Noise Assessment

Proposed Childcare Centre
7 Regiment Road
Rutherford, NSW

Prepared for: Brown Commercial Building Pty Ltd
November 2024
MAC242302-01RP1V2

Muller Acoustic Consulting

Document Information

Noise Assessment

Proposed Childcare Centre

7 Regiment Road

Rutherford, NSW

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1 Introduction

Muller Acoustic Consulting Pty Ltd (MAC) has been commissioned by Brown Commercial Building Pty Ltd (BCB) to prepare a Noise Assessment (NA) to quantify emissions from the Proposed Childcare Centre (CCC) to be established at 7 Regiment Road, Rutherford, NSW. The NA has quantified potential emissions associated with the proposed CCC as well as the noise intrusion from surrounding noise sources to the CCC spaces.

This assessment has been undertaken in accordance with the following documents:

- NSW Department of Environment and Climate Change (DECC), NSW Interim Construction Noise Guideline (ICNG), July 2009;
- NSW Environment Protection Authority (EPA), Noise Policy for Industry (NPI), 2017;
- NSW Environment Protection Authority (EPA's), Approved Methods for the measurement and analysis of environmental noise in NSW, 2022;
- Standards Australia AS 1055:2018 - Acoustics - Description and measurement of environmental noise - General Procedures;
- International Organisation for Standardisation (ISO) 9613-1:1993 (ISO9613:1) - Acoustics - Attenuation of Sound During Propagation Outdoors - Part 1: Calculation of the Absorption of Sound by the Atmosphere;
- International Organisation for Standardisation (ISO) 9613-2:1996 (ISO9613:2) - Acoustics - Attenuation of Sound during Propagation Outdoors - Part 2: General Method of Calculation; and
- Association of Australian Acoustical Consultants (AAAC), Guideline for Childcare Centre Acoustic Assessment (GCCCAA).

A glossary of terms, definitions and abbreviations used in this report is provided in **Appendix A**.

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2 Project Description

2.1 Background

The project is to be located at 7 Regiment Road, Rutherford, NSW, with the area surrounding the project a mix of commercial and residential land uses. The site is bound to the north by commercial premises comprising of a food and drinks premises and a service station. To the west of the project is several commercial buildings comprising of dance studios and sports training facility, with a landscape supplies sales centre located to the south. The nearest residential receivers are located to the east across Regiment Road at a setback distance of approximately 30m from the project boundary.

The ambient noise environment surrounding the project site is dominated by passing and distant traffic noise from the surrounding area, and wildlife noise.

The project proposes the construction of a single storey childcare centre with associated outdoor play area and carpark. The CCC will provide the following facilities:

- two baby rooms accommodating up to 32 babies;
- two toddler rooms accommodating up to 50 toddlers;
- two preschool rooms accommodating up to 40 preschool children;
- outdoor play area;
- admin offices and staff rooms;
- water closets with amenities; and
- associated car parking.

Site plans are provided in **Appendix B**. The CCC is proposed to operate 6.30am to 7pm Monday to Friday. It is noted that staff may access the project prior to the 6.30am commencement of operations. Staff arrivals have been considered as part of this assessment.

2.1.1 Receiver Review

A review of residential receivers in close proximity to the project has been completed and are summarised in **Table 1. Figure 1** provides a locality plan showing the position of these receivers in relation to the project.

Table 1 Receiver Locations

Receiver	Receiver Type	Receiver Height	MGA56 Coordinates	
			Easting	Northing
R01	Residential	1.5m	361141	6379442
R02	Residential	1.5m	361141	6379458
R03	Residential	1.5m	361173	6379452
R04	Residential	1.5m	361172	6379473
R05	Residential	1.5m	361181	6379491
R06	Residential	1.5m	361190	6379504
R07	Residential	1.5m	361206	6379526
R08	Residential	1.5m	361229	6379518
R09	Residential	1.5m	361249	6379541
R10	Residential	1.5m	361231	6379553
C01	Commercial	1.5m	361173	6379592
C02	Commercial	1.5m	361143	6379598
C03	Commercial	1.5m	361112	6379537
C04	Commercial	1.5m	361096	6379513
C05	Commercial	1.5m	361102	6379495

The CCC receivers for both external play areas and internal occupied rooms are presented in **Table 2**.

Table 2 On-site Receiver Locations

Receptors	Type	Height Above Ground Level	MGA56 Coordinates	
			Easting	Northing
Outdoor Play Area 01	External Play Area	1.5m	361127	6379534
Outdoor Play Area 02	External Play Area	1.5m	361133	6379542
Outdoor Play Area 03	External Play Area	1.5m	361138	6379548
Outdoor Play Area 04	External Play Area	1.5m	361143	6379556
Outdoor Play Area 05	External Play Area	1.5m	361148	6379562
Babies 1	Internal Play Area	1.5m	361152	6379568
Babies 2	Internal Play Area	1.5m	361123	6379541
Toddlers 1	Internal Play Area	1.5m	361131	6379554
Toddlers 2	Internal Play Area	1.5m	361139	6379565
Preschool 1	Internal Play Area	1.5m	361148	6379580
Preschool 2	Internal Play Area	1.5m	361161	6379573

FIGURE 1

Locality Plan

MAC242302

Regiment Road

Childcare Centre

KEY

- Receiver
- Unattended Noise Monitoring Location
- Attended Noise Monitoring Location
- Site Boundary

0 10 20 30 40 50 m

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3 Noise Policy and Guidelines

3.1 Noise Policy for Industry

The EPA released the Noise Policy for Industry (NPI) in October 2017 which provides a process for establishing noise criteria for consents and licenses enabling the EPA to regulate noise emissions from scheduled premises under the Protection of the Environment Operations Act 1997. The objectives of the NPI are to:

- provide noise criteria that is used to assess the change in both short term and long-term noise levels;
- provide a clear and consistent framework for assessing environmental noise impacts from industrial premises and industrial development proposals;
- promote the use of best-practice noise mitigation measures that are feasible and reasonable where potential impacts have been identified; and
- support a process to guide the determination of achievable noise limits for planning approvals and/or licences, considering the matters that must be considered under the relevant legislation (such as the economic and social benefits and impacts of industrial development).

The policy sets out a process for industrial noise management involving the following key steps:

1. Determine the Project Noise Trigger Levels (PNTLs) (ie criteria) for a development. These are the levels (criteria), above which noise management measures are required to be considered. They are derived by considering two factors: shorter-term intrusiveness due to changes in the noise environment; and maintaining the noise amenity of an area.
2. Predict or measure the noise levels produced by the development with regard to the presence of annoying noise characteristics and meteorological effects such as temperature inversions and wind.
3. Compare the predicted or measured noise level with the PNTL, assessing impacts and the need for noise mitigation and management measures.
4. Consider residual noise impacts - that is, where noise levels exceed the PNTLs after the application of feasible and reasonable noise mitigation measures. This may involve balancing economic, social and environmental costs and benefits from the proposed development against the noise impacts, including consultation with the affected community where impacts are expected to be significant.

5. Set statutory compliance levels that reflect the best achievable and agreed noise limits for the development.

6. Monitor and report environmental noise levels from the development.

3.1.1 Project Noise Trigger Levels (PNTL)

The policy sets out the procedure to determine the PNTLs relevant to an industrial development. The PNTL is the lower (ie, the more stringent) of the **Project Intrusiveness Noise Level** (PINL) and **Project Amenity Noise Level** (PANL) determined in accordance with Section 2.3 and Section 2.4 of the NPI.

3.1.2 Rating Background Level (RBL)

The Rating Background Level (RBL) is a determined parameter from noise monitoring and is used for assessment purposes. As per the NPI, the RBL is an overall single figure background level representing each assessment period (day, evening and night) over the noise monitoring period. The measured RBLs relevant to the project are contained in **Section4.1**.

3.1.3 Project Intrusiveness Noise Level (PINL)

The PINL ($LA_{eq(15min)}$) is the RBL + 5dB and seeks to limit the degree of change a new noise source introduces to an existing environment. Hence, when assessing intrusiveness, background noise levels need to be measured.

Background noise levels need to be determined before intrusive noise can be assessed. The NPI states that background noise levels to be measured are those that are present at the time of the noise assessment and without the subject development operating. For the assessment of modifications to existing premises, the noise from the existing premises should be excluded from background noise measurements. It is note that the exception is where the premises has been operating for a significant period of time and is considered a normal part of the acoustic environment; it may be included in the background noise assessment under the following circumstances:

- the development must have been operating for a period in excess of 10 years in the assessment period/s being considered and is considered a normal part of the acoustic environment; and
- the development must be operating in accordance with noise limits and requirements imposed in a consent or licence and/or be applying best practice.

Where a project intrusiveness noise level has been derived in this way, the derived level applies for a period of 10 years to avoid continuous incremental increases in intrusiveness noise levels. This approach is consistent with the purpose of the intrusiveness noise level to limit significant change in the acoustic environment. The purpose of the Project Amenity Noise Level is to moderate against background noise creep.

3.1.4 Project Amenity Noise Level (PANL)

The PANL is relevant to a specific land use or locality. To limit continuing increases in intrusiveness levels, the ambient noise level within an area from all combined industrial sources should remain below the recommended Amenity Noise Levels specified in Table 2.2 (of the NPI). The NPI defines two categories of Amenity Noise Levels:

- **Amenity Noise Levels (ANL)** – are determined considering all current and future industrial noise within a receiver area; and
- **Project Amenity Noise Level (PANL)** – is the recommended level for a receiver area, specifically focusing the project being assessed.

Additionally, Section 2.4 of the NPI states: "to ensure that industrial noise levels (existing plus new) remain within the recommended Amenity Noise Levels for an area, a Project Amenity Noise Level applies for each new source of industrial noise as follows":

PANL for new industrial developments = recommended **ANL** minus 5dBA.

The following exceptions apply when deriving the PANL:

- areas with high traffic noise levels;
- proposed developments in major industrial clusters;
- existing industrial noise and cumulative industrial noise effects; and
- greenfield sites.

The NPI states with respect to high traffic noise areas:

The level of transport noise, road traffic noise in particular, may be high enough to make noise from an industrial source effectively inaudible, even though the LAeq noise level from that industrial noise source may exceed the Project Amenity Noise Level. In such cases the Project Amenity Noise Level may be derived from the LAeq, period(traffic) minus 15 dB(A).

Where relevant this assessment has considered influences of traffic with respect to Amenity Noise Levels (ie areas where existing traffic noise levels are 10dB greater than the recommended ANL).

The recommended Amenity Noise Levels as per Table 2.2 of the NPI are reproduced in **Table 3**.

Table 3 Amenity Noise Levels

Receiver Type	Noise Amenity Area	Time of day[1]	Recommended Amenity Noise Level dB LAeq(period)
Residential	Rural	Day	50
		Evening	45
		Night	40
	Suburban	Day	55
		Evening	45
		Night	40
	Urban	Day	60
		Evening	50
		Night	45
Hotels, motels, caretakers' quarters, holiday accommodation, permanent resident caravan parks.	See column 4	See column 4	5dB above the recommended Amenity Noise Level for a residence for the relevant noise amenity area and time of day
School Classroom	All	Noisiest 1-hour period when in use	35 (internal) 45 (external)
Hospital ward			
- internal	All	Noisiest 1-hour	35
- external	All	Noisiest 1-hour	50
Place of worship - internal	All	When in use	40
Passive Recreation	All	When in use	50
Active Recreation	All	When in use	55
Commercial premises	All	When in use	65
Industrial	All	When in use	70

Notes: The recommended Amenity Noise Levels refer only to noise from industrial noise sources. However, they refer to noise from all such sources at the receiver location, and not only noise due to a specific project under consideration. The levels represent outdoor levels except where otherwise stated.

Types of receivers are defined as rural residential; suburban residential; urban residential; industrial interface; commercial; industrial – see Table 2.3 and Section 2.7 of the NPI.

Note 1: Day - the period from 7am to 6pm Monday to Saturday or 8am to 6pm on Sundays and public holidays; Evening - the period from 6pm to 10pm; Night - the remaining periods.

3.2 The AAAC Guideline

The Guideline for Childcare Centre Acoustic Assessment (GCCCAA) been prepared by the AAAC. The document provides criteria for the assessment of noise intrusion into and noise emissions from CCCs and also provides recommendations for treatment to minimise noise upon surrounding receptors. The guideline aligns with the NPI for establishing criteria for CCCs with respect to the following noise sources:

- mechanical plant (air conditioning condensers and mechanical ventilation);
- on-site traffic, deliveries and ingress and egress of vehicles;
- on-site drop off/collection areas of children; and
- noise emissions from children at play.

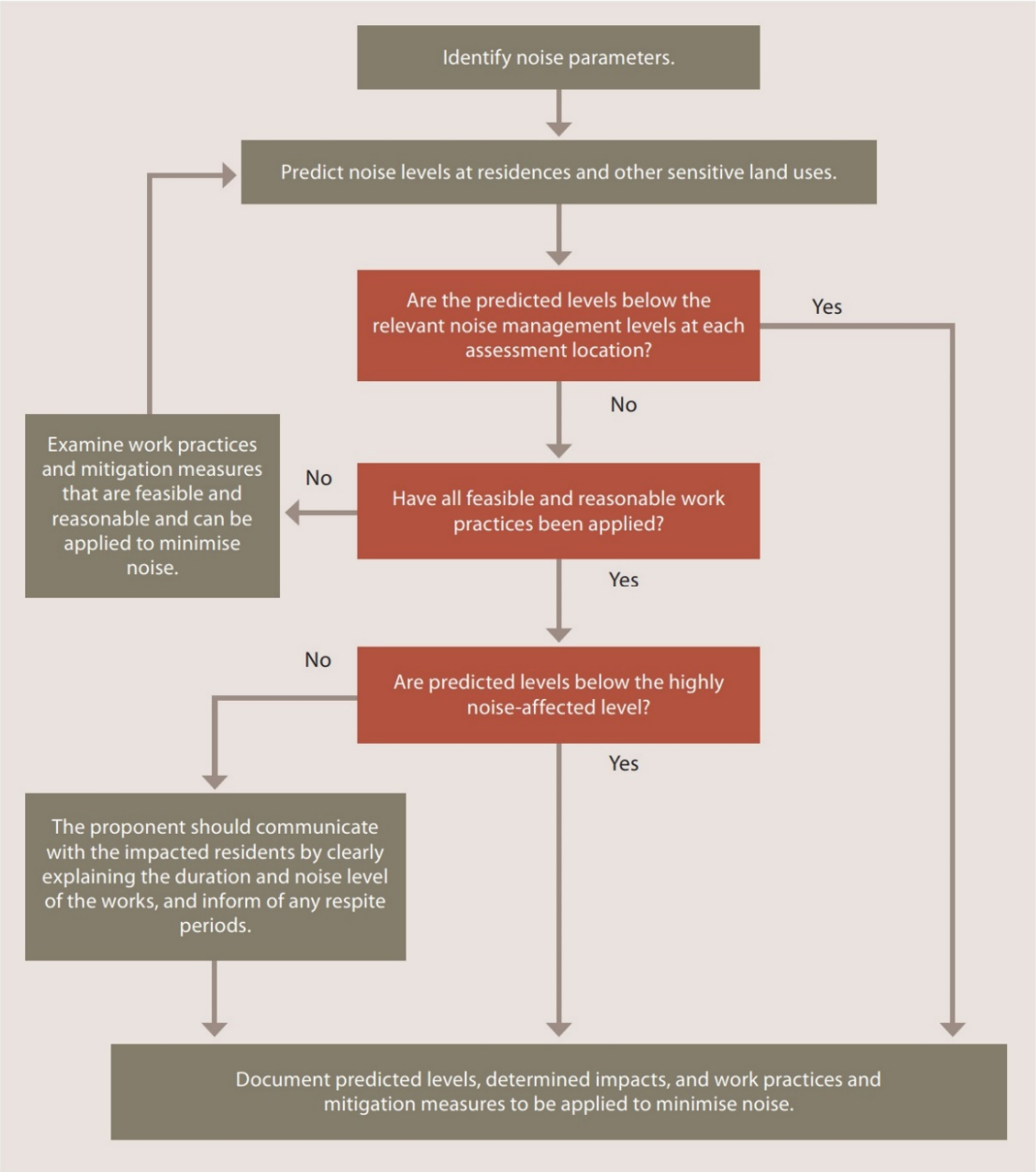
3.3 Interim Construction Noise Guideline

The ICNG sets out procedures to identify and address the impacts of construction noise on residences and other sensitive land uses. This section provides a summary of noise objectives that are applicable to the assessment. The ICNG provides two methodologies for the assessment of construction noise emissions:

- quantitative, which is suited to major construction projects with typical durations of more than three weeks; and
- qualitative, which is suited to short term infrastructure maintenance (< three weeks).

The qualitative assessment methodology is a more simplified approach that relies on noise management strategies. This NA has adopted a quantitative assessment approach which is summarised in **Figure 2.** The quantitative approach includes identification of potentially affected receivers, derivation of the construction noise management levels, quantification of potential noise impact at receivers via predictive modelling and, provides management and mitigation recommendations.

Figure 2 Quantitative Assessment Processes for Assessing and Managing Construction Noise



Source: Department of Environment and Climate Change, 2009.

3.3.1 Standard Hours for Construction

Table 4 presents the ICNG recommended standard hours for construction works.

