Noise Impact Assessment

Road Traffic Noise Assessment & Operational Noise Impact Assessment

174, 184, 188 Dowding Street & 81 Portal Street, Oxley

Calypso23 Pty Ltd

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Executive Summary

ATP Consulting Engineers (ATP) was engaged by Calypso23 Pty Ltd to prepare a noise impact assessment (NIA) for the proposed Reconfiguring a Lot (RaL) application at No. 174, 184 & 188 Dowding Street and No. 81 Portal Street in Oxley.

The proposed site is in close proximity to the Ipswich Motorway, which is a state-controlled noise corridor. The purpose of this report is to present the results of a Road Traffic Noise Assessment (RTNA) considering the future traffic flows of the Ipswich Motorway for the ultimate planning horizon of year 2037 in accordance with *State Development Assessment Provisions (SDAP) State Code 1*.

This is the Issue 3 of the report, which was prepared considering the most recent layout of the proposed subdivision development with the future Lots 6 and 7 having vehicle access through the Dowding Street.

An Operational Noise Impact Assessment (ONIA) is conducted in accordance with the *Brisbane City Plan (BCP) 2014*, while the Road Traffic Noise Impact Assessment (RTNA) is revised considering the most recent development layout (*24084-Preliminary Civil Drawing Set, Rev.: C, dated 19 May 2025*).

Conclusions and recommendations

Based on the results of the noise impact assessments, the following is concluded:

Road Traffic Noise Assessment

- Without noise control measures, the future allotments of the proposed development will be impacted by traffic noise from the Ipswich Motorway as per the traffic flows predicted within a 10-year planning horizon to year 2037.
- ATP recommends construction of two noise barrier fences (acoustic fence) to mitigate the road traffic noise from the Ipswich Motorway:
    - A 1.8m high noise barrier fence along the western boundary of the proposed Lot 3; and
    - A 1.8m high noise barrier fence along the western boundary of the proposed Lots 4 and 5, with a return along the southern boundary of the proposed Lot 5.
- The acoustic barrier must be constructed of a material with minimum superficial mass of 12.5kg/m^2, such as concrete blockwork, brick, autoclaved aerated concrete, minimum 9mm thick compressed fibre cement sheeting, minimum 25mm thick overlapping timber palings or approved modular wall system by Modular Walls, Poly-Tek or equivalent. There shall be no gaps on the surface and at the base of the acoustic barrier
- Detail views showing the alignment of the noise barrier is presented in Figure 4.1.

- The results of the noise propagation modelling, presented in Table 2.9 of this report, indicate the exceedance of private open space criterion at the front-loaded noise affected Lots (Lots 6 and 7) for no more than 2dB(A).

- While the road traffic noise marginally exceeds the desired private open space criterion for the proposed Lots 6 and 7, the exceedance of 2dB(A) is minor which is considered barely perceptible to the human ear.

- Because the proposed Lots 6 and 7 require vehicle access via Dowding Street, future dwelling on these noise-affected allotments will naturally be located on the west side, which will push the private open spaces to the protected side of the houses. The building mass will provide sufficient acoustic shielding for these private open spaces without a need for additional acoustic treatments.

- The results of the noise propagation modelling, presented in Table 2.9 of this report, indicate that even with the recommended noise barrier in place, all the allotments are still traffic noise affected and will require compliance with *QDCMP4.4*.

- The future lots listed in Table 2.9 of this report are impacted by traffic noise that corresponds with Noise Categories 1 and 2 of *QDCMP4.4*, therefore architectural treatment is required to the building façade.

- There are two options available for architectural treatment to the building façade, as follows:

    - **Option 1:** Implementation of the 'acceptable forms of construction' specified in Queensland Development Code (QDC) Mandatory Part 4.4 (Buildings in a Transport Noise Corridor) as per the noise categories presented in Table 2.9 of this report.

    - **Option 2:** Floor plan specific acoustic design, in accordance with AS3671-1989, to ensure compliance with the internal noise criteria.

Operational Noise Impact Assessment

- The existing industrial use operates from 7am to 8pm during weekdays and from 8am to 12pm on Saturdays.

- Based on site observations, the noise amenity of the surrounding area at No. 174, 184 & 188 Dowding Street and No. 81 Portal Street in Oxley is primarily dominated by road traffic noise along the Ipswich Motorway.

- According to the approved noise impact assessment for the existing industrial use at No. 2637 Ipswich Road in Darra, the proposed subdivision development will comply with the internal low-frequency noise criteria as presented in Table 3.3 of this report without any additional noise mitigation measure.

- The results of the approved noise impact assessment for the existing industrial use at No. 2637 Ipswich Road in Darra indicate the future dwellings at the proposed subdivision will achieve the required internal noise level, as presented in Table 3.3, with the implementation

of the architectural treatments to the façades of the future dwellings according to the QDCMP4.4.

Provided the recommended planning and design traffic noise control measures are implemented in the construction of the residential subdivision at No. 174, 184 & 188 Dowding Street and No. 81 Portal Street in Oxley, the road traffic noise from Ipswich Motorway and operational noise from the nearby industrial uses will not impose any further constraints on the establishment of the proposed development.

Table of Contents

Tables

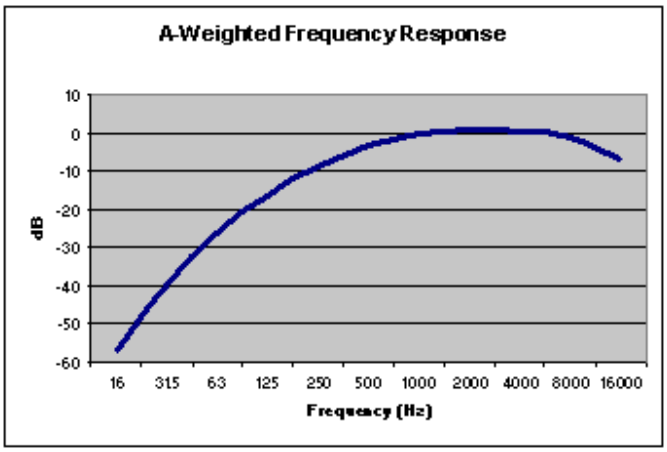
Figures

Appendices

Acoustics Glossary

A-weighting

The A-weighting filter suppresses low frequency sounds and some of the higher frequency sounds to which the human ear is less sensitive. It is a correction to sound pressure levels to mimic the response of the human ear at low sound pressure levels. The A-weighted sound pressure level correlates well with the perceived loudness at low sound levels. The A-weighted sound pressure level is used extensively for general purpose noise measurements.



Broadband sound

Sound distributed across the whole audible frequency range.

dB(A)

The A-weighted sound pressure level.

Fast time-weighting

The Fast ("F") time-weighting is defined in AS 1259.1-1990. Instruments with F time weighting use a time constant of 125 milliseconds in their exponential averaging circuit.

Hz (Hertz)

Hertz is the standard measure of the frequency of oscillations in a wave motion. The frequency is most often measured in cycles per second (cps) or Hertz (Hz). Frequency of 1 Hz is one cycle per second.

Impulsive noise and impulsiveness adjustment

Noise having a high peak of short duration or a sequence of such peaks. Impulsive noise is present if the difference in A-weighted maximum noise levels between fast response and impulse response is greater than 2dB. Impulsiveness adjustment (penalty) of up to 5dB should be applied to the component noise level.

$L_{Aeq,T}$

"Average-energy" sound level used in situations where sound varies over time. $L_{Aeq,T}$ is the A-weighted sound pressure level that has the same energy as the fluctuating sound over the time period T sec.

$L_{A01,T}$

Measure of the maximum sound level. $L_{A01,T}$ is a statistical parameter that is the A-weighted sound pressure level that is exceeded for 1% of the measurement time T.

$L_{A10,T}$

$L_{A10,T}$ is a statistical parameter that is the A-weighted sound pressure level that is exceeded for 10% of the measurement time T.

$L_{A90,T}$

Background sound level. $L_{A90,T}$ is a statistical parameter that is the A-weighted sound pressure level that is exceeded for 90% of the measurement time T.

Noise

Unwanted sound.

Octave bands and 1/3 octave bands	A range of frequencies whose upper frequency limit is twice that of its lower frequency limit. In acoustics, the audible spectrum (20Hz to 20kHz) is divided into 10 parts (octaves) with centre frequencies of 31.5Hz, 63Hz, 125Hz, 250Hz, 500Hz, 1kHz, 2kHz, 4kHz, 8kHz and 16kHz. For more detailed frequency analysis, octave bands are further divided into more discrete bands. For examples, 1/3 octaves bands are where each octave band is divided into three parts. IEC 61260:1995, *Electroacoustics — Octave-band and fractional-octave band filters*
Sound power	The sound energy radiated per unit time by a sound source in all directions, measured in Watts (W).
Sound Power Level, L_w (SWL)	The sound power level in decibels (dB) is 10 times the base 10 logarithm of the ratio of the sound power in W to the reference sound power of 1×10^{-12} W (hearing threshold).
Sound pressure	The difference between the pressure caused by a sound wave and the ambient pressure of the medium the sound wave is passing through. Measured in Pascals (Pa).
Sound Pressure Level, L_p (SPL)	The sound power level in decibels (dB) is 20 times the base 10 logarithm of the ratio of the sound pressure in Pa to the reference sound pressure of 2×10^{-5} Pa (hearing threshold).
Tonal noise, tonality and tonality adjustment	Tonal noise is characterised by one or more distinct frequency components (“tones”) that emerge audibly from the total sound. For example, distinct tones may be emitted by fans, saws, grinders and other equipment. Tonal noise is generally far more annoying than non-tonal noise. Presence of tonal sound (“tonality”) can be identified by analysing the sound levels in adjacent 1/3 octave bands. AS1055.1-1997 and the DEHP Noise Measurement Manual 2013 provides guidance on how tonality should be assessed. If tonal components are clearly audible and they can be detected by 1/3 octave analysis (1/3 octave band exceeds neighbouring bands by at least 5dB), tonality adjustment (penalty) of up to 5dB should be applied to the component noise level.
Weighted Sound Reduction Index (R_w)	A single-number quantity which characterises the airborne sound insulation of a material or building element over a range of frequencies.

1. Introduction

1.1 Project Background

ATP Consulting Engineers (ATP) was engaged by Calypso23 Pty Ltd to prepare a noise impact assessment for the proposed residential subdivision at No. 174, 184 & 188 Dowding Street and No. 81 Portal Street in Oxley.

The proposed site is in close proximity to the Ipswich Motorway, which is a state-controlled noise corridor. The purpose of this report is to present the results of a Road Traffic Noise Assessment (RTNA) considering the future traffic flows of the Ipswich Motorway for the ultimate planning horizon of year 2037 in accordance with *State Development Assessment Provisions (SDAP) State Code 1*.

This is the Issue 3 of the report, which reviews the outcomes of the operational noise impacts assessment prepared by ViPAC for the existing industrial uses at No. 2637 Ipswich Road in Darra and addresses the results of the noise impacts assessment (road traffic noise and operational noise from adjacent industrial uses) considering the most recent layout of the proposed subdivision development with future Lots 6 and 7 having vehicle access through the Dowding Street.

The Operational Noise Impact Assessment (ONIA) has been conducted in accordance with the *Brisbane City Plan (BCP) 2014*, while the Road Traffic Noise Impact Assessment (RTNA) has been revised considering the most recent development layout (*24084-Preliminary Civil Drawing Set, Rev.: C, dated 19 May 2025*).

1.2 Study Objectives

Study objectives are as follows:

Traffic Noise Impact Assessment

- Noise measurements to obtain information about the existing traffic noise levels at the site over a typical 7-day period.
- Consideration of the relevant performance and acceptable outcomes and traffic noise criteria applicable to the proposed development.
- Development of a 3D model (using SoundPLAN software) of the proposed development and the immediate surroundings with consideration of the existing and future (within a 10-year planning horizon) traffic on Ipswich Motorway.
- Assessment of traffic noise levels ($L_{10,18hr}$) from the Ipswich Motorway, within a 10-year planning horizon (year 2037), considering the traffic noise impact on the facades and the private open spaces of the future dwelling.
- Assessment of the traffic noise levels against the relevant criteria specified in the *SDAP State Code 1*.

***Operational Noise Impact Assessment*:**

- Site visit and background noise monitoring to determine the existing noise amenity.
- Development of a 3D noise propagation model using SoundPLAN software considering the primary noise sources associated with the existing noise amenity of the surrounding area.
- Validation of the noise propagation model by comparing with the attended noise measurements and assessment of the potential noise impacts on the proposed residential subdivision against the relevant noise criteria from the *BCP2014*.
- Recommendation of noise mitigation measures to protect the noise amenity of the future lots in the proposed residential subdivision from the operational noise emissions of the nearby existing industrial uses.

1.3 Subject Site

The proposed subdivision is located at Lot 10 (No.174) Dowding Street on RP53326, Lots 1 and 2 (Nos. 184 and 188) Dowding Street on RP78601, and Lot 5 (No. 81) Portal Street on RP84471 in Oxley. The land, with a total area of 17,375 m^2, is zoned as *Emerging Community* by the Brisbane City Planning Scheme 2014.

The location of the subject site is presented in Figure 1.1.

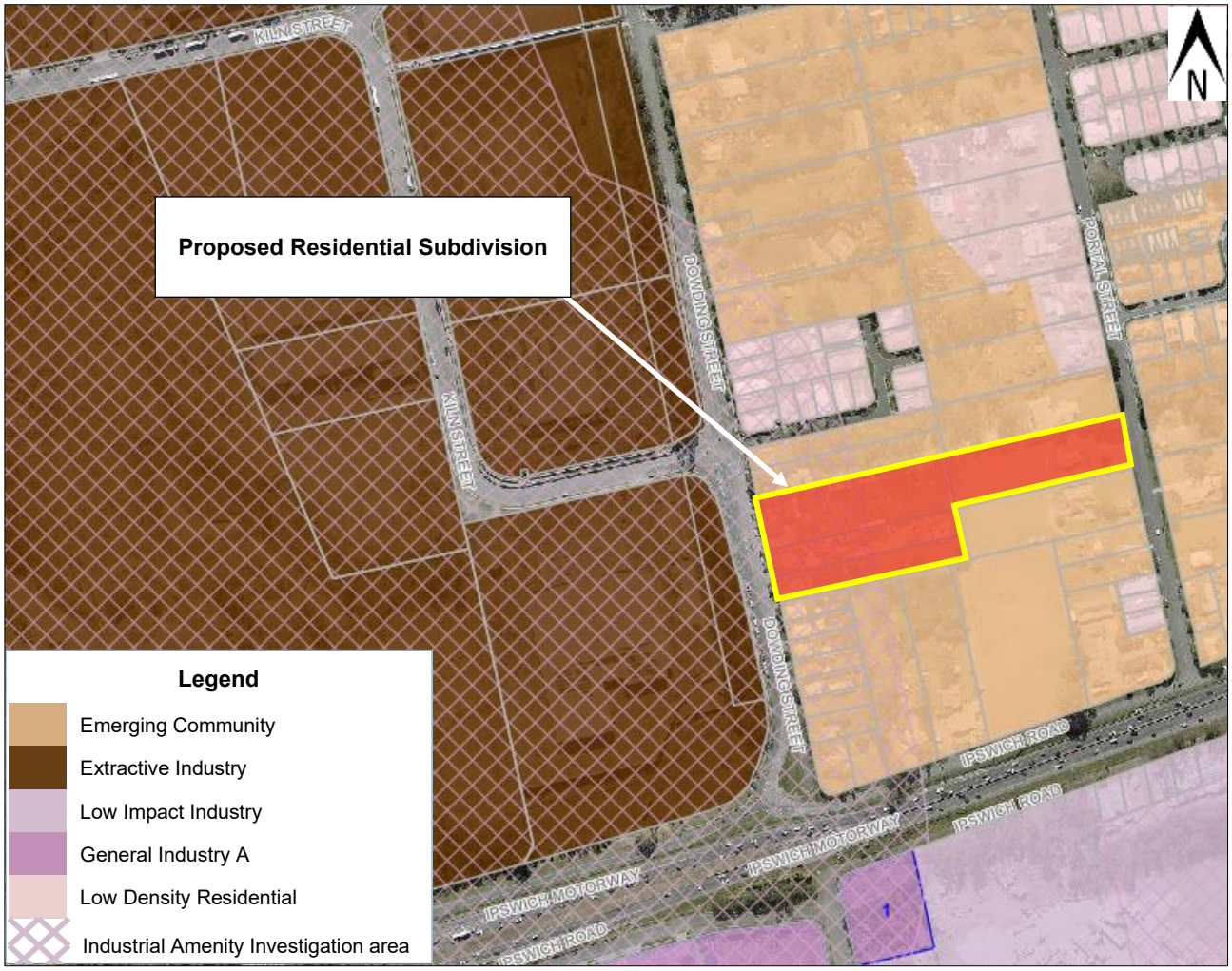


Figure 1.1 Site location

1.4 Proposed Development

The proposed development is to be subdivided into 35 new residential lots with a bio-basin area next to the future lot 35.

2. Road Traffic Noise Assessment

2.1 Existing Noise Amenity

2.1.1 Site-specific Noise Measurements

Road traffic noise measurements were carried out at a location to the southwest of the subject site using an automated noise logger to obtain information about the existing background noise levels during day, evening and night-time.

The noise measurement methodology is summarised in Table 2.1.

Table 2.1 Traffic noise measurements

Relevant legislation, standards, and guidelines	The noise measurements were carried out in accordance with: • Australian Standard AS1055-2018 (*Acoustics – Description and measurement of environmental noise*). • Australian Standard AS2702-1984 (*Acoustics – Methods for measurement of road traffic noise*).
Measurement location	The noise measurement was carried out using a noise logger at a representative location with clear exposure to traffic noise from the Ipswich Motorway, as presented in Figure 2.1. Photos showing the noise measurement location are presented in Appendix B.
Measurement period	Continuous noise measurements were carried out 24 hours a day from 29 July to 5 August 2024.
Measurement equipment	The following sound measurement equipment was used: • Environmental Logger – ARL Ngara (serial no. 87811C); and • Calibration – RION NC-74 Sound Level Calibrator (Serial no. 34413140). The sound measurement instruments conform to Australian Standard AS IEC61672.1-2019. Calibration was performed during set up and download of the data from the noise logger. The calibration drift was <0.1 dB(A).
Meteorological conditions	The prevailing conditions during the noise measurement period were mostly fine, with no significant rain fall recorded on this period. Full meteorological data over the noise measurement period is presented in Appendix C.
Analysis of data	The noise measurement data was analysed to determine the following noise descriptor: **Road Traffic Noise Assessment:** • **$L_{10,18hr}$:** L_{10} is the level of noise exceeded for 10% of any time period; $L_{10,18hr}$ is the typical traffic noise descriptor, and is the arithmetic average of 18 hourly $L_{10,1hr}$ levels over consecutive hours between 6am and 12am.

