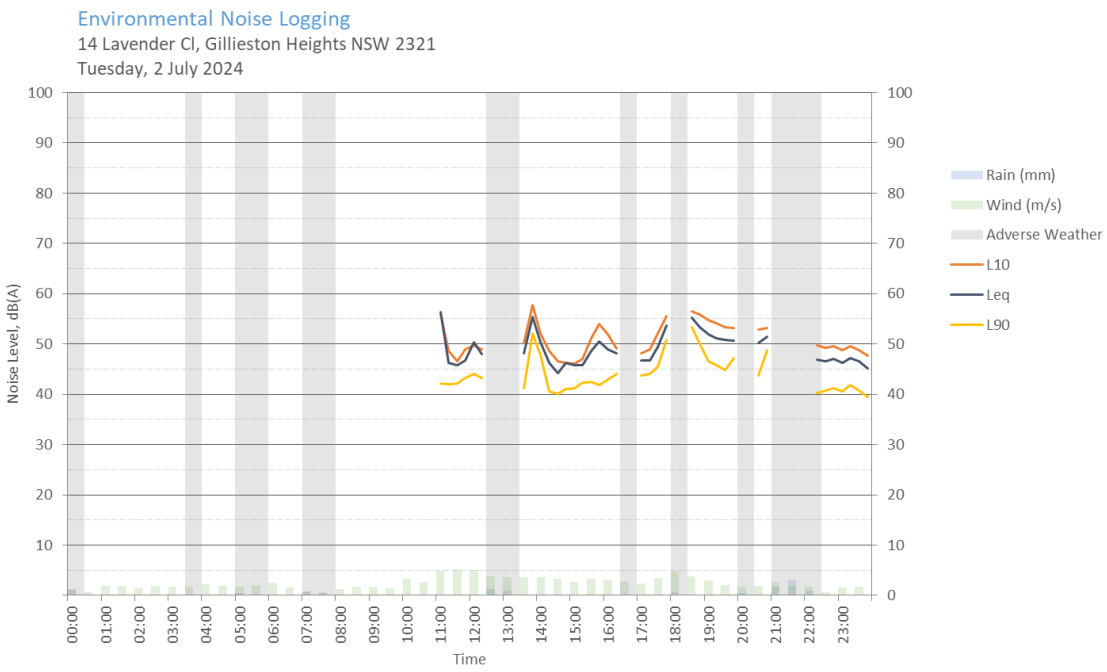
L_{90} is known as background noise. L_{90} is a statistical sound level which describes the percentage of times a sound level is exceeded. This parameter is used to set up the allowable noise levels for intrusive noise sources since the level of disturbance of the intrusive noise source will be dependent on how audible it is above the existing noise environment.

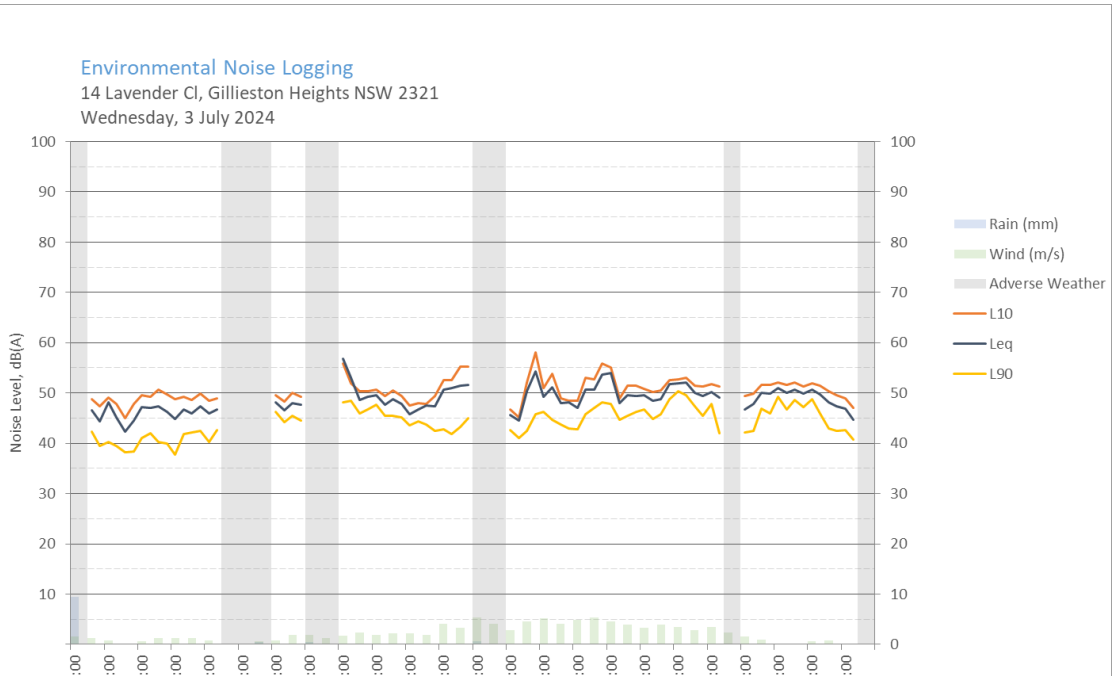
L_{eq} is the equivalent sound level which represents the average noise level during a measurement period. L_{eq} describes a receiver's cumulative noise exposure from all events over a specified period of time for compliance assessment purposes.