Table 4 Recommended Standard Hours for Construction

Daytime	Construction Hours
Monday to Friday	7am to 6pm
Saturdays	8am to 1pm
Sundays or Public Holidays	No construction

These recommended hours do not apply in the event of direction from police, or other relevant authorities, for safety reasons or where required in an emergency to avoid the loss of lives, property and/or to prevent environmental harm. Construction activities are anticipated to be undertaken during standard construction hours.

3.3.2 Construction Noise Management Levels

Section 4 of the ICNG details the quantitative assessment method involving predicting noise levels and comparing them with the Noise Management Level (NML) and are important indicators of the potential level of construction noise impact. **Table 5** reproduces the ICNG Noise Management Level (NML) for residential receivers. The NML is determined by adding 10dB (standard hours) or 5dB for Out of Hours (OOH) to the Rating Background Level (RBL) for each specific assessment period.

Table 5 Noise Management Levels		
Time of Day	Management Level LAeq(15min)[1]	How to Apply
Recommended standard hours: Monday to Friday 7am to 6pm Saturday 8am to 1pm No work on Sundays or public holidays.	Noise affected RBL + 10dB	The noise affected level represents the point above which there may be some community reaction to noise. Where the predicted or measured LAeq(15min) is greater than the noise affected level, the proponent should apply all feasible and reasonable work practices to meet the noise affected level. The proponent should also inform all potentially impacted residents of the nature of work to be carried out, the expected noise levels and duration, as well as contact details.
	Highly Noise Affected 75dBA (HNA)	The highly noise affected level represents the point above which there may be strong community reaction to noise. Where noise is above this level, the relevant authority (consent, determining or regulatory) may require respite periods by restricting the hours that the very noisy activities can occur, taking into account times identified by the community when they are less sensitive to noise such as before and after school for work near schools, or mid-morning or mid-afternoon for work near residences; and if the community is prepared to accept a longer period of construction in exchange for restrictions on construction times.
Outside recommended standard hours.	Noise affected RBL + 5dB	A strong justification would typically be required for work outside the recommended standard hours. The proponent should apply all feasible and reasonable work practices to meet the noise affected level. Where all feasible and reasonable practices have been applied and noise is more than 5dBA above the noise affected level, the proponent should negotiate with the community. For guidance on negotiating agreements see Section 7.2.2 of the ICNG.

Note 1: The Rating Background Level (RBL) is an overall single figure background level representing each assessment period over the whole monitoring period. The RBL is used to determine the construction noise management levels for noise assessment purposes and is the median of the ABL's.

3.3.3 Minimising Construction Noise

The ICNG outlines noise management and mitigation measures to minimise the noise impacts from construction activities on nearby sensitive receivers. Adopting the standard mitigation measures may result in an attenuation of up to 10dBA where space requirements place limitations on the attenuation options. Examples of standard mitigation measures are reproduced in **Table 6**, which may be adopted for the operation.

Table 6 Standard Mitigation Measures		
	Action Required	Details
Management Measures	Implement community consultation or notification measures	Notification detailing work activities, dates, and hours, impacts and mitigation measures, indication of work schedule over the night-time period, any operational noise benefits from the works (where applicable) and contact telephone number. Notification should be a minimum of 7 calendar days prior to the start of works. For projects other than maintenance works more advanced consultation or notification may be required. Please contact Roads and Maritime Communication and Stakeholder Engagement for guidance: - website (If required); - contact telephone number for community; - email distribution list (if required); and/or - community drop-in session (if required by approval conditions).
	Site Inductions	All employees, contractors and subcontractors are to receive an environmental induction. The induction must at least include: - all relevant project specific and standard noise and vibration mitigation measures; - relevant licence and approval conditions; - permissible hours of work; - any limitations on noise generating activities; - location of nearest sensitive receivers; - construction employee parking areas; - designated loading/unloading areas and procedures; - site opening/closing times (including deliveries); and - environmental incident procedures.
Site Controls	Minimise disturbance arising from delivery of goods to construction sites	Loading and unloading of materials/deliveries is to occur as far as possible from sensitive receivers. Select site access points and roads as far as possible away from sensitive receivers. Dedicated loading/unloading areas to be shielded if close to sensitive receivers. Delivery vehicles to be fitted with straps rather than chains for unloading, wherever possible. Avoid or minimise these out of hours movements where possible.
Path Controls	Shield stationary noise sources	Stationary noise sources should be enclosed or shielded whilst ensuring that the occupational health and safety of workers is maintained. Appendix D of AS2436:2010 lists materials suitable for shielding.
	Shield sensitive receivers from noise activities	Use structures to shield residential receivers from noise such as site shed placement; earth bunds; fencing; erection of operational stage noise barriers (where practicable) and consideration of site topography when situating plant.

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4 Existing Environment

4.1 Unattended Noise Monitoring

To quantify the existing background noise environment of the area, unattended noise monitoring was conducted at one location representative of the ambient environment surrounding the project site. The selected monitoring location is shown in Figure 1 and is considered representative of surrounding residential receivers as per Fact Sheet B1.1 of the NPI. The unattended noise survey was conducted in general accordance with the procedures described in Standards Australia AS 1055:2018, "Acoustics – Description and Measurement of Environmental Noise".

The measurements were carried out using one Svantek 977 noise analyser from Thursday 7 November 2024 to Monday 18 November 2024. All acoustic instrumentation used carries appropriate and current NATA (or manufacturer) calibration certificates with records of all calibrations maintained by MAC as per Approved Methods for the measurement and analysis of environmental noise in NSW (EPA, 2022) and complies with AS/NZS IEC 61672.1-2019-Electroacoustics - Sound level meters - Specifications. Calibration of all instrumentation was checked prior to and following measurements. Drift in calibration did not exceed ±0.5dBA.

Observations on-site identified the surrounding locality was typical of an urban environment, with traffic noise as the dominant noise source.

Data affected by adverse meteorological conditions have been excluded from the results in accordance with methodologies provided in Fact Sheet A4 of the NPI. Residential receivers situated in the surrounding area have been classified under the EPA's urban amenity category. This criterion is used in conjunction with the intrusiveness criteria to determine the limiting criteria. The results of long-term unattended noise monitoring are provided in **Table 7**. The noise monitoring charts, and a summary of the background monitoring data are provided in **Table C23** in **Appendix C.**

Table 7 Background Noise Monitoring Summary

Monitoring Location	Period[1]	Measured Background Noise Level (LA90) dB RBL	Measured dB LAeq
L1	Morning Shoulder	41	60
	Day	46	62
	Evening	44	60
	Night	33	58

Note 1: Morning Shoulder - the period from 6am to 7am; Day - the period from 7am to 6pm Monday to Saturday or 8am to 6pm on Sundays and public holidays; Evening - the period from 6pm to 10pm; Night - the remaining periods.

Note: Excludes periods of wind or rain affected data. Meteorological data obtained from the Bureau of Meteorology weather station Mailand Airport AWS (37.7°S 151.5°E 28m AMSL).

Note: Calibration certificates of the sound level meters used for this project are available on request.

4.2 Attended Noise Monitoring

To supplement the unattended noise assessment and to quantify the changes in ambient noise in the community surrounding the operation, one 15 minute attended measurement was completed.

The attended noise survey was conducted in general accordance with the procedures described in Australian Standard AS 1055:2018, "Acoustics – Description and Measurement of Environmental Noise".

The acoustic instrumentation used carries current NATA calibration and complies with AS/NZS IEC 61672.1-2019-Electroacoustics - Sound level meters - Specifications. Calibration of all instrumentation was checked prior to and following measurements. Drift in calibration did not exceed ±0.5dBA. All equipment carries appropriate and current NATA (or manufacturer) calibration certificates with records of all calibrations maintained by MAC as per the EPA's Approved Methods for the measurement and analysis of environmental noise in NSW (EPA, 2022).

The attended noise monitoring was conducted using one Svantek 971 noise analyser at the site (see **Figure 1**) on Thursday 7 November 2024 to quantify ambient background noise levels.

The attended measurement was completed during calm and clear meteorological conditions and confirmed that ambient traffic and insect noise dominated the surrounding environment. The results of the short-term noise measurement and observations are summarised in **Table 8**.

Table 8 Operator-Attended Noise Survey Results

Date/Time (hrs)	Noise Descriptor (dBA re 20 µPa)			Meteorology	Description and SPL, dBA
	L_{Amax}	L_{Aeq}	L_{A90}		
07/11/2024 13:37	73	58	48	WD: NE WS: 0.5m/s Rain: Nil	Traffic 43-73 Birds 40-68 Insects 40-50

5 Assessment Criteria

5.1 Operational Noise Trigger Levels (Criteria)

This section outlines the determination of PNTLs and Maximum Noise Assessment Trigger Levels in accordance with NPI methodology.

5.1.1 Intrusiveness Noise Levels

The PINL for the project are presented in **Table 9** and have been determined based on the RBL +5dBA and only apply to residential receivers.

Table 9 Project Intrusiveness Noise Levels

Location	Receiver Type	Period[1]	Measured RBL dB L_{A90}	Adopted RBL dB L_{A90}	PINL dB $L_{Aeq(15min)}$
L1	Residential	Morning Shoulder	41	41	46
		Day	46	46	51
		Evening	44	44	49
		Night	33	33	38

Note 1: Morning Shoulder - the period from 6am to 7am; Day - the period from 7am to 6pm Monday to Saturday or 8am to 6pm on Sundays and public holidays; Evening - the period from 6pm to 10pm; Night - the remaining periods.

Note 2: As per NPI guidance the minimum nighttime RBL is 30dBA.

5.1.2 Determination of NPI Residential Receiver Amenity Category

Classification of residential receivers in the surrounding area have been determined by review of the measured RBLs and a tally of the features for each category described in Table 2.3 of the NPI. The overall tally of features and resulting classifications are provided in **Table 10**. The detailed assessment of receiver categories is provided in **Appendix D.** This classification is used in conjunction with the intrusiveness criteria to determine the limiting criteria.

Table 10 Determination of NPI Residential Receiver Category

Receiver/Location/Catchment	Rural	Suburban	Urban
L1	0	1	8

Observations at locations in the surrounding locality support the assessment of the receiver as an urban residential category.

5.1.3 Amenity Noise Levels and Project Amenity Noise Levels

The PANL for residential receivers and other receiver types (ie non-residential) potentially affected by the project are presented in **Table 11.**

Table 11 Amenity Noise Levels and Project Amenity Noise Levels

Receiver Type	Noise Amenity Area	Assessment Period[1]	NPI Recommended ANL dB $LA_{eq(period)}$	ANL dB $LA_{eq(period)}$	PANL dB $LA_{eq(15min)}$[4]
Residential	Urban	Morning Shoulder	N/A[2]	N/A[2]	N/A[2]
		Day	60	55[3]	58
		Evening	50	45[3]	48
		Night	45	40[3]	43
Commercial	All	When in use	65	60[3]	63

Note 1: Morning Shoulder - the period from 6am to 7am; Day - the period from 7am to 6pm Monday to Saturday or 8am to 6pm on Sundays and public holidays; Evening - the period from 6pm to 10pm; Night - the remaining periods.

Note 2: As per NPI guidance, shoulder periods are assessed on intrusiveness levels only.

Note 3: Project Amenity Noise Level equals the Amenity Noise Level -5dB as there is other industry in the area.

Note 4: Includes a +3dB adjustment to the amenity period level to convert to a 15-minute assessment period as per Section 2.2 of the NPI.

5.1.4 Project Noise Trigger Levels

The PNTL are the lower of either the PINL or the PANL. **Table 12** presents the derivation of the PNTLs in accordance with the methodologies outlined in the NPI.

Table 12 Project Noise Trigger Levels

Receiver Type	Noise Amenity Area	Assessment Period[1]	PINL dB $LA_{eq(15min)}$	PANL dB $LA_{eq(15min)}$	PNTL dB $LA_{eq(15min)}$
Residential	Urban	Morning Shoulder	46	N/A[2]	46
		Day	51	58	51
		Evening	49	48	48
		Night	38	43	38
Educational	All	When in Use	N/A	63	63

Note 1: Morning Shoulder - the period from 5am to 7am; Day - the period from 7am to 6pm Monday to Saturday or 8am to 6pm on Sundays and public holidays; Evening - the period from 6pm to 10pm; Night - the remaining periods.

Note 2: As per NPI guidance, shoulder periods are assessed on intrusiveness levels only.

5.2 Noise Intrusion Criteria to Childcare Centres

The GCCCAA provides recommendations for external noise impact upon children in Childcare Centres. The relevant criteria for noise intrusion to the CCC is reproduced below:

- the $LA_{eq(1\text{-}hour)}$ intrusive noise level from road, rail or industry at any location within an outdoor play area should not exceed 55dBA; and
- the $LA_{eq(1\text{-}hour)}$ intrusive noise level from road, rail or industry within the indoor play or sleeping areas should not exceed 40dBA.

5.3 Noise Emission Criteria from Childcare Centres

The GCCCAA recommends a base criterion of 45dB $LA_{eq(15min)}$ for the assessment of outdoor play where the background noise level is less than 40dBA, however, where the background noise level is greater than 40dBA, the GCCCAA states:

> *The contributed Leq,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 (ie background +10 dB if outdoor play is limited to 2 hours in the morning and 2 hours in the afternoon).*

The project proposes unrestricted hours for outdoor play and has adopted the RBL+5dB assessment approach. Other noise emissions, from mechanical plant, drop off, pick up and any other activities are not to exceed the background noise level by more than 5dB.

In regard to sleep disturbance, activities prior to 7am, such as the LA_{max} noise level from staff vehicles arriving, parking etc should not exceed the background noise level by more than 15dB. **Table 13** summarises the noise emission criteria from the CCC.

Table 13 CCC Noise Emission Criteria

Location	Period	Activity	Criteria
L1	Day (7:00am-6:00pm)	Outdoor Play (Unlimited Play)	51dB $LA_{eq(15min)}$
	Morning Shoulder (6:00am-7:00am)	All Other Activities	46dB $LA_{eq(15min)}$
	Day (7:00am-6:00pm)		51dB $LA_{eq(15min)}$
	Evening (6:00pm to 7:00pm)		49dB $LA_{eq(15min)}$
	Morning Shoulder (6:00am-7:00am)	Staff Arrival	56dB LA_{max}

5.4 Construction Noise Management Levels

The relevant Noise Management Levels (NMLs) for standard construction hours are presented in Table 14.

Table 14 Construction Noise Management Levels

Receiver Type	Assessment Period[1]	Adopted RBL dB L_{A90}	NML dB $L_{Aeq(15min)}$
Residential	Standard Hours	46	56 (RBL+10dBA)
Commercial	When in use	N/A	70

Note 1: Refer to Table 4 for Standard Recommended Hours for Construction.

Note 2: External level based on 10dB with windows open for adequate ventilation (ICNG).

6 Modelling Methodology

A computer model was developed to quantify project noise emissions to neighbouring receivers using DGMR (iNoise, Version 2024.1) noise modelling software. iNoise is an intuitive and quality assured software for industrial noise calculations in the environment. 3D noise modelling is considered industry best practice for assessing noise emissions from projects.

The model incorporated a three-dimensional digital terrain map giving all relevant topographic information used in the modelling process. Additionally, the model uses relevant noise source data, ground type, attenuation from barrier or buildings and atmospheric information to predict noise levels at the nearest potentially affected receivers. Where relevant, modifying factors in accordance with Fact Sheet C of the NPI have been applied to calculations.

The model calculation method used to predict noise levels was in accordance with ISO 9613:1 and ISO 9613:2 including corrections for meteorological conditions using CONCAWE[1]. The ISO 9613 standards are the most used noise prediction method worldwide. Many countries refer to ISO 9613 in their noise legislation. However, the ISO 9613 standard does not contain guidelines for quality assured software implementation, which leads to differences between applications in calculated results. In 2015 this changed with the release of ISO/TR 17534-3. This quality standard gives clear recommendations for interpreting the ISO 9613 method. iNoise fully supports these recommendations. The models and results for the 19 test cases are included in the software.

6.1 Noise Attenuation Assumptions, Controls and Recommendations

The noise model adopted the following assumptions, controls and recommendations:

- the project is constructed as per the site design and plans, which includes the barrier attenuation provided by the project buildings orientation;
- construction of an impervious barriers (for noise intrusion) surrounding the northeastern boundary of project playground (see **Figure 3**). The barriers should be constructed to an RL of 1.8m above the relative ground level of the playground. The barriers should consist of materials with a surface density of at least 10kg/m^2, and not contain any gaps (ie lapped and capped timber or equivalent); and
- the mechanical plant for the CCC is yet to be finalised. Therefore, the modelling assumes one AC unit per classroom and one for the admin spaces, totalling eight AC units. The AC units are assumed to be located on northern and southern gable ends of the building (see **Figure 3**).

[1] Report no. 4/18, "the propagation of noise from petroleum and petrochemical complexes to neighbouring communities", Prepared by C.J. Manning, M.Sc., M.I.O.A. Acoustic Technology Limited (Ref.AT 931), CONCAWE, Den Haag May 1981

6.2 Sound Power Levels

Table 15 presents the sound power level for each noise source modelled in this assessment. It is noted that operational sound power levels were sourced from manufacturer's specifications or from in-field measurements at similar project sites. Sound powers for children at play activities were sourced from the Guideline for Childcare Centre Acoustic Assessment.