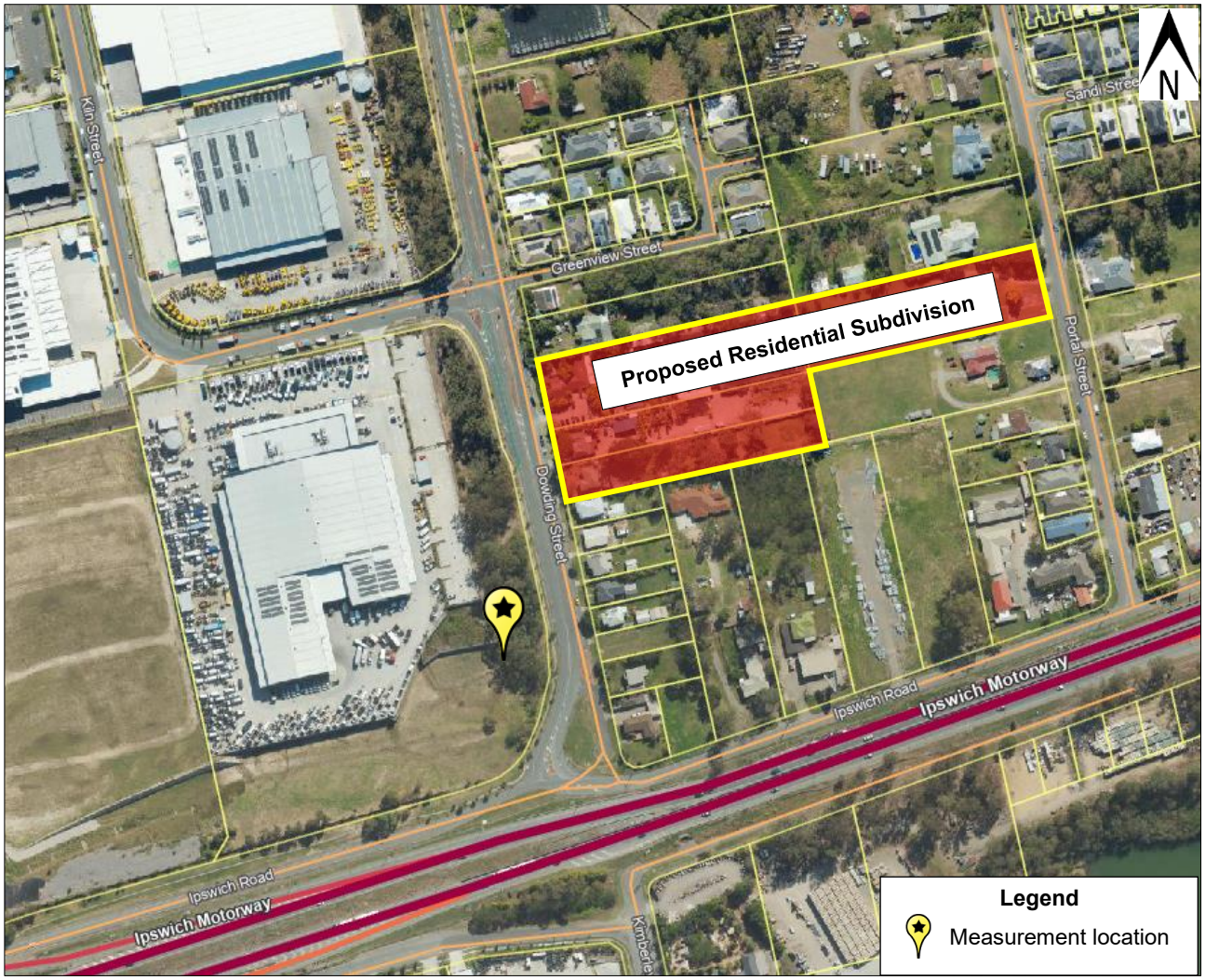


Figure 2.1 Road traffic & background noise measurement location

2.1.2 Road Traffic Noise Data

The results of the unattended noise measurements undertaken from 29 July to 5 August 2024 are presented in Table 2.2.

Table 2.2 Measured road traffic and background noise levels

Date	Traffic noise levels L_{10} dB(A)		Background noise levels L_{90} dB(A)	
	$L_{10,18hr}$ (6am–12am)	$L_{10,1hr\ max}$ (6am–12am)	$L_{90,18hr}$ (6am–12am)	$L_{90,8hr}$ (10pm–6am)
29 July 2024 (Mon)	—	—	—	51.9
30 July 2024 (Tue)	64.7	68.1	59.6	54.1
31 July 2024 (Wed)	64.4	67.8	59.3	54.3
1 August 2024 (Thu)	64.2	68.4	59.0	54.0
2 August 2024 (Fri)	64.7	68.0	59.6	53.0
3 August 2024 (Sat)	62.6	66.6	57.8	51.0
4 August 2024 (Sun)	61.6	64.6	55.9	50.0
Arithmetic Average (Weekdays Only)	**64.5**	**68.0**	**59.4**	**53.5**

Full summary of the noise measurement data, including full 1-hour measurement data is presented in Appendix D.

2.2 Traffic Noise Criteria

2.2.1 State Development Assessment Provisions (SDAP)

The proposed development is located near the Ipswich Motorway, which is a state-controlled Transport Noise Corridor under administration by Department of Transport and Main Roads (TMR). Traffic noise impacts on the noise sensitive development must be assessed in accordance with the TMR *Transport Noise Management Code of Practice, Volume 1 – Road Traffic Noise* (November 2013).

The relevant traffic noise criteria with both the performance outcomes (PO) and acceptable outcomes (AO) are provided in the following documents:

- Department of State Development, Manufacturing, Infrastructure and Planning (DSDMIP), *State Development Assessment Provisions (SDAP) Version 3.6* (May 2026), *State Code 1: Development in state-controlled road environment*; and
- Department of Transport and Main Roads (TMR), *Policy for Development on Land Affected by Environmental Emissions from Transport and Transport Infrastructure Version 4* (October 2017).

The applicable criteria from the *TMR Policy* and the *SDAP* are presented in Tables 2.3 and 2.4.

Table 2.3 External traffic noise criteria

Transport Infrastructure	Development Type	Location Within Development	Environmental Criteria
State-controlled Road	Accommodation activities[1]	All facades	≤60dB(A) $L_{10,18hr}$ facade corrected (measured $L_{90,8hr}$ free field between 10pm and 6am ≤ 40dB(A))
			≤63dB(A) $L_{10,18hr}$ facade corrected (measured $L_{90,8hr}$ free field between 10pm and 6am > 40dB(A))
		Outdoor spaces for passive recreation	≤57dB(A) $L_{10,18hr}$ free field (measured $L_{90,18hr}$ free field between 6am and 10pm ≤ 45dB(A))
			≤60dB(A) $L_{10,18hr}$ free field (measured $L_{90,18hr}$ free field between 6am and 10pm > 45dB(A))

Table 2.4 Performance and Acceptable Outcomes (SDAP State Code 1)

Performance outcome	Acceptable outcome
Involving the creation of 6 or more new residential lots adjacent to a state-controlled road or type 1 multi-modal corridor	
PO38 Reconfiguring a lot minimises free field noise intrusion from a state-controlled road.	**AO38**.1 Development provides a noise barrier or earth mound which is designed, sited, and constructed: a. to achieve the maximum free field acoustic levels in reference table 2 (item 2.1); b. in accordance with: a. Chapter 7 integrated noise barrier design of the Transport Noise Management Code of Practice: Volume 1 (Road Traffic Noise), Department of Transport and Main Roads, 2013; b. Technical Specification-MRTS15 Noise Fences, Transport and Main Roads, 2019; c. Technical Specification-MRTS04 General Earthworks, Transport and Main Roads, 2020. OR **AO38.2** Development achieves the maximum free field acoustic level in reference table 2 (item 2.1) for private open space by alternative noise attenuation measures where it is not practical to provide a noise barrier or earth mound.

The existing background noise levels at night-time, in terms of the $L_{90,\ 8hr}$ noise descriptor, are on average 53.5dB(A). Similarly, the existing background noise levels during daytime, in terms of the $L_{90,18hr}$ noise descriptor, are on average 59.4dB(A).

[1] Includes caretaker's accommodation, community residence, dual occupancy, dwelling house, dwelling unit, multiple dwelling, relocatable home park, residential care facility, resort complex, retirement facility, rooming accommodation, short-term accommodation, and tourist park.

Therefore, the applicable traffic noise criteria are:

- Building façades (façade adjusted[2]): ≤63dB(A) $L_{10,18hr}$; and
- Private open spaces (free-field[3]): ≤60dB(A) $L_{10,18hr}$.

2.2.2 Queensland Development Code (QDC) MP4.4

In case of exceedance of the external traffic noise criteria, architectural treatment must be applied to the external façade of the future dwellings to protect the internal noise amenity.

The architectural treatments are specified in *Queensland Development Code (QDC) Mandatory Part 4.4 (MP4.4) – Buildings in a Transport Noise Corridor.* Depending on the calculated 10-year planning horizon road traffic noise, under the *QDCMP4.4,* there are five road traffic noise categories and corresponding acceptable form of construction, as presented in Table 2.5.

Table 2.5 QDCMP4.4 Noise Categories

Noise category	Level of transport noise* $L_{A10,18hr}$ for State-controlled and designated local government roads
Category 4	≥ 73 dB(A)
Category 3	68 – 72 dB(A)
Category 2	63 – 67 dB(A)
Category 1	58 – 62 dB(A)
Category 0	≤ 57 dB(A)

**Measured at 1m from building façade*

QDCMP4.4 specifies acceptable forms of construction for the external walls, windows and roof/ceiling.

The noise categories applicable to the proposed development will be determined in this report.

As an alternative to the deemed-to-comply construction specifications from *QDCMP4.4*, the buildings can be constructed as per the advice of a qualified acoustical engineer. The engineer can carry out floor plan specific acoustic design in accordance with *AS3671-1989* and provide acoustic design specifications for the external walls, windows and roof/ceiling

[2] The façade adjusted noise criterion contains +2.5dB(A) adjustment factor for the sound energy reflected from the hard surface of a typical building. This adjustment factor is applicable for areas within 3m from a hard-reflective vertical surface.
[3] "Free-field" refers to open space with no reflected noise.

2.3 Traffic Noise Calculation Methodology

2.3.1 Traffic Flow Data (Year 2023)

Traffic noise levels at the proposed development, within a 10-year planning horizon (year 2037), were calculated using SoundPLAN noise propagation modelling software.

SoundPLAN calculates traffic noise as procedure specified in the UK Department of Transport Welsh Office *Method of Calculation of Road Traffic Noise* (CoRTN). This traffic noise calculation procedure is widely adopted in Australia.

The assumptions and data used in development of the traffic noise propagation model are presented in Table 2.6.

Table 2.6 Data and assumptions – Traffic noise model

Terrain	• The model uses the finished surface levels of the proposed development as presented in the earthworks plan (*File Name.: Design Super.dwg)*. • Elevation data for the surroundings were obtained from Department of Natural Resources and Mines Airborne Laser (LiDAR) 1 metre elevation data. • Ground surface absorption factor of 0 was applied to all paved surfaces and 1 for all grassed areas.
Development layout	• The model uses the proposed lot boundaries presented in the development layout for the full extent of the proposed subdivision (*File Name: 24084-Preliminary Civil Drawing Set, Rev.: C*), dated 19 May 2025. The development layout is presented in Appendix A.
Buildings	• Physical buildings at the proposed development are not included in the model as the application seeks approval for reconfiguration of lot only and no approval of building footprints are proposed. • Existing buildings near the proposed development were included in the model.

Road traffic	• The Ipswich Motorway was included in the modelling, with alignment determined based on aerial imagery. The length of the road considered in the traffic noise modelling spans approximately 300m either side of the proposed development site.
	• Traffic volumes for Ipswich Motorway were sourced from the AADT Segment Report for Traffic Year 2023, sourced from TMR traffic census for QLD state-declared road network. The data for Segment Site 136245, located at Cunningham Arterial Road (Ipswich Motorway) is as follows:
	  ○ 2023 AADT of 56,357 vehicles per day;
	  ○ 13.68% heavy vehicles; and
	  ○ Average annual growth rate of 2.31% per annum.
	• Future traffic volumes were calculated based on an average 2.31% growth per annum.
	• Ipswich Motorway has two lanes in either direction as it passes the development site.
	• Speed limit on Ipswich Motorway is 90km/h while it passes the development.
	• Pavement surface type is Dense Graded Asphalt (DGA), which is considered acoustically neutral and does not require a correction factor as per Table 4(a) of the TMR CoP Volume 1.
	• The CoRTN procedure requires traffic volume data input for 18hours. Traffic volume for 18-hour period (6:00am to midnight) was considered as 94% of the 24-hour AADT, as per the procedure of the TMR CoP Vol. 1.

<table>
<tr><td>Calculation receives</td><td>

2m grid spacing was used for calculation of noise contour maps.
Free-field and façade-adjusted noise contour maps were generated:

Free-field: No adjustment for façade reflection. Represents the traffic noise levels that are applicable to private open spaces; and
Facade-adjusted: +2.5dB(A) facade adjustment was applied to the calculated noise levels to account for noise reflection from building façades. Represents the traffic noise levels that are applicable to building façades.

Traffic noise levels were calculated at three different heights:

1.5m above ground level (Ground floor private open spaces);
1.8m above ground level (Ground floor building façades); and
4.6m above ground level (First floor building façades).

CoRTN Calibration Factors for Queensland Conditions was considered in this assessment, as per the procedure from the TMR CoP Vol. 1[4]:

Adjustment of -1.7 dB was applied to the calculated facade traffic noise levels; and
Adjustment of -0.7 dB was applied to the calculated free-field traffic noise levels.

</td></tr>
<tr><td>Calculation procedure</td><td>

CoRTN ’88.

</td></tr>
<tr><td>Volume attenuation (Vegetation)</td><td>

Sound attenuation by areas of bushland was considered in this assessment. Refer to the noise contour maps in Appendix F showing the volume attenuation areas (hatched in blue).
The attenuation by vegetation was calculated in SoundPLAN in accordance with the ISO9613 procedure. The sound attenuation for propagation distance d_f through foliage is presented below:

<table>
<tr><th>Propagation distance d_f, m</th><th>63 Hz</th><th>125 Hz</th><th>250 Hz</th><th>500 Hz</th><th>1000 Hz</th><th>2000 Hz</th><th>4000 Hz</th><th>8000 Hz</th></tr>
<tr><td>Attenuation, dB where $10 \le d_f \le 20$</td><td>0</td><td>0</td><td>1</td><td>1</td><td>1</td><td>1</td><td>2</td><td>3</td></tr>
<tr><td>Attenuation, dB/m where $20 \le d_f \le 200$</td><td>0.02</td><td>0.03</td><td>0.04</td><td>0.05</td><td>0.06</td><td>0.08</td><td>0.09</td><td>0.12</td></tr>
</table>
</td></tr>
<tr><td>Noise mitigation measures</td><td>

The recommended noise control measures are discussed in Section 4 of this report.

</td></tr>
</table>

[4] Source: Australian Road Research Board, 1982, *An Evaluation of the UK DoE Traffic Noise Prediction* (Report No. 122, ARRB – NAASRA Planning Group). Referenced in the TMR CoP Vol. 1.

2.3.2 Model Validation (Year 2024)

The Noise data collected during the monitoring period (as presented in Table 2.2) was used to validate the accuracy of the SoundPLAN model prior to undertaking calculations of the future road traffic noise levels within a 10-year planning horizon, after the development is fully established.

The traffic flow data[5]: considered in the SoundPLAN validation model is presented in Table 2.7.

Table 2.7 Traffic flow data

Road	Traffic volumes			Heavy vehicles (%)
	2023 AADT	2024 AADT	2037 AADT (10-year planning horizon)	
Ipswich Motorway (Eastbound)	27,789 vpd	28,550 vpd	40,572 vpd	13.31%
Ipswich Motorway (Westbound)	28,568 vpd	29,111 vpd	37,181 vpd	14.00%

Notes:

1. *AADT – Average Annual Daily Traffic.*
2. *Traffic data for the Ipswich Motorway was obtained from the TMR AADT Segment Report for Cunningham Arterial Road (Ipswich Motorway), Road Segment from 3.43km to 6.95km, Segment Site: 136245 – Traffic Year 2023.*

The results of the SoundPLAN model validation are presented in Table 2.8 and in Appendix E.

Table 2.8 SoundPLAN validation results

Measured $L_{10,18hr}$ dB(A)	Calculated $L_{10,18hr}$ dB(A)	Difference dB	Validation Factor
64.5	65.6	+1.1	n/a

**Free field*

The free-field calculated traffic noise level is overpredicting the measured traffic noise levels by 1.1dB(A). The SoundPLAN model, validated as per the results presented in Table 2.8 was used to calculate the road traffic noise levels within the 10-year planning horizon (year 2037) with no additional correction factor.

[5] Traffic data for Ipswich Motorway (Cunningham Arterial Road) was obtained from the QLD Traffic census 2023, traffic count site 136245, located near to Jervis Street. The average traffic growth for the site is 2.31% per annum.

An excerpt from the 3D SoundPLAN traffic noise validation model (year 2024) showing the alignment of Ipswich Motorway and the surrounding existing premises is presented in Figure 2.2.

Figure 2.2 Excerpt from 3D SoundPLAN traffic noise validation model (year 2024)

An excerpt from the 3D SoundPLAN traffic noise model for the 10-year planning horizon (year 2037) showing the alignment of Ipswich Motorway relative to the proposed development is presented in Figure 2.3.

