Project Duke Data Centre, Mascot

SSD-71368959 Noise and Vibration Impact Assessment

Goodman Property Services (Aust) Pty Ltd

1-11 Hayes Road, Roseberry NSW 2018

Prepared by:

SLR Consulting Australia

Client Reference: Rev B SSDA Amendment

SLR Project No.: 610.31795.00002

16 June 2025

Revision: 3.2

Making Sustainability Happen

Revision Record

Revision	Date	Prepared By	Checked By	Authorised By
3.2	16 June 2025	Joshua Ridgway	Steven Luzuriaga	Steven Luzuriaga
3.1	30 May 2025	Joshua Ridgway	Steven Luzuriaga	Steven Luzuriaga
3.0	28 May 2025	Joshua Ridgway	Steven Luzuriaga	Steven Luzuriaga
2.1	5 November 2024	Joshua Ridgway	Steven Luzuriaga	Steven Luzuriaga
2.0	5 November 2024	Joshua Ridgway	Steven Luzuriaga	Steven Luzuriaga
1.2	26 September 2024	Joshua Ridgway	Antony Williams	Antony Williams
1.1	24 September 2024	Joshua Ridgway	Antony Williams	Antony Williams
1.0	20 September 2024	Joshua Ridgway	Antony Williams	Antony Williams

Basis of Report

This report has been prepared by SLR Consulting Australia (SLR) with all reasonable skill, care and diligence, and taking account of the timescale and resources allocated to it by agreement with Goodman Property Services (Aust) Pty Ltd (the Client). Information reported herein is based on the interpretation of data collected, which has been accepted in good faith as being accurate and valid.

This report is for the exclusive use of the Client. No warranties or guarantees are expressed or should be inferred by any third parties. This report may not be relied upon by other parties without written consent from SLR.

SLR disclaims any responsibility to the Client and others in respect of any matters outside the agreed scope of the work.

Table of Contents

Tables in Text

Figures in Text

Appendices

1.0 Introduction

A State Significant Development Application (SSDA) has been prepared in support of a proposed data centre at 2 and 10-22 Kent Road, and 685 Gardeners Road, Mascot (Project Duke Data Centre, Mascot). The proposed development (SSD-71368959) will seek approval for the construction of a 120 MVA data centre. The proposal seeks to demolish existing structures on the site, construct, fit out and the 24/7 operation of a data centre, with associated works.

The works subject to SSD-71368959 include the following:

- Site preparation works including demolition, bulk excavation and removal of existing structures on the site, tree and vegetation clearing, and bulk earthworks;
- Construction, fit out and 24/7 operation of a 120 MVA data centre with a maximum building height of 40 m (from natural ground level) and total gross floor area of 26,052 m^2 comprising:
  - At-grade parking for thirty-four (34) car parking spaces and one (1) accessible car parking space,
  - Two (2) 12.5 m loading dock spaces,
  - Four (4) levels of technical data hall floor space with one (1) data hall on ground level, three (3) data halls on levels one and two, and two (2) data halls on level three,
  - Secure entrance lobby on ground level and ancillary office space on each level and mezzanine level.
- Provision of required plant and utilities, including:
  - Six (6) 33 kV switch-rooms on ground level,
  - 1,172,000 L above-ground diesel storage tanks,
  - 5,125 kL above-ground water storage tanks,
  - 72 diesel generators.
- Acoustic screen parapet;
- Vehicle access provided via Gardeners Road and Ricketty Street;

This report has been prepared to address the Secretary's Environmental Assessment Requirements (SEARs) and accompanying cover letter issued for the proposed development (SSD-71368959) dated 31 May 2024.

Specifically, this report has been prepared to respond to the SEARs requirement shown in **Table 1**.

Table 1 Secretary's Environmental Assessment Requirements

Item	Description of Requirement	Section Reference (this report)
12. Noise and Vibration	Provide a noise and vibration assessment prepared in accordance with the relevant EPA guidelines and Australian/International Standards. The assessment must detail construction and operational noise and vibration impacts (including testing of any back-up power system) on nearby sensitive receivers and structures, and outline the proposed mitigation, management and monitoring measures that would be implemented.	**Construction:** **Section 3.1**, **3.2**, **4.1**, **5.1** and **5.2** **Operation:** **Section 3.3**, **4.2** and **5.3** **Mitigation:** **Section 7.0**
Cover Letter – Operational noise	The EIS must include details of noise monitoring survey, background noise levels and amenity noise levels at the potentially most-affected residential receivers (i.e. top floor apartments to the east of the site).	**Section 2.0**
	The EIS must justify the correction factor used to convert $L_{Aeq(period)}$ to $L_{Aeq(15min)}$ when assessing continuous noise against amenity noise levels.	**Section 3.3.1**
	The EIS must evaluate data centre operational noise for any potential annoying noise characterises such as tonality and dominant low-frequency content in accordance with Fact Sheet C of the Noise Policy for Industry.	**Section 4.2.4**

SLR is suitably qualified and endorsed by the Planning Secretary to produce SSDA noise impact assessments. SLR staff are members of the Australian Acoustical Society (AAS) and SLR is a member firm of the Association of Australasian Acoustical Consultants (AAAC).

The following report uses specialist acoustic terminology. An explanation of common terms is provided in **Appendix A**.

1.1 The Site

The project is located on land known as 2 and 10-22 Kent Road, and 685 Gardeners Road, Mascot, legally referred to as Lot 1 DP529177, Lot 1 DP1009083 and Lot 2 DP529177. The site is located on Country of the Gadigal people within the local government area of Bayside Council.

It has a land area of approximately 23,470 m^2 with frontages to Ricketty Street, Kent Road and Gardeners Road, all of which are classified roads.

The site forms part of the Mascot West Employment lands which comprises a mix of land zoned for industrial, commercial and business park uses. To the east of the site is Mascot Station Town Centre which comprises a mix of retail, commercial, residential and recreational open space land uses.

Surrounding land uses in the immediate vicinity of the site include:

- North: Gardeners Road, which is the LGA boundary with the City of Sydney. Further to the north is existing industrial development with Alexandra Canal beyond.
- South: Ricketty Street is immediately south, with predominantly one to four storey commercial and industrial development beyond.

- East: Kent Road is immediately to the east, with 4 to 14 storey high density residential development beyond.
- West: To the west is light industrial development typically one to two storey in height.

The site is zoned E3 Productivity Support under the Bayside Local Environmental Plan 2021 (BLEP 2021). The proposal is permissible with development consent in the E3 zone and meets the zone objectives.

The site location and surrounding noise-sensitive receivers are shown in **Figure 1**. The proposed layout of the data centre is shown in **Figure 2** to **Figure 5**.

1.2 Nearest Receivers

The site is situated in the Mascot West Employment area, with commercial/industrial premises to the north, south and west. High density residential apartment towers up to 14 storeys in height are located to the east and south east of the site, and two childcare centres to the south east (MindChamps Early Learning & Preschool and Little Angels at Mascot Central).

The nearest receivers are shown in **Figure 1** and detailed in **Table 2**.

Table 2 Surrounding Sensitive Receivers

ID	Receiver	Type	Distance (m)	Direction
R01	671-675 Gardeners Road, Mascot	Residential	40 m	East
R02	12 Galloway Street, Mascot	Residential	30 m	East
R03	7-9 Kent Road, Mascot	Residential	30 m	East
R04	61-63 Church Avenue, Mascot	Residential	70 m	South east
R05	Child care centres	Child care[1]	85 m	South east
R06	Surrounding commercial premises	Commercial	5 m	North, South, West

Note 1: These include MindChamps Early Learning & Preschool and Little Angels at Mascot Central .

Scale: 1:2,500
Coordinate System: GDA2020 / MGA zone 56

Drawn Date: 30-May-2025
Project Number: 610.031795.00002

H:\Projects-SLR\610-SrvSYD\610-SYD\610.031795.00001 Kent Road Mascot Data Centre\06 SLR Data\07 A&V\01 QGIS\610.031795 Kent Rd Data Centre SSDA.qgz

SLR

Data Source:
ESRI World Imagery

DISCLAIMER: All information within this document may be based on external sources. SLR Consulting Pty Ltd makes no warranty regarding the data's accuracy or reliability for any purpose.

SITE MAP

FIGURE 1

Figure 2 Proposed Development – Ground Floor Layout

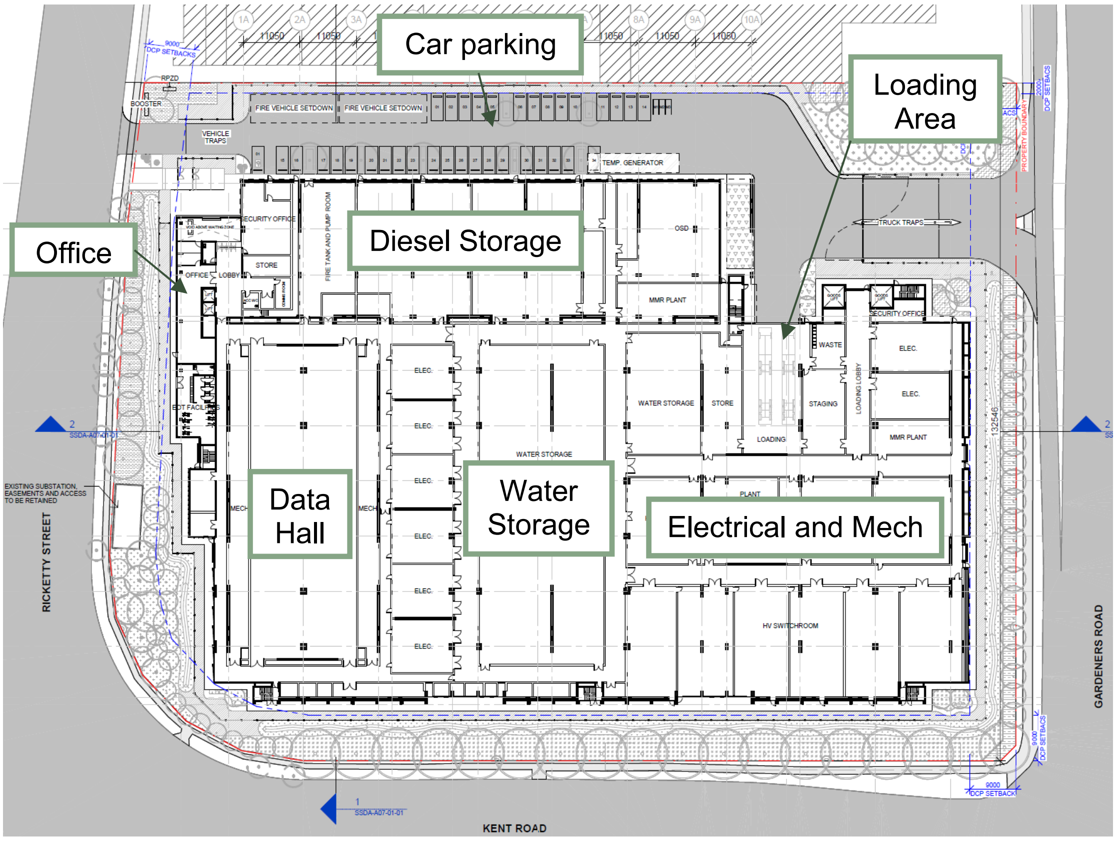
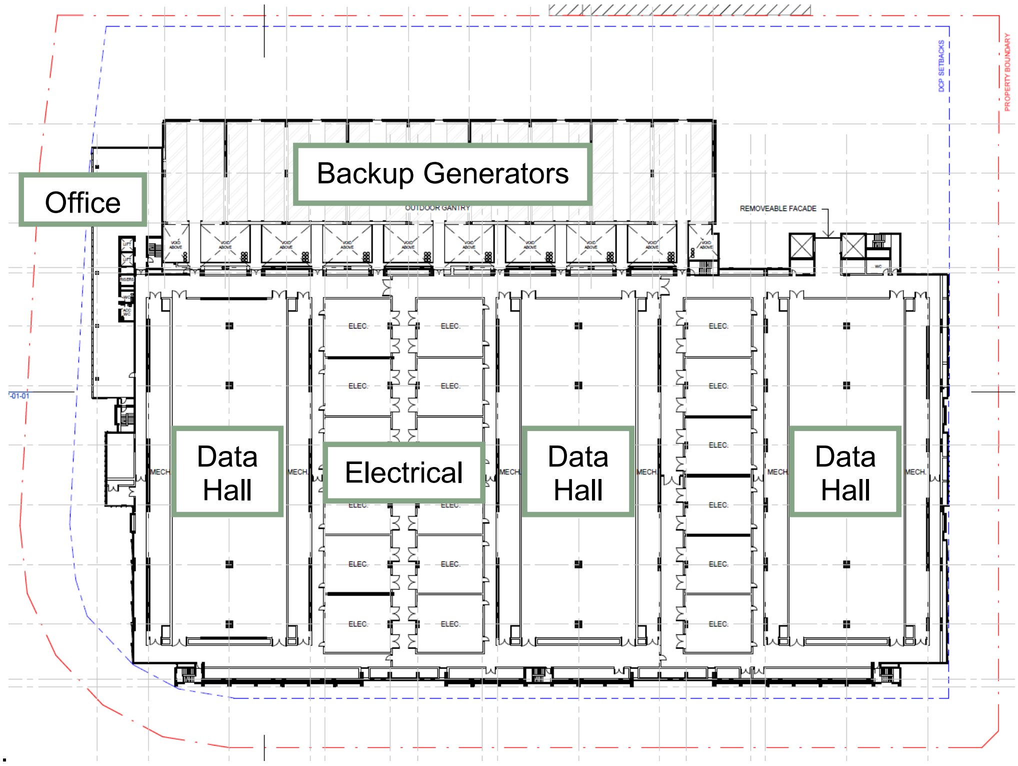


Figure 3 Proposed Development – Typical Data Hall Floor Layout



.

Figure 4 Proposed Development – Roof Layout

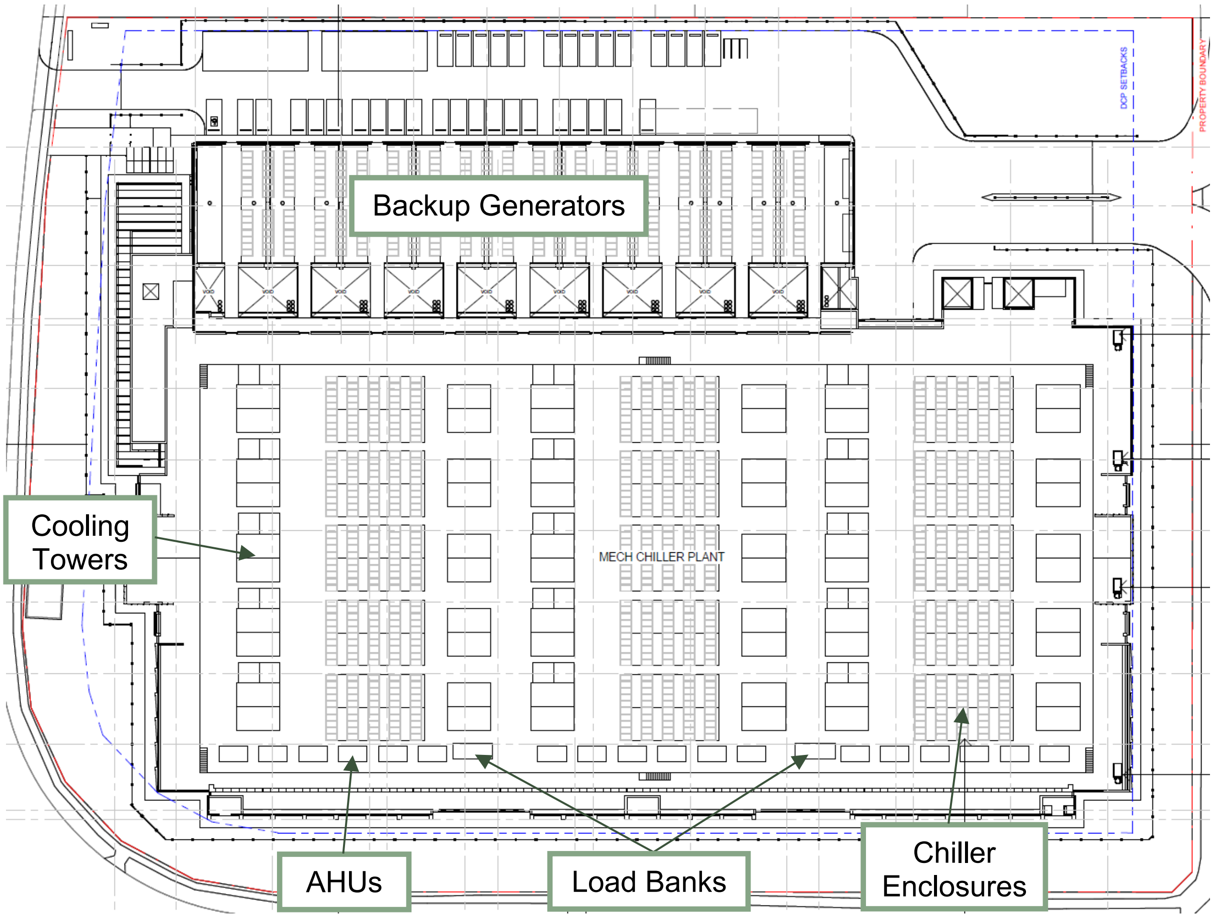
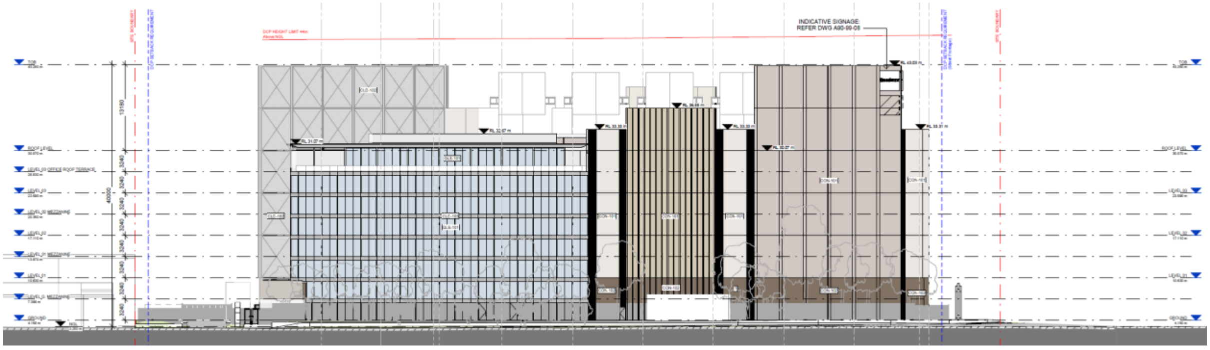


Figure 5 Proposed Development – South Elevation



2.0 Existing Noise Environment

The existing noise environment in the area is typically dominated by road traffic noise from Ricketty Street, Kent Road, Gardeners Road and more distant roads.

Unattended noise monitoring was undertaken at the adjacent residential receivers in October 2024. The monitoring was undertaken on the west-facing balcony of a top-floor residential apartment at 12 Galloway Street, Mascot.

This location was selected as representative of the potentially reasonably most-affected residential receivers. This location is the nearest receiver location to the development, with the top-floor apartment likely to be most-affected due to lower benefit from the acoustic screening of the rooftop mechanical plant than lower apartments. The location has similar exposure to both the development site and existing road traffic noise as the adjacent receivers. As such, this location is representative of the potentially reasonably most-affected residential receivers. Additionally, the predicted noise levels detailed in **Section 5.3** and **Appendix D** verify this location as one of the most-affected receivers. Traffic noise modelling was undertaken to verify the exposure to traffic noise for each apartment building. This is detailed in **Appendix H**.

The noise monitoring equipment continuously measured ambient noise levels in 15-minute periods during the daytime, evening and night-time. All equipment carried current National Association of Testing Authorities (NATA) or manufacturer calibration certificates and equipment calibration was confirmed before and after each measurement.

The measured data has been processed to exclude noise from extraneous events and periods affected by adverse weather conditions, such as strong wind or rain (measured at Sydney Airport AWS), to establish representative existing noise levels in the area.

The measured noise levels have been used to determine the existing noise environment and to set the criteria used to assess the potential impacts from the proposal. See **Appendix H** for further details regarding high traffic noise amenity criteria.

The noise monitoring location is shown in **Figure 1** and the results are summarised in **Table 3**. Details of the monitoring location together with graphs of the measured daily noise levels are provided in **Appendix B**.

Table 3 Summary of Unattended Noise Monitoring Results

ID	Address	Measured Noise Levels (dBA)[1]					
		Background Noise (RBL)			Average Noise (L_{Aeq})		
		Day	Evening	Night	Day	Evening	Night
L01	12 Galloway Street, Mascot – Top floor apartment, west-facing balcony[2]	58	55	48	64	62	59

Note 1: The assessment periods are the daytime which is 7 am to 6 pm Monday to Saturday and 8 am to 6 pm on Sundays and public holidays, the evening which is 6 pm to 10 pm, and the night-time which is 10 pm to 7 am on Monday to Saturday and 10 pm to 8 am on Sunday and public holidays. See the NSW EPA Noise Policy for Industry.

Note 2: Measured noise levels at this location have a -2.5 dB adjustment applied to account for the effect of the balcony to reflect ‘free field’ noise exposure.

Short-term attended noise monitoring was also completed at the monitoring location. The attended measurements allow the contributions of the various noise sources at the monitoring location to be determined. Detailed observations from the attended measurements are provided in **Appendix B**.

The attended measurements were generally found to be consistent with the results of the unattended noise monitoring and show that existing noise levels are typically dominated by road traffic noise from the surrounding road network.

3.0 Assessment Criteria

3.1 Construction Noise Criteria

The NSW *Interim Construction Noise Guideline* (ICNG) is used to assess and manage impacts from construction noise on residences and other sensitive land uses in NSW.

The ICNG contains procedures for determining project specific Noise Management Levels (NMLs) for sensitive receivers based on the existing background noise in the area. The 'worst-case' noise levels from construction of a proposal are predicted and then compared to the NMLs in a 15-minute assessment period to determine the likely impact of the proposal.

The NMLs are not mandatory limits, however, where construction noise levels are predicted or measured to be above the NMLs, feasible and reasonable work practices to minimise noise emissions are to be investigated.

3.1.1 Residential Receivers

The ICNG approach for determining NMLs at residential receivers is shown in **Table 4**.

Table 4 ICNG NMLs for Residential Receivers

Time of Day	NML $L_{Aeq(15minute)}$	How to Apply
Standard Construction Hours Monday to Friday 7:00 am to 6:00 pm Saturday 8:00 am to 1:00 pm No work on Sundays or public holidays	Noise affected RBL[1] + 10 dB	• The noise affected level represents the point above which there may be some community reaction to noise • Where the predicted or measured $L_{Aeq(15minute)}$ 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 works to be carried out, the expected noise levels and duration, as well as contact details.

	Highly Noise Affected
	75 dBA
		• The Highly Noise Affected (HNA) 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 restructuring the hours that the very noisy activities can occur, taking into account:
		  o Times identified by the community when they are less sensitive to noise (such as before and after school for works near schools or mid-morning or mid-afternoon for works near residences
		  o If the community is prepared to accept a longer period of construction in exchange for restrictions on construction times.

Outside Standard Construction Hours	Noise affected RBL + 5 dB	• A strong justification would typically be required for works 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 practises have been applied and noise is more than 5 dB above the noise affected level, the proponent should negotiate with the community.

Note 1: RBL is the Rating Background Level and the ICNG refers to the calculation procedures in the NSW *Industrial Noise Policy* (INP). The INP has been superseded by the NSW EPA *Noise Policy for Industry* (NPfI).

3.1.2 Other Sensitive' Land Uses and Commercial Receivers

Non-residential land uses have been identified in the study area. The NMLs for 'other sensitive' receivers are shown in **Table 5**.

Table 5 Construction NMLs for ICNG 'Other Sensitive' Receivers

Land Use	Noise management level $L_{Aeq(15minute)}$ (dBA) (applied when the property is in use)	
	Internal	External
ICNG 'other sensitive' receivers		
Commercial	-	70
Industrial	-	75
Non-ICNG 'other sensitive' receivers		
Child care centres – sleeping areas[2]	40	60[1]

Note 1: It is assumed that these receivers have fixed windows which conservatively results in internal noise levels being around 20 dB lower than the external noise level.

Note 2: Taken from Association of Australian Acoustical Consultants *Guideline for Child Care Centre Acoustic Assessment*.

3.1.3 NML Summary

The construction NMLs for the proposal have been determined using the results from the unattended noise monitoring and are shown in **Table 6**.

Out of hours NMLs would be applicable should works be required to be undertaken outside ICNG standard construction hours.

Table 6 Project Specific Noise Management Levels

Receiver Type	Monitoring Location	Noise Management Level ($L_{Aeq(15minute)}$ – dBA)			
		Standard Construction (RBL +10 dB)[1]	Out of Hours (RBL +5 dB)		
		Daytime	Daytime[2]	Evening	Night-time
Residential (R01-R04)	L01	68	63	60	53
Child care (R05)	n/a	60	60	-	-
Commercial (R06)	n/a	70	70	-	-

Note 1: RBL = Rating Background Level.

Note 2: Daytime out of hours is 7 am to 8 am and 1 pm to 6 pm on Saturday, and 8 am to 6 pm on Sunday and public holidays.

In addition to the above NMLs, residential receivers are considered to be 'highly noise affected' if the predicted level exceeds 75 dBA $L_{Aeq(15minute)}$.

3.2 Construction Vibration Criteria

The effects of vibration from construction works can be divided into three categories:

- Those in which the occupants of buildings are disturbed (human comfort)
- Those where building contents may be affected (building contents)
- Those where the integrity of the building may be compromised (structural or cosmetic damage).

3.2.1 Human Comfort Vibration

People can sometimes perceive vibration impacts when vibration generating construction works are located close to occupied buildings.

Vibration from construction works tends to be intermittent in nature and the EPA's *Assessing Vibration: a technical guideline* (2006) provides criteria for intermittent vibration based on the Vibration Dose Value (VDV). The 'preferred' and 'maximum' VDVs for human comfort impacts are shown in **Table 7**.

Table 7 Vibration Dose Values for Intermittent Vibration

Building Type	Assessment Period	Vibration Dose Value[1] ($m/s^{1.75}$)	
		Preferred	Maximum
Critical Working Areas (eg operating theatres or laboratories)	Day or night-time	0.10	0.20
Residential	Daytime	0.20	0.40
	Night-time	0.13	0.26
Offices, schools, educational institutions and places of worship	Day or night-time	0.40	0.80
Workshops	Day or night-time	0.80	1.60

Note 1: The VDV accumulates vibration energy over the daytime and night-time assessment periods, and is dependent on the level of vibration as well as the duration.

3.2.2 Effects on Building Contents

People perceive vibration at levels well below those likely to cause damage to building contents. For most receivers, the human comfort vibration criteria are the most stringent and it is generally not necessary to set separate criteria for vibration effects on typical building contents.

Exceptions to this can occur when vibration sensitive equipment, such as electron microscopes, are located in buildings near to construction works. No such items of equipment have been identified in the proposal area.

3.2.3 Structural and Cosmetic Damage Vibration

If vibration from construction works is sufficiently high it can cause damage to structural elements of affected buildings. The levels of vibration required to cause cosmetic damage tend to be at least an order of magnitude (10 times) higher than those at which people can perceive vibration.

Examples of damage that can occur includes cracks or loosening of drywall surfaces, cracks in supporting columns and loosening of joints. Structural damage vibration limits are contained in British Standard BS 7385 and German Standard DIN 4150.

BS 7385

British Standard BS 7385 recommends vibration limits for transient vibration judged to give a minimal risk of vibration induced damage to affected buildings. The limits for residential and industrial buildings are shown in **Table 8**.

Table 8 BS 7385 Transient Vibration Values for Minimal Risk of Damage

Group	Type of Building	Peak Component Particle Velocity in Frequency Range of Predominant Pulse	
		4 Hz to 15 Hz	15 Hz and Above
1	Reinforced or framed structures. Industrial and heavy commercial buildings	50 mm/s at 4 Hz and above	
2	Unreinforced or light framed structures. Residential or light commercial type buildings	15 mm/s at 4 Hz increasing to 20 mm/s at 15 Hz	20 mm/s at 15 Hz increasing to 50 mm/s at 40 Hz and above

Note 1: Where the dynamic loading caused by continuous vibration may give rise to dynamic magnification due to resonance, especially at the lower frequencies where lower guide values apply, then the guide values may need to be reduced by up to 50%.

For heritage buildings, the standard states that "*a building of historical value should not (unless it is structurally unsound) be assumed to be more sensitive*".

DIN 4150

German Standard DIN 4150 also provides guideline vibration limits for different buildings. Damage is not expected to occur where the values are complied with and the values are generally recognised to be conservative. The DIN 4150 values for buildings and structures are shown in **Table 9**.

Table 9 DIN 4150 Guideline Values for Short-term Vibration on Structures

Group	Type of Structure	Guideline Values Vibration Velocity (mm/s)				
		Foundation, All Directions at a Frequency of			Topmost Floor, Horizontal	Floor Slabs, Vertical
		1 to 10 Hz	10 to 50 Hz	50 to 100 Hz	All frequencies	All frequencies
1	Buildings used for commercial purposes, industrial buildings and buildings of similar design	20	20 to 40	40 to 50	40	20
2	Residential buildings and buildings of similar design and/or occupancy	5	5 to 15	15 to 20	15	20
3	Structures that, because of their particular sensitivity to vibration, cannot be classified as Group 1 or 2 **and** are of great intrinsic value (eg heritage listed buildings)	3	3 to 8	8 to 10	8	20[1]

Note 1: It may be necessary to lower the relevant guideline value markedly to prevent minor damage.

3.2.4 Minimum Working Distances for Vibration-intensive Works

Minimum working distances for typical vibration-intensive construction equipment are provided in the Transport for NSW (TfNSW) *Construction Noise and Vibration Guideline* (CNVG) and are shown in **Table 10**. The minimum working distances are for both cosmetic damage (from BS 7385 and DIN 4150) and human comfort (from the NSW EPA Vibration Guideline). They are based on empirical data which suggests that where works are further from receivers than the quoted minimum distances then impacts are not considered likely.

Table 10 Recommended Minimum Working Distances from Vibration-intensive Equipment

Plant Item	Rating/Description	Minimum Distance		
		Cosmetic Damage		Human Response (NSW EPA Guideline)
		Residential and Light Commercial (BS 7385)	Heritage Items (DIN 4150, Group 3)	
Vibratory Roller	<50 kN (1–2 tonne)	5 m	11 m	15 m to 20 m
	<100 kN (2–4 tonne)	6 m	13 m	20 m
	<200 kN (4–6 tonne)	12 m	25 m	40 m
	<300 kN (7–13 tonne)	15 m	31 m	100 m
	>300 kN (13–18 tonne)	20 m	40 m	100 m
	>300 kN (>18 tonne)	25 m	50 m	100 m
Small Hydraulic Hammer	300 kg (5 to 12 t excavator)	2 m	5 m	7 m
Medium Hydraulic Hammer	900 kg (12 to 18 t excavator)	7 m	15 m	23 m
Large Hydraulic Hammer	1,600 kg (18 to 34 t excavator)	22 m	44 m	73 m
Vibratory Pile Driver	Sheet piles	2 m to 20 m	5 m to 40 m	20 m
Piling Rig – Bored	≤ 800 mm	2 m (nominal)	5 m	4 m
Jackhammer	Hand held	1 m (nominal)	3 m	2 m

The minimum working distances are indicative and will vary depending on the particular item of equipment and local geotechnical conditions. The distances apply to cosmetic damage of typical buildings under typical geotechnical conditions.

3.3 Operational Noise Criteria

The NSW *Noise Policy for Industry* (NPfI) was released in 2017 and sets out the requirements for the assessment and management of operational noise from industry in NSW.

The NPfI defines how to determine 'trigger levels' for noise emissions from industrial developments. Where a development is likely to exceed the trigger levels at existing noise-sensitive receivers, feasible and reasonable noise management measures are required to be considered to reduce the impacts.

There are two types of trigger levels – one to account for 'intrusive' noise impacts and one to protect the 'amenity' of particular land uses:

- The **intrusiveness** of an industrial noise source is generally considered acceptable if the L_{Aeq} noise level of the source, measured over a period of 15-minutes, does not exceed the representative background noise level by more than 5 dB. Intrusive noise levels are only applied to residential receivers. For other receiver types, only the amenity levels apply.
- To limit continual increases in noise levels from the use of the intrusiveness level alone, the ambient noise level within an area from all industrial sources should remain below the recommended **amenity** levels specified in the NPfI for that particular land use.

Intrusive and amenity noise levels are not used directly as regulatory limits. They are used to assess the potential impact of noise, assess feasible and reasonable mitigation options and subsequently determine achievable noise requirements.

The NPfI provides guidance on assigning residential receiver amenity noise categories based on the site-specific features shown in **Table 11**.

Table 11 Residential Receiver Amenity

Receiver Category	Typical Planning Land Use Zoning	Typical Existing Background Noise Levels (RBL)	Description
Rural	RU1 – primary production RU2 – rural landscape RU4 – primary production small lots R5 – large lot residential E4 – environmental living	Daytime <40 dBA Evening <35 dBA Night <30 dBA	Rural – an area with an acoustical environment that is dominated by natural sounds, having little or no road traffic noise and generally characterised by low background noise levels. Settlement patterns would be typically sparse. Note: Where background noise levels are higher than those presented due to existing industry or intensive agricultural activities, the selection of a higher noise amenity area should be considered.

Receiver Category	Typical Planning Land Use Zoning	Typical Existing Background Noise Levels (RBL)	Description
Suburban residential	RU5 – village RU6 – transition R2 – low density residential R3 – medium density residential E2 – environmental conservation E3 – environmental management	Daytime <45 dBA Evening <40 dBA Night <35dBA	Suburban – an area that has local traffic with characteristically intermittent traffic flows or with some limited commerce or industry. This area often has the following characteristic: evening ambient noise levels defined by the natural environment and human activity.
Urban residential	R1 – general residential R4 – high density residential B1 – neighbourhood centre (boarding houses and shop-top housing) B2 – local centre (boarding houses) B4 – mixed use	Daytime >45 dBA Evening >40 dBA Night >35 dBA	Urban – an area with an acoustical environment that: • Is dominated by ‘urban hum’ or industrial source noise, where urban hum means the aggregate sound of many unidentifiable, mostly traffic and/or industrial related sound sources • Has through-traffic with characteristically heavy and continuous traffic flows during peak periods • Is near commercial districts or industrial districts • Has any combination of the above.

Amenity noise categories for the surrounding receivers have been determined with reference to the NPfI. The assessment is shown in **Table 12**.

Table 12 Residential Receiver Amenity Category Assessment

Area	Land Use Zoning	Existing Background Noise Levels RBL (dBA)			Resulting Amenity Classification	Discussion
		Day	Eve	Night		
R01-R03	MU1: Mixed Use – high density mixed use with residential fronting Kent Road	58	55	48	Urban	The residences fronting Kent Road are zoned as MU1 mixed use and are high density multi-storey residential with mixed uses on the lower levels. Existing noise levels are relatively high and controlled by road traffic noise. Residences have, therefore, been classified as urban.
R04	E1: Local Centre – high density local centre with residential fronting Kent Road	58	55	48	Urban	The residences fronting Kent Road are zoned as E1 local centre and are high density multi-storey residential with mixed uses on the lower levels. Existing noise levels are relatively high and controlled by road traffic noise. Residences have, therefore, been classified as urban.

3.3.1 Project Noise Trigger Levels

The trigger levels for industrial noise from the proposal are summarised in **Table 13**. They are based on the previously measured background noise levels, where appropriate. The Project Noise Trigger Levels (PNTL) are the most stringent of the intrusiveness and amenity trigger level for each period and are highlighted below.

Existing road traffic noise is the dominant noise source in the project area during the daytime, evening and night-time. In accordance with the procedure for amenity noise levels in areas of high traffic noise (refer to Section 2.4.1 of the NPfI), where the existing traffic noise is 10 dB or more above the recommended amenity noise level, the project amenity level was set at 15 dB below the existing traffic noise level. Based on the noise monitoring undertaken at R02, this is applicable for the evening and night-time periods for residential receivers R01-R04. Road traffic noise modelling was undertaken to verify the exposure to traffic noise across each of the apartment buildings and confirm the applicability of high traffic noise amenity noise levels. This is detailed in **Appendix H**.

The NPfI states that when converting the project amenity level from $L_{Aeq(period)}$ to $L_{Aeq(15minute)}$, the $L_{Aeq(15minute)}$ is equal to the $L_{Aeq(period)}$ plus 3 dB, unless robust evidence is provided for an alternative approach (refer to Section 2.2 of the NPfI). While the main source of operational noise from data centres is typically mechanical plant which would generally operate continuously, the dominant items of plant at the development (ie the cooling towers) have variable frequency drives and noise emissions are expected to vary depending on the number of units in use, their load, and the current ambient temperature. It is noted that the noise modelling of mechanical plant at the development assumes all mechanical plant items conservatively operate at representative worst-case loads at all times (see **Section 4.2.1** for further information). As such, it is considered appropriate to apply the standard NPfI assumption of $L_{Aeq(15minute)}$ equal to the $L_{Aeq(period)}$ plus 3 dB for this project.

Table 13 Project Noise Trigger Levels

Receiver Type	Period	Amenity Noise Level L_{Aeq} (dBA)	Measured Noise Level (dBA)		Project Noise Trigger Levels $L_{Aeq(15minute)}$ (dBA)	
			RBL[1]	$L_{Aeq(period)}$	Intrusiveness	Amenity[2,3]
Residential (R01-R04)	Day	60	58	64	63	**58**
	Evening	50	55	62	60	**50**[4]
	Night	45	48	59	53	**47**[4]
Child care (R05)[5]	When in use	40 (internal) 60 (external)	-	-	-	**58**
Commercial (R06)	When in use	65	-	-	-	**63**

Note 1: RBL = Rating Background Level.

Note 2: The recommended amenity noise levels have been reduced by 5 dB, where appropriate, to give the project amenity noise levels due to other sources of industrial noise being present in the area, as outlined in the NPfI.

Note 3: The project amenity noise levels have been converted to a 15-minute level by adding 3 dB, as outlined in the NPfI.

Note 4: The project amenity level was set at 15 dB below the existing road traffic noise level, as outlined in the NPfI. See **Appendix H** for further details.

Note 5: The NPfI does not include a recommended amenity noise level for child care centres, however, amenity noise level for school classroom (internal) has been used for child care centres for similar SSDA's. The criterion is specified as an internal noise level for this receiver category. As the noise model predicts external noise levels, external noise levels have conservatively been taken to be 20 dB higher than the corresponding internal level due to fixed glazing.

3.3.2 Cumulative Noise Impacts

The NSW Government *Cumulative Impact Assessment Guidelines for State Significant Projects* requires that the potential combined effect of cumulative impacts on all nearby industrial developments to be considered when assessing potential noise impacts from state significant projects. The guideline references the NPfI when determining the approach to assessing the cumulative industrial noise impacts.

The NPfI states that it aims to limit continuing increases in cumulative industrial noise through the application of amenity noise levels, which are applicable to all industrial noise sources in an area.

The NPfI requires that the amenity noise levels which are applied to an individual project be reduced by 5 dB to allow for the potential cumulative impact from multiple sources of industrial noise in an area (including existing and new).

