Noise Assessment

Proposed Childcare Centre
27 Steam Street
Maitland, NSW

Prepared for: Brown Commercial Building Pty Ltd
May 2025
MAC242284-01RP1

Muller Acoustic Consulting

Document Information

Noise Assessment

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Maitland, 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 27 Steam Street, Maitland, 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 27 Steam Street, Maitland, NSW, with the area surrounding the project a mix of commercial and residential land uses. The site is bound to the north by Steam Street and to the west and south by Allan Walsh Drive. The nearest residential receivers are located to the east of the project site with additional residential receivers located to the north across Steam Street.

The ambient noise environment surrounding the project site is dominated by distant traffic noise from the nearby New England Highway, from passing rail traffic, and wildlife noise.

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

- two baby rooms accommodating up to 32 babies;
- three toddler rooms accommodating up to 35 toddlers;
- two preschool rooms accommodating up to 40 preschool children;
- outdoor play area;
- admin offices and staff rooms;
- water closets with amenities; and
- associated basement 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	364228	6377015
R02	Residential	1.5m	364271	6377005
R03	Residential	1.5/4.5m	364294	6377021
R04	Residential	1.5/4.5m	364297	6376977

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	364247	6376972
Outdoor Play Area 02	External Play Area	1.5m	364257	6376971
Outdoor Play Area 03	External Play Area	1.5m	364242	6376982
Outdoor Play Area 04	External Play Area	1.5m	364258	6376979
Outdoor Play Area 05	External Play Area	1.5m	364273	6376977
Room 01	Internal Play Area	1.5m	364257	6376985
Room 02	Internal Play Area	1.5m	364270	6376983
Room 03	Internal Play Area	1.5m	364277	6376982
Room 04	Internal Play Area	1.5m	364279	6376976
Room 05	Internal Play Area	1.5m	364278	6376970
Room 06	Internal Play Area	1.5m	364268	6376969

FIGURE 1

Locality Plan

MAC242284-01

Steam Street, Maitland, NSW

KEY

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

0 4 8 12 16 20 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 Section 4.1.

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.

3.1.5 Maximum Noise Assessment Trigger Levels

The potential for sleep disturbance from maximum noise level events from a project during the night-time period needs to be considered. The NPI considers sleep disturbance to be both awakenings and disturbance to sleep stages.

Where night-time noise levels from a development/premises at a residential location exceed the following criteria, a detailed maximum noise level event assessment should be undertaken:

- $L_{Aeq(15min)}$ 40dB or the prevailing RBL plus 5dBA, whichever is the greater, and/or
- L_{Amax} 52dB or the prevailing RBL plus 15dBA, whichever is the greater.

A detailed assessment should cover the maximum noise level, the extent to which the maximum noise level exceeds the rating background noise level, and the number of times this happens during the night-time period.

Other factors that may be important in assessing the impacts on sleep disturbance include:

- how often the events would occur;
- the distribution of likely events across the night-time period and the existing ambient maximum events in the absence of the 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 understanding of effects of maximum noise level events at night.

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 in unlikely to awaken internal occupants. This level has been adopted to assess the impact of maximum noise events on occupant of commercial residential land uses to safeguard against sleep disturbance. The recommended Amenity Noise Level for the night period will be adopted for awakening assessment for these receivers.

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.

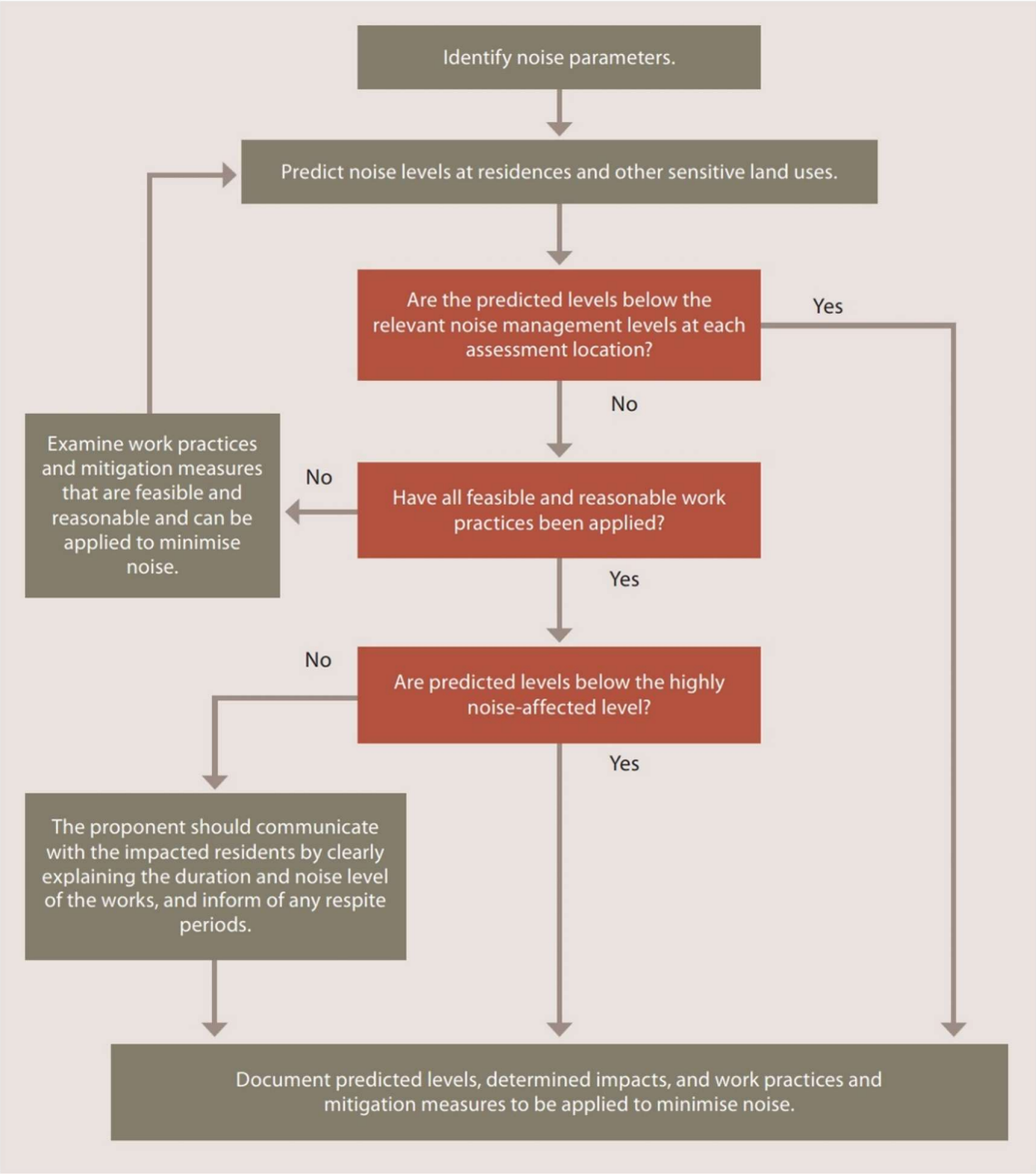
3.3 Interim Construction Noise Guideline

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.

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 Tuesday 3 December 2024 to Thursday 12 December 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	44	60
	Day	48	61
	Evening	44	59
	Night	33	57

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 Tuesday 3 December 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}		
03/12/2024 10:56	73	58	51	WD: NW WS: 0.5m/s Rain: Nil	Traffic 40-73 Birds 45-53 Insects were 40-46

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	44	44	49
		Day	48	48	53
		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	5

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 $LA_{eq(15min)}$[5]
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	42[4]	45

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: $LA_{eq,period}$ (traffic) as per section 2.4.1 of the NPI (i.e. existing $LA_{eq\ Traffic}$ -15dB).

Note 5: 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	49	N/A[2]	49
		Day	53	58	53
		Evening	49	48	48
		Night	38	45	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, 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)	53dB LAeq(15min)
	Morning Shoulder (6:00am-7:00am)	All Other Activities	49dB LAeq(15min)
	Day (7:00am-6:00pm)		53dB LAeq(15min)
	Morning Shoulder (6:00am-7:00am)	Staff Arrival	59dB LAmax

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 LA_{90}	NML dB $LA_{eq(15min)}$
Residential	Standard Hours	48	58 (RBL+10dBA)

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

6 Modelling Methodology

A computer model was developed to quantify project noise emissions to neighbouring receivers using DGMR (iNoise, Version 2024.3) 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.

[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

6.1 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 surrounding the boundary of project playground (see Figure 3). The barriers should be constructed to an RL of 2.0m 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 seven AC units. The AC units are assumed to be located in the basement area of the building (see Figure 3).

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 (x7)	76	84	1.4m
Rooftop extraction fan (x5)	73	80	0.5m
Car idle, start up and drive off (x15)[2]	81	84	0.5m
Car enters and exiting car park (15 cars per 15min)	81	84	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 (x35)	75	91	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	102		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.