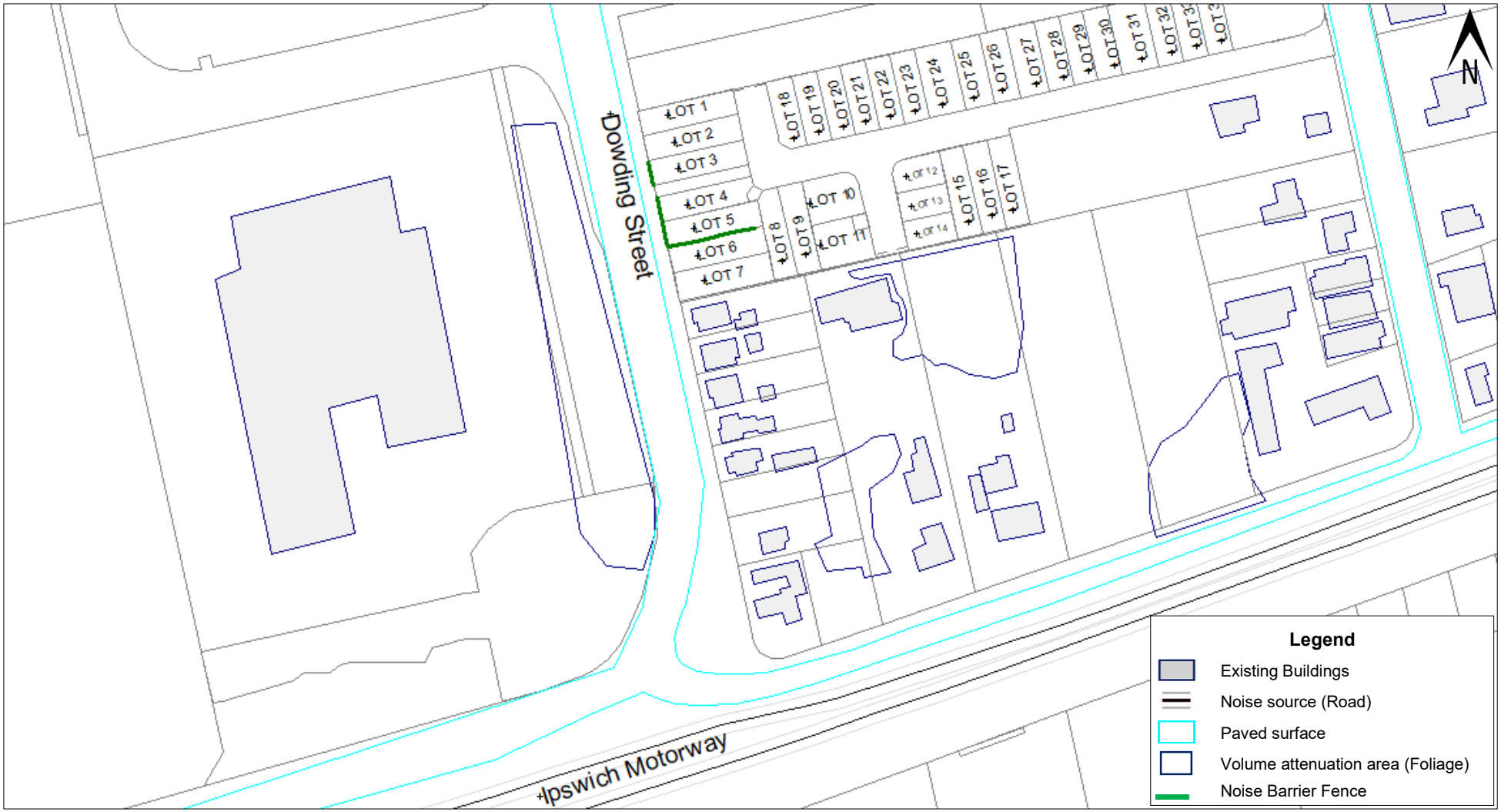


Figure 2.3 Excerpt from 3D SoundPLAN traffic noise propagation model (year 2037)

2.3.3 Calculated Traffic Noise Levels (Year 2037)

The road traffic noise levels were calculated at heights representative of the ground and upper floor façades of future dwellings, and at the representative private open spaces on the ground floors of the future dwellings.

The calculated noise levels were then assessed against the traffic noise criterion of ≤63dB(A) $L_{10,18hr}$ façade adjusted for building façades; and traffic noise criterion of ≤57dB(A) $L_{10,18hr}$ free-field for private open spaces.

The traffic noise levels for the entire development at No. 174, 184 & 188 Dowding Street and No. 81 Portal Street in Oxley are represented as noise contour maps in Appendix F, relative to compliance with the traffic noise criteria as per *TMR – Policy for Development on Land Affected by Environmental Emissions from Transport and Transport Infrastructure Version 4 (October 2017)* and *SDAP State Code 1*. In addition, the corresponding *QDCMP4.4* Noise Categories applicable to the façades of the future dwellings of the subdivision are summarised in Table 2.9.

Table 2.9 Traffic Noise Levels

Lot no.	Building façades (facade-adjusted)				Private open spaces (free-field) (1.5m AGL)
	Ground floor (1.8m AGL)		Upper floor (4.6m AGL)		
	Compliance with ≤63dB(A) criterion	Noise Category QDCMP4.4	Compliance with ≤63dB(A) criterion	Noise Category QDCMP4.4	Compliance with ≤60dB(A) criterion
1	Yes	Category 1	No	Category 2	Yes
2	Yes	Category 1	No	Category 2	Yes
3	Yes	Category 1	No	Category 2	Yes
4	Yes	Category 1	No	Category 2	Yes
5	No	Category 2	No	Category 2	Yes
6	No	Category 2	No	Category 2	No
7	No	Category 2	No	Category 2	No
8	Yes	Category 1	No	Category 2	Yes
9	Yes	Category 1	No	Category 2	Yes
10	Yes	Category 1	No	Category 2	Yes
11	Yes	Category 1	No	Category 2	Yes
12	Yes	Category 1	No	Category 2	Yes
13	Yes	Category 1	No	Category 2	Yes
14	Yes	Category 1	No	Category 2	Yes
15	Yes	Category 1	No	Category 2	Yes
16	Yes	Category 1	No	Category 2	Yes
17	Yes	Category 1	No	Category 2	Yes
18	Yes	Category 1	Yes	Category 1	Yes
19	Yes	Category 1	Yes	Category 1	Yes
20	Yes	Category 1	Yes	Category 1	Yes

Lot no.	Building façades (facade-adjusted)				Private open spaces (free-field) (1.5m AGL)
	Ground floor (1.8m AGL)		Upper floor (4.6m AGL)		
	Compliance with ≤63dB(A) criterion	Noise Category QDCMP4.4	Compliance with ≤63dB(A) criterion	Noise Category QDCMP4.4	Compliance with ≤60dB(A) criterion
21	Yes	Category 1	Yes	Category 1	Yes
22	Yes	Category 1	Yes	Category 1	Yes
23	Yes	Category 1	Yes	Category 1	Yes
24	Yes	Category 1	Yes	Category 1	Yes
25	Yes	Category 1	Yes	Category 1	Yes
26	Yes	Category 1	Yes	Category 1	Yes
27	Yes	Category 1	Yes	Category 1	Yes
28	Yes	Category 1	Yes	Category 1	Yes
29	Yes	Category 1	Yes	Category 1	Yes
30	Yes	Category 1	Yes	Category 1	Yes
31	Yes	Category 1	Yes	Category 1	Yes
32	Yes	Category 1	Yes	Category 1	Yes
33	Yes	Category 1	Yes	Category 1	Yes
34	Yes	Category 1	Yes	Category 1	Yes

3. Brisbane City Plan 2014 (Subdivision Code)

3.1 Existing Noise Amenity

3.1.1 Attended Noise Measurements

ATP carried out attended noise measurement on 6 February 2025 at the western boundary (corresponding with the most exposed façade) of the proposed development and the eastern boundary of the nearest industrial uses.

The noise measurement methodology is summarised in Table 3.1.

Table 3.1 Operational Noise measurements

Relevant legislation, standards, and guidelines	The noise measurements were carried out in accordance with: • Australian Standard AS1055-2018 (*Acoustics – Description and measurement of environmental noise*). • Department of Environment and Science, *Noise Measurement Manual, Version 4.*
Measurement location	The noise measurement was carried out using sound level meters at the western boundary of the proposed development and the eastern boundary of the nearest industrial uses, as presented in Figure 3.1. Photos showing the noise measurement locations are presented in Appendix B.
Measurement period	Continuous noise measurements were carried out during the peak hours of 7:55am to 10:00am on 6 February 2025.
Measurement equipment	The following sound measurement equipment was used: • Sound level meter – SVAN 977A (serial no.: 92176); • Sound level meter – SVAN 977 (serial no.: 98032); and • Calibration – RION NC-74 Sound Level Calibrator (Serial no. 34413140). The sound measurement instruments conform to Australian Standard AS IEC61672.1-2019. Calibration was performed during set up and download of the data from the sound level meter. The calibration drift was <0.1 dB(A).
Analysis of data	The noise measurement data was analysed to determine the following noise descriptor: **Operational Noise Assessment:** • **$L_{10,1hr}$:** Operational noise levels over a one-hour period.

Figure 3.1 Attended noise measurement locations

3.2 Industrial Noise Criteria

3.2.1 Brisbane City Plan 2014

The site at No. 174, 184 & 188 Dowding Street and No. 81 Portal Street in Oxley is located within the *Industrial Amenity Investigation area* of the *Industrial Amenity Overlay* under *Brisbane City Plan (BCP) 2014*.

According to the *Subdivision code* of *BCP2014*, it is required for development to address potential adverse impacts on the normal occupation of the proposed lots for its intended use and associated activities, especially when the site is in close proximity to industrial uses.

An excerpt of relevant performance outcome (PO) and acceptable outcome (AO) from the *Subdivision code* under *BCP2014* are presented in Table 3.2.

Table 3.2 Performance and acceptable outcomes (Subdivision Code)

Performance outcome	Acceptable outcome
Section A – General performance outcomes and acceptable outcomes for reconfiguring a lot	
PO5 Development provides for safe and healthy occupation of the lots relative to risks, hazards and land uses that adversely affect the normal occupation of the lot by the intended land use and activities associated with that use.	**AO5** Development ensures that lot density, location, arrangement and dimensions address potential adverse impacts on the normal occupation of the lot for its intended use and associated activities, by: a. identifying the sources of potential hazards including air, noise, dust, light, contaminated land and electromagnetic emissions;

Performance outcome	Acceptable outcome
	b. avoiding the hazard; or c. mitigating hazard impacts, including through buffers, structures or other necessary measures. Note – Overlays and neighborhood plans provide information about potential risks and hazards and how to address them. However, the planning scheme may not reflect risks and hazards determined as part of the analysis of the site and its surrounds and assessment of the development or changed circumstances or those associated with: • contaminated land; • transport noise corridors on State-controlled roads and the rail network. The Queensland Government's Contaminated land register and Environmental management register should be consulted regarding contaminated land. The State Planning Policy Interactive Mapping System should be consulted regarding transport noise corridors.

Compliance with AO5/PO5 of the BCP 2014 Subdivision Code can be achieved by demonstrating compliance with the relevant noise criteria from *Table 8.2.13.3.E Noise (planning) criteria* of the *Industrial amenity overlay code* under *BCP2014* as presented in Table 3.3.

Table 3.3 Excerpt of Noise (planning) criteria from BCP2014

Sleeping areas	Adjusted equivalent continuous sound pressure level ($L_{Aeq,adj,T}$) to be achieved during day, evening and night-time periods			Maximum sound pressure level (L_{Amax}) to be achieved during the night-time period
	$L_{eq,adj,11hr}$ **Day (7am – 6pm)**	$L_{eq,adj,4hr}$ **Evening (6pm – 10pm)**	$L_{eq,adj,9hr}$ **Night (10pm – 7am)**	L_{Amax} **Night (10pm – 7am)**
Sleeping areas	35dB(A)	35dB(A)	30dB(A)	45dB(A)
Other habitable rooms	35dB(A)	35dB(A)	35dB(A)	–
Low frequency noise criteria for specified sources				
Noise intrusion into habitable rooms	60dB(C)	60dB(C)	Sleeping areas: 55dB(C) Other habitable rooms: 60dB(C)	N/A

3.3 Industrial Noise Impacts

The results of the attended noise measurement are presented in Table 3.4.

Table 3.4 Measured operational noise levels

Time	Measured Noise Levels $L_{10,1hr}$ Free-Field	Measured Noise Levels $L_{Aeq,1hr}$ Free-field	Measured Noise Levels $L_{Aeq,1hr}$ Façade-adjusted
Sound Level Meter (Western Boundary of the development)			
8:00am – 9:00am	64.1	60.7	**63.2** (60.7+2.5)
9:00am – 10:00am	63.3	62.2	**64.7** (62.2+2.5)
Sound Level Meter (Eastern Boundary of the nearest industrial use)			
8:00am – 9:00am	65.4	62.0	**64.5** (62.0+2.5)
9:00am – 10:00am	64.0	62.4	**64.9** (62.4+2.5)

Based on site observations throughout the noise monitoring period, the dominant noise emissions were identified to be associated with road traffic noise coming from the Ipswich Motorway.

Noise propagation modelling was carried out using the traffic noise calculation methodology specified in the Section 2.3 for calculating the traffic noise for Year 2025. The results of the noise modelling were then used to assess the data obtained through on-site noise measurement of the industrial noise impacts near the proposed development site.

3.3.1 Calculated Traffic Noise levels

The traffic flow data[6]: considered in the SoundPLAN model is presented in Table 3.5.

Table 3.5 Traffic flow data (Year 2025)

Road	Traffic volumes		Heavy vehicles (%)
	2023 AADT	2025 AADT	
Ipswich Motorway (Eastbound)	27,789 vpd	29,333 vpd	13.31%
Ipswich Motorway (Westbound)	28,568 vpd	29,664 vpd	14.00%

Notes:

1. *AADT – Average Annual Daily Traffic.*
2. *Traffic data for the Ipswich Motorway was obtained from the TMR AADT Segment Report for Cunningham Arterial Road (Ipswich Motorway), Road Segment from 3.43km to 6.95km, Segment Site: 136245 – Traffic Year 2023.*

[6] Traffic data for Ipswich Motorway (Cunningham Arterial Road) was obtained from the QLD Traffic census 2023, traffic count site 136245, located near to Jervis Street. The average traffic growth for the site is 2.31% per annum.

An excerpt from the 3D SoundPLAN traffic noise model (year 2025) showing the alignment of Ipswich Motorway and the locations of two sound level meters in Figure 3.2.

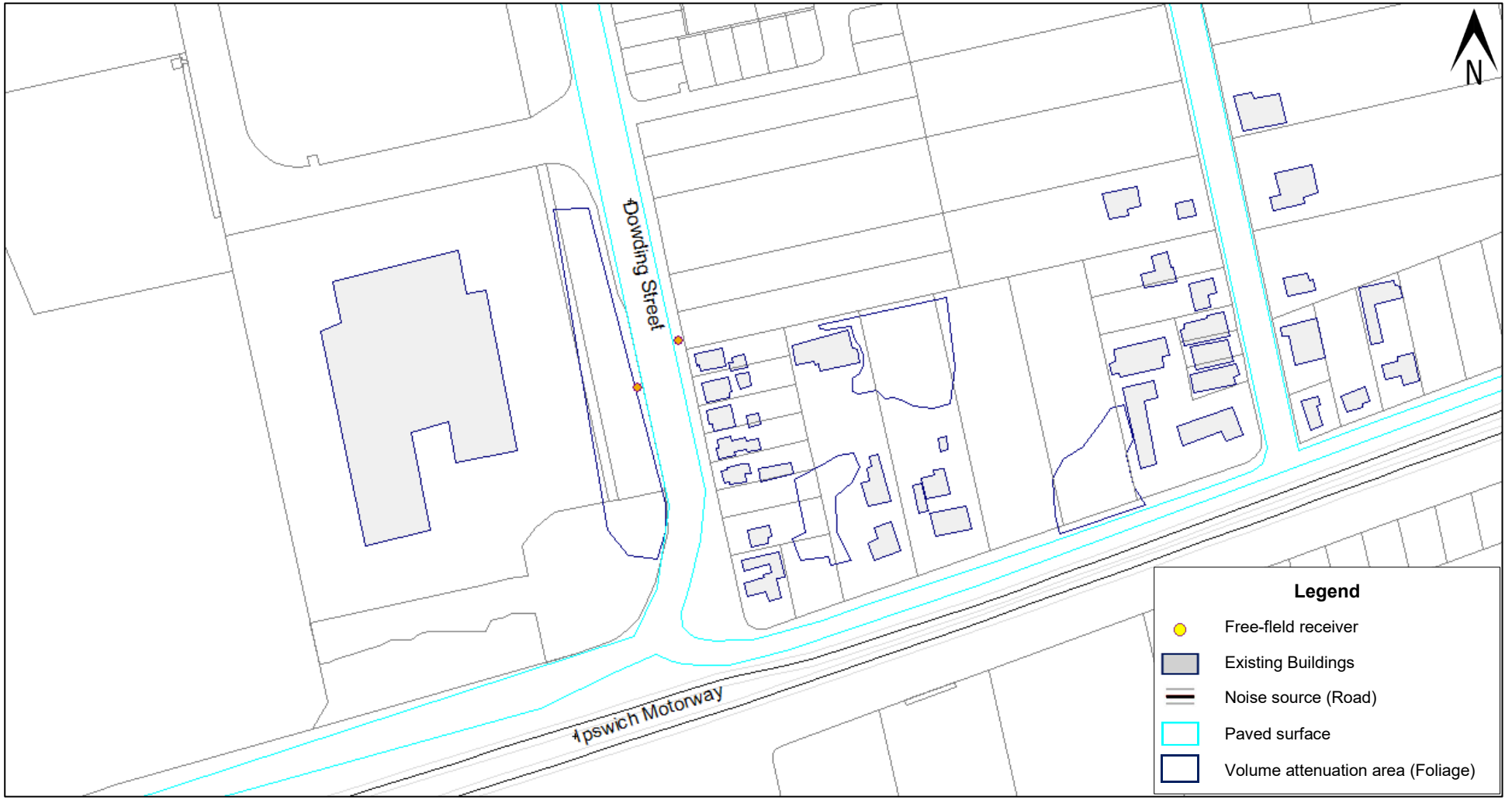


Figure 3.2 Excerpt from 3D SoundPLAN traffic noise model (year 2025)

The results of the SoundPLAN model comparing the on-site noise measurements and predicted traffic noise levels (Year 2025) are presented in Table 3.6 and in Appendix E.

