Acoustica Projects

The Noise Control Specialist

Child Care Centre
15 Loane Circuit
Farley NSW 2320

Child Care Centre Noise Impact Assessment

APLMC030

Surya Pingala
Allwin Homes Pty Ltd
suryaprakasamp@gmail.com
0413 328 202
Chisholm NSW 2322

Acoustica Projects Management Pty Ltd
Ground Floor 6A Nelson St, Annandale - NSW 2038.
t: 1300 498 268 m: 0416 246 299
enquiries@acousticaprojects.com.au
www.acousticaprojects.com.au

Project Details	
Report Title	Child Care Centre Noise Impact Assessment
Project Location	15 Loane Circuit, Farley NSW 2320
Project Title	Child Care Centre
Client	Surya Pingala

Reference	Date	Revision	Document Control	Prepared	Reviewed	Approved
APLMC030	14/08/2024	00	Issue	LC	DC	LC

Table of Contents

Table of Figures

Table of Tables

1 Introduction

Surya Pingala has engaged acoustic consultation to conduct a Noise Emission Assessment for the proposed Child Care Centre at 15 Loane Circuit, Farley NSW 2320. 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.

The existing site is currently undeveloped within an upcoming suburban estate adjacent to Wollombi Road. New plans are proposed to develop the child care centre with buildings shielding on the northern and western boundaries to shield the southern outdoor play area from neighbouring residential dwellings. 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 estate.

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. Supporting architectural and site survey planning documentation is as detailed in Table 1.

Table 1 – Reviewed Documentation

Reference	Document Title	Author	Date/Version
072.24	Contour and Detail Plan	Rennie Golledge Pty Ltd	21.03.2024/-
DA00.00	Cover Page	ArtMade Architects	08.08.2024/A
DA02.01	Site Plan	ArtMade Architects	08.08.2024/A
DA03.01	Ground Floor Plan	ArtMade Architects	08.08.2024/A
DA03.02	Area Calculations	ArtMade Architects	08.08.2024/A
DA04.01	External Elevations	ArtMade Architects	08.08.2024/A
DA05.01	Sections & External Finishes	ArtMade Architects	08.08.2024/A
DA06.01	Shadow Diagrams & View from Sun	ArtMade Architects	08.08.2024/A
DA06.02	Outdoor Play Area Solar/Shade Calculations	ArtMade Architects	08.08.2024/A
-	Mechanical Plant Markup	Surya Pingala	23.07.2024/A

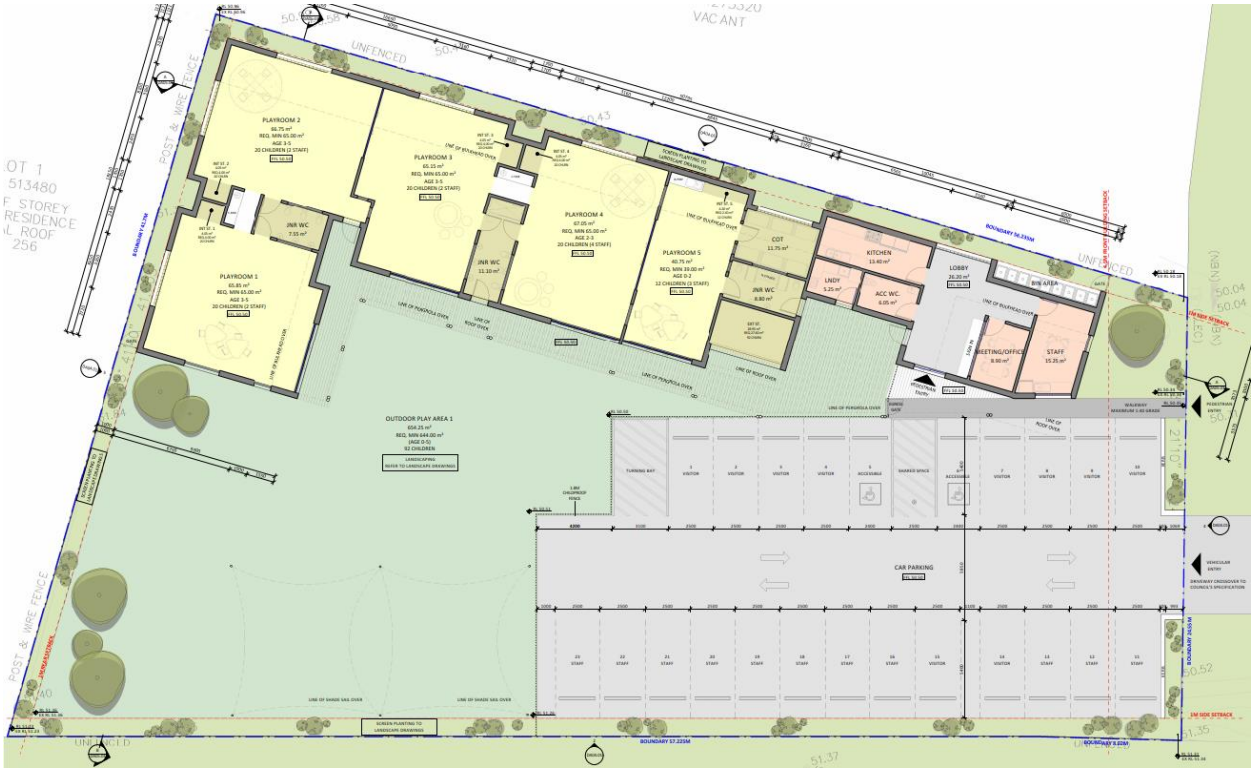
2 Project Details

2.1 Child Care Centre Facility

The existing project site is a currently undeveloped at 15 Loane Circuit, Farley. A proposal has been developed for a child care centre facility to be constructed with the following provisions, and represented in the ground floor plan shown in Figure 1.

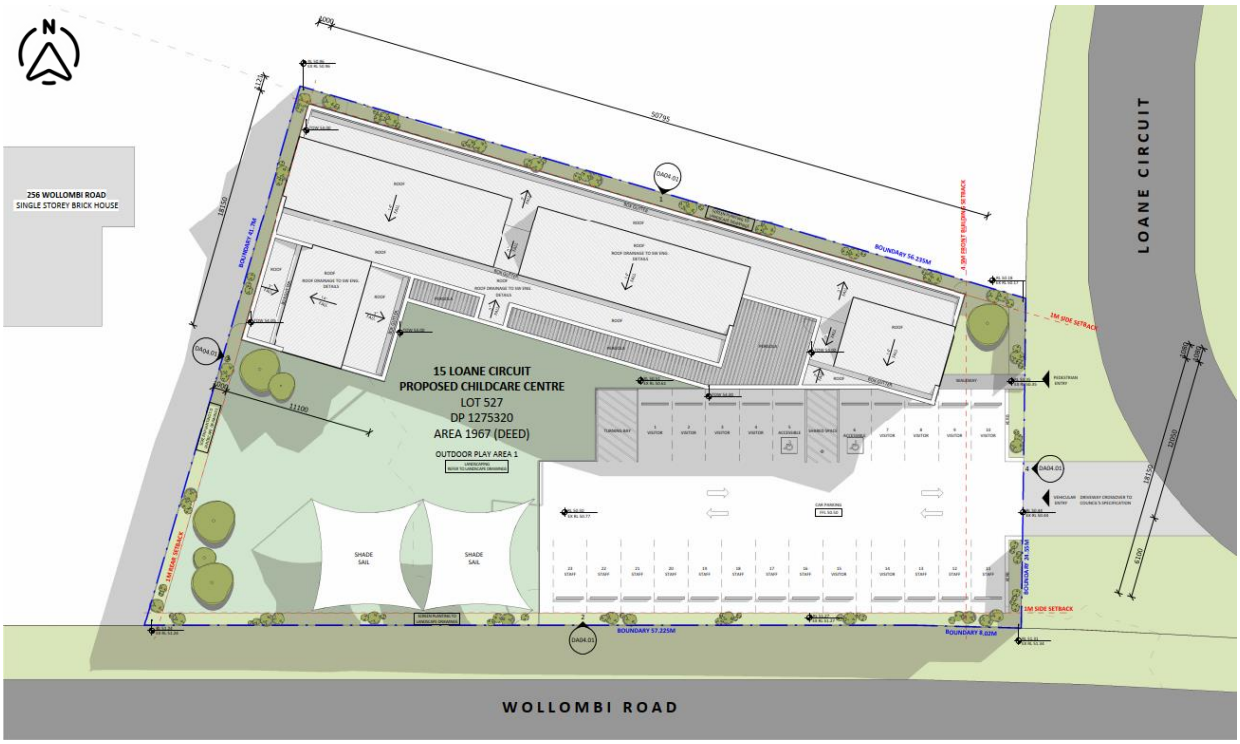
- 5 indoor playrooms
- 1 outdoor play areas
- staff office and rest room
- meeting room
- kitchen
- laundry
- sleeping rooms
- lavatories
- lobby area
- storage and ancillary rooms
- bin store
- 10 visitor car parking spaces
- 11 staff parking spaces
- 2 disabled parking spaces

Figure 1 – Ground Floor Plan (ArtMade Architects)



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 staff and visitor parking bays, and a turning bay. The child care facility is a single structure, approximately 50 metres wide, 18 metres long and 5 metres high. An outdoor play area is proposed with shade cloth sails. Architectural site plans of the proposed development are detailed in Figure 2.

