Noise Impact Assessment

Proposed Townhouse Development
1 Clarke Street, Southport

Azure Project 47 Pty Ltd

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Prepared by:	Bojan Todorovski
Position:	Senior Engineer - Acoustics
Signed:	
Date:	5 December 2025

Approved by:	Sasho Temelkoski RPEQ 13551
Position:	Manager - Acoustics
Signed:	
Date:	5 December 2025

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atf ATP Engineering Trust
ABN: 95 634 079 845

Gold Coast
34 Lakefront Crescent
Varsity Lakes, QLD 4227
Ph: (07) 5593 0487

Brisbane
Unit 34, 30 Anstey Street
Albion, QLD 4010
Ph: (07) 3256 1747

Melbourne
Brunswick East
VIC 3057
Ph: 0403 964 150

E-mail: admin@atpconsulting.com.au
Internet: www.atpconsulting.com.au

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Acoustics Glossary

A-weighting	Correction to sound levels to mimic the response of the human ear at low sound frequencies.
AADT	Annual average daily traffic. The total traffic flow over a 24-hour period along a specific segment of road.
Broadband sound	Sound distributed across the whole audible frequency range.
Decibel (dB)	(1) Degree of loudness (2) A unit for expressing the relative intensity of sounds on a scale from zero for the average least perceptible sound to about 130 for the average pain level. A unit used to express relative difference in power or intensity, between two acoustic signals, equal to ten times the common logarithm of the ratio of the two levels, one of which is a standard reference value.
dB(A)	The A-weighted sound pressure level.
Façade adjusted	The noise level at 1m from a building façade is calculated by adding 2.5dB to the free-field noise level to account for sound reflected from the building façade. The external noise levels at the building façades are "façade-adjusted".
Free-field	Noise level without any reflected sound from buildings or other hard, reflective surfaces (except for the ground plane).
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.
$L_{Amax,T}$	The maximum A-weighted sound pressure level occurring in a specified time period T in seconds.
$L_{Aeq,T}$	"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. Used as a traffic noise descriptor in Queensland.
$L_{A90,T}$	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.
$L_{A10,18hr}$	The arithmetic average of the 18 individual $L_{A10,1hr}$ values between 6:00am and 12:00am (midnight). It is a derived descriptor which is used as a main traffic noise descriptor in the Calculation of Road Traffic Noise (CoRTN) procedure developed by the UK Department of Environment, Welsh Office, HMSO, 1988
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, measured in Watts (W).
Sound Power Level, L_w (SWL)	Logarithmic measure of sound power on a decibel scale, referenced to the human hearing threshold of 1×10^{-12} W.
Sound pressure	The fluctuations in air, measured in Pascals (Pa).
Sound Pressure Level, L_p (SPL)	Logarithmic measure of sound pressure on a decibel scale, referenced to the human hearing threshold of 2×10^{-5} Pa.
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 to prepare a noise impact assessment report in support of the development approval (DA) application for the proposed townhouse development at 1 Clarke Street in Southport.

The proposed townhouse development is part of the EDQ Parklands Priority Development Area (PDA) within City of Gold Coast Council. As such, the development application will be assessed and decided under the Economic Development Act 2012 (ED Act).

This report presents the road traffic noise impact assessment considering the traffic noise from the Smith Street within a 10-year planning horizon (2036).

The purpose of this report is to provide detailed information regarding the acoustic design principles and the extent of noise control measures that will be required for the design and construction of the proposed development.

This report has been prepared based on the information provided by EDQ and other relevant authorities during the pre-lodgement meetings held prior to the preparation of the Development Application.

1.2 Study Objectives

Study objectives are as follows:

- Site visit and establishment of an automated noise logger at the subject site to determine the traffic noise levels for validation of the SoundPLAN traffic noise propagation model;
- Development of a three-dimensional traffic noise propagation model using SoundPLAN software with consideration of the proposed development layout (site location and elevations of the proposed development) and current and future (10-year planning horizon to 2036) traffic flows along Smith Street which is a state-controlled transport noise corridor;
- Calculation of the traffic noise levels ($L_{10,18hr}$) at the façades and private open spaces of the proposed townhouse development within a 10-year planning horizon and recommendations of traffic noise mitigation measures;
- Identification of the QDCMP4.4 Noise Categories as applicable to the proposed residential units to inform the acoustic design requirements to prevent road traffic noise intrusion in the units; and
- Recommendation of noise mitigation measures to prevent road traffic noise impact from the state-controlled transport noise corridor of Smith Street on the private and communal open spaces of the proposed development.

1.3 Subject Site

The proposed development is located at 1 Clarke Street in Southport, on the land described as Lot 7 on SP275512, within the CoGC local government area. The site has a total area of 17,330 m2 and is adjacent to the state-controlled transport noise corridor of Smith Street.

The location of the proposed development site is presented in Figure 1.1.

Figure 1.1 Site Location

1.4 Proposed Development

The proposed development comprises of a 114-townhouse community that will include a mix of the variety in product such as 1 and 2 bedrooms options in the Goshawks, entry level 3 bedrooms in Masons and elevated 3 bedrooms in the Portavillas and Embers. The following product mix is proposed:

- Goshawk 1B – 20 units;
- Goshawk 2B – 20 units;

- Mason – 41 units;
- Portavilla – 23 units; and
- Ember – 10 units;

The development will also comprise a shared central amenities (communal area) with facilities such as a manager's office, lounge area, swimming pool and other.

Figure 1.1 shows the product distribution across the project site.

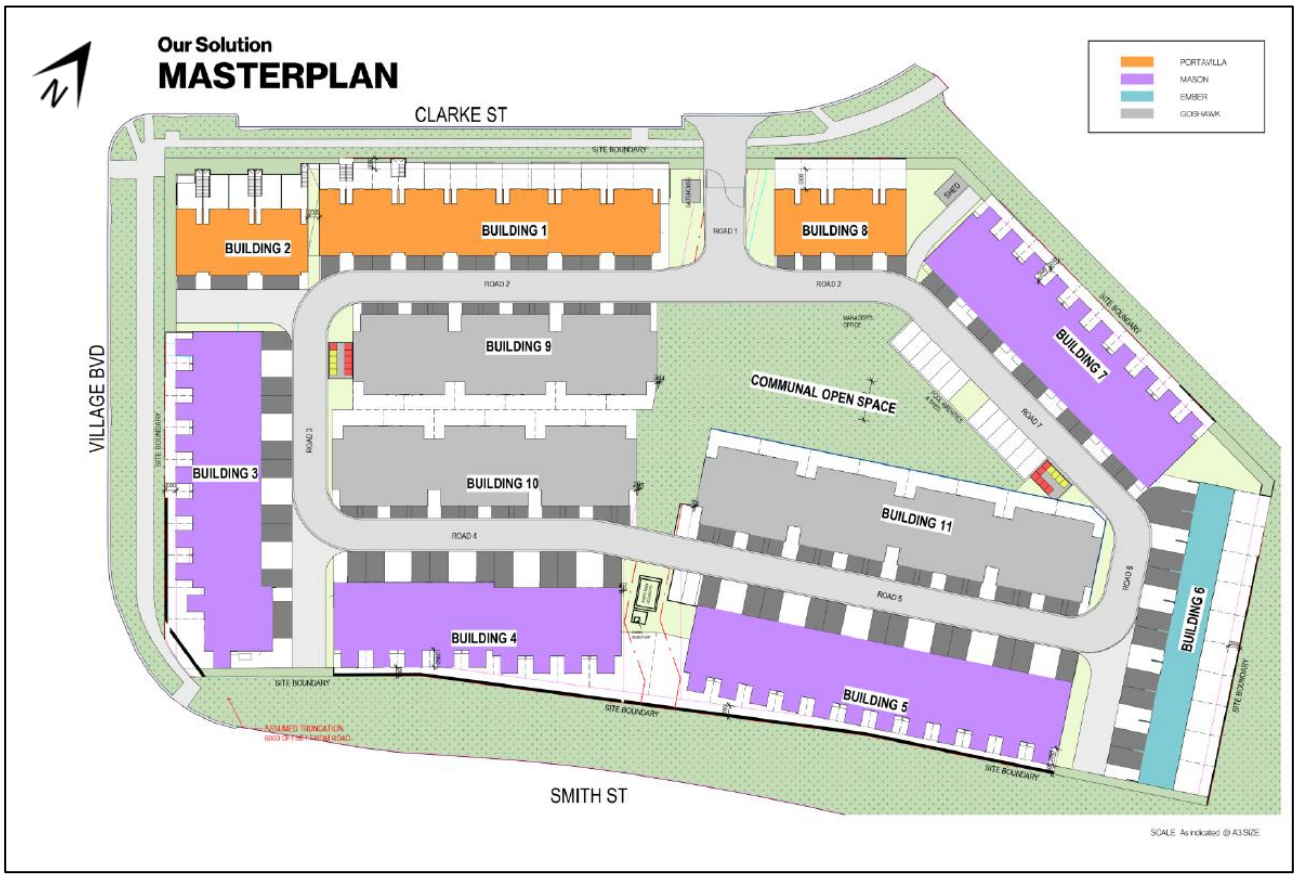


Figure 1.2 Townhouse types and distribution

The site, floor plans and elevations of the proposed concept plan are presented in Appendix A.

2. Existing Noise Amenity

2.1 Noise Measurement Locations

Noise measurements were carried out to obtain information about the existing traffic and general background noise levels at the proposed development site.

The noise measurement methodology is summarised in Table 2.1.

Table 2.1 Noise Measurements Methodology

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);* and • Australian Standard AS2702-1984 *(Acoustics – Methods for the measurement of road traffic noise).*
Measurement Locations	Traffic and background noise measurements were carried out at the proposed development site, as presented in Figure 2.1. The coordinates of the measurement location are as follows: • Road Traffic Noise Logger: 27°57'44.0"S 153°23'23.4"E; Photos showing the traffic noise measurement locations are presented in Appendix B.
Measurement Periods	Continuous unattended noise measurements were carried out 24 hours a day from 6 to 16 June 2024.
Measurement Equipment	The following sound measurement equipment was used: • Environmental noise logger – ARL EL (Serial No. #16-707-017); • Calibration – RION NC-74 Sound Level Calibrator (Serial No. #34615224). The noise measurement instruments conform to Australian Standard AS/NZSIEC61672.1-2019. 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 weather conditions during the monitoring period from 6 to 16 June 2024 were mostly fine, with no periods of inclement weather encountered. Full meteorological data[1] for the monitoring period are presented in Appendix C.
Analysis of Data	The noise measurement data was analysed to determine the following noise descriptors: • **$L_{10,18hr}$:** 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. • **$L_{A90,T}$**: Background noise level during daytime (7am to 6pm), evening (6pm to 10pm) and nighttime (10pm to 7am). • **RBL:** Rating Background Level during daytime (7am to 6pm), evening (6pm to 10pm) and night-time (10pm to 7am). The RBL was calculated from the $L_{A90,15min}$ noise levels using the procedure described in the NSW *Noise Policy for Industry*. The RBL noise levels are used to determine the Background Creep noise criteria as per Section 3 of this report.

The location of the unattended noise measurements is presented in Figure 2.1.

[1] Bureau of Meteorology (BoM) daily weather observations as recorded at the Gold Coast Seaway meteorological station (040764).

Figure 2.1 Noise Measurement Location

2.2 Unattended Noise Measurement Results

The results of the unattended noise measurements relevant for the traffic noise impact assessment carried out at 1 Clarke Street, Southport from 6 to 16 June 2024 are presented in Table 2.2.

Table 2.2 Traffic Noise Measurement Results

Date	Traffic noise levels		Background noise levels	
	$L_{10,18hr}$ (6:00am-12:00am)	$L_{10,1hr\ max}$ (6:00am-12:00am)	$L_{90,18hr}$ (6:00am-12:00am)	$L_{90,8hr}$ (10:00pm-6:00am)
6 June 2024 (Thu)	—	—	—	42.0
7 June 2024 (Fri)	62.8	68.2	51.0	43.3
8 June 2024 (Sat)	62.2	63.8	50.9	44.8
9 June 2024 (Sun)	61.6	63.7	50.1	43.5
10 June 2024 (Mon)	62.3	64.9	50.9	43.0

Date	Traffic noise levels		Background noise levels	
	$L_{10,18hr}$ (6:00am-12:00am)	$L_{10,1hr\ max}$ (6:00am-12:00am)	$L_{90,18hr}$ (6:00am-12:00am)	$L_{90,8hr}$ (10:00pm-6:00am)
11 June 2024 (Tue)	62.3	65.2	50.7	41.3
12 June 2024 (Wed)	61.7	65.0	50.2	42.0
13 June 2024 (Thu)	62.9	65.4	51.0	44.2
14 June 2024 (Fri)	62.7	65.3	50.9	43.4
15 June 2024 (Sat)	62.7	64.9	50.5	45.0
16 June 2024 (Sun)	61.4	63.9	49.2	41.9
Arithmetic average (weekdays only)	**62.4**	**65.7**	**50.8**	**42.8**

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

3. Road Traffic Noise Impact Assessment

3.1 Road Traffic Noise Criteria

The proposed development is located near the Smith Street which is a State-controlled Transport Noise Corridor under administration by Department of Transport and Main Roads (TMR). Traffic noise impact 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 are provided in the following documents:

- Department of State Development, Manufacturing, Infrastructure and Planning (DSDMIP), *State Development Assessment Provisions (SDAP) version 3.3 (18 July 2025), 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 SDAP are presented in Table 3.1.