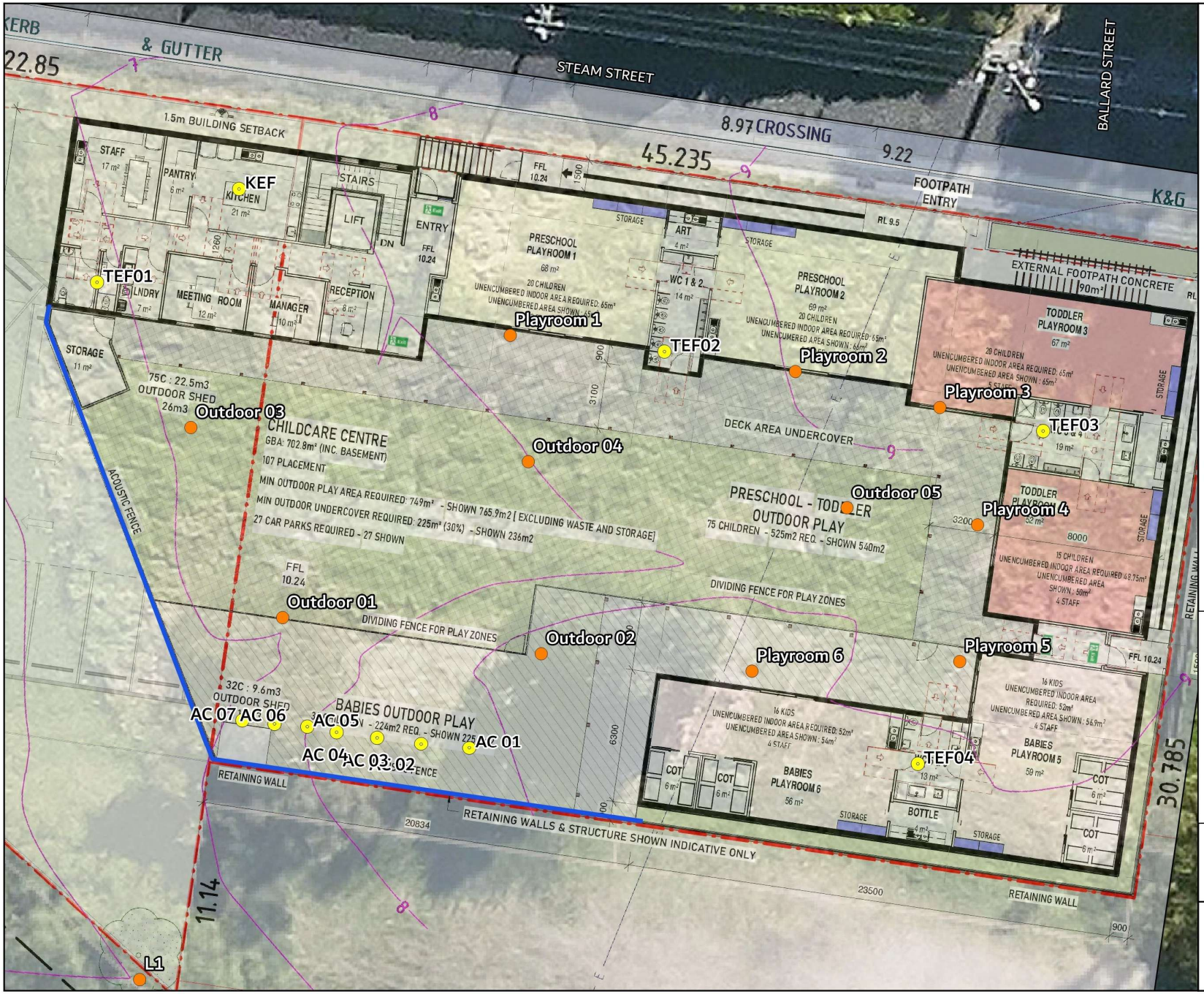


FIGURE 3

Barrier and Plant Plan

MAC242284-01

Steam Street, Maitland, NSW

KEY

- Receiver
- Mechanical Plant Location
- Playgorund 2.0m
- Acoustic Barrier

0 2 4 6 8 10 m

N

MAC Muller Acoustic Consulting

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 $L_{Aeq(15min)}$		PNTL dB $L_{Aeq(15min)}$		Compliant
	Morning Shoulder	Day	Morning Shoulder	Day	
R01	44	44	49	53	✓
R02	38	38	49	53	✓
R03	35	35	49	53	✓
R04	35	35	49	53	✓

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	Morning Shoulder	Day	
R01	49	49	51	60	✓
R02	42	42	51	60	✓
R03	39	39	51	60	✓
R04	39	39	51	60	✓

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 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 dB $LA_{eq(1hr)}$	Compliant
	Traffic Noise Levels		
Outdoor Play Area 1	55	55	✓
Outdoor Play Area 2	55	55	✓
Outdoor Play Area 3	55	55	✓
Outdoor Play Area 4	54	55	✓
Outdoor Play Area 5	49	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 20dB loss for the installed windows closed. Where windows are closed, the fresh air requirements outlined in the Building Code of Australia should be taken into consideration.

Table 19 Internal Cumulative Noise Results

Receiver	Predicted noise level dB $LA_{eq(1hr)}$		Internal Criteria dB $LA_{eq(1hr)}$	Compliant
	Traffic Noise Levels	Internal		
Room 01	53	<35	40	✓
Room 02	52	<35	40	✓
Room 03	50	<35	40	✓
Room 04	47	<35	40	✓
Room 05	43	<35	40	✓
Room 06	40	<35	40	✓

7.2.3 Noise Emission Results – Outdoor play

Table 20 presents the noise emission results for children at play ($L_{Aeq(15min)}$) 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 LAeq(15min)	Emission Criteria dB LAeq(15min)	Compliant
	Day	Day	
R01	42	53	✓
R02	42	53	✓
R03	39	53	✓
R04	42	53	✓

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 a waste collection impact 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
	Waste Collection Impact	Door Slam Northernmost Car Space	Entry Door Slam	Playground Door Slam		
R1	63	47	<35	<35	59	65
R2	57	41	<35	<35	59	65
R3	52	38	<35	<35	59	65
R4	37	<35	51	36	59	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 collections have the potential to be above the Maximum Noise Trigger Levels at one assessed receiver during the morning shoulder. Therefore, in accordance with Section 2.5 of the NPI, a detailed sleep disturbance assessment has been undertaken

.

7.2.5 Detailed Maximum Level 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 impacts for the project site, they will occur once in a 24 hour period and are proposed to be undertaken during either the day or morning shoulder 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 delivery impacts.

Accordingly, due to the low occurrence of the delivery impact 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.

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 $LA_{eq(15min)}$	Management Level dB $LA_{eq(15min)}$
R01	Day	56	58
R02	Day	57	58
R03	Day	52	58
R04	Day	54	58

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 27 Steam Street, Maitland, 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 surrounding the boundary of project playground (see Figure 3). The barriers should be constructed to an RL of 2.0m 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 seven AC units. The AC units are assumed to be located in the basement area 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 impacts may have the potential to be above the maximum noise trigger levels during the morning shoulder. However, a detailed maximum noise 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