L_{max} is the maximum sound level captured during a measurement period that is not exceeded at any time. This parameter is typically used to determine maximum permissible sound level for noise source activities within the existing noise environment.

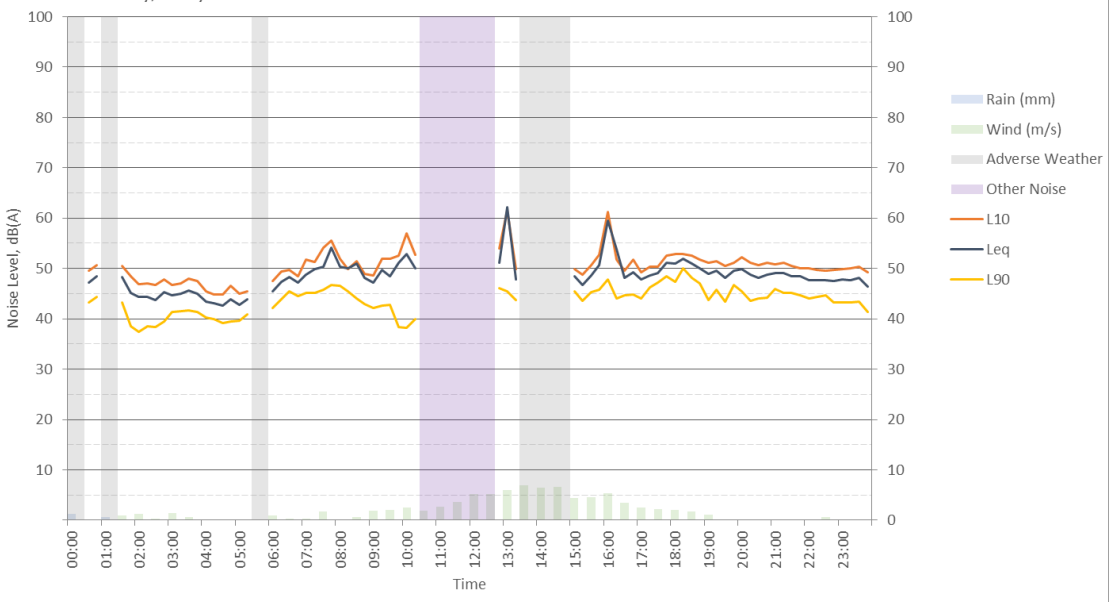
dB(A) A-weighted Sound Level (instantaneous) is the most common weighting used in noise measurements and it represents the frequency range detectable by the human ear. A-weighted is used for noise measurements, prediction purposes and is denoted as an "A" within the measurement descriptor.