Table 3.1 External Traffic Noise Criteria

Transport Infrastructure	Development Type	Location Within Development	Environmental Criteria
State-controlled Road	Accommodation activities[2]	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))

The relevant performance outcomes from the SDAP are presented in Table 3.2.

[2] 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.

Table 3.2 Performance and Acceptable Outcomes (SDAP State Code 1)

Performance outcome	Acceptable outcome
Material change of use (accommodation activity)	
Ground floor level requirements adjacent to a state-controlled road or type 1 multi-modal corridor	
PO39 Development minimises noise intrusion from a state-controlled road in private open space.	**AO39.1** Development provides a noise barrier or earth mound which is designed, sited, and constructed: 1. to achieve the maximum free field acoustic levels in reference table 2 (item 2.2) for private open space at the ground floor level; 2. 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** **AO39.2** Development achieves the maximum free field acoustic level in reference table 2 (item 2.2) for private open space by alternative noise attenuation measures where it is not practical to provide a noise barrier or earth mound.
PO40 Development (excluding a relevant residential building or relocated building) minimises noise intrusion from a state-controlled road in habitable rooms at the facade.	**AO40.1** Development (excluding a relevant residential building or relocated building) provides a noise barrier or earth mound which is designed, sited, and constructed: 1. to achieve the maximum building façade acoustic level in reference table 1 (item 1.1) for habitable rooms; 2. 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** **AO40.2** Development (excluding a relevant residential building or relocated building) achieves the maximum building façade acoustic level in reference table 1 (item 1.1) for habitable rooms by alternative noise attenuation measures where it is not practical to provide a noise barrier or earth mound.
PO41 Habitable rooms (excluding a relevant residential building or relocated building) are designed and constructed using materials to achieve the maximum internal acoustic level in reference table 3 (item 3.1).	No acceptable outcome is provided.

Performance outcome	Acceptable outcome
Above ground floor level requirements adjacent to a state-controlled road or type 1 multi-modal corridor	
PO42 Balconies, podiums, and roof decks include: 1. a continuous solid gap-free structure or balustrade (excluding gaps required for drainage purposes to comply with the Building Code of Australia); highly acoustically absorbent material treatment for the total area of the soffit above balconies, podiums, and roof decks.	**PO42** Balconies, podiums, and roof decks include: 2. a continuous solid gap-free structure or balustrade (excluding gaps required for drainage purposes to comply with the Building Code of Australia); highly acoustically absorbent material treatment for the total area of the soffit above balconies, podiums, and roof decks.

The background noise levels at night-time, in terms of the $L_{90,8hr}$ noise descriptor, are on average 42.8 dB(A), while the background noise levels during daytime, in terms of the $L_{90,18hr}$ noise descriptor, are on average 50.8 dB(A).

Therefore, the applicable traffic noise criteria are:

- Building façades (façade adjusted[3]): ≤63dB(A) $L_{10,18hr}$; and
- Private open spaces (free-field[4]): ≤60dB(A) $L_{10,18hr}$.

3.2 Queensland Development Code (QDC) MP4.4

In case of exceedance of the external traffic noise criteria, architectural treatment must be applied to the noise affected building façades to protect the internal noise amenity.

The architectural treatments are specified in *Mandatory Part 4.4 (Buildings in a Transport Noise Corridor)* of the *Queensland Development Code.* Depending on the calculated 10-year planning horizon road traffic noise, under the *MP4.4*, there are five road traffic noise categories and corresponding acceptable form of construction, as presented in Table 3.3.

Table 3.3 QDC 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.

[3] 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.
[4] "Free-field" refers to open space with no reflected noise.

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/ceilings.

3.3 Traffic Noise Calculation Methodology

The noise levels from the traffic on Smith Street, within a planning horizon of 10 years (year 2036), were calculated using SoundPLAN noise propagation modelling software.

SoundPLAN calculates traffic noise as per the procedure specified in the UK Department of Transport Welsh Office *Method of Calculation of Road Traffic Noise* (CoRTN'88). This is an accepted traffic noise calculation procedure applied widely in Australia.

The assumptions and data used in development of the traffic noise propagation model are presented in Table 3.4.

Table 3.4 Data and Assumptions – Traffic Noise Model

Terrain	• Elevation data for the development site and surroundings were obtained from Department of Natural Resources and Mines Airborne Laser Scanning (LiDAR) 1 metre elevation data. • Ground surface absorption factor of 0 was applied to all paved surfaces and 1 for all grassed areas. • The finished floor levels (RLs) for each level considered in the traffic noise propagation model, as per the development plans featured in Appendix A.
Buildings	• The proposed development was included in the model along with all neighbouring buildings. • Development plans are included in Appendix A.
Road Traffic	• The Smith Street was included in the modelling, with alignment determined based on aerial imagery. The length of the road considered in the traffic noise modelling spans 300m either side of the proposed development site. • Traffic volumes for Smith Street were sourced from the AADT Segment Reports for Smith Street north and south of the subject site (Road Section 101 – Smith Street Connection Road Segment from 0.480km to 3.74km (Segment Site 11400) – Traffic Year 2024), sourced from Traffic census for the Queensland state-declared road network . • The data for Segment Site 11400 located at between Second Avenue and Third Avenue is as follows: o 2024 AADT of 46,819 vehicles per day; o 4.5% heavy vehicles; and o 10-year annual growth rate indicates negative traffic growth. • The traffic growth rates are based on advice from TMR/SARA that where the annual traffic growth rate is less than 1%, 1% annual growth rate should be applied. • Speed limit along this section of the Smith Street is 80km/h. • Pavement surface type on Smith Street is dense graded asphalt, which is acoustically neutral (i.e., neither increases nor reduces the noise emissions). • The CoRTN procedure requires traffic volume data input for 18 hours. Traffic volume for 18-hour period (6:00am to midnight) was considered as 94% of the 24-hour AADT.

Receivers	• **Building** Façades**:** Receivers were attached to the façades of the proposed buildings. Receivers are placed at a height of 1.5m above each floor level. • SoundPLAN adds +2.5dB(A) to the calculated noise levels when the receivers are attached to the buildings, thus the tabulated traffic noise levels are façade adjusted. • **Private Open Spaces:** Receivers were placed at 1.5m above ground level within the private balconies and rooftop areas at a free-field location. • CoRTN Calibration Factors for Australian conditions were considered in this assessment, as per the procedure from the TMR Code of Practice Volume 1[5]: o Adjustment of -1.7 dB was applied to the calculated façade traffic noise levels; o Adjustment of -0.7 dB was applied to the calculated free-field traffic noise levels. • 1m grid spacing was used for calculation of noise contour maps.
Calculation Procedure	• CoRTN ’88.
Noise Mitigation Measures	• The noise mitigation measures are discussed in detail in Section 4 of this report.

3.4 Traffic Flow Data

Traffic flow data, as considered in the SoundPLAN model, is presented in Table 3.5.

Table 3.5 Traffic Flow Data

Road	Traffic Volumes		Heavy Vehicles (%)
	2024 AADT	2036 AADT (10-Year Planning Horizon)	
Smith Street	46,960	52,915	4.5%

Notes:

1. *AADT – Average Annual Daily Traffic.*
2. *Traffic data for Smith Street was obtained from the TMR AADT Segment Report for Road Section 101 – Smith Street Connection Road Segment from 0.480km to 3.74km (Segment Site 11400) – Traffic Year 2024. The traffic growth rates are based on advice from TMR/SARA that where the annual traffic growth rate is less than 1%, 1% annual growth rate should be applied.*

[5] 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 *Transport Noise Management Code of Practice, Volume 1: Road Traffic Noise*.

3.5 Road Traffic Noise Model Validation

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.

The results of the SoundPLAN model validation are presented in Table 3.6 and in Appendix E.

Table 3.6 SoundPLAN Validation Results

Measurement Location	Measured* $L_{10,18hr}$ dB(A)	Calculated* $L_{10,18hr}$ dB(A)	Difference dB
Adjacent to Smith Street	62.4	64.1	+1.7

**Free field*

The free-field calculated traffic noise level is overpredicting the measured traffic noise levels by 1.7dB(A). The SoundPLAN model, validated as per the results presented in Table 3.6 was used to calculate the road traffic noise levels within the 10-year planning horizon (year 2036) with no additional correction factor.

An excerpt from the 3D SoundPLAN traffic noise validation model (year 2025) and the 10-year planning horizon (year 2036) showing the alignment of the Smith Street passing the development site, is presented in Figures 3.1 and 3.2, respectively.