Table 3.6 SoundPLAN results comparing with the noise measurements (Year 2025)

Location	Measured $L_{10,1hr}$ dB(A)	Calculated $L_{10,1hr}$ dB(A)	Difference dB
Sound level meter Near western boundary of the proposed development	64.1	65.1	+1.0
Sound level meter Near the eastern boundary of the nearest industrial use	65.4	65.7	+0.3

The results indicate that even when only considering the road traffic noise along the Ipswich Motorway, the noise propagation model overpredicted the noise levels at locations most exposed to nearby industrial uses. This demonstrates that the noise amenity at the western boundary of the development is primarily influenced by road traffic noise from the Ipswich Motorway.

3.4 Review of the Existing Industrial Use

The nearest industrial use to the proposed subdivision is a commercial facility located at No. 2637 Ipswich Road in Darra, which is used for retail sale, servicing, and repairing of automotive vehicles, and activities ancillary.

The existing industrial use operates 24 hours and 7 days a week with the condition that all trucks and loading/unloading vehicles operating on site between 10pm to 7am are not to reverse or engage reverse beepers on the eastern portion of the site. Additionally, it is also specified in the *Item 19 – Noise Emissions* of BCC Approval Package (*ref. A004819392, dated 16 August 2018)* that the roller doors along the entire eastern façade facing Dowding Street are to be closed during the night-time hour (10pm to 7am) to minimise noise impacts to all nearby sensitive uses.

A Noise Impact Assessment (*Ref.: 70Q-17-0208-TRP-542379-*4) was carried out by ViPAC Engineers and Scientists Limited during the Development Approval (DA) stage for assessing the potential noise impacts to the nearby residential uses, as presented in Figure 3.3.

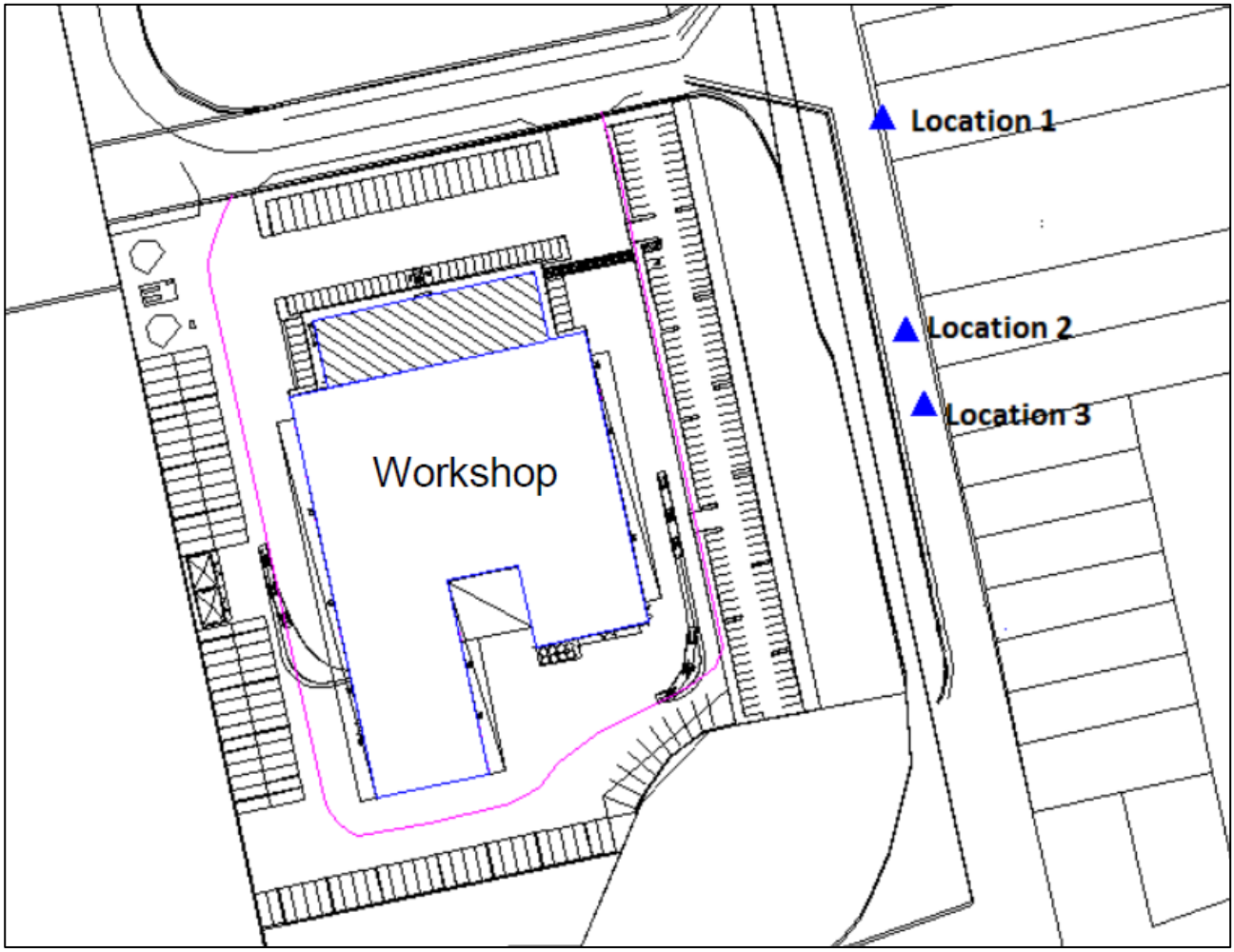


Figure 3.3 Noise assessment locations – Excerpt from ViPAC NIA report

As a results, the calculated noise levels at the assessment locations are summarized in Table 3.7.

Table 3.7 Predicted operational noise levels – Excerpt from ViPAC NIA report

Location	Floor	$L_{Aeq,adj,11hr}$ Day dB(A)	$L_{Aeq,adj,4hr}$ Evening dB(A)	$L_{Aeq,adj,9hr}$ Night dB(A)[7]	$L_{Ceq,adj,11hr}$ Day dB(C)	$L_{Ceq,adj,4hr}$ Evening dB(C)	$L_{Ceq,adj,9hr}$ Night dB(C)[7]	Absolute Highest $L_{Amax,night}$ dB(A)
Location 1	Ground floor	52	37	35	55	53	53	49
	First floor	52	40	36	56	54	54	51
Location 2	Ground floor	49	39	36	56	55	55	49
	First floor	53	42	38	58	56	56	52
Location 3	Ground floor	49	39	36	56	55	55	48
	First floor	53	42	38	57	56	56	52

[7] The noise impact assessment carried out by ViPAC considered the night-time scenario with roller doors closed on eastern façade.

Based on the results of noise impact assessment for the existing industrial use, the attended noise measurement carried out on 6 February 2025 indicated slightly higher noise levels than the calculated results. These findings align with on-site observations, confirming that the acoustic amenity around the proposed development site is dominated by road traffic noise from the State-controlled Ipswich Motorway.

Excerpts of noise contour maps showing the operational noise impacts from the existing industrial use at No. 2637 Ipswich Road are presented in Appendix G.

4. Discussion and Recommendations

4.1 Noise Mitigation Measures – Road Traffic Noise Assessment

Traffic noise propagation modelling was carried out considering the future traffic flows on Ipswich Motorway for a 10-year planning horizon to year 2037.

Under *PO38* of *SDAP State Code 1*, compliance with the façade and private open space criteria is required at the ground level site boundaries of all allotments within the proposed development.

4.1.1 Building Façades

The results of the noise propagation modelling, presented in Table 2.9 of this report, indicate that even with the recommended noise barrier in place, all future allotments of the proposed development are still traffic noise affected and will require compliance with *QDCMP4.4*.

The future dwellings, low-set or high-set, which are affected by traffic noise of ≥58dB(A) $L_{10,18hr}$ (facade adjusted), must be constructed as per acceptable forms of construction specified in Schedule 2 of *QDCMP4.4*.

The allotments of the subdivision subject to *QDCMP4.4* noise categories are summarised in Table 2.9 of this report. It should be noted that there are no acoustic design requirements for Noise Category 0 of *QDCMP4.4*.

There are two options available for architectural treatment to the building façade, as follows:

- Option 1: Implementation of the 'acceptable forms of construction' specified in *Queensland Development Code (QDC) Mandatory Part 4.4 (MP4.4) – Buildings in a Transport Noise Corridor* as per the Noise Categories presented in Table 2.9 of this report.
- Option 2: Floor plan specific acoustic design, in accordance with *AS3671-1989*, to ensure compliance with the internal noise criteria.

4.1.2 Private Open Space

ATP recommends construction of two noise barrier fences (acoustic fences) as follows:

- A 1.8m high noise barrier fence along the western boundary of the proposed Lot 3 to mitigate the road traffic noise; and
- A 1.8m high noise barrier fence along the western boundary of the proposed Lots 4 and 5, with a return for at least 40m along the southern boundary of the proposed Lot 5.

The acoustic barrier must be constructed of a material with minimum superficial mass of 12.5kg/m^2, such as concrete blockwork, brick, autoclaved aerated concrete, minimum 9mm thick compressed fibre cement sheeting, minimum 25mm thick overlapping timber palings or approved modular wall system by Modular Walls, Poly-Tek or equivalent. There shall be no gaps on the surface and at the base of the acoustic barrier.

Detail views showing the alignment the noise barriers as presented in Figure 4.1.

Figure 4.1 Noise barrier alignment

Based on the calculated road traffic noise levels, the front-loaded noise affected Lots (Lots 6 and 7) facing Dowding Street will be impacted by road traffic noise from state-controlled Ipswich Motorway to a level approximately 60-62dB(A) $L_{10(18hr)}$, which indicates no more than 2dB(A) exceedance for the private open space criteria.

While the road traffic noise marginally exceeds the desired private open space criterion for the proposed Lots 6 and 7, the exceedance of 2dB(A) is minor and considered barely perceptible to the human ear.

As shown in the Appendix A of the proposed subdivision layout, the proposed Lots 6 and 7 must take vehicle assess from the west via Dowding Street. Due to this vehicle access requirement, future dwellings will logically be located on the western side of the allotments, which pushes the private open space to the east, as demonstrated in Figure 4.2.

Provided these private open spaces are located along the protected eastern façade (facing away from the Dowding Street), or within a protected courtyard recessed into side of the buildings, compliance with the private open space criterion will be achieved.

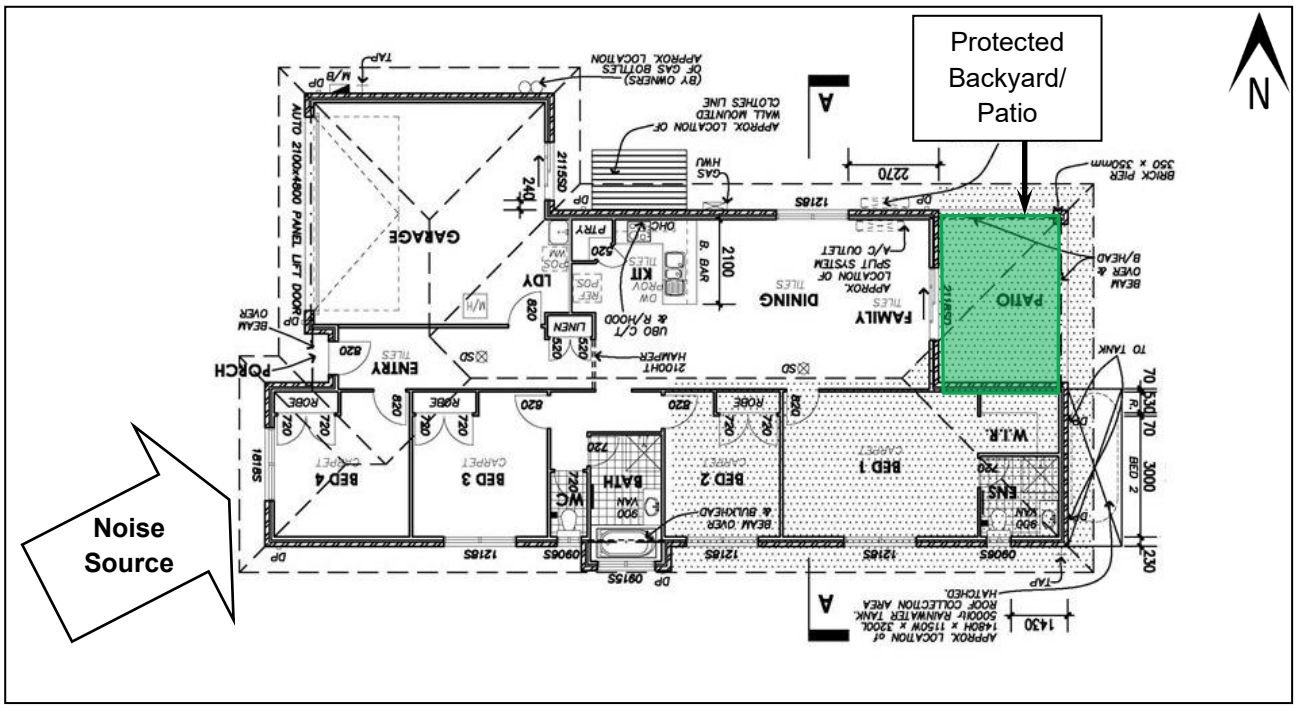


Figure 4.2 Private open space on the protected façade

4.2 Noise Mitigation Measures – Operational Noise Impact Assessment

4.2.1 BCP2014 – Continuous Internal Noise Criteria

For the internal noise criteria during the daytime and evening, which require each habitable room to achieve an internal noise level of 35dB(A). According to the noise impact assessment report prepared by ViPAC, the operational noise level from the existing industrial use to the boundary of the proposed development will reach a maximum of 53dB(A) at the first floor and 52dB(A) at the ground floor. As such, with future dwellings subject to the architectural treatment for QDCMP4.4 Noise Categories 1 and 2, the building envelopes will provide at least 25dB(A) noise reduction so that the future dwellings will achieve the required internal noise level for both the daytime and evening as per *Table 8.2.13.3.E – Noise (planning) criteria* of the *Industrial amenity overlay* under *BCP2014.*

As for the night-time internal noise criteria, which require each sleeping room to achieve an internal noise level of 30dB(A). The noise impact assessment report prepared by ViPAC considered a scenario where the roller doors located on the eastern façade remain closed during the entire night-time period (10pm to 7am). Under these conditions, operational noise levels from the existing industrial use at the boundary of the proposed development will reach a maximum of 38dB(A) at the first floor and 36dB(A) at the ground floor. With future dwellings subject to the architectural treatments for QDCMP4.4 Noise Categories 1 and 2, the building envelopes will provide at least 25dB(A) noise reduction. Consequently, future dwellings will achieve the required internal noise level during night-time operations of the existing industrial use at 16 Kiln Street in Darra.

4.2.2 BCP2014 – Low-frequency Noise Criteria

Based on the calculated noise levels presented in Table 3.7, the operational noise impacts from the existing industrial use at the boundaries of the proposed subdivision will not exceed 60dB(C) with maximum nigh-time noise impacts no greater than 56dB(C). Considering the setback distance from and the acoustic upgrades to the building envelopes required as per QDCMP4.4, compliance with the low-frequency noise criteria as per *Table 8.2.13.3.E – Noise (planning) criteria* of the *Industrial amenity overlay* under *BCP2014* will be achieved without any further acoustic treatment.

4.2.3 BCP2014 – Maximum Noise Criteria

As presented in Table 3.3, each habitable room of the future dwellings is required to achieve an internal night-time noise criterion where the maximum noise level is no greater than 45dB(A). According to the noise impact assessment prepared by ViPAC, the absolute highest L_{Amax} during night-time, considering the roller doors along the entire eastern façade remain closed, will be 52dB(A) at the first floor and 49dB(A) at the ground floor. With the acoustic upgrades to the building envelops of the future dwellings as per the QDCMP4.4 will provide at least 25dB(A) noise reduction, compliance with the maximum noise criterion as per *Table 8.2.13.3.E – Noise (planning) criteria* of the *Industrial amenity overlay* under *BCP2014* will be achieved without any further acoustic treatment.

In this case, the compliance of internal noise criteria, as presented in Table 3.7 of this report, can be achieved without any further acoustic treatment to the proposed development.

5. Conclusions

Based on the results of the noise impact assessment (Road Traffic Noise Assessment & Operational Noise Impact Assessment) for the proposed residential subdivision at No. 174, 184 & 188 Dowding Street and No. 81 Portal Street in Oxley, the following is concluded:

Road Traffic Noise Assessment

- Without noise control measures, the future allotments of the proposed development will be impacted by traffic noise from the Ipswich Motorway as per the traffic flows predicted within a 10-year planning horizon to year 2037.
- ATP recommends construction of two noise barrier fences (acoustic fence) to mitigate the road traffic noise from the Ipswich Motorway:
    - A 1.8m high noise barrier fence along the western boundary of the proposed Lot 3; and
    - A 1.8m high noise barrier fence along the western boundary of the proposed Lots 4 and 5, with a return of at least 40m long along the southern boundary of Lot 5.
- The acoustic barrier must be constructed of a material with minimum superficial mass of 12.5kg/m^2, such as concrete blockwork, brick, autoclaved aerated concrete, minimum 9mm thick compressed fibre cement sheeting, minimum 25mm thick overlapping timber palings or approved modular wall system by Modular Walls, Poly-Tek or equivalent. There shall be no gaps on the surface and at the base of the acoustic barrier
- The results of the noise propagation modelling, presented in Table 2.9 of this report, indicate the exceedance of private open space criterion at the front-loaded noise affected Lots (Lots 6 and 7) for no more than 2dB(A).
- While the road traffic noise marginally exceeds the desired private open space criterion for the proposed Lots 6 and 7, the exceedance of 2dB(A) is minor which is considered barely perceptible to the human ear.
- Because the proposed Lots 6 and 7 require vehicle access via Dowding Street, future dwelling on these noise-affected allotments will naturally be located on the west side, which will push the private open spaces to the protected side of the houses. The building mass will provide sufficient acoustic shielding for these private open spaces without a need for additional acoustic treatments.
- The results of the noise propagation modelling, presented in Table 2.9 of this report, indicate that all the allotments are traffic noise affected and will require compliance with *QDCMP4.4*.
- The future lots listed in Table 2.9 of this report are impacted by traffic noise that corresponds with QDCMP4.4 Noise Categories 1 and 2, therefore architectural treatment is required to the building façade.
- There are two options available for architectural treatment to the building façade, as follows:

- **Option 1:** Implementation of the 'acceptable forms of construction' specified in Queensland Development Code (QDC) Mandatory Part 4.4 (Buildings in a Transport Noise Corridor) as per the noise categories presented in Table 2.9 of this report.
- **Option 2:** Floor plan specific acoustic design, in accordance with AS3671-1989, to ensure compliance with the internal noise criteria.