By doing this, the policy accounts for potential cumulative impacts by lowering the criteria for each individual development to ensure that the ambient noise level within an area from all industrial noise sources combined remains below the recommended amenity noise levels, where feasible and reasonable. The NPfI states that *"where the project amenity noise level applies and it can be met, no additional consideration of cumulative industrial noise is required"*.

The potential cumulative impacts from the development and other sources of industrial noise in the area are therefore accounted for in the proposal-specific PNTLs (see **Table 13**).

3.3.3 Sleep Disturbance

The potential for sleep disturbance from maximum noise level events from the proposal during the night-time period is required to be considered. This is applicable only to residential receivers.

The NPfI defines the sleep disturbance screening level as 52 dBA L_{AFmax} or the prevailing background level plus 15 dB, whichever is greater.

The sleep disturbance screening levels for the proposal are shown in **Table 14**.

Table 14 Sleep Disturbance Screening Levels

Location	Noise Level (dBA)	
	Measured Prevailing Night-time Background Level	Sleep Disturbance Screening Level[1]
R01-R04	48	63

Note 1: The sleep disturbance screening level as 52 dBA L_{AFmax} or the prevailing background level plus 15 dB, whichever is greater

A detailed maximum noise level event assessment should be completed where the sleep disturbance screening level is exceeded. The detailed assessment should cover the maximum noise level, the extent to which the maximum noise level exceeds the RBL, and the number of times this happens during the night-time period.

The NPfI refers to the *Road Noise Policy* (RNP) for additional information regarding sleep disturbance. enHealth Council studies are referenced which indicate that for short-term or transient noise events, for good sleep over eight hours the indoor L_{AFmax} sound pressure level should ideally not exceed around 45 dBA more than 10 or 15 times per night.

The RNP goes on to conclude that from the research on sleep disturbance to date:

- Maximum internal noise levels below 50 dBA to 55 dBA are unlikely to awaken people from sleep
- One or two events per night with maximum internal noise levels of 65-70 dBA are not likely to affect health and wellbeing significantly.

3.3.4 Corrections for Annoying Noise Characteristics

Sources of industrial noise can cause greater annoyance where they contain certain characteristics, such as tonality, intermittency or dominant low-frequency content. The NPfI specifies the following modifying factor corrections, shown in **Table 15**, which are to be applied where annoying characteristics are present. The corrections are to be added to the noise level at the receiver before comparison with the Project Noise Trigger Levels.

Table 15 NPfI Modifying Factor Corrections

Factor	Assessment/ Measurement	When to Apply	Correction[1]
Tonal noise	One-third octave or narrow band analysis	Level of one-third octave band exceeds the level of the adjacent bands on both sides by the levels defined in the NPfI.	5 dB[2]
Low-frequency noise	Measurement of source contribution C-weighted and A-weighted level and one-third octave measurements	Measure/assess source contribution C and A weighted $L_{eq,t}$ levels over same time period. Correction to be applied where the C minus A level is 15 dB or more and the level to which the thresholds defined in the NPfI are exceeded.	2 or 5 dB[2]
Intermittent noise	Subjectively assessed but should be assisted with measurement to gauge the extent of change in noise level	The source noise heard at the receiver varies by more than 5 dB and the intermittent nature of the noise is clearly audible. The NPfI further defines intermittent noise as noise where the level suddenly drops/increases several times during the assessment period, with a noticeable change in source noise level of at least 5 dB, for example, equipment cycling on and off. The EPA has confirmed[4] that the intermittent correction does not apply to short-term events that emerge above the general industrial noise level and is therefore not applicable to industrial or commercial sites that have vehicle or plant movements at night, including audible reversing alarms. The intermittency correction is not intended to be applied to changes in noise level due to meteorology.	5 dB[3]

Factor	Assessment/ Measurement	When to Apply	Correction[1]
Maximum adjustment	Refer to individual modifying factors	Where two or more modifying factors are indicated.	Maximum correction of 10 dB[2] (excluding duration correction)

Note 1: Corrections to be added to the measured or predicted levels.

Note 2: Where a source emits tonal and low-frequency noise, only one 5 dB correction should be applied if the tone is in the low-frequency range, that is, at or below 160 Hz.

Note 3: Adjustment to be applied to night-time only.

Note 4: *How to Apply the Noise Policy for Industry Intermittent Modifying Factor Corrections*, NSW Environment Protection Authority, Acoustics Australia Vol. 50, No. 3, September 2022.

Details of the modifying factor corrections applied in the assessment are provided in **Section 4.2.4**.

3.3.5 Residual Impacts

The NPfI defines residual noise impacts as exceedances of the Project Noise Trigger Levels which remain after all feasible and reasonable source and pathway mitigation measures have been considered.

The significance of residual noise impacts, as defined in the NPfI, is shown in **Table 16.** Examples of receiver-based treatments that can be used to mitigate residual impacts are shown in **Table 17**.

Table 16 NPfI Significance of Residual Noise Impacts

If the Predicted Noise Level minus the Project Noise Trigger Level is:	And the Total Cumulative Industrial Noise Levels is:	Then the Significance of the Residual Noise Level is:
≤ 2 dBA	Not applicable	Negligible
≥ 3 but ≤ 5 dBA	< recommended amenity noise level or > recommended amenity noise level, but the increase in total cumulative industrial noise level resulting from the development is less than or equal to 1dB	Marginal
≥ 3 but ≤ 5 dBA	> recommended amenity noise level and the increase in total cumulative industrial noise level resulting from the development is more than 1 dB	Moderate
> 5 dBA	≤ recommended amenity noise level	Moderate
	> recommended amenity noise level	Significant

Table 17 NPfI Examples of Receiver-based Treatments to Mitigate Residual Noise Impacts

Significance of Residual Noise Impact	Example of Potential Treatment
Negligible	The exceedances would not be discernible by the average listener and therefore would not warrant receiver-based treatments or controls.
Marginal	Provide mechanical ventilation/comfort condition systems to enable windows to be closed without compromising internal air quality/amenity.
Moderate	As for ‘marginal’, but also upgraded facade elements, such as windows, doors or roof insulation, to further increase the ability of the building facade to reduce noise levels.
Significant	May include suitable commercial agreements where considered feasible and reasonable.

3.3.6 Traffic on Surrounding Roads

The potential impacts from proposal-related traffic on the surrounding public roads are assessed using the NSW EPA *Road Noise Policy* (RNP).

An initial screening test is first applied to evaluate if existing road traffic noise levels are expected to increase by more than 2.0 dB. Where this is considered likely, further assessment is required using the RNP criteria shown in **Table 18**.

Table 18 RNP/NCG Criteria for Assessing Traffic on Public Roads

Road Category	Type of Project/Land Use	Assessment Criteria (dBA)	
		Daytime (7 am – 10 pm)	Night-time (10 pm – 7 am)
Freeway/ arterial/ sub-arterial roads	Existing residences affected by additional traffic on existing freeways/arterial/sub-arterial roads generated by land use developments	$L_{Aeq(15hour)}$ 60 (external)	$L_{Aeq(9hour)}$ 55 (external)
Local roads	Existing residences affected by additional traffic on existing local roads generated by land use developments	$L_{Aeq(1hour)}$ 55 (external)	$L_{Aeq(1hour)}$ 50 (external)

4.0 Methodology

4.1 Construction Noise and Vibration Assessment

A noise model of the study area has been used to predict noise levels from the proposed construction work to all surrounding receivers. The model uses ISO 9613-2 algorithms in SoundPLAN software.

Local terrain, receiver buildings and structures were digitised in the noise model to develop a three-dimensional representation of the construction sites and surrounding areas.

4.1.1 Construction Activities

Representative scenarios have been developed to assess the likely impacts from the various construction phases of the proposal. These scenarios are shown in **Table 19**.

The assessment uses 'realistic worst-case' scenarios to determine the impacts from the noisiest 15-minute period that are likely to occur for each work scenario, as required by the ICNG. The impacts represent construction noise levels without mitigation applied.

The sound power levels for the construction equipment used in each scenario are presented in **Appendix C.**

Table 19 Construction Equipment

Scenario	Works Activity	Equipment	Likely Duration
W.01	Vegetation clearing	Chainsaw, chipper, excavator, front end loader, dump truck, water truck	1 month
W.02	Demolition	Rockbreaker, dozer, front end loader, dump truck, water truck	6 months
W.03	Earthworks	Dozer, excavator, front end loader, vibratory roller, dump truck, water truck	3 months
W.04	Excavation of hard rock	Rockbreaker, dozer, excavator, front end loader, dump truck, water truck	1 month
W.05	Construction of pads and hardstands	Concrete pump, concrete truck/agitator, concrete vibrator	6 months
W.06a	Construction of structures and equipment installation	Elevated working platform, flatbed truck, hand tools, mobile crane	12 months
W.06b	Rooftop equipment installation	Elevated working platform, flatbed truck, hand tools, mobile crane – hand tools and elevated working platform are located on the mechanical plant gantry on the roof of the data centre building for this scenario	6 months

The above scenarios indicatively have one of each equipment item located in the same place, ie the nearest part of the site to each receiver. All equipment is indicatively modelled with a source height of 1.5 m above ground level.

The exception to the above is W.06b (rooftop equipment installation). This scenario includes shielding from the data centre building, with the mobile crane and flatbed truck modelled on the western side of the building at a height of 1.5 m above ground level, and with hand tools and the elevated working platform modelled at 1.5 m above the mechanical plant gantry level on the roof of the data centre building. This scenario conservatively assumes that the rooftop screening detailed in **Section 4.2.1.1** has not yet been constructed on the roof, ie the noise sources are just on a flat rooftop.

4.1.2 Hours of Construction

Construction activities for the proposal would only be undertaken during the following hours:

- 7:00 am to 6:00 pm, Mondays to Fridays
- 8:00 am to 1:00 pm on Saturdays
- At no time on Sundays or Public Holidays.

4.2 Operational Noise Assessment

The potential operational noise levels from the proposal have been predicted to the surrounding receivers using the ISO 9613-2 algorithm in SoundPLAN V8.2, implemented in accordance with ISO 17534.

ISO 9613-2 is an industry standard algorithm that is considered suitable for use in the prediction of noise from industrial sources where intervening objects provide acoustic shielding, such as at the subject site and surrounding area.

The ISO 9613-2 algorithm predicts continuous A-weighted sound pressure levels under noise-enhancing meteorological conditions favourable to downwind propagation, or equivalently, propagation under a well-developed, moderate, ground-based temperature inversion, such as commonly occurs on clear calm nights.

Downwind propagation conditions include wind from source to receiver, with wind speeds of around 1 to 5 m/s, measured at a height of 3 to 11 m above the ground. These propagation conditions are considered consistent with the noise-enhancing weather conditions specified in *Fact Sheet D: Accounting for noise-enhancing weather conditions* of the NPfI.

ISO 9613-2 has been used extensively on industrial projects in Australia over several decades and has been accepted previously by NSW DPE (now DPHI) in numerous environmental noise assessments.

The noise model includes ground topography, ground type (ground absorption modelled at 0.0 (hard ground) in the project area), buildings and representative worst-case noise sources from the proposal.

The potential impacts have been determined by comparing the predicted worst-case noise levels to the NPfI PNTLs in a 15-minute assessment period.

Noise levels have been assessed at the identified sensitive receivers with reference to the requirements of 'Section 2.6 – Assessment Locations' of the NPfI. This includes assessment of impacts at all floors of the identified multi-storey buildings.

4.2.1 Operational Noise Sources

The proposal is in the early design stages and the future tenants are currently unknown. Several assumptions have been made regarding the future tenants and likely sources of noise. These assumptions have been used to develop representative worst-case noise modelling scenarios that reflect the expected highest noise emissions that the development would likely emit.

The proposal is a speculative development with no tenants committed. The facility has been designed to accommodate typical data centre users.

The development comprises a multi-storey data centre building with associated data halls, plant rooms, backup generators, ancillary office area, vehicle access, loading dock, carparking, security hut and fencing with secure access. Design plans of the development are shown in **Figure 2** to **Figure 5.**

Light vehicle access would be from Ricketty Street and truck access would be from Gardeners Road. The site would be in use 24 hours a day. It is anticipated that deliveries and loading dock access would typically be via medium rigid trucks.

The main sources of operational noise at the development are expected to include:

- Rooftop cooling towers and other externally located items of mechanical plant
- Testing of backup generators (see **Section 4.2.2.1** for more details)
- Internally located mechanical plant, such as items within electrical plant rooms and other mechanical services areas
- On-site light and heavy vehicle movements
- Loading dock activities
- Off-site vehicle movements.

A summary of the expected noise sources and representative worst-case assessment scenarios associated with the operation of the development is provided below. The location of the modelled noise sources is shown in **Figure 6** and **Figure 7**.

Figure 6 Modelled Noise Sources – Ground Level Sources

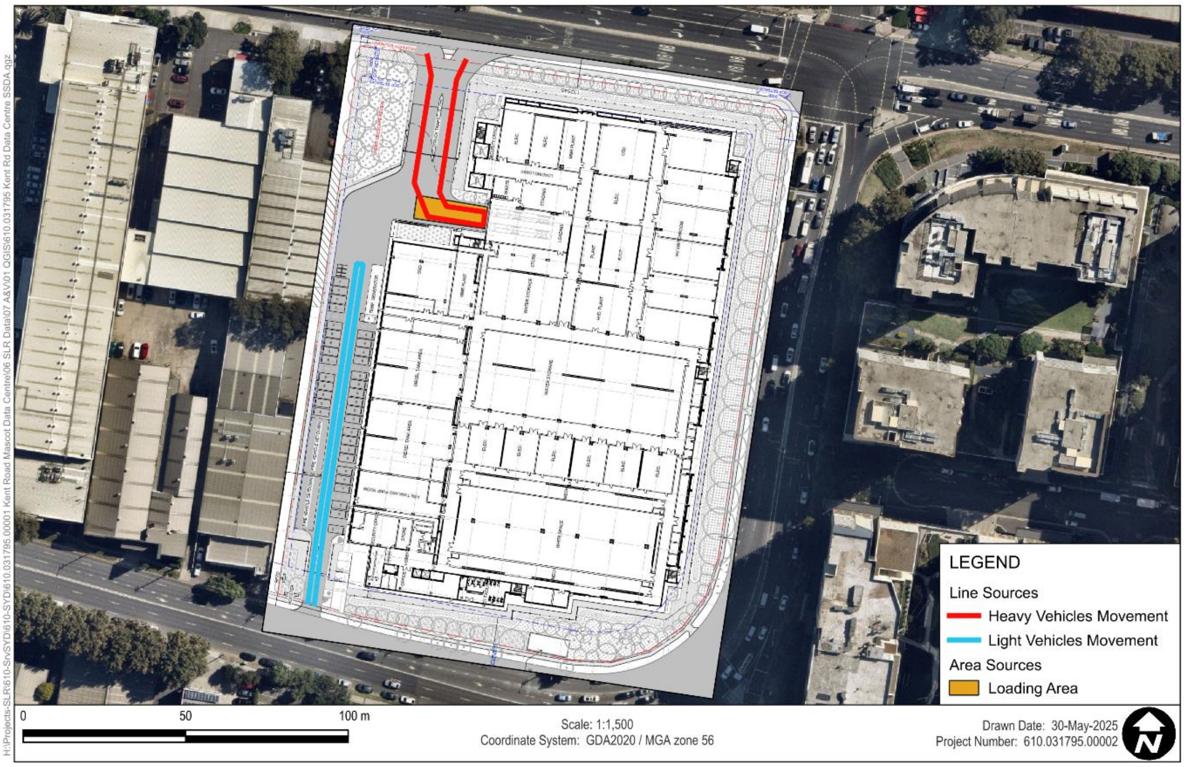
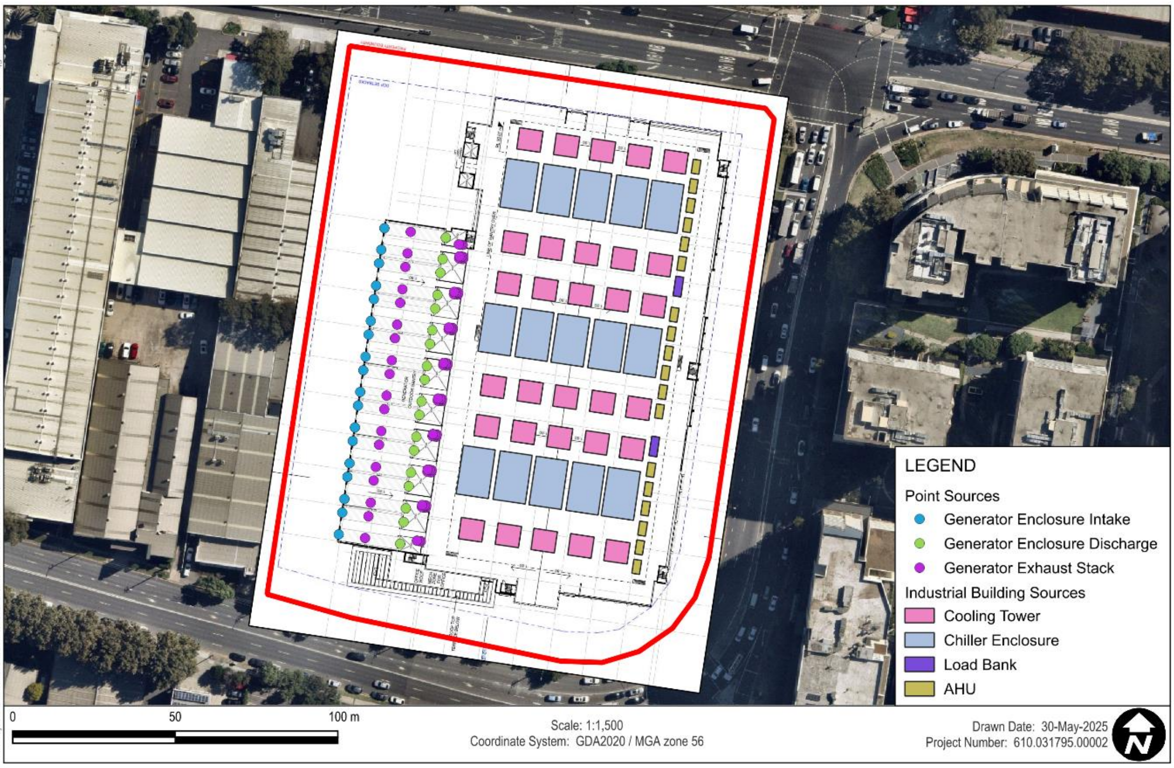


Figure 7 Modelled Noise Sources – Elevated Sources



4.2.1.1 Roof Layout

The proposed roof layout incorporates the following features:

- Acoustic louvre screens to a height of RL 43.25 m along the eastern elevation (around 2.5 m behind the parapet), with an undercut of around 2.35 m.
- Solid walls to a height of RL 43.0 m along part of the northern, eastern and southern elevations.
- Solid walls to a height of RL 39.8 m along part of the northern elevation.
- Solid walls to a height of RL 36.55 m along part of the northern, western and southern elevations.
- Solid parapet wall to a height of RL 33.3 m along all other areas of each elevation.
- Perforated metal screens to a height of RL 43.0 m around the generator areas. These screens are not acoustically rated and are conservatively assumed to provide no noise attenuation.
- Solid walled voids for generator discharge adjacent to the generators to a height of RL 43.0 m.

The indicative screens are shown in **Figure 8** to **Figure 10**. These screens have been included in the noise model. The design of the roof louvres, screens and parapets is indicative and will be reviewed during a later design stage of the project.

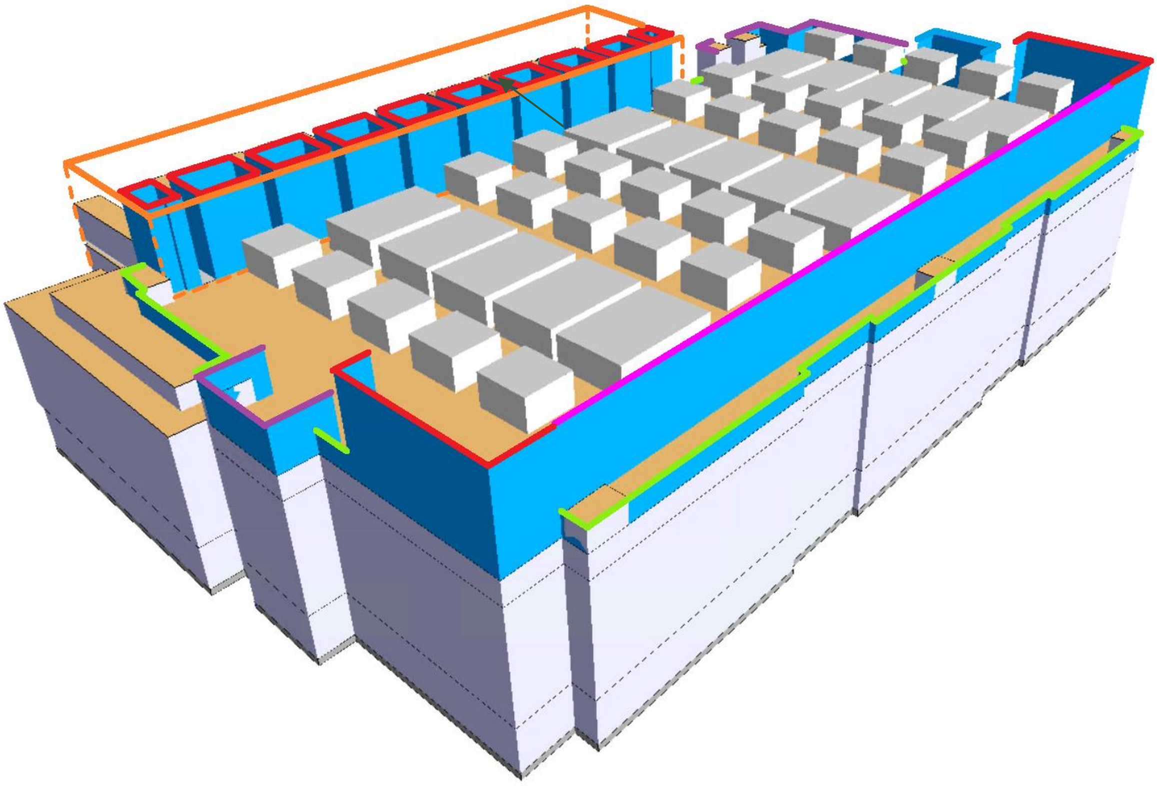
The acoustic louvre screen modelling methodology is described below:

- The acoustic louvre screen is represented as a solid noise wall.
- The acoustic louvre wall is dissected into a high resolution grid of receiver points and incident noise levels from the rooftop plant are calculated for the inside face of the wall.
- A grid of area sources is applied to the outside face of the wall, emitting the incident noise levels minus the transmission loss of the example acoustic louvre.
- The acoustic louvre screen indicatively uses IAC Acoustics Noishield Model 2R acoustic louvre transmission loss (acoustic rating Rw 24 dB). Acoustic louvre data sheet is provided in **Appendix G**.

Figure 8 Indicative Screening on Rooftop – Top-Down View

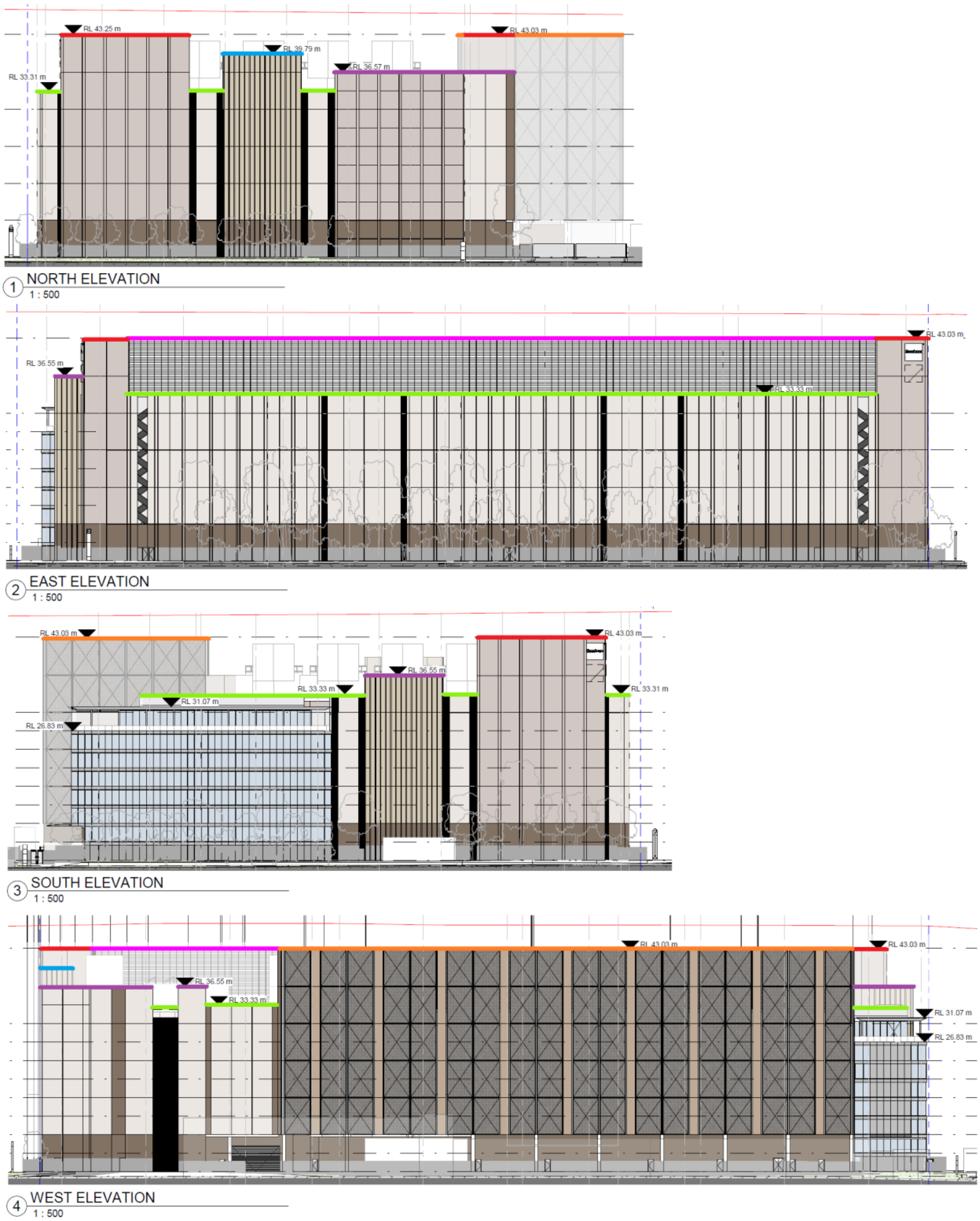
Note 1: Pink is acoustic louvre screen to RL 43.25 m with 2.35 m undercut. Red is solid wall to RL 43.0m. Blue is solid wall to RL 39.8 m. Purple is solid wall to RL 36.55 m. Green is solid parapet wall to RL 33.3 m. Orange is perforated metal screen to RL 43.0 m.

Figure 9 Indicative Screening on Rooftop – 3D View



Note 1: Pink is acoustic louvre screen to RL 43.25 m with 2.35 m undercut. Red is solid wall to RL 43.0m. Blue is solid wall to RL 39.8 m. Purple is solid wall to RL 36.55 m. Green is solid parapet wall to RL 33.3 m. Orange is perforated metal screen to RL 43.0 m (perforated screens are not acoustically rated and are conservatively not included in the noise model).

Figure 10 Indicative Screening on Rooftop – Elevations



Note 1: Pink is acoustic louvre screen to RL 43.25 m with 2.35 m undercut. Red is solid wall to RL 43.0m. Blue is solid wall to RL 39.8 m. Purple is solid wall to RL 36.55 m. Green is solid parapet wall to RL 33.3 m. Orange is perforated metal screen to RL 43.0 m.

4.2.1.2 On-Site Traffic

On-site vehicles have been modelled using the data provided by the project's traffic consultant in **Table 20**. The volumes are representative of the expected worst-case 15-minute period for the daytime, evening and night-time. The volumes conservatively assume that light and heavy vehicles access the site concurrently during the worst-case 15-minute assessment period. In reality, vehicle access would be unlikely to occur concurrently, particularly during the night-time.

Heavy vehicle deliveries and loading dock access would typically be via medium rigid trucks.

Table 20 Vehicle Traffic Data – Worst-case 15-Minute Period

Vehicle Type	Location	Sound Power Level (dBA)	Vehicle Speed (km/h)	Number of Vehicles in Worst-case 15-Minute Period[1]		
				Daytime (7am to 6pm)	Evening (6pm to 10pm)	Night-time (10pm to 7am)
Medium trucks	Vehicle entry and hardstand	95[2]	5	1	0	0
Light vehicles	Vehicle entry and carpark	90[2]	5	9	4	5

Note 1: Total vehicles, includes both inbound and outbound vehicles. Volumes are rounded up to whole numbers for display purposes.

Note 2: Sound power level based on SLR measurement data.

4.2.1.3 Loading Docks

Details of the loading dock noise sources are shown in **Table 21**. The various sources have been modelled in the loading dock area based on the corresponding number of heavy vehicle movements in the worst-case 15-minute periods (see **Table 20**). The loading docks are recessed and no forklifts would be operated externally.

Table 21 Typical Hardstand and Loading Dock Noise Sources

Noise Source	Sound Power Level (dBA)[1]	Typical Duration of Use in Worst-case 15-minute Period
Truck reversing alarm	107[2,3]	30 seconds
Air brakes	118	1 second
Roller door	94	15 seconds

Note 1: SWLs based on measurement data, where appropriate.

Note 2: SWL based on recommendation to use broadband reversing alarms, see **Section 7.2**.

Note 3: SWL includes a -3 dB reduction due to alarms being discrete events.

4.2.1.4 Mechanical Plant

The main sources of externally located mechanical plant noise at the development would be the rooftop cooling towers, chiller enclosures and air handling units (AHUs), and maintenance testing of the backup generators.

The mechanical plant used in the assessment, together with corresponding sound power levels and number of units and locations, are detailed in **Table 22**. Mechanical plant specifications and data sheets are provided in **Appendix G**.

Table 22 Mechanical Plant

Noise Source	Example Unit	Sound Power Level (dBA)	Locations and Operations
Cooling towers	BAC XES3E-1222-07M ENDURA/H	78 dBA[1] Sound pressure levels at 15 m: Air Inlet: 43 dBA End: 36 dBA Top: 46 dBA	30 cooling towers on roof of data centre (see **Figure 7**). Assumed to operate 24 hours a day. Cooling towers are modelled as 'industrial building' objects in the noise model, which are equivalent to a 3D box with a noise source on each face. The noise sources were calibrated based on the manufacturers data to achieve the stated sound pressure levels at a distance of 15 m.
Chillers	York YZ_MA04 1AN037P078HA	67 dBA breakout from enclosure	30 pre-built chiller enclosures on roof of data centre (see **Figure 7**). Assumed to operate 24 hours a day. Chiller enclosures are modelled as 'industrial building' objects in the noise model.
AHUs	Airchange PCU-N-D 40	52 dBA	18 AHUs on roof of data centre see **Figure 7**). Assumed to operate 24 hours a day. AHU's are modelled as 'industrial building' objects in the noise model.
Backup generators	Rolls Royce MTU 16V4000 DS2500	Intake design SWL 89 dBA[2] Discharge design SWL 89 dBA[2] Exhaust stack design SWL 89 dBA[2]	72 backup generators located in four levels in the west area of the site. The exhaust stacks for all generators terminate around RL 43.0 m. The backup generators would be tested during daytime hours (see **Section 4.2.2.1** for more details). Generators are modelled as individual enclosures. Enclosure air intake and discharge are modelled as point sources at the centroid of the enclosure end faces. Generator exhaust stacks rise up individually and terminate at a height of around RL 43.0m, modelled as point sources at the exhaust terminations.
Load bank	Sephco WAR20CL2500	106 dBA	2 load banks located on roof of data centre (see **Figure 7**) will be used during testing of backup generators. Load banks are modelled as 'industrial building' objects in the noise model.

Note 1: Sound power level of cooling towers based on unit operating at typical peak speed based on advice from the manufacturer. Conservatively modelled during the evening and night-time at the typical peak speed for the daytime.

Note 2: Generator enclosures are custom built with design sound power levels for the generator enclosure intakes and discharges, and generator exhaust gas stacks.

Various items of mechanical plant would also be located internally within the data centre. This includes items within the various data halls, electrical plant rooms and mechanical services areas. Details regarding these internal items of equipment are not currently available, however, breakout noise from these items is expected to be relatively minor compared to noise from externally located mechanical plant and testing of backup generators given the internal plant areas are generally separated from the external facades by service corridors (see **Figure 2** to **Figure 5**).

The exact requirements for all items of mechanical plant would be determined as the project progresses when specifics are known about tenant requirements. Further noise modelling of all items of mechanical plant would be completed during the production of later noise assessments when the selected mechanical plant is known.

4.2.2 Operational Scenarios

4.2.2.1 Maintenance Testing of Backup Generators

The backup generators would require scheduled maintenance and would be tested during daytime business hours (ie 7 am to 6 pm Monday to Saturday and 8 am to 6 pm Sundays and public holidays). The maintenance testing schedule would include quarterly and annual testing, with a maximum of two generators being tested at a time, accompanied by two load banks.

The generators will operate as a standby power supply in the event of mains failure. The electricity feeders are fully rated supplies of the entire site load, with each feeder from a diverse bus section of the zone substation. Historical power disruption for the area (refer to Services Infrastructure Report) is around 74.5 minutes of cumulative incidents per year per customer over the past 10 years. This equates to less than 0.01% likelihood of occurrence in a year. Major power interruptions requiring the simultaneous operation of all standby generators would only occur infrequently and for a limited time.

Details regarding the backup generator testing are shown in **Table 23**.

Table 23 Proposed Generator Maintenance Testing Regime

Parameter	Value	
Test frequency per generator	Quarterly maintenance*	Annually operational run
No of generators	72	72
No of tests each year per generator	3	1
Run time per test	65 minutes	90 minutes
Cooldown per test	5 minutes	5 minutes
No of generators per test	2	2
No of load banks per test	2	2
Cumulative hours	183 hours	
Testing scehdule	7:00 am to 6:00 pm Monday to Saturday, and 8:00 am to 6:00 pm Sundays & public holidays	

Note: Generator tested under low load is to be undertaken such that the emissions do not exceed the POEO (Clean Air) Standard of Concentration for non-scheduled premises.

* Quarterly maintenance occurs in three quarters of the year, annual testing occurs in the 4th quarter.

Source: Data provided by ARUP 2025

4.2.2.2 Emergency Power Failure

Operation of backup generators (outside of maintenance/testing) is only expected to occur during an emergency where mains power to the development is lost. It is not considered reasonable for the development to be required to meet the operational noise criteria during this infrequent emergency scenario and it has not been assessed further.

4.2.2.3 Representative Operational Scenarios

Representative scenarios have been developed to assess the likely impacts from the operation of the proposal. These scenarios are shown in **Table 24**.

Table 24 Operational Assessment Scenarios

Scenario	Name	Description
OP.01	Normal Operations	• All equipment operating at typical peak capacity, except for backup generators and load banks. • Assessed during daytime, evening and night-time periods.
OP.02	Maintenance/Testing Operations	• All equipment operating at typical peak capacity, including concurrent maintenance / testing of two backup generators with two load banks. • All generator locations were modelled, with the worst-case generators for each receiver included in the predicted noise levels for that receiver. • Assessed during daytime only.

4.2.3 Noise Source Inventory

A noise source inventory which includes the details of the various operational noise sources at the development is shown in **Table 25**.

Table 25 Noise Source Inventory

Category	Noise Source	Usage	Reference for Noise Data
On-site traffic	Light vehicles	Light vehicles would access the development and park in the car park. Modelled in the location shown in **Figure 6** using vehicle volumes in **Table 20**.	Sound power level taken from measurement data of various light vehicle types and models at speeds of up to around 40 km/h, including vehicle acceleration.
	Medium vehicle	Deliveries to the development would be via heavy vehicles. Heavy vehicle deliveries would be limited to medium rigid trucks due to site constraints. Heavy vehicles would access the development via Gardeners Road and travel to the loading docks. Modelled on the heavy vehicle route shown in **Figure 6** using vehicle volumes in **Table 20**.	Sound power level taken from historical measurement data of various medium rigid truck types and models in approximate 5 to 15 tonne range.

Category	Noise Source	Usage	Reference for Noise Data
Loading docks	Reversing alarms, air brakes, roller doors	Heavy vehicle deliveries would be unloaded via the recessed loading docks. No forklifts would be operated externally. Modelled in the loading docks shown in **Figure 6** using vehicle volumes in **Table 20**.	Sound power level taken from historical measurement data of typical loading dock activities at various warehousing and distribution facilities.
Internal activities	Typical data centre activities	Internal noise-generating activities would be associated with typical data centre activities, including mechanical plant in the various data halls, electrical plant rooms and mechanical services areas.	Details regarding these internal items of equipment are not currently available at this early stage in the development, however, breakout noise from these items is expected to be relatively minor (compared to noise from externally located mechanical plant and testing of backup generators) given the internal plant areas are generally separated from the external facades by service corridors.
Mechanical plant	Cooling towers	Cooling towers would be used to expel heat from the data centre operations. Indicative cooling tower requirements are 30 units. These units would operate 24 hours a day and have been modelled on the data centre roof shown in **Figure 7** using the details in **Table 22**.	Sound power level and directivity taken from manufacturers specifications for the indicative units, supplied by the project team. Low-frequency 1/3 octave spectrum has been conservatively estimated based on measurements of similar equipment, as detailed in **Section 4.2.4**.
	Chillers	Chillers would be used as a heat exchange for various data centre operations. Indicative chiller requirements are 30 units in pre-built chiller enclosures on the roof of the data. These units would operate 24 hours a day and have been modelled on the data centre roof shown in **Figure 7** using the details in **Table 22**.	Sound power level taken from manufacturers specifications for the indicative units, supplied by the project team.
	Air handling units	Air handling units would be used for to cool and pressurise internal spaces within the data centre and office. Indicative AHU requirements are 18 units. These units would operate 24 hours a day and have been modelled on the data centre roof shown in **Figure 7** using the details in **Table 22**.	Sound power level taken from manufacturers specifications for the indicative units, supplied by the project team.

Category	Noise Source	Usage	Reference for Noise Data
	Backup generators	Backup generators would be used to provide power to the data centre in the event of loss of mains power. 72 backup generators have been modelled in four levels in the west area of the site shown in **Figure 7** using the details in **Table 22**. Backup generators would be operated as detailed in **Section 4.2.2**.	The generators would be housed in custom built containers with exhaust stacks that terminate above roof level. Design sound power levels were supplied by the project team based in manufacturers specifications and indicative attenuator and silencer designs to meet the design sound power levels.
	Load bank	Two load banks will be used during testing of backup generators and have been modelled on the data centre roof shown in **Figure 7** using the details in **Table 22**. The load banks would be operated only during testing of backup generators as detailed in **Section 4.2.2**..	Sound power level taken from manufacturers specifications for the indicative load bank unit, supplied by the project team.

4.2.4 Corrections for Annoying Noise Characteristics

The potential annoying noise characteristics and modifying factor corrections relevant to the proposal are tonality, low-frequency noise and intermittent noise. The assessment of tonality and low-frequency noise is typically limited by the available data for the applicable noise sources, with manufacturer sound power level data for mechanical plant typically being supplied as either a single overall level, or limited octave band levels (typically 63 Hz to 8 kHz), rather than 1/3 octave levels required for NPfI assessment of tonality and low-frequency noise. Additionally, all mechanical plant is indicative and will be reviewed during detailed design once tenant requirements are confirmed.