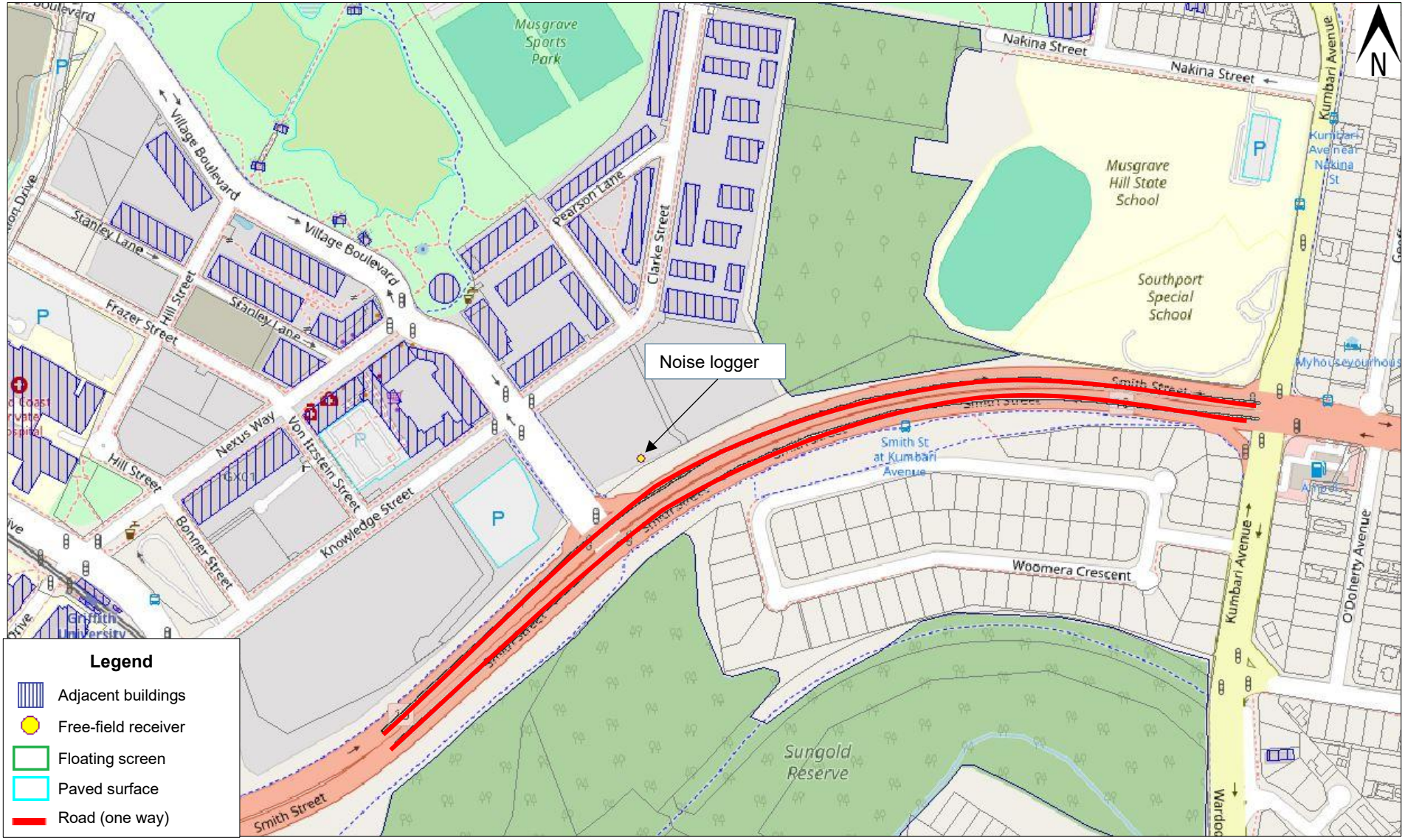


Figure 3.1 3D Traffic Noise Model – SoundPLAN Excerpt – Model Validation

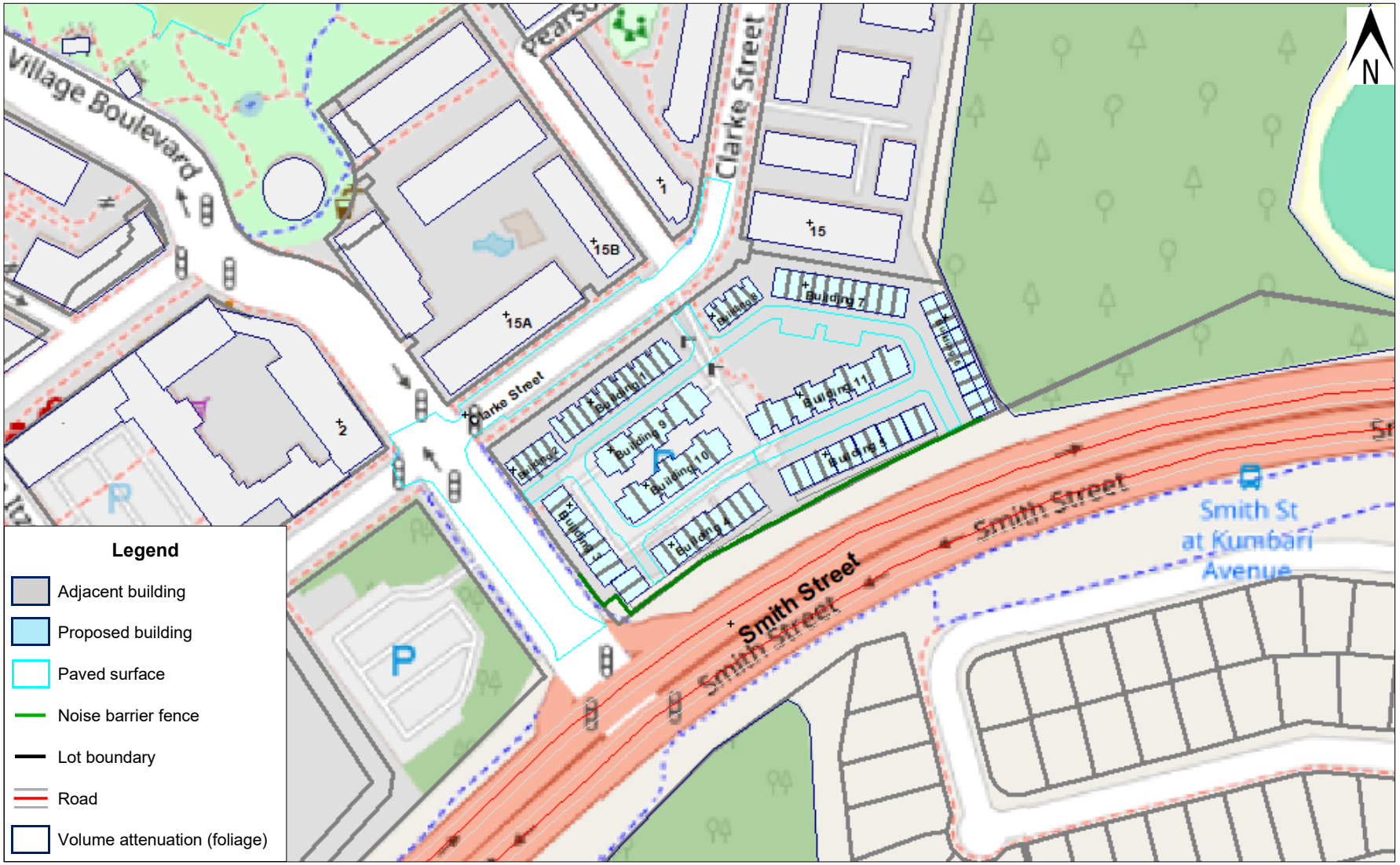


Figure 3.2 3D Traffic Noise Model – SoundPLAN Excerpt – Future Traffic Prediction (2036)

3.6 Traffic Noise Calculation Results

Based on the results of the road traffic noise modelling, the Masons-type townhouses (Buildings 4 and 5) along Smith Street are the most affected by road traffic noise. The predicted noise levels correspond to QDC MP4.4 Noise Category 1 at the ground floor levels, and Noise Category 3 at the upper floor levels of the future dwellings.

The applicable QDC MP4.4 Noise Categories for each proposed building blocks (Building 1 to 11) are summarised in Table 3.7 to Table 3.17 and the noise contours illustrating the propagation of traffic noise across the development site are provided in Appendix F.

Table 3.7 QDCMP4.4 Noise Categories – Buildings façades (Building 1)

Building Type & Location	Unit Number	Floor	Façade Orientation	Noise Category QDC MP4.4
Building 1	TH1 to TH13	Ground	N	Noise Category 0
			E	
			S	
			W	
	TH1 to TH13	Level 01	N	Noise Category 0
			E	
			S	
			W	
	TH1 to TH10	Level 02	N	Noise Category 0
			E	
			S	
			W	
	TH11 to TH13		N	Noise Category 0
			E	N/A
			S	Noise Category 1
			W	Noise Category 0

Table 3.8 QDCMP4.4 Noise Categories – Buildings façades (Building 2)

Building Type & Location	Unit Number	Floor	Façade Orientation	Noise Category QDC MP4.4
Building 2	TH14 to TH16	Ground	N	Noise Category 0
			E	Noise Category 0
			S	Noise Category 0
			W	N/A
	TH17 to TH18		N	Noise Category 0
			E	N/A
			S	Noise Category 1
			W	Noise Category 1

	TH14	Level 01	N	Noise Category 0
			E	
			S	
			W	
	TH15 to TH18		N	Noise Category 0
			E	N/A
			S	Noise Category 1
			W	Noise Category 1
	TH14 to TH18	Level 02	N	Noise Category 0
			E	Noise Category 1
			S	Noise Category 1
			W	Noise Category 1

Table 3.9 QDCMP4.4 Noise Categories – Buildings façades (Building 3)

Building Type & Location	Unit Number	Floor	Façade Orientation	Noise Category QDC MP4.4
Building 3	TH19 to TH26	Ground	N	Noise Category 0
			E	Noise Category 0
			S	Noise Category 1
			W	Noise Category 1
	TH27 to TH28		N	Noise Category 0
			E	Noise Category 1
			S	Noise Category 1
			W	Noise Category 1
	TH9 to TH20	Level 01	N	Noise Category 1
			E	Noise Category 0
			S	N/A
			W	Noise Category 1
	TH21 to TH23		N	N/A
			E	Noise Category 0
			S	N/A
			W	Noise Category 2
	TH24 toTH26		N	N/A
			E	Noise Category 1
			S	Noise Category 2
			W	Noise Category 2
	TH27 to TH28		N	Noise Category 1
			E	Noise Category 3
			S	Noise Category 3

			W	Noise Category 3
	TH19 to TH21	Level 02	N	Noise Category 1
			E	Noise Category 1
			S	N/A
			W	Noise Category 2
	TH22 to TH24		N	N/A
			E	Noise Category 1
			S	N/A
			W	Noise Category 2
	TH25		N	N/A
			E	Noise Category 2
			S	N/A
			W	Noise Category 2
	TH26 to TH28		N	N/A
			E	Noise Category 3
			S	Noise Category 3
			W	Noise Category 3

Table 3.10 QDCMP4.4 Noise Categories – Buildings façades (Building 4)

Building Type & Location	Unit Number	Floor	Façade Orientation	Noise Category QDC MP4.4
Building 4	TH29 to TH37	Ground	N	Noise Category 0
			E	Noise Category 1
			S	Noise Category 1
			W	Noise Category 1
	TH29 to TH37	Level 01	N	Noise Category 0
			E	Noise Category 3
			S	Noise Category 3
			W	Noise Category 3
		Level 02	N	Noise Category 0
			E	Noise Category 3
			S	Noise Category 3
			W	Noise Category 3

Table 3.11 QDCMP4.4 Noise Categories – Buildings façades (Building 5)

Building Type & Location	Unit Number	Floor	Façade Orientation	Noise Category QDC MP4.4
Building 5	TH38 to TH49	Ground	N	Noise Category 0
			E	Noise Category 1
			S	Noise Category 1

			W	Noise Category 1
	TH38 to TH49	Level 01	N	Noise Category 0
			E	Noise Category 3
			S	Noise Category 3
			W	Noise Category 3
		Level 02	N	Noise Category 2
			E	Noise Category 3
			S	Noise Category 3
			W	Noise Category 3

Table 3.12 QDCMP4.4 Noise Categories – Buildings façades (Building 6)

Building Type & Location	Unit Number	Floor	Façade Orientation	Noise Category QDC MP4.4
Building 6	TH59	Ground	N	N/A
			E	Noise Category 2
			S	Noise Category 3
			W	Noise Category 1
	TH51		N	N/A
			E	Noise Category 1
			S	N/A
			W	Noise Category 1
	TH52 to TH59		N	Noise Category 0
			E	Noise Category 0
			S	N/A
			W	Noise Category 0
	TH50	Level 01	N	N/A
			E	Noise Category 3
			S	Noise Category 3
			W	Noise Category 3
	TH51		N	N/A
			E	Noise Category 2
			S	N/A
			W	Noise Category 2
	TH52 to TH53		N	N/A
			E	Noise Category 1
			S	N/A
			W	Noise Category 1
	TH54 to TH56		N	N/A

			E	Noise Category 1
			S	N/A
			W	Noise Category 1
	TH57 to TH58		N	Noise Category 0
			E	Noise Category 0
			S	N/A
			W	Noise Category 0
	TH50 to TH51	Level 02	N	N/A
			E	Noise Category 3
			S	Noise Category 3
			W	Noise Category 3
	TH52 to TH53		N	N/A
			E	Noise Category 2
			S	N/A
			W	Noise Category 2
	TH54 to TH55		N	N/A
			E	Noise Category 2
			S	N/A
			W	Noise Category 1
	TH56 to TH57		N	N/A
			E	Noise Category 1
			S	N/A
			W	Noise Category 1
	TH58 to TH59		N	Noise Category 0
			E	Noise Category 1
			S	N/A
			W	Noise Category 1

Table 3.13 QDCMP4.4 Noise Categories – Buildings façades (Building 7)

Building Type & Location	Unit Number	Floor	Façade Orientation	Noise Category QDC MP4.4
Building 7	TH60 to TH69	Ground	N	Noise Category 0
			E	
			S	
			W	
		Level 01	N	
			E	
			S	
			W	
		Level 02	N	
			E	
			S	
			W	

Table 3.14 QDCMP4.4 Noise Categories – Buildings façades (Building 8)

Building Type & Location	Unit Number	Floor	Façade Orientation	Noise Category QDCMP4.4
Building 8	TH70 to TH74	Ground	N	Noise Category 0
			E	
			S	
			W	
		Level 01	N	
			E	
			S	
			W	
		Level 02	N	
			E	
			S	
			W	

Table 3.15 QDCMP4.4 Noise Categories – Buildings façades (Building 9)

Building Type & Location	Unit Number	Floor	Façade Orientation	Noise Category QDCMP4.4
Building 9	TH75 to TH86	Ground	N	Noise Category 0
			E	
			S	
			W	
	TH75 to TH86	Level 01	N	Noise Category 0
			E	
			S	
			W	
		Level 02	N	Noise Category 0
			E	Noise Category 0
			S	Noise Category 0
			W	Noise Category 1

Table 3.16 QDCMP4.4 Noise Categories – Buildings façades (Building 10)

Building Type & Location	Unit Number	Floor	Façade Orientation	Noise Category QDCMP4.4
Building 10	TH87 to TH98	Ground	N	Noise Category 0
			E	
			S	
			W	
	TH87 to TH88	Level 01	N	Noise Category 0
			E	N/A
			S	Noise Category 1
			W	Noise Category 1
	TH89 to TH96		N	Noise Category 0
			E	N/A
			S	Noise Category 0
			W	N/A
	TH97 to TH98		N	Noise Category 0
			E	Noise Category 0
			S	Noise Category 1
			W	N/A
	TH87	Level 02	N	Noise Category 1
			E	N/A
			S	Noise Category 2
			W	Noise Category 1

	TH88 to TH98		N	Noise Category 1
			E	
			S	
			W	

Table 3.17 QDCMP4.4 Noise Categories – Buildings façades (Building 11)

Building Type & Location	Unit Number	Floor	Façade Orientation	Noise Category QDCMP4.4
Building 11	TH99 to TH114	Ground	N	Noise Category 0
			E	
			S	
			W	
	TH99 to TH101	Level 01	N	Noise Category 0
			E	N/A
			S	Noise Category 1
			W	Noise Category 1
	TH102 to TH114		N	Noise Category 0
			E	Noise Category 0
			S	Noise Category 0
			W	N/A
	TH99 to TH114	Level 02	N	Noise Category 1
			E	
			S	
			W	

The calculated road traffic noise levels at the private open spaces for the most affected dwellings facing the state-controlled road Smith Street, are presented in Table 3.18.

Table 3.18 Traffic Noise Levels – Private Open Spaces

Building	Floor	Receiver	Traffic Noise Level $L_{10,18hr}$ dB(A)*	Compliance with ≤60dB(A) $L_{10,18hr}$ criterion?
3	GF	TH24	61.1	No
	GF	TH25	62.2	No
	GF	TH26	62.7	No
	GF	TH27	63.1	No
	GF	TH28	68.1	No
4	GF	TH29	67.5	No
	GF	TH30	67.4	No
	GF	TH31	67.4	No

Building	Floor	Receiver	Traffic Noise Level $L_{10,18hr}$ dB(A)*	Compliance with ≤60dB(A) $L_{10,18hr}$ criterion?
	GF	TH32	68.3	No
	GF	TH33	67.4	No
	GF	TH34	67.4	No
	GF	TH35	67.3	No
	GF	TH36	67.2	No
	GF	TH37	67.1	No
5	GF	TH38	67.2	No
	GF	TH39	67.2	No
	GF	TH40	67.3	No
	GF	TH41	67.0	No
	GF	TH42	67.2	No
	GF	TH43	66.9	No
	GF	TH44	67.3	No
	GF	TH45	66.7	No
	GF	TH46	67.0	No
	GF	TH47	66.4	No
	GF	TH48	66.5	No
	GF	TH49	65.9	No
6	GF	TH50	60.6	No
	GF	TH51	57.4	Yes
	GF	TH52	54.6	Yes

**Free-field*

The predicted road traffic noise levels at the private open spaces (POS) of the most exposed Building 3, 4, 5, and 6 exceed the 60dB(A) $L_{10,18hr}$ noise criteria. To ensure full compliance, it is recommended that a noise-barrier fence be installed along the development's south-eastern boundary, with a return section along Village Boulevard. Further details on the recommended barrier and POS noise-criteria compliance are provided in Section 4.1.1 of the report.