8 Appendix B – Noise Monitoring Data

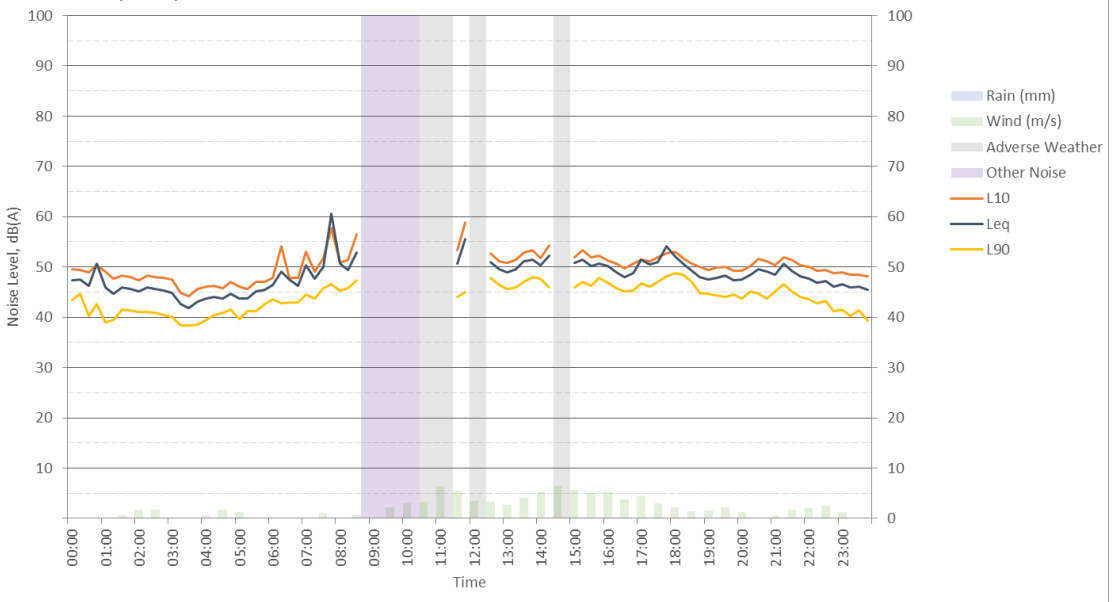




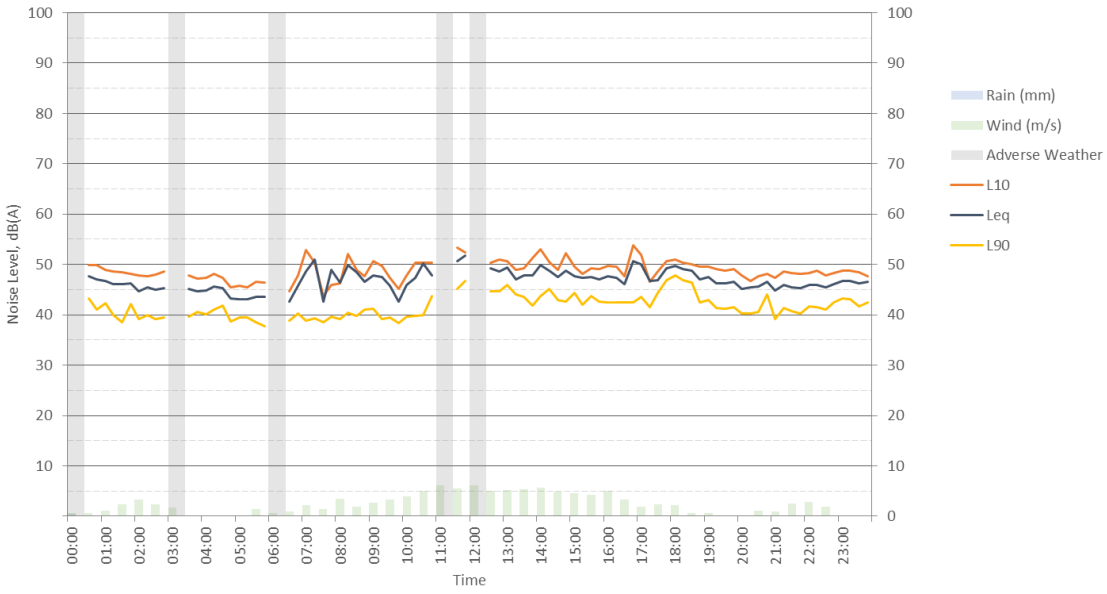
Environmental Noise Logging
14 Lavender Cl, Gillieston Heights NSW 2321
Thursday, 4 July 2024