Operational Noise Impact Assessment

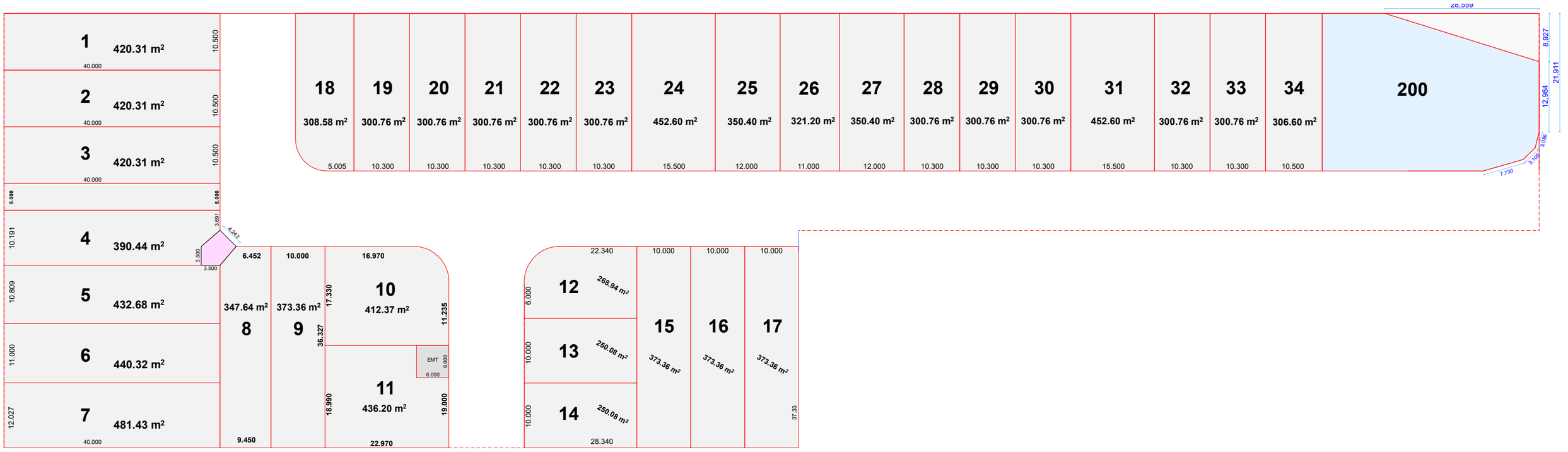
- The existing industrial use operates from 7am to 8pm during weekdays and from 8am to 12pm on Saturdays.
- Based on site observations, the noise amenity of the surrounding area at No. 174, 184 & 188 Dowding Street and No. 81 Portal Street in Oxley is primarily dominated by road traffic noise along the Ipswich Motorway.
- According to the approved noise impact assessment for the existing industrial use at No. 2637 Ipswich Road in Darra, the proposed subdivision development will comply with the internal low-frequency noise criteria as presented in Table 3.3 of this report without any additional noise mitigation measure.
- The results of the approved noise impact assessment for the existing industrial use at No. 2637 Ipswich Road in Darra indicate the future dwellings at the proposed subdivision will achieve the required internal noise level, as presented in Table 3.3, with the implementation of the architectural treatments to the façades of the future dwellings according to the QDCMP4.4.

Provided the recommended planning and design traffic noise control measures are implemented in the construction of the residential subdivision at No. 174, 184 & 188 Dowding Street and No. 81 Portal Street in Oxley, the road traffic noise from Ipswich Motorway and operational noise from the nearby industrial uses at No. 2637 Ipswich Road in Darra will not impose any further constraints on the establishment of the proposed development.

6. References

- Australian Standard AS 1055:2018 *(Acoustics – Description and Measurement of Environmental Noise)*
- Australian Standard ASIEC61672.1-2004 (Electroacoustics – Sound level meters – Specifications)
- Colin H. Hansen, 1994, *Fundamentals of Acoustics*, University of Adelaide, Department of Mechanical Engineering, Adelaide, SA 5005
- International Standard ISO 9613 (*Acoustics – Attenuation of sound during propagation outdoors*)
- Ipswich City Council – *Ipswich Planning Scheme*
- Queensland Government, 2019, *Environmental Protection (Noise) Policy 2019*
- ViPAC Engineers & Scientists Limited, 2018, *Commercial & Industrial Property – AHG ConnectWest Business Park – Noise Assessment* (Ref.: 70Q-17-0208-TRP-542379-4)

Appendix A – Development Plans



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Appendix B – Noise Measurement Location

Photo 1: Noise monitoring location, view due east

Photo 2: Noise monitoring location, view due south

Photo 3: Attended noise monitoring location, at eastern boundary of nearby industrial use

Photo 4: Attended noise monitoring location, at western boundary of the proposed development

Appendix C – Meteorological Data

Archerfield, Queensland
July 2024 Daily Weather Observations

Australian Government
Bureau of Meteorology

Date	Day	Temps		Rain	Evap	Sun	Max wind gust			9am						3pm					
		Min	Max				Dirn	Spd	Time	Temp	RH	Cld	Dirn	Spd	MSLP	Temp	RH	Cld	Dirn	Spd	MSLP
		°C	°C	mm	mm	hours		km/h	local	°C	%	eighths		km/h	hPa	°C	%	eighths		km/h	hPa
1	Mo	16.9	19.2	1.8			S	24	16:57	18.5	86	7	SW	9	1019.4	18.6	85	7	SE	9	1017.4
2	Tu	13.1	16.5	14.0			SSW	26	04:47	13.7	94	8	SSW	11	1023.1	15.9	86	8	SSW	17	1020.9
3	We	13.1	18.9	13.0			SSE	52	16:42	15.0	84	8	SW	11	1025.6	18.5	70	8	S	13	1023.7
4	Th	12.5	21.7	0.4			SE	46	10:46	16.2	69		SSW	17	1028.2	19.8	53	5	SSE	24	1026.2
5	Fr	8.6	21.8	0			SE	46	13:05	16.1	73	1	SSW	13	1030.4	19.5	56	8	SSE	31	1028.6
6	Sa	10.2	22.1	0.8			SE	50	13:29	17.1	75		S	15	1031.5	20.4	52	8	SSE	30	1029.1
7	Su	10.6	22.5	0			ESE	39	12:44	16.4	70		S	13	1030.2	19.7	57	1	SE	26	1026.7
8	Mo	9.5	21.1	0.6			NNE	24	15:52	13.9	93	7	SSE	9	1027.5	17.7	84	8	NNE	13	1023.8
9	Tu	12.4	21.8	2.0			NE	17	12:08	16.6	93	8	WSW	6	1023.8	21.6	74	8	W	4	1020.4
10	We	13.7	24.1	0			WSW	20	09:50	16.2	98	8	WNW	11	1022.2	24.0	60	5	W	7	1018.8
11	Th	11.3	23.4	0			SW	50	07:35	16.9	71		WSW	9	1020.6	21.6	57	4	SSE	11	1016.3
12	Fr	8.6	23.8	0						15.4	81		WSW	17	1014.4	23.4	43		NW	17	1009.1
13	Sa	9.8	20.6				W	52	12:44	14.2	68	4	W	19	1011.6	19.7	43	2	WSW	24	1008.7
14	Su	8.3	20.8	0			W	46	16:32	14.0	65		W	24	1014.5	20.1	33	1	W	24	1009.8
15	Mo	6.2	19.6	0			WNW	43	14:46	12.1	63	7	WSW	13	1012.8	18.5	35		W	28	1008.9
16	Tu	4.5	18.5	0			W	72	12:59	12.3	61		W	24	1011.9	17.5	34		W	43	1007.8
17	We	7.6	16.9	0			WNW	54	11:42	12.1	57		W	30	1013.1	15.6	49		WSW	33	1010.2
18	Th	9.9	19.9	0			W	44	03:09	13.5	64		W	30	1015.1	17.7	44	4	WSW	26	1012.4
19	Fr	6.1	21.0	0			WNW	37	13:00	13.9	64		W	24	1020.0	20.3	37		W	22	1015.6
20	Sa	3.6	23.7	0			WNW	59	13:15	16.4	48		WNW	30	1016.6	22.9	23		W	35	1011.9
21	Su	8.7	21.7	0			WSW	48	13:11	14.8	44		W	20	1020.5	21.1	24		W	30	1017.4
22	Mo	6.0	22.2	0			WSW	24	02:02	13.4	56		WSW	17	1027.1	21.5	31		NW	7	1023.8
23	Tu	4.6	23.3	0			ESE	26	16:32	12.5	72		WSW	13	1028.5	22.3	30		ESE	9	1024.4
24	We	7.2	23.9	0			E	39	17:42	13.9	74	1	WSW	11	1027.1	21.4	53	2	NE	17	1022.5
25	Th	8.4	24.2	0.2			NNE	37	12:48	16.5	82		S	7	1024.4	23.2	50		N	20	1021.8
26	Fr	7.9	25.3	0			NNE	31	15:27	15.5	90		WSW	4	1024.4	23.5	60	1	NE	19	1020.4
27	Sa	9.9	22.6	0			N	31	13:15	13.7	98	8	W	9	1023.4	21.3	67	8	NE	19	1018.7
28	Su	13.5	23.2	0.2			W	50	15:32	15.5	71	8	W	19	1020.2	22.1	30		W	28	1016.4
29	Mo	6.1	21.2	0			WNW	41	13:14	11.3	48		W	24	1024.6	20.8	16		WSW	26	1020.3
30	Tu	4.8	20.6	0			SW	35	12:07	12.1	49		SW	13	1029.0	19.9	32		SSW	20	1026.0
31	We	2.9	21.1	0			SSW	30	10:40	16.1	48		SW	13	1030.6	20.2	29		S	17	1027.1
Statistics for July 2024																					
	Mean	8.9	21.5							14.7	71	6		15	1022.3	20.3	48	5		20	1018.9
	Lowest	2.9	16.5							11.3	44	1	WSW	4	1011.6	15.6	16	1	W	4	1007.8
	Highest	16.9	25.3	14.0			W	72		18.5	98	8	#	30	1031.5	24.0	86	8	W	43	1029.1
	Total			33.0																	

Observations were drawn from Archerfield Airport {station 040211}

Some cloud observations are from automated equipment; these are somewhat different to those made by a human observer and may not appear every day.

IDCJDW4003.202407 Prepared at 13:01 UTC on 3 Oct 2024

Archerfield, Queensland
August 2024 Daily Weather Observations

Australian Government
Bureau of Meteorology

Date	Day	Temps		Rain	Evap	Sun	Max wind gust			9am						3pm					
		Min	Max				Dirn	Spd	Time	Temp	RH	Cld	Dirn	Spd	MSLP	Temp	RH	Cld	Dirn	Spd	MSLP
		°C	°C	mm	mm	hours		km/h	local	°C	%	eighths		km/h	hPa	°C	%	eighths		km/h	hPa
1	Th	2.7	21.6	0			S	33	13:10	12.9	57		WSW	15	1029.6	21.1	31		S	13	1024.8
2	Fr	3.3	22.6	0			SSW	28	12:13	13.5	61		WSW	17	1028.0	21.6	33		SE	9	1023.5
3	Sa	5.5	23.4	0			ESE	30	15:22	13.8	66		W	13	1028.8	22.9	40	7	SW	7	1024.8
4	Su	6.5	23.5	0			ENE	24	14:36	13.9	73		SW	9	1028.8	21.5	47	5	E	19	1024.9
5	Mo	9.9	23.0	0			NE	28	13:34	13.1	82			Calm	1026.4	21.3	51	8	NNE	17	1022.7
6	Tu	11.9	23.1	1.8			WNW	35	12:06	15.8	87	8	W	9	1023.0	22.4	52	1	W	20	1019.2
7	We	10.0	23.3	0			E	35	16:19	16.3	70		WSW	17	1025.4	20.6	57	5	E	20	1022.7
8	Th	7.3	21.7	0			ESE	35	14:14	14.0	82	8	S	9	1028.0	20.9	56	7	ESE	20	1024.4
9	Fr	9.5	22.7	0.4			ESE	30	14:39	15.5	74	8	WSW	6	1027.0	21.8	51	8	ESE	20	1023.5
10	Sa	6.4	24.7	0			ESE	33	12:23	17.0	76		SSW	11	1026.3	21.6	56	8	E	19	1023.8
11	Su	10.8	24.6	0			SSE	37	12:28	18.8	63		SSW	17	1026.5	22.4	58	5	SSE	26	1023.6
12	Mo	15.2	21.6	4.8			ENE	52	12:34	18.1	92	6	SW	7	1025.9	19.2	92	8	E	11	1023.9
13	Tu	17.3	21.1	31.0			E	41	11:33	18.6	90	7	ESE	17	1025.4	19.8	80	8	E	22	1021.7
14	We	17.2	20.0	19.8			ENE	31	01:39	18.0	94	8	NE	13	1019.4	19.8	85	8	NE	20	1016.1
15	Th	17.3	24.9	6.8			SE	24	16:05	19.2	95	8	S	15	1016.7	22.8	80	8	E	9	1012.6
16	Fr	18.5	27.5	0.4			W	28	13:04	21.4	79	2	W	17	1014.5	25.9	47	8	W	17	1010.5
17	Sa	11.2	30.5	0			W	65	14:15	18.3	83			Calm	1013.0	28.6	26		W	44	1007.0
18	Su	8.6	25.3	0			WNW	43	11:35	18.2	48		W	17	1015.7	24.8	25		WNW	19	1012.5
19	Mo	8.4	24.2	0			SE	31	14:29	17.5	64		S	17	1023.1	21.5	57	3	E	20	1021.2
20	Tu	11.5	23.9	0.4			NE	28	14:36	16.1	91		SSW	11	1026.7	22.7	61		NE	20	1022.5
21	We	12.5	26.0	0			NNE	35	15:43	15.8	98		SSE	6	1024.3	24.0	61		NE	22	1019.6
22	Th	13.1	27.9	0.2			ENE	33	14:37	14.5	98			Calm	1021.5	25.6	56		NNE	20	1017.8
23	Fr	15.0	26.1	0			ESE	46	13:26	22.5	66		E	9	1023.5	24.1	49	5	ESE	28	1022.0
24	Sa	10.6	26.5	0			NE	24	15:27	18.4	75		SW	9	1024.4	25.8	44		NNE	9	1020.3
25	Su	12.2	29.3	0			W	46	09:34	19.5	77		WSW	7	1020.1	27.6	54		NNE	19	1016.3
26	Mo	15.4	29.8	0			ENE	30	15:09	20.4	84	1	W	6	1019.2	28.6	54	7	NNE	20	1014.9
27	Tu	15.6	29.4	0			NE	30	15:26	23.1	82	7	ENE	11	1022.5	27.7	58	2	N	13	1018.0
28	We	17.7	31.5	0			NNE	37	16:16	22.2	72		WNW	7	1020.7	28.8	53		NNE	24	1013.7
29	Th	15.0	34.0	0			WSW	43	15:07	25.0	59		WSW	2	1015.8	33.4	15		W	22	1010.5
30	Fr	11.3	31.7	0			N	33	15:37	20.8	56		SW	7	1014.2	30.4	51		NNE	20	1008.0
31	Sa	14.0	36.3	0			WNW	46	13:18	27.3	48		NNW	6	1012.9	35.6	23		WNW	19	1009.2
Statistics for August 2024																					
	Mean	11.7	25.9							18.0	75	6		9	1022.5	24.3	51	6		18	1018.6
	Lowest	2.7	20.0							12.9	48	1		Calm	1012.9	19.2	15	1	SW	7	1007.0
	Highest	18.5	36.3	31.0			W	65		27.3	98	8	#	17	1029.6	35.6	92	8	W	44	1024.9
	Total			65.6																	

Observations were drawn from Archerfield Airport {station 040211}

Some cloud observations are from automated equipment; these are somewhat different to those made by a human observer and may not appear every day.