4. Discussion and Recommendations

Site specific noise measurements and detailed traffic noise propagation modelling was carried out to assess noise impact from the state-controlled transport noise corridor of Smith Street considering the future road traffic up to a 10-year planning horizon (year 2036). The assessment indicates the following:

- Buildings 3, 4, 5 and 6 experience the highest levels of traffic-noise exposure, being located in close proximity to the Smith Street corridor. These buildings contain multiple façades within QDC MP4.4 Noise Category 3, particularly on the east, south, and west orientations, and predominantly at upper levels. The noise categories for these buildings range from Noise Category 0 to Noise Category 3.
- Buildings 1, 2, 9, 10, and 11 experience comparatively lower traffic-noise exposure. Most façades fall within Category 0 to 1, with isolated upper-level façades in Buildings 2, 10, and 11 reaching Category 1 to 2, but no Category 3.
- Buildings 7 and 8 experience very low exposure, with façades assessed within Noise Category 0. Their increased distance from the Smith Street corridor contributes to these reduced noise levels.

In summary, road-traffic noise impacts are greatest for Buildings 3, 4, 5, and portions of Building 6, particularly on upper floors facing east, south, and west, where Noise Category 3 applies under QDC MP4.4. Buildings 1, 2, 9, 10, and 11 are moderately exposed, mostly falling within Noise Categories 0 to 1, while Buildings 7 and 8 experience the lowest noise levels.

As per the requirements of QDC MP4.4, the façades of all buildings experiencing noise levels higher than Noise Category 0, must be designed and constructed to prevent traffic noise impacts.

Each habitable room within these dwellings must be constructed to comply with the applicable QDCMP4.4 Noise Category, as presented in Tables 3.7 to 3.17 and Appendix F.

As an alternative to applying the acceptable forms of construction from QDCMP4.4, detailed floor plan specific acoustic design as per AS3671-1989 can be carried out to determine the specific design requirements at the building approval stage.

4.1 Noise Mitigation Measures

4.1.1 Private Open Spaces

The results of the noise propagation modelling indicate exceedance of the private open space criteria ($L_{10,18hr}$ ≤ 60dB(A), free-field) at the yards of Buildings 3, 4, 5, and 6 facing Smith Street.

ATP recommends the construction of a variable-height noise barrier along the south-eastern boundary of the development, comprising a 2.6 m high barrier along Village Boulevard and a 2.8 m high barrier along the Smith Street frontage.

In addition, a 2.4 m high noise barrier is recommended along the corner of Building 6 facing Smith Street, with a return along Musgrave Park, to ensure appropriate acoustic protection of the private open space (POS) associated with TH50.

The RLs at the base and top of the proposed noise barriers are presented in Table 4.1.

Table 4.1 Noise barrier RLs

x, m (Easting)	y, m (Northing)	Lot no.	RL, m Centre of lot	RL, m Base of noise barrier	Height of noise barrier, m	RL, m Top of noise barrier
538262.34;	6906908.11;	TH25	15.4	15.4	2.6	18.0
538268.75;	6906899.50;	TH26	15.4	15.4	2.6	18.0
538269.13;	6906898.99;	TH27	15.7	15.6	2.6	18.2
538271.94;	6906895.18;	TH27	15.7	15.7	2.6	18.3
538277.58;	6906899.38;	TH28	15.7	15.6	2.6	18.2
538283.32;	6906891.69;	TH28	15.7	15.7	2.8	18.5
538290.36;	6906896.79;	Lane 2	n/a	15.7	2.8	18.5
538295.69;	6906900.84;	Lane 2	n/a	15.5	2.8	18.3
538300.34;	6906904.30;	Lane 2	n/a	15.4	2.8	18.2
538300.55;	6906904.46;	TH29	15.4	15.4	2.8	18.2
538305.67;	6906908.22;	TH30	15.4	15.4	2.8	18.2
538310.25;	6906911.46;	TH31	15.7	15.4	2.8	18.2
538313.82;	6906913.98;	TH32	15.7	15.4	2.8	18.2
538314.10;	6906914.14;	TH33	15.7	15.7	2.8	18.5
538319.73;	6906917.28;	TH33	15.7	15.7	2.8	18.5
538323.70;	6906919.45;	TH34	15.7	15.7	2.8	18.5
538323.95;	6906919.58;	TH35	15.7	15.7	2.8	18.5
538329.71;	6906922.71;	TH35	15.7	15.7	2.8	18.5
538333.56;	6906924.83;	TH36	15.7	15.7	2.8	18.5
538333.90;	6906925.02;	TH36	15.7	15.7	2.8	18.5
538339.59;	6906928.13;	TH37	15.7	15.7	2.8	18.5
538343.58;	6906930.03;	TH37	15.7	15.7	2.8	18.5
538343.97;	6906930.23;	Easement	n/a	16.0	2.8	18.8
538348.16;	6906932.37;	TH38	16.1	16.1	2.8	18.9
538352.74;	6906934.72;	TH38	16.1	16.1	2.8	18.9
538357.87;	6906937.48;	TH39	16.1	16.1	2.8	18.9
538362.08;	6906939.75;	TH39	16.1	16.1	2.8	18.9
538362.48;	6906940.01;	TH40	16.5	16.5	2.8	19.3
538367.23;	6906942.61;	TH41	16.5	16.5	2.8	19.3
538371.96;	6906945.16;	TH42	16.9	16.5	2.8	19.3

x, m (Easting)	y, m (Northing)	Lot no.	RL, m Centre of lot	RL, m Base of noise barrier	Height of noise barrier, m	RL, m Top of noise barrier
538372.35;	6906945.37;	TH42	16.9	16.9	2.8	19.7
538376.14;	6906947.33;	TH43	16.9	16.9	2.8	19.7
538381.81;	6906950.49;	TH44	17.3	16.9	2.8	19.7
538382.15;	6906950.65;	TH45	17.3	17.3	2.8	20.1
538387.13;	6906953.00;	TH46	17.7	17.3	2.8	20.1
538391.96;	6906955.15;	TH47	17.7	17.3	2.8	20.1
538392.32;	6906955.33;	TH47	17.7	17.7	2.8	20.5
538401.99;	6906959.87;	TH48	18.1	17.7	2.8	20.5
538402.32;	6906960.04;	TH49	18.1	18.1	2.8	20.9
538407.97;	6906963.03;	TH49	18.1	18.1	2.8	20.9
538412.01;	6906964.83;	TH50	18.1	18.1	2.8	20.9
538414.18;	6906965.80;	Lane 3	n/a	18.9	2.8	21.7
538417.81;	6906967.50;	Lane 3	n/a	18.9	2.8	21.7
538431.73;	6906973.76;	TH50	21.9	21.9	2.4	24.3
538438.00;	6906976.61;	TH50	21.9	21.9	2.4	24.3
538436.54;	6906979.79;	TH50	21.9	21.9	2.4	24.3

Detailed design of the noise barrier must be carried out to ensure that the noise barrier is built to comply with:

- Department of Transport and Main Roads (TMR) Technical Specification *Transport and Main Roads Specifications MRTS15 Noise Fences*, dated March 2019;
- Department of Transport and Main Roads (TMR) Technical Specification *Transport and Main Roads Specifications MRTS04 general Earthworks,* dated November 2022; and
- TMR *Road Traffic Noise Management: Code of Practice*, Chapter 7: *Integrated Noise Barrier Design.*

It is important to consider all requirements under MRTS15, including aesthetic requirements such as maximum stepping height of 600 mm. These requirements must be taken into consideration at the detailed design stage.

Detail view showing the alignment of the noise barrier is presented in Figures 4.1 to 4.4.

- All Noise Barriers shall be designed and constructed in accordance with Technical Specification MRTS15

- The Top of Noise Barrier heights shall be measured from either the Finished Floor Level or the finished earthworks surface level (top of retaining wall).

Figure 4.1 Noise barrier alignment – Total

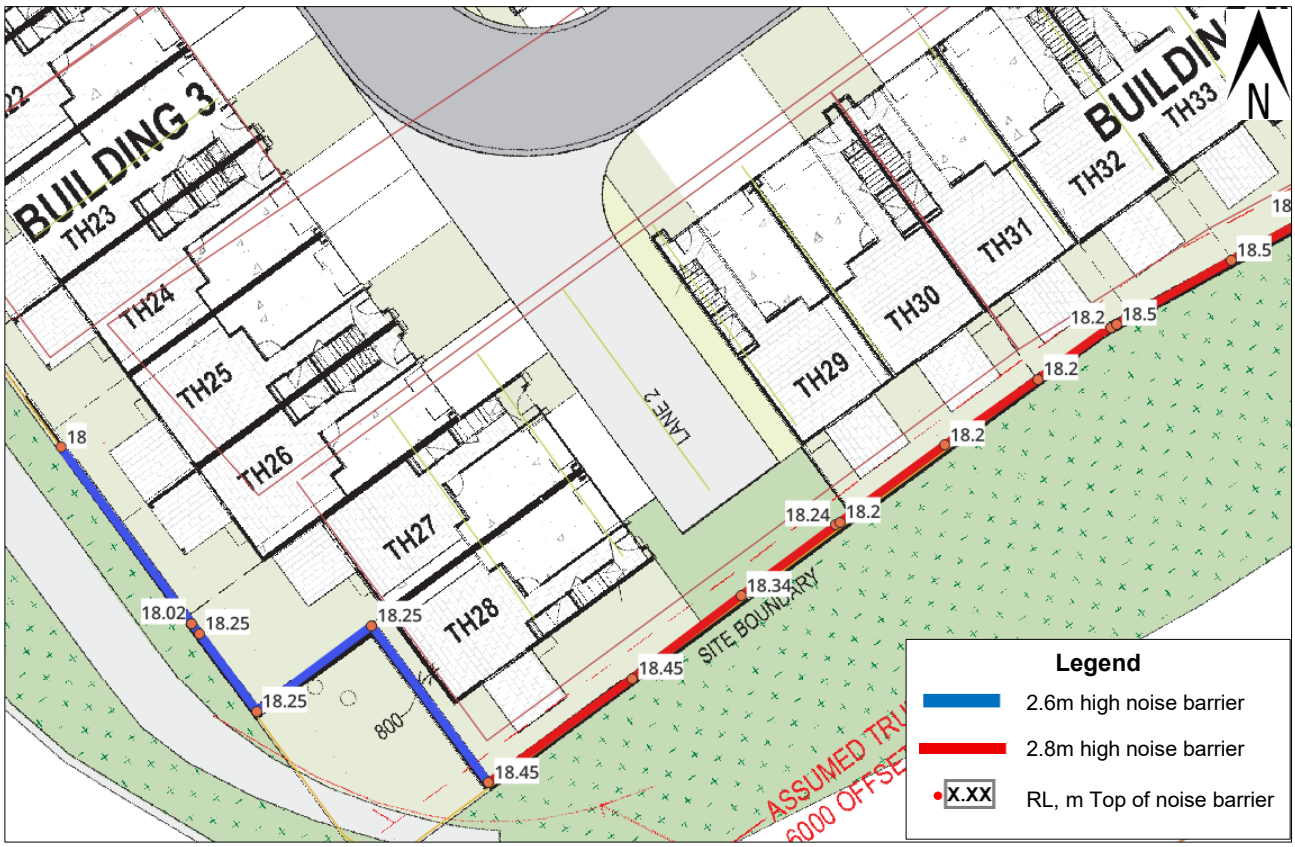


Figure 4.2 Noise barrier alignment – Part 1

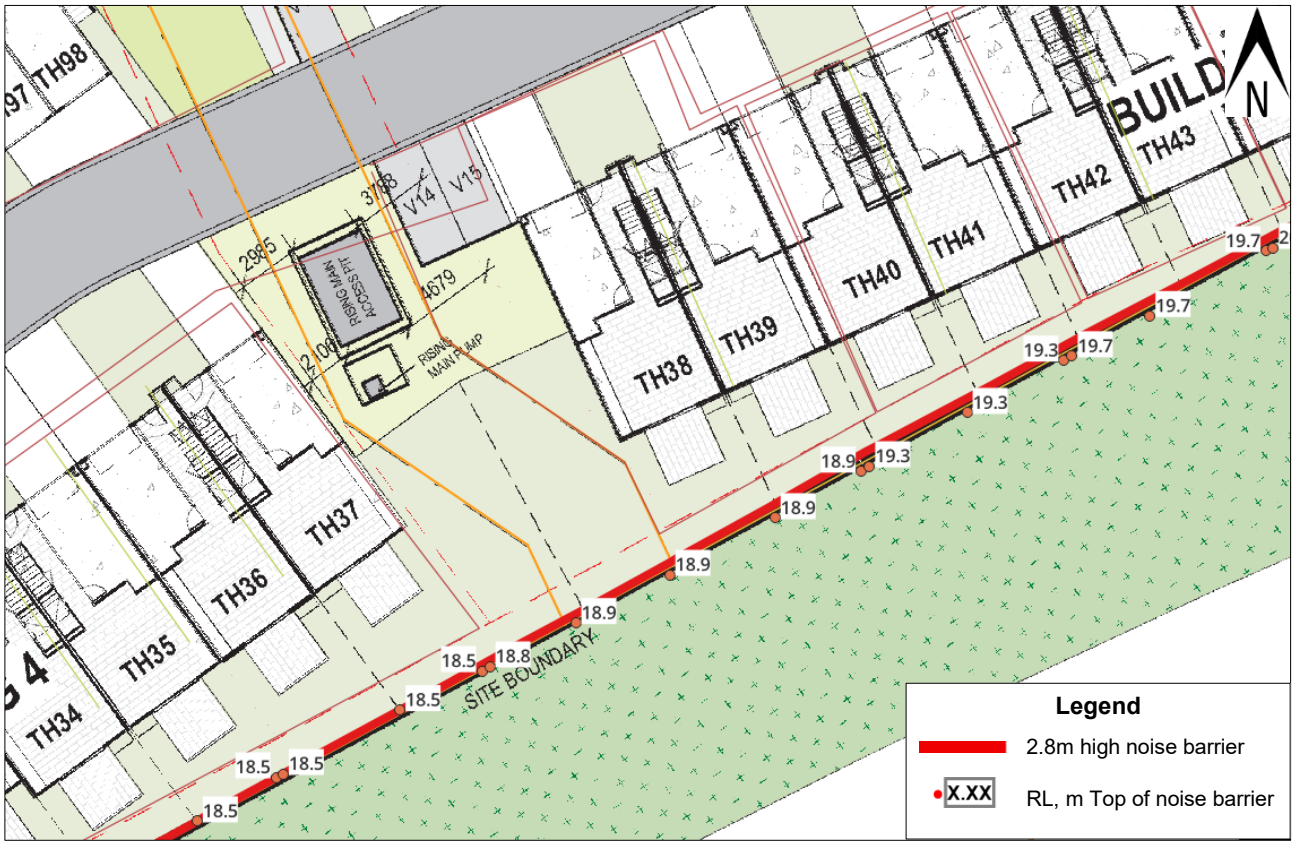


Figure 4.3 Noise barrier alignment – Part 2

Figure 4.4 Noise barrier alignment – Part 3

4.1.2 Architectural Treatment of Building Envelope

The results of the noise propagation modelling, presented in Tables 3.7 to 3.17 of this report, indicate that even with the recommended noise barrier in place, a number of townhouses are still traffic noise affected and will require compliance with QDC MP4.4. The future dwellings, 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 QDC MP4.4.