Cooling towers are the dominant item of equipment for normal operations. The proposed data centre at 1-5 Khartoum Road, Macquarie Park, proposes to use the same model cooling towers as this assessment (ie, BAC XES3E-1222-07M ENDURA/H) (refer to Arup report *“MPark Talavera Road Data Centre Noise and Vibration Impact Assessment”*, reference *304093-AC05 v5 SSDA NVIA*, dated December 2024) (1-5 Khartoum Rd NVIA). The 1-5 Khartoum Rd NVIA was sourced from the NSW Major Projects Planning Portal.

As low frequency 1/3 octave spectrum noise levels for the cooling towers are not provided on the manufacturer data sheets for the units, the 1/3 octave spectrum below 63 Hz for cooling towers has been conservatively estimated based on the data from the 1-5 Khartoum Rd NVIA, adjusted for the cooling tower unit sound power level in this assessment.

The adopted 1/3 octave spectrum for the cooling towers is shown in **Table 26**.

Table 26 Adopted 1/3 Octave Spectrum – Cooling Towers

<table>
<tr><th rowspan="2">Source</th><th colspan="5">Unweighted 1/3 Octave Frequency (Hz) Sound Power Level (dBZ)</th><th rowspan="2">Total A-Weighted Sound Power Level (dBA)</th></tr>
<tr><th>10
12.5
16
20
25
31.5
40</th><th>50
63
80
100
125
160</th><th>200
250
315
400
500
630</th><th>800
1,000
1,250
1,600
2,000
2,500</th><th>3,150
4,000
5,000
6,300
8,000
10,000</th></tr>
<tr><td>Cooling Towers</td><td>77
80
83
85
81
81
81</td><td>80
78
78
78
77
76</td><td>74
72
71
69
67
67</td><td>67
67
67
67
67
65</td><td>63
61
59
56
53
53</td><td>78</td></tr>
</table>

An example of the tonality and low-frequency assessment results is shown in **Table 27** based on the predicted operational noise levels at the most-affected residential receiver. The below assessment has been undertaken for all applicable receivers to determine the applicable corrections for annoying noise characteristics.

Table 27 Assessment of Annoying Noise Characteristics

<table>
<tr><th rowspan="3">Most-Affected Receiver</th><th colspan="6">Predicted L$_{eq(15minute)}$ Noise Levels – OP.01 Night</th><th rowspan="3">Tonal Trigger</th><th rowspan="3">Low Frequency Trigger</th></tr>
<tr><th colspan="5">Unweighted 1/3 Octave Frequency (Hz) (dBZ)</th><th rowspan="2">Total Noise Level (dB)</th></tr>
<tr><th>10
12.5
16
20
25
31.5
40</th><th>50
63
80
100
125
160</th><th>200
250
315
400
500
630</th><th>800
1,000
1,250
1,600
2,000
2,500</th><th>3,150
4,000
5,000
6,300
8,000
10,000</th></tr>
<tr><td>R02
top floor</td><td>48
51
54
55
52
52
51</td><td>49
49
47
46
46
44</td><td>42
41
40
39
38
38</td><td>38
38
36
35
34
32</td><td>30
27
24
21
17
11</td><td>47 dBA
62 dBZ
58 dBC</td><td>No</td><td>No</td></tr>
</table>

The above assessment has been undertaken for all applicable receivers to determine the applicable corrections for annoying noise characteristics, detailed as follows:

- **Tonality** – the only source identified with potential tonal characteristics is truck reversing alarms. However, when considering broadband reversing alarms have been recommended as a noise mitigation measure (see **Section 7.2**), it is unlikely that this noise source would result in tonal noise impacts at the receivers and no corrections have been applied.
- **Low frequency noise** – noise levels at residential receivers from development-related mechanical plant were analysed as per the requirements of the NPfI and are not expected to result in low frequency noise impacts. No corrections have been applied.
- **Intermittent noise** – the NPfI defines intermittent noise as noise heard at the receiver where the level suddenly drops or increases several times during the assessment period, with a noticeable change of at least 5 dB. The intermittent correction does not apply to short-term events that emerge above the general industrial noise level and is therefore not applicable to industrial or commercial sites that have vehicle or plant movements at night, including audible reversing alarms. While testing of the backup generators may be intermittent, the testing is only undertaken during the daytime when no correction is applicable. No other sources have been identified with potential intermittent characteristics.

The above corrections for annoying noise characteristics will be reviewed during the detailed design stage of the project when tenant requirements for specific mechanical plant are known.

4.2.5 Noise Sources with Potential for Sleep Disturbance

As the development is proposed to operate 24-hours a day, noise emissions during the night-time require assessment for potential sleep disturbance at the nearest residential receivers. The details of typical activities with the potential to cause sleep disturbance are shown in **Table 28**.

The various sources have been modelled in the car parking area and light vehicle access (see **Figure 6**). It is noted that truck movements and loading dock operations are not proposed during the night-time period.

Table 28 Sleep Disturbance Noise Events – L_{Amax} Sound Power Levels

Noise Source	Sound Power Level L_{Amax} (dBA)
Light vehicle movement and parking	100

4.2.6 Off-site Road Traffic

Access to/from the site would be via Ricketty Street or Gardeners Road for light vehicles, and Gardeners Road for heavy vehicles. Daytime and night-time vehicle movements from the proposed development have been provided by the projects traffic consultant, detailed as follows:

- Daytime (7am to 10pm) – 85 light vehicle movements on Ricketty Street, 87 light vehicle movements on Gardeners Road, and 14 heavy vehicle movements on Gardeners Road.
- Night-time (10pm to 7am) – 22 light vehicle movements on Ricketty Street, 20 light vehicle movements on Gardeners Road, and 0 heavy vehicle movements.

Additionally, the on-site structures (buildings, screens, large equipment, etc) have the potential to affect off-site traffic noise at the receivers:

- Screening by the on-site structures to the wider road network, potentially reducing traffic noise levels at some receivers.
- Reflection of traffic noise off the on-site structures, potentially increasing traffic noise levels at some receivers.

Traffic counting was undertaken on Gardeners Road, Ricketty Street, Kent Road and Bourke Street in April 2025 to measure the existing traffic volumes, types and speed. The results of the traffic counts, along with assessment of traffic noise impacts with and without the development are detailed in **Appendix H**.

4.2.7 Weather Conditions

Fact Sheet D of the NPfI requires noise assessments to consider the potential effects of noise-enhancing weather conditions, such as wind from the source to the receiver and/or temperature inversions.

The nearest sensitive receivers are within 200 m of the proposal site and the effects of weather on noise levels are expected to be minimal. Notwithstanding, the noise prediction modelling uses ISO 9613-2 algorithms which include noise-enhancing weather conditions including downwind propagation, or equivalently, propagation under a well-developed moderate ground-based temperature inversion.

As such, the assessment has conservatively applied noise-enhancing weather conditions for all periods as per Option 1 of Fact Sheet D of the NPfI.

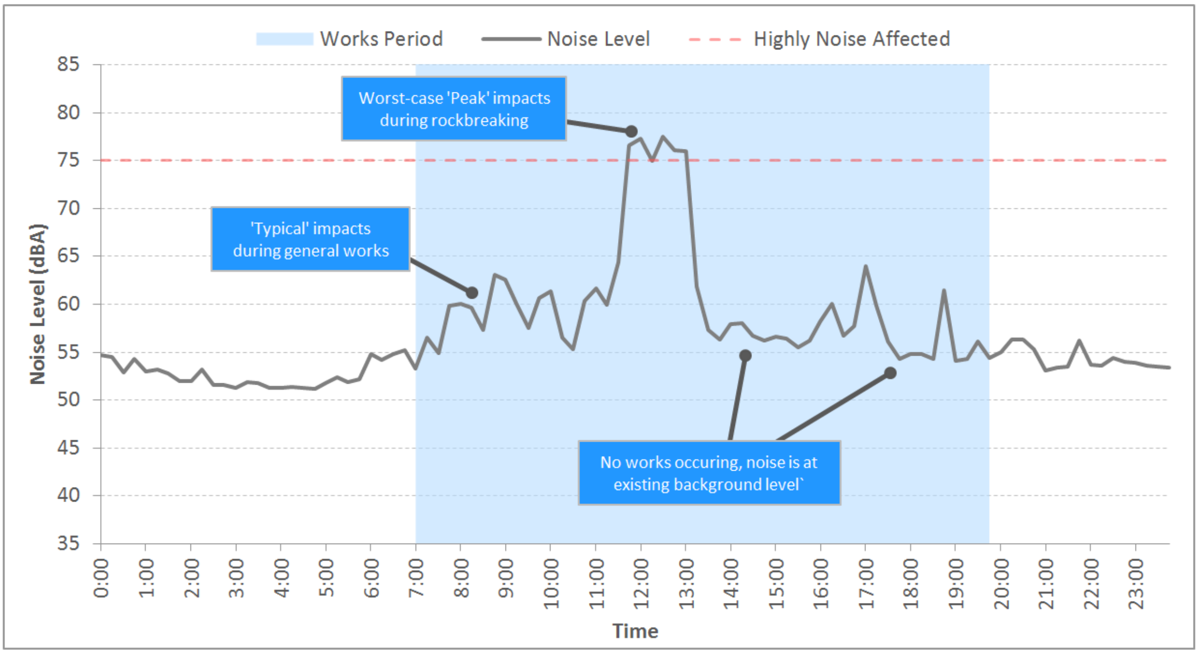
5.0 Assessment of Impacts

5.1 Construction Noise

5.1.1 Duration of Construction Noise Impacts

The following summary of construction noise impacts is based on the predicted noise levels at the most-affected receivers and is representative of the worst-case situation where construction equipment is at the closest point of the site to each receiver. For most works, construction noise impacts would frequently be lower than predicted as the worst-case situation is typically only apparent for a relatively short period when noisy equipment is in use. This concept is illustrated in **Figure 11**, which shows noise levels measured next to major construction works during a period of 'peak impact' rock-breaking and shows how construction noise levels vary over the works period.

Figure 11 Example of Indicative Construction Noise Levels During Rock-Breaking



Note 1: The measurement location was around 40 metres away from the works.

In the above example, while the worst-case noise levels result in highly noise affected impacts, they only last for part of the works period and the noise levels during 'typical impacts' are much lower. There are also periods when no works are occurring, and noise levels are at the existing background level (eg road traffic and general urban hum).

5.1.2 Predicted Construction Noise Levels

The predicted noise levels at the most-affected sensitive receivers surrounding the site are shown in **Table 29** and exceedances of the NMLs are shown in **Table 30**.

The predictions represent a realistic worst-case scenario where the equipment in each scenario is working concurrently and the nearest location to each receiver. It is expected that noise levels would frequently be lower than the worst-case levels presented.

Construction of the facility will be during Standard Daytime Construction Hours. Construction outside standard hours will be managed in accordance with the out-of-hours works protocol in a Construction Noise and Vibration Management Plan (CNVMP) prepared prior to commencement of construction.

Table 29 Predicted Construction Noise Levels – Standard Daytime Construction Hours

ID	Receiver Location	Type	NML	Predicted Noise Level – $L_{Aeq(15minute)}$ (dBA)						
				W.01 Vegetation clearing	W0.2 Demolition	W.03 Earthworks	W.04 Excavation of hard rock	W.05 Construction of pads & hardstands	W.06a Construction of structures & equipment installation	W.06b Rooftop equipment installation
R01	671-675 Gardeners Road, Mascot	Residential	68	73	74	70	**77**	64	65	57
R02	12 Galloway Street, Mascot	Residential	68	74	75	71	**78**	65	66	58
R03	7-9 Kent Road, Mascot	Residential	68	74	75	71	**78**	65	66	58
R04	61-63 Church Avenue, Mascot	Residential	68	69	70	66	73	60	61	54
R05	Child care centres[1]	Child care	60	64	65	61	68	55	56	48
R06	Surrounding commercial	Commercial	70	77	78	74	81	68	69	69

Note 1: The most affected child care receiver is MindChamps Early Learning & Preschool.
Note 2: **Bold red** indicates an exceedance of the Highly Noise Affected NML.

Table 30 Predicted Exceedance at Nearest Receivers – Standard Daytime Construction Hours

ID[1]	Address	Type	NML	Predicted Exceedance – $L_{Aeq(15minute)}$ (dB)						
				W.01 Vegetation clearing	W0.2 Demolition	W.03 Earthworks	W.04 Excavation of hard rock	W.05 Construction of pads & hardstands	W.06a Construction of structures & equipment installation	W.06b Rooftop equipment installation
R01	671-675 Gardeners Road, Mascot	Residential	68	5	6	2	9	-	-	-
R02	12 Galloway Street, Mascot	Residential	68	6	7	3	10	-	-	-
R03	7-9 Kent Road, Mascot	Residential	68	6	7	3	10	-	-	-
R04	61-63 Church Avenue, Mascot	Residential	68	1	2	-	5	-	-	-
R05	Child care centres	Child care	60	4	5	1	8	-	-	-
R06	Surrounding commercial	Commercial	70	7	8	4	11	-	-	-

Legend (NML exceedances)		
	Green	= Minor to marginal (1 to 10 dB)
	Yellow	= Moderate (11 to 20 dB)
	Red	= High (>20 dB)

The above worst-case predictions show the following:

- Construction noise levels during W.01 (vegetation clearing), W.02 (demolition) and W.03 (earthworks) are predicted to result in minor exceedances of the NMLs at the nearest receivers. Noise levels at receivers further back from the first row of buildings would typically be below the NMLs.
- Construction noise levels during W.04 (excavation of hard rock) are predicted to result in minor to moderate exceedances of the NMLs at the nearest receivers. Noise levels at R01 to R03 are predicted to exceed the Highly Noise Affected NML when the noisiest equipment is working close to these receivers.
- Construction noise levels during W.05 (construction of pads and hardstands), W.06a (construction of structures and equipment installation) and W.06b (rooftop equipment installation) are predicted to be below the NMLs at the nearest receivers. Noise levels during W.06b are lower than W.06a at the residential receivers as the noisier equipment (mobile crane and flatbed truck) are located behind the data centre structure, with quieter equipment (hand tools and elevated working platform) located on the roof near the receivers.

- The highest impacts are predicted during ‘vegetation clearing’ when a chainsaw/chipper is in use, and during ‘demolition’ and ‘excavation of hard rock’ when a rockbreaker is in use.
- Works would only occur during Standard Daytime Construction Hours. There is no expectation that evening or night-time work would be required.

The presented impacts would only be expected to occur when noisy work is being completed close to the site boundaries, relative to each receiver. When work is further from the receiver, or when less noise-intensive equipment is being used, the noise levels and potential impacts would be lower.

Feasible and reasonable construction noise mitigation measures should be applied where exceedances of the NMLs are predicted. Construction noise mitigation and management measures are discussed in **Section 7.1**.

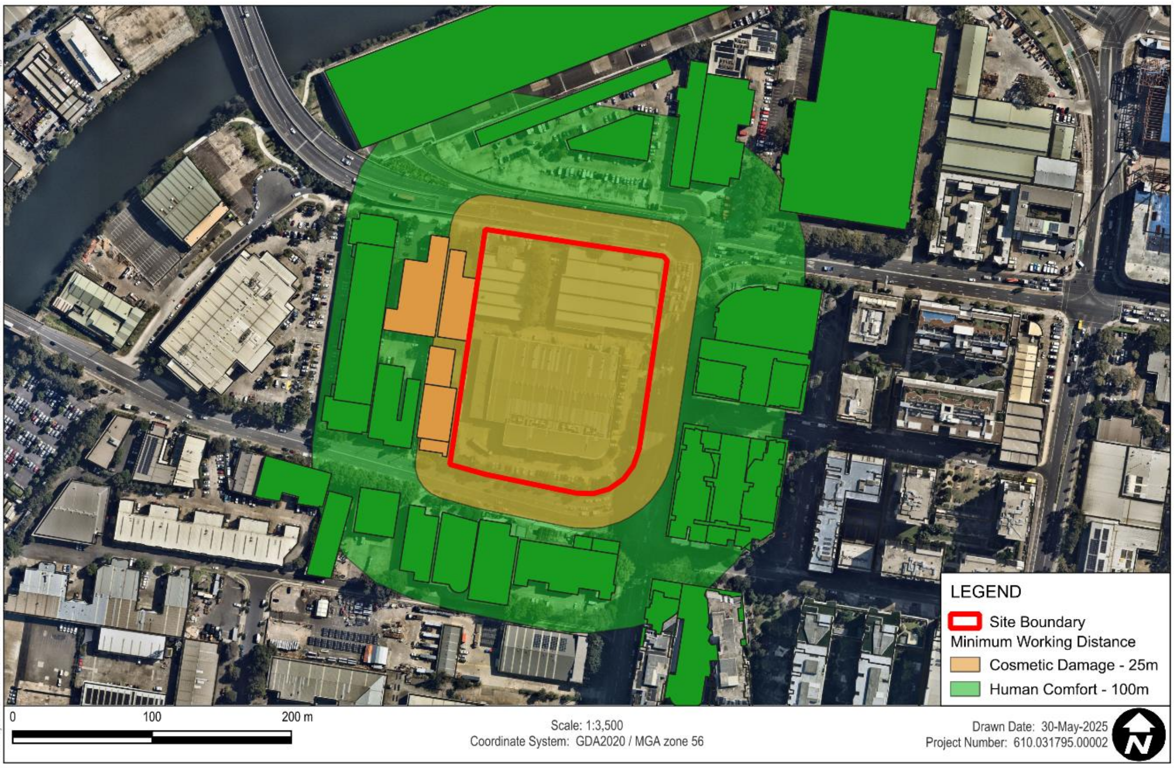
5.2 Construction Vibration

The major potential sources of vibration from the proposed construction activities would likely be during:

- ‘Earthworks’ when vibratory rollers are being used
- ‘Demolition’ and ‘excavation of hard rock’ when rockbreakers are being used.

Vibration offset distances have been determined from the CNVG minimum working distances for cosmetic damage and human comfort (see **Table 10**) and the assessment is summarised in **Figure 12** for the potential worst-case scenario, which is during the use of a large vibratory roller. Buildings within the minimum working distances are highlighted in the figure.

Figure 12 Construction Vibration – Large Vibratory Roller



Cosmetic Damage Assessment

The above figure shows that three commercial buildings to the west are likely within the minimum working distance when vibratory rollers are in use at the western boundaries of the construction site. Several more commercial buildings to the west and south, and the residential on the eastern side, are also close to being within the minimum working distance.

All residential and child care buildings are sufficiently distant from the site to be outside the minimum working distance and cosmetic damage impacts at these receivers are unlikely.

Feasible and reasonable construction vibration mitigation measures should be applied where vibration-intensive works are required within the minimum working distances. Construction mitigation and management measures are discussed further in **Section 7.1**.

Human Comfort Vibration Assessment

The above figures indicate that the nearest commercial, residential and child care receivers surrounding the site are within the human comfort minimum working distance and occupants of these buildings may be able to perceive vibration impacts at times when vibratory rollers or rockbreakers are in use nearby. Where impacts are perceptible, they would likely only be apparent for relatively short durations when vibration-intensive equipment is in use.

Feasible and reasonable construction vibration mitigation measures should be applied where vibration-intensive works are required within the minimum working distances. Construction mitigation and management measures are discussed further in **Section 7.1**.

5.3 Operational Noise

5.3.1 Predicted Noise Levels

A summary of the worst-case operational noise assessment at the receivers surrounding the proposal is shown in **Table 31**.

The predicted worst-case levels are compared to the Project Noise Trigger Levels to determine the potential impact from the proposal.

Table 31 Operational Noise Assessment

ID	Receiver Location	Type	Period	Predicted Noise Level $L_{Aeq(15minute)}$ (dBA)[5]			Compliance
				Noise Criteria	OP.01[1]	OP.02[2]	
R01	671-675 Gardeners Road, Mascot[3]	Residential	Day	58	46	57	Yes
			Evening	50	46	-	Yes
			Night	47	46	-	Yes
R02	12 Galloway Street, Mascot[3]	Residential	Day	58	47	58	Yes
			Evening	50	47	-	Yes
			Night	47	47	-	Yes
R03	7-9 Kent Road, Mascot[3]	Residential	Day	58	47	58	Yes
			Evening	50	47	-	Yes
			Night	47	47	-	Yes
R04	61-63 Church Avenue, Mascot[3]	Residential	Day	58	41	53	Yes
			Evening	50	41	-	Yes
			Night	47	41	-	Yes
R05	Child care centres[3]	Child care	When in use	58	35	50	Yes
R06	Surrounding commercial premises	Commercial	When in use	63	57	63	Yes

Note 1: OP.01 – Normal Operations.

Note 2: OP.02 – Maintenance/Testing Operations.

Note 3: The most affected area of each residential receiver is the top floor of each building (refer to facade noise contours in **Appendix D**).

Note 4: The most affected child care receiver is MindChamps Early Learning & Preschool.

Note 5: A 3 dB safety factor has been added to the predicted noise levels. This safety factor represents an allowance for potential uncertainty and increased noise emissions from the proposal that may occur due to selection of different mechanical plant units, increases to cooling tower noise due to variable frequency drives, additional minor external mechanical plant that is not known at this stage, or other minor modifications to noise sources utilised on the site.

The above assessment indicates that noise from the proposal is predicted to comply with the PNTLs at all residential, child care and commercial receivers during both OP.01 (normal operations) and OP.02 (testing of backup generators).

It is noted that the details of the mechanical plant used in this assessment are indicative, including the unit types, sound power levels, number of units and locations of equipment. All mechanical plant items should be reviewed during later acoustic assessments during the detailed design stage of the project to confirm compliance with the PNTLs. It is expected that compliance is achievable through a combination of appropriate mechanical plant selection, acoustic louvres where appropriate, etc.

A detailed investigation of all potential feasible and reasonable mitigation measures is provided in **Section 7.2**.

Facade noise maps of the predicted worst-case operational noise impacts are provided in **Appendix D**.

5.3.2 Sleep Disturbance

The predicted night-time maximum noise levels at the nearest residential receivers are shown in **Table 32**. These include the mitigation measures specified in **Section 7.2**.

The predictions include noise-enhancing weather conditions as discussed in **Section 4.2.7**.

Table 32 Sleep Disturbance Assessment

ID	Receiver Location	Source	Maximum Noise Level L_{Amax} (dBA)[1]			Below Screening Level
			Sleep Dist. Screening Level	Predicted	Exceedance	
R01 – R04	Residential to the east of Kent Road	Light vehicle movements and parking	63	53	-	Yes

Note 1: Maximum noise level shown for all floors of all residential receivers R01 to R04.

The above shows that maximum noise levels are predicted to comply with the sleep disturbance screening level at the nearest residential receivers. As such, maximum noise levels from the development are unlikely to result in sleep disturbance at these receivers and a detailed maximum noise level assessment is not required.

5.4 Off-site Traffic Assessment

The off-site traffic assessment is detailed in **Appendix H**. A summary of the results is shown in **Table 33**.

Table 33 Traffic Noise Assessment

Location	Predicted Change in Noise Level (dBA)[1]					
	Day $L_{Aeq(15hour)}$			Night $L_{Aeq(9hour)}$		
	Max	Min	Median	Max	Min	Median
R01 – Residential	+1.0	-0.4	+0.4	+0.9	-0.4	+0.4
R02 – Residential	+1.0	-0.2	+0.4	+0.9	-0.2	+0.3
R03 – Residential	+0.9	0.0	+0.4	+0.9	0.0	+0.4
R04 – Residential	+1.2	-0.1	+0.2	+1.2	-0.1	+0.2
R05 – Childcare	+0.2	0.0	+0.1	+0.2	-0.1	+0.1
R06 – Commercial	+0.2	0.0	+0.1	+0.2	0.0	+0.1
		Median	**+0.3**		**Median**	**+0.2**

The above assessment shows that the predicted change in road noise levels at the nearest residences on Kent Road from development-related vehicles is expected to be below 2.0 dB. Increases of less than 2.0 dB are considered minor and not perceptible to the average person.

The potential impacts from development-related traffic on the surrounding roads are expected to be negligible and no consideration of mitigation is required.

6.0 Cumulative Impacts

The NSW Government *Cumulative Impact Assessment Guidelines for State Significant Projects* requires that the potential combined effect of cumulative impacts on all nearby industrial developments to be considered when assessing potential noise impacts from state significant projects.

Cumulative impacts can be caused by the compounding effects of multiple projects in an area, and by the accumulation of effects from past, current and future activities as they arise.

6.1 Construction Noise

Cumulative construction noise impacts can occur where multiple work activities are being completed near to a particular receiver at the same time.

The construction work associated with the proposal has the possibility of interacting with the construction activities of other nearby projects. Key projects are described in **Table 34**.

Table 34 Nearby Developments – Potential Cumulative Construction Impacts

DA Reference	Development Description	Current Status	Comments Regarding Cumulative Impacts
546-548 Gardeners Road, Mascot SSD-42544484	Demolition of existing warehouse and construction of two-level warehouse and distribution centre	Approved 7 September 2023 – construction unlikely to commence until mid 2030's based on current tenant leases.	Located to around 70 m to the north east of the proposal. Potential cumulative impacts not anticipated.

The above indicates that the potential for cumulative construction noise impacts from the above projects are not anticipated due to their delayed construction commencement. Should other projects be approved in the area there is potential for cumulative construction impacts if they are constructed at the same time as the proposal, however this would be addressed in their respective Construction Noise and Vibration Management Plans.

Since construction scenarios and equipment for projects in the area would generally require similar items of equipment to the proposal, concurrent construction work could theoretically increase the worst-case noise levels in this report by around 3 dB (ie a logarithmic adding of two sources of noise at the same level). The likelihood of worst-case noise levels at any individual receiver being generated by works on different projects at the same time is, however, considered low.

As such, cumulative construction impacts are not likely to significantly alter the predictions in this report and no specific mitigation is expected to be required.

The potential cumulative impacts from the proposal and other projects would continue to be considered as the project progresses when detailed construction planning is developed.

6.2 Operational Noise

The *Noise Policy for Industry* states that it aims to limit continuing increases in cumulative industrial noise through the application of amenity noise levels, which are applicable to all industrial noise sources in an area.

The policy accounts for potential cumulative impacts by lowering the criteria for each individual development to ensure that the ambient noise level within an area from all industrial noise sources combined remains below the recommended amenity noise levels, where feasible and reasonable. As such (as discussed in **Section 3.3.2**), the potential cumulative impacts from the proposal and other potential sources of industrial noise in the area are accounted for in the proposal-specific PNTLs and, therefore, do not require further consideration.

7.0 Mitigation and Management Measures

7.1 Construction Impacts

The impacts during construction of the proposal are predicted to be consistent with major construction work near sensitive receivers. No works outside of Standard Construction Hours are currently proposed.

The use of standard mitigation measures to minimise the impacts is considered sufficient to control the majority of the impacts. Examples of measures that could be applied to the work are provided in the Transport for NSW *Construction Noise and Vibration Guideline* (see **Appendix E**).

Recommended universal work practices and standard mitigation measures for the proposal construction include:

- Regular toolbox notification and training of workers and contractors to be aware of nearby noise sensitive receivers and use equipment in ways to minimise noise.
- Use the minimum sized equipment necessary to complete the work and where possible, use alternative, low-impact construction techniques
- Long term stationary noise sources should be enclosed or shielded from nearby sensitive receivers where possible
- Where rockbreakers or other pneumatic equipment is required, select silenced and dampened equipment where possible
- Implement community consultation to provide surrounding receivers with information such as the total construction time, what works are expected to be noisy, their duration and mitigation measures that are being applied to minimise the noise
- Consultation should include nearby ‘other sensitive’ receivers such as educational institutions. Noise intensive work that is predicted to impact ‘other sensitive’ receivers will be scheduled outside of particularly sensitive periods, such as exams, where possible.

A Construction Noise and Vibration Management Plan (CNVMP) would be prepared before any work begins. The plan would:

- Identify nearby sensitive receivers
- Describe the activities, construction equipment and work that will be completed and quantify resulting impacts at sensitive receivers
- Include noise and vibration management criteria and relevant licence and approval conditions
- Include measures to manage noise and vibration and minimise the potential for impacts during construction, aligned with the results of community consultation and feedback during the approval process
- Set out requirements for noise and vibration verification monitoring
- Set out procedures for handling complaints.

AS 2436 provides further guidance on the control of construction noise and vibration and includes the nominal noise reduction possible from various mitigation strategies summarised in **Table 35**.

Table 35 Nominal Construction Noise Reductions

Control	Example	Nominal Noise Reduction (AS 2436)
Distance	Maximising the offset distance between noisy plant and adjacent sensitive receivers.	6 dB per doubling of distance
Screening	Use of structures (ie site shed, earth bund, temporary hoarding) to shield adjacent sensitive receivers from noisy plant and activities.	5-10 dB
Enclosure	Construct a solid enclosure around generators, compressors, pumps or similar long-term plant.	15-25 dB
Silencing	Fit muffler, silenced or dampened bit to relevant noise intensive equipment.	5-10 dB

Construction impacts are expected to remain during certain work activities at the nearest sensitive receivers even with the implementation of all feasible and reasonable mitigation measures. The CNVMP would review the predicted residual construction noise impacts when more detailed planning information is available and confirm the mitigation measures which would be implemented to minimise construction noise impacts as much as practicable.

7.2 Operational Noise Impacts

Where operational noise impacts from the development are predicted to exceed the relevant noise criteria, feasible and reasonable operational noise mitigation and management measures should be considered, with the aim of reducing noise emissions to the relevant criteria.

The typical hierarchy for mitigation and management of industrial noise sources is as follows:

- Reducing noise emissions at the source (ie noise source control)
- Reducing noise in transmission to the receiver (ie noise path control)
- Reducing noise at the receiver (ie at-receiver control).

A detailed assessment of potential feasible and reasonable mitigation measures that can be applied to the development to minimise the operational noise impacts has been completed and is summarised in **Table 36**.

The measures should be regarded as indicative and would be further refined during detailed design and in an Operational Noise Management Plan (ONMP) when the specific tenants operations are known.

Table 36 Operational Noise Mitigation Options

Ref.	Mitigation Option	Noise Impact/Benefit	Feasible and Reasonable to Apply
Source Control			
S1	Optimised site layout to minimise noise emissions from the site	Where possible, the site layout has been designed so that the buildings screen the noisier areas of the development from the nearest receivers.	Yes – applied during design of the concept
S2	Limit vehicle movements	A reduction in concurrent vehicle movements across the site by staggering delivery/pickup times and/or employee shift change times could reduce noise emissions. In practice, this would occur naturally due to operational requirements.	No – vehicle volumes used in this assessment are likely needed to meet tenant's requirements. Additionally, vehicle movements are not a dominant contributor to noise emissions from the site.
S3	Use broadband and/or ambient sensing alarms on heavy vehicles where they are required to reverse during the night-time.	Reduce potential for annoying noise emissions during the night-time.	Yes – encourage use of broadband and/or ambient sensing alarms on heavy vehicles where they are required to reverse during the night-time
S4	Appropriate specification and location of mechanical plant during detailed design.	Reduce potential for noise impacts and annoying noise emissions.	Yes – the specified example units of mechanical plant have been selected to meet the noise requirements of the project. The noise impacts from all items of mechanical plant would be reviewed during detailed design stage to confirm units selections and any mitigation requirements.
S5	Roller doors kept closed when loading/unloading is not occurring.	Reduce potential for noise breakout from internal activity.	Yes – roller doors should be kept closed when not in use for loading/unloading.
S6	Appropriate design of site layout to minimise the need for trucks to stop or brake outside of loading docks with line of sight to residential receivers.	Minimise noise emissions, particularly from truck airbrakes.	Yes – applied during design of the concept.

Ref.	Mitigation Option	Noise Impact/Benefit	Feasible and Reasonable to Apply
S7	Production of an Operational Noise Management Plan.	This would detail the measures that could be used by the various tenants to minimise general noise emissions from the site. Reference can be made to the Best Management Practice (BMP) measures listed in the NPfI (see **Appendix F**).	Yes – the ONMP would detail any operational requirements for the development.
Path Control			
P1	Acoustic Screening	Construction of acoustic screening has been incorporated into the design of the roof layout (see **Section 4.2.1**) to mitigate noise from the rooftop mechanical plant.	Yes – an indicative combination of solid screening and acoustic louvres on the rooftop has been incorporated in the building design. Any louvred areas would indicatively use IAC Acoustics Noishield Model 2R acoustic louvres or similar (manufacturer data sheet supplied by the project team). The design and requirements for acoustic screening would be confirmed during the detailed design stage of the project.
Receiver Control			
R1	Not considered required	n/a	n/a

The proposal does not have tenants committed and the exact operational procedures of the site are not known at the time of this assessment. Several assumptions have been made regarding the likely future uses and sources of noise. The noise predictions in this report represent the expected peak operational noise emissions based on currently available information for planning purposes and will be reviewed at a later stage when detailed information is available.

8.0 Conclusion

SLR has been engaged to assess the potential construction and operational noise emissions from the proposed Project Duke Data Centre, Mascot. The proposal includes the operation of a multi-storey data centre, which would be in use 24/7.

The potential impacts from the proposal have been assessed against the noise and vibration specific Secretary's Environmental Assessment Requirements.

Minor to moderate exceedances of the construction noise management levels are predicted at the nearest sensitive receivers during some of the noisier scenarios, particularly when noise-intensive items of equipment, such as rockbreakers, are in use. The nearest residences are predicted to be highly noise affected during excavation of hard rock is being undertaken near to the receiver. Construction noise levels are generally expected to comply with the management levels when noisy equipment is not in use and at receivers further back from the first row. Mitigation measures have been recommended to address the potential construction impacts.

The operational noise assessment includes feasible and reasonable mitigation measures to minimise potential impacts from the proposal. The measures include rooftop acoustic screening as per the building design, selection of appropriate mechanical plant during detailed design, and implementation of operational management measures. With the inclusion of the proposed mitigation, operational noise levels are expected to comply with the trigger levels at the nearest receivers.

The potential operational impacts and requirements for mitigation would be reviewed during further acoustic assessments completed during detailed design when tenant requirements are known.

Based on the predicted levels and indicative mitigation measures, the proposal is considered appropriate from an acoustic standpoint.

Appendix A Acoustic Terminolgy

Project Duke Data Centre, Mascot

SSD-71368959 Noise and Vibration Impact Assessment

Goodman Property Services (Aust) Pty Ltd

SLR Project No.: 610.31795.00002

16 June 2025

1. Sound Level or Noise Level

The terms 'sound' and 'noise' are almost interchangeable, except that 'noise' often refers to unwanted sound.

Sound (or noise) consists of minute fluctuations in atmospheric pressure. The human ear responds to changes in sound pressure over a very wide range with the loudest sound pressure to which the human ear can respond being ten million times greater than the softest. The decibel (abbreviated as dB) scale reduces this ratio to a more manageable size by the use of logarithms.

The symbols SPL, L or LP are commonly used to represent Sound Pressure Level. The symbol LA represents A-weighted Sound Pressure Level. The standard reference unit for Sound Pressure Levels expressed in decibels is 2 x 10^{-5} Pa.

2. 'A' Weighted Sound Pressure Level

The overall level of a sound is usually expressed in terms of dBA, which is measured using a sound level meter with an 'A-weighting' filter. This is an electronic filter having a frequency response corresponding approximately to that of human hearing.

People's hearing is most sensitive to sounds at mid frequencies (500 Hz to 4,000 Hz), and less sensitive at lower and higher frequencies. Different sources having the same dBA level generally sound about equally loud.

A change of 1 dB or 2 dB in the level of a sound is difficult for most people to detect, whilst a 3 dB to 5 dB change corresponds to a small but noticeable change in loudness. A 10 dB change corresponds to an approximate doubling or halving in loudness. The table below lists examples of typical noise levels.

Sound Pressure Level (dBA)	Typical Source	Subjective Evaluation
130	Threshold of pain	Intolerable
120	Heavy rock concert	Extremely noisy
110	Grinding on steel	
100	Loud car horn at 3 m	Very noisy
90	Construction site with pneumatic hammering	
80	Kerbside of busy street	Loud
70	Loud radio or television	
60	Department store	Moderate to quiet
50	General Office	
40	Inside private office	Quiet to very quiet
30	Inside bedroom	
20	Recording studio	Almost silent

Other weightings (eg B, C and D) are less commonly used than A-weighting. Sound Levels measured without any weighting are referred to as 'linear', and the units are expressed as dB(lin) or dB.

3. Sound Power Level

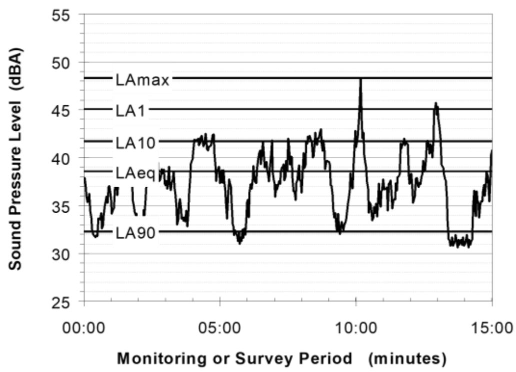
The Sound Power of a source is the rate at which it emits acoustic energy. As with Sound Pressure Levels, Sound Power Levels are expressed in decibel units (dB or dBA), but may be identified by the symbols SWL or LW, or by the reference unit 10^{-12} W.

The relationship between Sound Power and Sound Pressure is similar to the effect of an electric radiator, which is characterised by a power rating but has an effect on the surrounding environment that can be measured in terms of a different parameter, temperature.

4. Statistical Noise Levels

Sounds that vary in level over time, such as road traffic noise and most community noise, are commonly described in terms of the statistical exceedance levels LAN, where LAN is the A-weighted sound pressure level exceeded for N% of a given measurement period. For example, the LA1 is the noise level exceeded for 1% of the time, LA10 the noise exceeded for 10% of the time, and so on.

The following figure presents a hypothetical 15 minute noise survey, illustrating various common statistical indices of interest.



Of particular relevance, are:

LA1 The noise level exceeded for 1% of the 15 minute interval.

LA10 The noise level exceeded for 10% of the 15 minute interval. This is commonly referred to as the average maximum noise level.

LA90 The noise level exceeded for 90% of the sample period. This noise level is described as the average minimum background sound level (in the absence of the source under consideration), or simply the background level.

LAeq The A-weighted equivalent noise level (basically, the average noise level). It is defined as the steady sound level that contains the same amount of acoustical energy as the corresponding time-varying sound.

5. Frequency Analysis

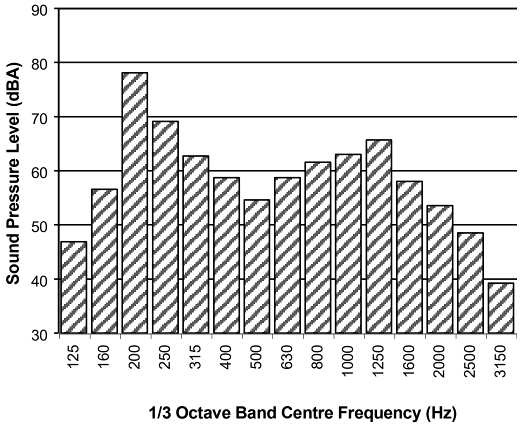
Frequency analysis is the process used to examine the tones (or frequency components) which make up the overall noise or vibration signal.

The units for frequency are Hertz (Hz), which represent the number of cycles per second.