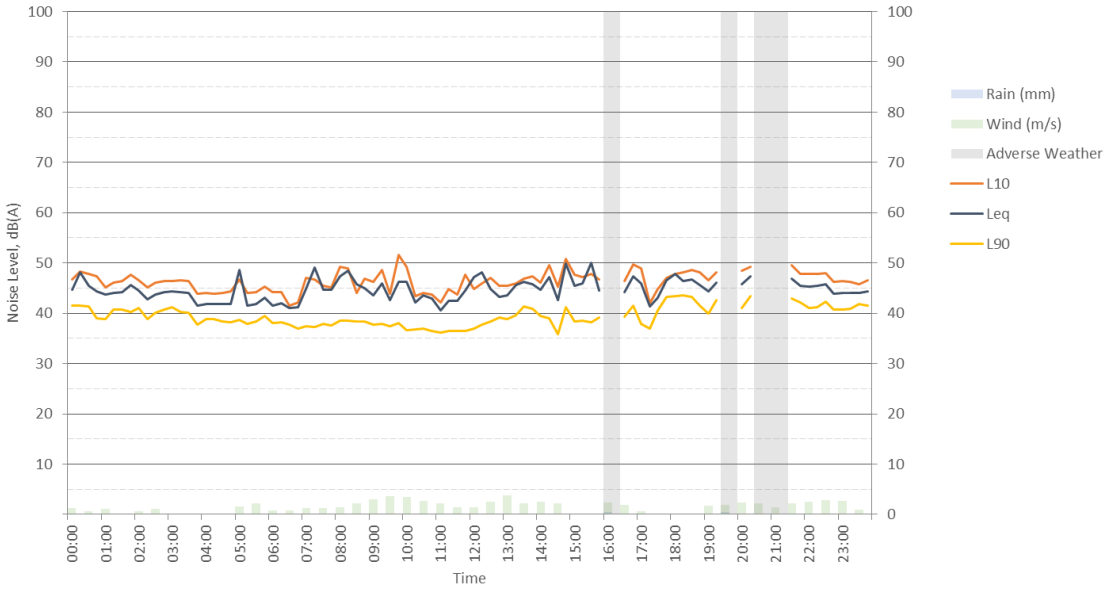
Environmental Noise Logging
14 Lavender Cl, Gillieston Heights NSW 2321
Friday, 5 July 2024