Table 15 Acoustically Significant Sources - Sound Power Levels dBA (re 10^{-12} Watts)

Item and number modelled per 15 minutes	Sound Power Level, dB LA_{eq}	Total Sound Power Level, dB $LA_{eq(15min)}$	Source Height[1]
CCC Operational Sources			
AC plant (x8)	76	85	1.4m
Rooftop extraction fan (x6)	73	81	0.5m
Car idle, start up and drive off (x20)[2]	81	86	0.5m
Car enters and exiting car park (20 cars per 15min)	81	86	0.5m
Waste Collection (x1)	86	86	1.0m
CCC Outdoor Play Sources			
Child aged 0-2 years vocal effort (x32)	68	83	0.5m
Child aged 2-3 years vocal effort (x50)	75	92	0.5m
Child aged 3-6 years vocal effort (x40)	77	93	0.5m
Maximum Noise Level Assessment (LA_{max}), Morning Shoulder (5am – 7am)			
Door Slam	87		0.5m
Waste Collection Impact	104		2.0m
Construction Fleet			
Combined Construction Fleet	108		1.5m

Note 1: Height above the relative ground or building below source.

Note 2: Includes a duration adjustment assuming vehicles operate for three (3) minutes continuously within a period of 15-minutes.

FIGURE 3

Barrier and Plant Plan

MAC242302

Regiment Road

Childcare Centre

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7 Noise Assessment Results

7.1 Operational Noise Assessment

Noise predictions from all operational sources (mech plant and onsite parent/educator vehicles) have been quantified at surrounding residential receivers to the project site and are presented in **Table 16**.

Table 16 Noise Predictions – All Receivers

Location	Predicted Noise Level dB $LA_{eq(15min)}$			PNTL dB $LA_{eq(15min)}$			Compliant
	Morning Shoulder	Day	Evening	Morning Shoulder	Day	Evening	
R01	36	36	36	46	51	49	✓
R02	39	39	39	46	51	49	✓
R03	38	38	38	46	51	49	✓
R04	41	41	41	46	51	49	✓
R05	42	42	42	46	51	49	✓
R06	43	43	43	46	51	49	✓
R07	42	42	42	46	51	49	✓
R08	32	32	32	46	51	49	✓
R09	37	37	37	46	51	49	✓
R10	39	39	39	46	51	49	✓

Location	Period	Predicted Noise Level dB $LA_{eq(15min)}$	PNTL dB $LA_{eq(15min)}$	Compliant
C01	When in use	39	63	✓
C02	When in use	35	63	✓
C03	When in use	45	63	✓
C04	When in use	42	63	✓
C05	When in use	40	63	✓

Note 1: Morning Shoulder - the period from 6am to 7am; Day - the period from 7am to 6pm Monday to Saturday or 8am to 6pm on Sundays and public holidays; Evening - the period from 6pm to 10pm; Night - the remaining periods.

Satisfying the NPI PNTLs also ensures the GCCCAA emission criteria from mechanical plant and onsite vehicles.

Waste collections are expected to be undertaken once per day during the day, evening and morning shoulder periods. Waste collection usually takes several minutes, but to present a conservative assessment, it has been assumed that it would take up to 15 minutes to complete. Fact Sheet C of the NPI allows for exceedance of the PNTL or adjustment of the PNTL for short term single events that may occur in any 24-hour period. Table C3 of the NPI allows an adjustment to the PNTL of +7dB for the daytime and evening periods and +2dB during the morning shoulder period, when the event is expected to occur. Results of the noise modelling predictions are presented in **Table 17** for operations with waste collection during the morning shoulder, daytime and evening periods.

Table 17 Noise Predictions – All Receivers

Location	Predicted Noise Level dB $L_{Aeq(15min)}$			PNTL dB $L_{Aeq(15min)}$			Compliant
	Morning Shoulder	Day	Evening	Morning Shoulder	Day	Evening	
R01	39	39	39	48	58	56	✓
R02	41	41	41	48	58	56	✓
R03	40	40	40	48	58	56	✓
R04	43	43	43	48	58	56	✓
R05	45	45	45	48	58	56	✓
R06	45	45	45	48	58	56	✓
R07	44	44	44	48	58	56	✓
R08	33	33	33	48	58	56	✓
R09	38	38	38	48	58	56	✓
R10	40	40	40	48	58	56	✓

Location	Period	Predicted Noise Level dB $L_{Aeq(15min)}$	PNTL dB $L_{Aeq(15min)}$	Compliant
C01	When in use	39	70	✓
C02	When in use	35	70	✓
C03	When in use	46	70	✓
C04	When in use	44	70	✓
C05	When in use	43	70	✓

Note 1: Morning Shoulder - the period from 6am to 7am; Day - the period from 7am to 6pm Monday to Saturday or 8am to 6pm on Sundays and public holidays; Evening - the period from 6pm to 10pm; Night - the remaining periods.

Satisfying the NPI PNTLs also ensures the GCCCAA emission criteria from mechanical, onsite vehicles and waste collections.

7.2 Child Care Centre Noise Assessment Results

7.2.1 Noise Intrusion Results – Outdoor Play Area

Table 18 presents the predicted noise intrusion from the existing ambient levels impacting on the CCC external play spaces. The predicted results show compliance with the criteria in the GCCCAA.

Table 18 External Play Area Noise Results

Receiver	Predicted Noise Level dB $LA_{eq(1hr)}$	Criteria	Compliant
	Traffic Noise Levels	dB $LA_{eq(1hr)}$	
Outdoor Play Area 1	48	55	✓
Outdoor Play Area 2	49	55	✓
Outdoor Play Area 3	53	55	✓
Outdoor Play Area 4	51	55	✓
Outdoor Play Area 5	52	55	✓

7.2.2 Noise Intrusion Results – Internal Play Spaces

Table 19 presents the predicted internal CCC noise levels from the existing ambient noise levels. The predicted results show compliance with the criteria in the GCCCAA assuming a 10dB loss for the installed windows partially open.

Table 19 Internal Cumulative Noise Results

Receiver	Predicted noise level dB $LA_{eq(1hr)}$		Internal Criteria	Compliant
	Traffic Noise Levels	Internal	dB $LA_{eq(1hr)}$	
Babies 1	47	37	40	✓
Babies 2	49	39	40	✓
Toddlers 1	49	39	40	✓
Toddlers 2	48	38	40	✓
Preschool 1	46	36	40	✓
Preschool 2	47	37	40	✓

7.2.3 Noise Emission Results – Outdoor play

Table 20 presents the noise emission results for children at play ($LA_{eq(15min)}$) in the outdoor play areas of the CCC The predicted results show compliance with the criteria in the GCCCAA. For modelling purposes, children were spread evenly over the playground areas.

Table 20 Noise Emissions Results – CCC Outdoor Play

Receiver	Predicted Noise Level dB $LA_{eq(15min)}$	Emission Criteria dB $LA_{eq(15min)}$	Compliant
	Day	Day	
R01	<35	51	✓
R02	38	51	✓
R03	<35	51	✓
R04	<35	51	✓
R05	<35	51	✓
R06	<35	51	✓
R07	<35	51	✓
R08	<35	51	✓
R09	<35	51	✓
R10	<35	51	✓

Note 1: Morning Shoulder - the period from 6am to 7am; Day - the period from 7am to 6pm Monday to Saturday or 8am to 6pm on Sundays and public holidays; Evening - the period from 6pm to 10pm; Night - the remaining periods.

7.2.4 Noise Emission Results – Transient Events

Table 21 presents the noise emission results for transient events such door slam events in the car park or playground area or waste collection impacts during the morning shoulder period (L_{Amax}).

Table 21 Noise Emissions Results –Transient Events[1]

Receiver	Predicted Noise Level[2] dB LAmax				GCCCAA Trigger Level dB LAmax	RNP Trigger Level dB LAmax
	Door Slam Northernmost Car Space	Door Slam Easternmost Car Space	Door Slam Southernmost Car Space	Waste Collection Impact		
R1	<35	35	37	55	56	65
R2	<35	37	40	57	56	65
R3	<35	38	38	55	56	65
R4	36	41	42	58	56	65
R5	40	44	44	60	56	65
R6	42	45	44	61	56	65
R7	45	42	40	59	56	65
R8	35	<35	<35	46	56	65
R9	37	36	<35	54	56	65
R10	40	36	<35	55	56	65

Note 1: Morning Shoulder - the period from 6am to 7am; Day - the period from 7am to 6pm Monday to Saturday or 8am to 6pm on Sundays and public holidays; Evening - the period from 6pm to 10pm; Night - the remaining periods.

Note 2: Maximum predicted noise level on any façade.

The predicted results show compliance with the criteria in the GCCCAA for door slams. Satisfying the GCCCAA criteria also satisfies the maximum noise trigger levels established in accordance with NPI methodologies.

Maximum noise emissions levels from waste collection have the potential to be above the Maximum Noise Trigger Levels at several assessed receivers. Accordingly, in accordance with Section 2.5 of the NPI, a detail sleep disturbance assessment has been undertaken.

7.2.5 Detailed Sleep Disturbance Assessment

Section 5.2 of the NPI outlines the other factors that may be important in assessing the extent of impacts on sleep. These other factors include:

- how often high noise events will occur;
- the distribution of likely events across the night-time period and the existing ambient maximum events in the absence of the subject development;
- whether there are times of day when there is a clear change in the noise environment (such as during early-morning shoulder periods); and
- current scientific literature available at the time of the assessment regarding the impact of maximum noise level events at night.

Reviewing the proposed waste collection for the project site, they will occur once in a 24 hour period and are proposed to be undertaken during either the morning shoulder or day assessment periods. Therefore, the maximum occurrence of high noise events from either event is once per 24 hours, with the majority of collections to be undertaken during the day period, resulting in no sleep disturbance events at all.

Additionally, the NPI outlines that additional guidance on maximum noise level assessments may be sourced from the EPA NSW Road Noise Policy (RNP). Section 5.4 of the RNP outlines that a maximum internal noise level of 50-55dBA is unlikely to awaken people from sleep. Taking into account a 10dB loss for a partially open window, an external level of 65dBA is unlikely to awaken internal occupants.

It is noted that no receiver is predicted to experience noise levels above 65dBA L_{Amax} sleep disturbance criteria from waste collection.

Accordingly, due to the low occurrence of these events occurring during the night period which are not predicted to be above the maximum level of 65dBA, the potential for sleep disturbance is considered negligible.

7.3 Construction Noise Assessment

Table 22 presents the results of modelled construction noise emissions taking into account the additional 10dB attenuation provided by standard mitigation measures. Predictions identify that emissions from construction would remain below the Construction NMLs at all the assessed receivers with the inclusion of standard mitigation measures.

Table 22 Construction Noise Levels – All Receivers

Receiver	Period[1]	Predicted Noise Level dB $L_{Aeq(15min)}$	Management Level dB $L_{Aeq(15min)}$
R01	Day	45	56
R02	Day	48	56
R03	Day	47	56
R04	Day	49	56
R05	Day	50	56
R06	Day	51	56
R07	Day	51	56
R08	Day	34	56
R09	Day	47	56
R10	Day	49	56
C01	Day	54	70
C02	Day	54	70
C03	Day	54	70
C04	Day	50	70
C05	Day	48	70

Note 1: See Table 4 for Recommended Standard Hours for Construction.

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8 Discussion and Conclusion

Muller Acoustic Consulting Pty Ltd (MAC) has completed a Noise Assessment (NA) to quantify emissions from the Proposed Childcare Centre to be established at 7 Regiment Road, Rutherford, NSW. The Noise Assessment has quantified potential emissions associated with the proposed CCC as well as the noise intrusion from surrounding noise sources to the CCC.

The results of the Noise Assessment demonstrate that noise emissions from the operation would satisfy the relevant trigger levels at all assessed receivers once noise controls for the project are implemented (see Section 6.1):

- the project is constructed as per the site design and plans, which includes the barrier attenuation provided by the project buildings orientation;
- construction of an impervious barriers (for noise intrusion) surrounding the northeastern boundary of project playground (see Figure 3). The barriers should be constructed to an RL of 1.8m above the relative ground level of the playground. The barriers should consist of materials with a surface density of at least 10kg/m^2, and not contain any gaps (ie lapped and capped timber or equivalent); and
- the mechanical plant for the CCC is yet to be finalised. Therefore, the modelling assumes one AC unit per classroom and one for the admin spaces, totalling eight AC units. The AC units are assumed to be located on northern and southern gable ends of the building (see Figure 3).

The predicted maximum noise level results show compliance with the criteria in the GCCCAA for all receivers for door slam events.

Assessment of maximum noise level events associated with transient event noise emissions from waste collection may have the potential to be above the maximum noise trigger levels. However, a detailed maximum level assessment demonstrated that due to the low occurrence of these events occurring during the morning shoulder period which are not predicted to be above the maximum level of 65dBA, the potential for sleep disturbance is considered negligible.

Modelled noise emissions from construction activities identify that predicted noise emissions will remain below the applicable construction management levels at all receivers taking into account the standard mitigation measures (see Table 6).

In summary, the Noise Assessment supports the Development Application for the project incorporating the recommendations and controls outlined in this report.

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Appendix A – Glossary of Terms

A number of technical terms have been used in this report and are explained in **Table A1**.

Table A1 Glossary of Acoustical Terms

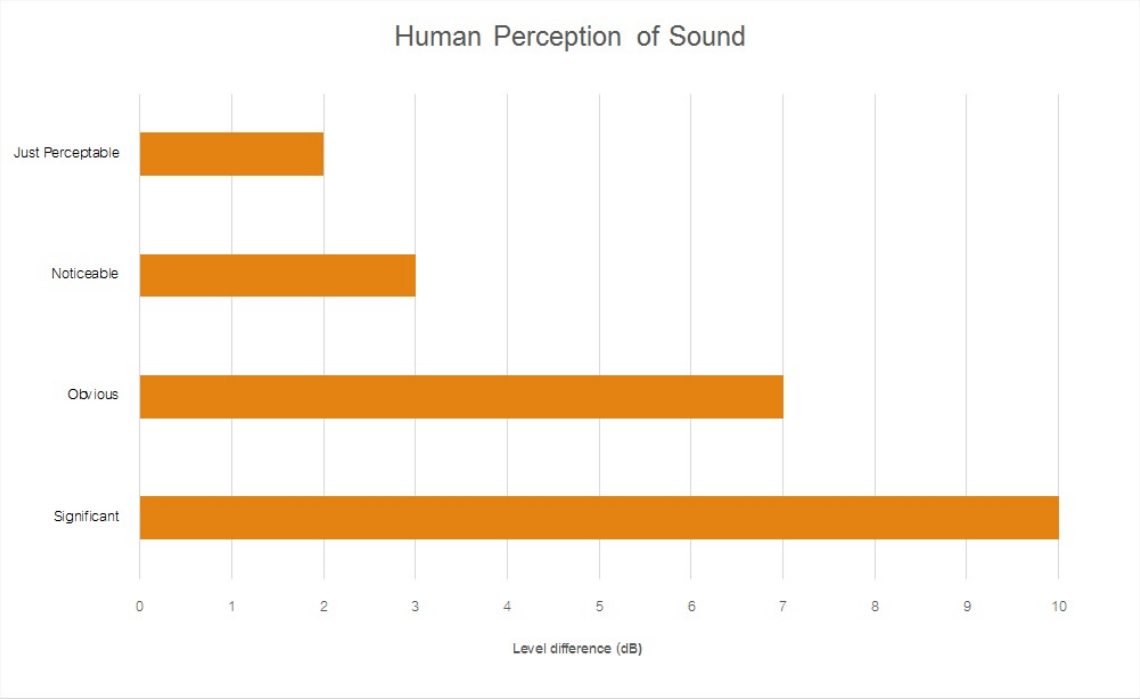
Term	Description
1/3 Octave	Single octave bands divided into three parts
Octave	A division of the frequency range into bands, the upper frequency limit of each band being twice the lower frequency limit.
ABL	Assessment Background Level (ABL) is defined in the NPI as a single figure background level for each assessment period (day, evening and night). It is the tenth percentile of the measured L90 statistical noise levels.
Ambient Noise	The total noise associated with a given environment. Typically, a composite of sounds from all sources located both near and far where no particular sound is dominant.
A Weighting	A standard weighting of the audible frequencies designed to reflect the response of the human ear to sound.
Background Noise	The underlying level of noise present in the ambient noise, excluding the noise source under investigation, when extraneous noise is removed. This is usually represented by the LA90 descriptor
dBA	Noise is measured in units called decibels (dB). There are several scales for describing noise, the most common being the 'A-weighted' scale. This attempts to closely approximate the frequency response of the human ear.
dB(Z), dB(L)	Decibels Z-weighted or decibels Linear (unweighted).
Extraneous Noise	Sound resulting from activities that are not typical of the area.
Hertz (Hz)	The measure of frequency of sound wave oscillations per second - 1 oscillation per second equals 1 hertz.
LA10	A sound level which is exceeded 10% of the time.
LA90	Commonly referred to as the background noise, this is the level exceeded 90% of the time.
LAeq	Represents the average noise energy or equivalent sound pressure level over a given period.
LAmax	The maximum sound pressure level received at the microphone during a measuring interval.
Masking	The phenomenon of one sound interfering with the perception of another sound. For example, the interference of traffic noise with use of a public telephone on a busy street.
RBL	The Rating Background Level (RBL) as defined in the NPI, is an overall single figure representing the background level for each assessment period over the whole monitoring period. The RBL, as defined is the median of ABL values over the whole monitoring period.
Sound power level (Lw or SWL)	This is a measure of the total power radiated by a source in the form of sound and is given by 10.log10 (W/Wo). Where W is the sound power in watts to the reference level of 10^{-12} watts.
Sound pressure level (Lp or SPL)	the level of sound pressure; as measured at a distance by a standard sound level meter. This differs from Lw in that it is the sound level at a receiver position as opposed to the sound 'intensity' of the source.