Frequency analysis can be in:

- Octave bands (where the centre frequency and width of each band is double the previous band)
- 1/3 octave bands (three bands in each octave band)
- Narrow band (where the spectrum is divided into 400 or more bands of equal width)

The following figure shows a 1/3 octave band frequency analysis where the noise is dominated by the 200 Hz band. Note that the indicated level of each individual band is less than the overall level, which is the logarithmic sum of the bands.



6. Annoying Noise (Special Audible Characteristics)

A louder noise will generally be more annoying to nearby receivers than a quieter one. However, noise is often also found to be more annoying and result in larger impacts where the following characteristics are apparent:

- **Tonality** - tonal noise contains one or more prominent tones (ie differences in distinct frequency components between adjoining octave or 1/3 octave bands), and is normally regarded as more annoying than 'broad band' noise.
- **Impulsiveness** - an impulsive noise is characterised by one or more short sharp peaks in the time domain, such as occurs during hammering.
- **Intermittency** - intermittent noise varies in level with the change in level being clearly audible. An example would include mechanical plant cycling on and off.
- **Low Frequency Noise** - low frequency noise contains significant energy in the lower frequency bands, which are typically taken to be in the 10 to 160 Hz region.

7. Vibration

Vibration may be defined as cyclic or transient motion. This motion can be measured in terms of its displacement, velocity or acceleration. Most assessments of human response to vibration or the risk of damage to buildings use measurements of vibration velocity. These may be expressed in terms of 'peak' velocity or 'rms' velocity.

The former is the maximum instantaneous velocity, without any averaging, and is sometimes referred to as 'peak particle velocity', or PPV. The latter incorporates 'root mean squared' averaging over some defined time period.

Vibration measurements may be carried out in a single axis or alternatively as triaxial measurements (ie vertical, longitudinal and transverse).

The common units for velocity are millimetres per second (mm/s). As with noise, decibel units can also be used, in which case the reference level should always be stated. A vibration level V, expressed in mm/s can be converted to decibels by the formula $20 \log (V/Vo)$, where Vo is the reference level (10^{-9} m/s). Care is required in this regard, as other reference levels may be used.

8. Human Perception of Vibration

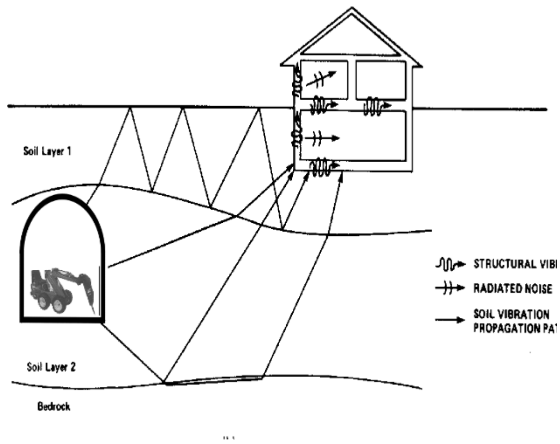
People are able to 'feel' vibration at levels lower than those required to cause even superficial damage to the most susceptible classes of building (even though they may not be disturbed by the motion). An individual's perception of motion or response to vibration depends very strongly on previous experience and expectations, and on other connotations associated with the perceived source of the vibration. For example, the vibration that a person responds to as 'normal' in a car, bus or train is considerably higher than what is perceived as 'normal' in a shop, office or dwelling.

9. Ground-borne Noise, Structure-borne Noise and Regenerated Noise

Noise that propagates through a structure as vibration and is radiated by vibrating wall and floor surfaces is termed 'structure-borne noise', 'ground-borne noise' or 'regenerated noise'. This noise originates as vibration and propagates between the source and receiver through the ground and/or building structural elements, rather than through the air.

Typical sources of ground-borne or structure-borne noise include tunnelling works, underground railways, excavation plant (eg rockbreakers), and building services plant (eg fans, compressors and generators).

The following figure presents an example of the various paths by which vibration and ground-borne noise may be transmitted between a source and receiver for construction activities occurring within a tunnel.



The term 'regenerated noise' is also used in other instances where energy is converted to noise away from the primary source. One example would be a fan blowing air through a discharge grill. The fan is the energy source and primary noise source. Additional noise may be created by the aerodynamic effect of the discharge grill in the airstream. This secondary noise is referred to as regenerated noise.

Appendix B Noise Monitoring Data

Project Duke Data Centre, Mascot

SSD-71368959 Noise and Vibration Impact Assessment

Goodman Property Services (Aust) Pty Ltd

SLR Project No.: 610.31795.00002

16 June 2025

Noise Monitoring Location	L01
Noise Monitoring Address	**12 Galloway Street, Mascot – Top floor apartment, west-facing balcony**

Logger Device Type: Svantek 977, Logger Serial No: 92622

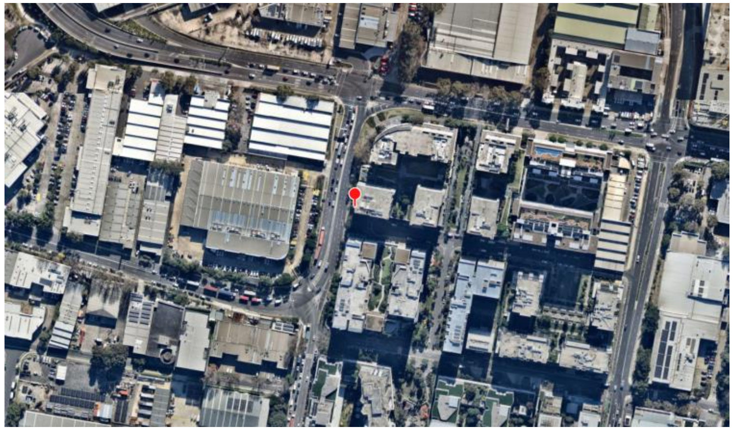
Sound Level Meter Device Type: Brüel & Kjær Type 2270, Sound Level Meter Serial No: 3008352

Ambient noise logger deployed on top-floor apartment west-facing balcony at 12 Galloway Street, Mascot. Noise logger location overlooks the project site and Kent Road, with views towards Ricketty Street, Gardeners Road, the St Peters Interchange and Sydney Airport.

Attended noise measurements indicate the ambient noise environment at this location is dominated by road traffic noise from Kent Road, Gardeners Road, Ricketty Street and distant road noise. Aircraft noise, car/truck horns and airbrakes, loud vehicles, and occasional industrial noise (such as reverse beepers) also contribute to the LAeq at this location.

Measured Typical LAmax: Ambient traffic: 58-63 dBA, Accelerating trucks: 63-70 dBA, Aircraft: 63-79 dBA, Truck airbrakes: 68-77 dBA, Motorbike: 74 dBA, Reverse beepers: audible at times, Background noise (idle traffic & distant traffic): 58-61 dBA

Map of Noise Monitoring Location



Ambient Noise Logging Results – ICNG Defined Time Periods

Monitoring Period	Noise Level (dBA)			
	RBL	**LAeq**	**L10**	**L1**
Daytime	58	64	66	71
Evening	55	62	64	71
Night-time	48	59	60	66

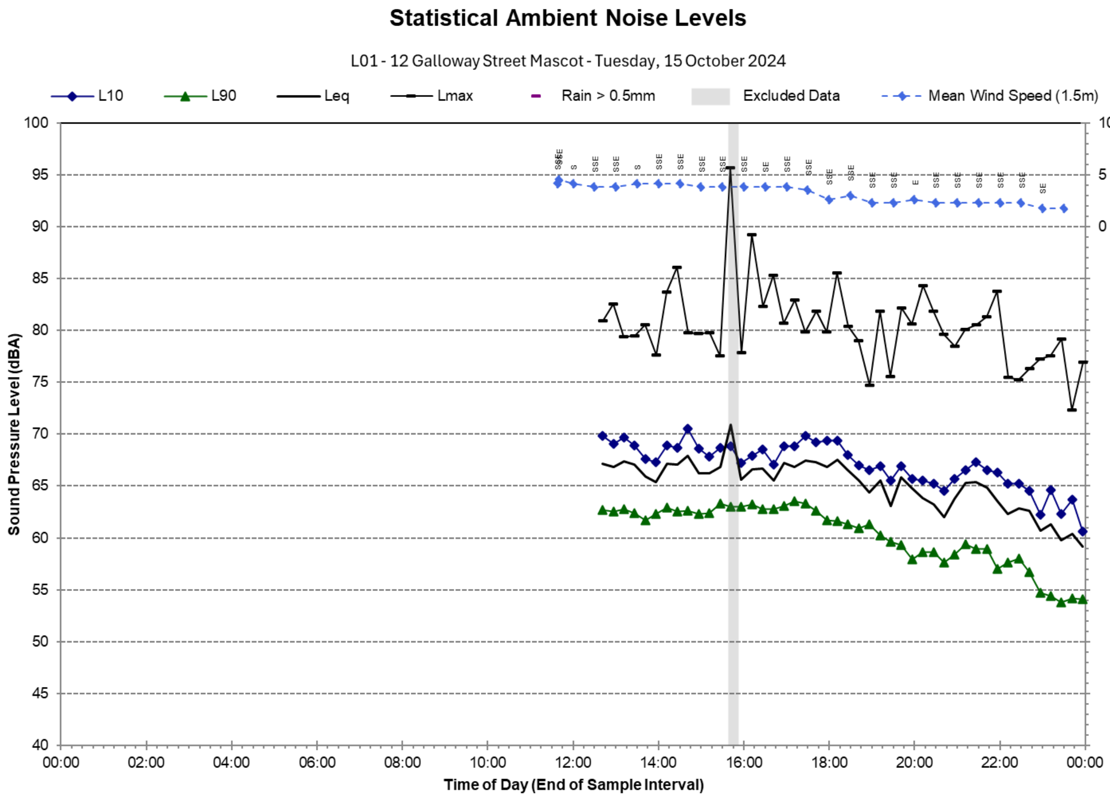
Ambient Noise Logging Results – RNP Defined Time Periods

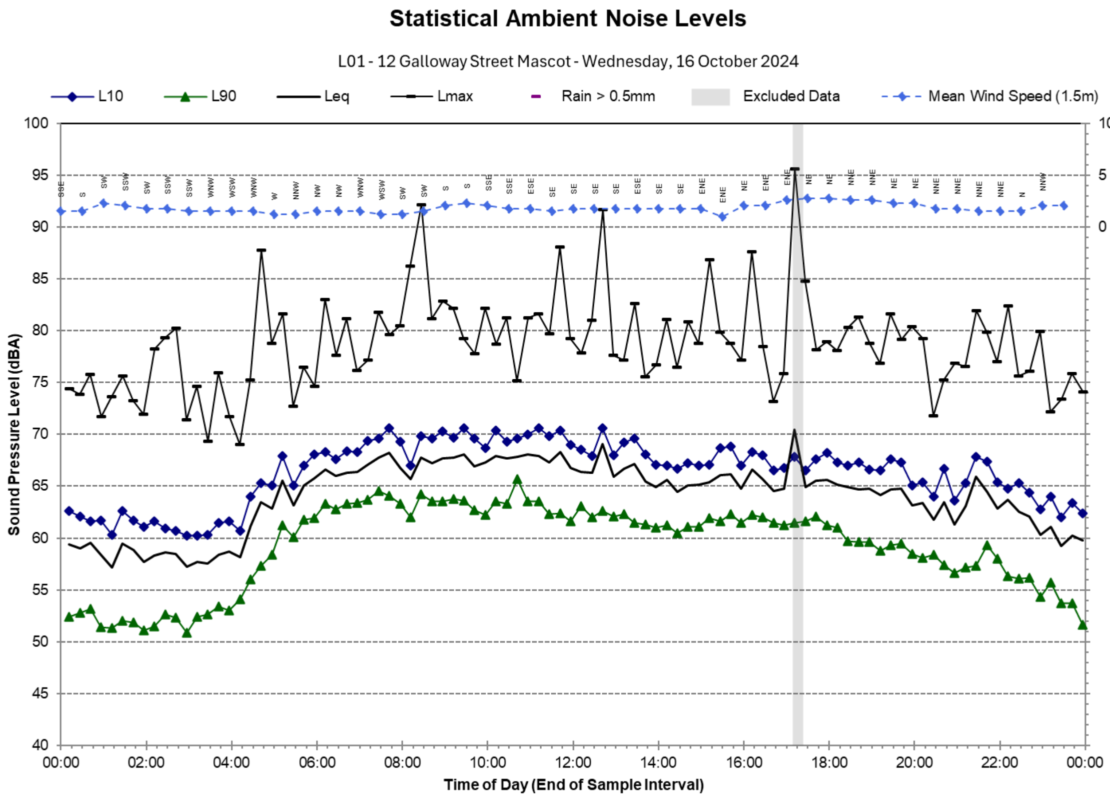
Monitoring Period	Noise Level (dBA)	
	LAeq(period)	**LAeq(1hour)**
Daytime (7am-10pm)	63	65
Night-time (10pm-7am)	59	63

Attended Noise Measurement Results

Date	Start Time	Measured Noise Level (dBA)		
		LA90	**LAeq**	**LAmax**
15/10/2024	12:25	60	65	79

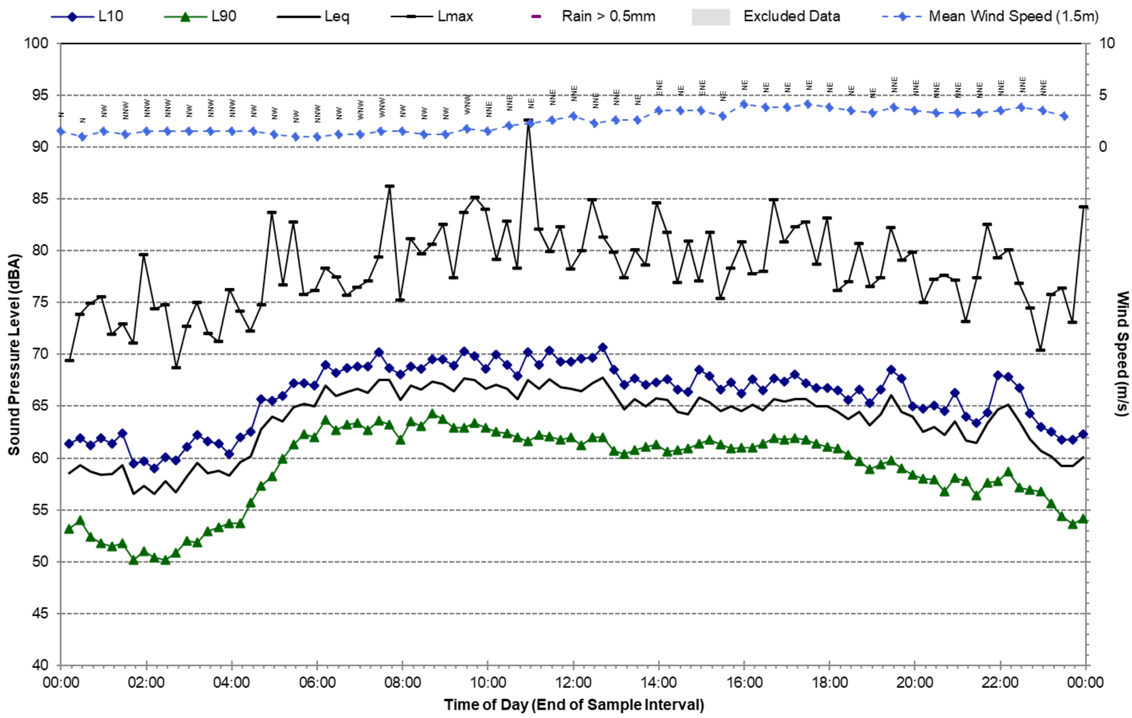
Photo of Noise Monitoring Location


Statistical Ambient Noise Levels
L01 - 12 Galloway Street Mascot - Tuesday, 15 October 2024
L10
L90
Leq
Lmax
Rain > 0.5mm
Excluded Data
Mean Wind Speed (1.5m)
Sound Pressure Level (dBA)
Wind Speed (m/s)
Time of Day (End of Sample Interval)


Statistical Ambient Noise Levels
L01 - 12 Galloway Street Mascot - Wednesday, 16 October 2024
L10
L90
Leq
Lmax
Rain > 0.5mm
Excluded Data
Mean Wind Speed (1.5m)
Sound Pressure Level (dBA)
Wind Speed (m/s)
Time of Day (End of Sample Interval)

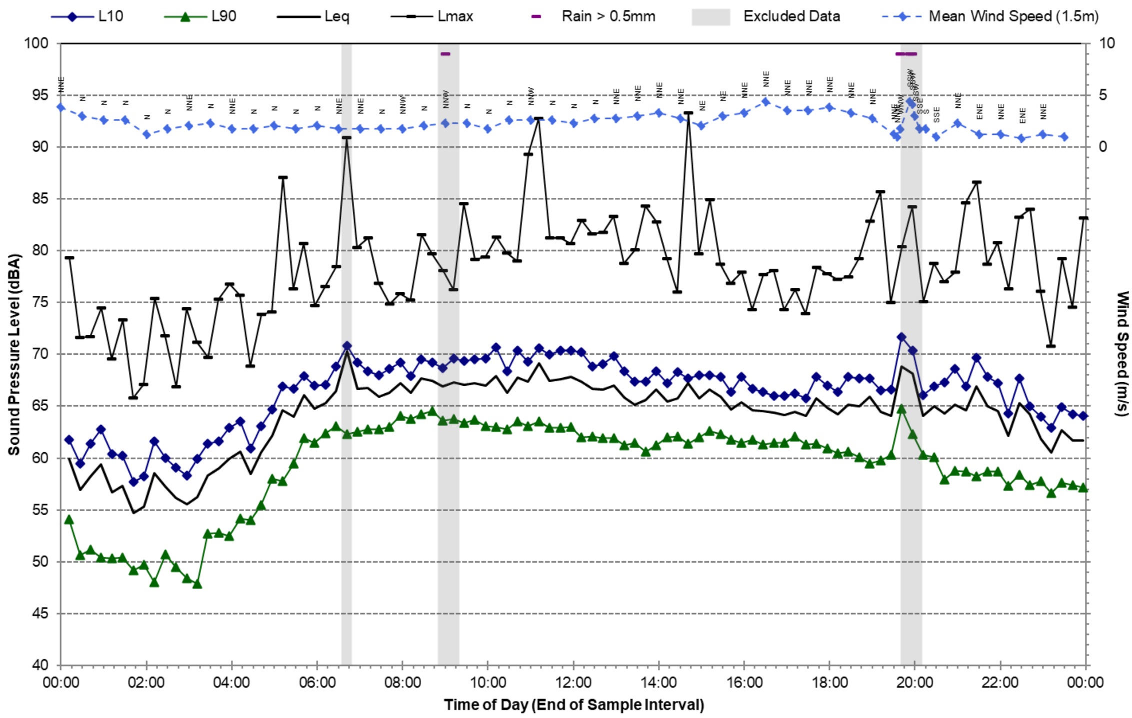
Statistical Ambient Noise Levels

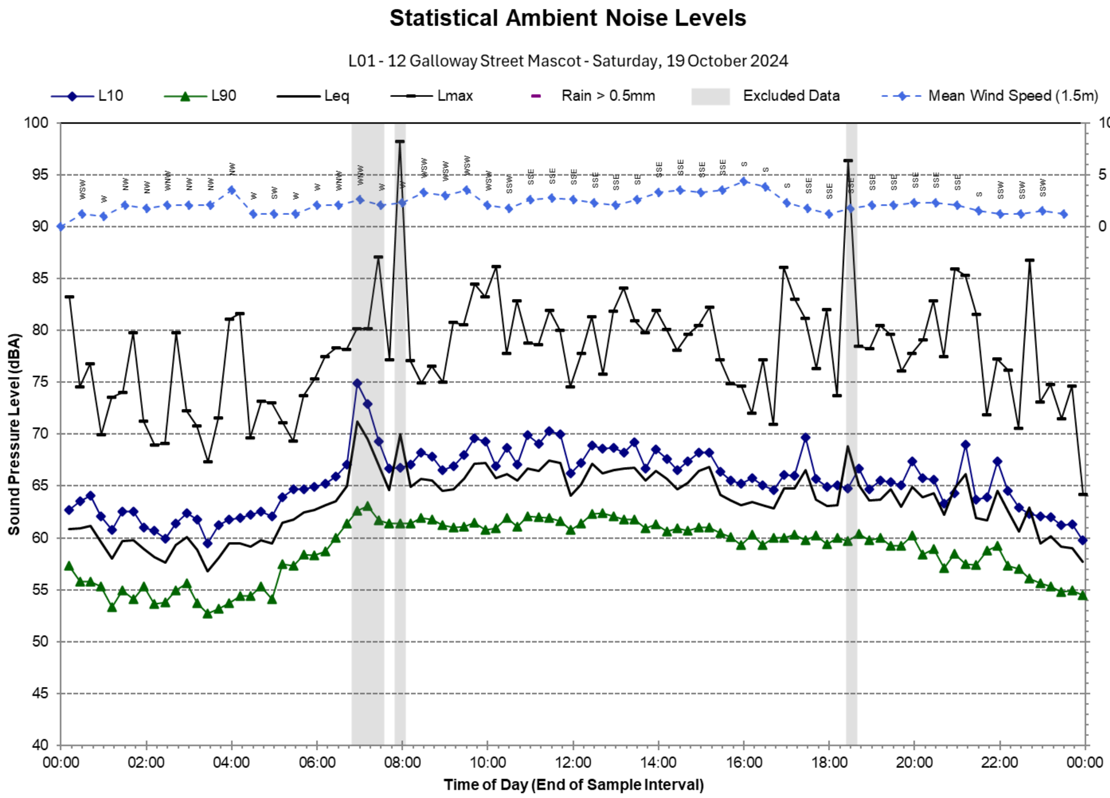
L01 - 12 Galloway Street Mascot - Thursday, 17 October 2024

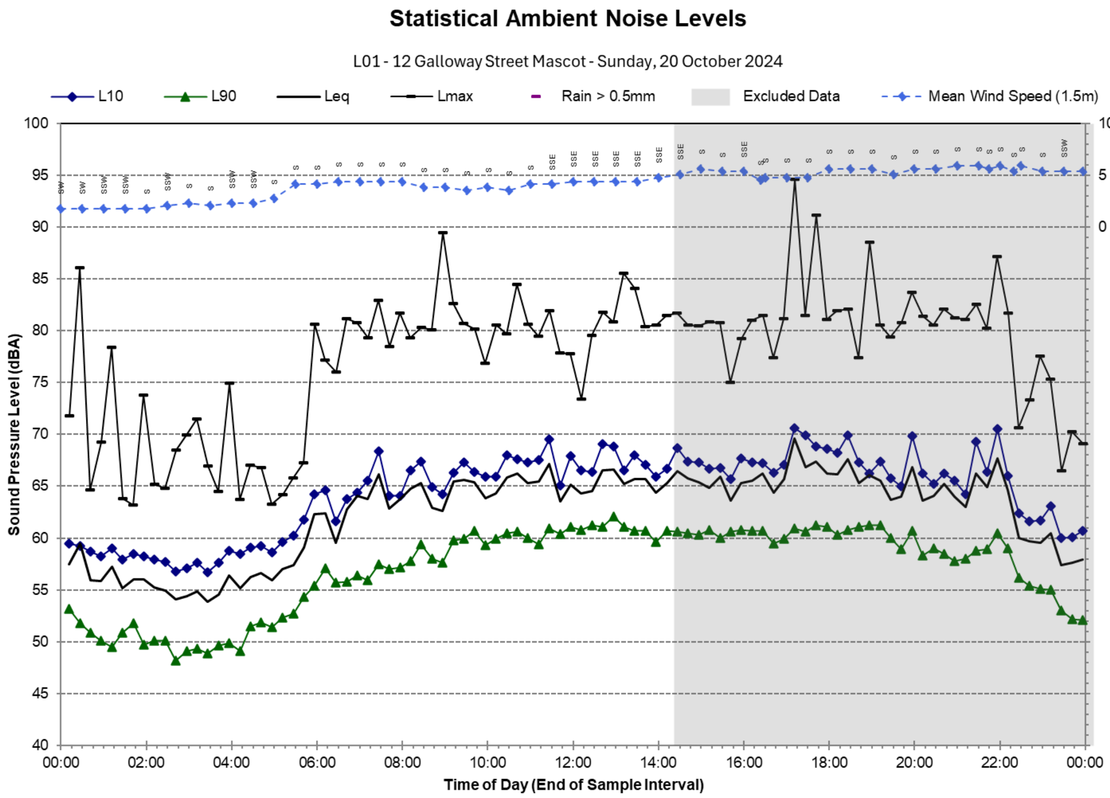


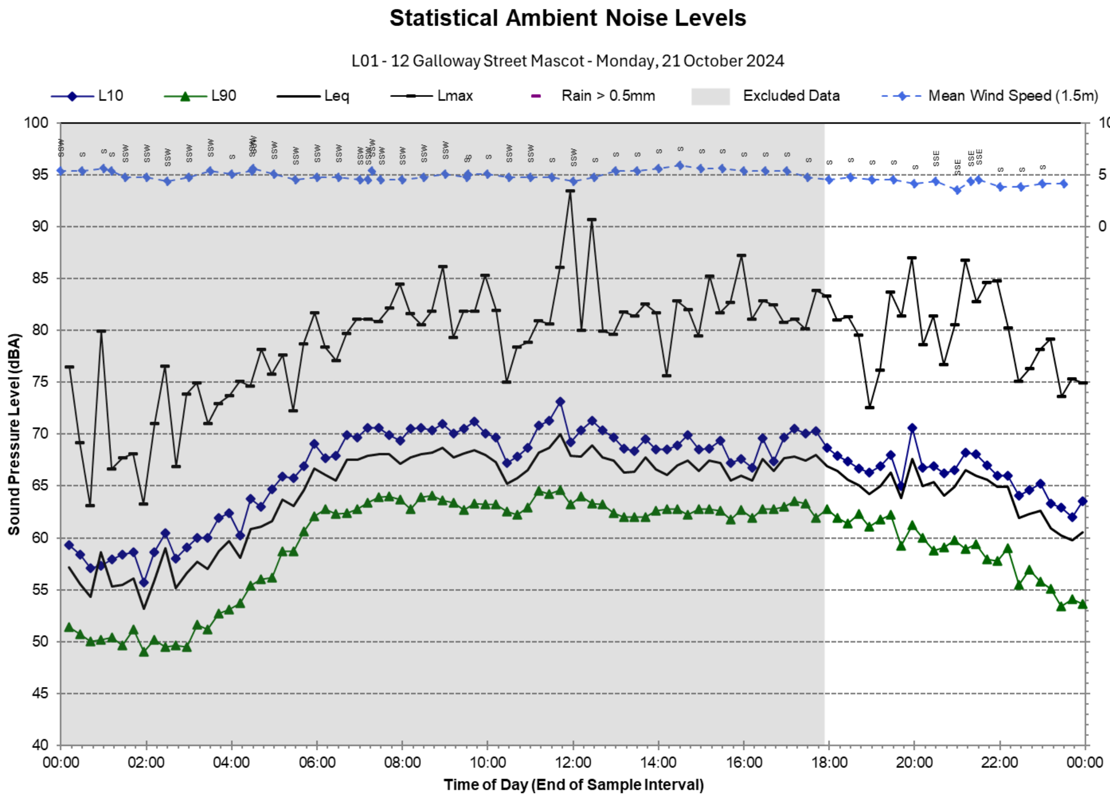
Statistical Ambient Noise Levels

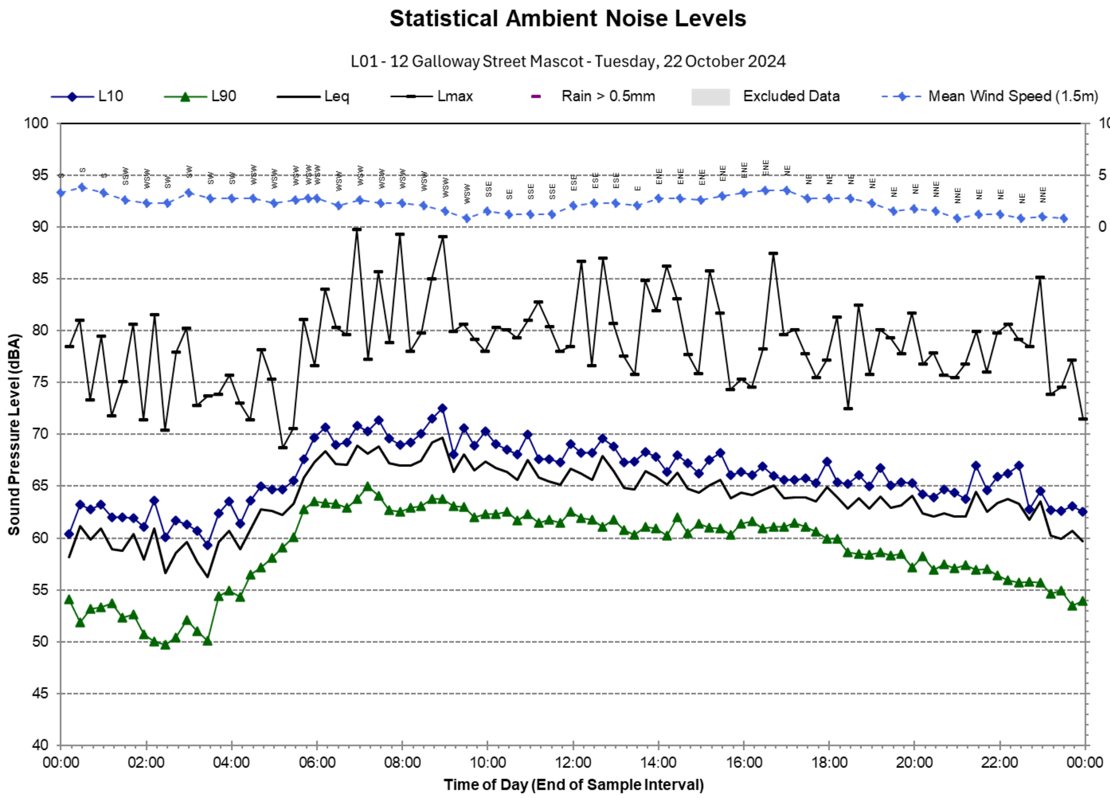
L01 - 12 Galloway Street Mascot - Friday, 18 October 2024

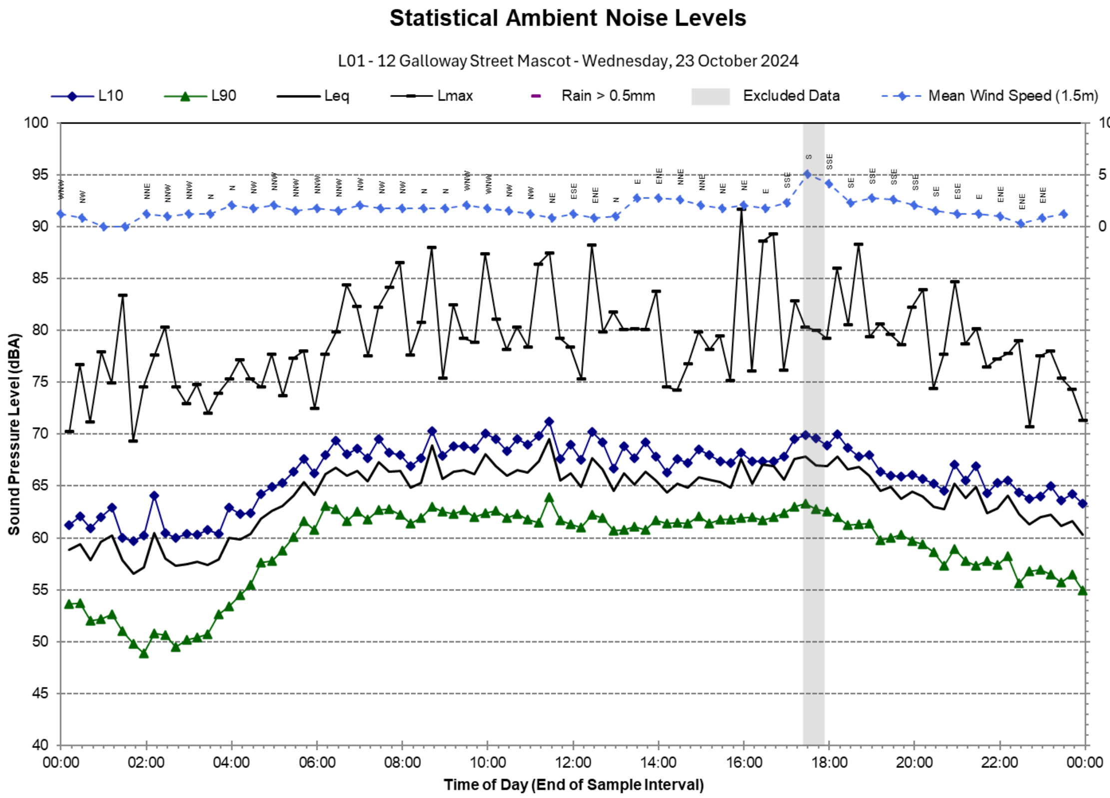


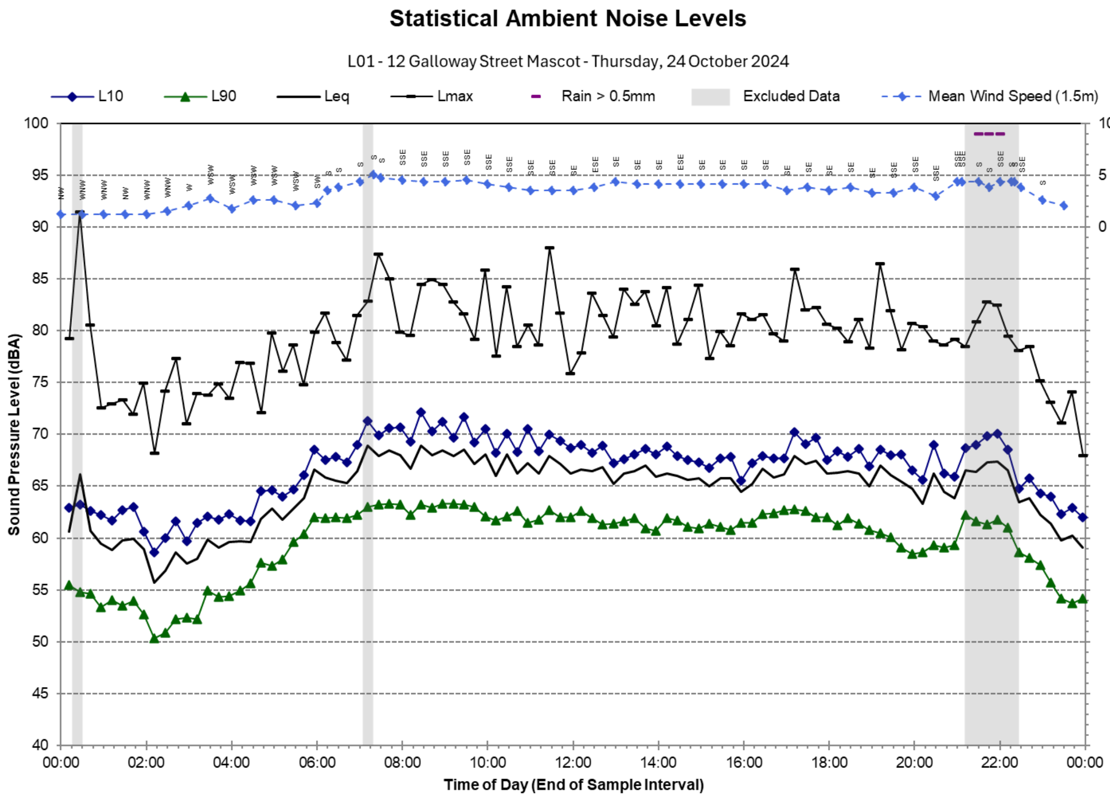

Statistical Ambient Noise Levels
L01 - 12 Galloway Street Mascot - Saturday, 19 October 2024
L10
L90
Leq
Lmax
Rain > 0.5mm
Excluded Data
Mean Wind Speed (1.5m)
Sound Pressure Level (dBA)
Wind Speed (m/s)
Time of Day (End of Sample Interval)

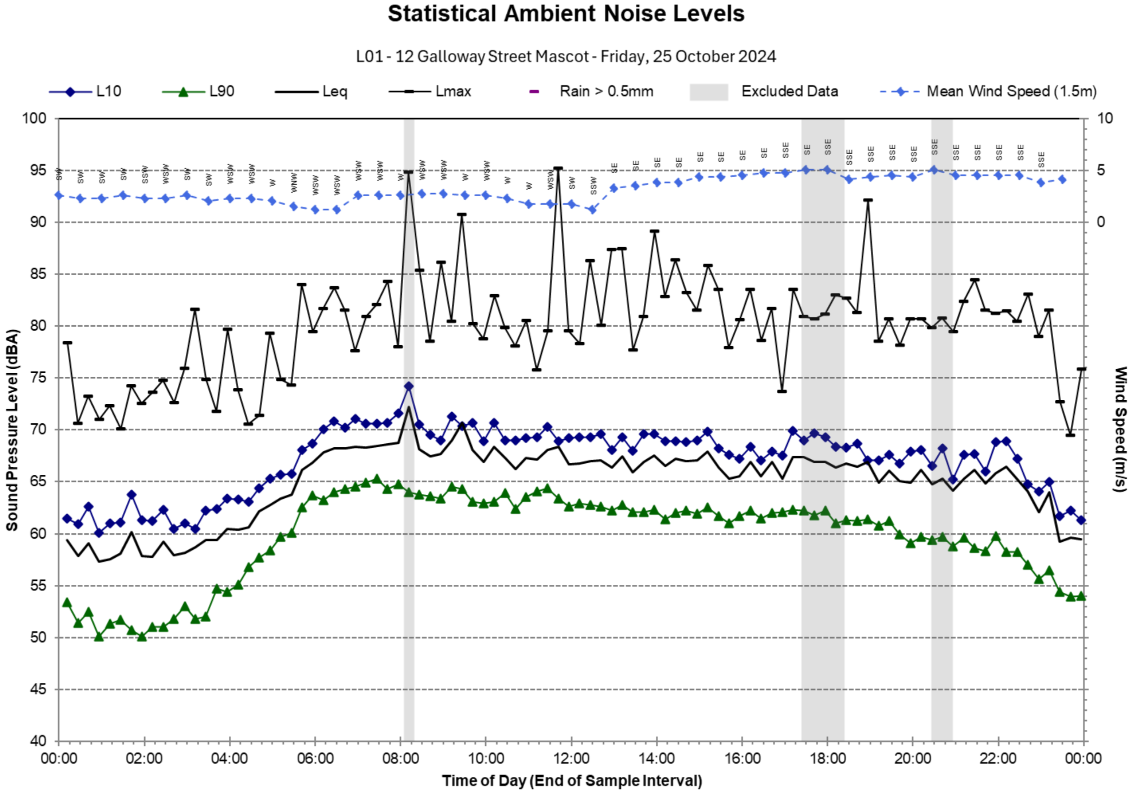

Statistical Ambient Noise Levels
L01 - 12 Galloway Street Mascot - Sunday, 20 October 2024
L10
L90
Leq
Lmax
Rain > 0.5mm
Excluded Data
Mean Wind Speed (1.5m)
Sound Pressure Level (dBA)
Wind Speed (m/s)
Time of Day (End of Sample Interval)