Figure 2 – Child Care Centre Site Plan (ArtMade Architects)



2.2 Proposed Operational Schedule

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

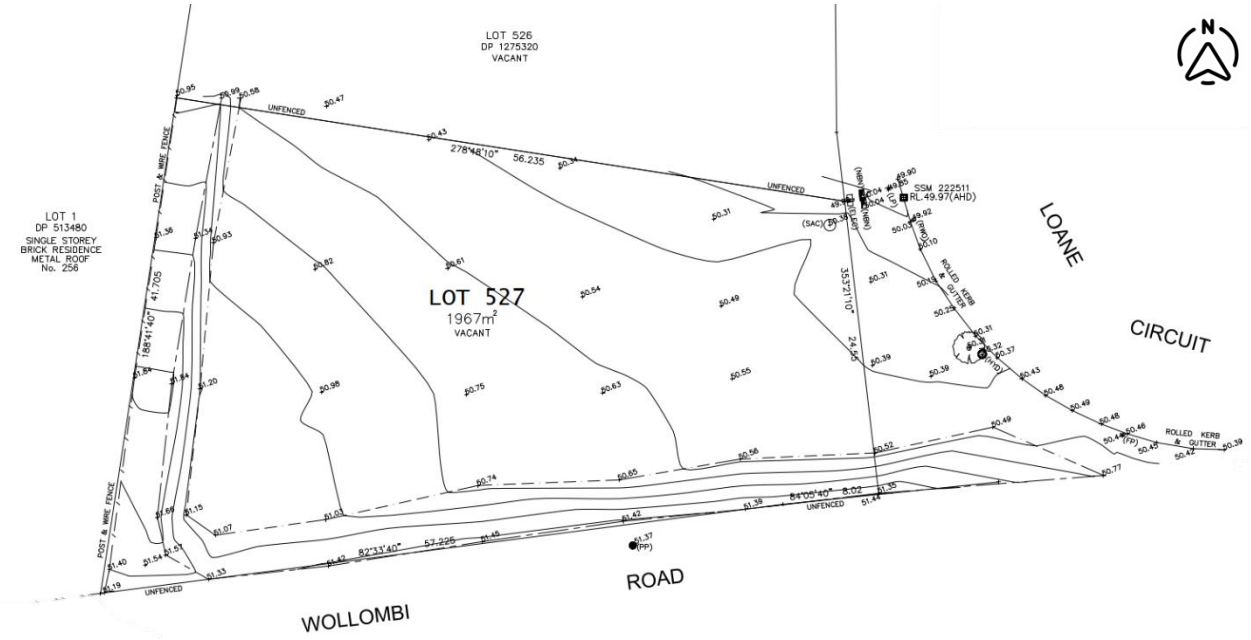
Table 2 – Operational Hours

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

2.3 Site Survey Plan

The site survey of the existing lot and the natural surface levels are shown below in Figure 3.

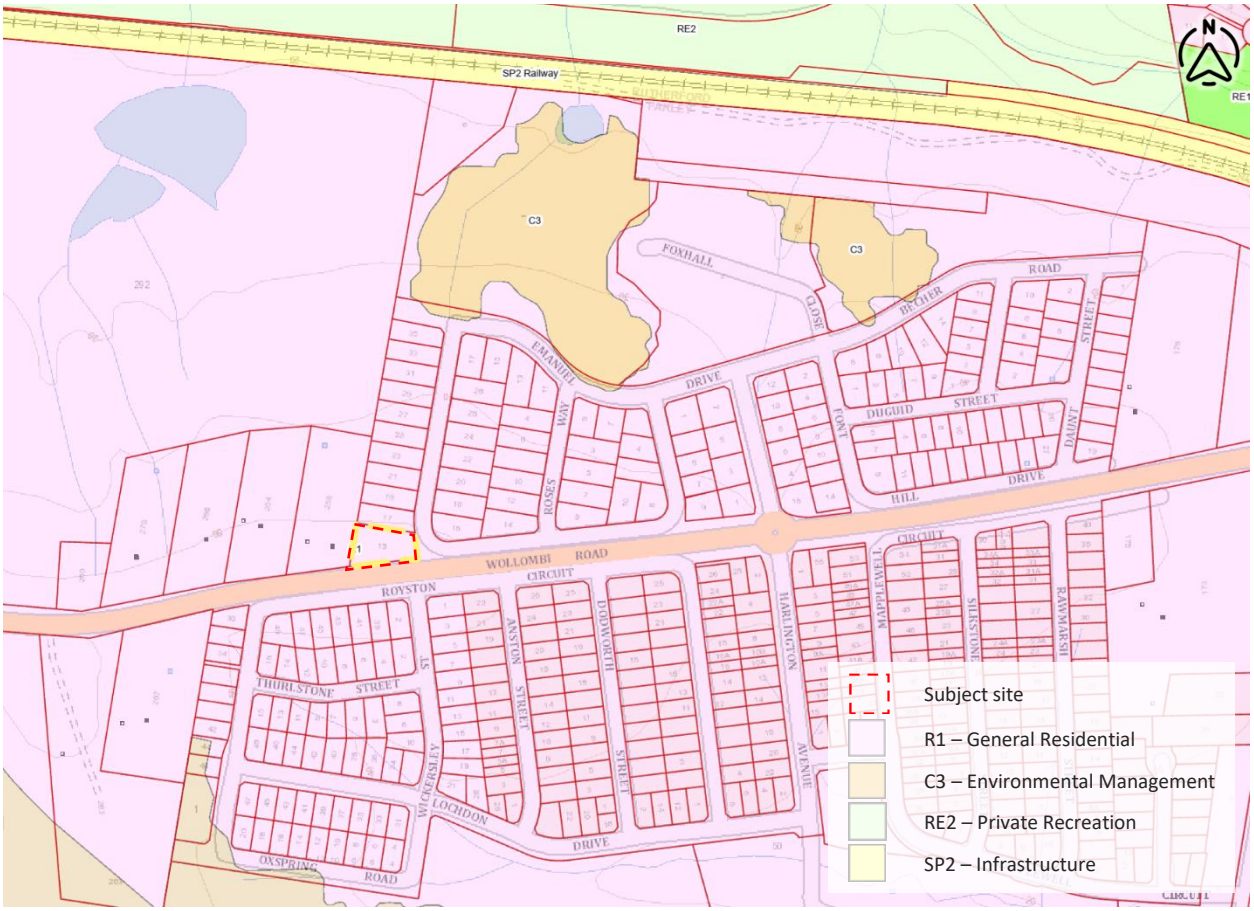
Figure 3 – Contour and Detail Plan (Rennie Golledge Pty Ltd)



2.4 Project Locality Zoning

The site is located within the Maitland City Council area and lies within an (R1) General Residential zone area on Loane Circuit in Farley. The site is surrounded by residential dwellings within the same (R1) General Residential zoning. The Hunter railway line is located 450m north of the subject site in an (SP2) Infrastructure zoning, with a (RE2) Private Recreation zoned north of the rail line, which was previously a golf course and has more recently been built out as a residential estate. A state-controlled road, Wollombi Road, is located directly to the south of the site as shown in Figure 4.

Figure 4 – Area Zoning Map (NSW Planning Portal)



2.5 Noise Sources

Intrusive noise from external sources with the potential to affect the development include road noise from the adjacent Wollombi Road to the south of the subject site, temporary construction noise from the estate development to the north and east of the subject site, and the railway infrastructure to the north of the subject site.

Noise emission sources with the potential to affect nearby noise sensitive receivers include mechanical equipment, outdoor play areas and vehicle movements. It is unlikely that indoor play areas will affect adjacent residential dwellings due to design principles in building layout acting as noise barriers for adjacent sensitive land use as shown in Figure 2.

2.6 Acoustic Barriers

Solid construction boundary fencing is proposed to surround the entire property at 1.8m height following the natural surface level with a reduced height street frontage fence (at 1.2m height) along the eastern property boundary. A break in the boundary fence line is proposed at the entrance to the carpark and pedestrian access points only, as detailed in the markup shown in Figure 5. 1.8m height fences enclose the outdoor play areas; it is the understanding of this office that all fences are proposed as solid construction barriers, providing acoustic barrier effects.