The allotments of the subdivision subject to QDC MP4.4 noise categories are summarised in Tables 3.7 to 3.17 of this report, and presented in Appendix F. It should be noted that there are no acoustic design requirements for Noise Category 0 of QDC MP4.4.

There are two options available for architectural treatment to the building façades, 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 Tables 3.7 to 3.17 of this report.
- **Option 2:** Floor plan specific acoustic design, in accordance with AS3671-1989, to ensure compliance with the internal noise criteria for habitable rooms in accommodation activity (≤ 35 dB(A) $L_{eq,1hr}$) as specified in *Table 3: Maximum internal acoustic levels* of SDAP *State Code 1: Development in a state-controlled road environment*.

Provided the recommended road traffic noise mitigation measures are implemented in the design and construction of the dwellings on the proposed residential development at 1 Clarke Street, Southport, the road traffic noise from the Smith Street will not impose any further constraints on the establishment of the proposed development.

5. References

- Australian Standard AS1055-2018 *(Acoustics – Description and Measurement of Environmental Noise)*
- Australian Standard AS/NZS2107 - 2016 *(Acoustics – Recommended design sound levels and reverberation times for building interiors)*
- Australian Standard AS2702-1984 (*Acoustics – Methods for the measurement of road traffic noise*)
- Australian Standard AS3671-1989 *(Acoustics – Road Traffic Noise Intrusion – Building sitting and construction)*
- Australian Standard AS/NZS IEC61672.1-2019 (*Electroacoustics – Sound level meters – Specifications*)
- Department of Environment and Science, 2019, *Environmental Protection (Noise) Policy*
- Department of Housing and Public Works Queensland Government, 2015, *Queensland Development Code – Mandatory Part 4.4 (Buildings in a Transport Noise Corridor)*
- Department of State Development Infrastructure and Planning, July 2025, *State Development Assessment Provisions* (Version 3.3)*, State Code 1: Development in a state-controlled road environment*
- Department of Transport and Main Roads, 2013*, Policy for Development on Land Affected by Environmental Emissions from Transport and Transport Infrastruct*ure (Version 4)
- Department of Transport and Main Roads, 2023*, Transport Noise Management Code of Practice: Volume 1 – Road Traffic Noise*
- Department of Transport and Main Roads, 2020, *Traffic Census Data*
- *Parklands PDA Development Scheme,* December 2023

6. Appendices

Appendix A – Development Plan

Appendix B – Site Photos

Appendix C – Meteorological Data

Appendix D – Background Noise Measurement Results

Appendix E – Validation of CoRTN Traffic Noise Model

Appendix F – Traffic Noise Contour Maps

Appendix A – Development Plan

Our Solution

MASTERPLAN

SCALE As indicated @ A3 SIZE

Our Solution

PROPOSED PLAN - LEVEL 1

SCALE 1:500 @ A3 SIZE

Our Solution

PROPOSED PLAN - LEVEL 2

CLARKE ST

SITE ENTRY

2000 SETBACK

SITE BOUNDARY

ROAD 1

BUILDING 1

BUILDING 2

BUILDING 8

ROAD 2

SHED

SITE BOUNDARY

BUILDING 7

LANE 1

BUILDING 9

BIN ROOM 1

COMMUNAL OPEN SPACE

ROAD 7

EASEMENT

BIN ROOM 2

BUILDING 3

ROAD 3

BUILDING 10

BUILDING 11

ROAD 4

ROAD 5

ROAD 6

RISING MAIN ACCESS PIT

RISING MAIN PUMP

BUILDING 4

BUILDING 6

LANE 2

BUILDING 5

LANE 3

SITE BOUNDARY

1500 SETBACK

2000 SETBACK

SITE BOUNDARY

SITE BOUNDARY

SITE BOUNDARY

1500 SETBACK

2000 SETBACK

VILLAGE BVD

MUSGRAVE PARK

SMITH ST

SCALE 1:500 @ A3 SIZE

Appendix B – Site Photos

Photo: Noise Logger – Road Traffic Noise Measurements

Appendix C – Meteorological Data

Gold Coast, Queensland
June 2024 Daily Weather Observations

Observations from the Gold Coast Seaway, at the northern end of Southport Spit.

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	Sa	18.9	21.7	0.2			SW	48	18:45	20.1	86		NW	11	1018.6	21.6	86		N	9	1013.4
2	Su	12.9	20.9	5.6			WNW	31	04:43	17.5	65		WSW	7	1016.3	20.3	62		E	11	1013.9
3	Mo	10.9	21.4	0			WSW	33	13:17	16.8	64		WNW	15	1014.9	20.7	39		W	20	1011.4
4	Tu	9.7	20.2	0			W	19	03:50	15.7	48		SW	7	1017.2	19.8	50		NE	13	1015.3
5	We	10.2	22.3	0			NNE	22	14:35	16.4	62		WSW	2	1018.3	21.2	50		NE	19	1015.0
6	Th	12.3	22.9	0.4			N	26	15:31	18.9	63			Calm	1017.2	21.8	56		NNE	15	1014.5
7	Fr	12.0	20.6	0						14.5	65		NW	11	1016.1	18.8	39		WNW	17	1012.7
8	Sa	10.6	21.4	0			W	33	13:49	15.0	63		NW	13	1016.1	20.5	49		WNW	15	1013.5
9	Su	11.5	22.6	0			WNW	24	06:26	17.3	63		WNW	13	1019.1	20.7	54		E	13	1016.3
10	Mo	11.7	21.9	0			SE	30	16:55	15.5	69		WNW	9	1019.7	20.3	51		ESE	9	1016.9
11	Tu	11.5	22.5	0			WNW	26	22:46	17.0	54		WSW	7	1022.1	22.1	42		NNE	11	1017.6
12	We	13.1	23.9	0			WSW	35	20:56	18.4	52		NW	13	1013.9	23.5	38		WNW	13	1009.7
13	Th	11.2	20.8	0			SSW	28	09:31	16.8	42		SW	13	1017.9	20.4	50		S	13	1016.2
14	Fr	10.7	22.7	0			ESE	26	16:36	16.7	62		WNW	9	1018.0	20.2	60		E	15	1014.6
15	Sa	14.3	21.6	1.2			S	31	20:58	18.1	68		SSE	9	1013.7	19.6	61		ENE	17	1009.3
16	Su	10.4	20.6	0			SSE	33	11:10	15.9	60		W	6	1013.7	18.7	50		SSE	9	1011.3
17	Mo	11.8	20.4	0			WSW	31	11:37	14.9	40		W	17	1013.5	19.9	23		W	15	1010.8
18	Tu	10.8		0						16.5	54		W	9	1016.0	19.7	47		NE	13	1013.3
Statistics for the first 18 days of June 2024																					
Mean		11.9	21.7							16.8	60			9	1016.8	20.5	50			13	1013.7
Lowest		9.7	20.2							14.5	40			Calm	1013.5	18.7	23		#	9	1009.3
Highest		18.9	23.9	5.6			SW	48		20.1	86		W	17	1022.1	23.5	86		W	20	1017.6
Total				7.4																	

Observations were drawn from Gold Coast Seaway {station 040764}

The Gold Coast Seaway site is an Automatic Weather Station (AWS) at the northern end of Southport Spit. If you are interested in the southern end of the Gold Coast, see the observations from Coolangatta.

IDCJDW4050.202406 Prepared at 06:26 UTC on 18 Jun 2024

Appendix D – Noise Measurement Results

Unattended Noise Measurements
1 Clarke Street, Southport

Noise Levels - 18hr Day (Traffic Noise)

Logger Location -
27°57'44.0"S 153°23'23.4"E

ARL Environmental Noise Logger	
Logger Serial Number	16-707-017
Measurement Title	Clarke Street
Measurement started at	6/06/2024 11:30
Measurement stopped at	17/06/2024 16:00
Frequency Weighting	A
Time Averaging	Fast
Statistical Interval	15 min
Pre-measurement Ref.	94.0
Post-measurement Ref.	93.8
Engineering Units	dB SPL

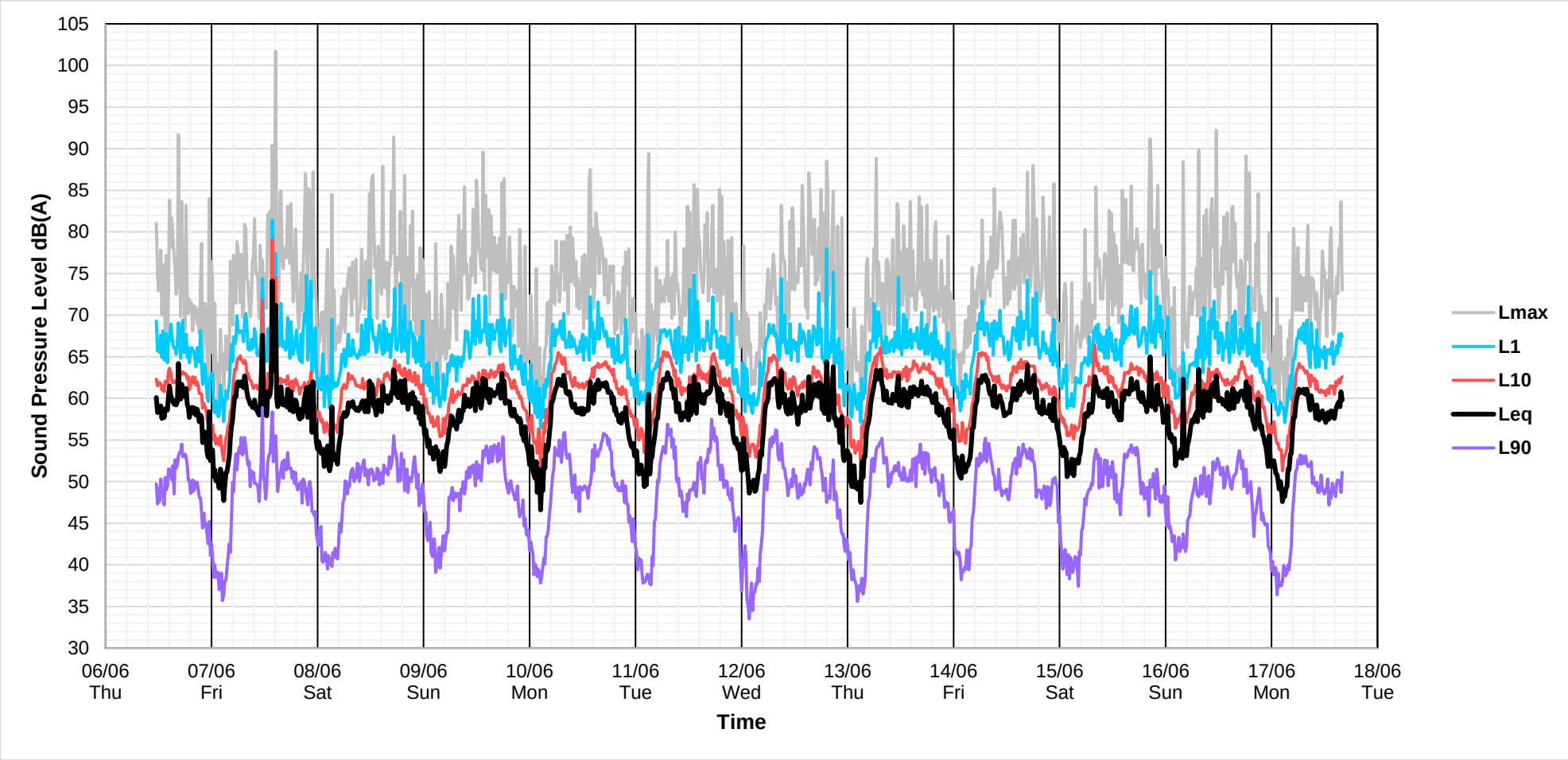
		$L_{A10,T}$			$L_{Aeq,T}$		$L_{A90,T}$	
Date	**Day**	**18hr day 6am-12am**	**1hr max 6am-12am**	**Time for 1hr max**	**18hr day 6am-12am**	**8hr night 10pm-6am**	**18hr day 6am-12am**	**8hr night 10pm-6am**
6/06/2024	Thursday	—	—	—	—	54	—	42
7/06/2024	Friday	62.8	68.2	0.6	60.2	55.1	51.0	43.3
8/06/2024	Saturday	62.2	63.8	0.7	59.6	55.1	50.9	44.8
9/06/2024	Sunday	61.6	63.7	0.7	59.0	53.9	50.1	43.5
10/06/2024	Monday	62.3	64.9	0.3	59.4	54.4	50.9	43.0
11/06/2024	Tuesday	62.3	65.2	0.3	59.5	53.0	50.7	41.3
12/06/2024	Wednesday	61.7	65.0	0.3	59.3	53.5	50.2	42.0
13/06/2024	Thursday	62.9	65.4	0.3	60.0	54.8	51.0	44.2
14/06/2024	Friday	62.7	65.3	0.3	60.0	54.3	50.9	43.4
15/06/2024	Saturday	62.7	64.9	0.3	60.0	56.2	50.5	45.0
16/06/2024	Sunday	61.4	63.9	0.7	58.8	52.6	49.2	41.9
Average		**62.3**	**65.0**		**59.6**	**54.2**	**50.6**	**43.2**
Average (weekdays only)		**62.4**	**65.7**		**59.7**	**54.1**	**50.8**	**42.8**