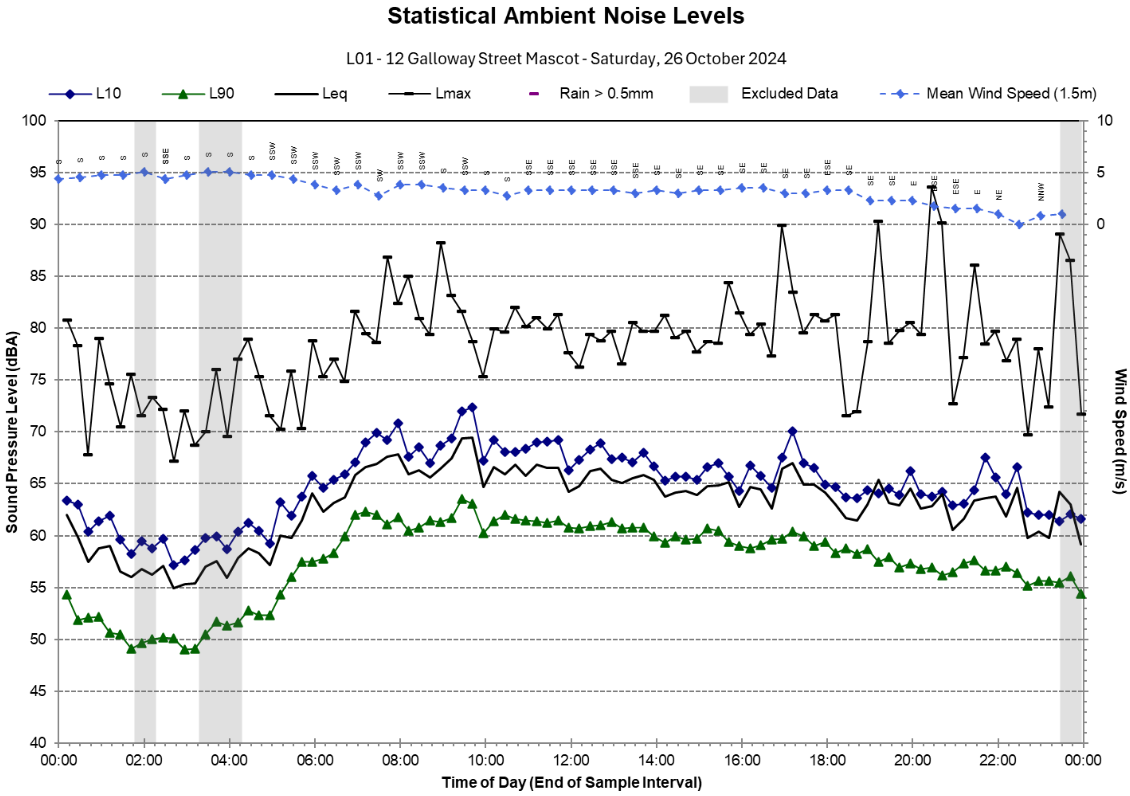

Statistical Ambient Noise Levels
L01 - 12 Galloway Street Mascot - Monday, 21 October 2024
L10
L90
Leq
Lmax
Rain > 0.5mm
Excluded Data
Mean Wind Speed (1.5m)
Sound Pressure Level (dBA)
Wind Speed (m/s)
Time of Day (End of Sample Interval)

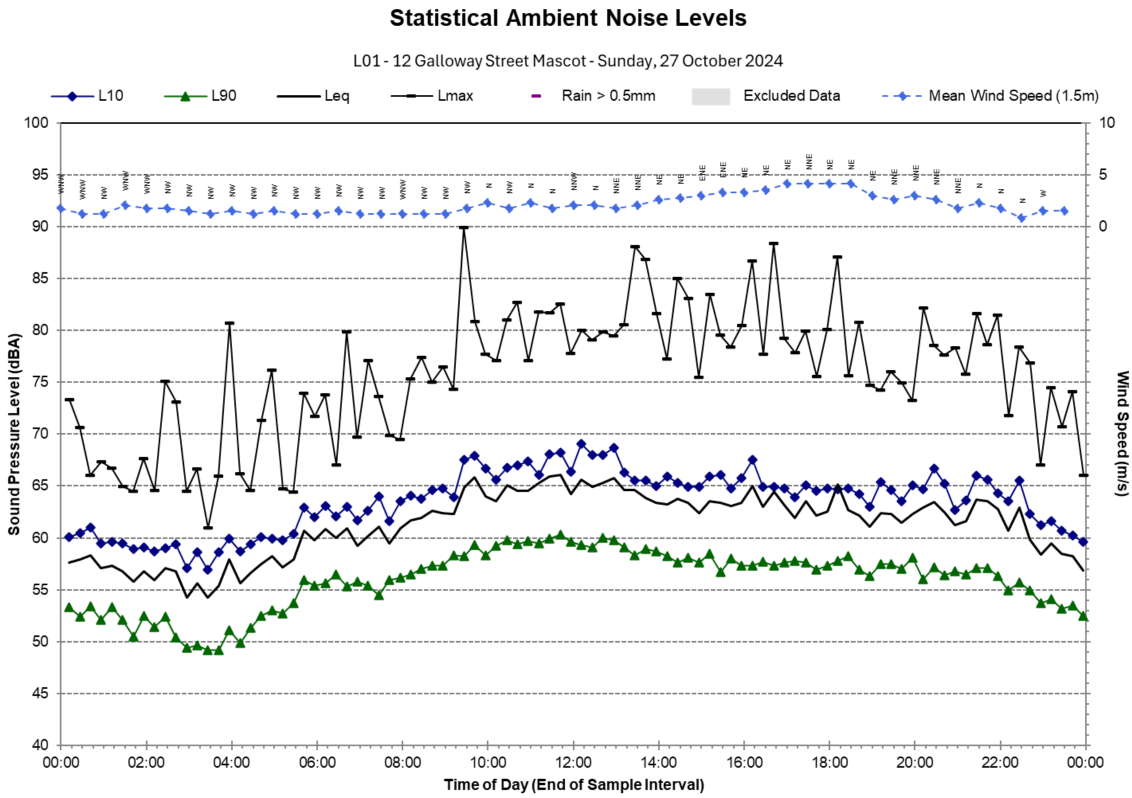

Statistical Ambient Noise Levels
L01 - 12 Galloway Street Mascot - Tuesday, 22 October 2024
L10
L90
Leq
Lmax
Rain > 0.5mm
Excluded Data
Mean Wind Speed (1.5m)
Sound Pressure Level (dBA)
Wind Speed (m/s)
Time of Day (End of Sample Interval)

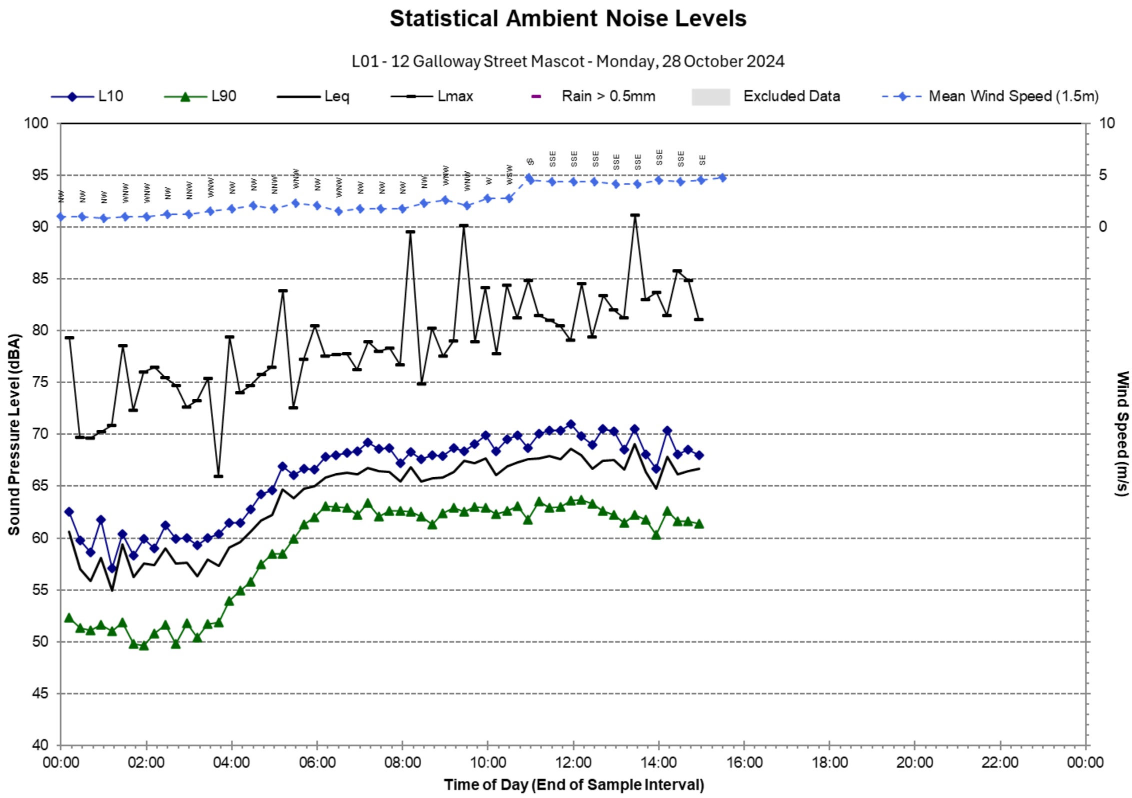

Statistical Ambient Noise Levels
L01 - 12 Galloway Street Mascot - Wednesday, 23 October 2024
L10
L90
Leq
Lmax
Rain > 0.5mm
Excluded Data
Mean Wind Speed (1.5m)
Sound Pressure Level (dBA)
Wind Speed (m/s)
Time of Day (End of Sample Interval)


Statistical Ambient Noise Levels
L01 - 12 Galloway Street Mascot - Thursday, 24 October 2024
L10
L90
Leq
Lmax
Rain > 0.5mm
Excluded Data
Mean Wind Speed (1.5m)
Sound Pressure Level (dBA)
Wind Speed (m/s)
Time of Day (End of Sample Interval)


Statistical Ambient Noise Levels
L01 - 12 Galloway Street Mascot - Friday, 25 October 2024
L10
L90
Leq
Lmax
Rain > 0.5mm
Excluded Data
Mean Wind Speed (1.5m)
Sound Pressure Level (dBA)
Wind Speed (m/s)
Time of Day (End of Sample Interval)


Statistical Ambient Noise Levels
L01 - 12 Galloway Street Mascot - Saturday, 26 October 2024
L10
L90
Leq
Lmax
Rain > 0.5mm
Excluded Data
Mean Wind Speed (1.5m)
Sound Pressure Level (dBA)
Wind Speed (m/s)
Time of Day (End of Sample Interval)


Statistical Ambient Noise Levels
L01 - 12 Galloway Street Mascot - Sunday, 27 October 2024
L10
L90
Leq
Lmax
Rain > 0.5mm
Excluded Data
Mean Wind Speed (1.5m)
Sound Pressure Level (dBA)
Wind Speed (m/s)
Time of Day (End of Sample Interval)


Statistical Ambient Noise Levels
L01 - 12 Galloway Street Mascot - Monday, 28 October 2024
L10
L90
Leq
Lmax
Rain > 0.5mm
Excluded Data
Mean Wind Speed (1.5m)
Sound Pressure Level (dBA)
Wind Speed (m/s)
Time of Day (End of Sample Interval)

Appendix C Construction Noise Sources

Project Duke Data Centre, Mascot

SSD-71368959 Noise and Vibration Impact Assessment

Goodman Property Services (Aust) Pty Ltd

SLR Project No.: 610.31795.00002

16 June 2025

Equipment	Total SWL	Chainsaw[1]	Chipper	Concrete Pump	Concrete Truck	Concrete Vibrator	Crane - Mobile (100t)	Dozer	Elevated Working Platform	Excavator (20t)	Excavator (30t) + Hydraulic Hammer[1]	Front End Loader	Hand Tools	Roller - Vibratory[1]	Truck - Dump	Truck - Flatbed	Water Truck
Sound Power Level[2]		119	120	109	109	113	113	116	97	105	127	112	104	114	110	103	107
Estimated on-time in any 15 minutes		5	15	10	15	5	15	10	15	10	5	10	15	15	10	10	10
Scenario																	
W.01 Vegetation clearing	122	X	X							X		X			X		X
W.02 Demolition	123							X			X	X			X		X
W.03 Earthworks	119							X		X		X		X	X		X
W.04 Excavation of hard rock	126							X		X	X	X			X		X
W.05 Construction of pads & hardstands	113			X	X	X											
W.06a Construction of structures & equip. install & W.06b Rooftop equip install	114						X		X				X			X	

Note 1: Equipment classed as ‘annoying’ in the ICNG and requires a 5 dB correction.

Note 2: Sound power level data is taken from AS 2436, the DEFRA Noise Database and TfNSW *Construction and Vibration Guideline*.

Appendix D Operational Noise Facade Maps

Project Duke Data Centre, Mascot

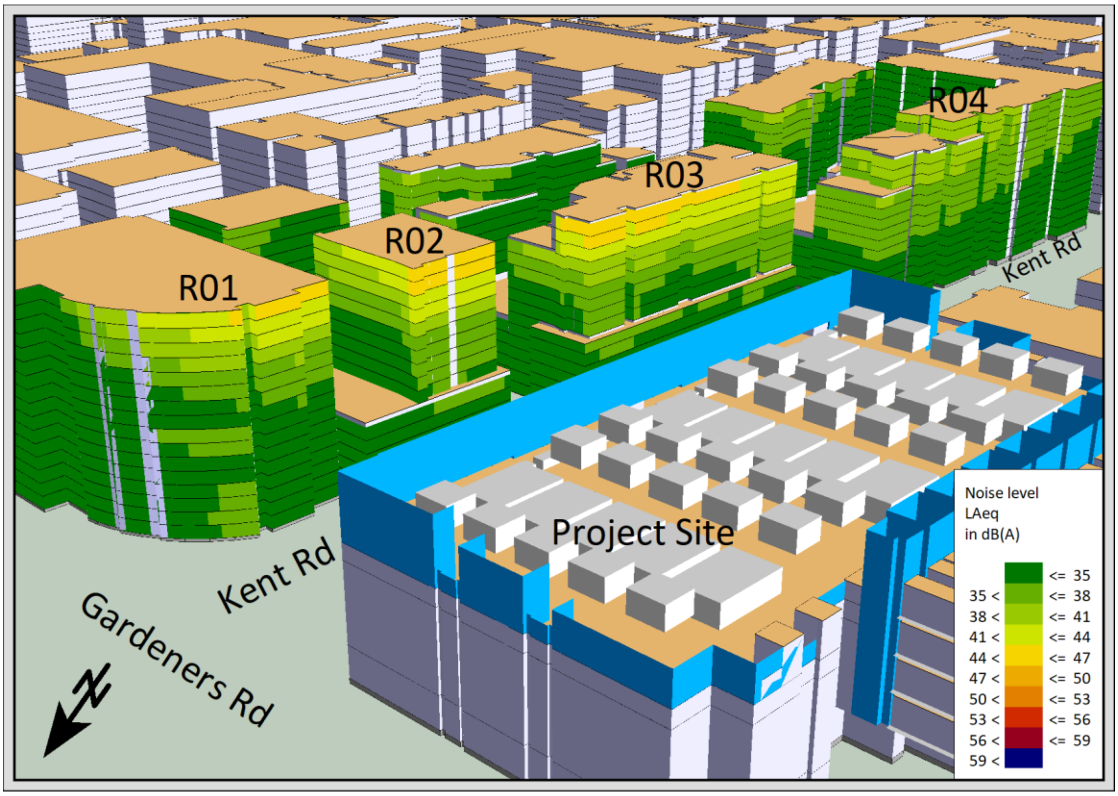
SSD-71368959 Noise and Vibration Impact Assessment

Goodman Property Services (Aust) Pty Ltd

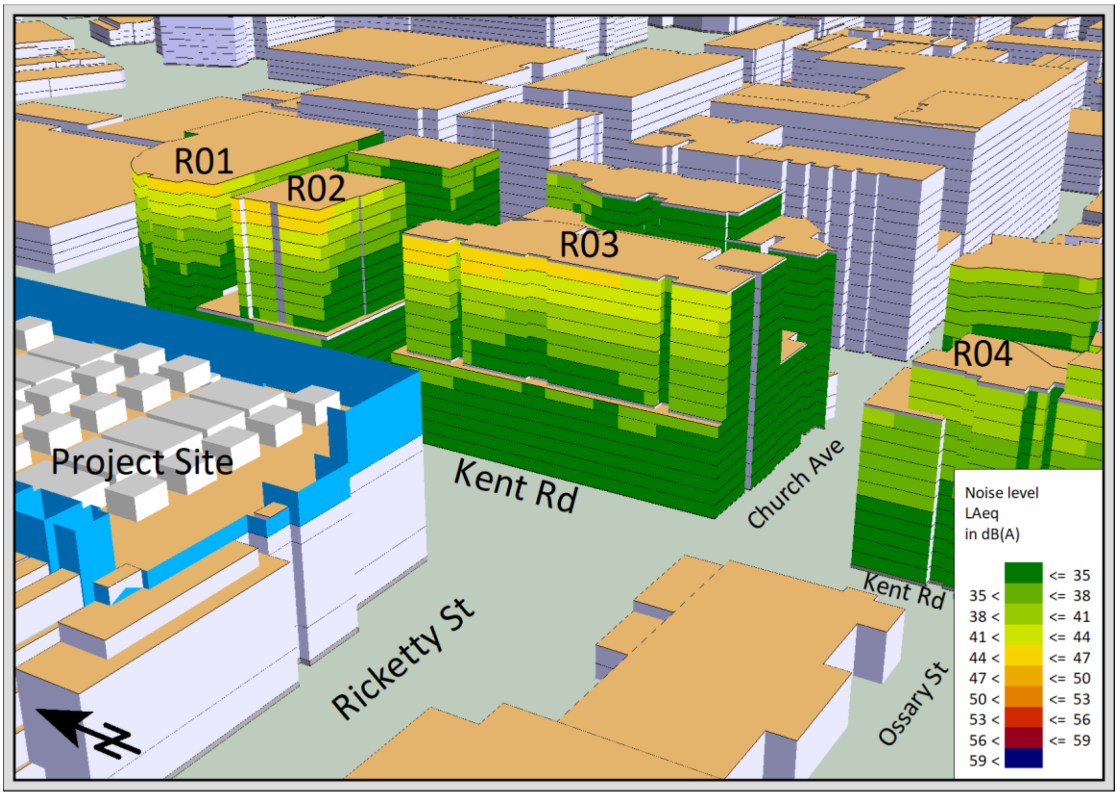
SLR Project No.: 610.31795.00002

16 June 2025

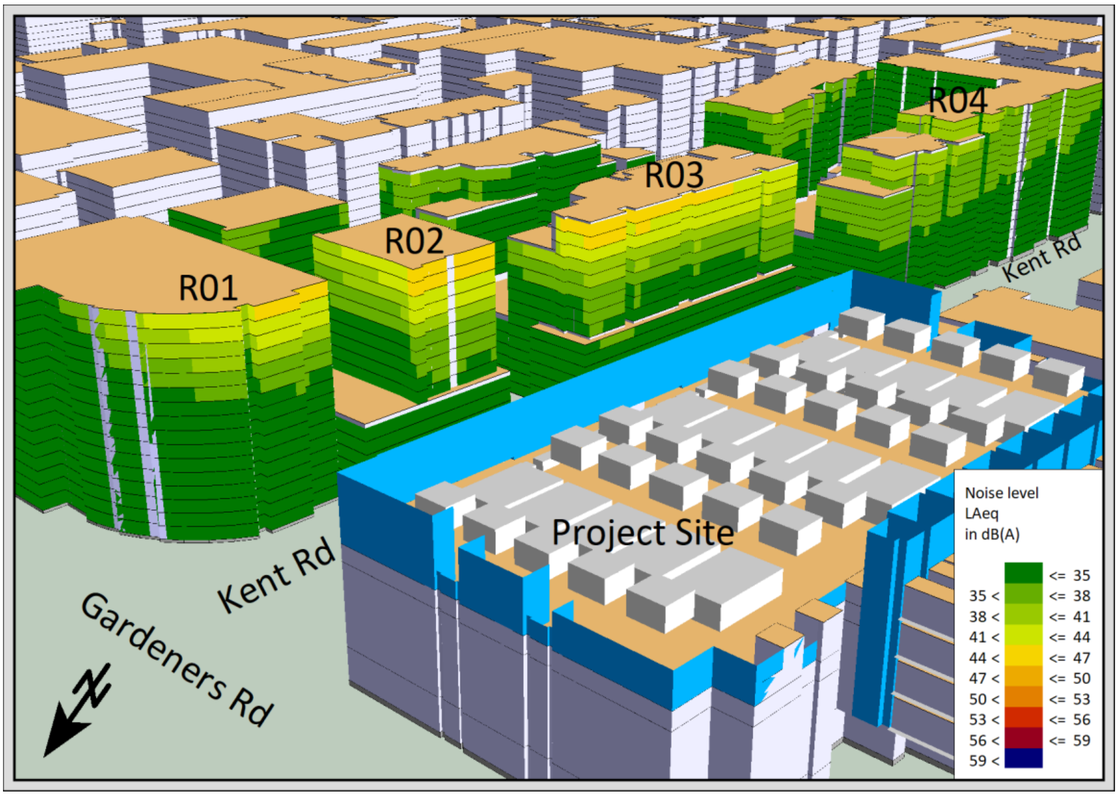
Predicted Operational Noise Facade Map – OP.01: Day – Southeast View



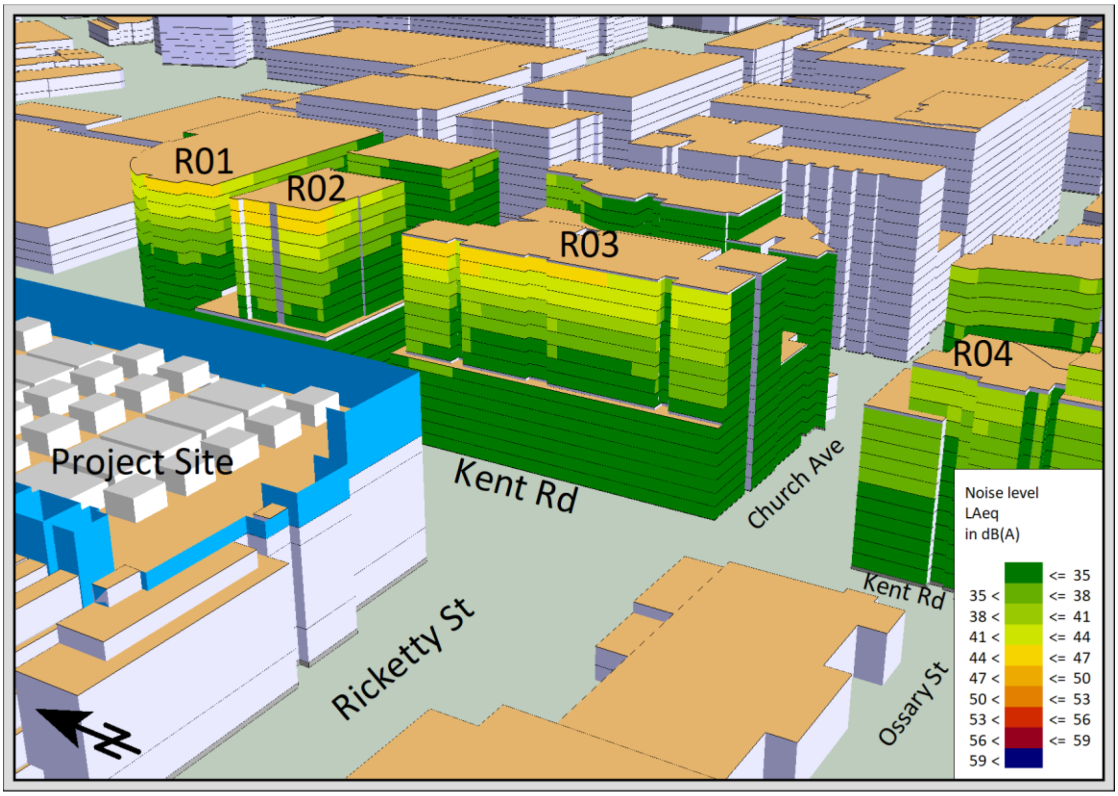
Predicted Operational Noise Facade Map – OP.01: Day – Northeast View



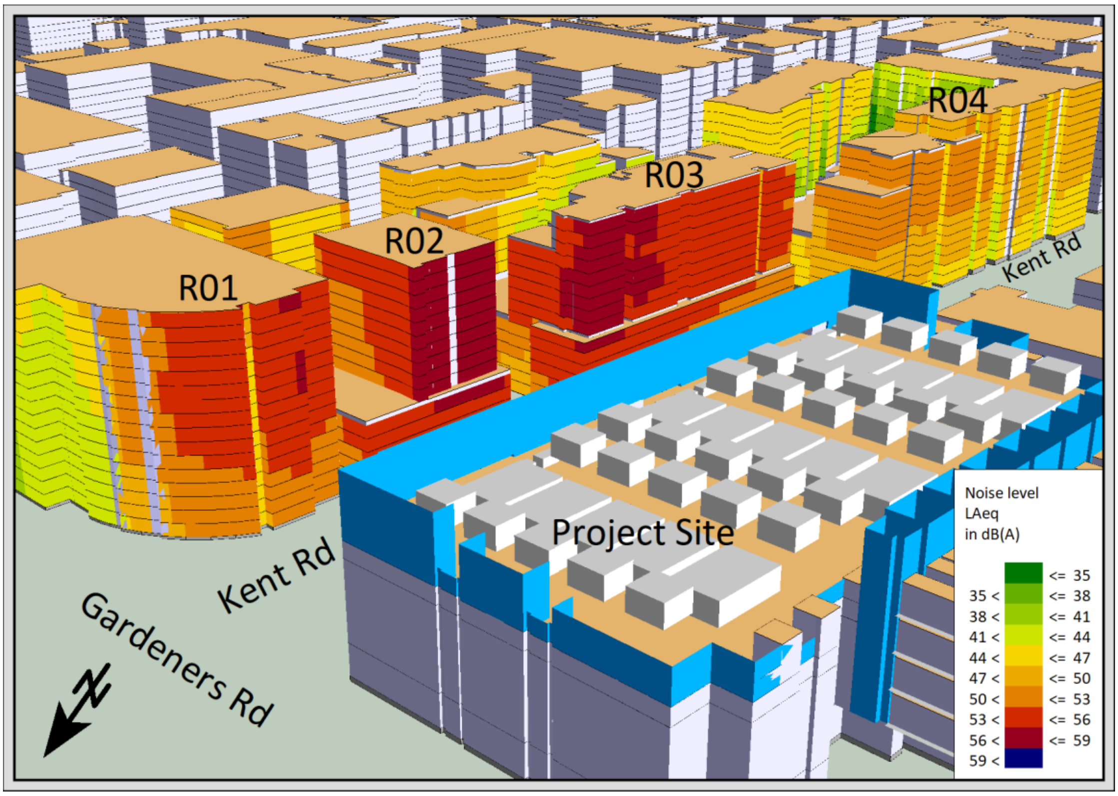
Predicted Operational Noise Facade Map – OP.01: Night – Southeast View



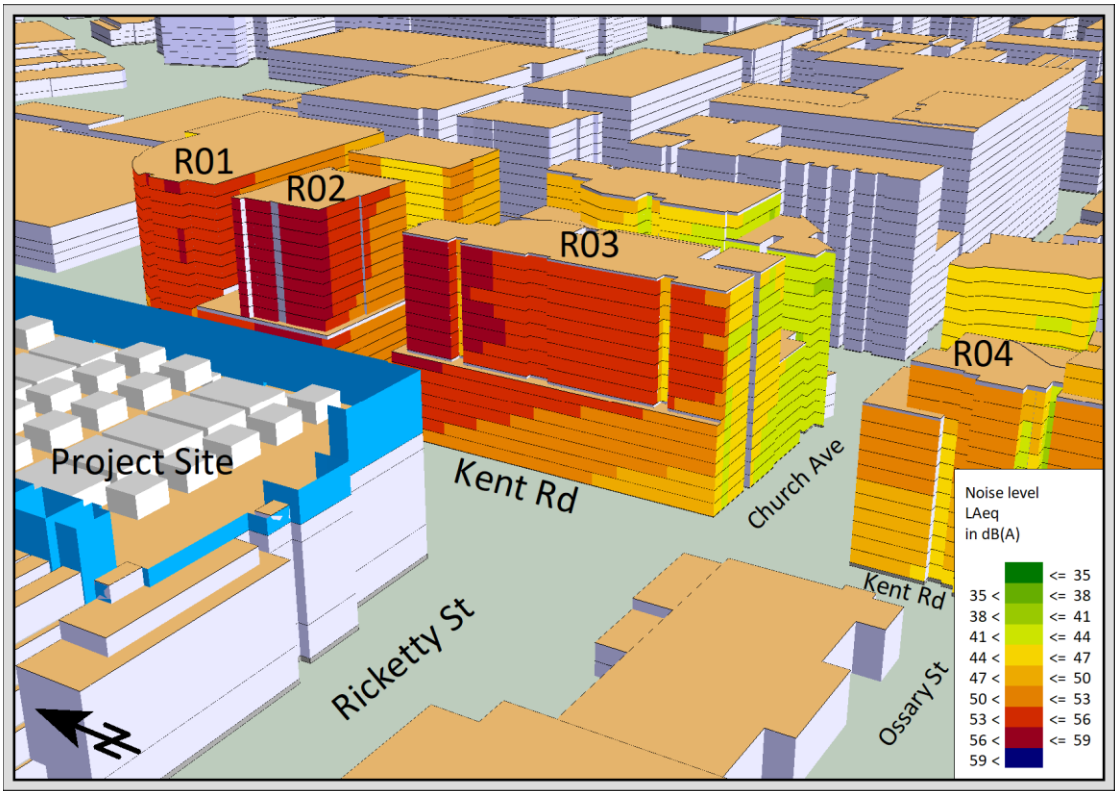
Predicted Operational Noise Facade Map – OP.01: Night – Northeast View



Predicted Operational Noise Facade Map – OP.02: Day + Generator Testing – Southeast View



Predicted Operational Noise Facade Map – OP.02: Day + Generator Testing – Northeast View



Appendix E CNVG Mitigation Measures

Project Duke Data Centre, Mascot

SSD-71368959 Noise and Vibration Impact Assessment

Goodman Property Services (Aust) Pty Ltd

SLR Project No.: 610.31795.00002

16 June 2025

CNVG Standard Mitigation and Management Measures

Action Required	Applies To	Details
Management measures		
Implementation of any project specific mitigation measures required.	Airborne noise	Implementation of any project specific mitigation measures required.
Implement community consultation or notification measures.	Airborne noise Ground-borne noise & vibration	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 Transport Communication and Stakeholder Engagement for guidance. Website (If required) Contact telephone number for community Email distribution list (if required) Community drop-in session (if required by approval conditions).
Site inductions	Airborne noise Ground-borne noise & vibration	All employees, contractors and subcontractors are to receive an environmental induction. The induction must at least include: • all project specific and relevant standard noise and vibration mitigation measures • relevant licence and approval conditions • permissible hours of work • any limitations on high noise generating activities • location of nearest sensitive receivers • construction employee parking areas • designated loading/unloading areas and procedures • site opening/closing times (including deliveries) • environmental incident procedures.
Behavioural practices	Airborne noise	No swearing or unnecessary shouting or loud stereos/radios on site. No dropping of materials from height, throwing of metal items and slamming of doors.
Verification	Airborne noise Ground-borne noise & vibration	Where specified under Appendix C of the CNVG a noise verification program is to be carried out for the duration of the works in accordance with the Construction Noise and Vibration Management Plan and any approval and licence conditions.
Attended vibration measurements	Ground-borne vibration	Where required attended vibration measurements should be undertaken at the commencement of vibration generating activities to confirm that vibration levels are within the acceptable range to prevent cosmetic building damage.

Action Required	Applies To	Details
Update Construction Environmental Management Plans	Airborne noise Ground-borne noise & vibration	The CEMP must be regularly updated to account for changes in noise and vibration management issues and strategies.
Building condition surveys	Vibration Blasting	Undertake building dilapidation surveys on all buildings located within the buffer zone prior to commencement of activities with the potential to cause property damage
Source controls		
Construction hours and scheduling	Airborne noise Ground-borne noise & vibration	Where feasible and reasonable, construction should be carried out during the standard daytime working hours. Work generating high noise and/or vibration levels should be scheduled during less sensitive time periods.
Construction respite period during normal hours and out-of-hours work	Ground-borne noise & vibration Airborne noise	See Appendix C of the CNVG for more details on the following respite measures: • Respite Offers (RO) • Respite Period 1 (R1) • Respite Period 2 (R2) • Duration Respite (DR)
Equipment selection.	Airborne noise Ground-borne noise & vibration	Use quieter and less vibration emitting construction methods where feasible and reasonable. For example, when piling is required, bored piles rather than impact-driven piles will minimise noise and vibration impacts. Similarly, diaphragm wall construction techniques, in lieu of sheet piling, will have significant noise and vibration benefits. Ensure plant including the silencer is well maintained.
Plant noise levels.	Airborne-noise	The noise levels of plant and equipment must have operating Sound Power or Sound Pressure Levels compliant with the criteria in Appendix H of the CNVG. Implement a noise monitoring audit program to ensure equipment remains within the more stringent of the manufacturers specifications or Appendix H of the CNVG.
Rental plant and equipment.	Airborne-noise	The noise levels of plant and equipment items are to be considered in rental decisions and in any case cannot be used on site unless compliant with the criteria in Table 2 of the CNVG.
Use and siting of plant.	Airborne-noise	The offset distance between noisy plant and adjacent sensitive receivers is to be maximised. Plant used intermittently to be throttled down or shut down. Noise-emitting plant to be directed away from sensitive receivers. Only have necessary equipment on site.
Plan worksites and activities to minimise noise and vibration.	Airborne noise Ground-borne vibration	Locate compounds away from sensitive receivers and discourage access from local roads. Plan traffic flow, parking and loading/unloading areas to minimise reversing movements within the site.

Action Required	Applies To	Details
		Where additional activities or plant may only result in a marginal noise increase and speed up works, consider limiting duration of impact by concentrating noisy activities at one location and move to another as quickly as possible. Very noise activities should be scheduled for normal working hours. If the work can not be undertaken during the day, it should be completed before 11:00pm. Where practicable, work should be scheduled to avoid major student examination periods when students are studying for examinations such as before or during Higher School Certificate and at the end of higher education semesters. If programmed night work is postponed the work should be re-programmed and the approaches in this guideline apply again.
Reduced equipment power	Airborne noise Ground-borne vibration	Use only the necessary size and power.
Non-tonal and ambient sensitive reversing alarms	Airborne noise	Non-tonal reversing beepers (or an equivalent mechanism) must be fitted and used on all construction vehicles and mobile plant regularly used on site and for any out of hours work. Consider the use of ambient sensitive alarms that adjust output relative to the ambient noise level.
Minimise disturbance arising from delivery of goods to construction sites.	Airborne noise	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.
Engine compression brakes	Construction vehicles	Limit the use of engine compression brakes at night and in residential areas. Ensure vehicles are fitted with a maintained Original Equipment Manufacturer exhaust silencer or a silencer that complies with the National Transport Commission's 'In-service test procedure' and standard.
Path controls		
Shield stationary noise sources such as pumps, compressors, fans etc.	Airborne noise	Stationary noise sources should be enclosed or shielded where feasible and reasonable whilst ensuring that the occupational health and safety of workers is maintained. Appendix D of AS 2436:2010 lists materials suitable for shielding.
Shield sensitive receivers from noisy activities.	Airborne noise	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.

Action Required	Applies To	Details
Receptor control		
Structural surveys and vibration monitoring	Ground-borne vibration	Pre-construction surveys of the structural integrity of vibration sensitive buildings may be warranted. At locations where there are high-risk receptors, vibration monitoring should be conducted during the activities causing vibration.
See Appendix C of the CNVG for additional measures	Airborne noise Ground-borne vibration	In some instances, additional mitigation measures may be required.

Appendix F NPfI Mitigation Measures

Project Duke Data Centre, Mascot

SSD-71368959 Noise and Vibration Impact Assessment

Goodman Property Services (Aust) Pty Ltd

SLR Project No.: 610.31795.00002

16 June 2025

Best Management Practice (BMP)

Best management practice (BMP) is the application of particular operational procedures that minimise noise while retaining productive efficiency.

Where applied, these measures and practices are often documented in a noise management plan so that operational practices and undertakings are clearly understood and applied at all levels of an industrial operation. Application of BMP can include the following types of practice:

- Using the quietest plant that can do the job
- Scheduling the use of noisy equipment at the least-sensitive time of day
- Not operating, or reducing operations at night
- Siting noisy equipment behind structures that act as barriers, or at the greatest distance from the noise-sensitive area or orienting the equipment so that noise emissions are directed away from any sensitive areas, to achieve the maximum attenuation of noise
- Where there are several noisy pieces of equipment, scheduling operations so they are used separately rather than concurrently
- Keeping equipment well-maintained and operating it in a proper and efficient manner
- Using ‘quiet’ practices when operating equipment, for example, positioning idling trucks in appropriate areas
- Running staff-education programs and regular tool box talks on the effects of noise and the use of quiet work practices.

For many industries there are a wide range of factors that can restrict the feasibility and reasonableness of applying BMP measures on a particular site. Work health and safety considerations must also be taken into account as well as any other regulatory and process requirements.

Appendix G Mechanical Plant Data Sheets

Project Duke Data Centre, Mascot

SSD-71368959 Noise and Vibration Impact Assessment

Goodman Property Services (Aust) Pty Ltd

SLR Project No.: 610.31795.00002

16 June 2025

Baltimore Aircoil Company

Cooling Tower Selection Report

Version: 8.11.19 ANZ
Product data correct as of: December 07, 2021

Project Name: Project Duke
Selection Name: XES3E-1222-07M ENDURA/H
Project State/Province: NSW
Project Country/Region: Australia
Date: March 09, 2025

Model Information

Product Line: Series 3000 (2021 WQF)
Model: XES3E-1222-07M ENDURA/H
Number of Units: 2

Intake Option: None
Internal Option: None
Discharge Option: None

This model includes the ENDURADRIVE® Fan System.
Fan Type: Whisper Quiet Fan (2021)
Fan Motor: (1) 14.92 = 14.92 kW/Unit
Total Standard Fan Power: 56.99% of Full Speed, 2.76 BkW/Unit

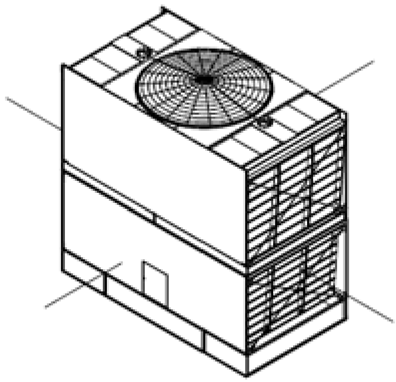
Octave band and A-weighted sound pressure levels (Lp) are expressed in decibels (dB) reference 0.0002 microbar. Sound power levels (Lw) are expressed in decibels (dB) reference one picowatt. Octave band 1 has a center frequency of 63 Hertz.