Figure 5 – Acoustic Barriers Markup (ArtMade Architects)

2.7 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	20	2	65.85m^2
Playroom 2	3-5 years	20	2	66.75m^2
Playroom 3	3-5 years	20	2	65.15m^2
Playroom 4	2-3 years	20	4	67.05m^2
Playroom 5	0-2 years	12	3	40.75m^2
Outdoor Play Area Schedule				
Outdoor Play Area 1	0-5 years	92	-	654.25m^2

2.8 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 the designated locations provided. Laundry, kitchen and toilet exhaust fans are proposed above their respective space.

A markup of the proposed mechanical equipment locations is shown in the Figure 6. Hatched markings represent small extraction fans located in the ceiling cavity or rooftop level, which are not significant to contribute to development noise emissions. Outdoor condenser units have been proposed at the denotated at ground level within the external façade returns as the solid markers.

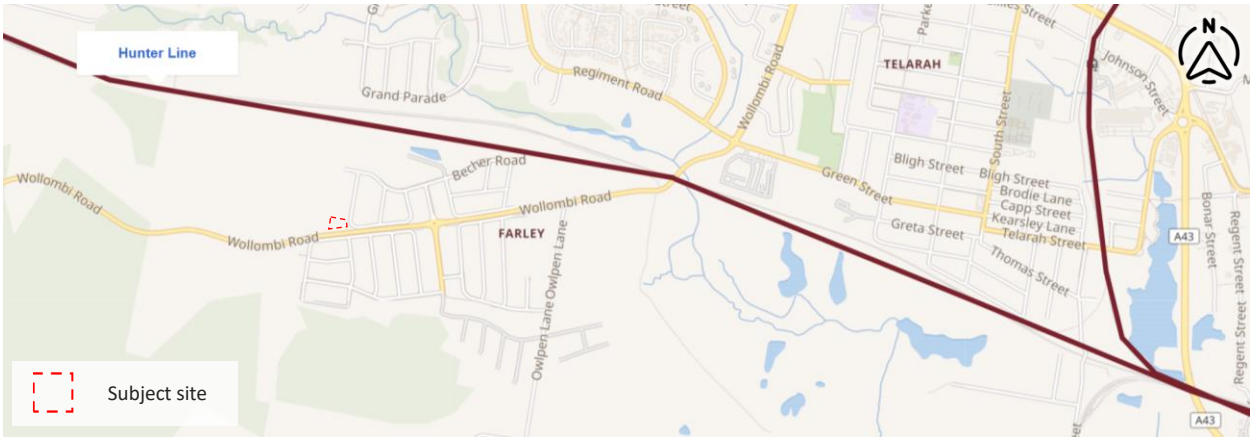
Figure 6 – Mechanical Equipment Location Markup (Surya Pingala/ArtMade Architects)

2.9 State Controlled Infrastructure

2.9.1 Railway Line

The Hunter railway line is located 450m north of the subject site across the Rutherford local government border as shown in Figure 7. It is noted that the subject site currently has direct line of site to the railway line as it overlooks the line with a 30m elevation difference between the subject site and the tracks, however, residential developments are under construction with the subject estate which will contribute to visual and acoustic shielding of this railway infrastructure. It is unlikely that this noise source will adversely affect the subject development.

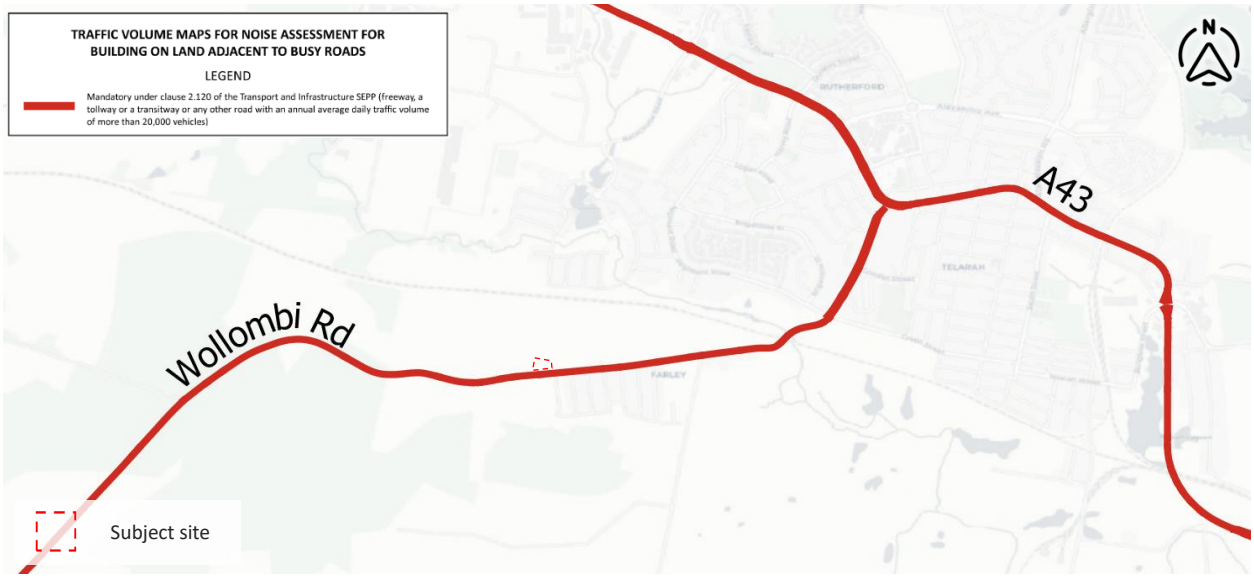
Figure 7 – NSW TrainLink Hunter Line (Wikimedia / OpenStreetMap)



2.9.2 Classified Road

Wollombi Road is located directly adjacent to the south of the subject site, which is identified as a State Environmental Planning Policy (SEPP) controlled road with a daily traffic volume greater than 20,000 vehicles per day. SEPP road infrastructure mapping relative to the subject site is shown in Figure 8.

Figure 8 – NSW Traffic Volume Map 1A (Transport for NSW)



2.10 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 at existing and developing residential dwellings directly adjacent on the western and northern boundaries, and to the east of the subject site, across Loane Circuit. Figure 9 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 9 – Aerial Imagery of Subject Site and Noise Sensitive Receivers (Airbus, Maxar Technologies)

Table 4 – Nearest Noise Affected Receivers

ID	Address	Zoning	Type	Distance to Receiver
R1	256 Wollombi Road, Farley	R1	Residential	15m West
R2	17 Loane Circuit, Farley	R1	Residential	5m North
R3	16 Loane Circuit, Farley	R1	Residential	25m West

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 Wednesday, 10th July to Tuesday, 16th July 2024.

The noise logger was located at the western boundary of the subject site at the electrical service box nearest to Loane Circuit. 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 10. Background noise levels in the area were noted to be controlled by traffic movements on Wollombi Road.

Figure 10 – Logger Installation at 15 Loane Circuit, Farley

3.2 Traffic Noise Assessment

Noise exposure from dominant intrusive sources was logged include Wollombi Road directly to the south and the Hunter Line railway to the north. The average and peak 1-hour daytime and night-time transport noise intrusion as assessed by the NSW Road Noise Policy is detailed in Table 5.

Table 5 – Peak 1-hour Intrusive Noise from Road and Rail

Date	Measured Intrusive Noise Level (RBL), dB(A) L_{eq}			
	Daytime Avg. (7:00am – 10:00pm)	Daytime 1hr$_{peak}$ (7:00am – 10:00pm)	Night-time Avg. (10:00pm – 7:00am)	Night-time 1hr$_{peak}$ (10:00pm – 7:00am)
Wednesday, 10 July 2024	60	62	58	58
Thursday, 11 July 2024	59	61	55	58
Friday, 12 July 2024	59	61	54	56
Saturday, 13 July 2024	58	60	54	55
Sunday, 14 July 2024	57	59	54	58
Monday, 15 July 2024	59	60	59	-
Tuesday, 16 July 2024	61	62	-	-
Median	**59**	**61**	**54**	**58**

3.3 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 6 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 6 – 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-time (10:00pm – 7:00am)	Morning Shoulder (6:00am – 7:00am)
Wednesday, 10 July 2024	49	44	-	
Thursday, 11 July 2024	47	43	42	47
Friday, 12 July 2024	48	43	40	48
Saturday, 13 July 2024	47	40	40	41
Sunday, 14 July 2024	46	41	41	42
Monday, 15 July 2024	50	43	41	47
Tuesday, 16 July 2024	54	-	-	50
Median	**49**	**42**	**42**	**46**

3.4 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 State Environmental Planning Policy (Transport and Infrastructure) 2021

4.2.1 Roadway Noise Impacts to Child Care Facility

SEPP Clause 2.120 details the criteria for noise impacts from roadway infrastructure to noise sensitive users, including child care centres.