Table A2 provides a list of common noise sources and their typical sound level.

Table A2 Common Noise Sources and Their Typical Sound Pressure Levels (SPL), dBA

Source	Typical Sound Pressure Level
Threshold of pain	140
Jet engine	130
Hydraulic hammer	120
Chainsaw	110
Industrial workshop	100
Lawnmower (operator position)	90
Heavy traffic (footpath)	80
Elevated speech	70
Typical conversation	60
Ambient suburban environment	40
Ambient rural environment	30
Bedroom (night with windows closed)	20
Threshold of hearing	0

Figure A1 – Human Perception of Sound



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Appendix B – Site Plans

DEVELOPMENT APPLICATION
NEW CHILDCARE CENTRE
LOT 700 DP 592547
7 REGIMENT ROAD, RUTHERFORD

SHEET LIST		
Sheet Number	Sheet Name	Current Rev
00	TITLE	2
01	SUBDIVISION PLAN	2
02	SITE ANALYSIS & DEMOLITION PLAN	2
03	SITE PLAN	2
04	FLOOR PLAN	2
05	ROOF PLAN & VEHICLE SWEEP PATH	2
07	ELEVATIONS	2

GENERAL NOTES:

1. BUILDING SHELL DESIGN INTENT SHOWN,CONTRACTOR TO PROPOSE DETAILED DESIGN FOR CONSTRUCTION, INCLUDING ALL SITE RELATED WORKS, STRUCTURAL, CIVIL WORKS & BUILDING SERVICES.
2. THE CONTRACTOR SHALL VERIFY ALL EXISTING IN-GROUND AND ABOVE-GROUND SERVICES WITHIN THE SCOPE OF WORKS BEFORE COMMENCING CONSTRUCTION/DEMOLITION.
3. ANY 3D DRAWINGS ARE INDICATIVE ONLY, AND ARE TO BE READ IN CONJUNCTION WITH OTHER RELEVANT DRAWINGS.
4. ALL ACCESSIBILITY AND MOBILITY DESIGN (DDA) ITEMS TO COMPLY WITH A.S. 1428.1 2009.
5. THIS DRAWINGS SHOULD BE READ IN CONJUNCTION WITH ALL RELEVANT CONTRACTS, SPECIFICATIONS, SCHEDULES AND DRAWINGS INCLUDING CIVIL, STRUCTURAL, HYDRAULIC
6. DIMENSIONS:

CONTRACTOR AND SUB-CONTRACTOR SHALL VERIFY ALL DIMENSIONS OF THIS DRAWING AND SITE CONDITIONS PRIOR TO ANY WORK COMMENCING.
FIGURED DIMENSIONS TAKE PRECEDENCE OVER SCALED DIMENSIONS (UNLESS NOTED OTHERWISE).
FIGURED DIMENSIONS ARE:

- WALL / PARTITIONS SETOUT TO CENTRE LINE WHERE NOTED
- ALL OTHER WALL/PARTITION DIMENSIONS ARE TO FINISHED FACE OF PARTITION.
- CEILINGS: FINISHED UNDERSIDE OF CEILINGS - CEILING HEIGHT IS MEASURED FROM FINISH FLOOR LEVEL.
- FITTINGS AND FIXTURES. - DIMENSIONS TO FIXTURES AND FITTINGS ARE SETOUT FROM "FINISH" WALL FACE / FINISH FLOOR LEVEL.

PLANS TO BE READ IN CONJUNCTION WITH:

- BUILDING CODE OF AUSTRALIA
- RELEVANT AUSTRALIAN STANDARDS
- HYDRAULIC DRAWING SET
- CIVIL DRAWING SET
- STRUCTURAL DRAWING SET
- LANDSCAPE DRAWING SET

IF NO INTERNAL FITOUT FINISHES & PLANS ARE PRESENT, CLIENT SELECTIONS & DETAILS ARE TO TAKE PRECEDENCE.

PLEASE NOTE:
DETAILS SHOWN ON THIS PLAN ARE INTENDED TO BE ACCURATE, HOWEVER INFORMATION WRITTEN INTO INDIVIDUAL CONTRACTS

LIST OF CLAUSES:

- Clause B1.4 – Materials & Forms Constructions
- Spec. C1.1 • Fire Resisting Construction
- Spec. C1.10 – Fire Hazard Properties
- Spec. C1.11 – Performance of External Walls In a Fire
- Clause C2.6 – Vertical Separation of Openings in External Walls
- Clause C2.12 – Separation of Equipment
- Clause C2.13 – Electricity Supply System
- Clause C2.4 – Acceptable Methods of Protection (of openings)
- Clause C3.8 – Opening in Fire Isolated Exits
- Clause C3.15 – Openings for Service Installations
- Clause D1.10 – Discharge from Exits
- Clause D2.7 – Installations in Exits and Paths of Travel

• Clause D2.13 – Goings and Risers Treads which have:-
(a) A surface with a slip-resistance classification not less than that listed in Table D2.14 when tested in accordance with AS 4586 or
(b) A nosing strip with a slip-resistance classification not less than that listed in Table D2.14 when tested in accordance with AS 4586.

• Clause D2.14 – Landings which have: -
a. A surface with a slip-resistance classification not less than that listed in Table D2.14 when tested in accordance with AS 4586 or
(b) A strip at the edge of the landing with a slip-resistance classification not less than that listed in Table D2.14 when tested in accordance with AS 4586, where the edge leads to a flight below.

- Clause D2.15 – Thresholds
• Clause D2.16 – Balustrades
• Clause D2.17 – Handrails
- Clause D2.21 – Operation of Latch
- Clause D2.23 – Sign on Doors
- Clause D3.2 – General Building Access Requirements
- Clause D3.3 – Parts of Building to be Accessible
- Clause D3.6 – Identification of Accessible Facilities, Services and Features
- Clause D3.8 – Tactile Indicators
- Clause F1.7 – Waterproofing of Wet Areas
- Clause F1.9/ F1.10 – Damp Proofing
- Clause F2.5 – Construction of Sanitary Compartments
- Part F4 – Lighting and Ventilation
- Clause F5.4 – Sound Insulation of Floors
- Clause F5.5 – Sound Insulation of Walls
- Clause F5.6 – Sound Insulation of Services
- Clause F5.7 – Sound Insulation of Pumps

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Rev.	Description	Date	Issued by
1	PRELIM. DA SET	26.09.24	B.SIVA
2	DRAFT DA SET	17.10.24	B.SIVA

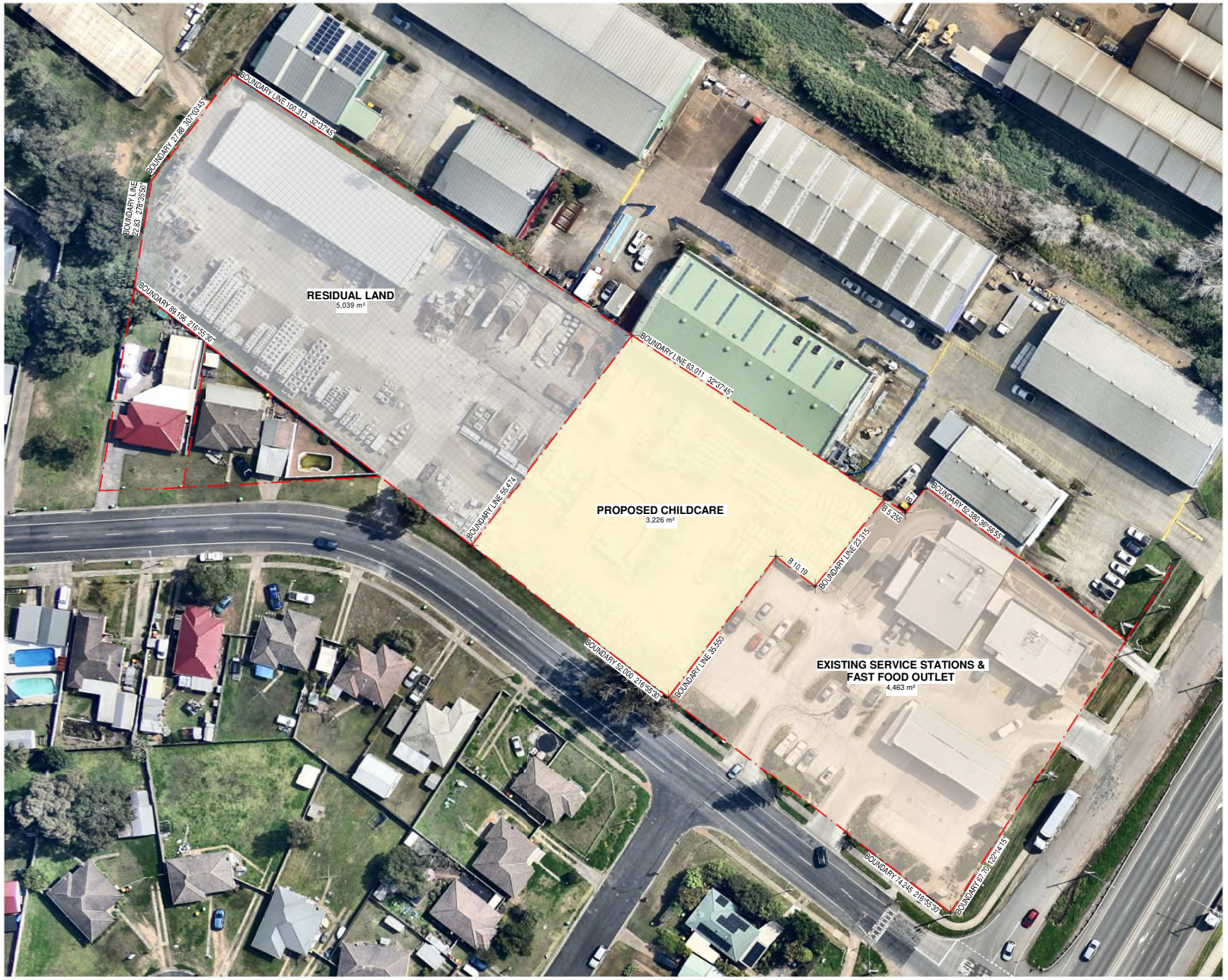
0 1 2 4 6m

NOTES:
1. All dimensions, levels, and setouts are to be verified on site prior to fabrication or construction.
2. Written dimensions take precedence over scaled ones

Project: CHILDCARE CENTRE
Sheet Title: TITLE
Project No: BC0543

Lot: 700 **DP:** 592547 **No:** 7 **Street:** REGIMENT ROAD **Suburb:** RUTHERFORD

Client: KOBY GROUP
Project Status: CONSTRUCTION CERTIFICATE
Scale: 1 : 50 on A1
Revision: 2
DWG No: 00



Rev	Description	Date	Issued by
2	DRAFT DA SET	17.10.24	B.SIVA

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www.brownbuild.com.au
2 Ewart Close
Beresfield, NSW 2322
PO Box 570
East Maitland NSW 2323
Ph: (02)49644 0218

Client

KOBY GROUP

Project

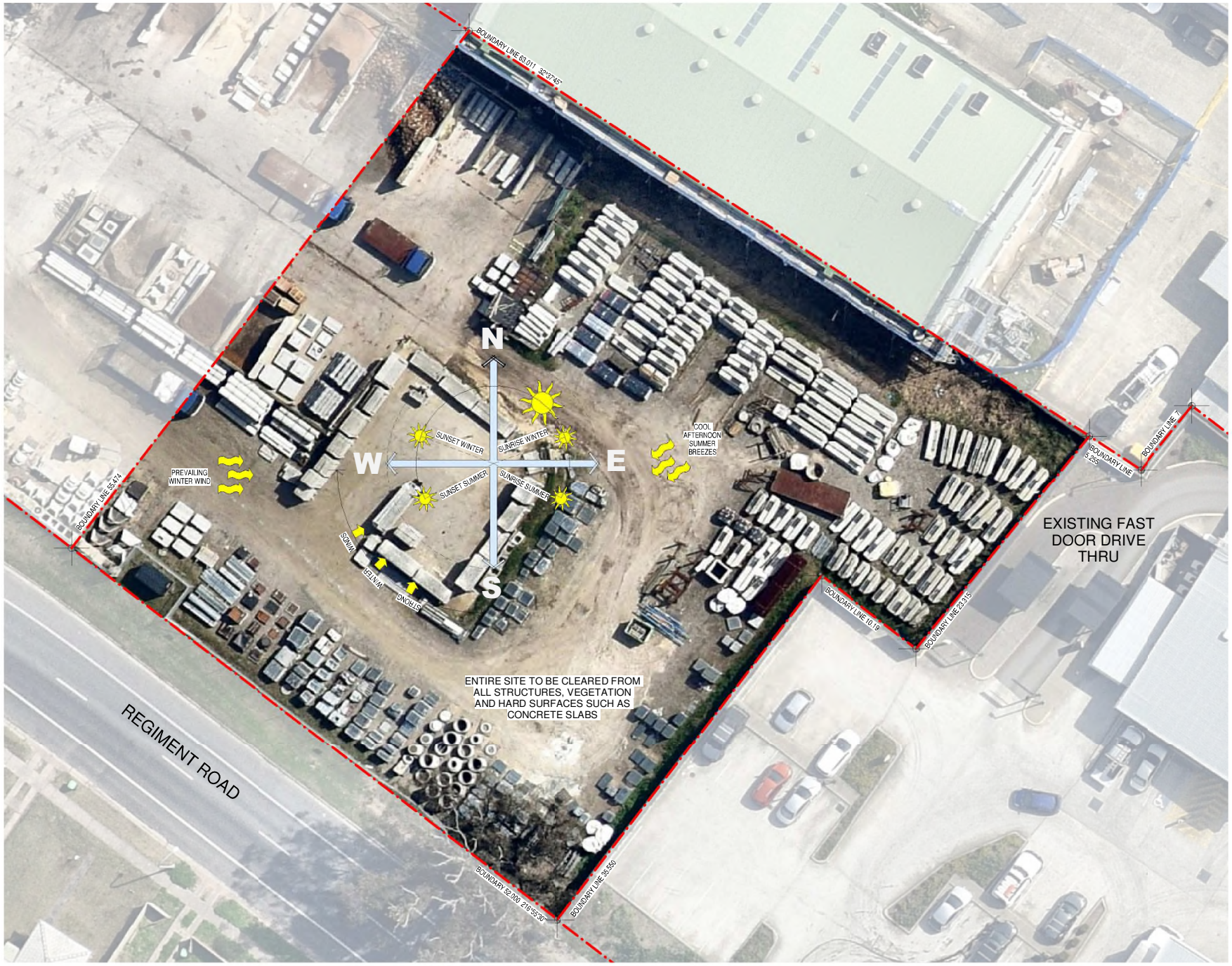
CHILDCARE CENTRE

Location:	
Lot:	700
No:	7
Street:	REGIMENT ROAD
Suburb:	RUTHERFORD
DP:	592547
Scale	1 : 400
Drawn by	B.SIVA
Checked by	B.YOUNG
Sheet Size	A1