Top – Sound Pressure (dB)

Octave Band	Distance 1.5 m	Distance 15 m
1	57	50
2	56	50
3	51	45
4	48	40
5	47	40
6	44	40
7	40	35
8	34	25
A-wgtd	**52**	**46**

Air Inlet – Sound Pressure (dB)

Octave Band	Distance 1.5 m	Distance 15 m
1	60	52
2	60	48
3	53	42
4	50	38
5	50	40
6	39	33
7	37	25
8	42	29
A-wgtd	**54**	**43**



End – Sound Pressure (dB)

Octave Band	Distance 1.5 m	Distance 15 m
1	52	51
2	53	44
3	46	36
4	43	30
5	40	30
6	34	27
7	32	20
8	26	13
A-wgtd	**45**	**36**

End – Sound Pressure (dB)

Octave Band	Distance 1.5 m	Distance 15 m
1	52	51
2	53	44
3	46	36
4	43	30
5	40	30
6	34	27
7	32	20
8	26	13
A-wgtd	**45**	**36**

Total Sound Power (dB)

Octave Band	Center Frequency (Hertz)	Lw
1	63	83
2	125	82
3	250	77
4	500	72
5	1000	72
6	2000	72
7	4000	66
8	8000	58
A-wgtd		**78**

Air Inlet – Sound Pressure (dB)

Octave Band	Distance 1.5 m	Distance 15 m
1	60	52
2	60	48
3	53	42
4	50	38
5	50	40
6	39	33
7	37	25
8	42	29
A-wgtd	**54**	**43**

Note: The use of frequency inverters (variable frequency drives) can increase sound levels.
Extra Notes: Sound data provided by CTI ATC-128 sound test code revision 2019

3. Mechanical Plant Noise Data

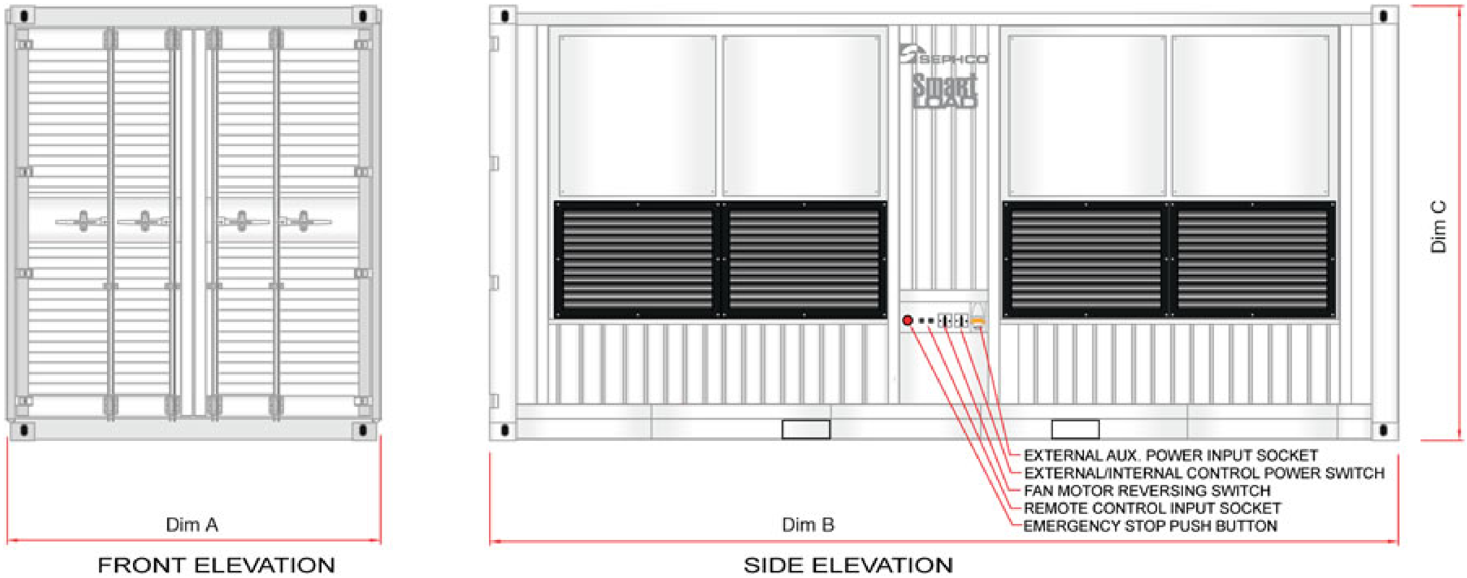
Table 3: Project major mechanical equipment, quantities, and noise levels (per unit)

Equipment	Source	Number of items	Location	Sound Level Parameter	Total Level per item, dB(A)	Sound Level Spectra by Octave Band per item, dB(Z)							
						63Hz	125Hz	250Hz	500Hz	1kHz	2kHz	4kHz	8kHz
Water-cooled chillers WCC (mitigated)	Housed in acoustic enclosure	30	Rooftop plant	Lw (i.e. radiated from enclosure / mitigated WCC)	68	81	69	64	57	60	64	48	44
Packaged Air Conditioning Units	AirChange PCU-N-D-40	18	Roof plant platform	Lw (spectral data is A-weighted)	-	17	33	48	42	47	44	40	32

SEPHCO WAR-CL SERIES LOAD BANK DIMENSIONS

Off the Shelf load bank with 91dbA @1 m.

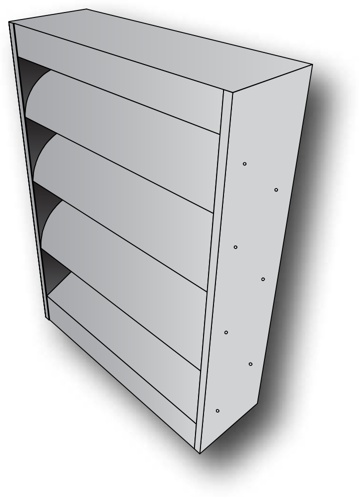
WAR20CL, WAR40CL SERIES 2000kVa To 6500kVa



CONTROL PANEL
LC12D remote control type

MODEL NO	RATING	LOAD STEPS	DIM.A	DIM.B	DIM.C	WEIGHT	NOISE LEVEL
WAR40CL650C	6500KVA	6.25KVA	2440	12100	2595	20000KG	92dBa @ 1M
WAR40CL4500	4500KVA	6.25KVA	2440	12100	2595	16400KG	92dBa @ 1M
WAR40CL400C	4000KVA	6.25KVA	2440	6058	2595	13500KG	91dBa @ 1M
WAR20CL3300	3300KVA	6.25KVA	2440	6058	2595	12800KG	91dBa @ 1M
WAR20CL300C	3000KW	6.25KVA	2440	6058	2595	12000KG	91dBa @ 1M
WAR20CL2800	2800KVA	6.25KVA	2440	6058	2595	11200KG	91dBa @ 1M
WAR20CL2500	2500KVA	6.25KVA	2440	6058	2595	10600KG	91dBa @ 1M
WAR20CL200C	2000KVA	6.25KVA	2440	6058	2595	10000KG	91dBa @ 1M

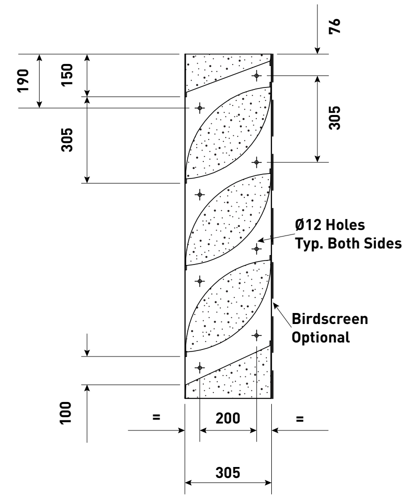
Model R Noishield™ Acoustic Louvres



Weight
40kg/m²

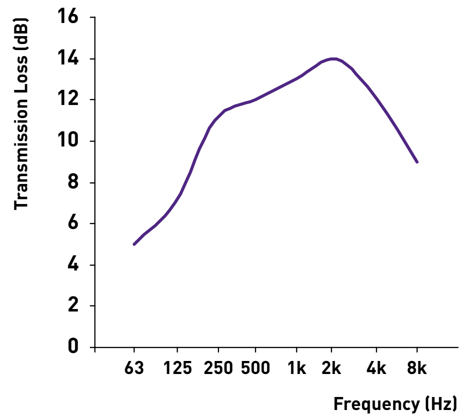
Module Width
300 - 1219mm

Standard Module Height
305 - 3660mm (in 305mm increments)
Intermdiate heights are available



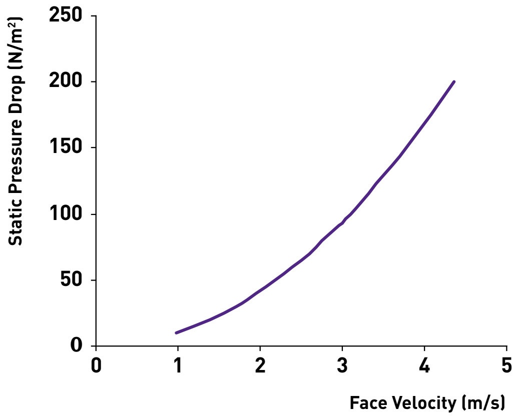
Acoustic Performance

Octave Band Centre Frequency (Hz)	63	125	250	500	1k	2k	4k	8k
Transmission Loss (dB)	5	7	11	12	13	14	12	9
Acoustic Rating	R_w14dB / D_{new}21dB							



Aerodynamic Performance

Static Pressure Drop (N/m²)	10	20	30	40	50	60	70	80	90	100
Face Velocity (m/s)	0.98	1.39	1.71	1.95	2.18	2.39	2.60	2.75	2.93	3.10
Nominal Free Area	43%*					* Average over louvre depth				
Aerodynamic Coefficient	17.53k									



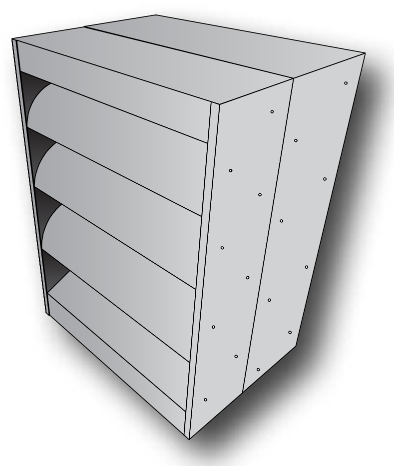
Acoustic Louvred Doors

- Single and double doors are available in the R louvre range.
- See page 22 for further details

iac acoustics
making the world a quieter place

www.iac-australia.com.au

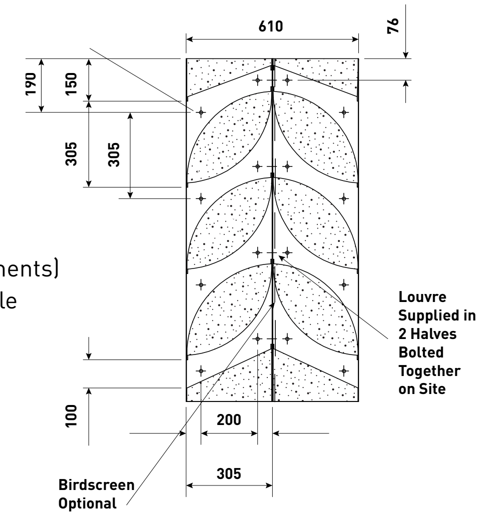
Model 2R Noishield™ Acoustic Louvres



Weight
80kg/m²

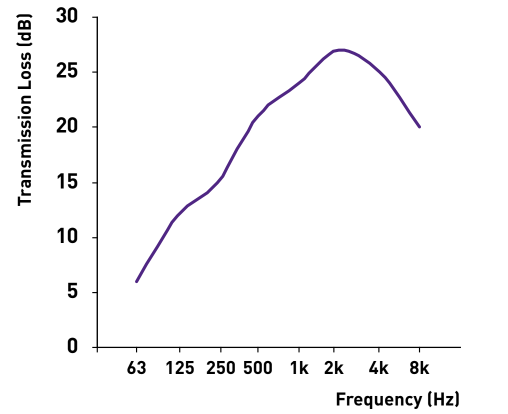
Module Width
300 - 1219mm

Standard Module Height
305 - 3660mm (in 305mm increments)
Intermediate heights are available



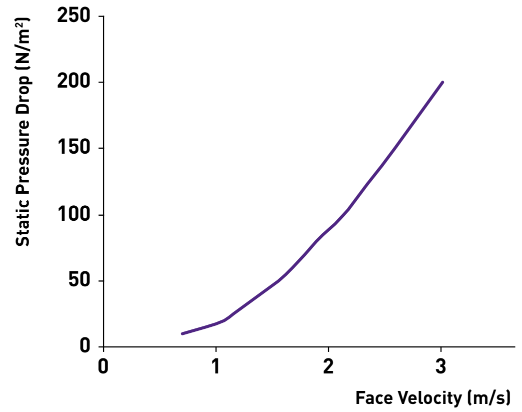
Acoustic Performance

Octave Band Centre Frequency (Hz)	63	125	250	500	1k	2k	4k	8k
Transmission Loss (dB)	6	12	15	21	24	27	25	20
Acoustic Rating	R_w24dB / D_{new}31dB							



Aerodynamic Performance

Static Pressure Drop (N/m²)	10	20	30	40	50	60	70	80	90	100
Face Velocity (m/s)	0.70	1.07	1.21	1.39	1.55	1.68	1.79	1.89	2.01	2.13
Nominal Free Area	43%*					* Average over louvre depth				
Aerodynamic Coefficient	34.68k									



iac acoustics
making the world a quieter place

www.iac-australia.com.au

Appendix H Traffic Noise Modelling

Project Duke Data Centre, Mascot

SSD-71368959 Noise and Vibration Impact Assessment

Goodman Property Services (Aust) Pty Ltd

SLR Project No.: 610.31795.00002

16 June 2025

Technical Memorandum

SLR

Company: Goodman Property Services (Aust) Pty Ltd

SLR Consulting Australia Pty Ltd

Date: 30 May 2025

Project No. 610.031795.00002

RE: Project Duke Data Centre, Mascot Traffic Noise Modelling

1.0 Introduction

This memorandum details the methodology and results of road traffic noise modelling undertaken as part of the SSD-71368959 Noise and Vibration Impact Assessment (NVIA) for the Project Duke Data Centre, Mascot.

The traffic noise modelling has been prepared for the following purposes:

- To determine existing road traffic noise exposure at sensitive receivers adjacent to the site, in particular, the residential apartment buildings on Kent Road.
- To assist in justifying the adoption of high traffic noise amenity criteria at the most-affected residential receivers, based on noise monitoring undertaken as part of the NVIA.
- To determine any change in traffic noise levels at sensitive receivers due to construction and operation of the data centre project.

The site is located at 2 and 10-22 Kent Road, and 685 Gardeners Road, Mascot, with commercial/industrial premises to the north, south and west. High density residential apartment towers up to 14 storeys in height are located to the east and southeast of the site, and two childcare centres to the southeast (MindChamps Early Learning & Preschool and Little Angels at Mascot Central).

The nearest receivers are shown in **Figure 1** and detailed in **Table 1**.

Table 1 Surrounding Sensitive Receivers

ID	Receiver	Type	Distance (m)	Direction
R01	671-675 Gardeners Road, Mascot	Residential	40 m	East
R02	12 Galloway Street, Mascot	Residential	30 m	East
R03	7-9 Kent Road, Mascot	Residential	30 m	East
R04	61-63 Church Avenue, Mascot	Residential	70 m	Southeast
R05	Child care centres	Child care	85 m	Southeast
R06	Surrounding commercial premises	Commercial	5 m	North, South, West

0 50 100 150 m

Scale: 1:2,500
Coordinate System: GDA2020 / MGA zone 56

Drawn Date: 30-May-2025
Project Number: 610.031795.00002

H:\Projects-SLR\610-SrvSYD\610-SYD\610.031795.00001 Kent Road Mascot Data Centre\06 SLR Data\07 A&V\01 QGIS\610.031795 Kent Rd Data Centre SSDA.qgz

SLR

Data Source:
ESRI World Imagery

DISCLAIMER: All information within this document may be based on external sources. SLR Consulting Pty Ltd makes no warranty regarding the data's accuracy or reliability for any purpose.

SITE MAP

FIGURE 1

2.0 Traffic Survey

A traffic survey was undertaken on the major roads around the site in April 2025 to determine the existing traffic volumes, vehicle types and typical speeds. Vehicle volumes were measured in Austroads Vehicle Classification classes, with average vehicle speeds also measured.

Seven days of data was collected, from 6pm on Friday 4 April 2025 to 6pm on Friday 11 April 2025.

The survey included each direction of the following roads:

- TC1 – Gardeners Road – west of Kent Road
- TC2 – Gardeners Road – east of Kent Road
- TC3 – Kent Road – north of Ricketty Street
- TC4 – Kent Road – south of Ricketty Street
- TC5 – Ricketty Street – west of Kent Road
- TC6 – Bourke Street – between Gardeners Road and Church Avenue

The traffic survey locations are shown in **Figure 1** and the results are detailed in **Table 2**.

Table 2 Traffic Survey Results

ID	Road	Direction	Existing Traffic Volumes[1,2]											
			Day (7am-6pm)				Evening (6pm-10pm)				Night (10pm-7am)			
			Light Vehicles	Medium Vehicles	Heavy Vehicles	Speed (km/h)	Light Vehicles	Medium Vehicles	Heavy Vehicles	Speed (km/h)	Light Vehicles	Medium Vehicles	Heavy Vehicles	Speed (km/h)
TC1	Gardeners Road (West of Kent Road)[3]	Eastbound	9,263	578	213	47	1,676	59	18	49	2,100	207	81	52
		Westbound	7,358	421	141	53	1,625	33	20	53	1,669	103	56	54
TC2	Gardeners Road (East of Kent Road)[3]	Eastbound	11,973	693	107	53	2,188	52	7	53	2,608	223	35	54
		Westbound	12,150	614	89	47	3,550	66	6	49	2,794	131	21	52
TC3	Kent Road (North of Ricketty Street)	Northbound	6,026	705	188	38	1,174	63	26	44	1,402	142	66	44
		Southbound	8,511	906	168	42	2,679	124	14	43	1,804	210	62	45
TC4	Kent Road (South of Ricketty Street)	Northbound	4,452	485	135	39	1,112	68	33	41	932	110	57	44
		Southbound	4,710	583	149	40	1,222	113	29	41	1,491	199	67	44
TC5	Ricketty Street (West of Kent Road)	Eastbound	7,068	745	341	47	1,621	102	64	49	2,026	227	124	52
		Westbound	6,985	898	384	53	2,004	121	75	53	1,529	200	112	54
TC6	Bourke Street (Between Gardeners Road and Church Avenue)	Northbound	5,483	303	17	39	1,812	56	3	38	1,367	73	2	42
		Southbound	2,995	286	23	40	1,048	44	9	41	848	56	5	44

Note 1: Time periods are split into day, evening and night based on the *Noise Policy for Industry* assessment periods.

Note 2: Light vehicles are Austroads Classes 1 and 2, Medium (rigid) vehicles are Austroads Classes 3 to 5, Heavy (articulated) vehicles are Austroads Classes 6 to 12.

Note 3: Traffic speeds were not able to be measured on Gardeners Road due to access restrictions. This assessment has used indicative speeds for Gardeners Road based on Ricketty Street measured average speeds.

3.0 Noise Monitoring

3.1 Unattended Noise Monitoring

Unattended noise monitoring was undertaken adjacent to Kent Road for the duration of the traffic survey in April 2025. The monitoring was undertaken on the project site, around 8 m from the centre of the nearest traffic lane of Kent Road (representative of the distance to the ground floor facades of the receiver buildings on Kent Road).

This location was selected as a validation point for the road traffic noise model, to compare the predicted noise level to the measured noise level during the same period of traffic.

The noise monitoring equipment continuously measured ambient noise levels in 15-minute periods during the daytime, evening and night-time. All equipment carried current National Association of Testing Authorities (NATA) or manufacturer calibration certificates and equipment calibration was confirmed before and after each measurement.

The measured data has been processed to exclude noise from extraneous events and periods affected by adverse weather conditions, such as strong wind or rain (measured at Sydney Airport AWS).

The unattended noise monitoring location is shown in **Figure 1** and the results are summarised in **Table 3**. The below results are shown for 6pm on Friday 4 April 2025 to 6pm on Friday 11 April 2025, consistent with the traffic survey. Details of the monitoring location together with graphs of the measured daily noise levels are provided in **Attachment A**.

Table 3 Summary of Unattended Noise Monitoring Results

ID	Location	Measured Noise Levels (dBA)[1]					
		Background Noise (RBL)			Average Noise (L_{Aeq})		
		Day	Evening	Night	Day	Evening	Night
M01	10-22 Kent Road, Mascot – around 8 m from centre of nearest traffic lane	59	56	46	70	67	64

Note 1: Time periods are split into day (7am to 6pm), evening (6pm to 10pm) and night (10pm to 7am) based on the *Noise Policy for Industry* assessment periods.

3.2 Attended Noise Measurements

Short-term attended noise measurements were completed at the monitoring location. Simultaneous attended noise measurements were also undertaken at the base of each residential apartment building (receivers R01, R02, R03 and R04). The attended measurements were undertaken for a 15-minute period at each location (R01 to R04) during the day and night periods, with a corresponding measurement undertaken adjacent to the unattended monitoring location (M01). Measurements at both locations started and ended at the same time.

These simultaneous measurements allowed for a direct comparison of noise levels at the monitoring location to those at the base of each receiver building, and assist with validation of the road traffic noise model.

The attended noise measurement locations are shown in **Figure 1** and the results are summarised in **Table 4**. Detailed observations from the attended measurements are provided in **Attachment B**.

Table 4 Summary of Simultaneous Attended Noise Measurement Results

ID	Location	Date	Period	Start Time	Measured Noise Levels (dBA)				Notes
					L_{Amax}	L_{Aeq}	L_{A10}	L_{A90}	
A-M01	Unattended monitoring location – 10-22 Kent Road, Mascot	7/04/2025	Day	14:58	84	70	73	61	L_{Amax} – loud car passby
				15:17	86	70	73	61	L_{Amax} – truck passby
				15:40	87	71	73	60	L_{Amax} – truck passby
				16:01	96	72	73	61	L_{Amax} – loud car passby
			Night	22:00	85	66	69	55	L_{Amax} – motorbike passby
				22:18	85	66	69	53	L_{Amax} – truck passby
				22:36	83	66	69	53	L_{Amax} – truck brake squeal
				22:54	84	64	67	50	L_{Amax} – truck passby
A-R01	Base of R01 – 671-675 Gardeners Road, Mascot	7/04/2025	Day	14:58	90	69	72	60	L_{Amax} – truck brake squeal
			Night	22:00	89	65	68	52	L_{Amax} – loud car passby
A-R02	Base of R02 – 12 Galloway Street, Mascot	7/04/2025	Day	15:17	84	69	72	60	L_{Amax} – truck passby
			Night	22:18	81	65	70	51	L_{Amax} – truck passby
A-R03	Base of R03 – 7-9 Kent Road, Mascot	7/04/2025	Day	15:40	90	71	74	61	L_{Amax} – truck passby
			Night	22:36	92	69	71	53	L_{Amax} – truck brake squeal
A-R04	Base of R04 – 61-63 Church Avenue, Mascot	7/04/2025	Day	16:01	83	67	71	57	L_{Amax} – truck passby
			Night	22:54	82	65	68	49	L_{Amax} – truck passby

Comparison of the simultaneous measurements is shown in **Table 5**.

Table 5 Comparison of Simultaneous Attended Noise Measurement Results

Comparison	Period	A-M01 Minus A-R0x (dBA)[1]				Notes
		L_{Amax}	L_{Aeq}	L_{A10}	L_{A90}	
A-M01 to A-R01	Day	-5.1	+0.5	+1.1	+0.4	Generally similar L_{Aeq}, L_{A10} and L_{A90}
	Night	-3.9	+0.3	+0.9	+3.0	Generally similar L_{Aeq} and L_{A10} – higher L_{A90} during the night at A-M01 than A-R01
A-M01 to A-R02	Day	+2.3	+0.5	+0.6	+0.3	Generally similar L_{Aeq}, L_{A10} and L_{A90}
	Night	+3.1	+0.2	-1.3	+1.8	Generally similar L_{Aeq}, L_{A10} and L_{A90}
A-M01 to A-R03	Day	-3.0	-0.8	-0.9	-1.2	Generally similar L_{Aeq}, L_{A10} and L_{A90}
	Night	-9.1	-2.9	-1.8	-0.3	Truck break squeal increased the L_{Amax} and L_{Aeq} at A-R03, causing those levels to be higher than A-M01
A-M01 to A-R04	Day	+12.7	+4.8	+2.5	+3.8	A-M01 was higher than A-R04 during the day. A loud car increased the L_{Amax} at A-M01 but didn't significantly affect the L_{Aeq}
	Night	+2.4	-0.3	-0.8	+0.5	Generally similar L_{Aeq}, L_{A10} and L_{A90}
Median Level	Day	-0.4	+0.5	+0.9	+0.3	Median difference for both day and night is generally ±1 dB between A-M01 and the other locations
	Night	-0.8	-0.1	-1.1	+1.2	

Note 1: A positive difference indicates the noise level at A-M01 was higher, a negative difference indicates it was lower.

The attended measurements generally showed similar L_{Aeq}, L_{A10} and L_{A90} between the unattended monitoring location and each of the simultaneous measurements, with larger differences typically being caused by a local L_{Amax} event that affected one of the locations more than the other.

4.0 Modelling Methodology

A road traffic noise model has been used to predict noise levels from the road network around the site. The model uses *Transport Noise Model 3.0* (TNM) (U.S. Department of Transportation Federal Highway Administration, 2019) algorithms in SoundPLAN V8.2 software, which includes vehicle acceleration profiles for light, medium and heavy vehicles.

The three-dimensional operational industrial noise model prepared for the NVIA was used as a base for the road traffic noise model. Consistent with the NVIA model, ground absorption is modelled at 0.0 (hard ground) in the project area.

Road surfaces within the project area are Dense Grade Asphalt (DGA). DGA has a 0 dB road surface correction factor.

The road traffic noise model uses the traffic survey results detailed in **Section 2.0** to predict the existing road traffic noise levels, both at the validation locations and at the receiver locations around the site.

Three scenarios have been modelled:

- **Existing** – includes existing traffic with the existing project site buildings.
  This scenario shows the existing traffic noise levels at the receivers and validation points.
- **Post-Construction** – includes existing traffic with the data centre buildings, structures and screens.
  This scenario shows the effect of the data centre buildings, structures and screens on the existing traffic noise levels, including any screening or reflections.
- **Post-Operation** – includes existing traffic plus the data centre operational traffic (detailed in **Section 8.0**) with the data centre buildings, structures and screens.
  This scenario shows the off-site traffic noise levels following commencement of operation of the data centre.

5.0 Noise Model Validation

To validate the road traffic noise model, the results of the existing traffic noise model at the validation locations have been compared to the measured noise levels.

The unattended noise monitoring at M01 provides a direct comparison using the same 6pm on Friday 4 April 2025 to 6pm on Friday 11 April 2025 period for the measured noise levels and the traffic survey inputs into the model.

Comparison to the attended measurements at M01 and R01 to R04 also provides an indication of the model validation in these areas. A summary of the noise model validation is shown in **Table 6**.

The Transport for NSW (TfNSW) *Road Noise Model Validation Guideline* (RNMVG) notes that noise models typically result in random scatter error of ±2.0 dB. All validation locations are within the expected model accuracy during all periods.

At the monitoring location M01, the difference between predicted and measured noise levels is negligible during the night, with slight underprediction during the day and evening.

The predictions show that the noise model is within accepted tolerances. As such, the model is considered valid for prediction of road traffic noise levels in the project area.

Table 6 Comparison of Measured and Predicted Road Traffic Noise Levels

Location	Noise Level (dBA)[1]								
	Day $L_{Aeq(11hour)}$			Evening $L_{Aeq(4hour)}$			Night $L_{Aeq(9hour)}$		
	Measured	Predicted	Difference[2]	Measured	Predicted	Difference[2]	Measured	Predicted	Difference[2]
M01 – Unattended monitoring location	**69.8**	**68.7**	**-1.1**	**67.2**	**65.4**	**-1.8**	**63.9**	**64.2**	**+0.3**
A-M01 – Attended measurement	70.0	69.8	-0.2	n/a[3]	66.5	n/a[3]	65.8	65.3	-0.5
A-R01 – Attended measurement	69.4	68.9	-0.5	n/a[3]	65.7	n/a[3]	65.5	64.3	-1.2
A-R02 – Attended measurement	69.3	69.6	+0.3	n/a[3]	66.6	n/a[3]	65.4	65.0	-0.4
A-R03 – Attended measurement	71.4	71.9	+0.5	n/a[3]	68.9	n/a[3]	68.8	67.2	-1.6
A-R04 – Attended measurement	67.3	67.9	+0.6	n/a[3]	65.4	n/a[3]	64.5	64.3	-0.2
		Median	**+0.1**		**Median**	**-1.8**		**Median**	**-0.5**

Note 1: Measured noise levels at M01 (unattended monitoring location) and predicted noise levels at all locations and are $L_{Aeq(period)}$ noise levels based on *Noise Policy for Industry* assessment periods (ie, day 7am-6pm, evening 6pm-10pm, night 10pm-7am).
Measured noise levels at attended measurement locations are $L_{Aeq(15minute)}$ noise levels.

Note 2: Difference is Predicted minus Measured. A negative difference indicates the predicted level of road traffic noise is lower than the measured data, a positive difference indicated the predicted level is higher.

Note 3: Attended measurements were not undertaken during the evening period.

6.0 Predicted Traffic Noise Levels

The predicted road traffic noise levels for the existing and post-construction scenarios are summarised in **Table 7**.

Noise contours for the existing scenario night-time period are shown in **Figure 2** and facade noise maps are shown in **Figure 3** and **Figure 4**. Noise contours are shown for 1.5 m above ground level and facade noise maps show free-field noise levels 1 m from the building facade.

Noise contours and facade noise maps for the existing and post-construction scenarios for all periods are provided in **Attachment C**.

Table 7 Predicted Road Traffic Noise Levels

ID	Receiver	Type	Period[1]	Predicted Road Traffic Noise Level $L_{Aeq(period)}$ (dBA)[2]	
				Existing Scenario	Post-Construction Scenario
R01	671-675 Gardeners Road, Mascot	Residential	Day	69	69
			Evening	66	66
			Night	64	64
R02	12 Galloway Street, Mascot	Residential	Day	69	66
			Evening	66	66
			Night	64	64
R03	7-9 Kent Road, Mascot	Residential	Day	71	71
			Evening	68	68
			Night	66	66
R04	61-63 Church Avenue, Mascot	Residential	Day	69	69
			Evening	67	67
			Night	65	65
R05	Child care centres	Child care	When in use	62	62
R06	Surrounding commercial premises	Commercial	When in use	72	72

Note 1: Time periods are split into day (7am to 6pm), evening (6pm to 10pm) and night (10pm to 7am) based on the *Noise Policy for Industry* assessment periods.

Note 2: Predicted noise levels are shown for the most-affected area of each receiver – typically the floor nearest to the roads (refer to facade noise contours in **Attachment C**).

Figure 2 Predicted Noise Levels – Contour Map – Existing Scenario – Night Period

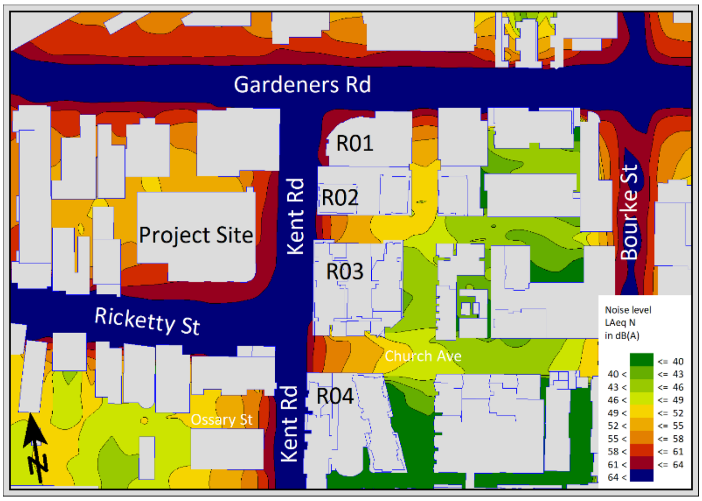


Figure 3 Facade Noise Map Southeast View – Existing Scenario – Night Period

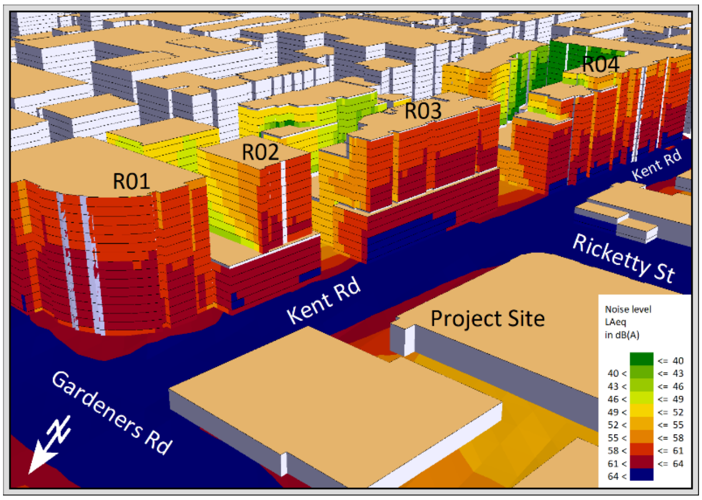
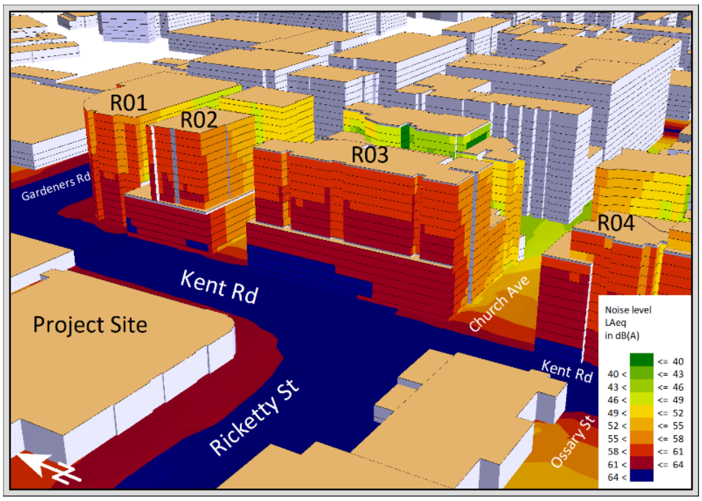


Figure 4 Facade Noise Map Northeast View – Existing Scenario – Night Period



Construction of the data centre building, structures and screens, and their associated screening and reflections, is predicted to have minimal effect on the road traffic noise levels at the sensitive receivers. A summary of the change in road traffic noise levels is shown in **Table 8**.

Table 8 Change in Road Traffic Noise Level Due to Screening And Reflections

Location	Predicted Change in Noise Level (dBA)[1]								
	Day $L_{Aeq(11hour)}$			Evening $L_{Aeq(4hour)}$			Night $L_{Aeq(9hour)}$		
	Max	Min	Median	Max	Min	Median	Max	Min	Median
R01 – Residential	+0.9	-0.4	+0.4	+1.0	-0.4	+0.4	+0.9	-0.4	+0.4
R02 – Residential	+1.0	-0.2	+0.4	+0.9	-0.2	+0.3	+0.9	-0.2	+0.3
R03 – Residential	+0.9	0.0	+0.4	+0.9	0.0	+0.4	+0.9	0.0	+0.4
R04 – Residential	+1.2	0.0	+0.2	+1.2	-0.1	+0.2	+1.2	-0.1	+0.2
R05 – Childcare	+0.2	0.0	+0.1	+0.2	0.0	+0.1	+0.2	-0.1	+0.1
R06 – Commercial	+0.2	0.0	+0.1	+0.2	0.0	+0.1	+0.2	0.0	+0.1
		Median	**+0.3**		**Median**	**+0.2**		**Median**	**+0.2**

Note 1: Time periods are split into day (7am to 6pm), evening (6pm to 10pm) and night (10pm to 7am) based on the *Noise Policy for Industry* assessment periods.

The results above show that:

- Traffic noise levels at front row receivers typically exceed the *Road Noise Policy* criteria for existing roads (Day 60 dBA, Night 55 dBA – refer to Section 3.3.6 of the NVIA).
- As outlined in **Table 7** and **Table 8**, there is no perceptible change in predicted noise levels from the existing scenario and the post-construction scenario.

7.0 Operational Industrial Noise Assessment

7.1 Operational Noise Criteria

Section 2.4.1 of the *Noise Policy for Industry* (NPfI) details that high traffic project amenity noise level may be applied if the following apply:

- Traffic noise is identified as the dominant source of noise at the site;
- The existing traffic noise level is 10 dB or more above the recommended amenity noise level for the area; and
- It is highly unlikely that traffic noise levels will decrease in the future.

Where the above triggers are not met, the recommended amenity noise level for the area should be applied (urban amenity for residential receivers R01 to R04).

7.1.1 Application of High Traffic Project Amenity

The following observations have been made in relation to the project:

- *Traffic noise is identified as the dominant source of noise at the site*

As detailed in Section 3.3.1 of the NVIA and **Section 3.0**, existing road traffic noise is the dominant noise source in the project area during the daytime, evening and night-time.

- *It is highly unlikely that traffic noise levels will decrease in the future*

Noise monitoring undertaken before and after the opening of the Sydney Gateway road project, both at ground level on the development site and at Level 13 of 12 Galloway Street (noise monitoring location L01 in the NVIA), showed a minor reduction in noise levels following its opening. The reduction is in line with the predicted noise levels for the Sydney Gateway project and is not expected to reduce further. It is likely that noise levels will slowly increase in the future as traffic volumes increase over time.

- *The existing traffic noise level is 10 dB or more above the recommended amenity noise level for the area*

Based on the noise monitoring undertaken at R02 (detailed as noise monitoring location L01 in the NVIA), the existing traffic noise levels are 10 dB or more above the recommended urban amenity noise level during the evening and night-time periods.

The above points meet the triggers for application of high traffic project amenity noise level detailed in the NPfI. As such, it is reasonable to consider its application for the R01 to R04 residential receivers.

7.1.2 Traffic Noise Modelling

Based on the existing traffic noise modelling detailed in **Section 6.0**, **Figure 5** to **Figure 8** identify areas of the residential facades where the predicted existing traffic noise levels are 10 dB or more above the recommended urban amenity. For the evening that is areas of $L_{Aeq(period)}$ 60 dB or more, while for night-time it is areas of $L_{Aeq(period)}$ 55 dBA or more. High traffic project amenity is applicable to these areas.