> *2.120 Impact of road noise or vibration on non-road development*
>
> *(1) This section applies to development for any of the following purposes that is on land in or adjacent to the road corridor for a freeway, a tollway or a transitway or any other road with an annual average daily traffic volume of more than 20,000 vehicles (based on the traffic volume data published on the website of TfNSW) and that the consent authority considers is likely to be adversely affected by road noise or vibration—*
>
> *(d) an educational establishment or centre-based child care facility.*
>
> *(3) If the development is for the purposes of residential accommodation, the consent authority must not grant consent to the development unless it is satisfied that appropriate measures will be taken to ensure that the following LAeq levels are not exceeded—*
>
> *(a) in any bedroom in the residential accommodation—35 dB(A) at any time between 10 pm and 7 am,*
>
> *(b) anywhere else in the residential accommodation (other than a garage, kitchen, bathroom or hallway)—40 dB(A) at any time.*

4.2.2 Railway Noise Impacts to Child Care Facility

SEPP Clause 2.100 details the criteria for noise impacts from railway infrastructure to noise sensitive users, including child care centres.

> *2.100 Impact of rail noise or vibration on non-rail development*
>
> *(1) This section applies to development for any of the following purposes that is on land in or adjacent to a rail corridor and that the consent authority considers is likely to be adversely affected by rail noise or vibration—*
>
> *(d) an educational establishment or centre-based child care facility.*
>
> *(3) If the development is for the purposes of residential accommodation, the consent authority must not grant consent to the development unless it is satisfied that appropriate measures will be taken to ensure that the following LAeq levels are not exceeded—*
>
> *(a) in any bedroom in the residential accommodation—35 dB(A) at any time between 10.00 pm and 7.00 am,*
>
> *(b) anywhere else in the residential accommodation (other than a garage, kitchen, bathroom or hallway)—40 dB(A) at any time.*

4.3 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.

4.3.1 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 7.

Table 7 – 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 and R3	Daytime (7:00am – 6:00pm)	49	54

4.3.2 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 and Section 2.2 of the NPfI. The amenity noise criterion for each noise sensitive receiver is detailed in Table 8.

Table 8 – 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 and R3	Daytime (7:00am – 6:00pm)	55	53

4.3.3 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 9.

Table 9 – Project Noise Trigger Levels

Receiver	Time of Day	Project Trigger Noise Level, dB(A) $L_{eq,15min}$
Residential Receivers R1, R2 and R3	Daytime (7:00am – 6:00pm)	53

4.3.4 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 10.

> *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 10 - 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 and R3	Morning Shoulder (6:00am – 7:00am)	51	61

4.4 AAAC Guideline for Child Centre Assessment

The Association of Australasian Acoustical Consultants identified a need to provide guidance in assessing noise impact to and from proposed child care centres consistently, accurately, and fairly. This guideline is not a statutory requirement; however, it provides suitable guidance in relation to the acoustic assessment and management of child care centres. 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.

The $L_{Aeq,1hr}$ noise level from road traffic, rail or industry at any location within the outdoor play or activity area during the hours when the Centre is operating should not exceed 55 dB(A).

The $L_{Aeq,1hr}$ noise level from road traffic, rail or industry at any location within the indoor activity or sleeping areas of the Centre during the hours when the centre is operating shall be capable (i.e. with doors and / or windows closed) of achieving 40 dB(A) within indoor activity areas and 35 dB(A) in sleeping areas.

4.5 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 11.

Table 11 – 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

4.6 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 12 below.

Table 12 – Subject Site Operational Noise Criteria

Receiver	Time of Day	Noise Criteria		
		NPfI	AS2107	AAAC
Residential Receivers R1, R2 and R3	Morning Shoulder (6:30am – 7:am)	51 $L_{eq,15min}$ dB(A) (external) 61 L_{AFmax} dB(A) (sleep disturbance)	35 $L_{eq,t}$ dB(A) (internal)	61 L_{AFmax} dB(A) (sleep disturbance)
	Daytime (7:00am – 6:00pm)	53 $L_{eq,15min}$ dB(A) (external)	40 $L_{eq,t}$ dB(A) (internal)	59 $L_{eq,15min}$ dB(A) (≤4hrs split outdoor play) 54 $L_{eq,15min}$ dB(A) (>4hrs outdoor play) 40 $L_{eq,1hr}$ dB(A) (internal) 35 $L_{eq,1hr}$ dB(A) (internal)
Child Care Centre	Operational Hours	-	-	55 $L_{eq,1hr}$ dB(A) (outdoor play areas) 40 $L_{eq,1hr}$ dB(A) (indoor play areas) 35 $L_{eq,1hr}$ dB(A) (sleeping areas)

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 92 children aged 0-5yrs in Outdoor Play Area 1 (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 Area operating at 50% capacity
  - Indoor playrooms do not contribute to acoustic impacts at residential receivers given their design and isolation to neighbouring noise sensitive 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 13:

- 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 13 – 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 14.

- Boundary fence lines and barriers are assessed as per the markup in Figure 5 and assumed to be constructed of a solid construction without airgaps at 1.8m and 1.2m in height, demarcated in pink and blue respectively. 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.
- Other fences 1.8m in height are demarcated in blue and assumed to be acoustically transparent. This construction type may include aluminium 'pool' fence designs. No acoustic shielding has been modelled across these fences.
- 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 14 – 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 . 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 11 and Table 4.

Figure 11 – Noise Sensitive Receiver Prediction Locations (National Map)

5.3.1 Operational Noise Impact – Receiver 1

Receiver 1 is located at 256 Wollombi Road, directly adjacent to the west with the nearest receiver façade exposed to noise emissions from Outdoor Play Area and the Car Park as detailed in Table 15.

Table 15 – Operational Noise Impact at Receiver 1 – 256 Wollombi Road, Farley

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)	46 (50 L_{AFmax})
Air condenser unit M1	27
Air condenser unit M2	13
Air condenser unit M3	10
Cumulative noise contribution (external / internal)	46 / 15
Noise criteria (external / internal)	51 / 35
Compliance (Sleep Disturbance $L_{AFmax} \leq 61$)	Yes (Yes)
Noise Scenario 2 – Daytime outdoor active playtime	
Air condenser unit M1	27
Air condenser unit M2	13
Air condenser unit M3	10
Outdoor Play Area (92 children 0-5yrs)	52
Cumulative noise contribution (external / internal)	52 / 21
Noise criteria (external / internal)	53 / 40
Compliance	Yes
Noise Scenario 3 – Peak pickup time	
Light vehicles x15	46
Air condenser unit M1	27
Air condenser unit M2	13
Air condenser unit M3	10
Outdoor Play Area (45 children 0-5yrs)	49
Cumulative noise contribution (external / internal)	51 / 20
Noise criteria (external / internal)	53 / 40
Compliance	Yes

5.3.2 Operational Noise Impact – Receiver 2

Receiver 2 is located at 17 Loane Circuit, adjacent to the north with the nearest receiver façade exposed to noise emissions from Outdoor Play Area and the Outdoor Condenser Units located on the northern façade as detailed in Table 16.

Table 16 – Operational Noise Impact at Receiver 2 – 17 Loane Circuit, Farley

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)	36 (40 L_{AFmax})
Air condenser unit M1	18
Air condenser unit M2	33
Air condenser unit M3	33
Cumulative noise contribution (external / internal)	39 / 12
Noise criteria (external / internal)	51 / 35
Compliance (Sleep Disturbance $L_{AFmax} \leq 61$)	Yes (Yes)
Noise Scenario 2 – Daytime outdoor active playtime	
Air condenser unit M1	18
Air condenser unit M2	33
Air condenser unit M3	33
Outdoor Play Area (92 children 0-5yrs)	36
Cumulative noise contribution (external / internal)	38 / 11
Noise criteria (external / internal)	53 / 40
Compliance	Yes
Noise Scenario 3 – Peak pickup time	
Light vehicles x15	36
Air condenser unit M1	18
Air condenser unit M2	33
Air condenser unit M3	33
Outdoor Play Area (45 children 0-5yrs)	33
Cumulative noise contribution (external / internal)	39 / 12
Noise criteria (external / internal)	53 / 40
Compliance	Yes

5.3.3 Operational Noise Impact – Receiver 3

Receiver 3 is located at 16 Loane Circuit, adjacent to the west with the nearest receiver façade exposed to noise emissions from Outdoor Play Area and the Car Park as detailed in Table 17.

Table 17 – Operational Noise Impact at Receiver 3 – 16 Loane Circuit, Farley

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)	51 (56 L_{AFmax})
Air condenser unit M1	7
Air condenser unit M2	18
Air condenser unit M3	27
Cumulative noise contribution (external / internal)	51 / 21
Noise criteria (external / internal)	51 / 35
Compliance (Sleep Disturbance $L_{AFmax} \leq 61$)	Yes (Yes)
Noise Scenario 2 – Daytime outdoor active playtime	
Air condenser unit M1	7
Air condenser unit M2	18
Air condenser unit M3	27
Outdoor Play Area (92 children 0-5yrs)	45
Cumulative noise contribution (external / internal)	45 / 14
Noise criteria (external / internal)	53 / 40
Compliance	Yes
Noise Scenario 3 – Peak pickup time	
Light vehicles x15	51
Air condenser unit M1	7
Air condenser unit M2	18
Air condenser unit M3	27
Outdoor Play Area (45 children 0-5yrs)	42
Cumulative noise contribution (external / internal)	52 / 21
Noise criteria (external / internal)	53 / 40
Compliance	Yes

5.4 Operational Noise Intrusions

Traffic noise intrusion from road and rail sources were measured at the logging position, which is representative of the outdoor play area by distance and elevation to intrusive noise sources. Conservatively modelling the intrusive noise ingress from the median peak 1-hour daytime level to the outdoor play area with the provision of boundary noise barriers and shielding buildings constructed, the following intrusive noise assessment for the proposed child care centre is detailed in Table 18.