Note

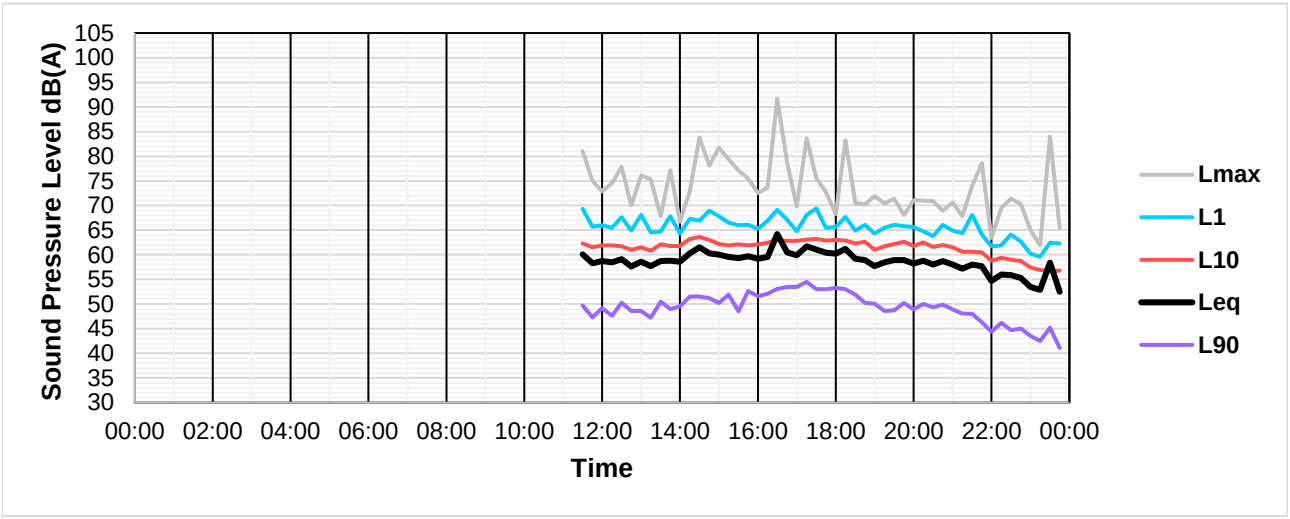
— No noise data available

Rainfall recorded on this day

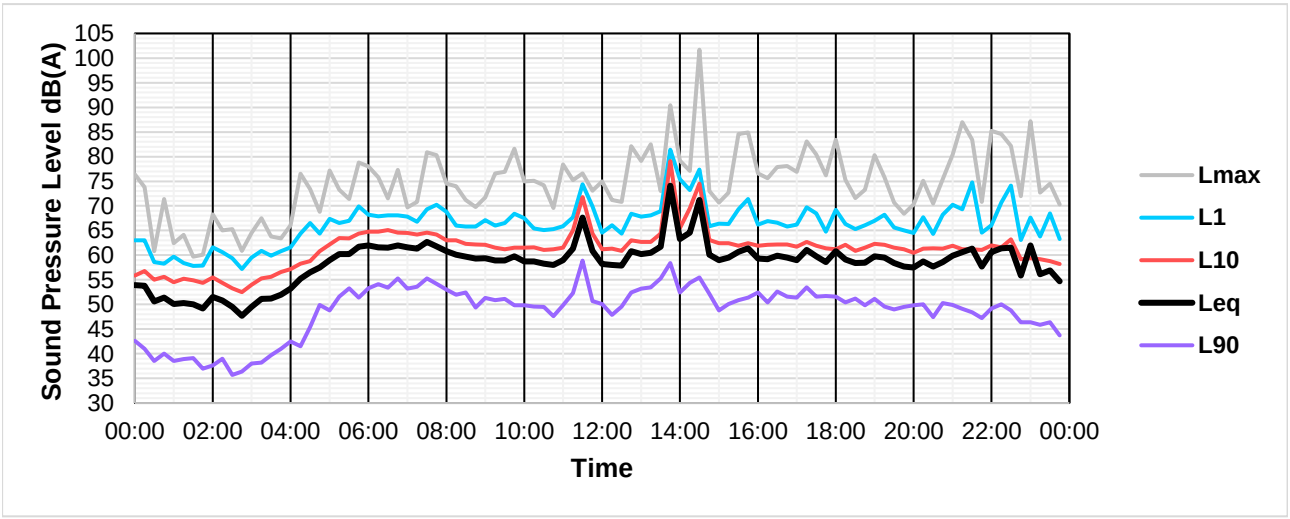
Unattended Noise Measurements
6 to 17 June 2024



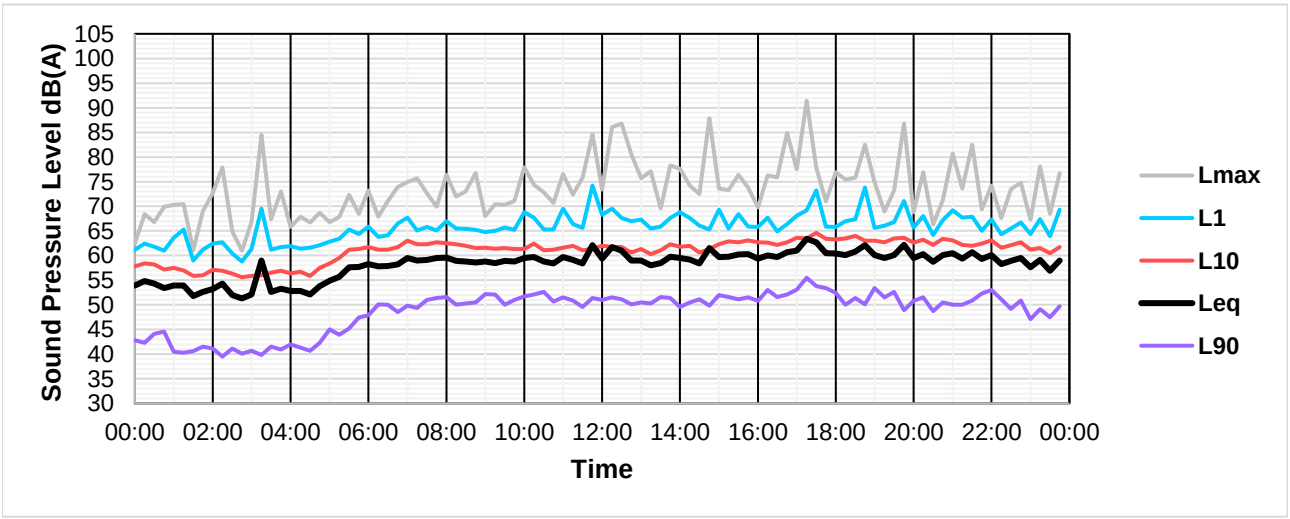
Unattended Noise Measurements
Thursday 6 June 2024



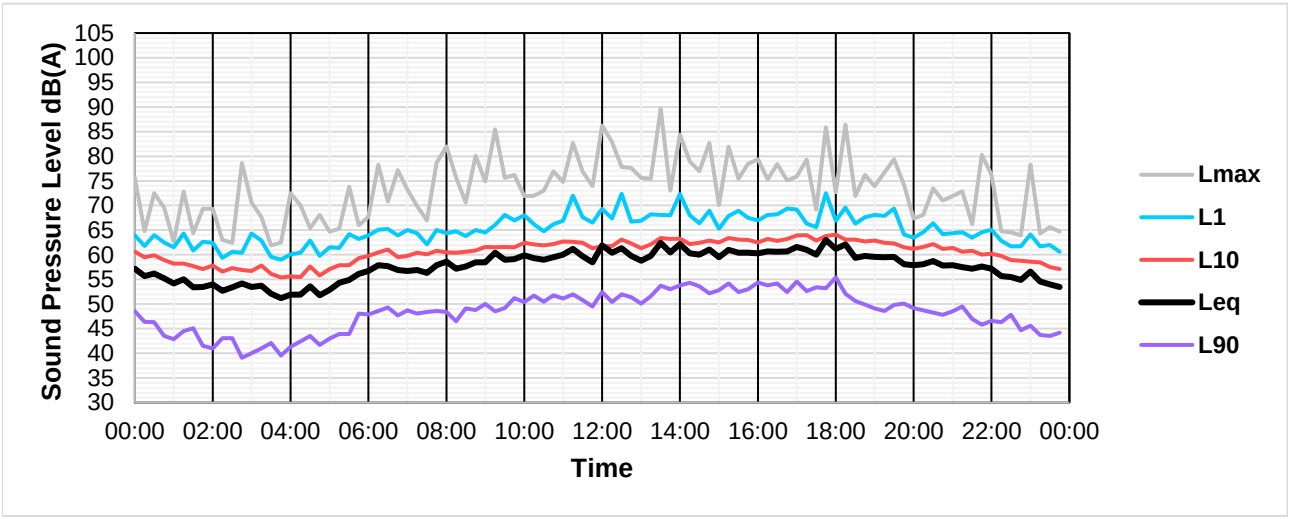
Unattended Noise Measurements
Friday 7 June 2024



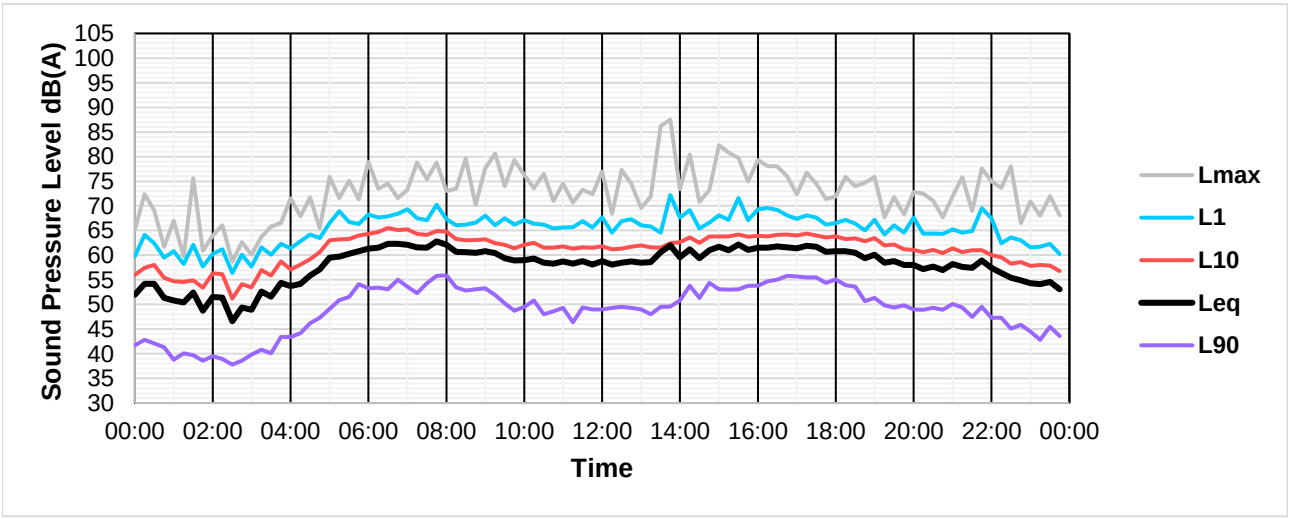
Unattended Noise Measurements
Saturday 8 June 2024