Figure 5 High Traffic Amenity Application Southeast View – Evening Period

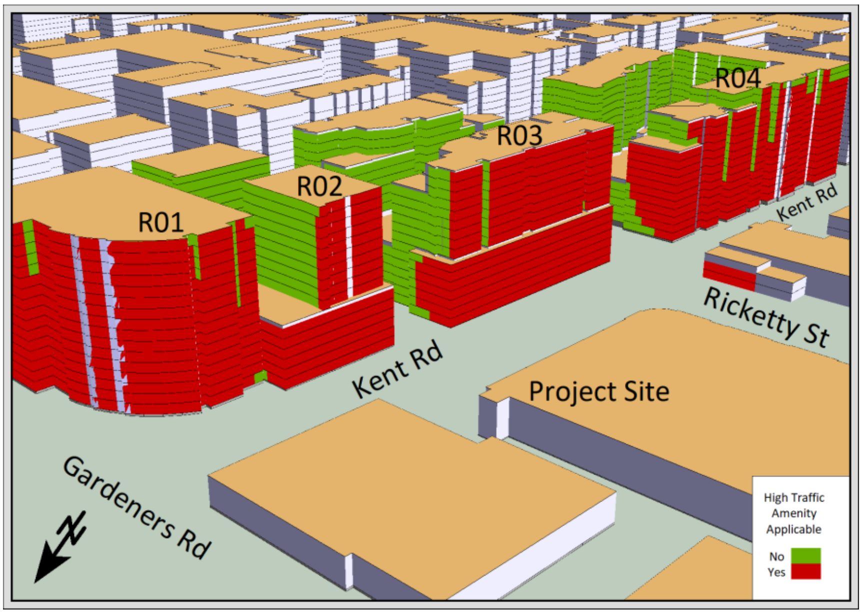


Figure 6 High Traffic Amenity Application Northeast View – Evening Period

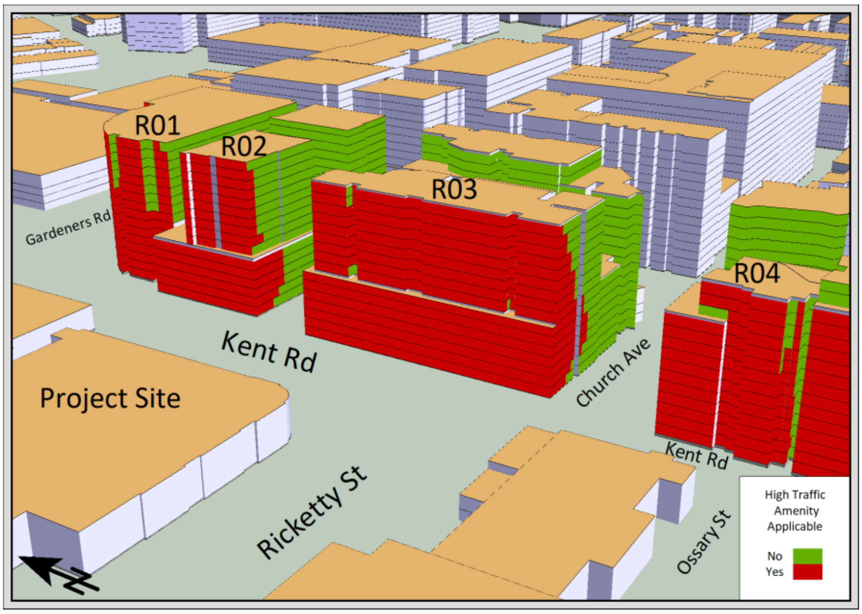


Figure 7 High Traffic Amenity Application Southeast View – Night Period

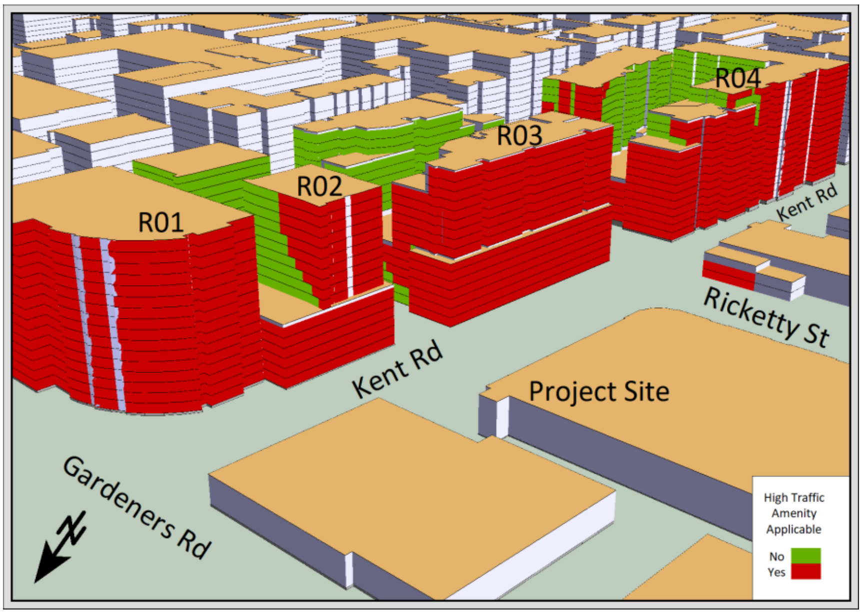
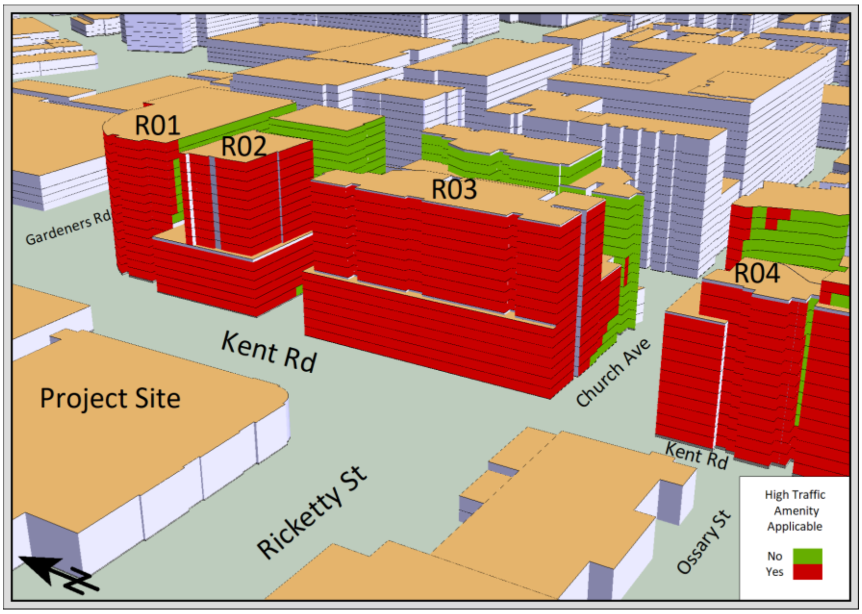


Figure 8 High Traffic Amenity Application Northeast View – Night Period



The Project Noise Trigger Levels (PNTL) detailed in Section 3.3.1 of the NVIA (based on noise monitoring location L01) determined high traffic project amenity noise levels of 50 dBA $L_{Aeq(15minute)}$ for the evening and 47 dBA $L_{Aeq(15minute)}$ for the night-time.

The predicted existing traffic noise levels detailed in **Section 6.0** and the facade noise contours in **Attachment C** show that the above amenity levels are conservative for the front (western) facades of R01 to R04 and part of the side (north and south) facades.

Recommended urban amenity noise levels would be applicable to areas shown in green in the above figures. This would be project amenity levels of 48 dBA $L_{Aeq(15minute)}$ for the evening, and 43 dBA $L_{Aeq(15minute)}$ for the night-time. There would be a small area of transition from the high traffic project amenity noise levels to the urban project amenity noise levels. The predicted noise levels show this area to be minimal.

7.2 Assessment of Operational Noise Levels

Predicted industrial noise levels from operation of the data centre are detailed in Section 5.3.1 of the NVIA. The facade noise contours for normal operations during the night-time are shown in **Figure 9** and **Figure 10**.

Figure 9 Predicted Operational Noise Facade Maps – OP.01: Night – Southeast View

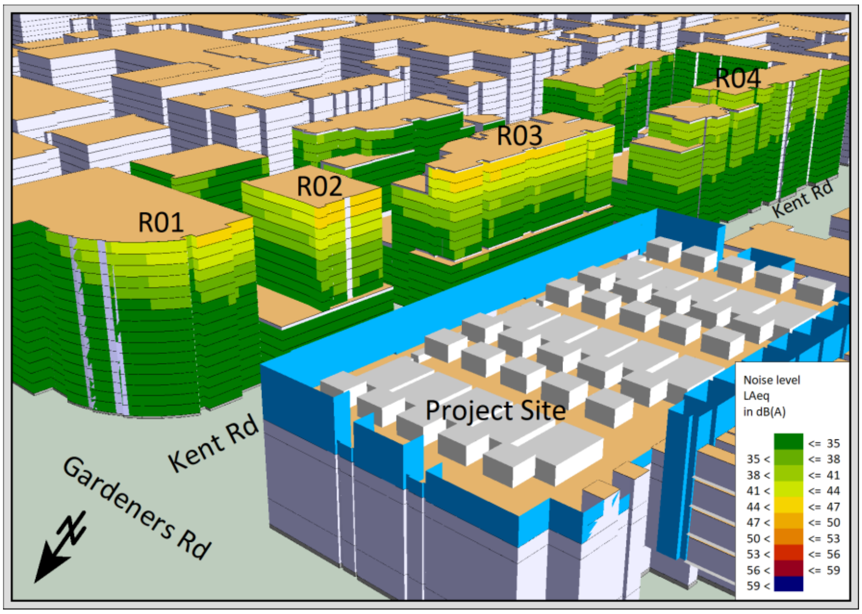
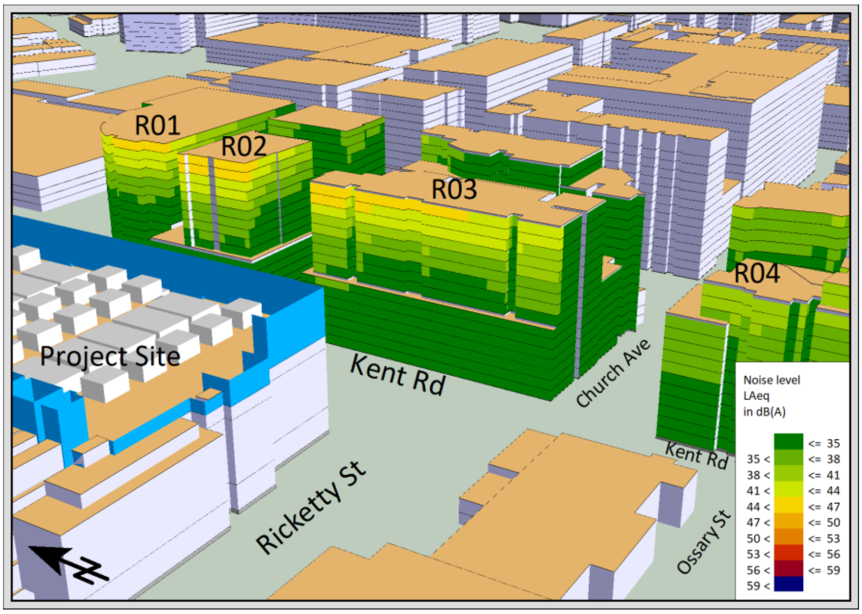


Figure 10 Predicted Operational Noise Facade Maps – OP.01: Night – Northeast View



As shown in the above figures, predicted operational noise levels generally reduce in the same areas as the traffic noise levels.

Predicted operational noise levels during the evening and night-time periods do not exceed the project amenity noise level in any facade areas of residential receivers R01 to R04, including areas of high traffic project amenity, urban project amenity, and the transition between the two.

As such, application of the specified high traffic project amenity noise levels for R01 to R04 is considered to be conservative and appropriate for the operational noise assessment.

8.0 Off-Site Road Traffic Noise Assessment

As detailed in Section 4.2.6 of the NVIA, daytime and night-time vehicle movements from the proposed development have been provided by the projects traffic consultant, detailed as follows:

- Daytime (7am to 10pm) – 85 light vehicle movements on Ricketty Street, 87 light vehicle movements on Gardeners Road, and 14 heavy vehicle movements on Gardeners Road.
- Night-time (10pm to 7am) – 22 light vehicle movements on Ricketty Street, 20 light vehicle movements on Gardeners Road, and 0 heavy vehicle movements.

Due to the high existing volumes of traffic on the access routes to the development, the addition of development related traffic to the noise model has a negligible effect on the predicted noise levels.

The change in predicted off-site traffic noise levels is primarily due to construction of the data centre building, structures and screens, and their associated screening and reflections, rather than the change in traffic volumes. A summary of the change in road traffic noise levels is shown in **Table 8**.

Table 9 Off-Site Traffic Noise Assessment

Location	Predicted Change in Noise Level (dBA)[1]					
	Day $L_{Aeq(15hour)}$			Night $L_{Aeq(9hour)}$		
	Max	Min	Median	Max	Min	Median
R01 – Residential	+1.0	-0.4	+0.4	+0.9	-0.4	+0.4
R02 – Residential	+1.0	-0.2	+0.4	+0.9	-0.2	+0.3
R03 – Residential	+0.9	0.0	+0.4	+0.9	0.0	+0.4
R04 – Residential	+1.2	-0.1	+0.2	+1.2	-0.1	+0.2
R05 – Childcare	+0.2	0.0	+0.1	+0.2	-0.1	+0.1
R06 – Commercial	+0.2	0.0	+0.1	+0.2	0.0	+0.1
		Median	**+0.3**		**Median**	**+0.2**

Note 1: Time periods are split into day (7am to 10pm) and night (10pm to 7am) based on the *Road Noise Policy* assessment periods.

The above assessment shows that the predicted change in road noise levels at the nearest residences on Kent Road from development-related vehicles is expected to be below 2.0 dB. Increases of less than 2.0 dB are considered minor and not perceptible to the average person.

The potential impacts from development-related traffic on the surrounding roads are expected to be negligible and no consideration of mitigation is required.

Attachments

Attachment A – Unattended Noise Monitoring Data

Attachment B – Attended Noise Measurement Data

Attachment C – Road Traffic Noise Maps

Attachment A – Unattended Noise Monitoring Data

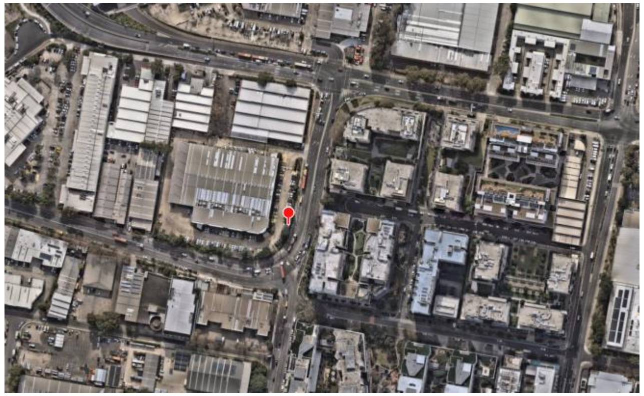
Noise Monitoring Location	M01
Noise Monitoring Address	**10-22 Kent Road, Mascot**

Logger Device Type: Svantek 957, Logger Serial No: 21423

Ambient noise logger deployed on the project site, adjacent to the existing car parking area. Noise logger was around 8 m from the centre of the nearest lane of Kent Road, representative of the distance to the ground floor of the apartment buildings on the other side of Kent Road.

The logging results presented below are for 6pm on Friday 4 April 2025 to 6pm on Friday 11 April 2025, corresponding to the traffic survey period.

Map of Noise Monitoring Location



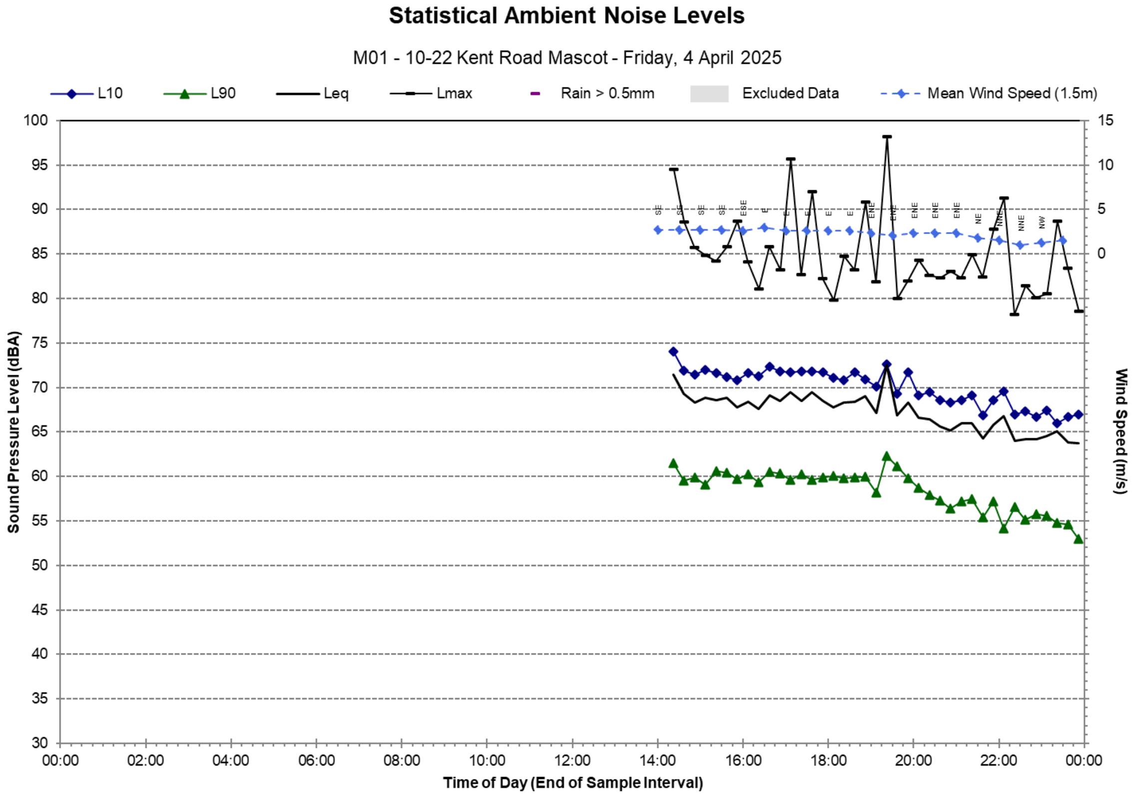
Ambient Noise Logging Results – ICNG Defined Time Periods

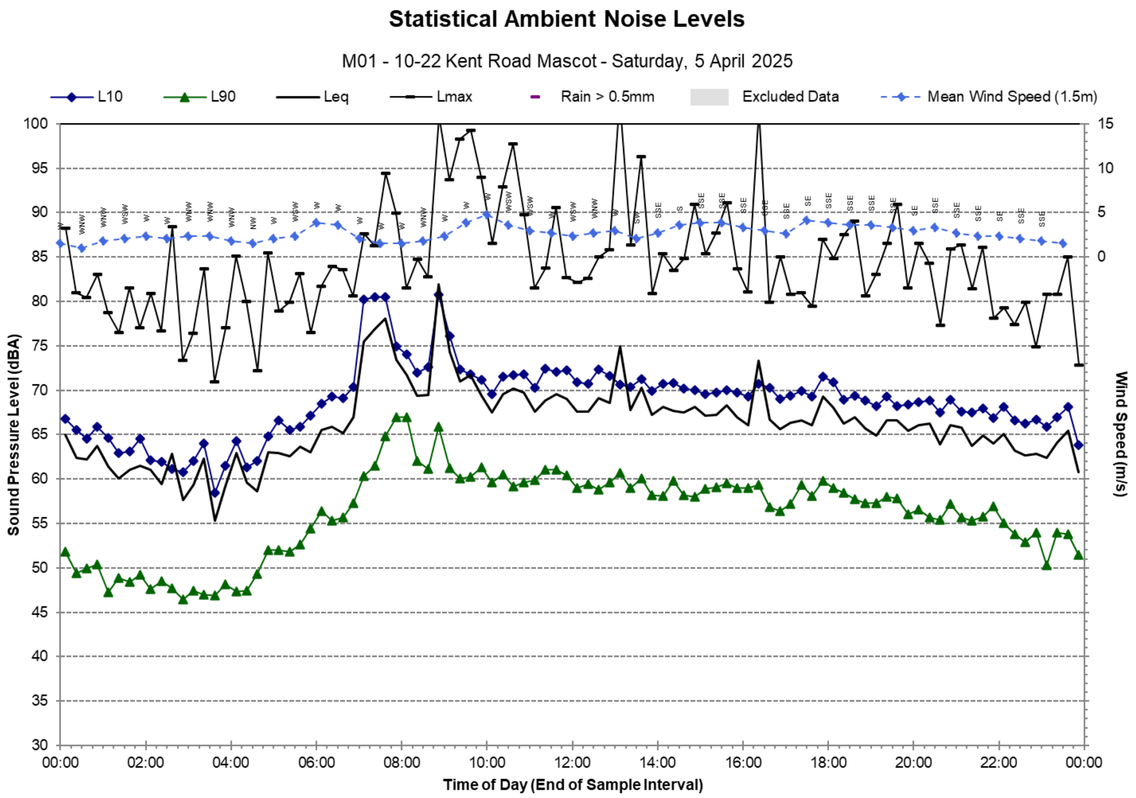
Monitoring Period	Noise Level (dBA)			
	RBL	LAeq	L10	L1
Daytime	59	70	73	79
Evening	56	67	70	76
Night-time	46	64	66	74

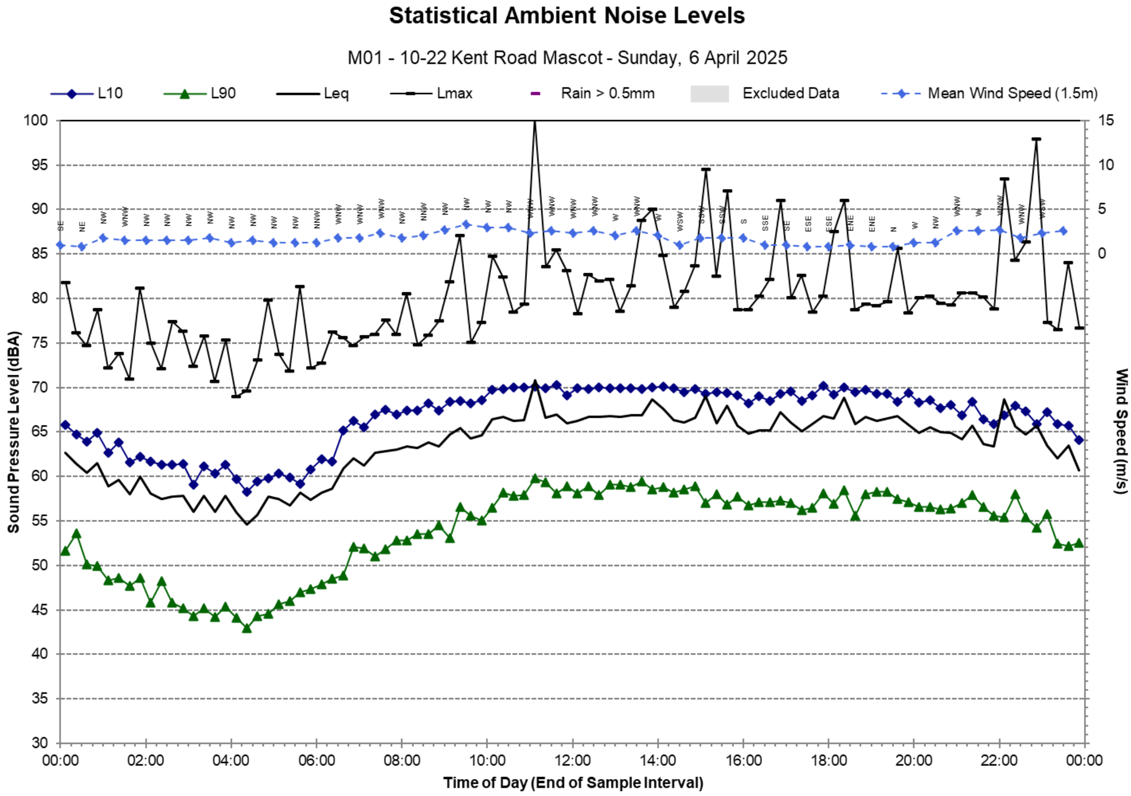
Ambient Noise Logging Results – RNP Defined Time Periods

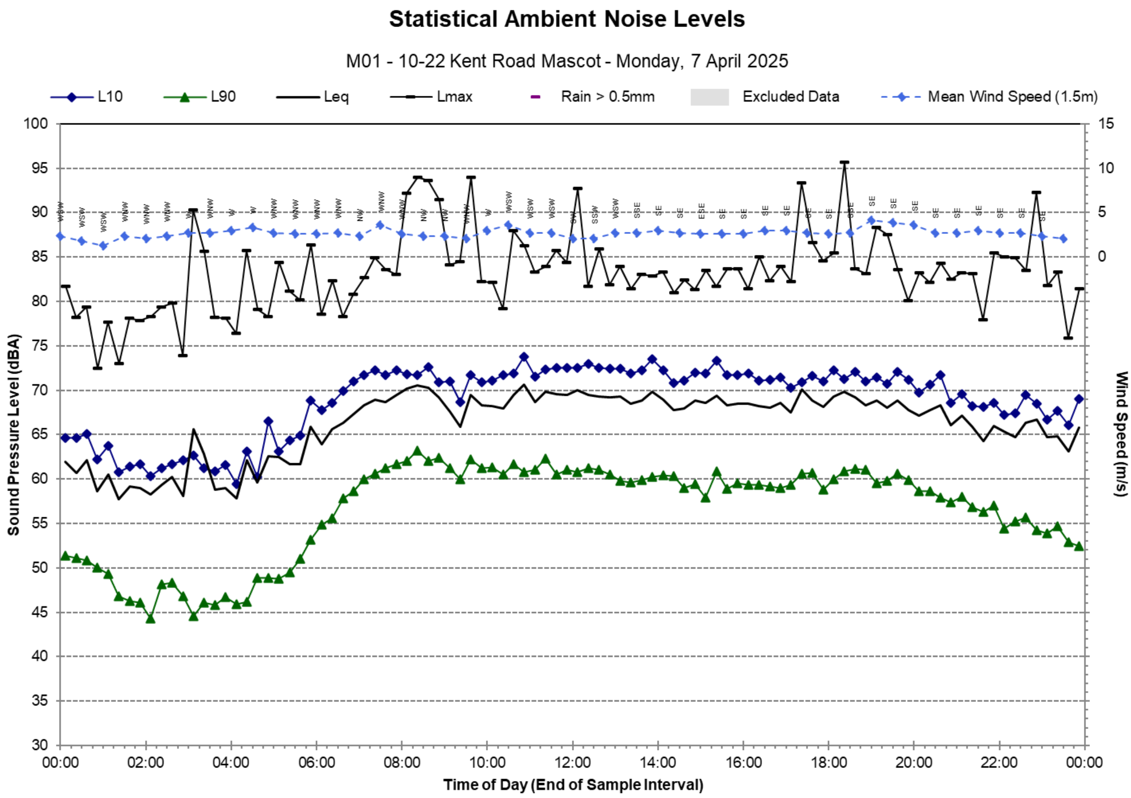
Monitoring Period	Noise Level (dBA)	
	LAeq(period)	LAeq(1hour)
Daytime (7am-10pm)	69	70
Night-time (10pm-7am)	64	66

Photo of Noise Monitoring Location


Statistical Ambient Noise Levels
M01 - 10-22 Kent Road Mascot - Friday, 4 April 2025
L10
L90
Leq
Lmax
Rain > 0.5mm
Excluded Data
Mean Wind Speed (1.5m)
Sound Pressure Level (dBA)
Wind Speed (m/s)
Time of Day (End of Sample Interval)

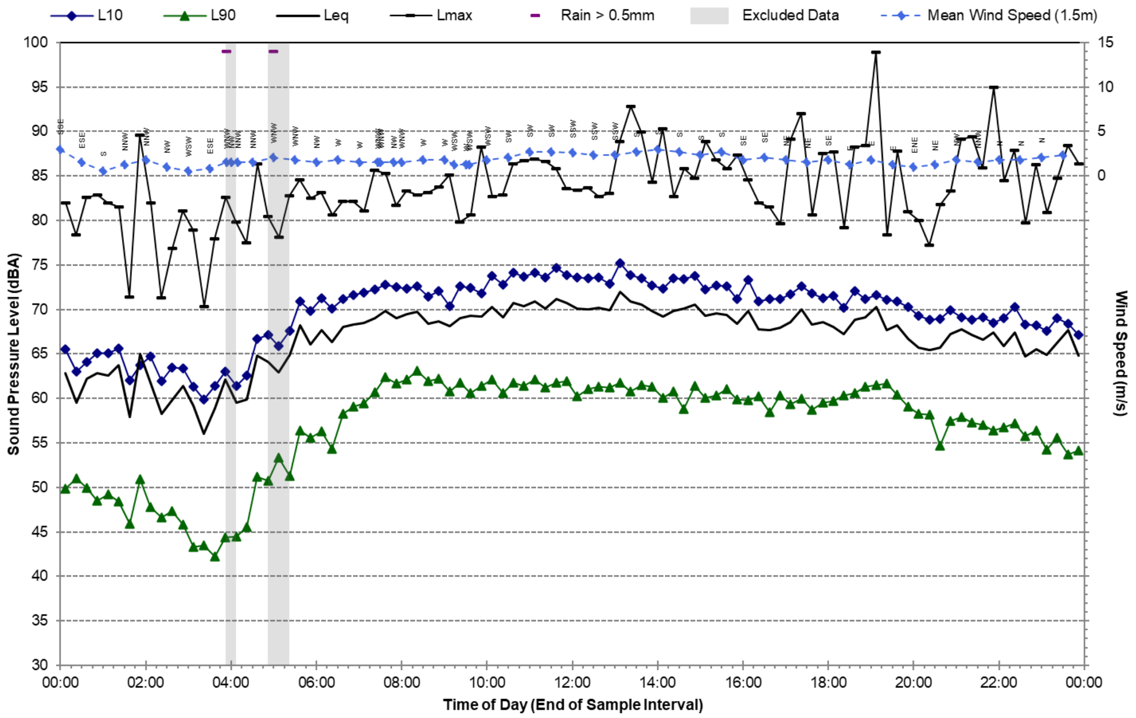

Statistical Ambient Noise Levels
M01 - 10-22 Kent Road Mascot - Saturday, 5 April 2025
L10
L90
Leq
Lmax
Rain > 0.5mm
Excluded Data
Mean Wind Speed (1.5m)
Sound Pressure Level (dBA)
Wind Speed (m/s)
Time of Day (End of Sample Interval)


Statistical Ambient Noise Levels
M01 - 10-22 Kent Road Mascot - Sunday, 6 April 2025
L10
L90
Leq
Lmax
Rain > 0.5mm
Excluded Data
Mean Wind Speed (1.5m)
Sound Pressure Level (dBA)
Wind Speed (m/s)
Time of Day (End of Sample Interval)


Statistical Ambient Noise Levels
M01 - 10-22 Kent Road Mascot - Monday, 7 April 2025
L10
L90
Leq
Lmax
Rain > 0.5mm
Excluded Data
Mean Wind Speed (1.5m)
Sound Pressure Level (dBA)
Wind Speed (m/s)
Time of Day (End of Sample Interval)

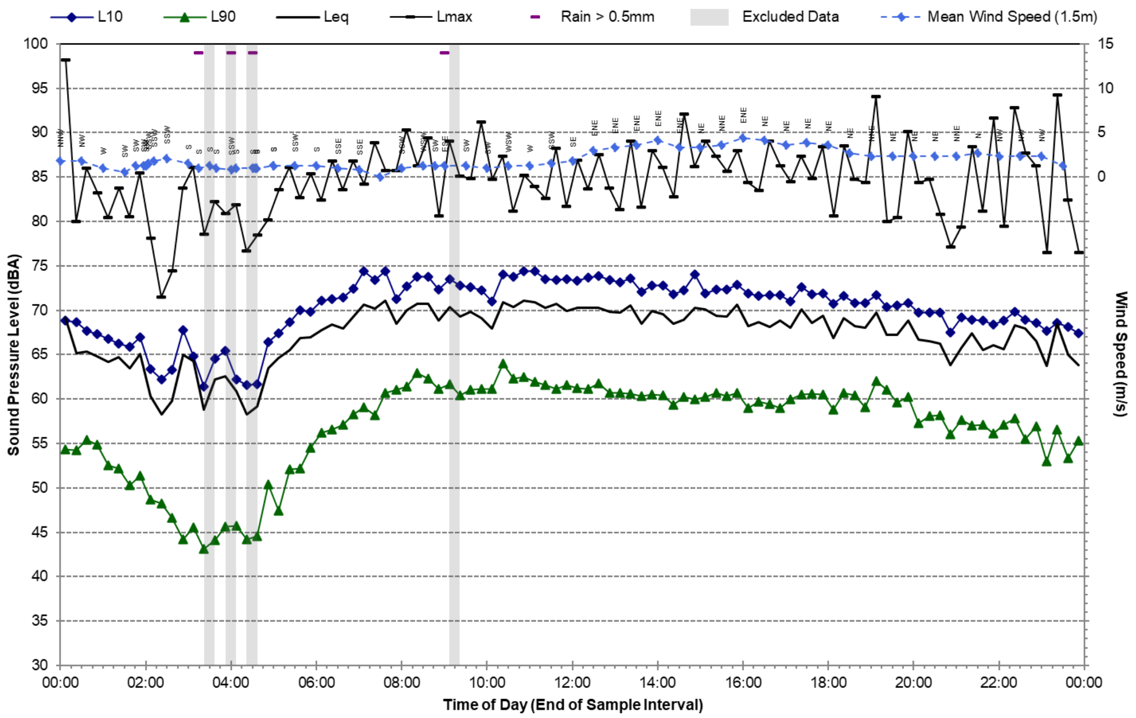
Statistical Ambient Noise Levels

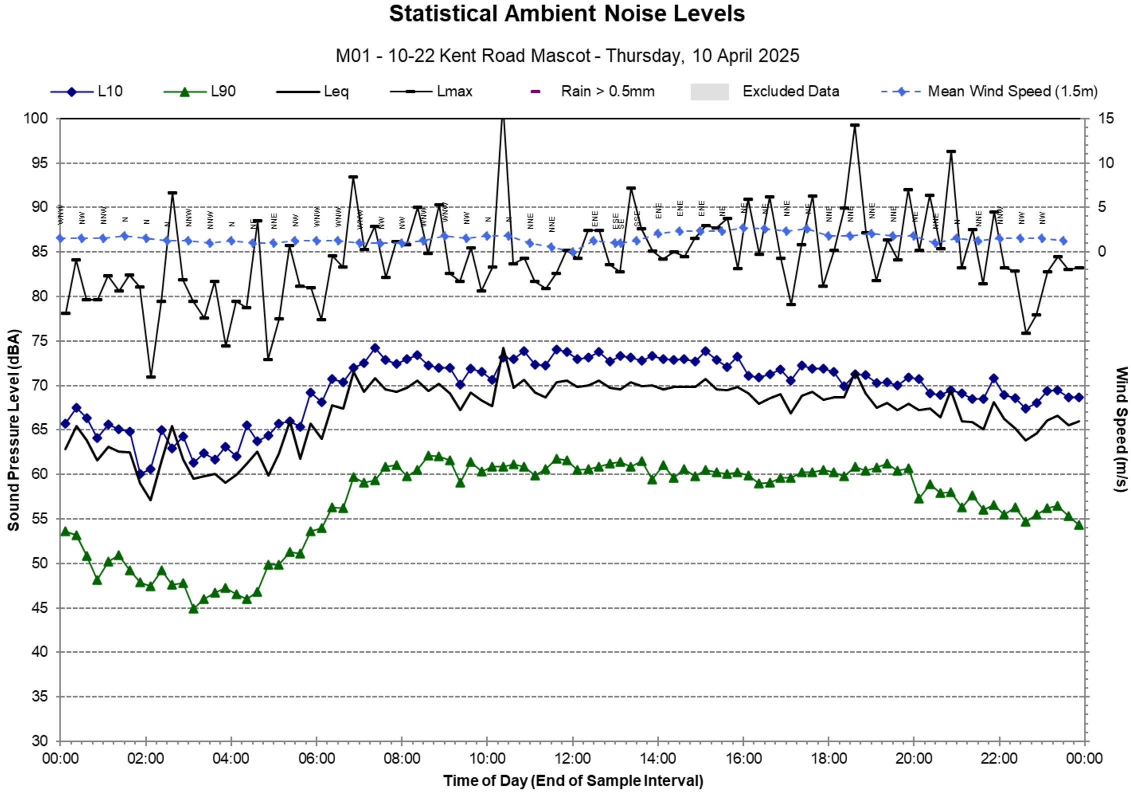
M01 - 10-22 Kent Road Mascot - Tuesday, 8 April 2025