Table 18 – Operational Noise Intrusions at the Subject Site – 15 Loane Circuit, Farley

Noise Source Element	Noise Source Contribution, $L_{eq,1hr.peak}$ dB(A)
Peak 1-hr Traffic Noise Intrusion	
Road Traffic from Wollombi Road	<50
Rail movements from the Hunter Line	<44
Cumulative noise contribution (external / internal)	51 / 23
Noise criteria (external / internal)	55 / 40
Compliance	Yes

5.5 Operational Noise Compliance Summary

The noise emission assessment concludes the proposed operations of the child care centre is compliant with all acoustic criteria for noise impacts when in use at the nearest noise sensitive receivers. 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.

Noise intrusions from external noise sources including Wollombi Road and the Hunter Railway Line do not adversely affect the operational use of indoor or outdoor play areas under the peak noise conditions. No additional acoustic treatment is required.

6 Conclusion

A noise emission assessment has been conducted for the proposed Child Care Centre located at 15 Loane Circuit, Farley NSW 2320. 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.

Noise intrusions from Wollombi Road and the Hunter Railway Line do not adversely impact the children's use of outdoor and indoor play areas in accordance with the provisions of the AAAC Guidelines for Child Care Centres. No additional acoustic treatments are required for external noise exposure.

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 5.1 and 5.2 of this report. These can be summarised under solid construction external boundary 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

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.

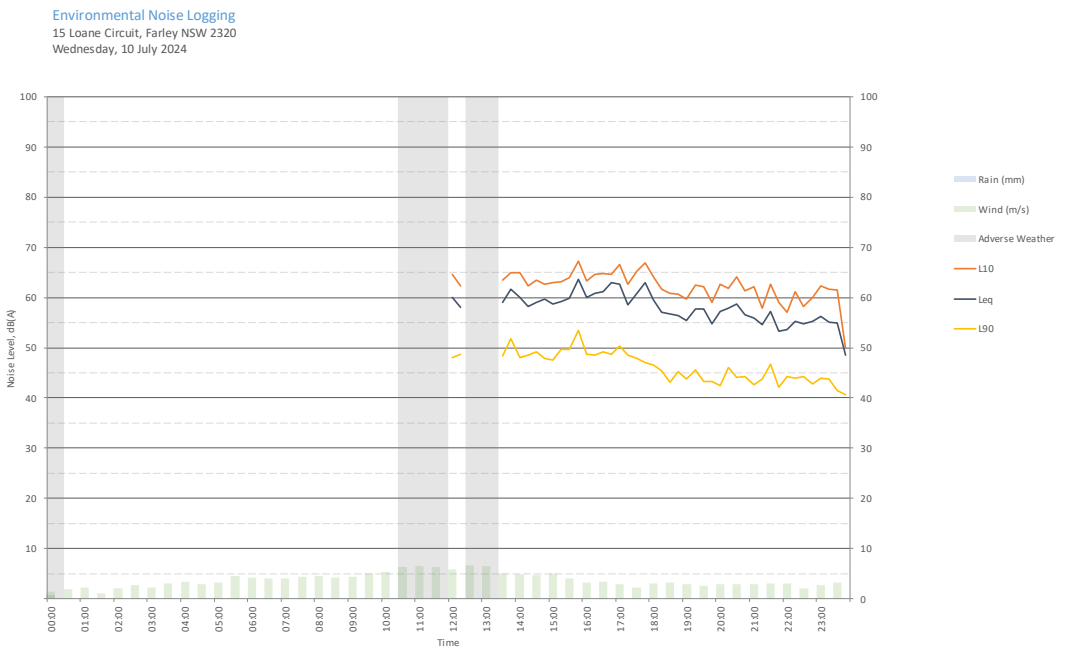
L_{90} is known as background noise. L_{90} is a statistical sound level which describes the percentage of times a sound level is exceeded. This parameter is used to set up the allowable noise levels for intrusive noise sources since the level of disturbance of the intrusive noise source will be dependent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

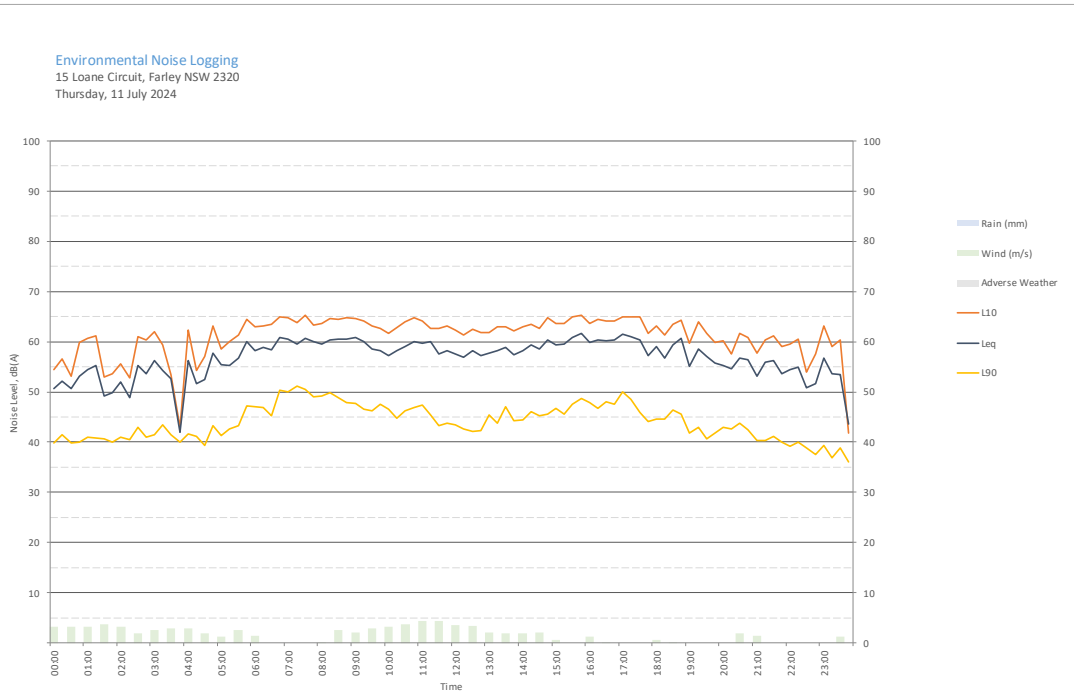
L_{eq} is the equivalent sound level which represents the average noise level during a measurement period. L_{eq} describes a receiver's cumulative noise exposure from all events over a specified period of time for compliance assessment purposes.

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.

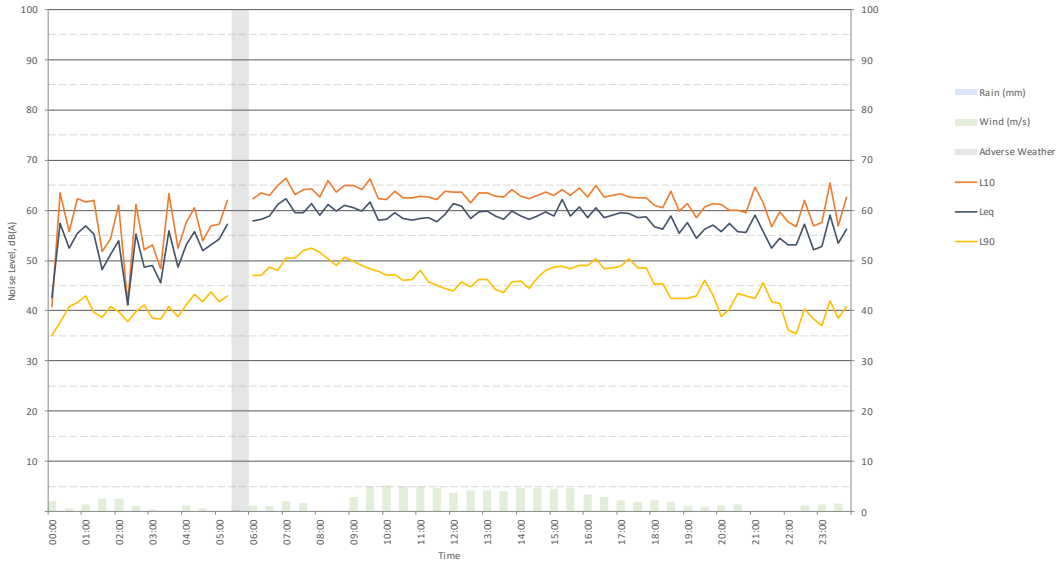
dB(A) A-weighted Sound Level (instantaneous) is the most common weighting used in noise measurements and it represents the frequency range detectable by the human ear. A-weighted is used for noise measurements, prediction purposes and is denoted as an "A" within the measurement descriptor.