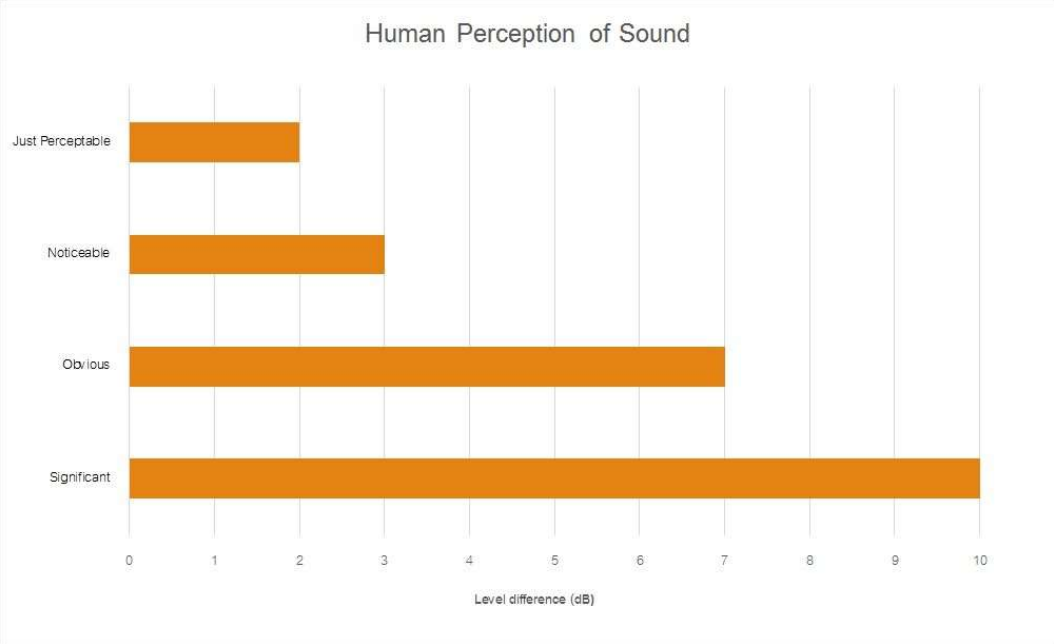
Term	Description
1/3 Octave	Single octave bands divided into three parts
Octave	A division of the frequency range into bands, the upper frequency limit of each band being twice the lower frequency limit.
ABL	Assessment Background Level (ABL) is defined in the NPI as a single figure background level for 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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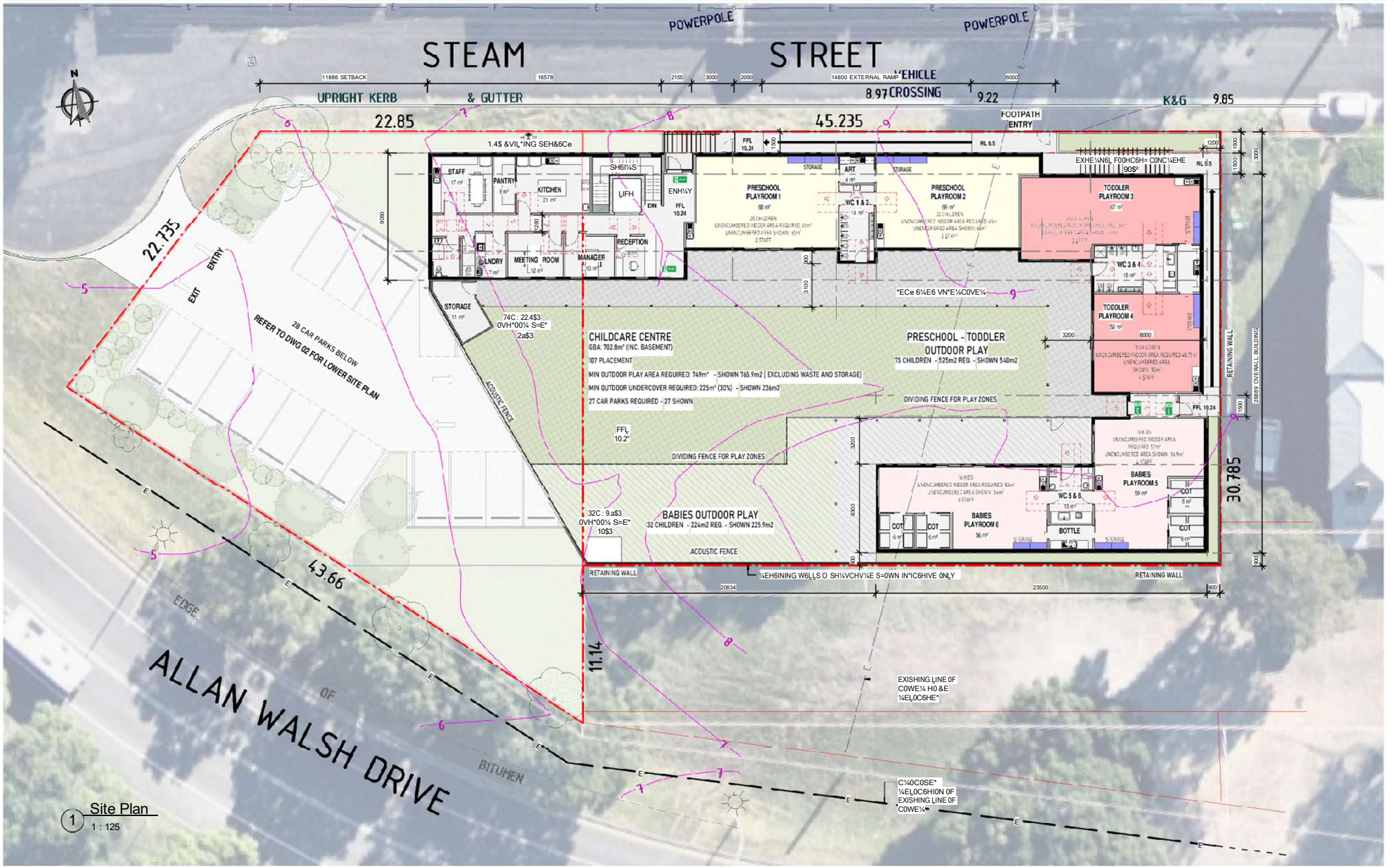
Appendix B – Site Plans



1 Site Plan
1 : 125

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Rev.	Description	Date	Issued by
16	DRAFT REVIEW	21.11.24	M.Marshall
17	SITE REDRAWN	17.01.25	LT
18	ELEVATIONS	03.03.25	M.Marshall
19	CLIENT REVS	07.03.25	M.Marshall
20	CLIENT REVS	07.03.25	M.Marshall
21	CLIENT REVS	10.03.25	M.Marshall
22	CLIENT REVS	13.03.25	M.Marshall

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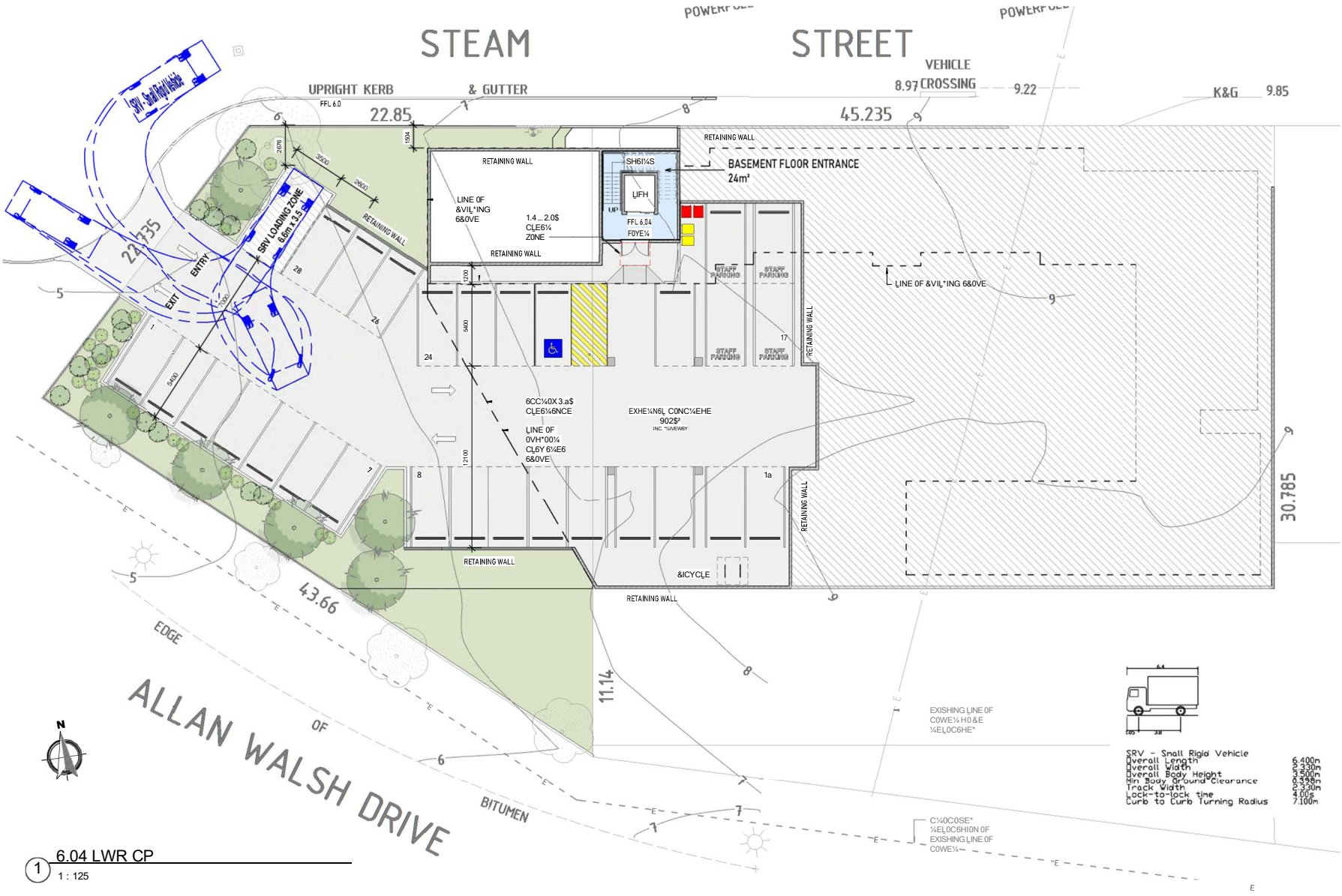
NOTES:

Project: CHILDCARE CENTRE
Sheet Title: UPPER SITE PLAN
Project No: BCO503
Lot: 33 - 33 DP: 1193849 No: 27-33 Street: STEAM STREET Suburb: MAITLAND
Client: BROWN COMMERCIAL
Project Status: CONCEPT PLANS ONLY
Scale: 1 : 125 on A1
Revision: 22
DWG No: 01



1 6.04 LWR CP
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21	CLIENT REVS	10.03.25	M.Marshall
22	CLIENT REVS	13.03.25	M.Marshall

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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.