Drawing

SUBDIVISION PLAN

Job No:	Issue:	No:
BC0543	2	01



Rev	Description	Date	Issued by
2	DRAFT DA SET	17.10.24	B.SIVA

BROWN COMMERCIAL BUILDING
www.brownbuild.com.au

Client

KOBY GROUP

Project

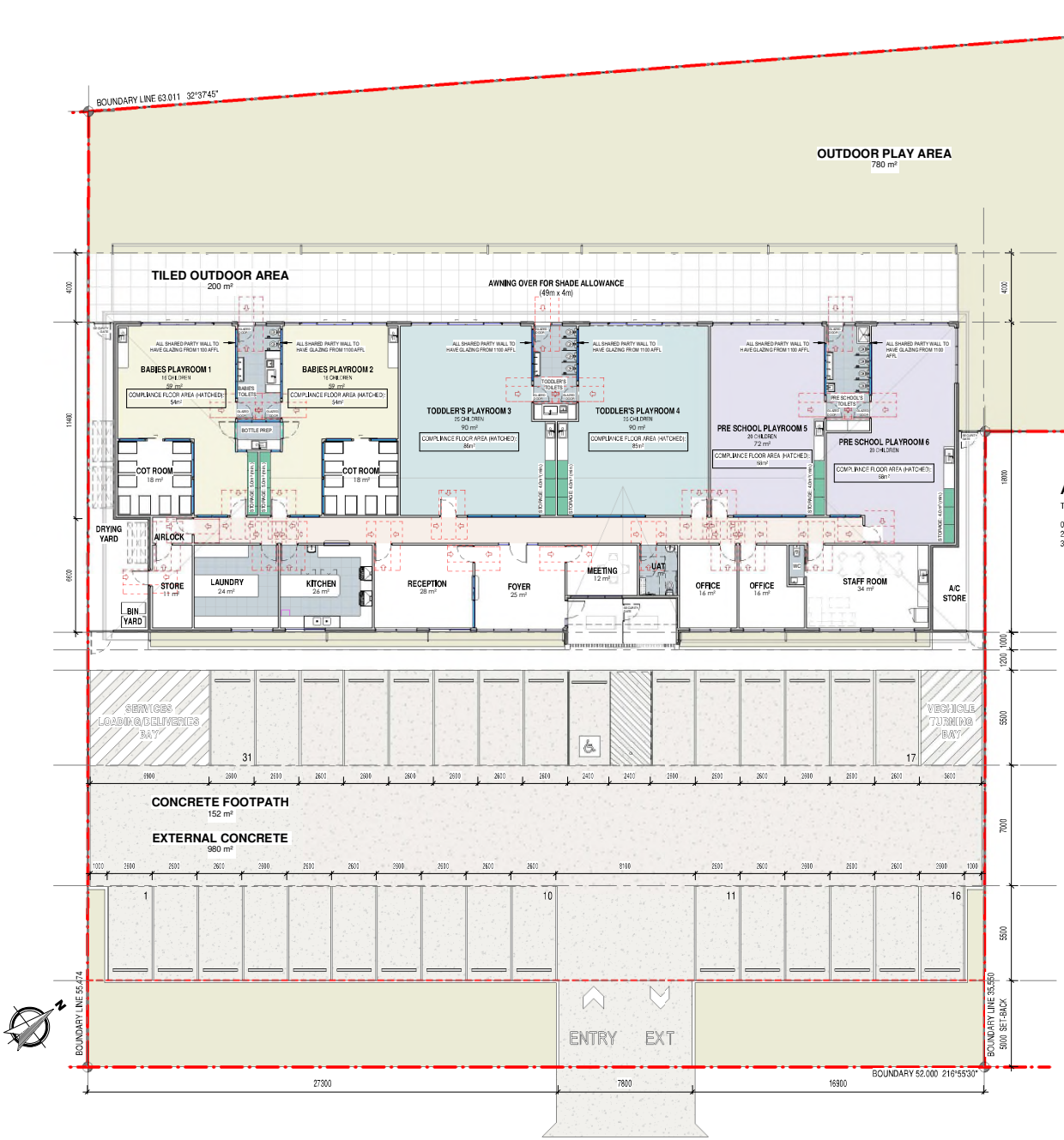
CHILDCARE CENTRE

Location:	
Lot:	700
No:	7
Street:	REGIMENT ROAD
Suburb:	RUTHERFORD
DP:	592547
Scale	As indicated
Drawn by	B.SIVA
Checked by	B.YOUNG
Sheet Size	A1

Drawing

SITE ANALYSIS & DEMOLITION PLAN

Job No:	Issue:	No:
BC0543	2	02



AREA COMPLIANCE SUMMARY

TOTAL NUMBER OF CHILDREN 122

0 - 2 YEARS BABIES 32
2 - 3 YEARS TODDLERS 50
3 - 5 YEARS PRE SCHOOL 40

BABIES 0 - 2 YEARS UNENCUMBERED INDOOR AREA

PLAY ROOM 01	16 CHILDREN	54m²	[52m² REQ]
PLAY ROOM 02	16 CHILDREN	54m²	[52m² REQ]

TODDLERS 2 - 3 YEARS UNENCUMBERED INDOOR AREA

PLAY ROOM 03	25 CHILDREN	86m²	[81.25m² REQ]
PLAY ROOM 04	25 CHILDREN	85m²	[81.25m² REQ]

PRE SCHOOL 3 -5 YEARS UNENCUMBERED INDOOR AREA

PLAY ROOM 05	20 CHILDREN	68m²	[65m² REQ]
PLAY ROOM 06	20 CHILDREN	68m²	[65m² REQ]

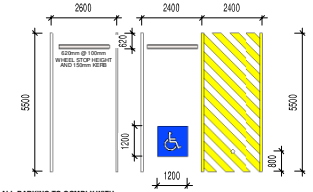
EXTERNAL UNENCUMBERED PLAY AREA

PLAY AREA 122 CHILDREN 980m² [854m² REQ]
INCLUDING 200m² UNDERCOVER PLAY AREA

GROSS BUILDING AREA = 850m²
GROSS FLOOR AREA = 837m²

TOTAL INTERNAL STORAGE 24.4m³
TOTAL EXTERNAL STORAGE 50m²

PARKING DETAILS



ALL PARKING TO COMPLY WITH:
AS/NZ 2890.1:2004 PART 1 OFF-STREET PARKING
AS/NZ 2890.6:2009 PART 6 OFF-STREET PARKING FOR PEOPLE WITH DISABILITIES

Rev	Description	Date	Issued by
2	DRAFT DA SET	17.10.24	B.SIVA
1	PRELIM. DA SET	26.09.24	B.SIVA

BROWN COMMERCIAL BUILDING
www.brownbuild.com.au

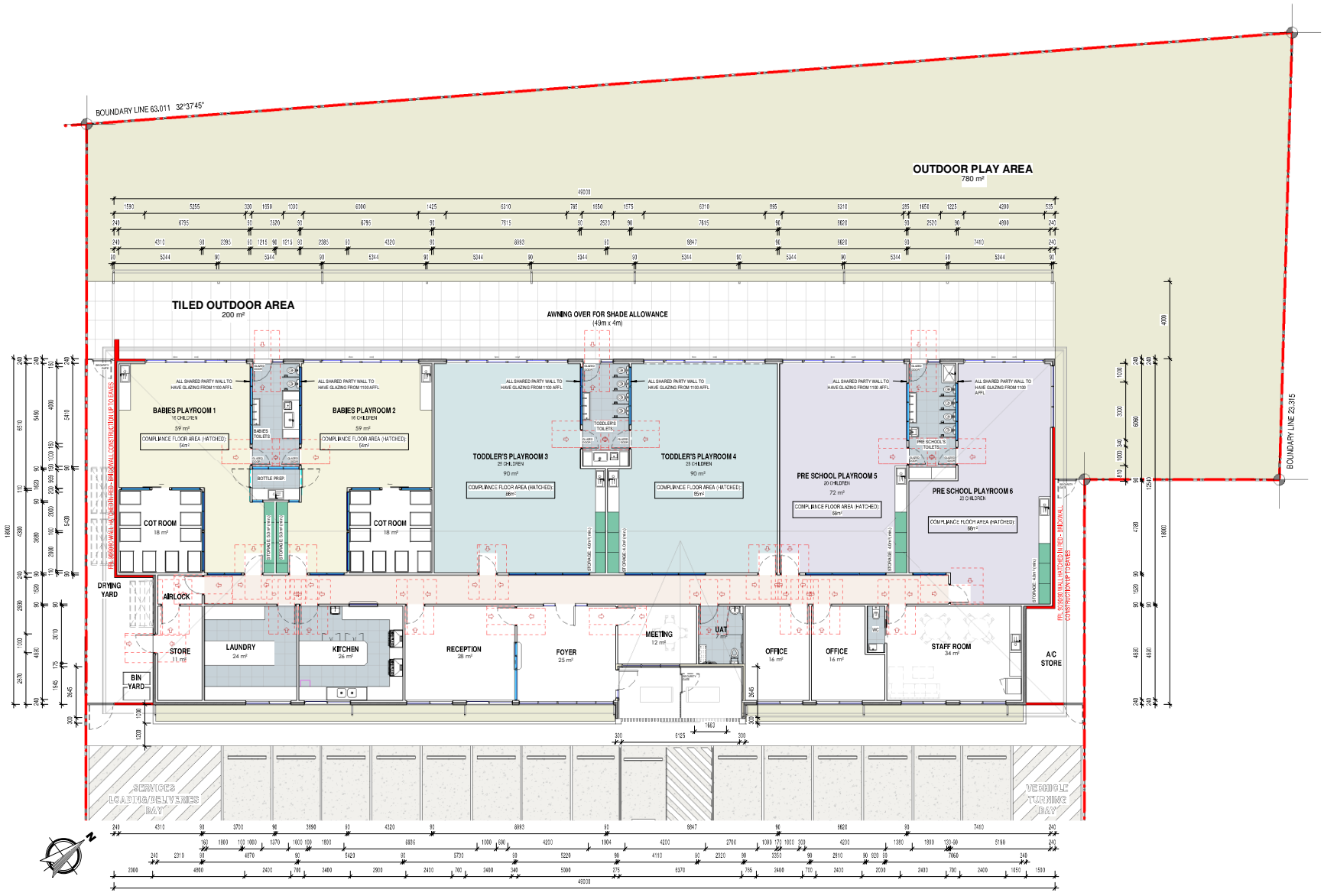
Client
KOBY GROUP

Project
CHILDCARE CENTRE

Location:	
Lot:	700
No:	7
Street:	REGIMENT ROAD
Suburb:	RUTHERFORD
DP:	592547
Scale	As indicated
Drawn by	B.SIVA
Checked by	B.YOUNG
Sheet Size	A1

Drawing
SITE PLAN

Job No:	Issue:	No:
BC0543	2	03



Rev	Description	Date	Issued by
2	DRAFT DA SET	17.10.24	B.SIVA
1	PRELIM. DA SET	26.09.24	B.SIVA

BROWN COMMERCIAL BUILDING
2 Ewart Close Beresfield, NSW 2322
PO Box 576 East Maitland NSW 2323
Ph: (02)49644 0218
www.brownbuild.com.au

Client

KOBY GROUP

Project

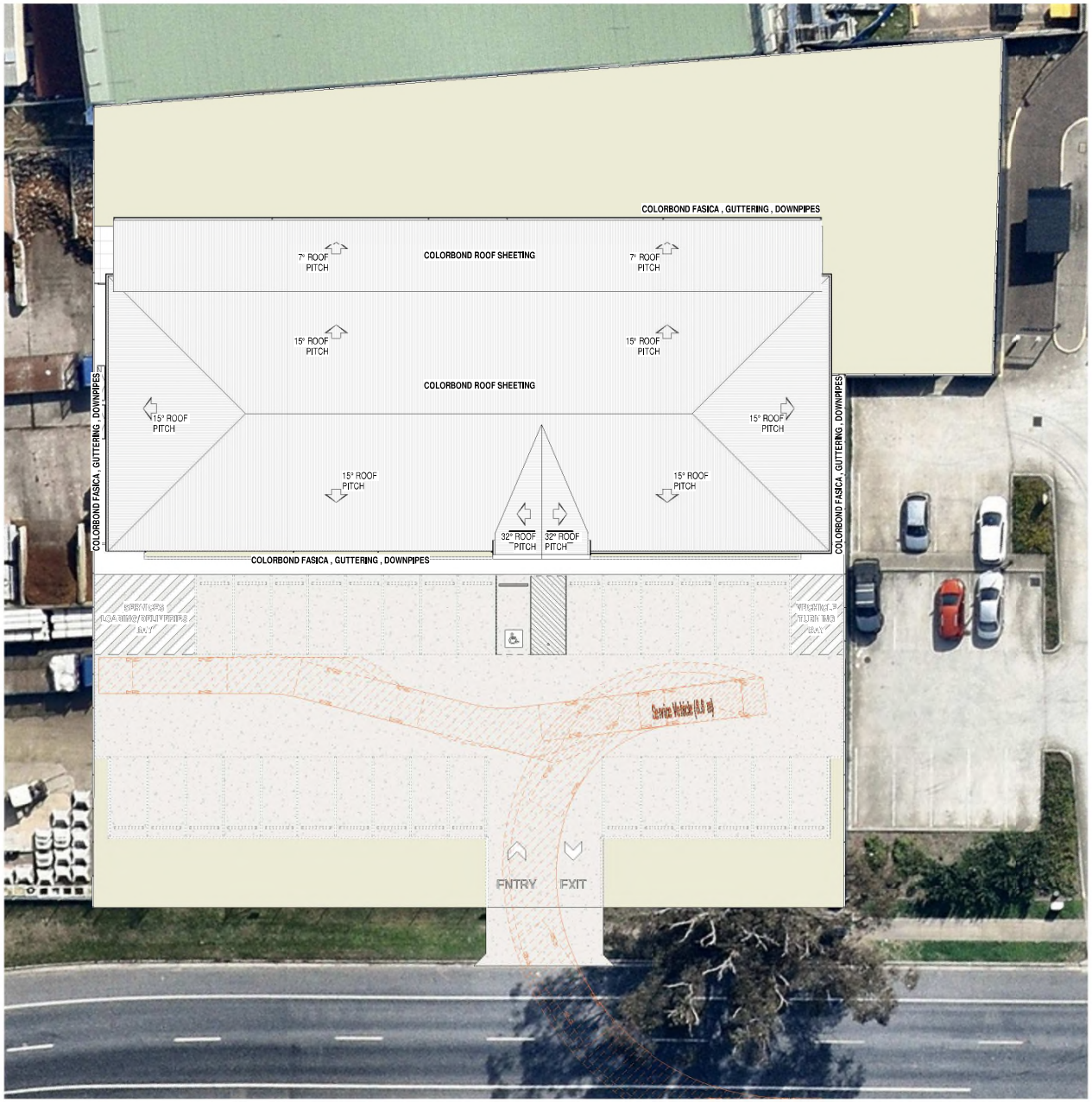
CHILDCARE CENTRE

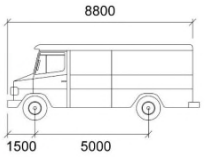
Location:	
Lot:	700
No:	7
Street:	REGIMENT ROAD
Suburb:	RUTHERFORD
DP:	592547
Scale	1 : 100
Drawn by	B.SIVA
Checked by	B.YOUNG
Sheet Size	A1

Drawing

FLOOR PLAN

Job No:	Issue:	No:
BC0543	2	04





SERVICE VEHICLE

Width	: 2500mm
Track	: 2500
Lock to Lock Time	: 6.0
Steering Angle	: 38.7

Rev	Description	Date	Issued by
2	DRAFT DA SET	17.10.24	B.SIVA
1	PRELIM. DA SET	26.09.24	B.SIVA

BROWN COMMERCIAL BUILDING
2 Ewart Close Bonnells, NSW 2320
PO Box 976 East Maitland NSW 2323
Ph: (02)49644 0218
www.brownbuild.com.au

Client

KOBY GROUP

Project

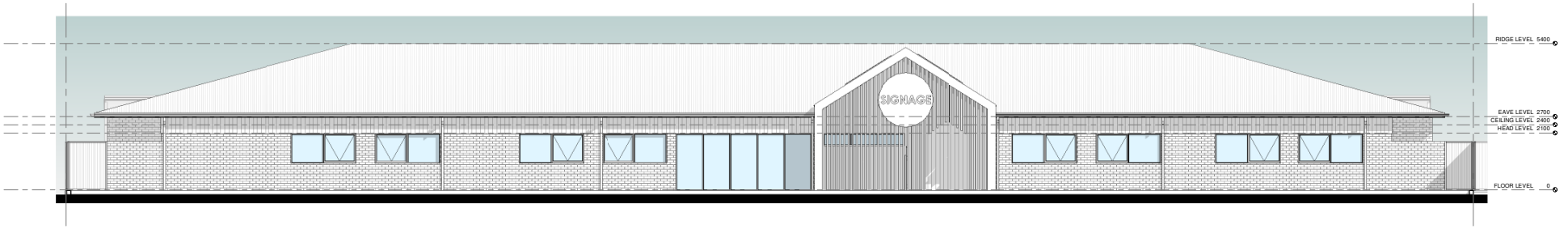
CHILDCARE CENTRE

Location:	
Lot:	700
No:	7
Street:	REGIMENT ROAD
Suburb:	RUTHERFORD
DP:	592547
Scale	1 : 150
Drawn by	B.SIVA
Checked by	B.YOUNG
Sheet Size	A1

Drawing

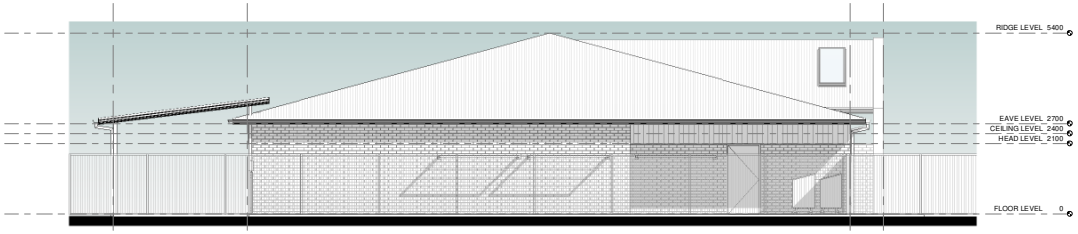
ROOF PLAN & VEHICLE SWEEP PATH

Job No:	Issue:	No:
BC0543	2	05



1 SOUTH EAST Elevation

1 : 75

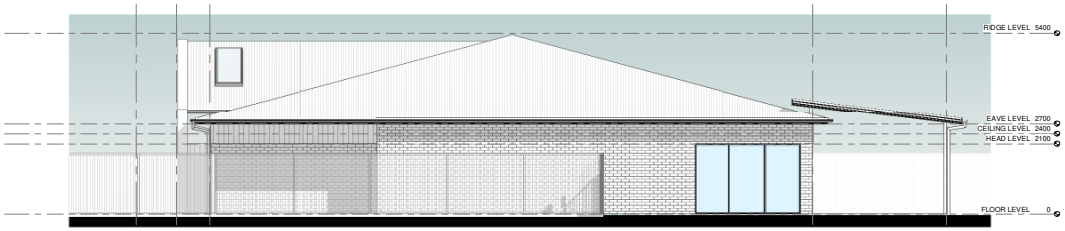


2 SOUTH WEST Elevation

1 : 75

3 NORTH WEST Elevation

1 : 75



4 NORTH EAST Elevation

1 : 75

BROWN COMMERCIAL BUILDING
www.brownbuild.com.au
2 Elwell Close
Beresfield, NSW 2322
PO Box 596
East Maitland NSW 2323
Ph: (02)4966 0218