Appendix B – Noise Monitoring Data

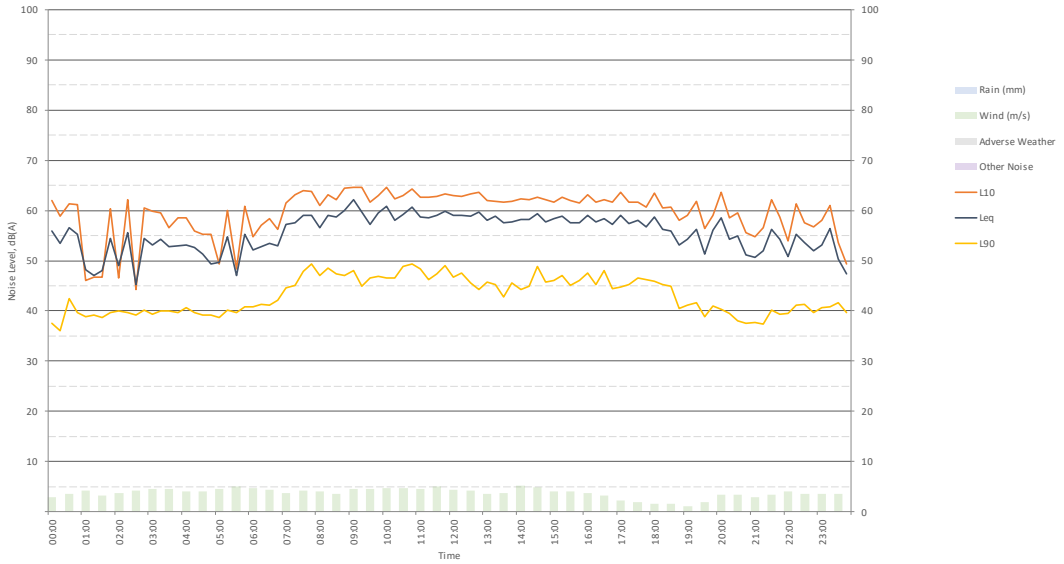




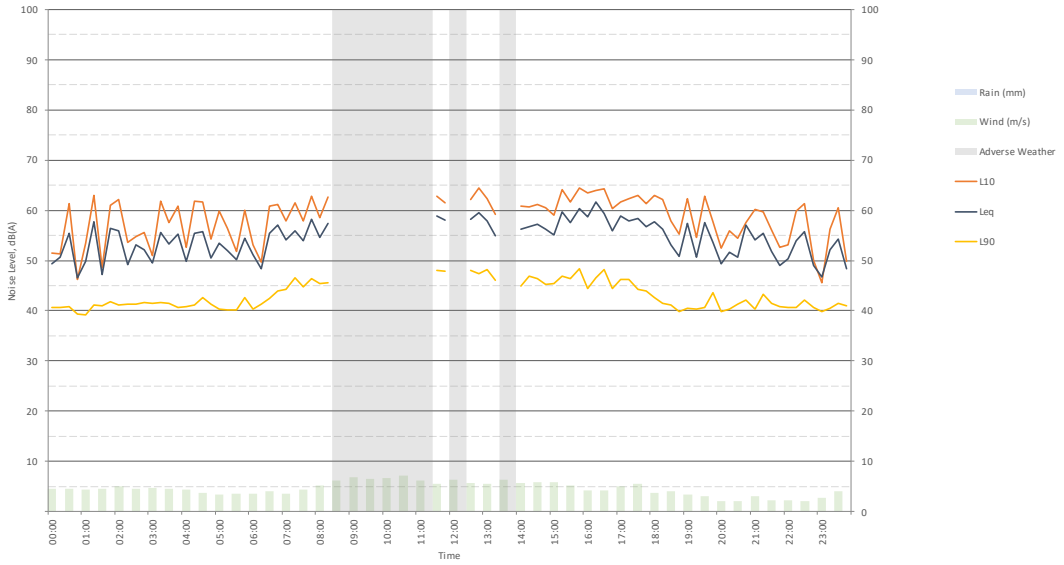
Environmental Noise Logging
15 Loane Circuit, Farley NSW 2320
Friday, 12 July 2024



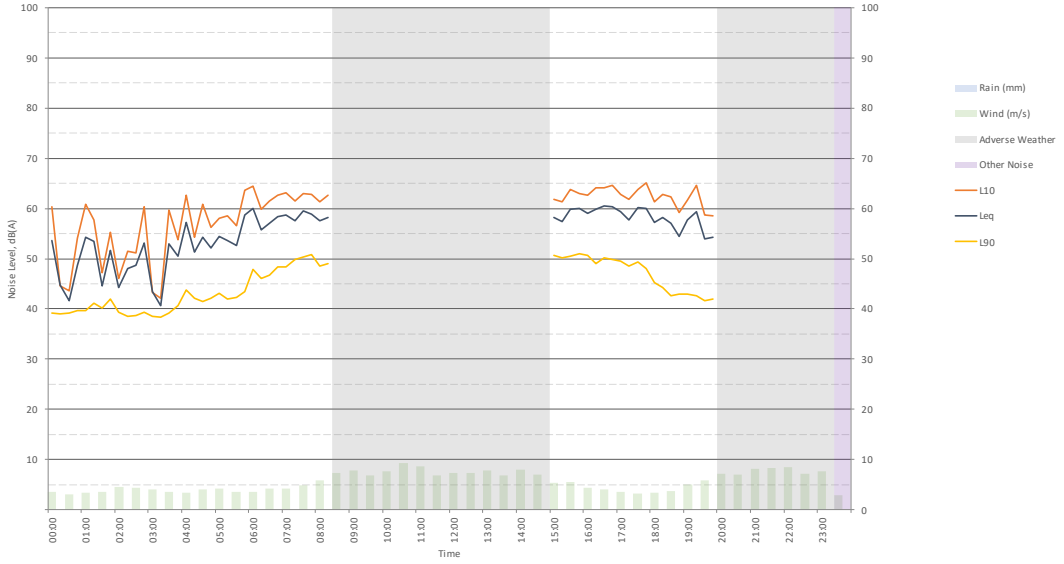
Environmental Noise Logging
15 Loane Circuit, Farley NSW 2320
Saturday, 13 July 2024



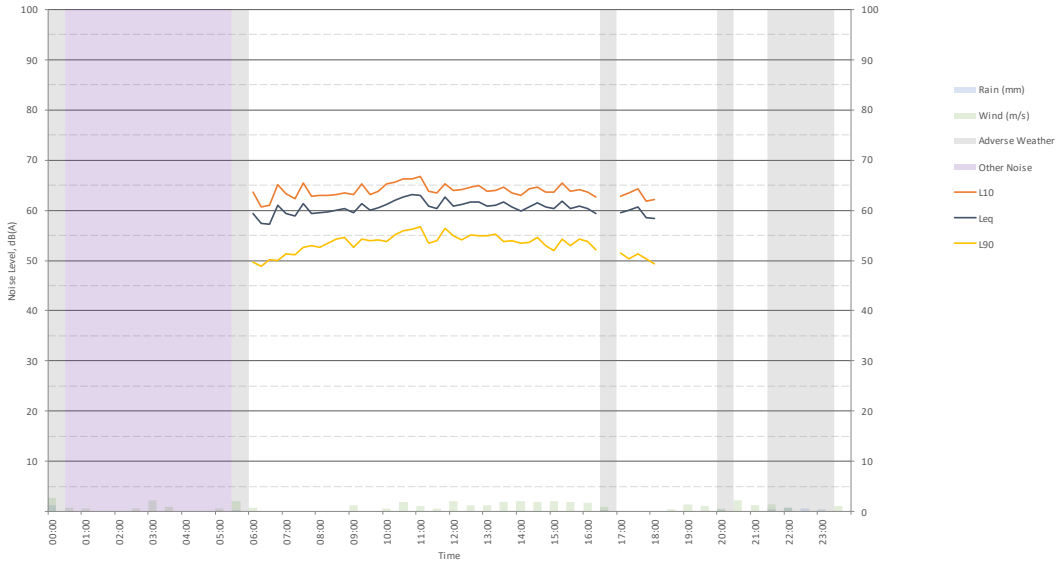
Environmental Noise Logging
15 Loane Circuit, Farley NSW 2320
Sunday, 15 July 2024