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CHILDCARE CENTRE	LOWER SITE PLAN	BCO503

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Client:	Project Status:	Scale:	Revision:
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20	CLIENT REVS	07.03.25	M.Marshall
21	CLIENT REVS	10.03.25	M.Marshall
22	CLIENT REVS	13.03.25	M.Marshall

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Sheet Title: ELEVATIONS
Project No: BCO503
Lot: 33 - 33 DP: 1193849 No: 27-33 Street: STEAM STREET Suburb: MAITLAND
Client: BROWN COMMERCIAL
Project Status: CONCEPT PLANS ONLY
Scale: 1 : 1 on A1
Revision: 22
DWG No: 03

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20	CLIENT REVS	07.03.25	M.Marshall
21	CLIENT REVS	10.03.25	M.Marshall
22	CLIENT REVS	13.03.25	M.Marshall

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NOTES:

Project: CHILDCARE CENTRE

Sheet Title: ELEVATIONS

Project No: BCO503

Lot: 33 - 33 DP: 1193849 No: 27-33 Street: STEAM STREET Suburb: MAITLAND

Client: BROWN COMMERCIAL

Project Status: CONCEPT PLANS ONLY

Scale: 1 : 1 on A1

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19	CLIENT REVS	07.03.25	M.Marshall
20	CLIENT REVS	07.03.25	M.Marshall
21	CLIENT REVS	10.03.25	M.Marshall
22	CLIENT REVS	13.03.25	M.Marshall

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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: BCO503

Lot: 33 - 33 DP: 1193849 No: 27-33 Street: STEAM STREET Suburb: MAITLAND

Client: BROWN COMMERCIAL

Project Status: CONCEPT PLANS ONLY

Scale: 1 : 1 on A1

Revision: 22

DWG No: 05

Appendix C – Noise Monitoring Charts and ABLs Summary

Table C23 Background Noise Monitoring Summary – Location L1						
Date	Measured Background Noise Level (LA_{90}) dB ABL[1]			Measured dB $LA_{eq(period)}$		
	Day	Evening	Night	Day	Evening	Night
Tuesday 3 December 2024	--[2]	45	34	--[2]	61	57
Wednesday 4 December 2024	50	43	33	60	60	56
Thursday 5 December 2024	47	44	33	62	59	56
Friday 6 December 2024	48	45	34	63	60	55
Saturday 7 December 2024	47	46	37	61	60	58
Sunday 8 December 2024	48	42	32	61	58	58
Monday 9 December 2024	49	41	31	61	59	57
Tuesday 10 December 2024	50	42	33	61	59	57
Wednesday 11 December 2024	48	44	34	61	57	58
Thursday 12 December 2024	--[2]	--[2]	--[2]	--[2]	--[2]	--[2]
Location1 – RBL / Leq Overall	48	44	33	61	59	57

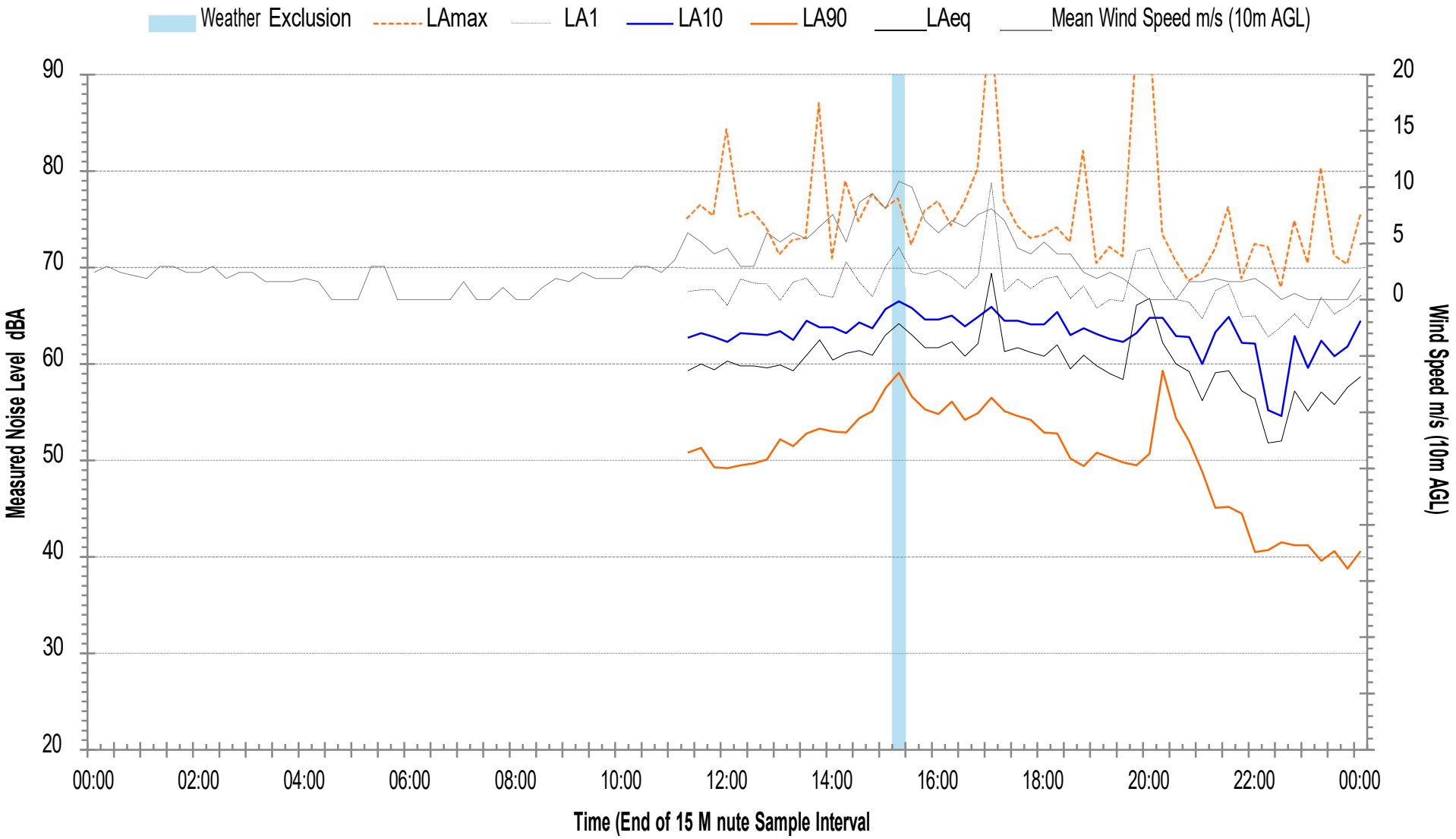
Note 1: Assessment background level (ABL) – the single-figure background level representing each assessment period day, evening and night as per NPI Fact Sheet A.