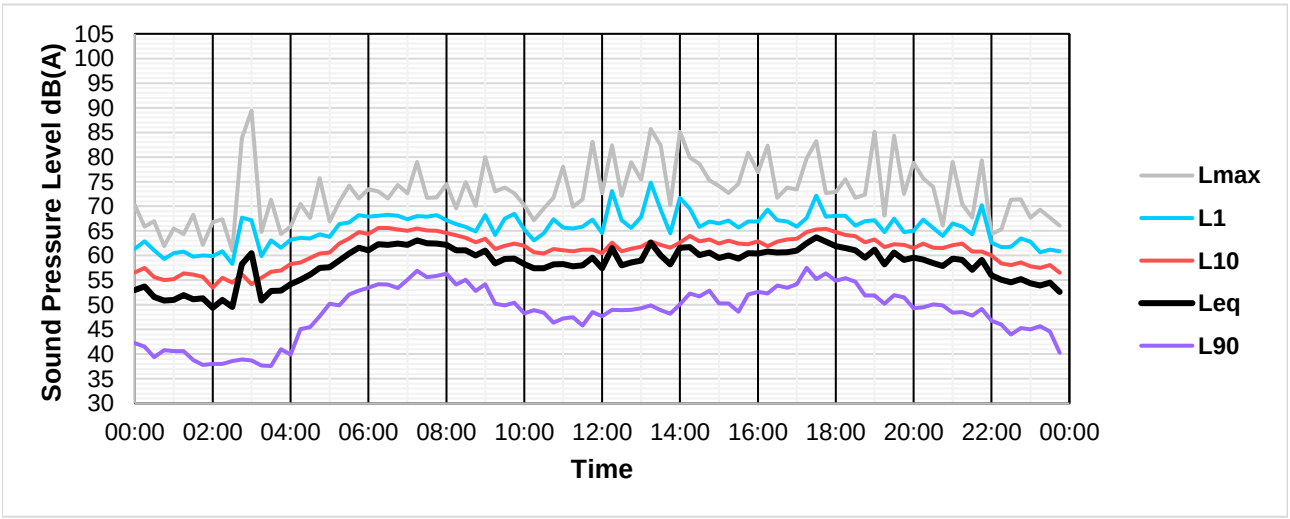
Unattended Noise Measurements
Sunday 9 June 2024



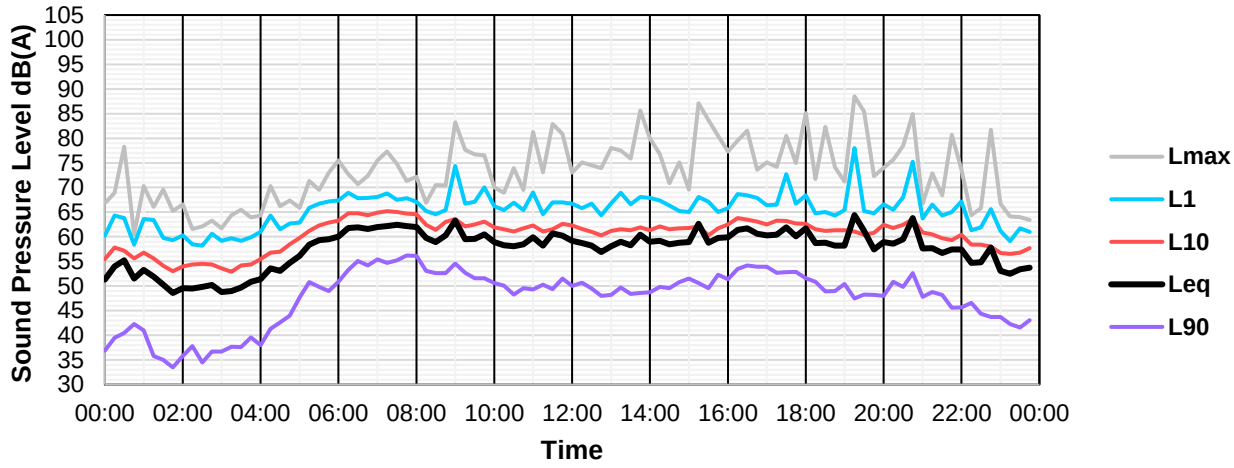
Unattended Noise Measurements
Monday 10 June 2024



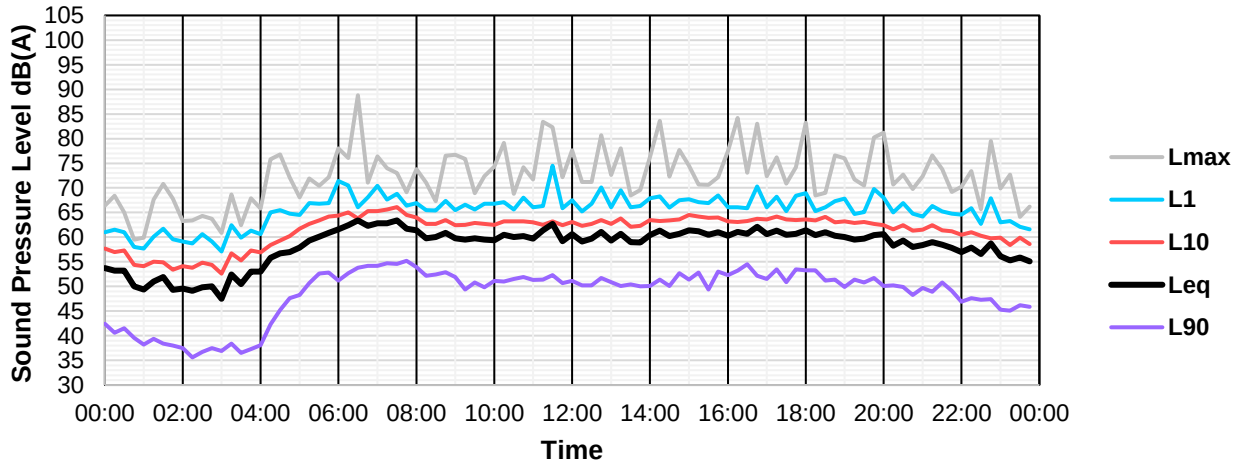
Unattended Noise Measurements
Tuesday 11 June 2024



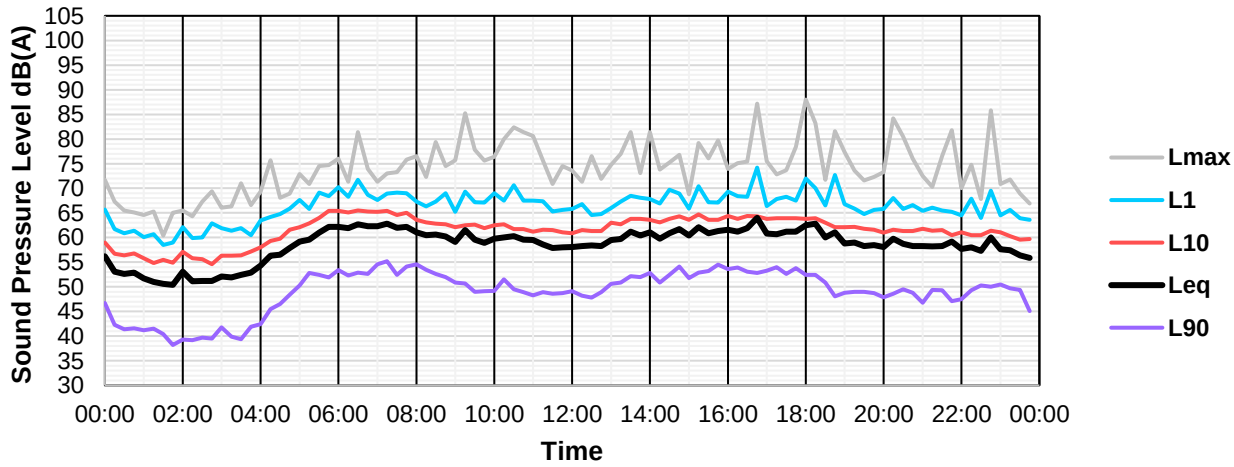
Unattended Noise Measurements
Wednesday 12 June 2024



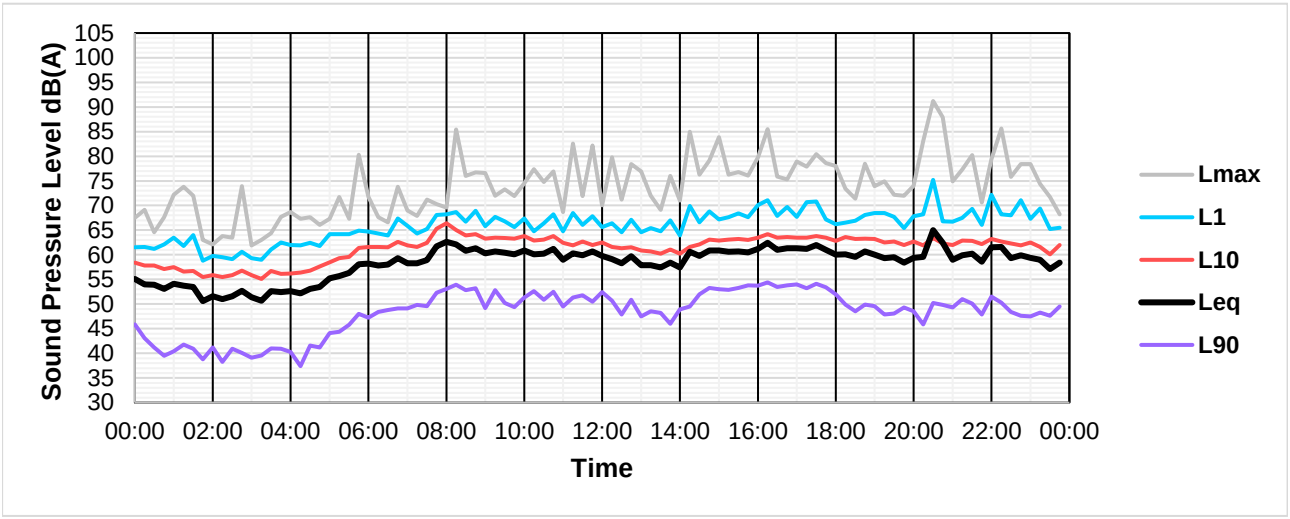
Unattended Noise Measurements
Thursday 13 June 2024



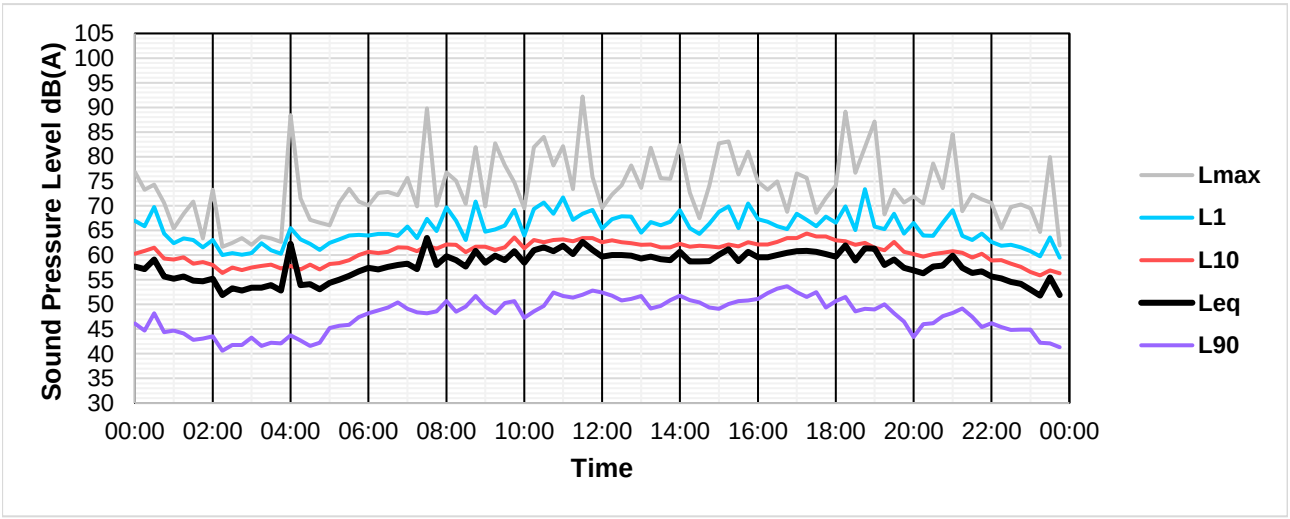
Unattended Noise Measurements
Friday 14 June 2024



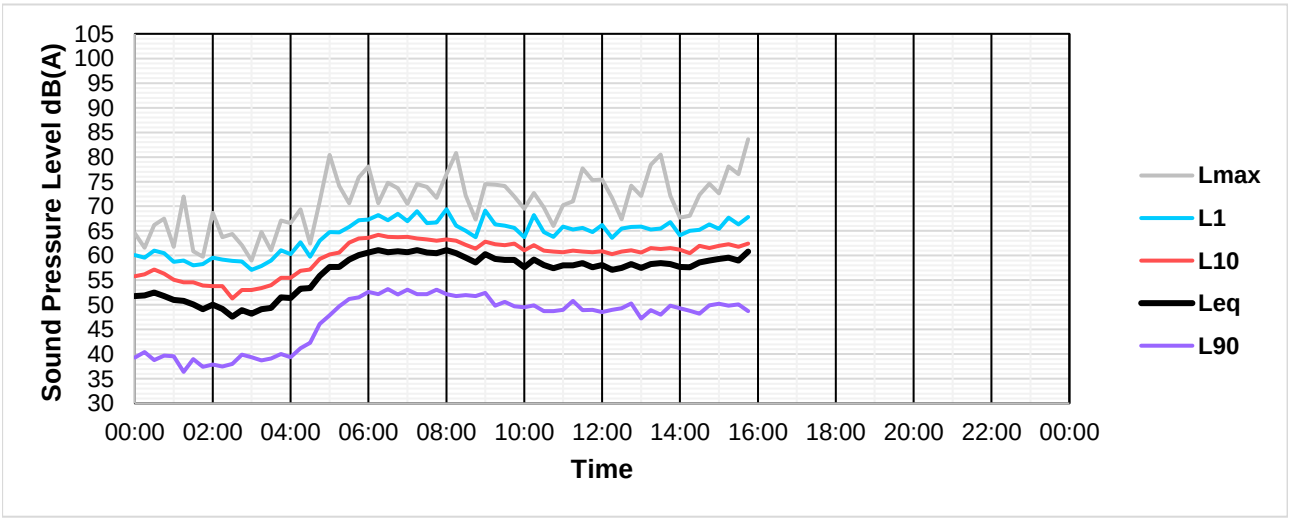
Unattended Noise Measurements
Saturday 15 June 2024