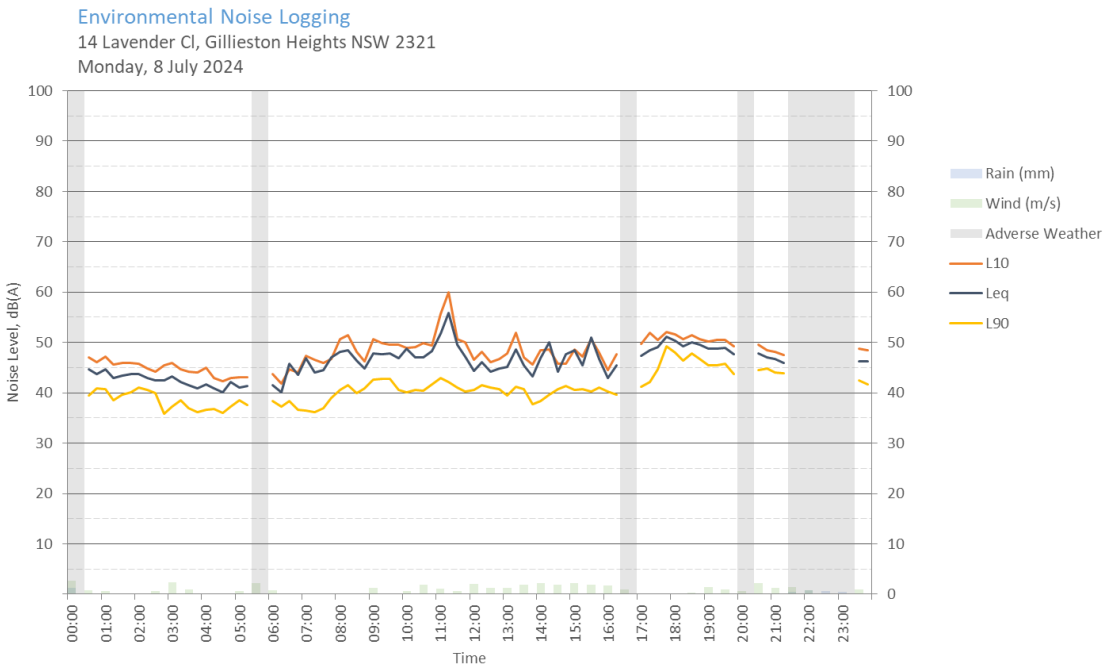


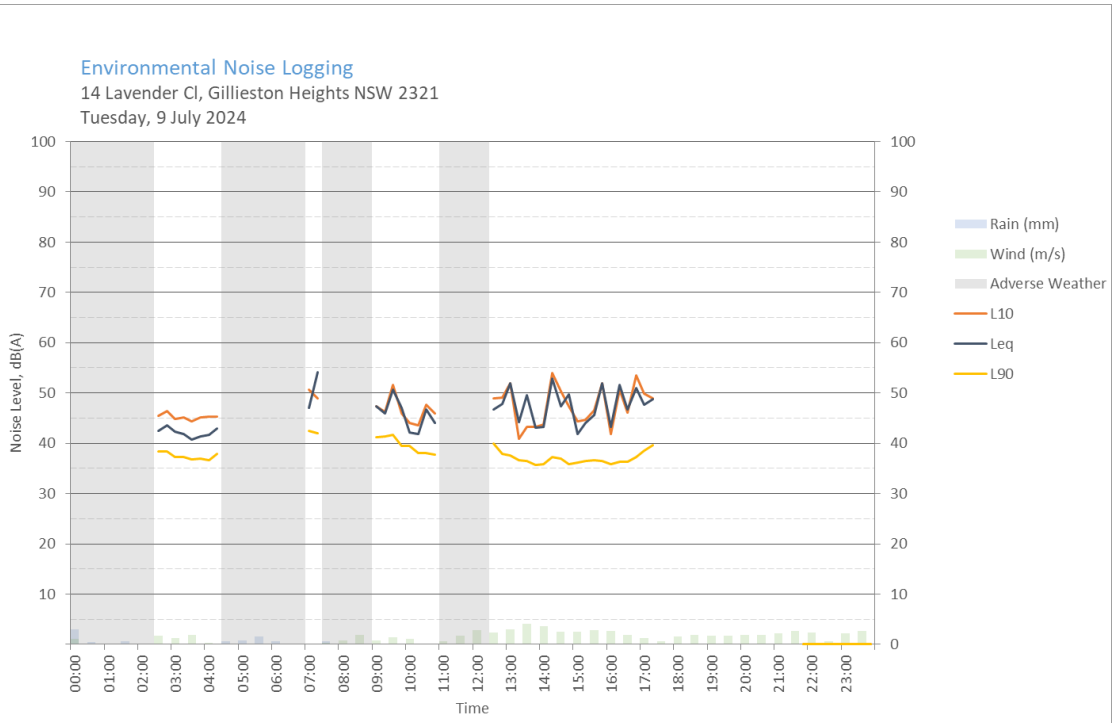
Environmental Noise Logging
14 Lavender Cl, Gillieston Heights NSW 2321
Saturday, 6 July 2024



Environmental Noise Logging
14 Lavender Cl, Gillieston Heights NSW 2321
Sunday, 7 July 2024




Environmental Noise Logging
14 Lavender Cl, Gillieston Heights NSW 2321
Monday, 8 July 2024
Noise Level, dB(A)
Time
Rain (mm)
Wind (m/s)
Adverse Weather
L10
Leq
L90


Environmental Noise Logging
14 Lavender Cl, Gillieston Heights NSW 2321
Tuesday, 9 July 2024
Noise Level, dB(A)
Time
Rain (mm)
Wind (m/s)
Adverse Weather
L10
Leq
L90

9 Appendix C – Survey Plan Acoustic Barrier Markup