IDCJDW4003.202408 Prepared at 16:01 UTC on 2 Oct 2024

Appendix D – Noise Measurement Results

Unattended Noise Measurements
174-188 Dowding Street

Noise Levels - 18hr Day (Traffic Noise)

Logger Location - Southwest of the Subject Site

ARL Environmental Noise Logger	
Logger Serial Number	87811C
Measurement Title	20240729_164227
Measurement started at	29/07 17:15
Measurement stopped at	05/08 08:15
Frequency Weighting	A
Time Averaging	Fast
Statistical Interval	15 min
Pre-measurement Ref.	94.0
Post-measurement Ref.	93.9
Engineering Units	dB SPL

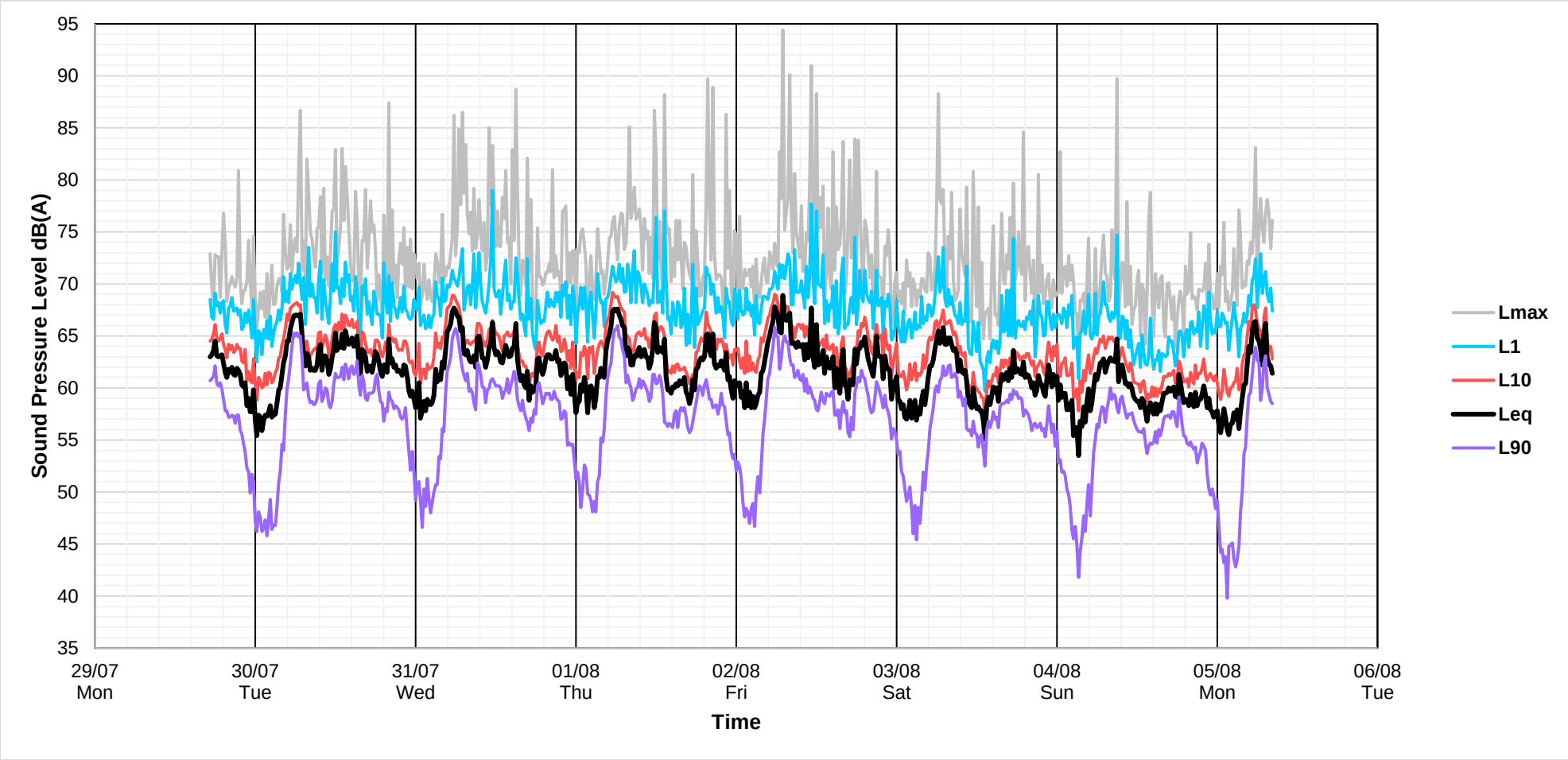
		$L_{A10,T}$			$L_{Aeq,T}$		$L_{A90,T}$	
Date	**Day**	**18hr day 6am-12am**	**1hr max 6am-12am**	**Time for 1hr max**	**18hr day 6am-12am**	**8hr night 10pm-6am**	**18hr day 6am-12am**	**8hr night 10pm-6am**
29/07/2024	Monday	—	—	—	—	59.7	—	51.9
30/07/2024	Tuesday	64.7	68.1	0.3	62.9	61.0	59.6	54.1
31/07/2024	Wednesday	64.4	67.8	0.3	62.7	61.2	59.3	54.3
1/08/2024	Thursday	64.2	68.4	0.3	62.5	61.1	59.0	54.0
2/08/2024	Friday	64.7	68.0	0.3	63.1	59.7	59.6	53.0
3/08/2024	Saturday	62.6	66.6	0.3	61.0	58.8	57.8	51.0
4/08/2024	Sunday	61.6	64.6	0.3	59.7	59.0	55.9	50.0
Average		**63.7**	**67.2**		**62.0**	**60.1**	**58.5**	**52.6**
Average (weekdays only)		**64.5**	**68.0**		**62.8**	**60.5**	**59.4**	**53.5**

Note

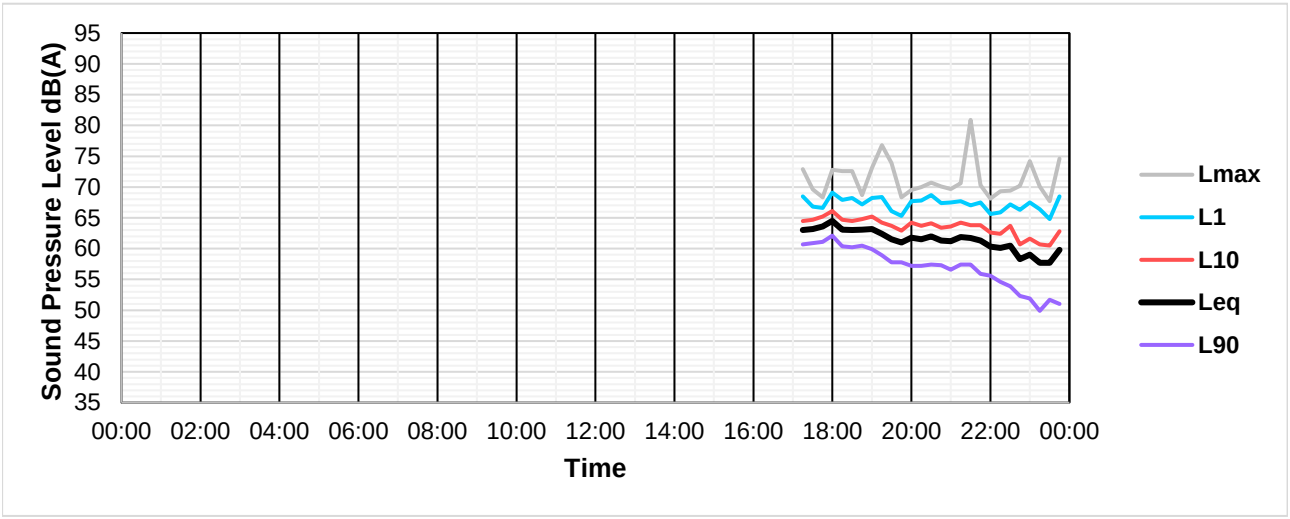
— No noise data available

Rainfall recorded on this day

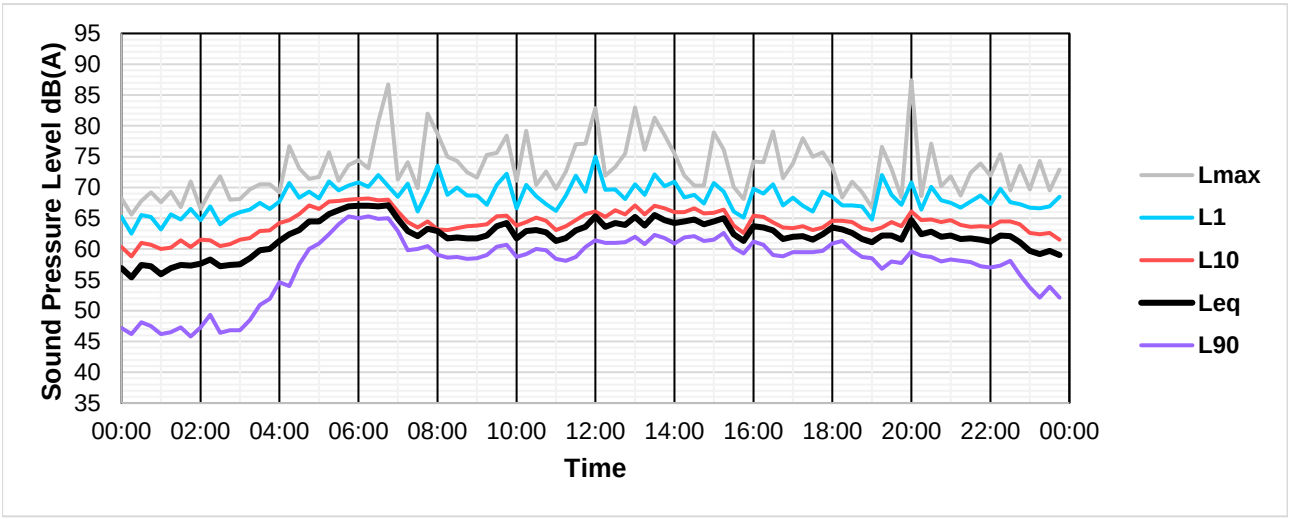
Unattended Noise Measurements
29 July to 5 August 2024



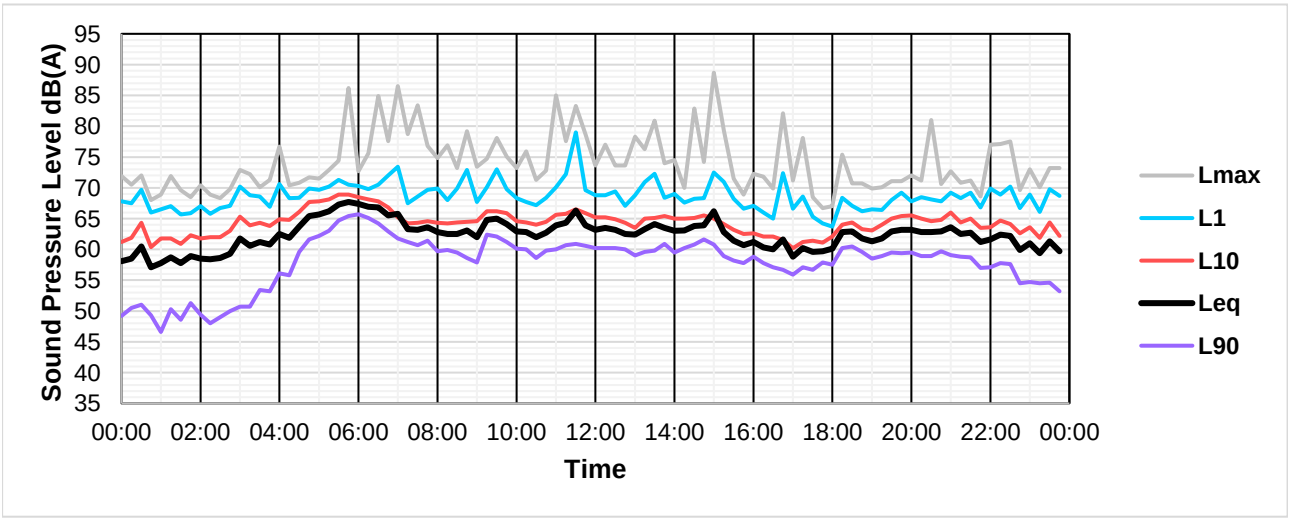
Unattended Noise Measurements
Monday 29 July 2024



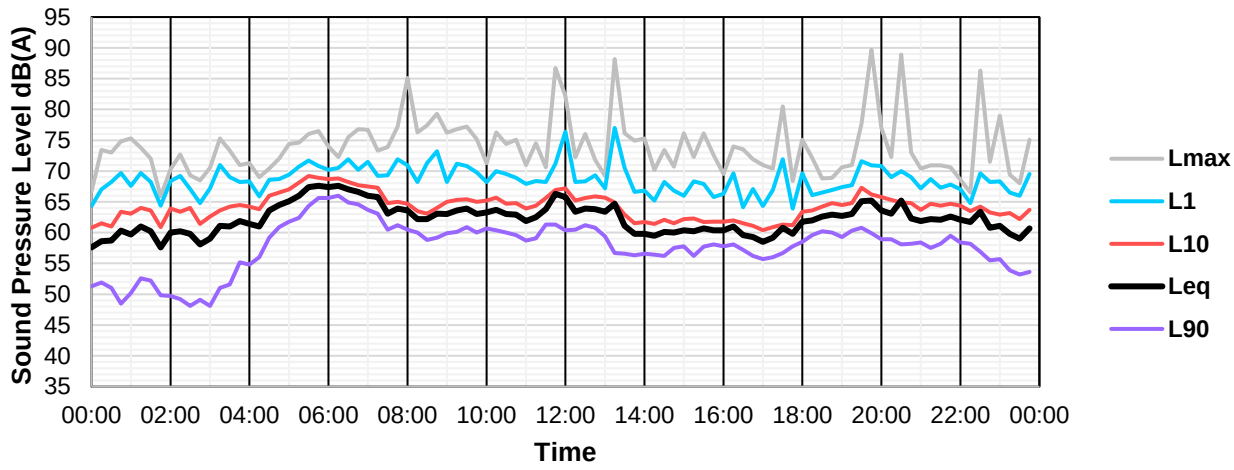
Unattended Noise Measurements
Tuesday 30 July 2024



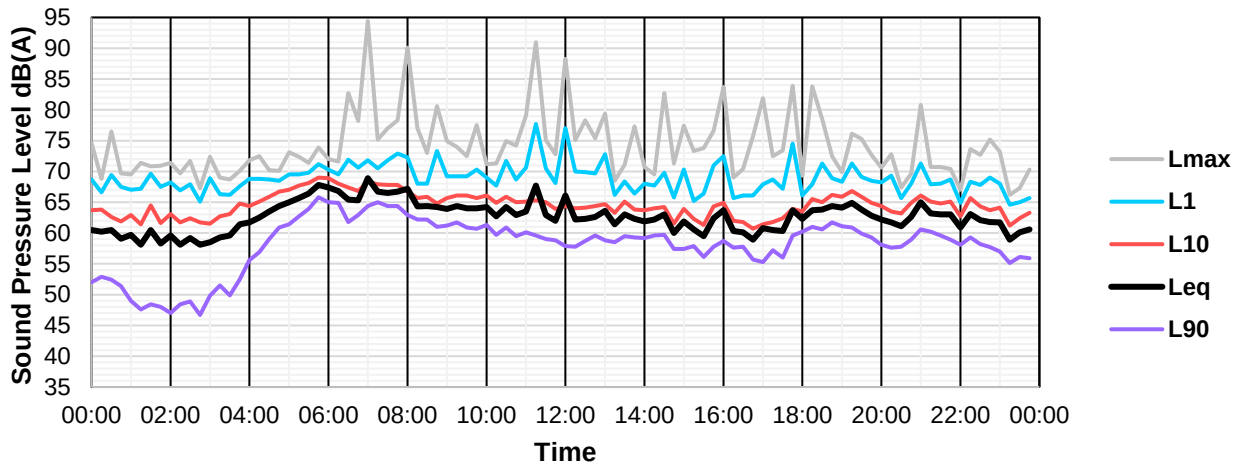
Unattended Noise Measurements
Wednesday 31 July 2024



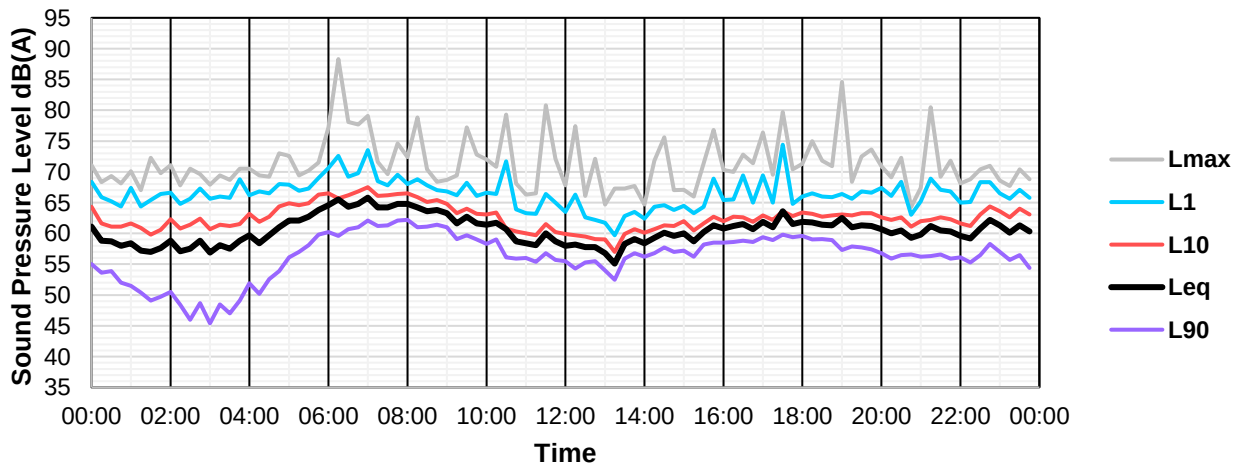
Unattended Noise Measurements
Thursday 1 August 2024



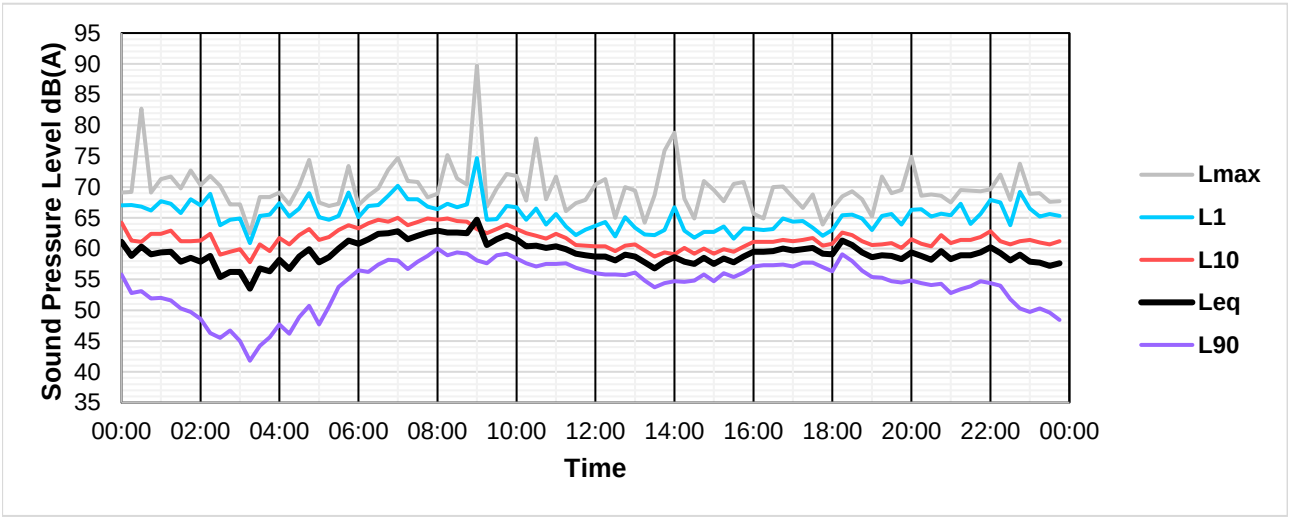
Unattended Noise Measurements
Friday 2 August 2024