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

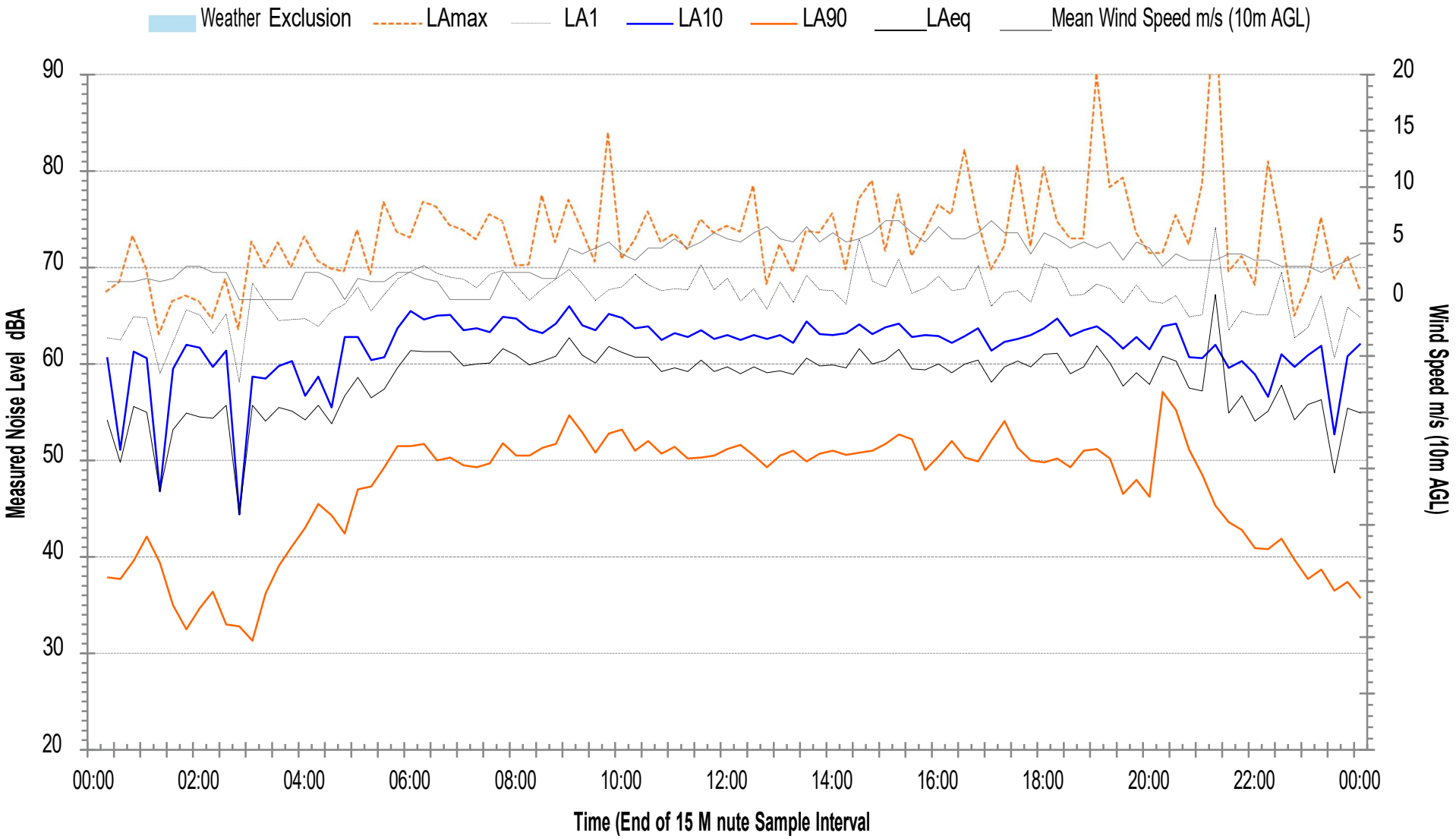
Background Noise Levels

27 Steam Street, Maitland, NSW - Tuesday 3 December 2024



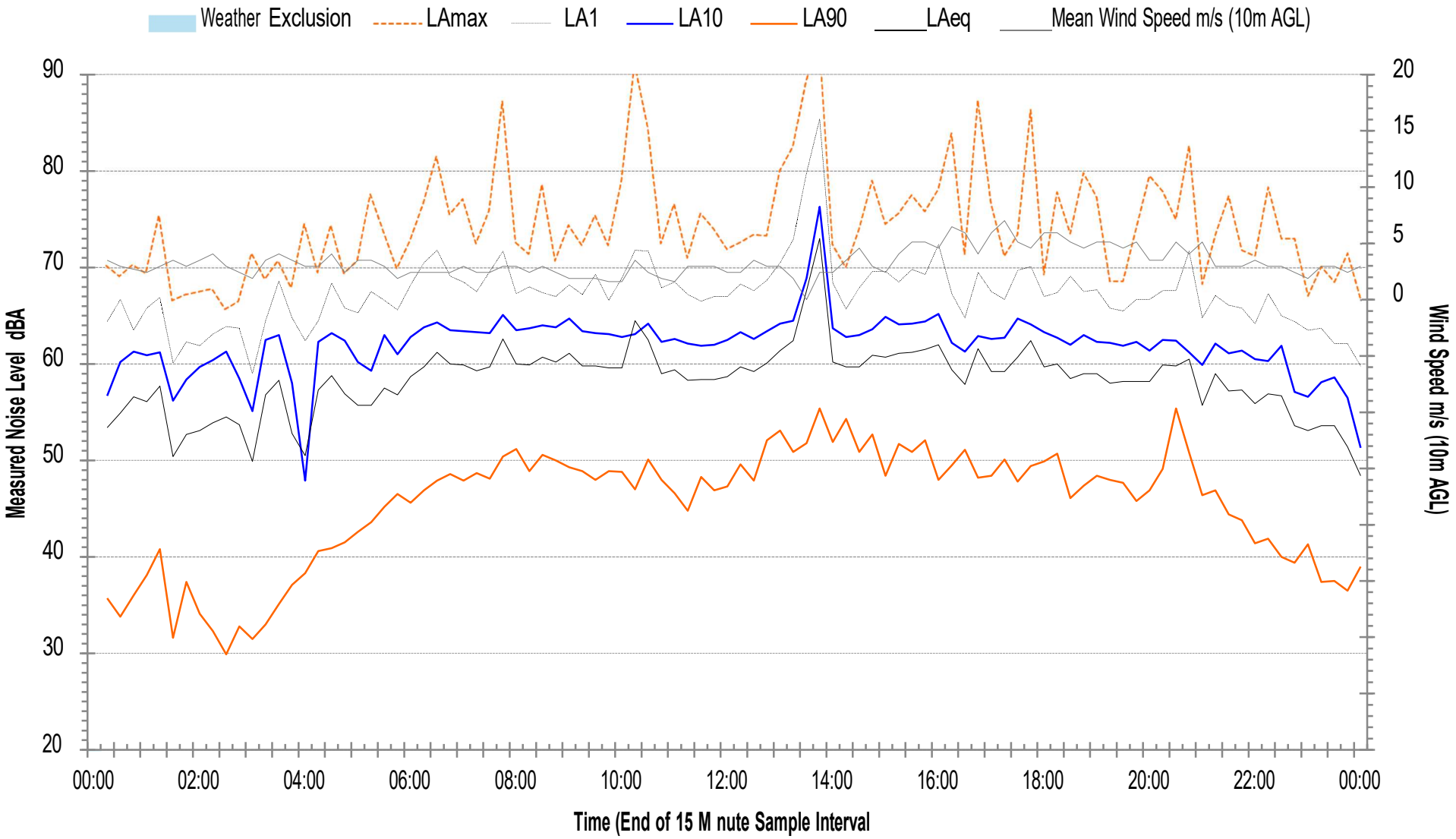
Background Noise Levels

27 Steam Street, Maitland, NSW - Wednesday 4 December 2024



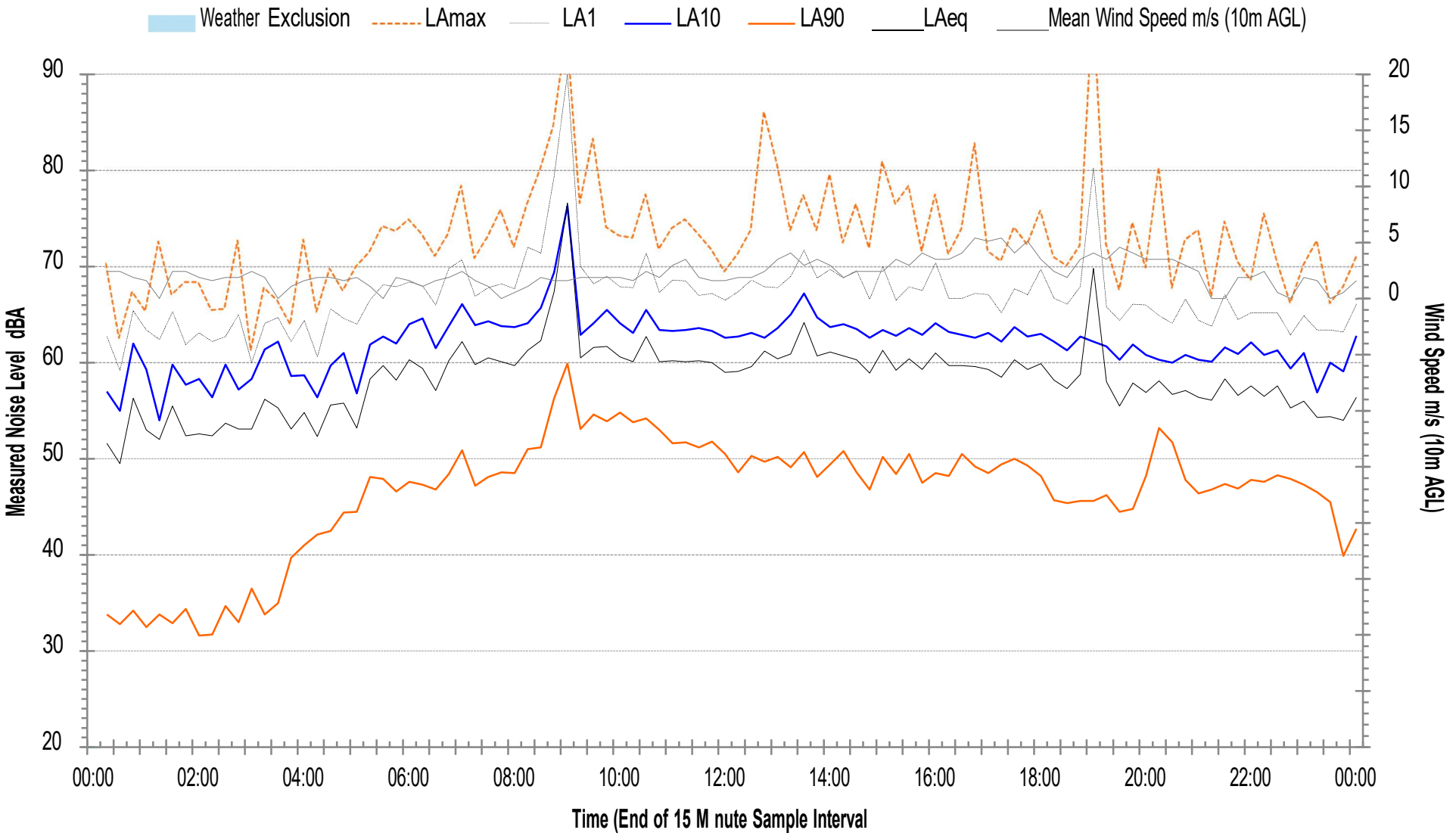
Background Noise Levels

27 Steam Street, Mait and, NSW - Thursday 5 December 2024



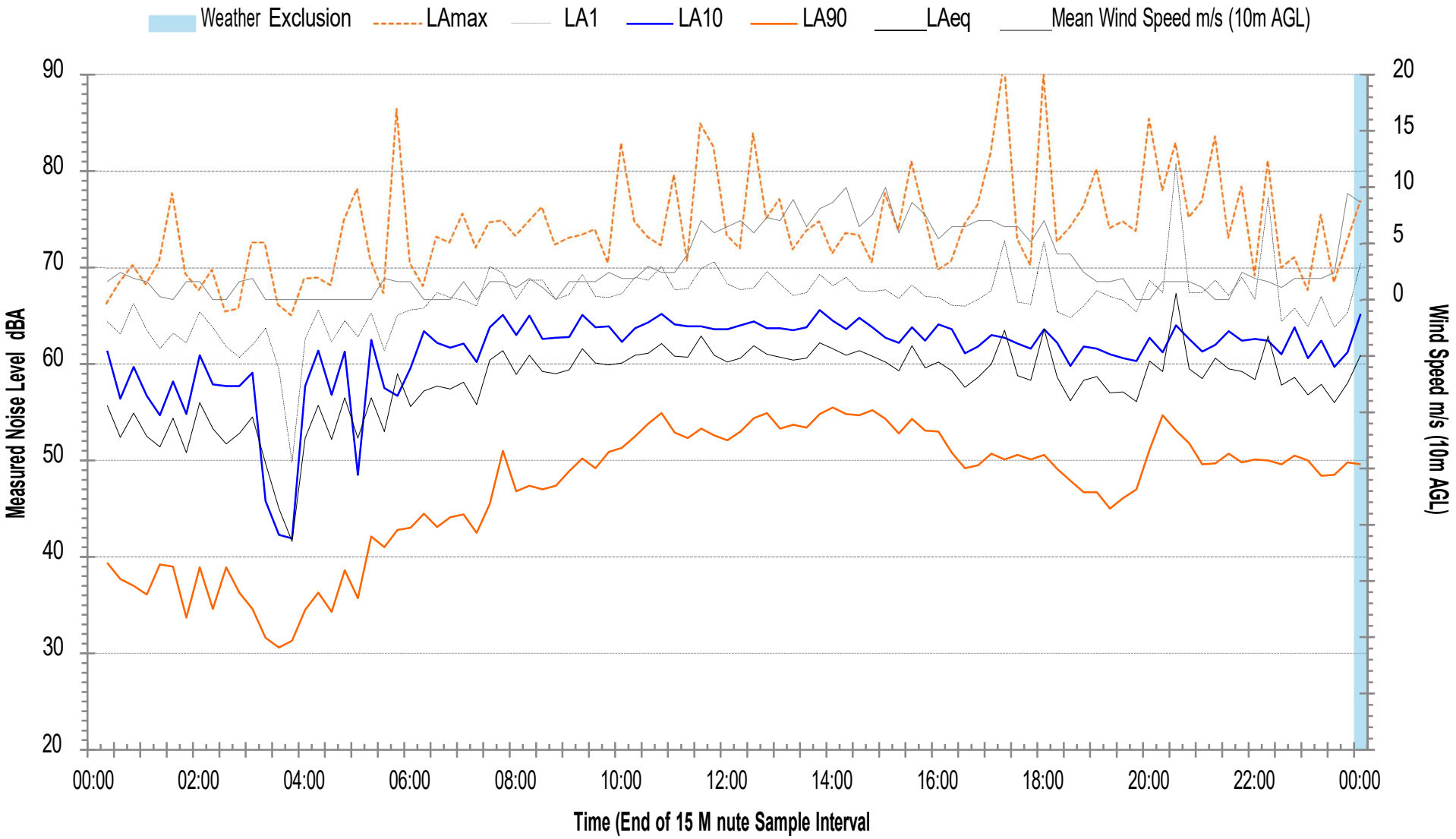
Background Noise Levels

27 Steam Street, Maitland, NSW - Friday 6 December 2024



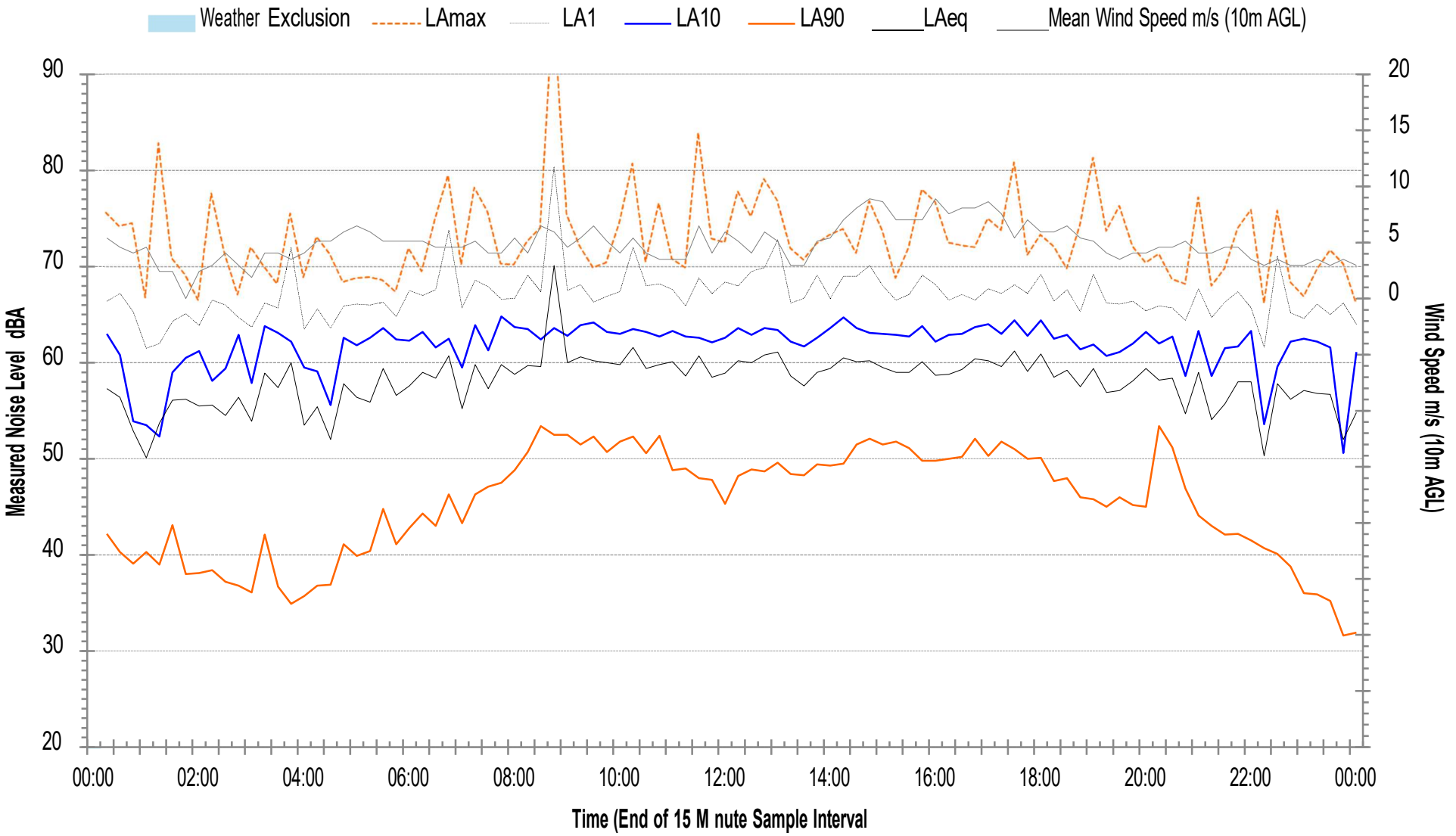
Background Noise Levels

27 Steam Street, Maitland, NSW - Saturday 7 December 2024



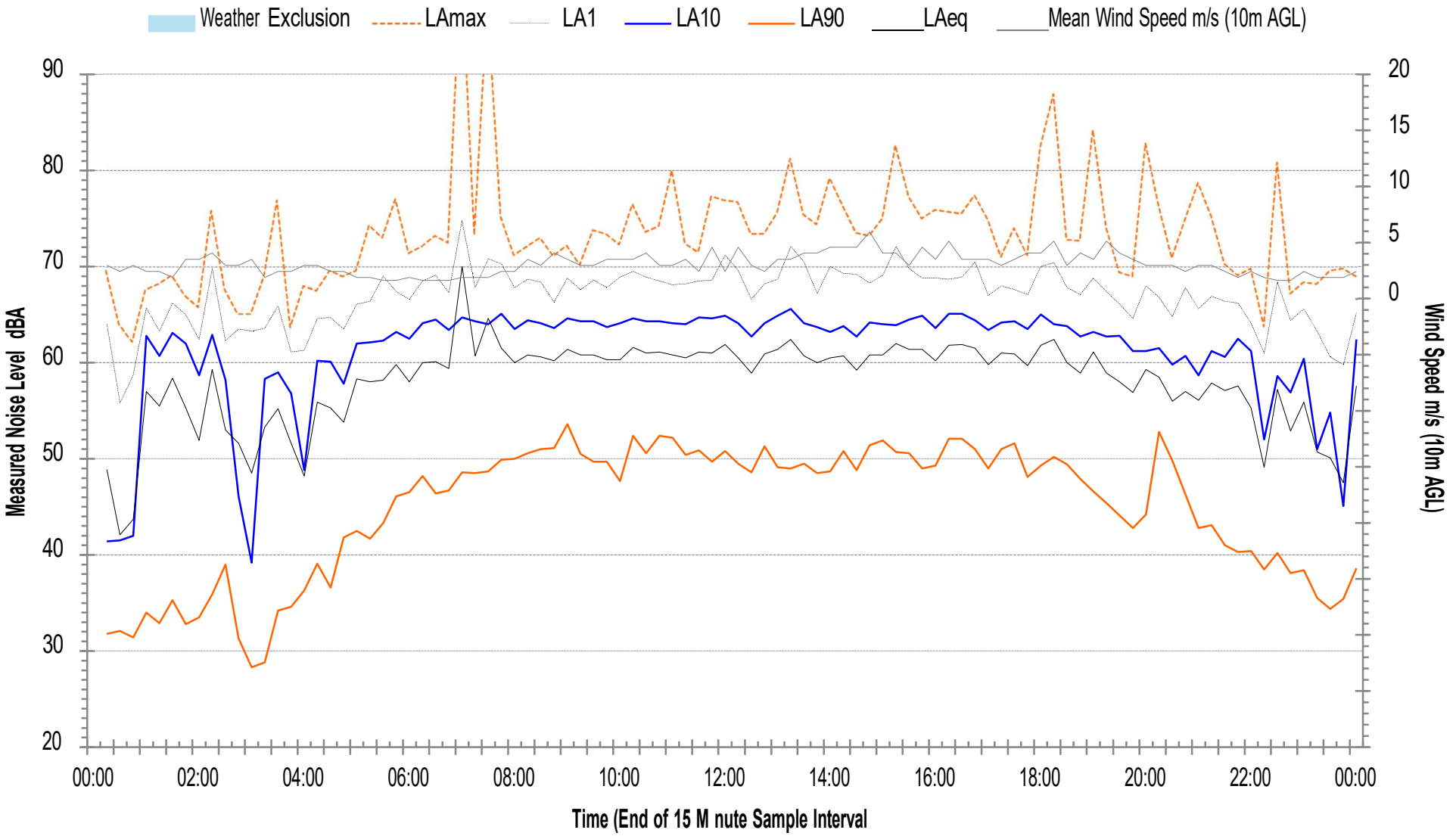