Rev.	Description	Date	Issued by
1	PRELIM. DA SET	26.09.24	B.SIVA
2	DRAFT DA SET	17.10.24	B.SIVA

0 1 2 4 6m

NOTES:
1. All dimensions, levels, and setouts are to be verified on site prior to fabrication or construction;
2. Written dimensions take precedence over scaled ones

Project: CHILDCARE CENTRE

Sheet Title: ELEVATIONS

Project No: BC0543

Lot: 700 **DP:** 592547 **No:** 7 **Street:** REGIMENT ROAD **Suburb:** RUTHERFORD

Client: KOBY GROUP

Project Status: CONSTRUCTION CERTIFICATE

Scale: 1 : 75 on A1

Revision: 2

DWG No: 07

Appendix C – Noise Monitoring Charts and ABLs Summary

Table C23 Background Noise Monitoring Summary – Location L1

Date	Measured Background Noise Level (LA90) dB ABL[1]			Measured dB LAeq(period)		
	Day	Evening	Night	Day	Evening	Night
Thursday 7 November 2024	--[2]	46	39	--[2]	60	59
Friday 8 November 2024	47	42	33	61	60	55
Saturday 9 November 2024	43	43	33	61	61	56
Sunday 10 November 2024	44	38	32	61	60	56
Monday 11 November 2024	45	47	--[2]	62	61	--[2]
Tuesday 12 November 2024	46	46	31	62	62	56
Wednesday 13 November 2024	46	47	33	63	61	56
Thursday 14 November 2024	45	46	32	61	60	55
Friday 15 November 2024	47	42	31	62	61	54
Saturday 16 November 2024	46	44	31	61	59	65
Sunday 17 November 2024	46	42	33	61	59	56
Monday 18 November 2024	--[2]	--[2]	--[2]	--[2]	--[2]	--[2]
Location1 – RBL / Leq Overall	46	44	33	62	60	58

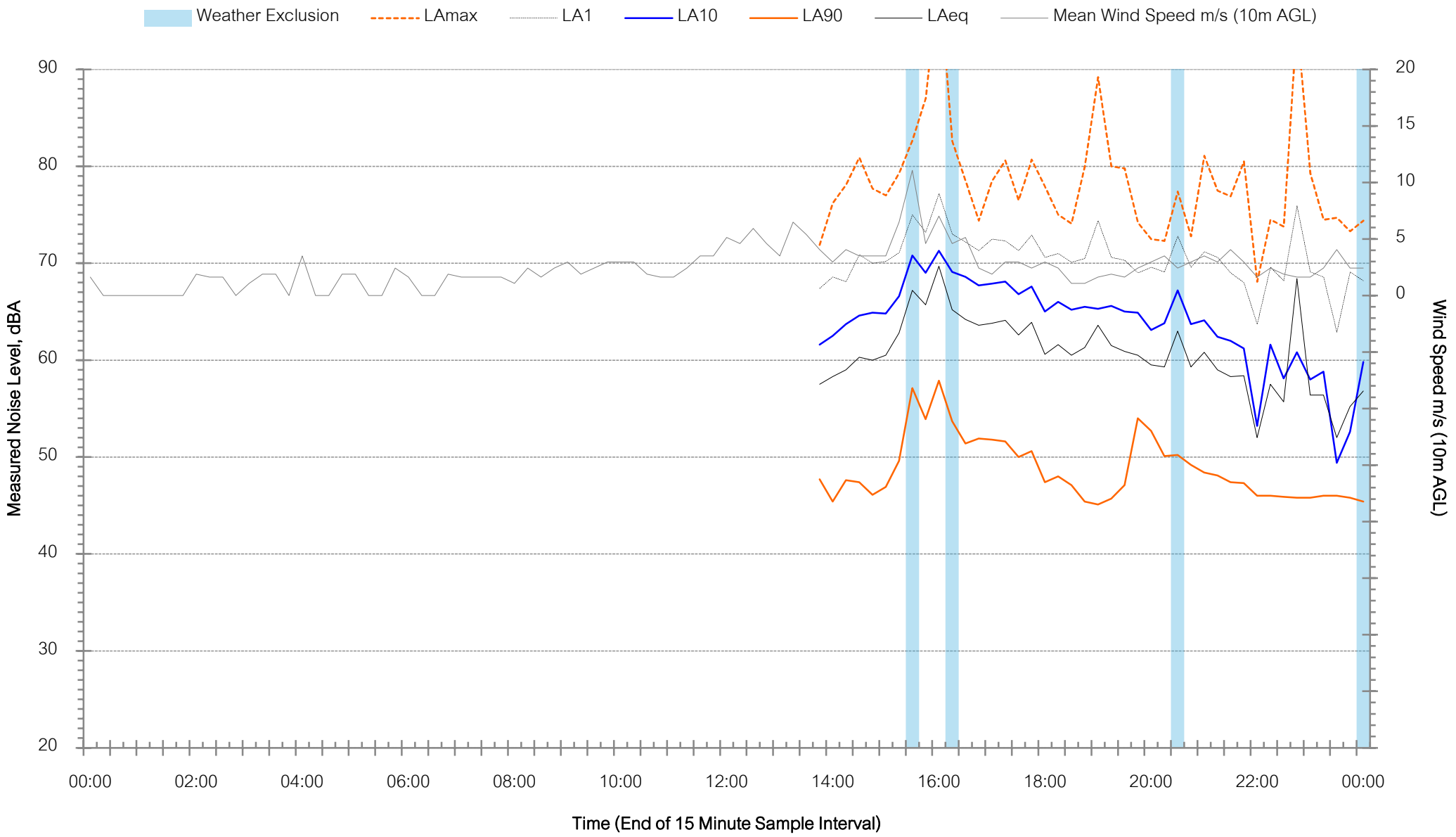
Note 1: Assessment background level (ABL) – the single-figure background level representing each assessment period day, evening and night as per NPI Fact Sheet A.

Note 2: Measurement removed due to adverse weather as per NPI Fact Sheet A.

Note: Day - the period from 7am to 6pm Monday to Saturday or 8am to 6pm on Sundays and public holidays; Evening - the period from 6pm to 10pm; Night - the remaining periods