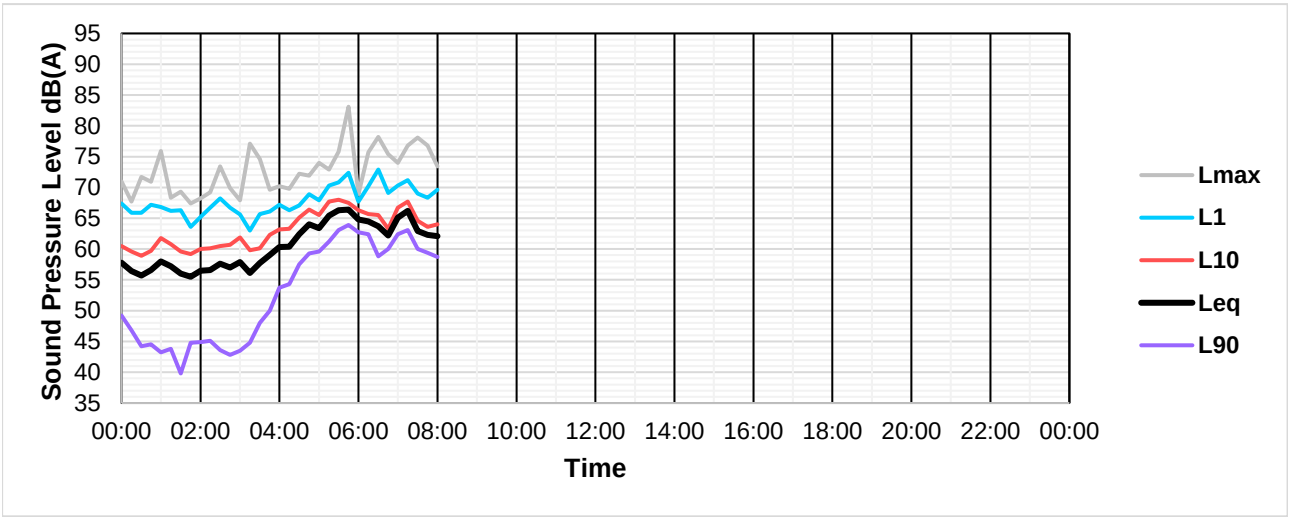
Unattended Noise Measurements
Saturday 3 August 2024



Unattended Noise Measurements
Sunday 4 August 2024



Unattended Noise Measurements
Monday 5 August 2024



Appendix E – RTNA Validation (Year 2024 & 2025)

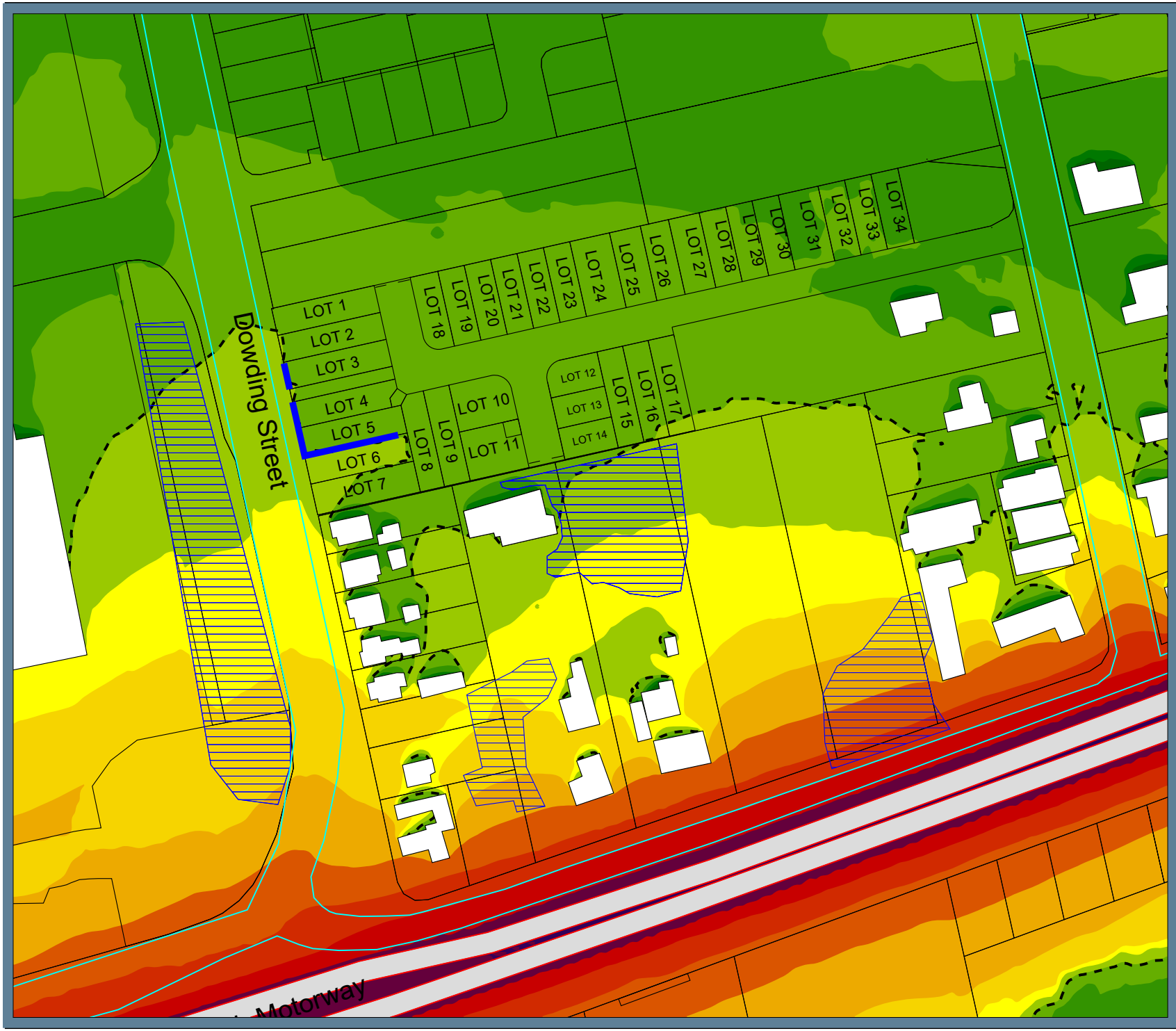
174, 184, 188 Dowding and 81 Portal Street, Oxley
Road Traffic Noise Validation Model
Year 2024

Receiver Name	L10(18h) dB(A)
Noise Logger	65.6

174, 184, 188 Dowding and 81 Portal Street, Oxley
Road Traffic Noise Validation Model
Year 2025

Receiver Name	L10(1h) dB(A)
Sound Level Meter (East)	65.1
Sound Level Meter (West)	65.7

Appendix F – RTNA Noise Contour Maps (Year 2037)



NOISE & VIBRATION SPECIALISTS

ATP240726

Proposed Development
174, 184, 188 Dowding Street and 81 Portal Street, Oxley

Traffic Noise Modelling
Year 2037

Private Open Space
Ground Floor
(1.5m AGL)

Traffic noise level
Free-field
Adjusted for Queensland Conditions[1]
$L_{10(18hr)}$ dB(A)

	<= 51
51 <	<= 54
54 <	<= 57
57 <	<= 60
60 <	<= 63
63 <	<= 66
66 <	<= 69
69 <	<= 72
72 <	<= 75
75 <	<= 78
78 <	<= 81
81 <	<= 84
84 <	

Legend

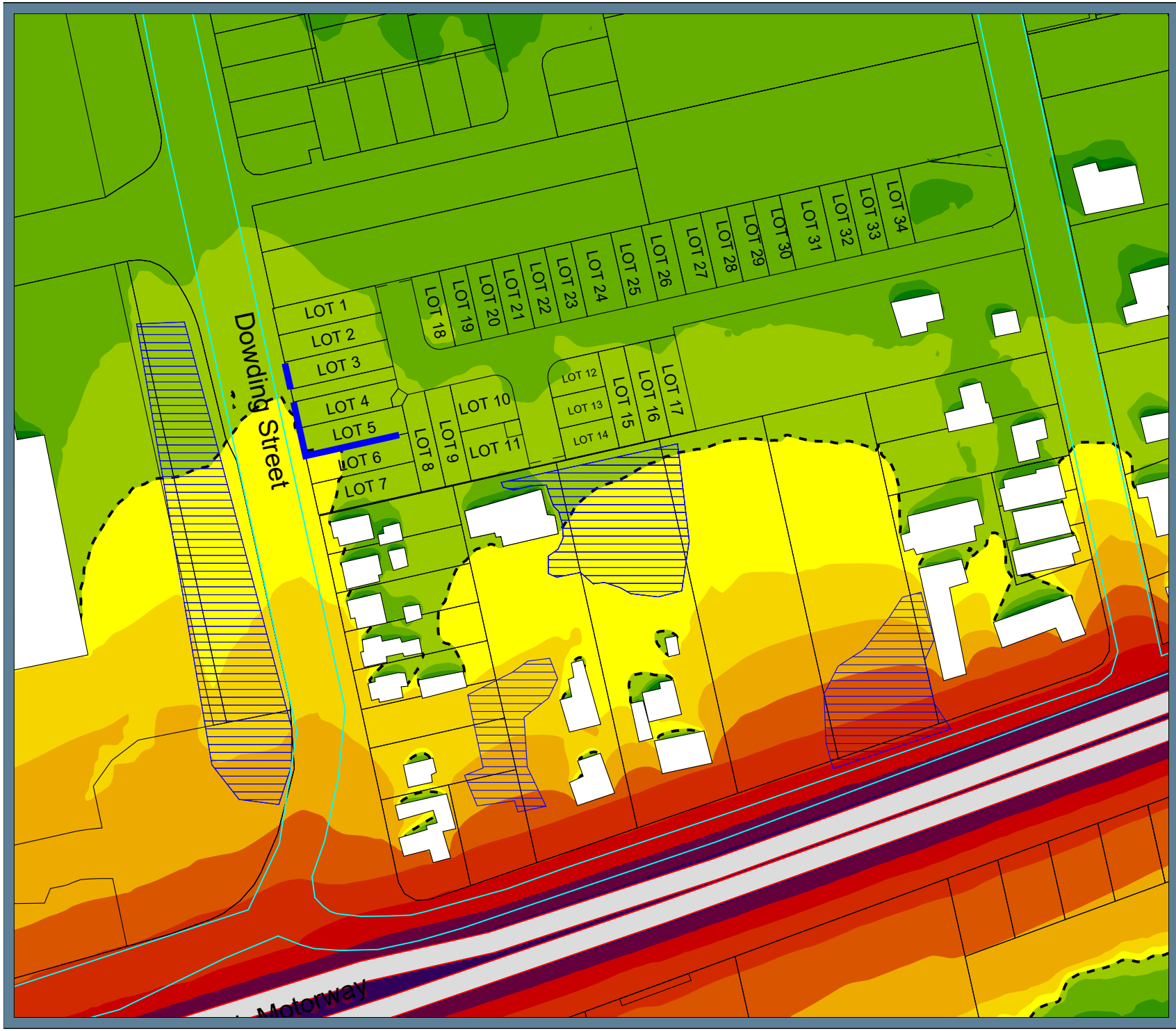
- Road
- Road surface
- Noise barrier fence
- Limit line - 60dB
- Line
- Surrounding buildings
- Foliage

SCALE @ A4 1:2000

0 5 10 20 30 40 50 60 m

Grid Spacing: 2m
Project Engineer: Mark Chang
Created: 17/06/2026
Processed with SoundPLAN 9.1

[1] As per procedure of TMR Code of Practice Volume 1



ATP NOISE & VIBRATION SPECIALISTS

ATP240726

Proposed Development
174, 184, 188 Dowding Street and 81 Portal Street, Oxley

Traffic Noise Modelling
Year 2037

External Facades
Ground Floor
(1.8m AGL)

Traffic noise level
Facade-adjusted
Adjusted for Queensland Conditions[1]
$L_{10(18hr)}$ dB(A)

	<= 51
51 <	<= 54
54 <	<= 57
57 <	<= 60
60 <	<= 63
63 <	<= 66
66 <	<= 69
69 <	<= 72
72 <	<= 75
75 <	<= 78
78 <	<= 81
81 <	<= 84
84 <	

Legend

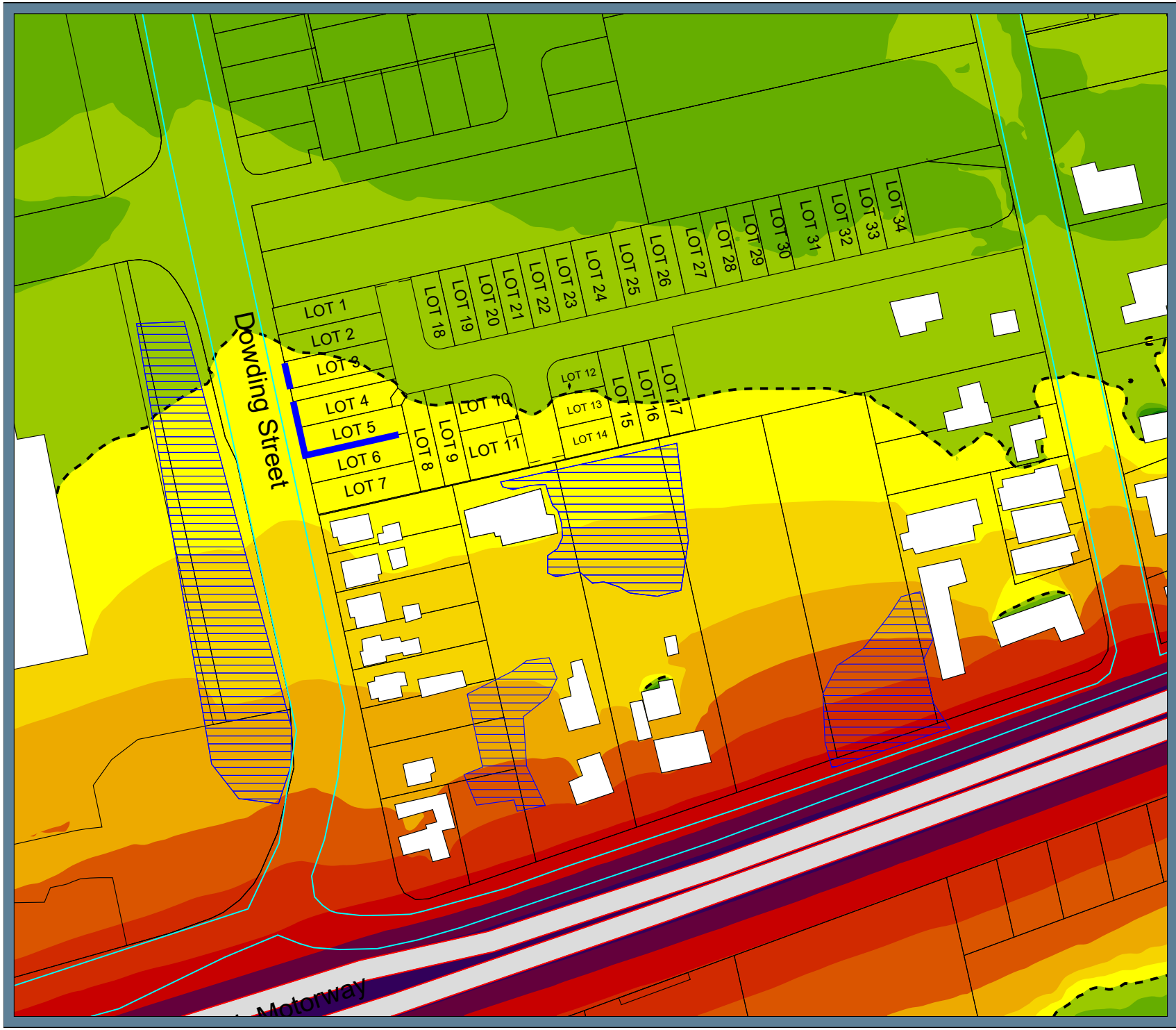
- Road
- Road surface
- Noise barrier fence
- Limit line - 63dB
- Line
- Surrounding buildings
- Foliage

SCALE @ A4 1:2000

0 5 10 20 30 40 50 60 m

Grid Spacing: 2m
Project Engineer: Mark Chang
Created: 17/06/2026
Processed with SoundPLAN 9.1

[1] As per procedure of TMR Code of Practice Volume 1



ATP240726

Proposed Development
174, 184, 188 Dowding Street and 81 Portal Street, Oxley

Traffic Noise Modelling
Year 2037

External Facades
First Floor
(4.6m AGL)

Traffic noise level
Facade-adjusted
Adjusted for Queensland Conditions[1]
$L_{10(18hr)}$ dB(A)

	<= 51
51 <	<= 54
54 <	<= 57
57 <	<= 60
60 <	<= 63
63 <	<= 66
66 <	<= 69
69 <	<= 72
72 <	<= 75
75 <	<= 78
78 <	<= 81
81 <	<= 84
84 <	