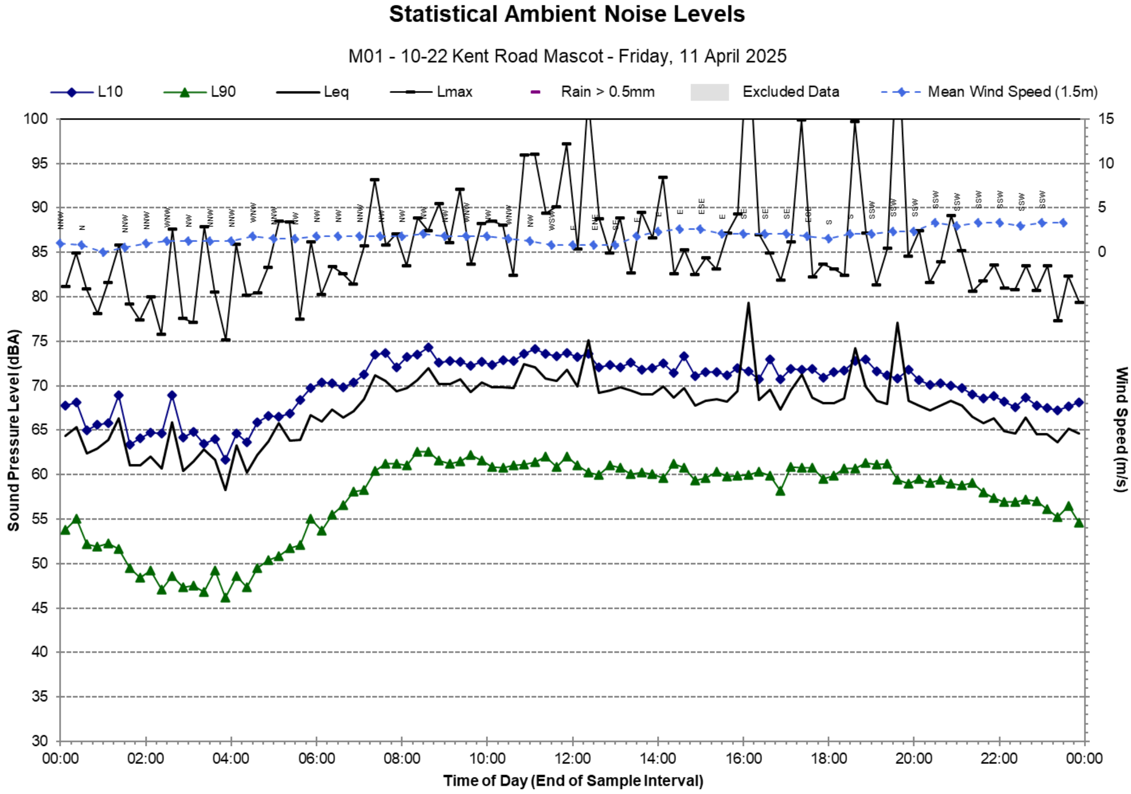


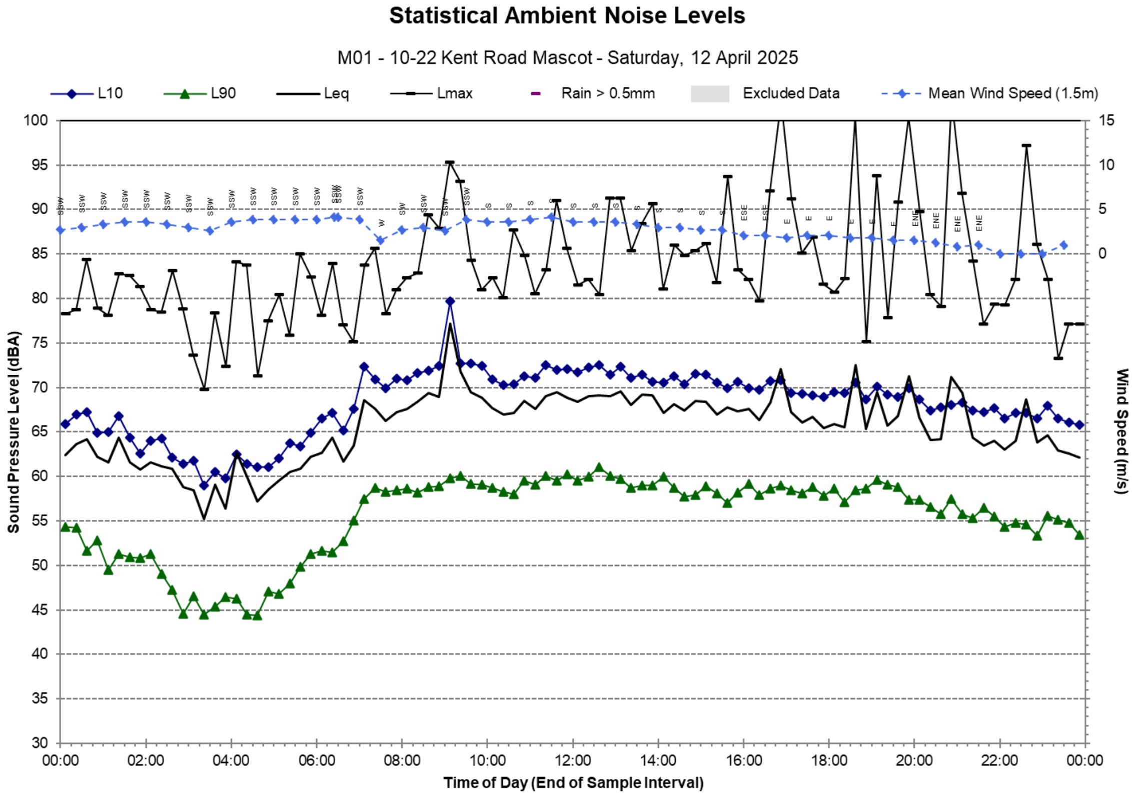
Statistical Ambient Noise Levels

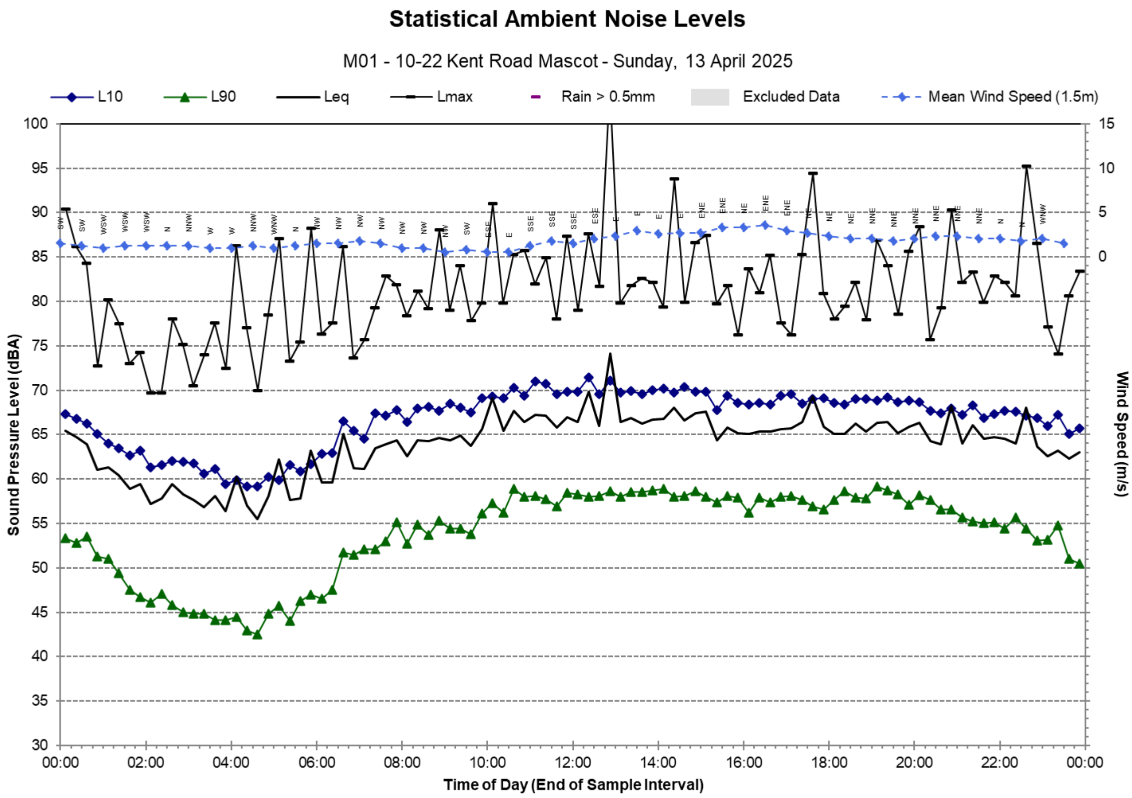
M01 - 10-22 Kent Road Mascot - Wednesday, 9 April 2025

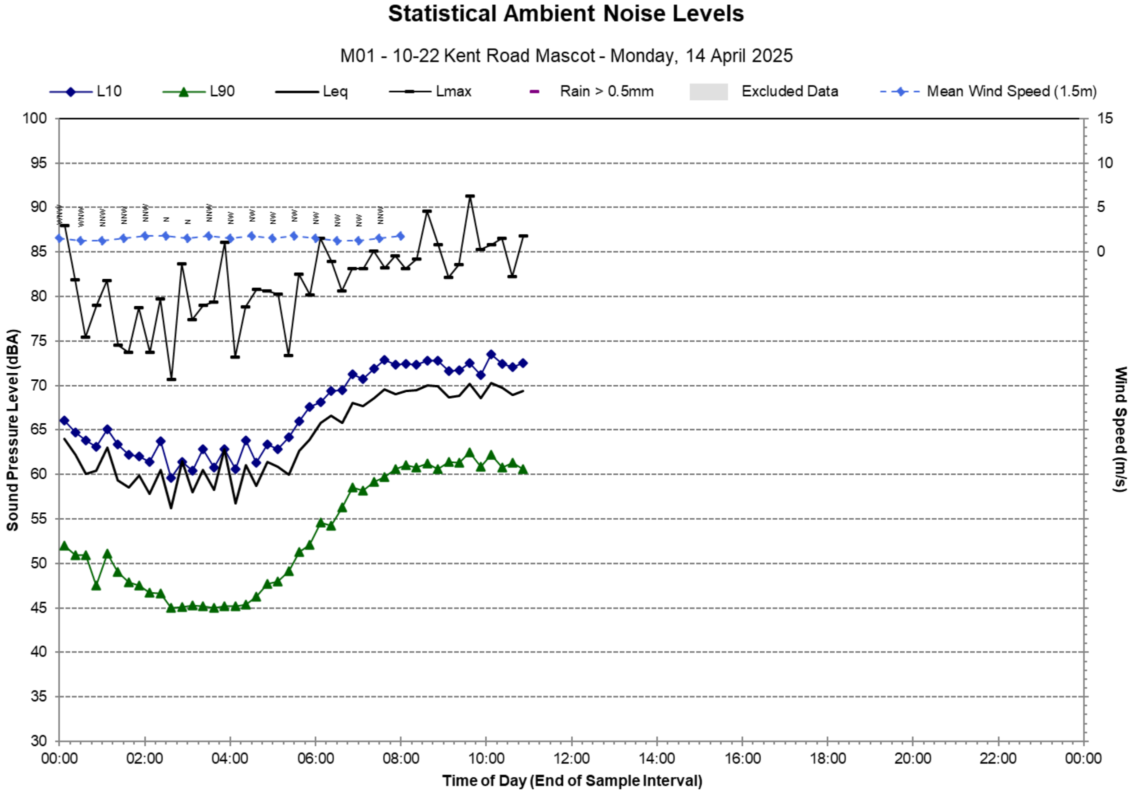



Statistical Ambient Noise Levels
M01 - 10-22 Kent Road Mascot - Thursday, 10 April 2025
L10
L90
Leq
Lmax
Rain > 0.5mm
Excluded Data
Mean Wind Speed (1.5m)
Sound Pressure Level (dBA)
Wind Speed (m/s)
Time of Day (End of Sample Interval)


Statistical Ambient Noise Levels
M01 - 10-22 Kent Road Mascot - Friday, 11 April 2025
L10
L90
Leq
Lmax
Rain > 0.5mm
Excluded Data
Mean Wind Speed (1.5m)
Sound Pressure Level (dBA)
Wind Speed (m/s)
Time of Day (End of Sample Interval)


Statistical Ambient Noise Levels
M01 - 10-22 Kent Road Mascot - Saturday, 12 April 2025
L10
L90
Leq
Lmax
Rain > 0.5mm
Excluded Data
Mean Wind Speed (1.5m)
Sound Pressure Level (dBA)
Wind Speed (m/s)
Time of Day (End of Sample Interval)


Statistical Ambient Noise Levels
M01 - 10-22 Kent Road Mascot - Sunday, 13 April 2025
L10
L90
Leq
Lmax
Rain > 0.5mm
Excluded Data
Mean Wind Speed (1.5m)
Sound Pressure Level (dBA)
Wind Speed (m/s)
Time of Day (End of Sample Interval)


Statistical Ambient Noise Levels
M01 - 10-22 Kent Road Mascot - Monday, 14 April 2025
L10
L90
Leq
Lmax
Rain > 0.5mm
Excluded Data
Mean Wind Speed (1.5m)
Sound Pressure Level (dBA)
Wind Speed (m/s)
Time of Day (End of Sample Interval)
100
95
90
85
80
75
70
65
60
55
50
45
40
35
30
15
10
5
0
00:00
02:00
04:00
06:00
08:00
10:00
12:00
14:00
16:00
18:00
20:00
22:00
00:00

Attachment B – Attended Noise Measurement Data

Noise Monitoring Location	**A-M01**
Noise Monitoring Address	**10-22 Kent Road, Mascot**

Sound Level Meter Device Type: Brüel & Kjær Type 2250, Sound Level Meter Serial No: 3005904

Attended noise measurements undertaken on footpath adjacent to unattended monitoring location M01 at 10-22 Kent Road, Mascot.

Daytime Attended Measurements
Ambient noise environment was dominated by road traffic noise from Kent Road during the day. During the measurements there was generally a steady flow of light vehicles, with intermittent heavy vehicles and some queuing at the traffic lights.

Measured Typical L_{Amax}: Light vehicle traffic on Kent Road: up to 76 dBA, Heavy vehicle traffic on Kent Road: up to 87 dBA, Loud cars on Kent Road: up to 96 dBA, Motorbikes on Kent Road: up to 84 dBA, Truck brake squeal: up to 78 dBA, Aircraft: up to 80 dBA.

Night-time Attended Measurements
Ambient noise environment was dominated by road traffic noise from Kent Road during the night. During the measurements there was generally a steady flow of light vehicles, with intermittent heavy vehicles and some queuing at the traffic lights.

Measured Typical L_{Amax}: Light vehicle traffic on Kent Road: up to 74 dBA, Heavy vehicle traffic on Kent Road: up to 85 dBA, Motorbikes on Kent Road: up to 85 dBA, Truck brake squeal: up to 83 dBA, Aircraft: up to 78 dBA.

Attended Noise Measurement Results

Date	Period	Start Time	Measured Noise Level (dBA)			
			L_{Amax}	L_{Aeq}	L_{A10}	L_{A90}
7/04/2025	Daytime	14:58	84	70	73	61
7/04/2025	Daytime	15:17	86	70	73	61
7/04/2025	Daytime	15:40	87	71	73	60
7/04/2025	Daytime	16:01	96	72	73	61
7/04/2025	Night-time	22:00	85	66	69	55
7/04/2025	Night-time	22:18	85	66	69	53
7/04/2025	Night-time	22:36	83	66	69	53
7/04/2025	Night-time	22:54	84	64	67	50

Noise Monitoring Location	A-R01
Noise Monitoring Address	**671-675 Gardeners Road, Mascot**

Sound Level Meter Device Type: Brüel & Kjær Type 2250, Sound Level Meter Serial No: 3004635

Attended noise measurements undertaken on footpath adjacent to the ground floor of residential receiver R01 at 671-675 Gardeners Road, Mascot.

Daytime Attended Measurement
Ambient noise environment was dominated by road traffic noise from Kent Road and Gardeners Road during the day. During the measurement there was generally a steady flow of light vehicles, with intermittent heavy vehicles.

Measured Typical L_{Amax}: Light vehicle traffic on Kent Road and Gardeners Road: up to 75 dBA, Heavy vehicle traffic on Kent Road and Gardeners Road: up to 80 dBA, Truck brake squeal: 90 dBA, Aircraft: 76 dBA.

Night-time Attended Measurement
Ambient noise environment was dominated by road traffic noise from Kent Road and Gardeners Road during the night. During the measurement there was generally a steady flow of light vehicles, with intermittent heavy vehicles.

Measured Typical L_{Amax}: Light vehicle traffic on Kent Road and Gardeners Road: up to 75 dBA, Heavy vehicle traffic on Kent Road and Gardeners Road: up to 80 dBA, Loud car turning from Gardeners Road to Kent Road: 89 dBA, Motorbike turning from Kent Road to Gardeners Road: 73 dBA, Aircraft: 77 dBA.

Attended Noise Measurement Results

Date	Period	Start Time	Measured Noise Level (dBA)			
			L_{Amax}	L_{Aeq}	L_{A10}	L_{A90}
7/04/2025	Daytime	14:58	90	69	72	60
7/04/2025	Night-time	22:00	89	65	68	52

Noise Monitoring Location	A-R02
Noise Monitoring Address	**12 Galloway Street, Mascot**

Sound Level Meter Device Type: Brüel & Kjær Type 2250, Sound Level Meter Serial No: 3004635

Attended noise measurements undertaken on footpath adjacent to the ground floor of residential receiver R02 at 12 Galloway Street, Mascot.

Daytime Attended Measurement
Ambient noise environment was dominated by road traffic noise from Kent Road during the day. During the measurement there was generally a steady flow of light vehicles, with intermittent heavy vehicles and some queuing at the traffic lights.

Measured Typical L_{Amax}: Light vehicle traffic on Kent Road: up to 75 dBA, Heavy vehicle traffic on Kent Road: up to 84 dBA, Motorbike on Kent Road: 78 dBA, Aircraft: 76 dBA.

Night-time Attended Measurement
Ambient noise environment was dominated by road traffic noise from Kent Road during the night. During the measurement there was generally a steady flow of light vehicles, with intermittent heavy vehicles and some queuing at the traffic lights.

Measured Typical L_{Amax}: Light vehicle traffic on Kent Road: up to 75 dBA, Heavy vehicle traffic on Kent Road: up to 81 dBA, Motorbike on Kent Road: 76 dBA, Aircraft: 73 dBA.

Attended Noise Measurement Results

Date	Period	Start Time	Measured Noise Level (dBA)			
			L_{Amax}	L_{Aeq}	L_{A10}	L_{A90}
7/04/2025	Daytime	15:17	84	69	72	60
7/04/2025	Night-time	22:18	81	65	70	51

Noise Monitoring Location	A-R03
Noise Monitoring Address	**7-9 Kent Road, Mascot**

Sound Level Meter Device Type: Brüel & Kjær Type 2250, Sound Level Meter Serial No: 3004635

Attended noise measurements undertaken on footpath adjacent to the ground floor of residential receiver R03 at 7-9 Kent Road, Mascot.

Daytime Attended Measurement
Ambient noise environment was dominated by road traffic noise from Kent Road during the day. During the measurement there was generally a steady flow of light vehicles, with intermittent heavy vehicles and some queuing at the traffic lights.

Measured Typical L_{Amax}: Light vehicle traffic on Kent Road: up to 77 dBA, Heavy vehicle traffic on Kent Road: up to 90 dBA, Aircraft: 76 dBA.

Night-time Attended Measurement
Ambient noise environment was dominated by road traffic noise from Kent Road during the night. During the measurement there was generally a steady flow of light vehicles, with intermittent heavy vehicles and some queuing at the traffic lights.

Measured Typical L_{Amax}: Light vehicle traffic on Kent Road: up to 75 dBA, Heavy vehicle traffic on Kent Road: up to 85 dBA, Truck brake squeal: 92 dBA, Aircraft: 76 dBA.

Attended Noise Measurement Results

Date	Period	Start Time	Measured Noise Level (dBA)			
			L_{Amax}	L_{Aeq}	L_{A10}	L_{A90}
7/04/2025	Daytime	15:40	90	71	74	61
7/04/2025	Night-time	22:36	92	69	71	53

Noise Monitoring Location	A-R04
Noise Monitoring Address	**61-63 Church Avenue, Mascot**

Sound Level Meter Device Type: Brüel & Kjær Type 2250, Sound Level Meter Serial No: 3004635

Attended noise measurements undertaken on footpath adjacent to the ground floor of residential receiver R04 at 61-63 Church Avenue, Mascot.

Daytime Attended Measurement
Ambient noise environment was dominated by road traffic noise from Kent Road and Ricketty Street during the day. During the measurement there was generally a steady flow of light vehicles, with intermittent heavy vehicles and some queuing at the traffic lights.

Measured Typical L_{Amax}: Light vehicle traffic on Kent Road and Ricketty Street: up to 73 dBA, Heavy vehicle traffic on Kent Road and Ricketty Street: up to 83 dBA, Aircraft: 80 dBA.

Night-time Attended Measurement
Ambient noise environment was dominated by road traffic noise from Kent Road and Ricketty Street during the night. During the measurement there was generally a steady flow of light vehicles, with intermittent heavy vehicles and some queuing at the traffic lights.

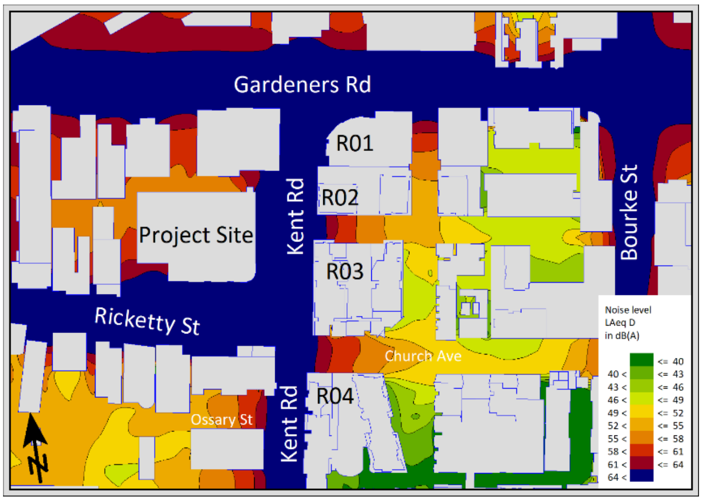
Measured Typical L_{Amax}: Light vehicle traffic on Kent Road and Ricketty Street: up to 70 dBA, Heavy vehicle traffic on Kent Road and Ricketty Street: up to 82 dBA, Aircraft: 56 dBA.

Attended Noise Measurement Results

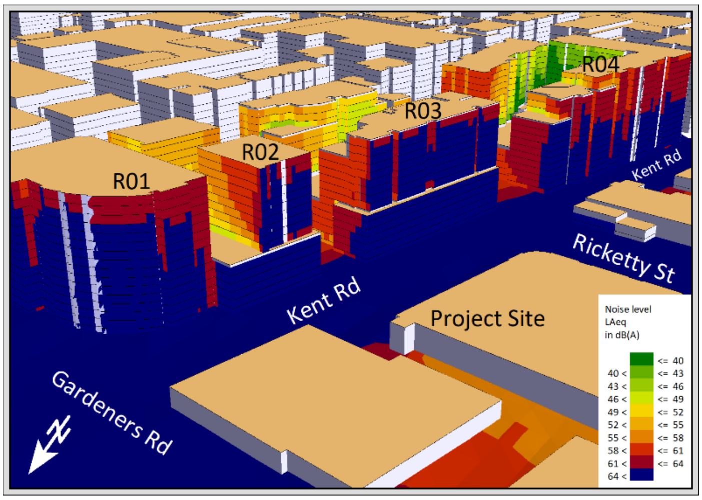
Date	Period	Start Time	Measured Noise Level (dBA)			
			L_{Amax}	L_{Aeq}	L_{A10}	L_{A90}
7/04/2025	Daytime	16:01	83	67	71	57
7/04/2025	Night-time	22:54	82	65	68	49

Attachment C – Road Traffic Noise Maps

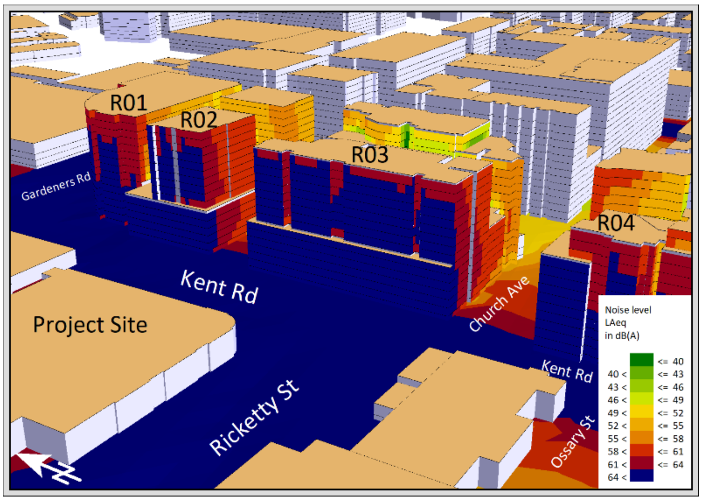
Predicted Noise Levels – Contour Map – Existing Scenario – Day Period



Facade Noise Map Southeast View – Existing Scenario – Day Period

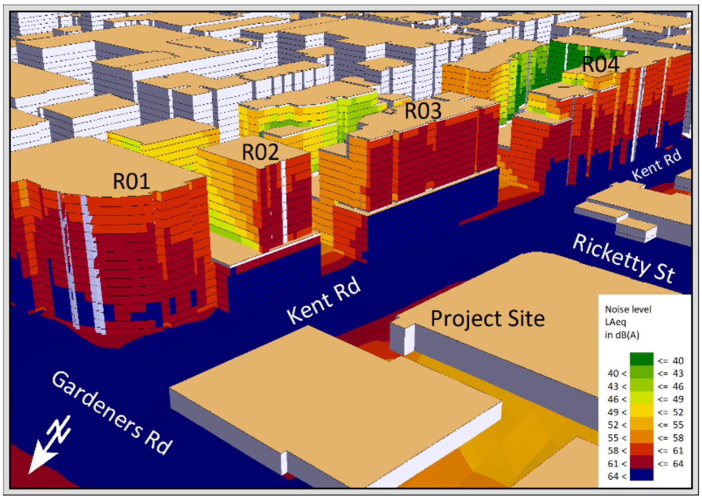


Facade Noise Map Northeast View – Existing Scenario – Day Period

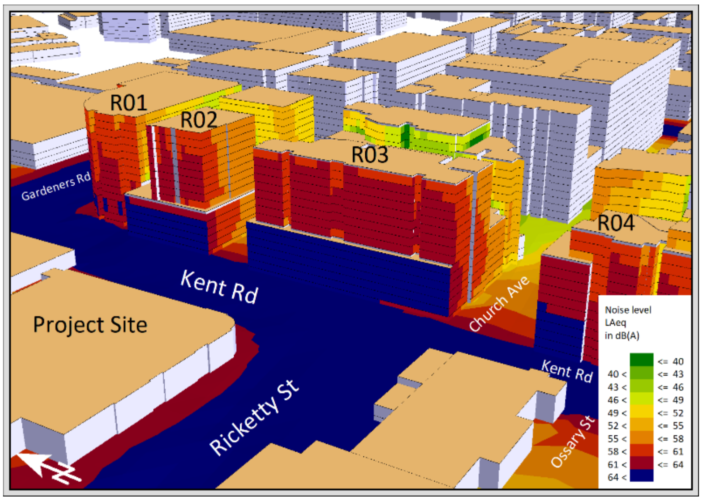


Predicted Noise Levels – Contour Map – Existing Scenario – Evening Period

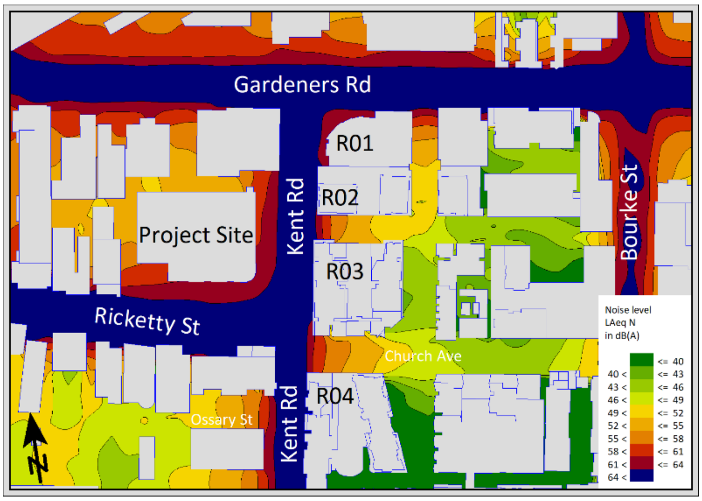
Facade Noise Map Southeast View – Existing Scenario – Evening Period



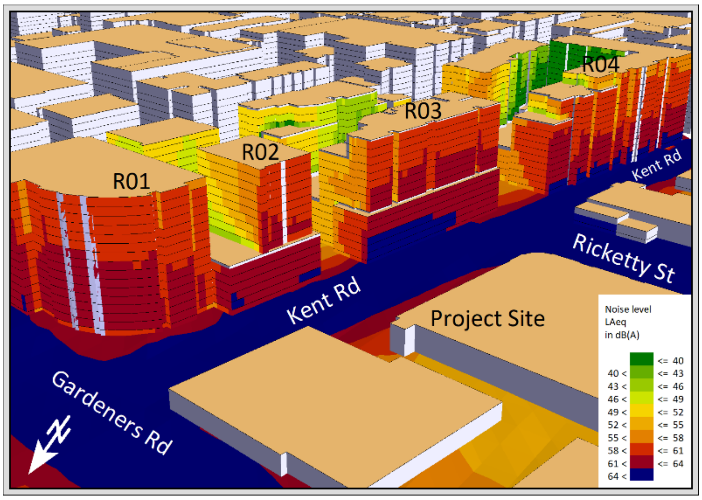
Facade Noise Map Northeast View – Existing Scenario – Evening Period



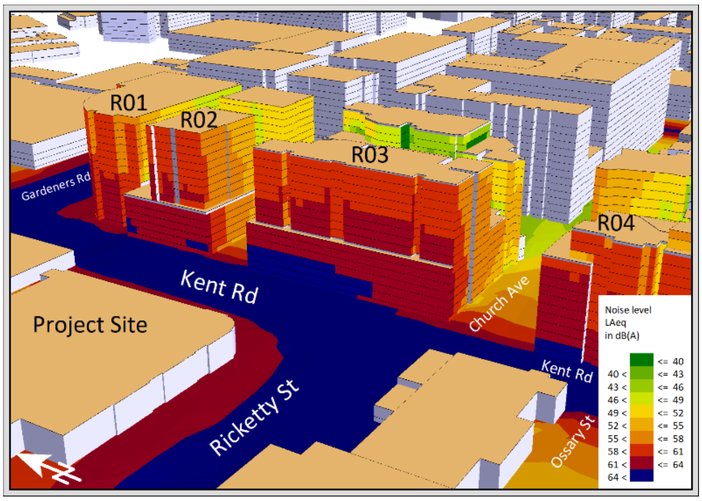
Predicted Noise Levels – Contour Map – Existing Scenario – Night Period



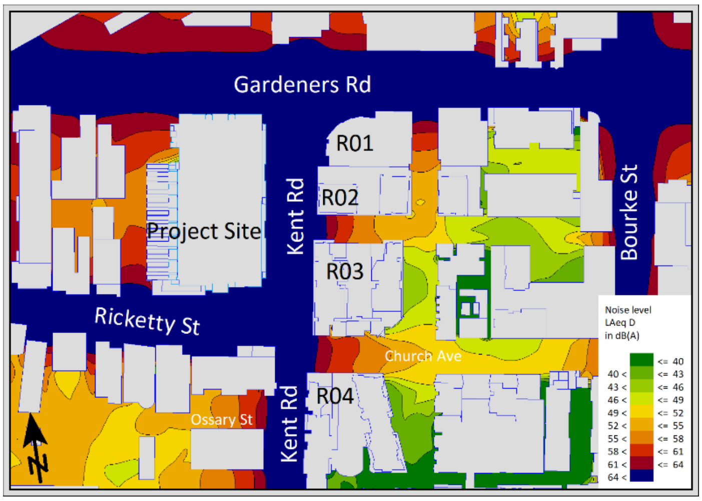
Facade Noise Map Southeast View – Existing Scenario – Night Period



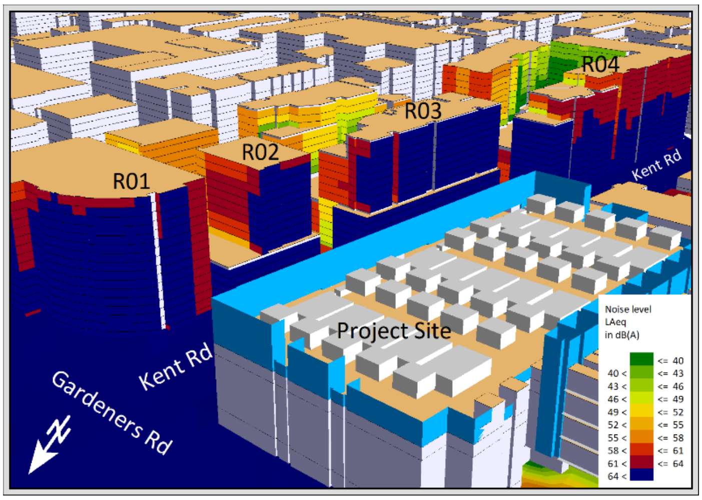
Facade Noise Map Northeast View – Existing Scenario – Night Period



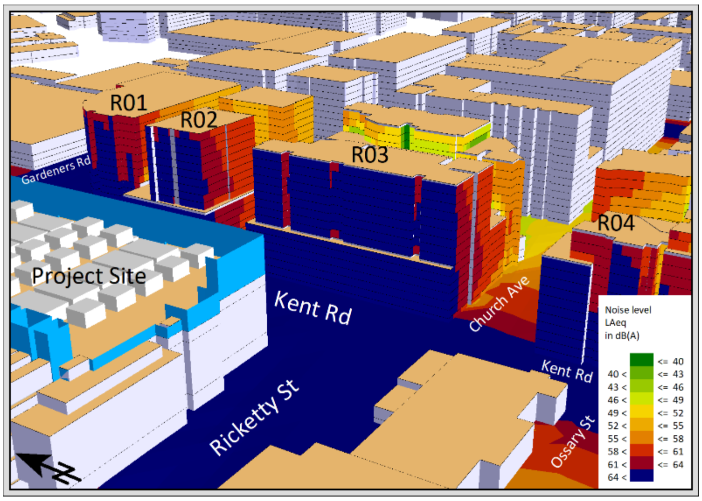
Predicted Noise Levels – Contour Map – Post-Construction Scenario – Day Period



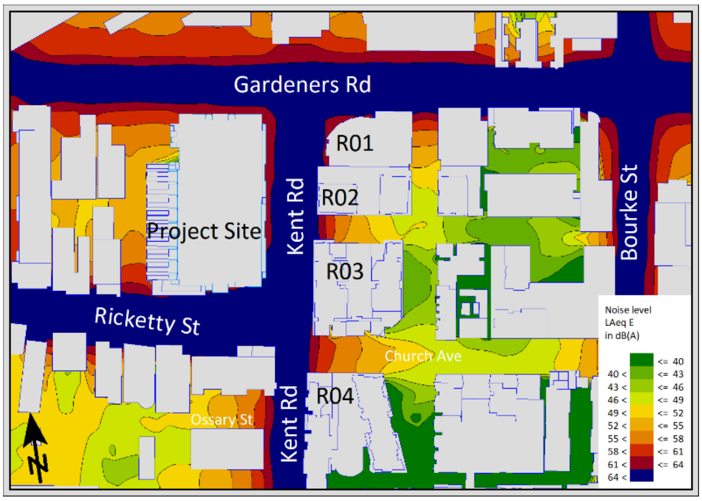
Facade Noise Map Southeast View – Post-Construction Scenario – Day Period



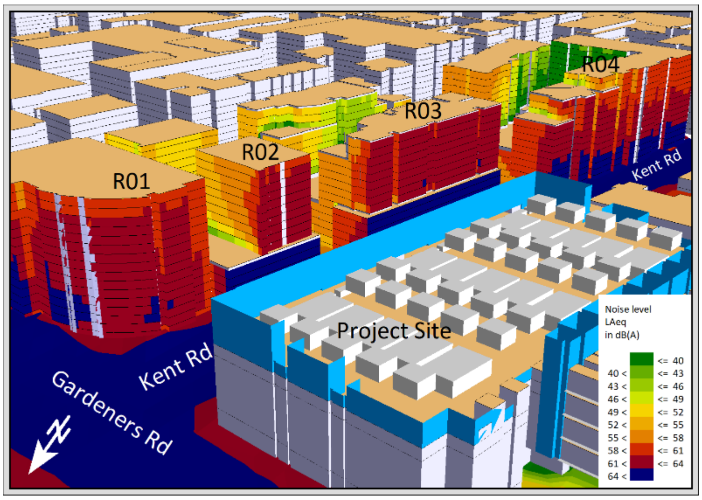
Facade Noise Map Northeast View – Post-Construction Scenario – Day Period



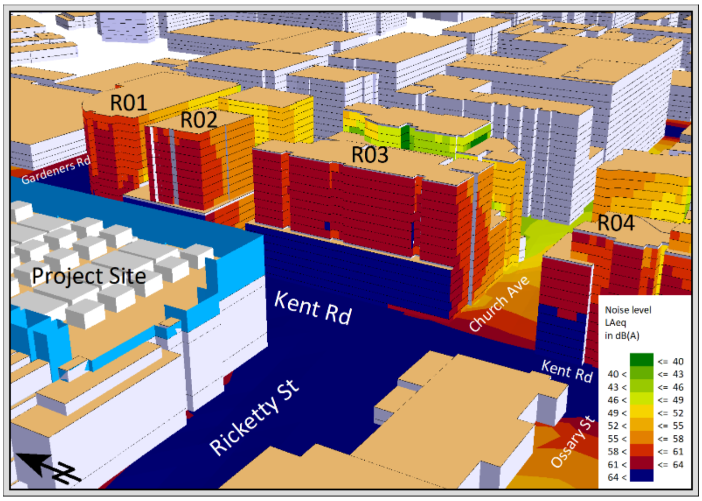
Predicted Noise Levels – Contour Map – Post-Construction Scenario – Evening Period



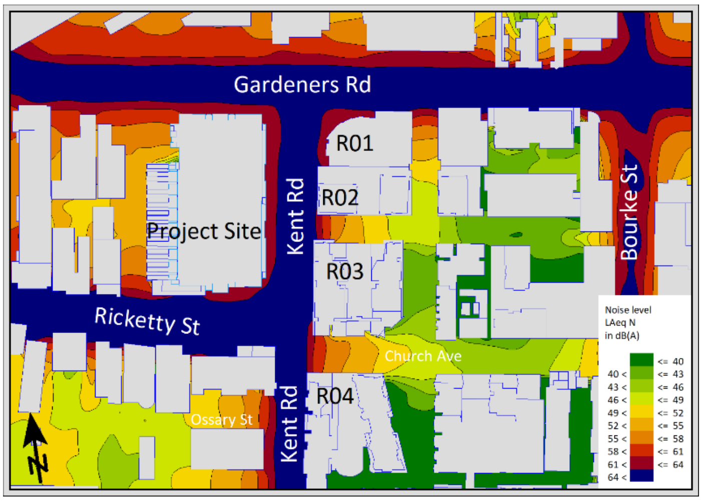
Facade Noise Map Southeast View – Post-Construction Scenario – Evening Period



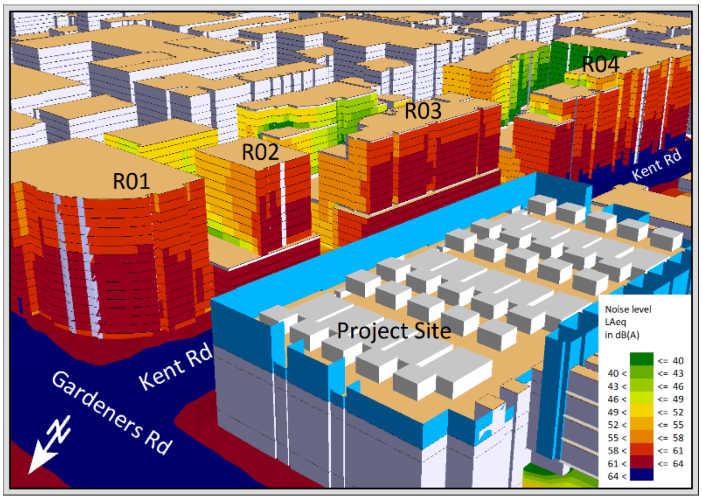
Facade Noise Map Northeast View – Post-Construction Scenario – Evening Period



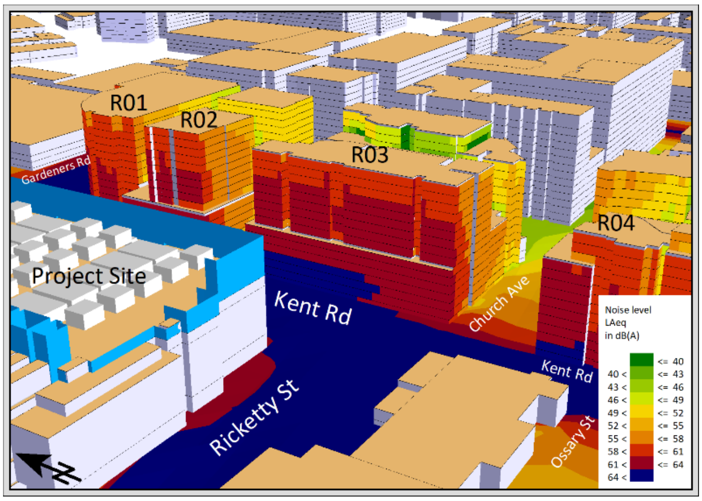
Predicted Noise Levels – Contour Map – Post-Construction Scenario – Night Period



Facade Noise Map Southeast View – Post-Construction Scenario – Night Period



Facade Noise Map Northeast View – Post-Construction Scenario – Night Period



Making Sustainability Happen