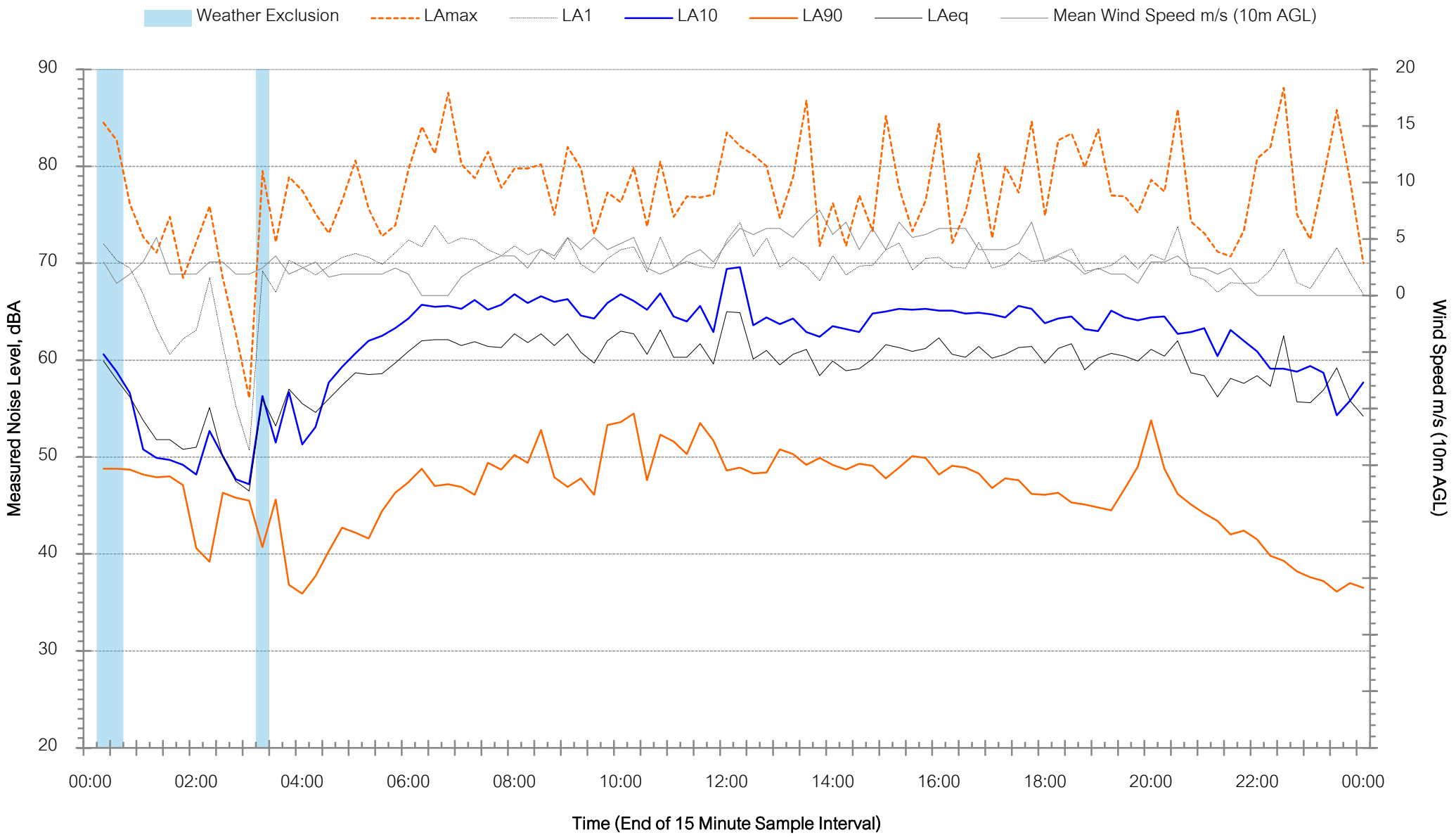
Background Noise Levels

Regiment Road, Rutherford - Thursday 7 November 2024



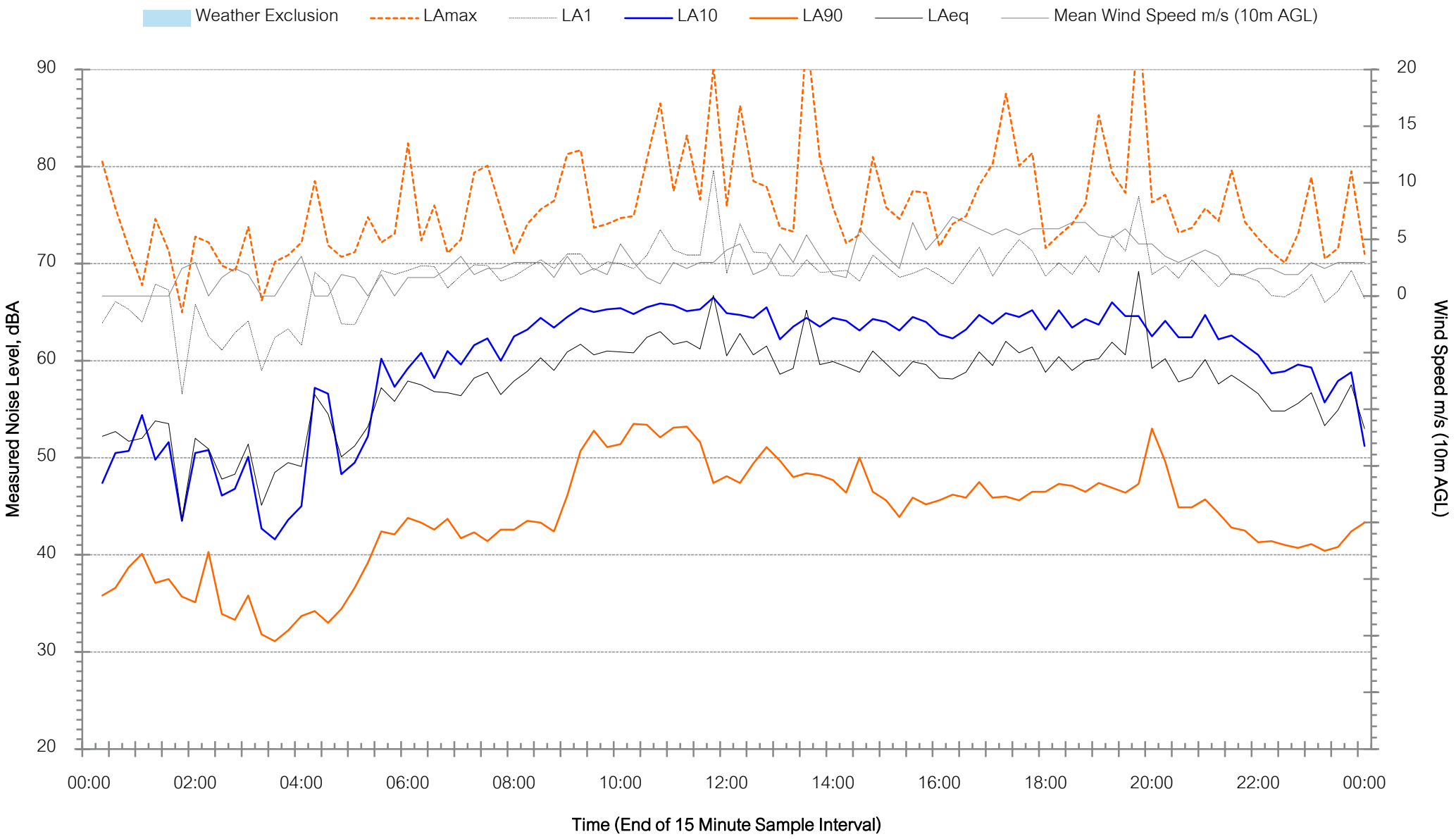
Background Noise Levels

Regiment Road, Rutherford - Friday 8 November 2024



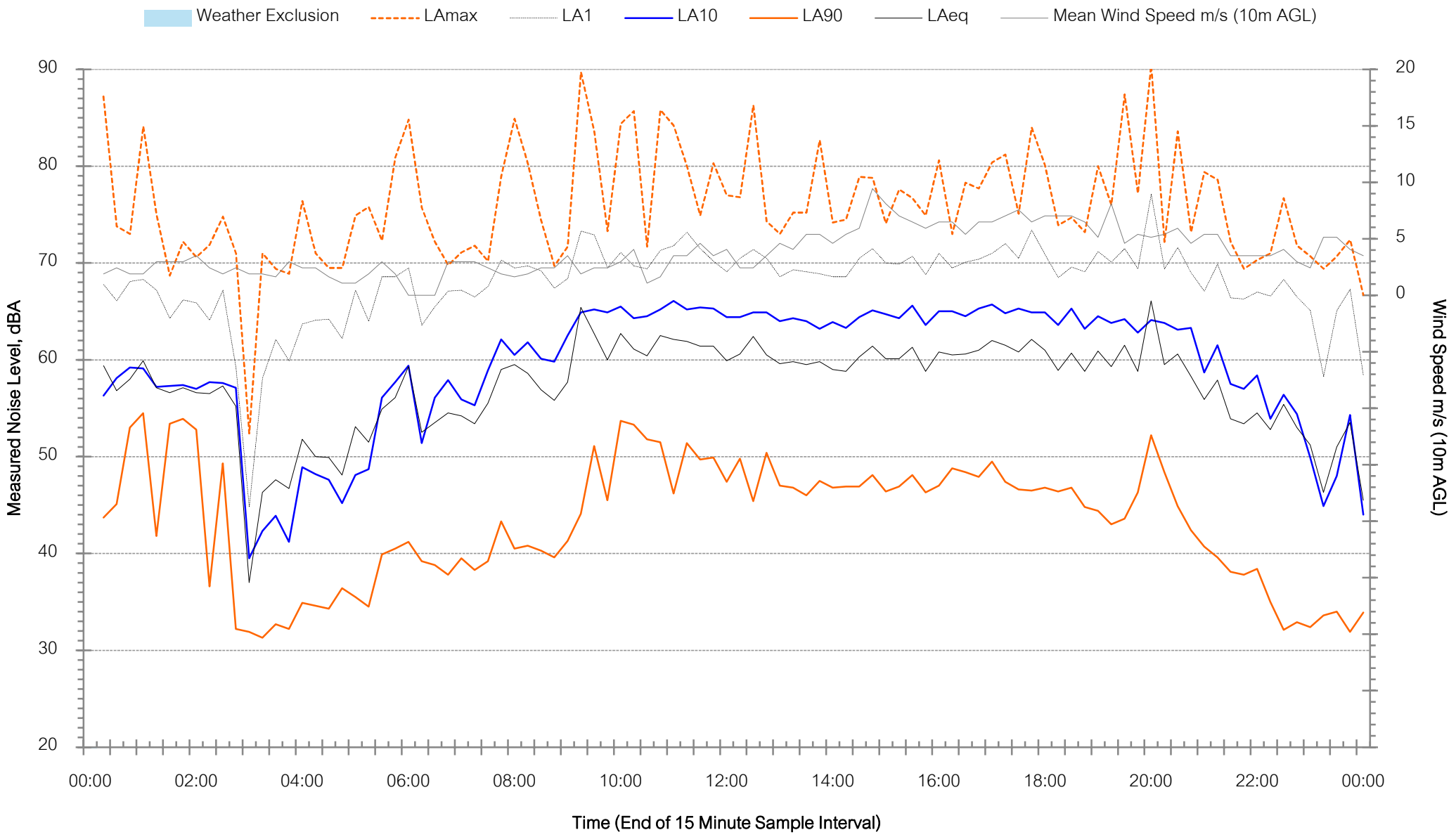
Background Noise Levels

Regiment Road, Rutherford - Saturday 9 November 2024



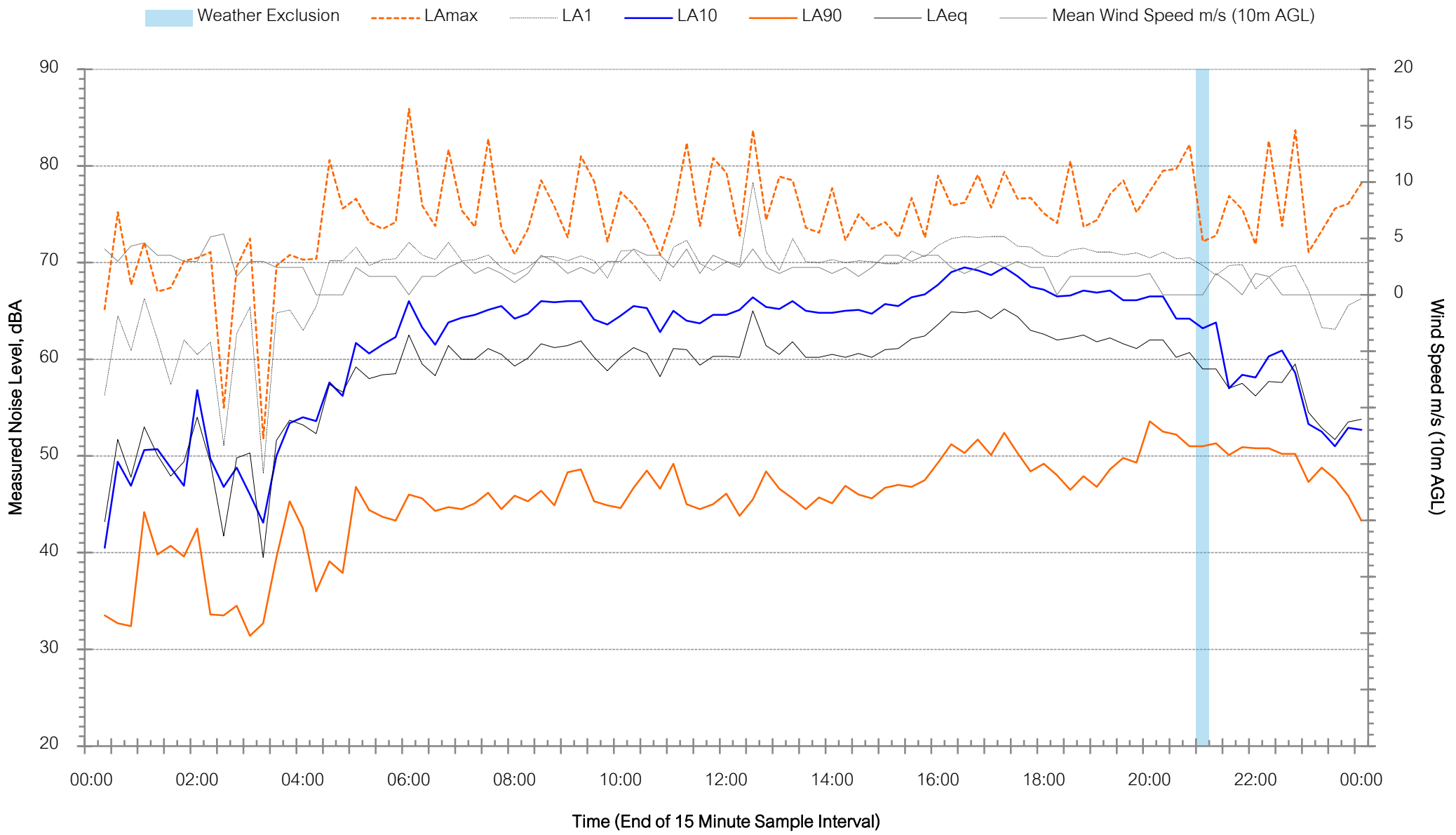
Background Noise Levels

Regiment Road, Rutherford - Sunday 10 November 2024



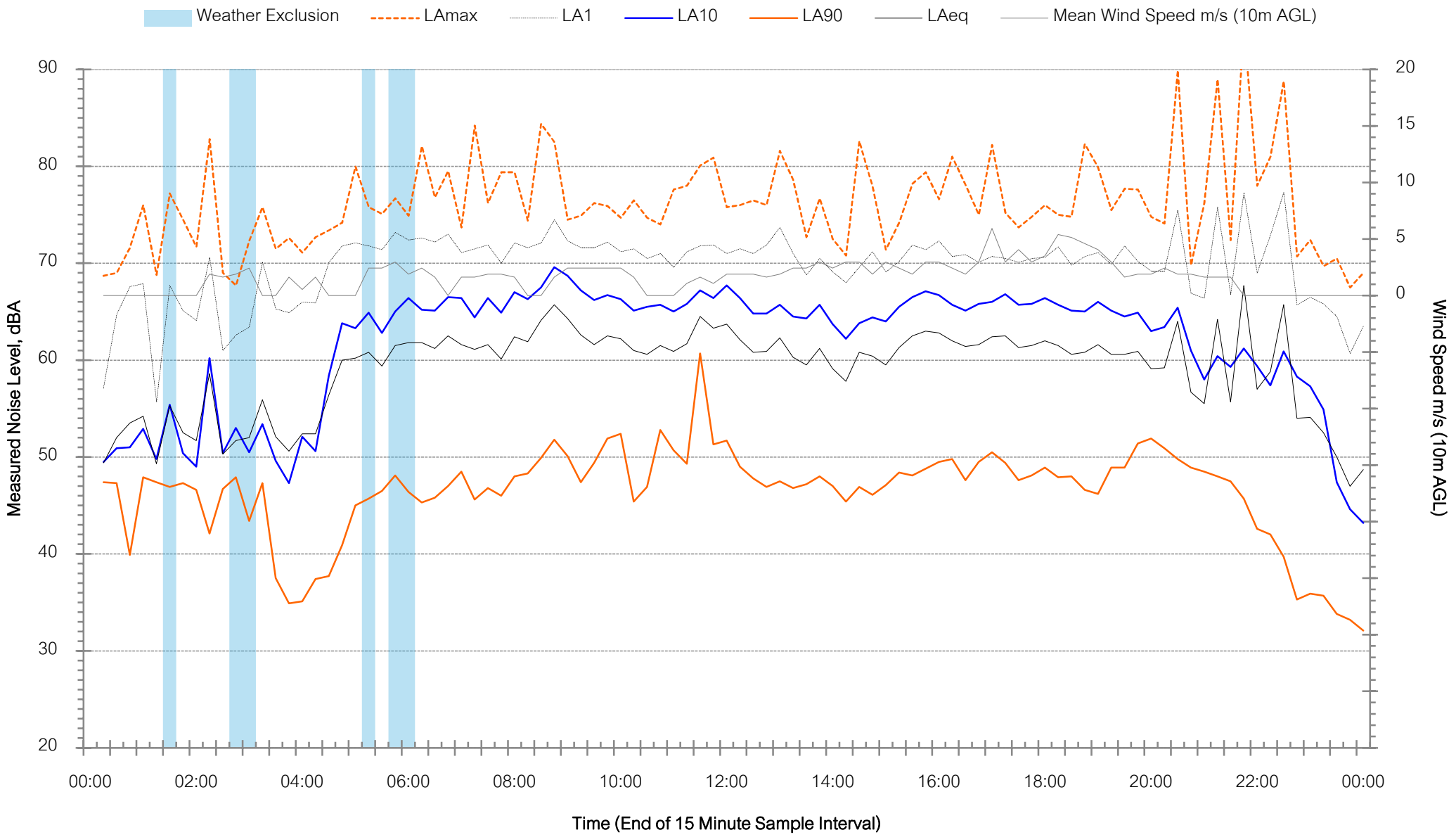
Background Noise Levels

Regiment Road, Rutherford - Monday 11 November 2024



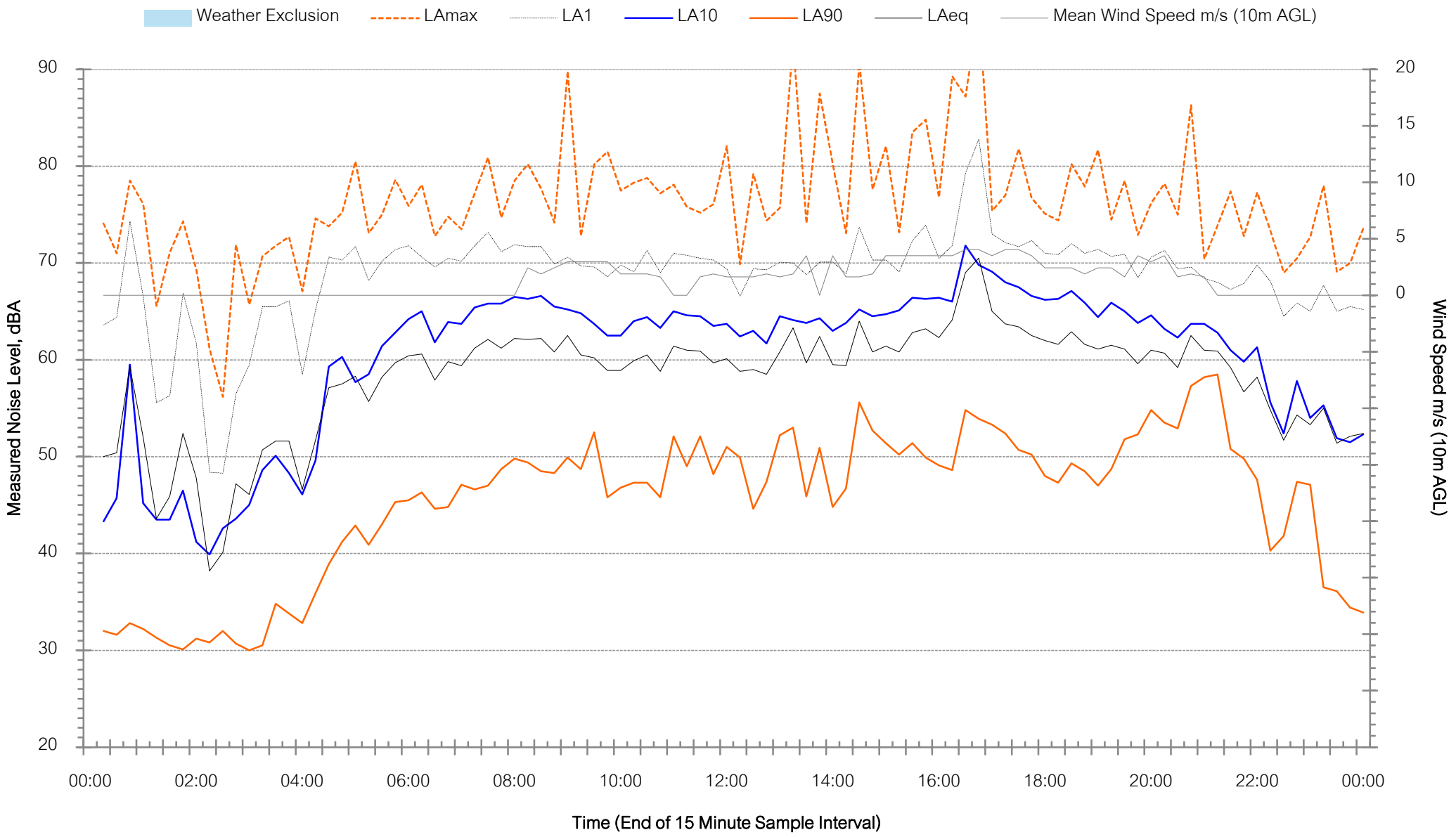
Background Noise Levels

Regiment Road, Rutherford - Tuesday 12 November 2024



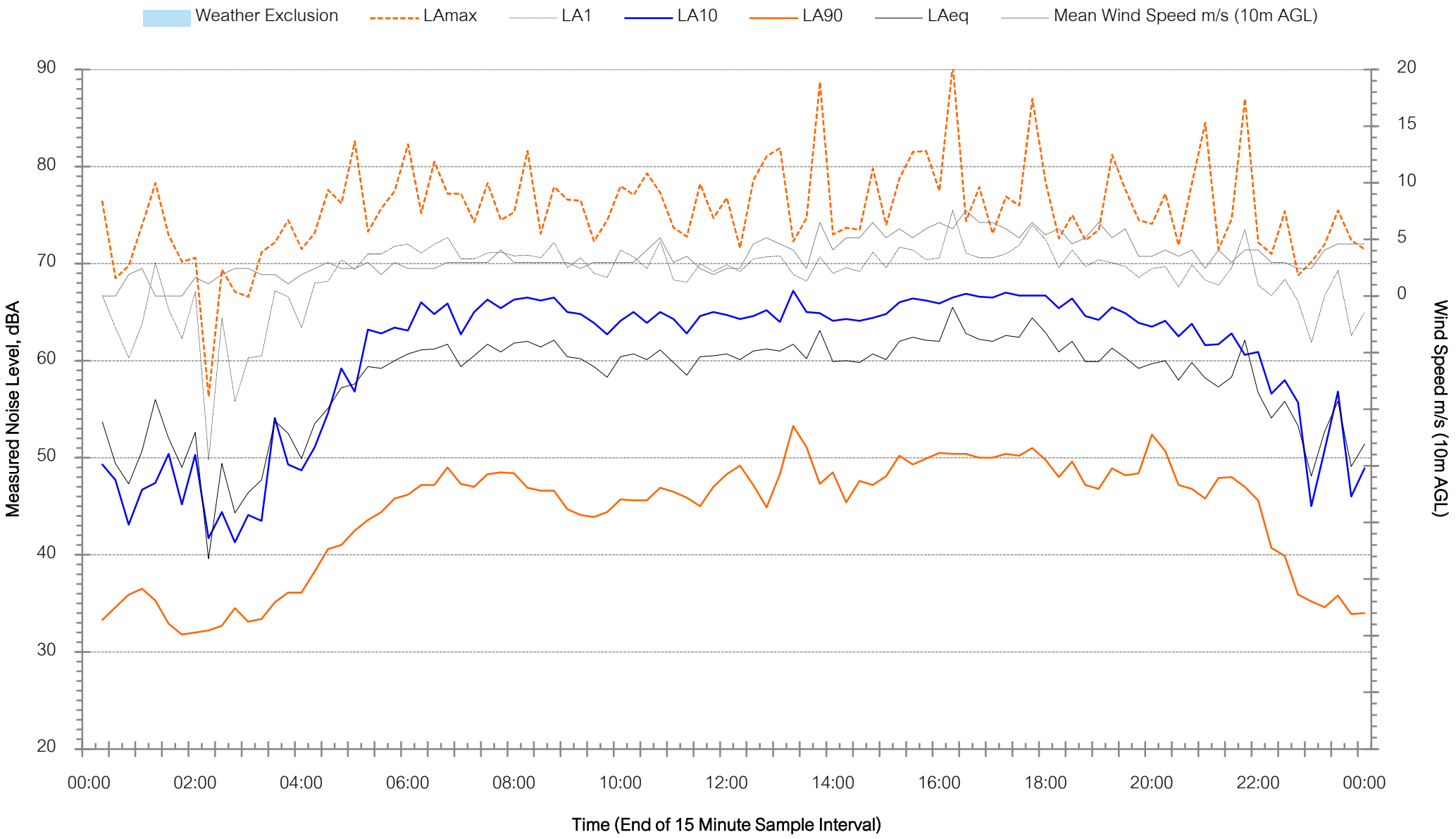
Background Noise Levels

Regiment Road, Rutherford - Wednesday 13 November 2024



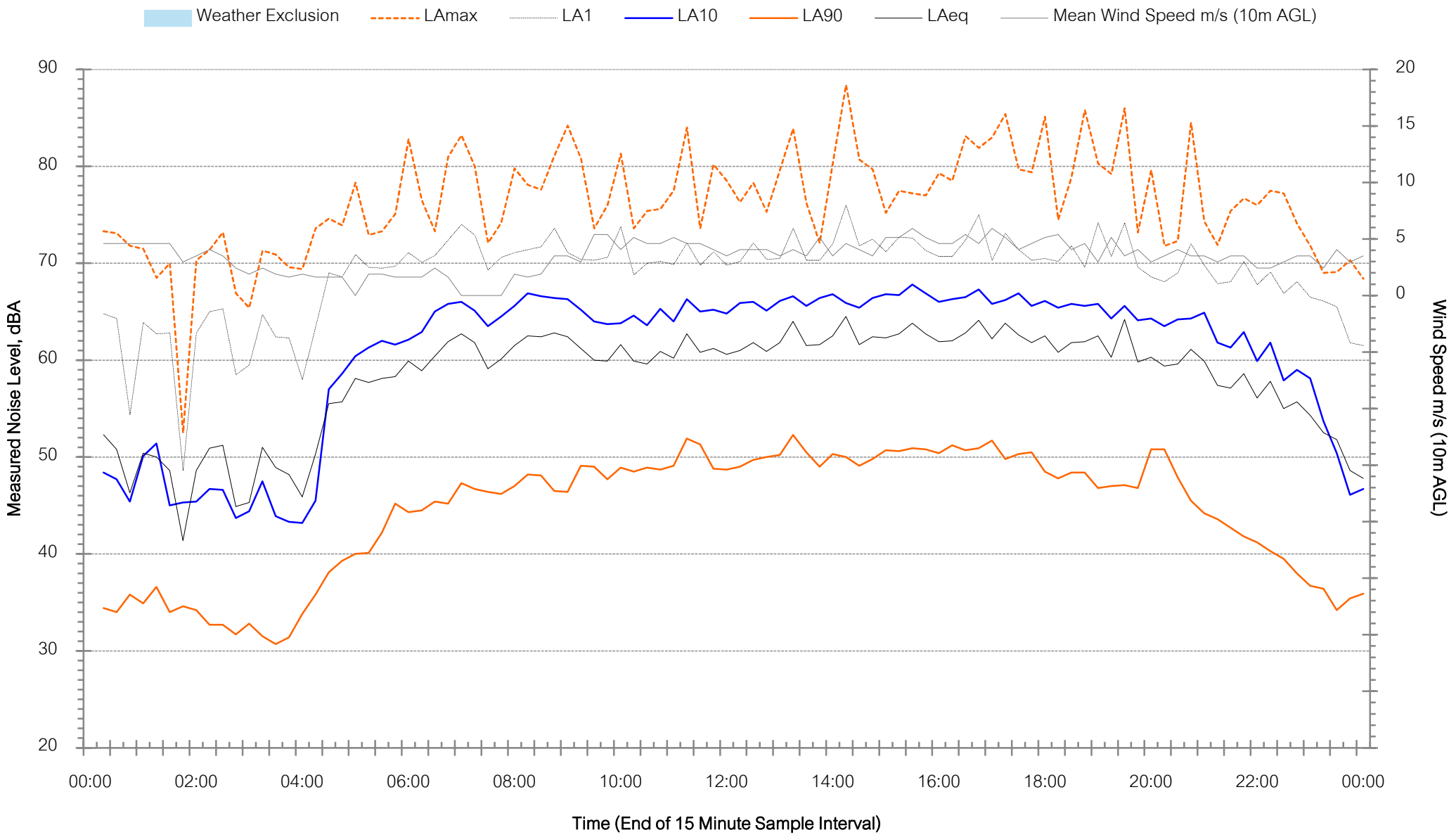
Background Noise Levels

Regiment Road, Rutherford - Thursday 14 November 2024



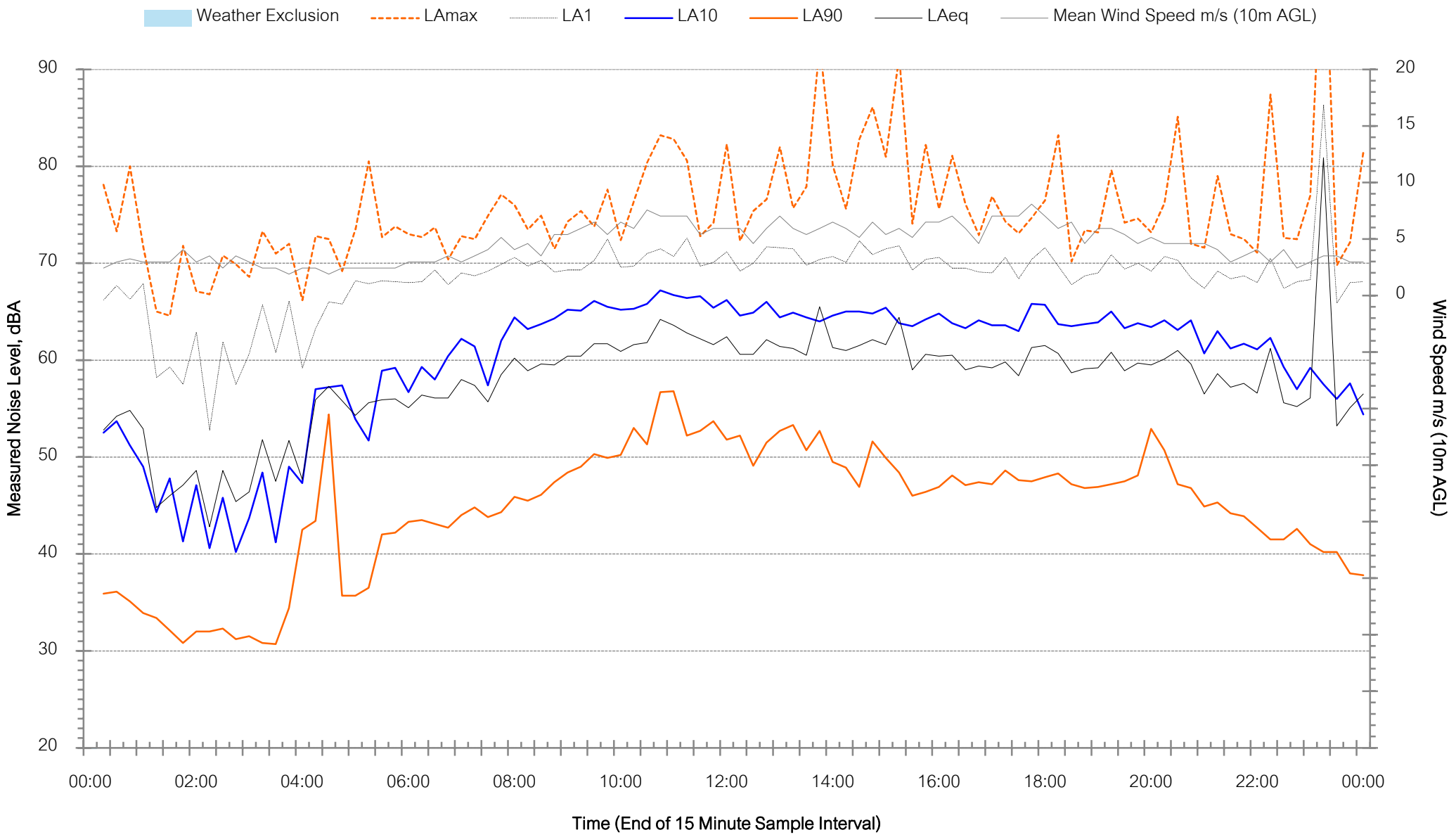
Background Noise Levels

Regiment Road, Rutherford - Friday 15 November 2024



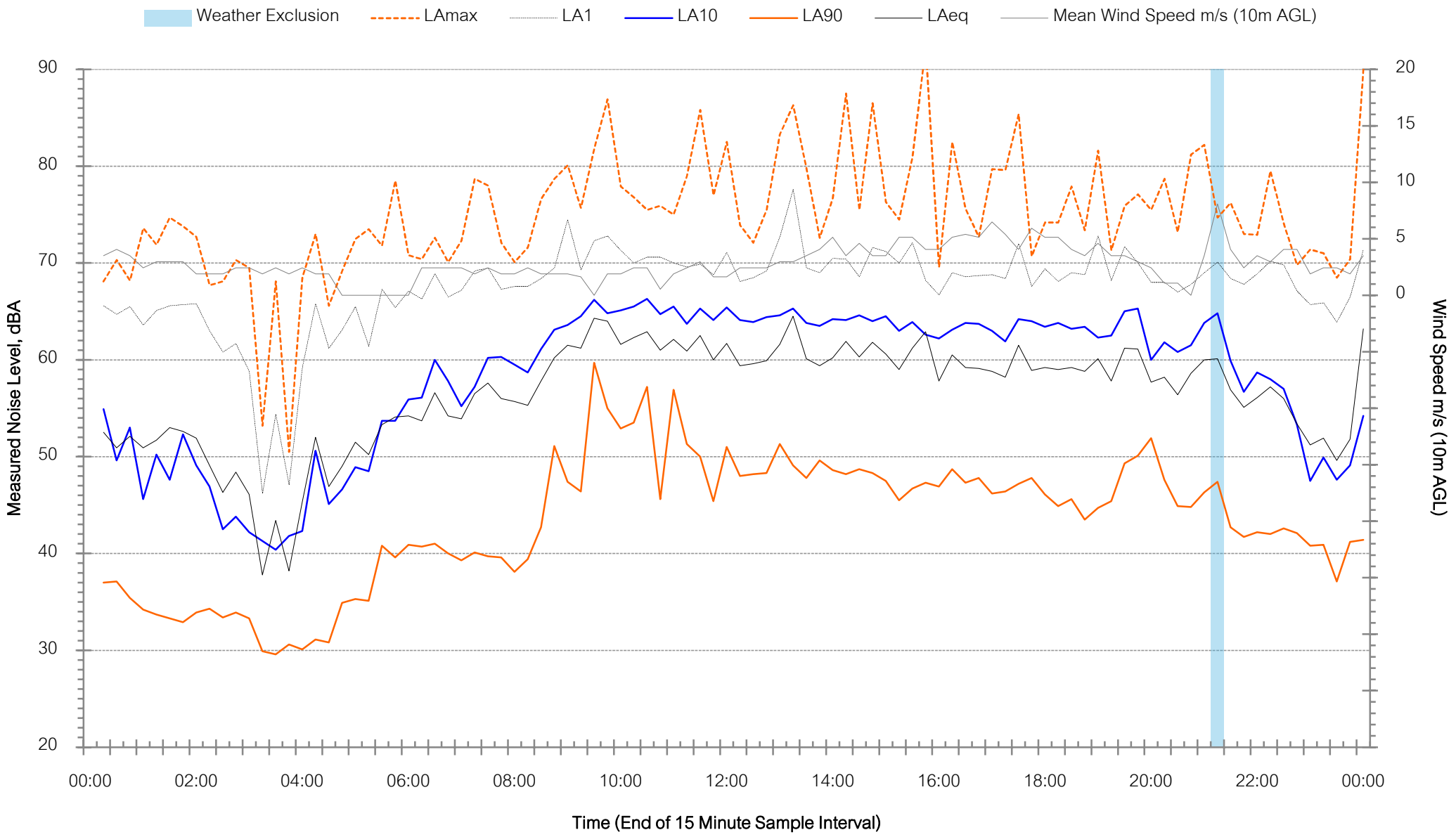
Background Noise Levels

Regiment Road, Rutherford - Saturday 16 November 2024



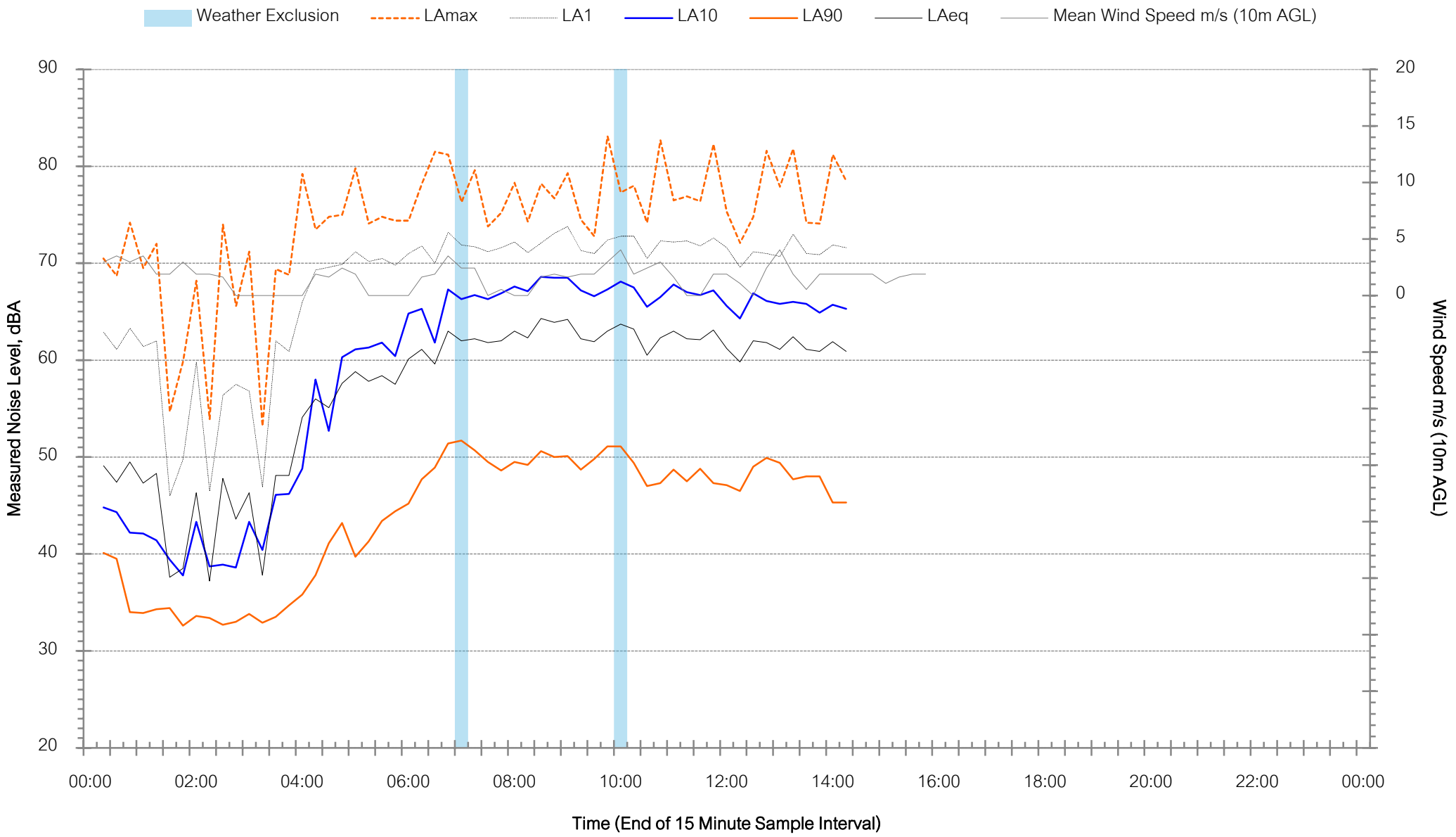
Background Noise Levels

Regiment Road, Rutherford - Sunday 17 November 2024



Background Noise Levels

Regiment Road, Rutherford - Monday 18 November 2024



Appendix D – Determination of Receiver Category

Table D23 - Determination of NPI Residential Receiver Category