Background Noise Levels

27 Steam Street, Maitland, NSW - Sunday 8 December 2024



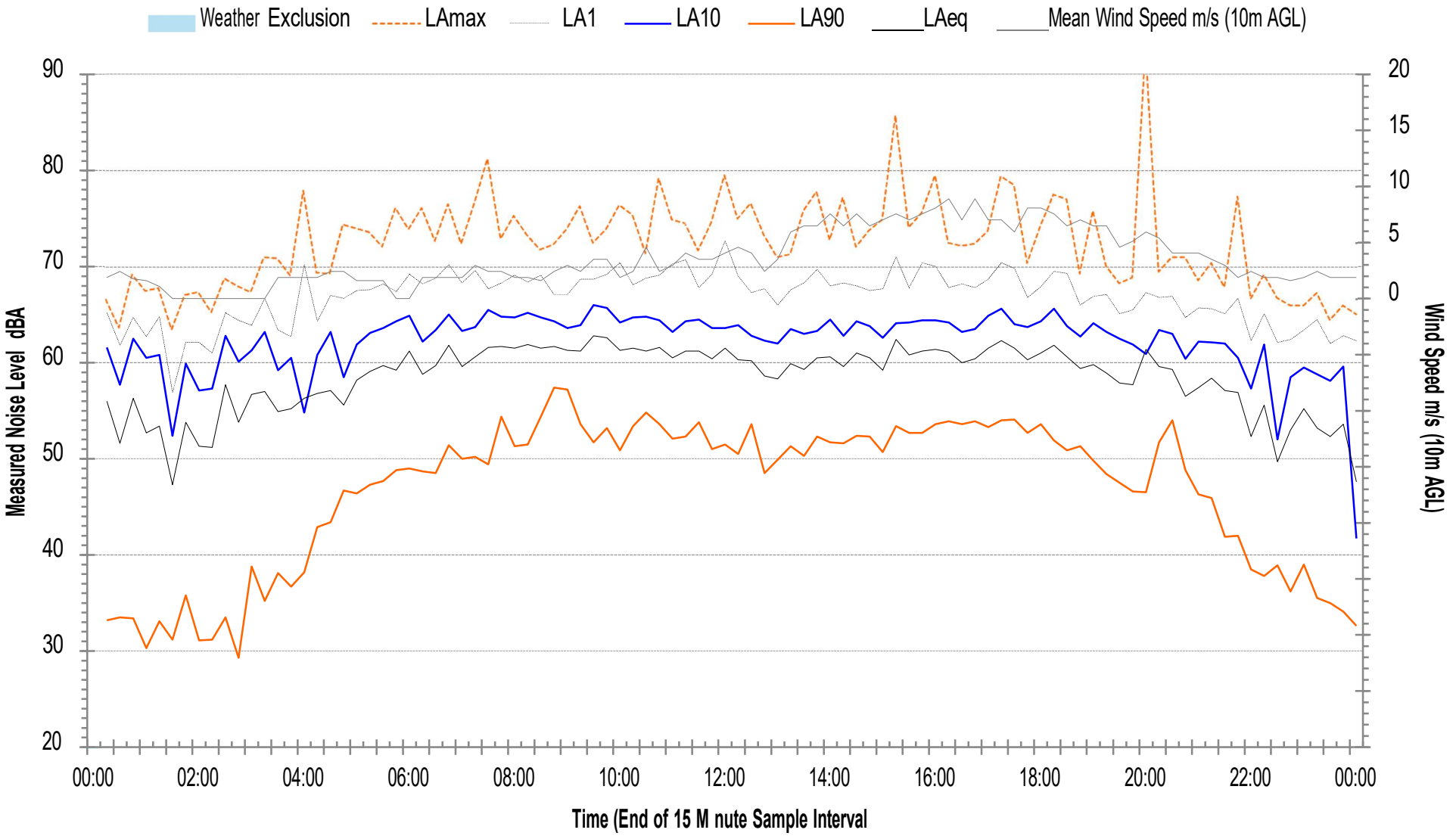
Background Noise Levels

27 Steam Street, Mait and, NSW - Monday 9 December 2024



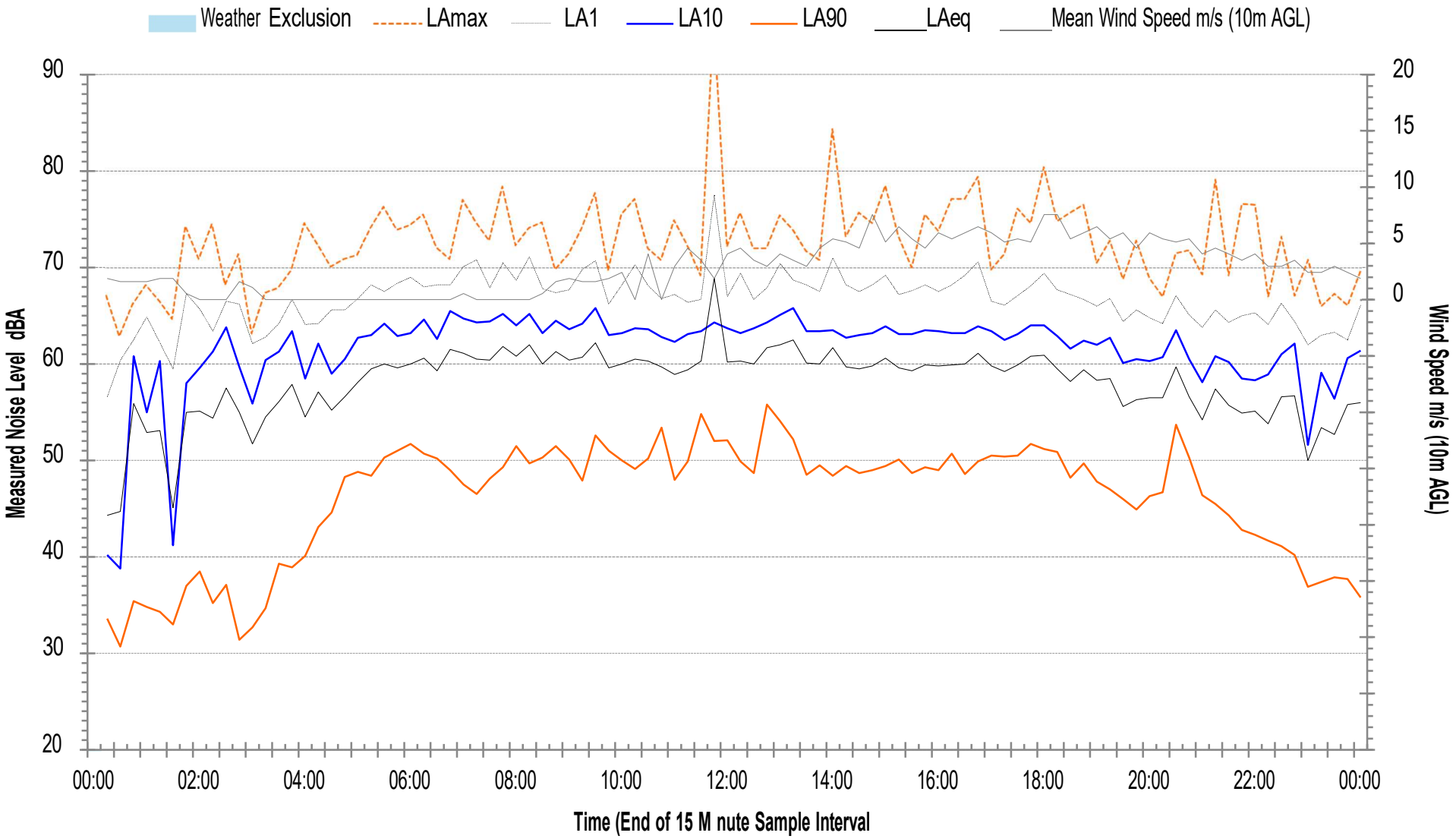
Background Noise Levels

27 Steam Street, Maitland, NSW - Tuesday 10 December 2024



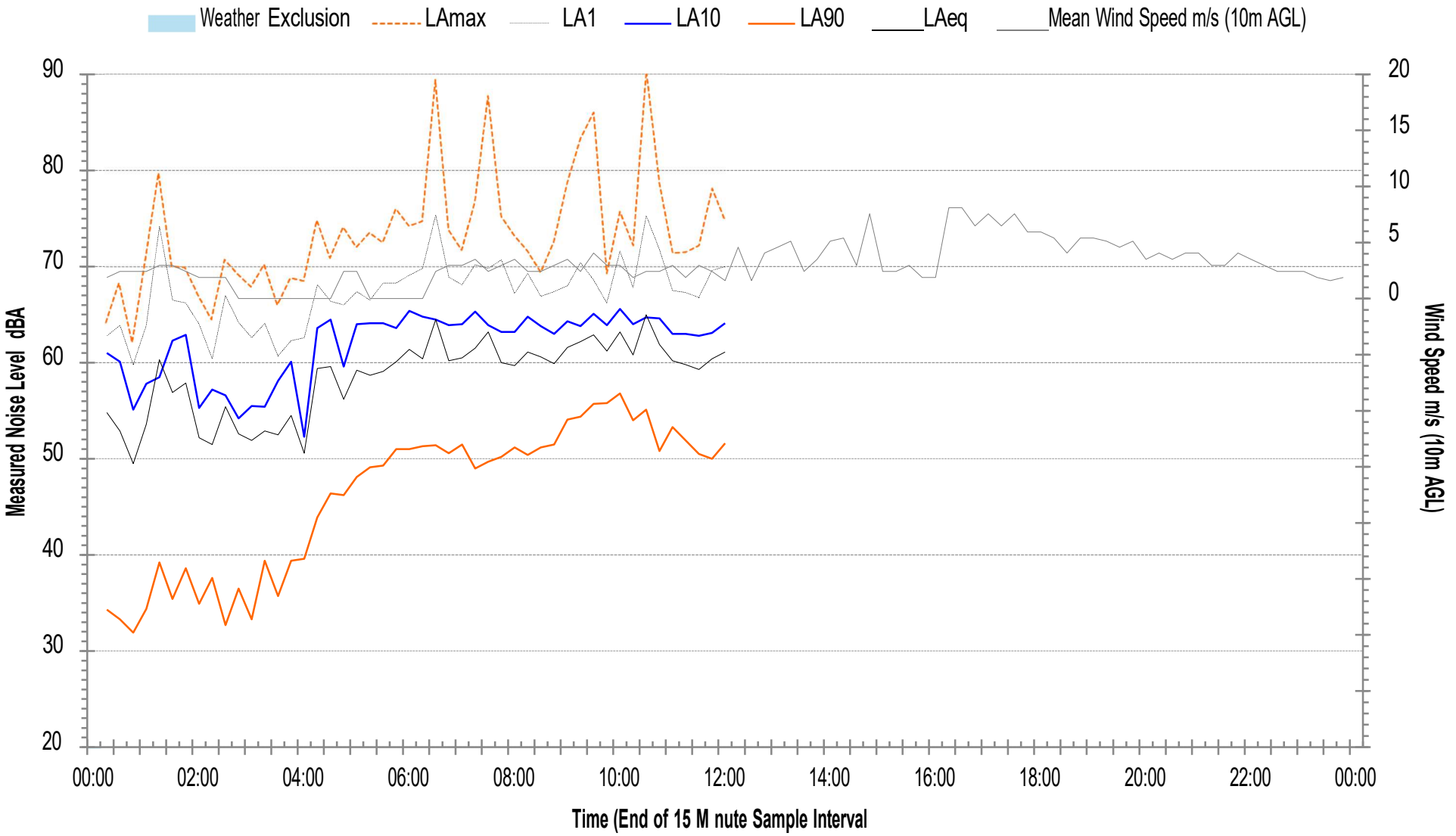
Background Noise Levels

27 Steam Street, Maitland, NSW - Wednesday 11 December 2024



Background Noise Levels

27 Steam Street, Mait and, NSW - Thursday 12 December 2024



Appendix D – Determination of Receiver Category

Table D24 - Determination of NPI Residential Receiver Category																													