Legend

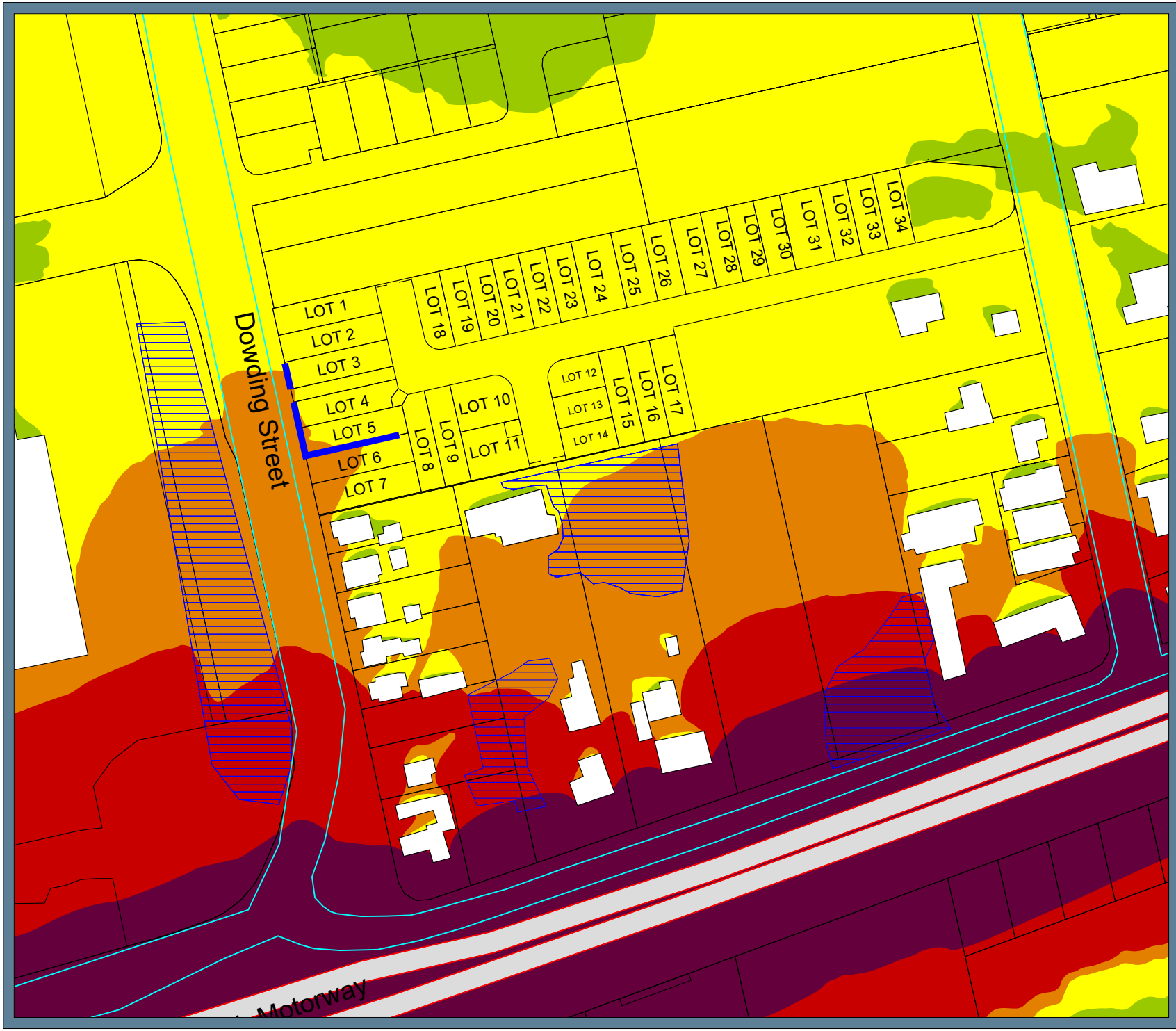
- Road
- Road surface
- Noise barrier fence
- Limit line - 63dB
- Line
- Surrounding buildings
- Foliage

SCALE @ A4 1:2000

0 5 10 20 30 40 50 60 m

Grid Spacing: 2m
Project Engineer: Mark Chang
Created: 17/06/2026
Processed with SoundPLAN 9.1

[1] As per procedure of TMR Code of Practice Volume 1



ATP NOISE & VIBRATION SPECIALISTS

ATP240726

Proposed Development
174, 184, 188 Dowding Street and 81 Portal Street, Oxley

Traffic Noise Modelling
Year 2037

External Facades
Ground Floor
(1.8m AGL)

QDC MP4.4 Noise Category
Facade adjusted
Adjusted for Queensland Conditions[1]

- Category 0
- Category 1
- Category 2
- Category 3
- Category 4

Legend

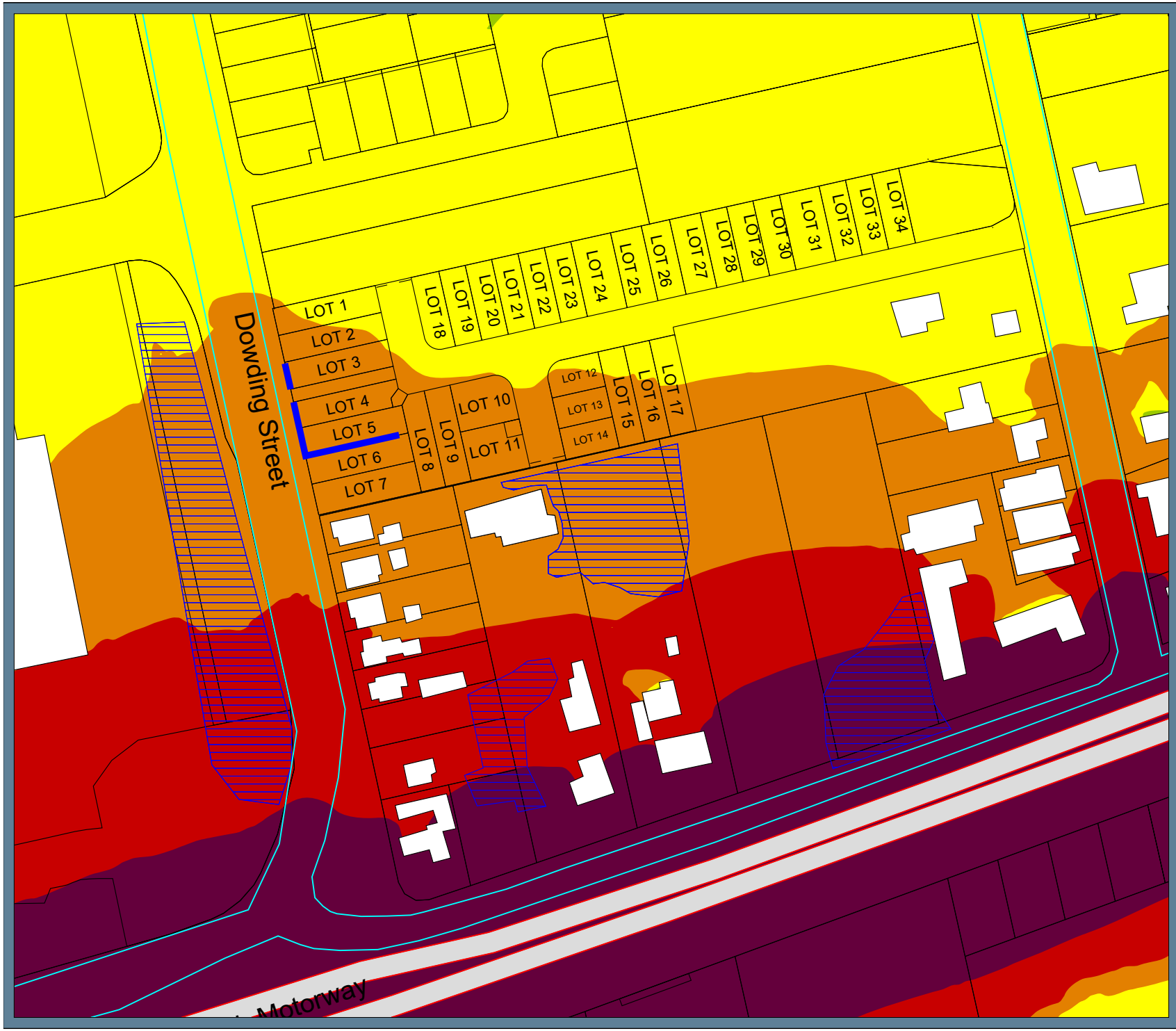
- Road
- Road surface
- Noise barrier fence
- Line
- Surrounding buildings
- Foliage

SCALE @ A4 1:2000

0 5 10 20 30 40 50 60 m

Grid Spacing: 2m
Project Engineer: Mark Chang
Created: 17/06/2026
Processed with SoundPLAN 9.1

[1] As per procedure of TMR Code of Practice Volume 1



NOISE & VIBRATION SPECIALISTS

ATP240726

Proposed Development
174, 184, 188 Dowding Street and 81 Portal Street, Oxley

Traffic Noise Modelling
Year 2037

External Facades
First Floor
(4.6m AGL)

QDC MP4.4 Noise Category
Facade adjusted
Adjusted for Queensland Conditions[1]

- Category 0
- Category 1
- Category 2
- Category 3
- Category 4

Legend

- Road
- Road surface
- Noise barrier fence
- Line
- Surrounding buildings
- Foliage

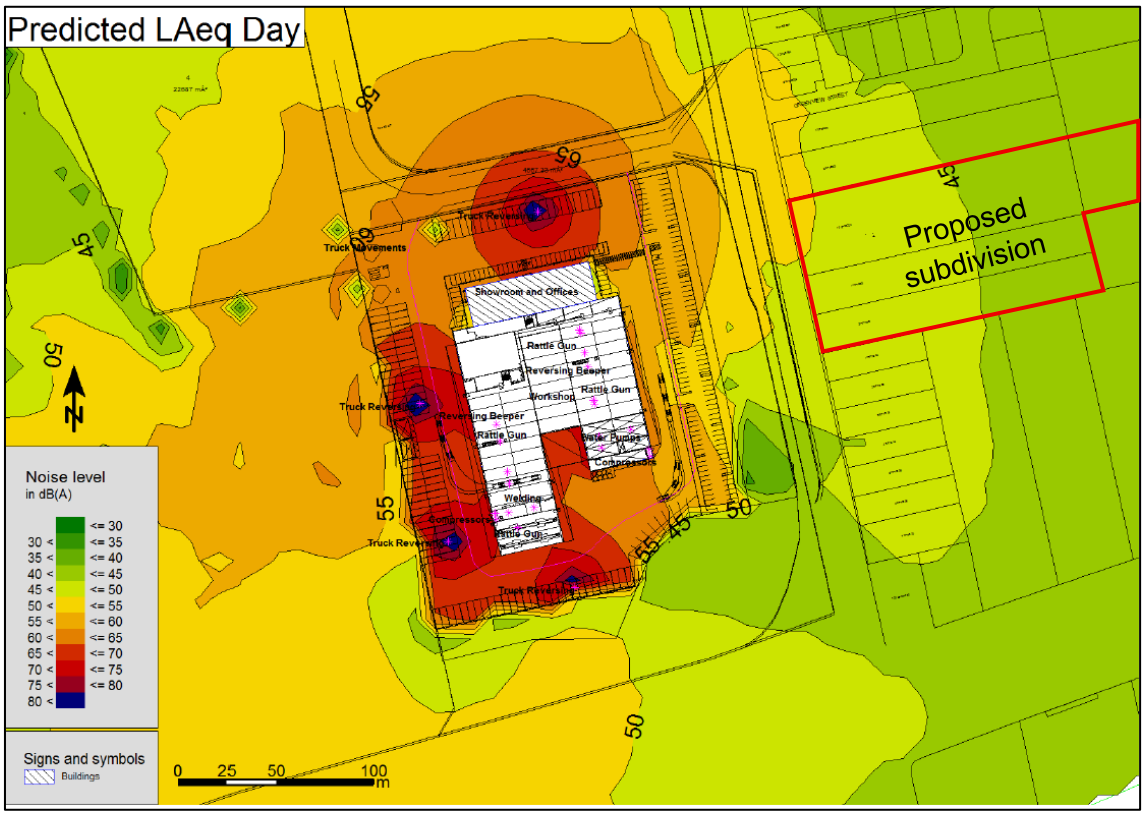
SCALE @ A4 1:2000

0 5 10 20 30 40 50 60 m

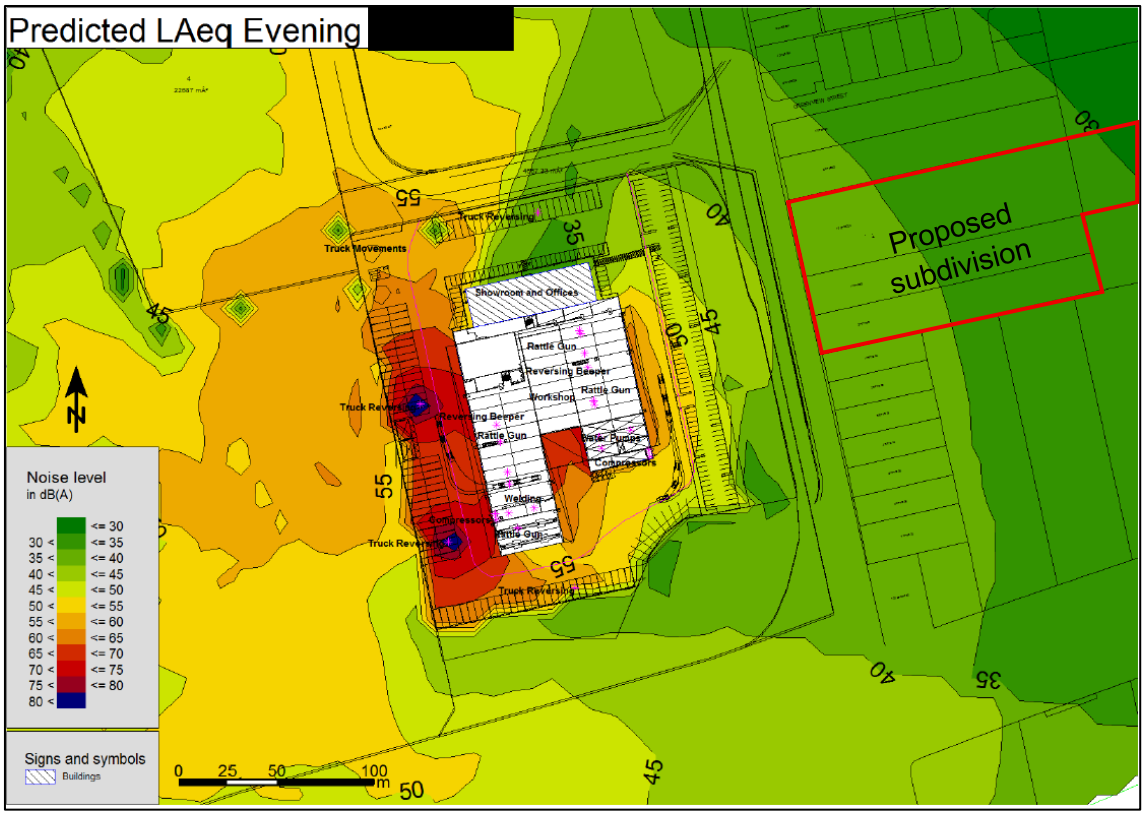
Grid Spacing: 2m
Project Engineer: Mark Chang
Created: 17/06/2026
Processed with SoundPLAN 9.1

[1] As per procedure of TMR Code of Practice Volume 1

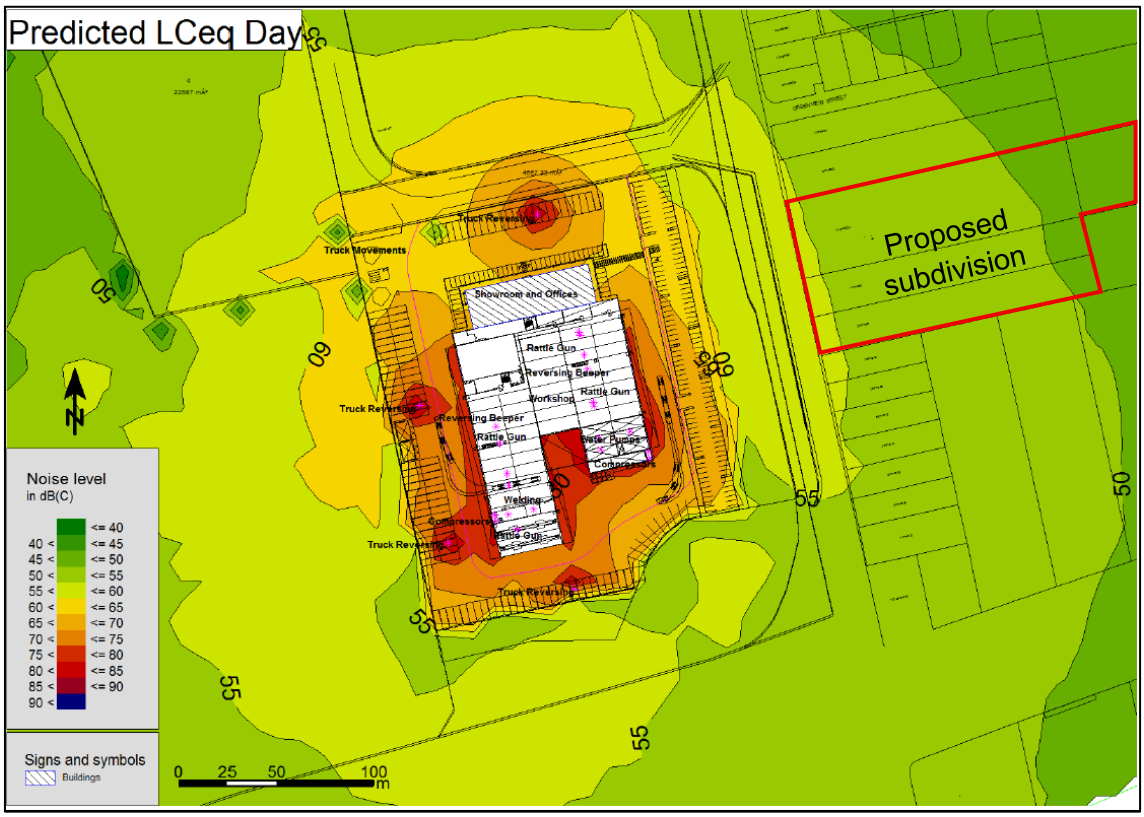
Appendix G – Excerpts of Operational Noise Contour Maps



Excerpt 1: Predicted L_{Aeq} – Day



Excerpt 2: Predicted L_{Aeq} – Evening



Excerpt 3: Predicted L_{Ceq} – Day

Excerpt 4: Predicted L_{Ceq} – Evening