Location/ Catchment	Period	Measured RBL dB $LA_{90(period)}$	Land Use Zone: Rural (RU1, RU2, RU4, R5, E4)	Land Use Zone: Suburban (RU5, RU6, R2, R3, R4, E2, E3)	Land Use Zone: Urban (R1, R4, B1, B2, B4)	Land Use Zone: Commercial, Industrial (Others)	Typical Existing Background Noise Levels Table 2.3 NPI: RURAL Daytime <40 Eve <35 Night <30	Typical Existing Background Noise Levels Table 2.3 NPI: SUBURBAN Daytime <45 Eve <40 Night <35	Typical Existing Background Noise Levels Table 2.3 NPI: URBAN Daytime >45 Eve >40 Night >35	Rural Residential - an area with an acoustical environment that: is dominated by natural sounds.	Rural Residential: having little or no road traffic noise	Rural Residential: generally characterised by low background noise levels.	Rural Residential: Settlement patterns would be typically sparse	Suburban Residential - an area that has: local traffic with characteristically intermittent traffic flows	Suburban Residential: or with some limited commerce or industry.	Suburban Residential: evening ambient noise levels defined by the natural environment and human activity.	Urban Residential- an area with an acoustical environment that: is dominated by 'urban hum' or industrial source noise	Urban Residential: has through-traffic with characteristically heavy and continuous traffic flows during peak . .	Urban Residential: is near commercial districts or industrial districts	Urban Residential: has any combination of the above
Location 1	Day	46				✓			✓									✓	✓	
	Evening	44				✓			✓									✓	✓	
	Night	33				✓		✓										✓	✓	

where urban hum means the aggregate sound of many unidentifiable, mostly traffic and/or industrial related sound sources

Assessment

Location	Rural	Suburban	Urban	Rural - RBL	Suburban - RBL	Urban - RBL	Rural - Description				Suburban - Description			Urban - Description			
Location 1	0	1	**8**	0	1	2	0	0	0	0	0	0	0	0	3	3	0

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MAC
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