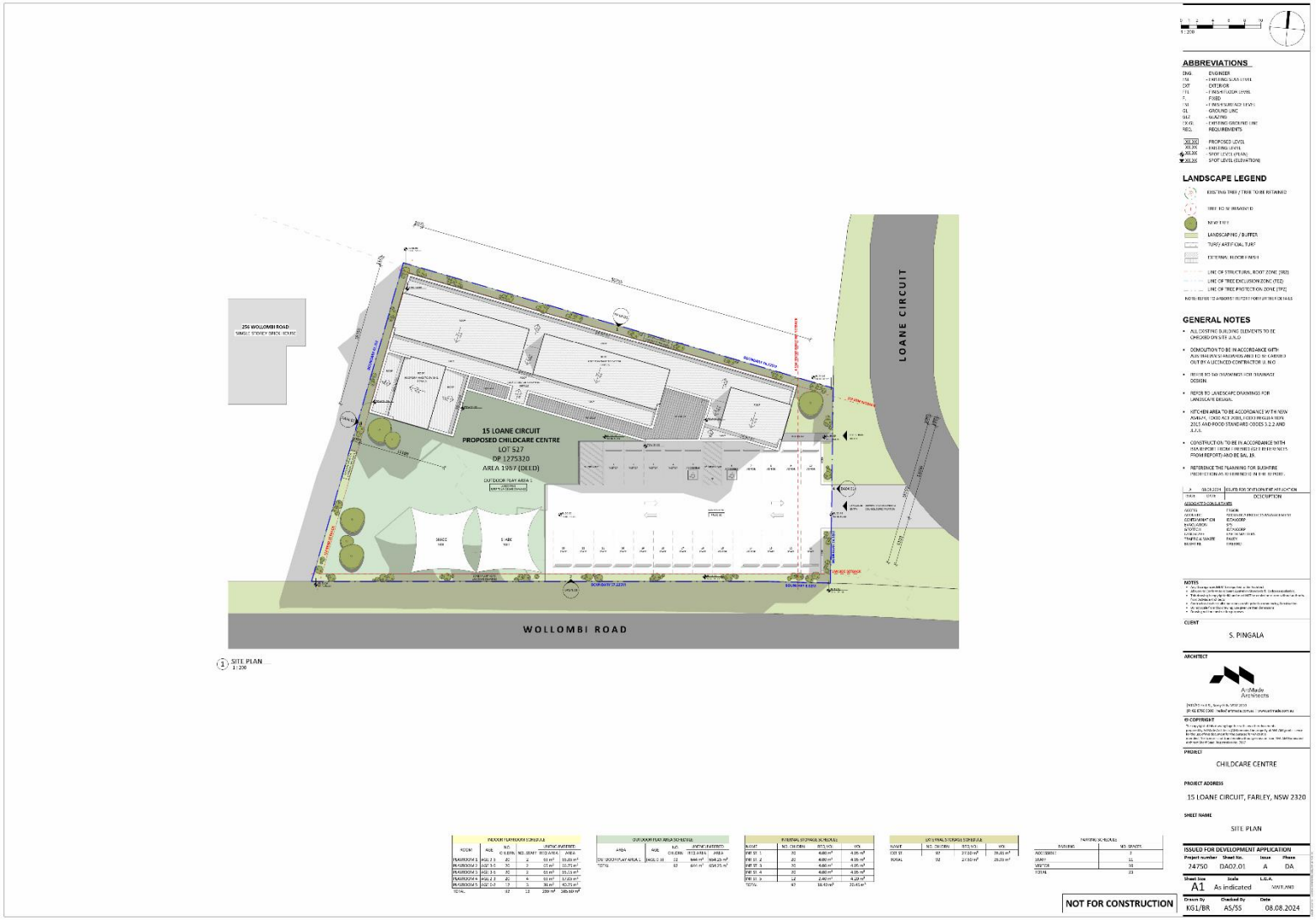
Environmental Noise Logging
15 Loane Circuit, Farley NSW 2320
Monday, 16 July 2024



Environmental Noise Logging
15 Loane Circuit, Farley NSW 2320
Tuesday, 17 July 2024



Appendix C – Architectural Plans



1 GROUND FLOOR PLAN
1 : 100

2 FENCE/BARRIER DIAGRAM
1 : 500

DA - FENCE LEGEND

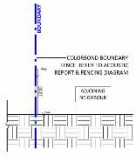

FS1
460.30 m²
LS 1
713.70 m²
LS 2
5.65 m²
LS 3
6.25 m²
GFA
LANDSCAPE AREA
PROPOSED - GFA
Name
Area
FSR
TOTAL
460.30 m²
MIN LS AREA
PROPOSED - LANDSCAPE AREA
LS %
713.70 m²
5.65 m²
6.25 m²
725.60 m²
NOT FOR CONSTRUCTION
NOTES
CLIENT
S. PINGALA
ARCHITECT
ArtMade Architects
© COPYRIGHT
PROJECT
CHILDCARE CENTRE
PROJECT ADDRESS
15 LOANE CIRCUIT, FARLEY, NSW 2320
SHEET NAME
AREA CALCULATIONS
ISSUED FOR DEVELOPMENT APPLICATION
Project number
24750
Sheet No.
DA03.02
Issue
A
Phase
DA
Sheet Size
A1
Scale
1 : 200
L.G.A.
Drawn By
KG1/BR
Checked By
AS/SS
Date
08.08.2024


1 NORTHERN ELEVATION
1 : 100
2 SOUTHERN ELEVATION
1 : 200
3 WESTERN ELEVATION
1 : 200
4 EASTERN ELEVATION
1 : 200
5 SIGNAGE DETAIL
1 : 20
CHILD CARE CENTRE
EXTERNAL FINISHES
CB1
CB2
CL1
CL2
XP1
XP2
NOT FOR CONSTRUCTION
CLIENT
S. PINGALA
ARCHITECT
Architects
PROJECT
CHILDCARE CENTRE
PROJECT ADDRESS
15 LOANE CIRCUIT, FARLEY, NSW 2320
SHEET NAME
EXTERNAL ELEVATIONS
ISSUED FOR DEVELOPMENT APPLICATION
Project number 24750
Sheet No. DA04.01
Issue A
Phase DA
Sheet Size A1
Scale As indicated
L.G.A. WOLLONGONG
Drawn By KG1/BR
Checked By AS/SS
Date 08.08.2024