			Land Use Zone				Typical Existing Background Noise Levels Table 2.3 NPI			Rural Residential - an area with an acoustical environment that:				Suburban Residential - an area that has:			Urban Residential- an area with an acoustical environment that:												
			RU1, RU2, RU4, R5, E4	RU5, RU6, R2, R3, R4, E2, E3	R1, R4, B1, B2, B4	Others																							
Location/ Catchment	Period	Measured RBL dB $LA_{90(period)}$	Rural	Suburban	Urban	Commercial, Industrial	RURAL Daytime <40 Eve <35 Night <30	SUBURBAN Daytime <45 Eve <40 Night <35	URBAN Daytime >45 Eve >40 Night >35	is dominated by natural sounds.	having little or no road traffic noise	generally characterised by low background noise levels.	Settlement patterns would be typically sparse	local traffic with characteristically intermittent traffic flows	or with some limited commerce or industry.	evening ambient noise levels defined by the natural environment and human activity.	is dominated by ' urban hum' or industrial source noise	has through-traffic with characteristically heavy and continuous traffic flows during peak	is near commercial districts or industrial districts	has any combination of the above										
Location 1	Day	48				✓			✓									✓											
	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 - RBL	Suburban - RBL	Urban - RBL	Rural - Description				Suburban - Description				Urban - Description				
Location 1	0	1	**5**	0	0	0		0	1	2	0	0	0	0	0	0	0		0	3	0	0	

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