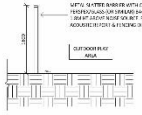
A SECTION A-A

B SECTION B-B

D1 TYP BOUNDARY FENCE DETAIL 1

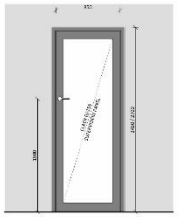


D2 TYP BOUNDARY FENCE DETAIL 2

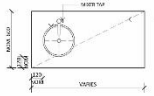


D3 ACOUSTIC FENCE DETAIL 3

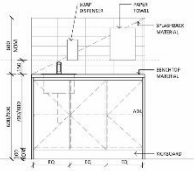
ARTIST'S IMPRESSION



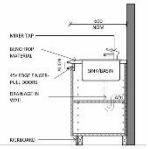
TYP GLASS DOORS TO COT ROOMS, JNR WC



TYPICAL CRAFT SINK - PLAN



TYPICAL CRAFT SINK - ELEVATION



TYPICAL CRAFT SINK - SECTION

NOT FOR CONSTRUCTION

NOTES

CLIENT
S. PINGALA

ARCHITECT
Ai-Made Architects

PROJECT
CHILDCARE CENTRE

PROJECT ADDRESS
15 LOANE CIRCUIT, FARLEY, NSW 2320

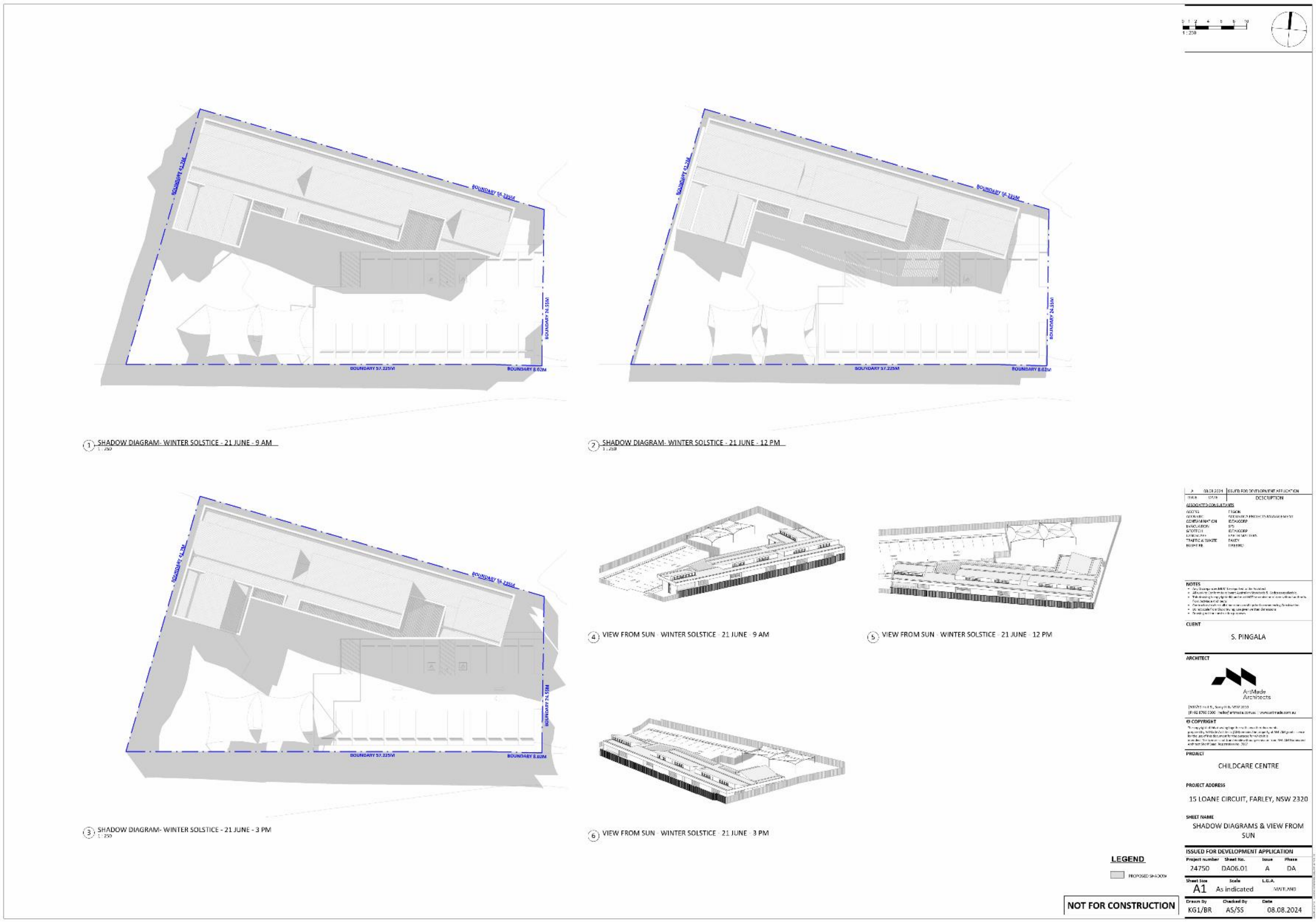
SHEET NAME
SECTIONS & EXTERNAL FINISHES

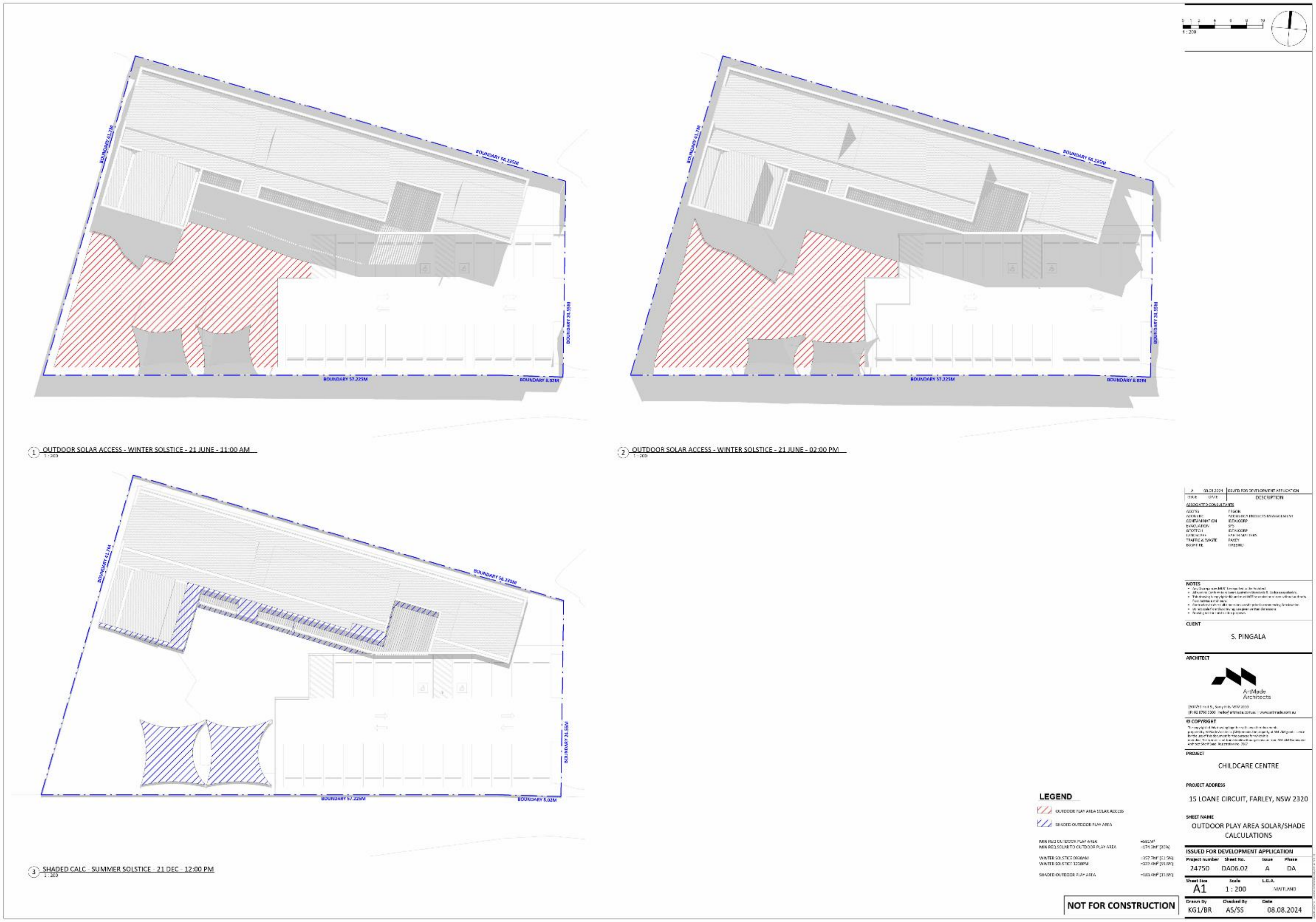
ISSUED FOR DEVELOPMENT APPLICATION

Project number	Sheet No.	Issue	Phase
24750	DA05.01	A	DA

Sheet Size	Scale	L.G.A.
A1	As indicated	WAVERLEY

Drawn By	Checked By	Date
KG1/BR	AS/SS	08.08.2024


SHADOW DIAGRAM- WINTER SOLSTICE - 21 JUNE - 9 AM
SHADOW DIAGRAM- WINTER SOLSTICE - 21 JUNE - 12 PM
SHADOW DIAGRAM- WINTER SOLSTICE - 21 JUNE - 3 PM
VIEW FROM SUN - WINTER SOLSTICE - 21 JUNE - 9 AM
VIEW FROM SUN - WINTER SOLSTICE - 21 JUNE - 12 PM
VIEW FROM SUN - WINTER SOLSTICE - 21 JUNE - 3 PM
LEGEND
NOT FOR CONSTRUCTION
NOTES
CLIENT
S. PINGALA
ARCHITECT
ArtMade Architects
© COPYRIGHT
PROJECT
CHILDCARE CENTRE
PROJECT ADDRESS
15 LOANE CIRCUIT, FARLEY, NSW 2320
SHEET NAME
SHADOW DIAGRAMS & VIEW FROM SUN
ISSUED FOR DEVELOPMENT APPLICATION
Project number 24750
Sheet No. DA06.01
Issue A
Phase DA
Sheet Size A1
Scale As indicated
Drawn By KG1/BR
Checked By AS/SS
Date 08.08.2024



OUTDOOR SOLAR ACCESS - WINTER SOLSTICE - 21 JUNE - 11:00 AM
OUTDOOR SOLAR ACCESS - WINTER SOLSTICE - 21 JUNE - 02:00 PM
SHADED CALC - SUMMER SOLSTICE - 21 DEC - 12:00 PM
LEGEND
OUTDOOR PLAY AREA SOLAR ACCESS
SHADED OUTDOOR PLAY AREA
NOT FOR CONSTRUCTION
CLIENT
S. PINGALA
ARCHITECT
ArtMade Architects
© COPYRIGHT
PROJECT
CHILDCARE CENTRE
PROJECT ADDRESS
15 LOANE CIRCUIT, FARLEY, NSW 2320
SHEET NAME
OUTDOOR PLAY AREA SOLAR/SHADE CALCULATIONS
ISSUED FOR DEVELOPMENT APPLICATION
Project number 24750
Sheet No. DA06.02
Issue A
Phase DA
Sheet Size A1
Scale 1 : 200
Drawn By KG1/BR
Checked By AS/SS
Date 08.08.2024