Unattended Noise Measurements
Sunday 16 June 2024



Unattended Noise Measurements
Monday 17 June 2024

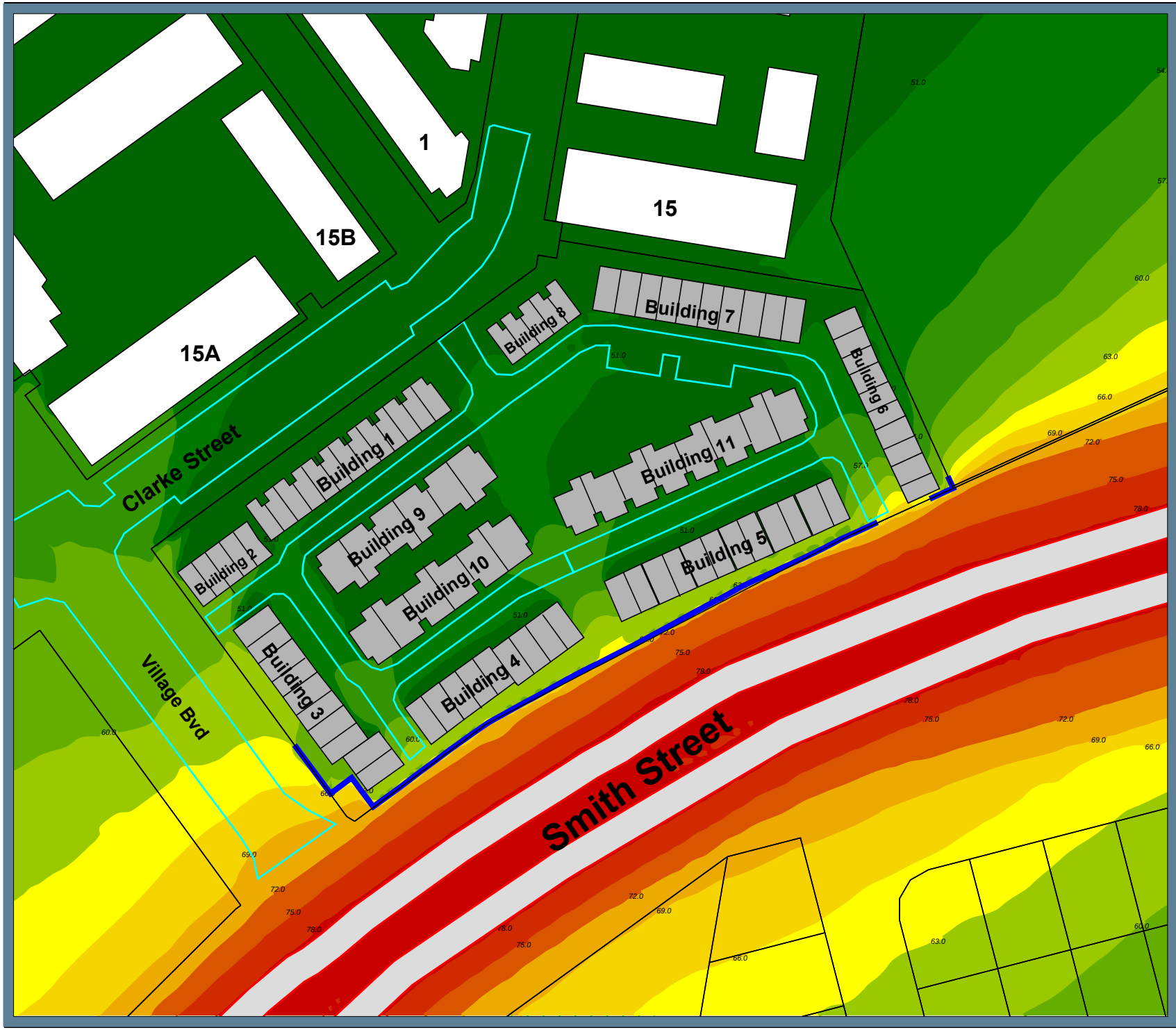


Appendix E – Validation of CoRTN Traffic Noise Model

1 Clarke Street, Southport
Calculated Traffic Noise Levels
RTNA Validation

Receiver	L10(18h) dB(A)
Noise logger	65.0

Appendix F – Traffic Noise Contour Maps



ATP250934

Proposed Development
1 Clarke Street, Southport

Traffic Noise Modelling
Year 2036

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

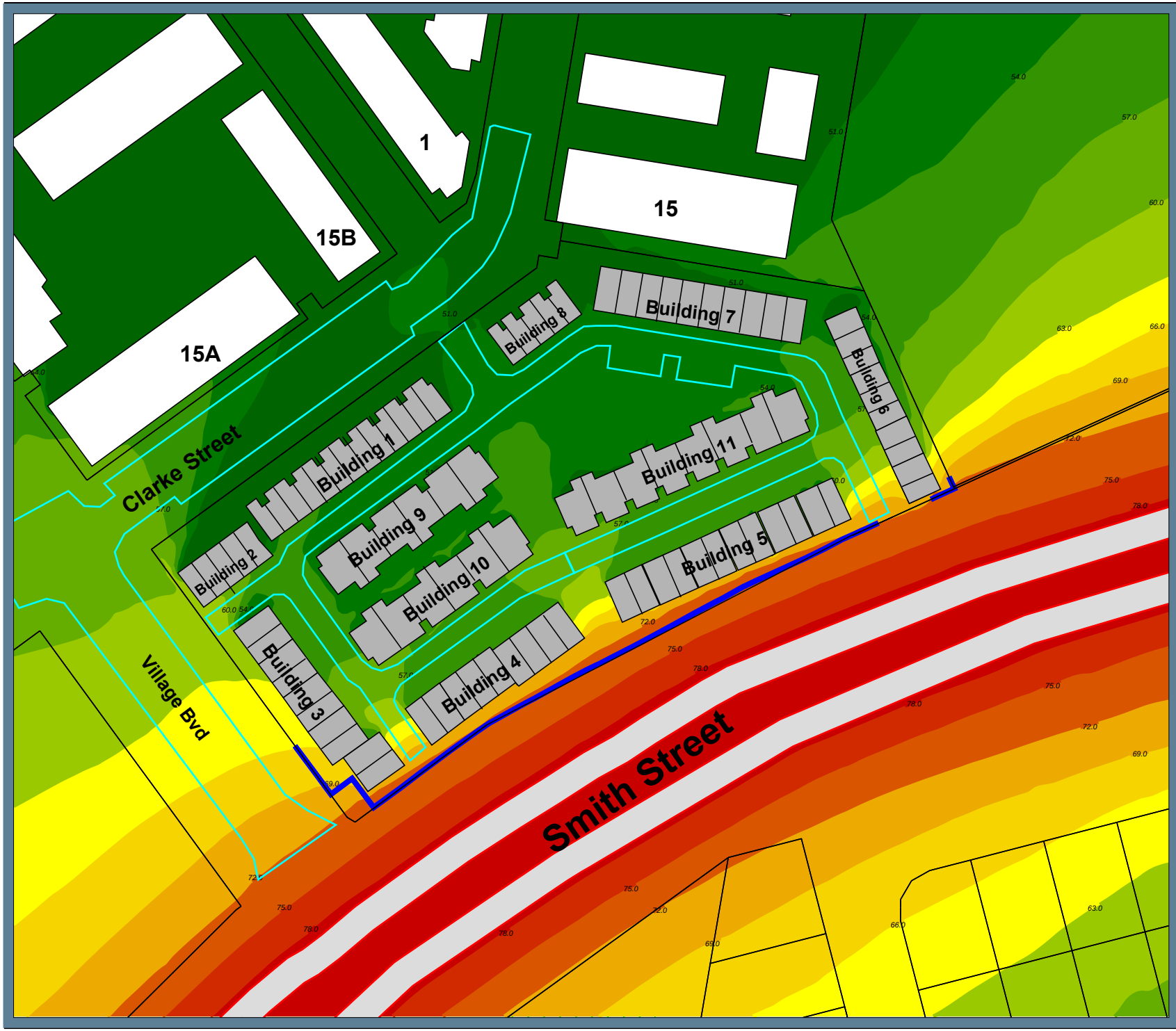
- Adjacent Building
- Ground Absorption
- Lot boundary
- Point receiver
- Proposed Development
- Road
- Foliage
- Acoustic fence

SCALE @ A4 1:1400

0 5 10 20 30 40 50 m

Grid Spacing: 2m
Project Engineer: Bojan Todorovski
Created: 5/12/2025
Processed with SoundPLAN 9.1

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



ATP250934

Proposed Development
1 Clarke Street, Southport

Traffic Noise Modelling
Year 2036

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

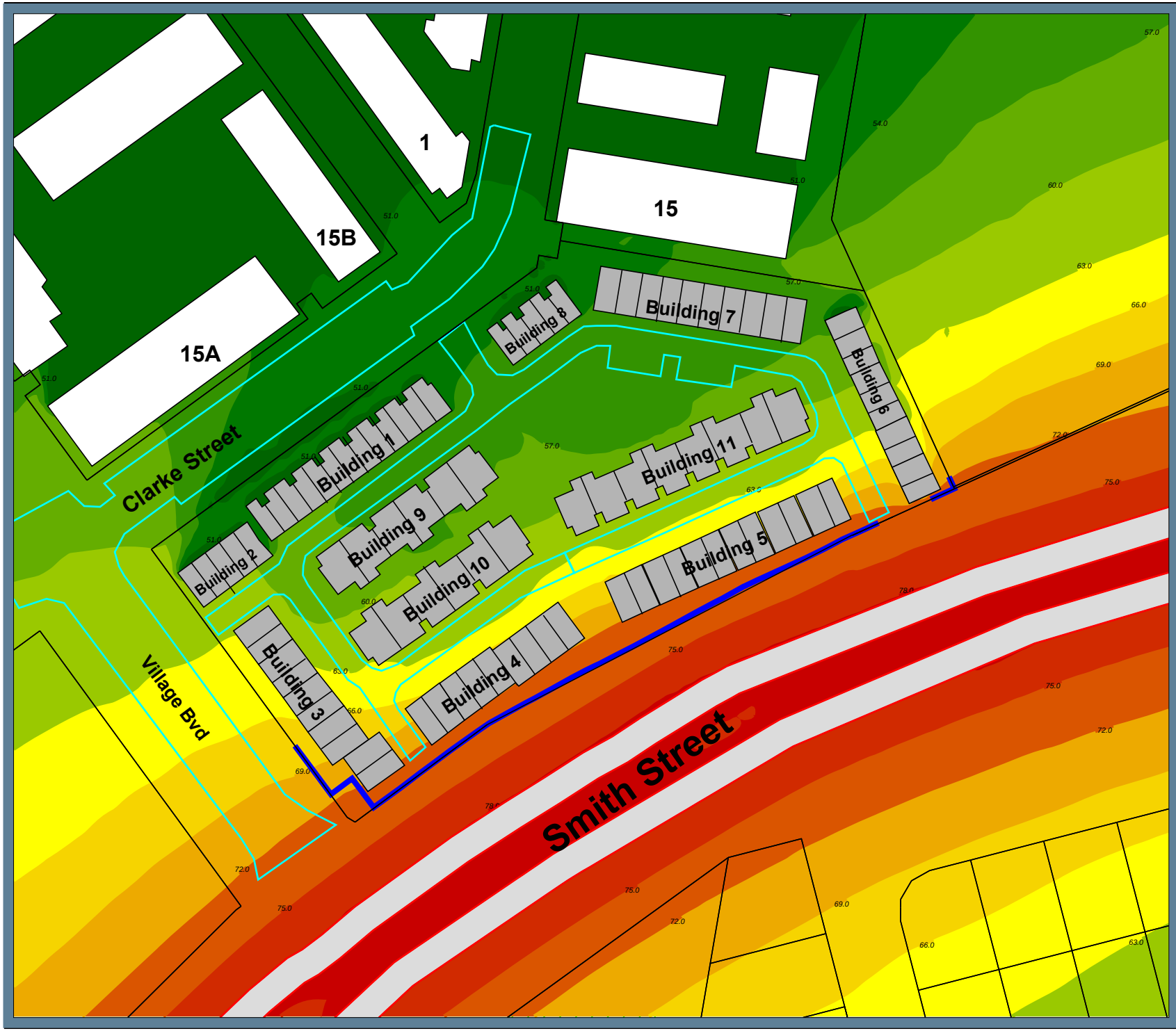
- Adjacent Building
- Ground Absorption
- Lot boundary
- Point receiver
- Proposed Development
- Road
- Foliage
- Acoustic fence

SCALE @ A4 1:1400

0 5 10 20 30 40 50 m

Grid Spacing: 2m
Project Engineer: Bojan Todorovski
Created: 5/12/2025
Processed with SoundPLAN 9.1

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



ATP250934

Proposed Development
1 Clarke Street, Southport

Traffic Noise Modelling
Year 2036

Second Floor
(7.4m 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

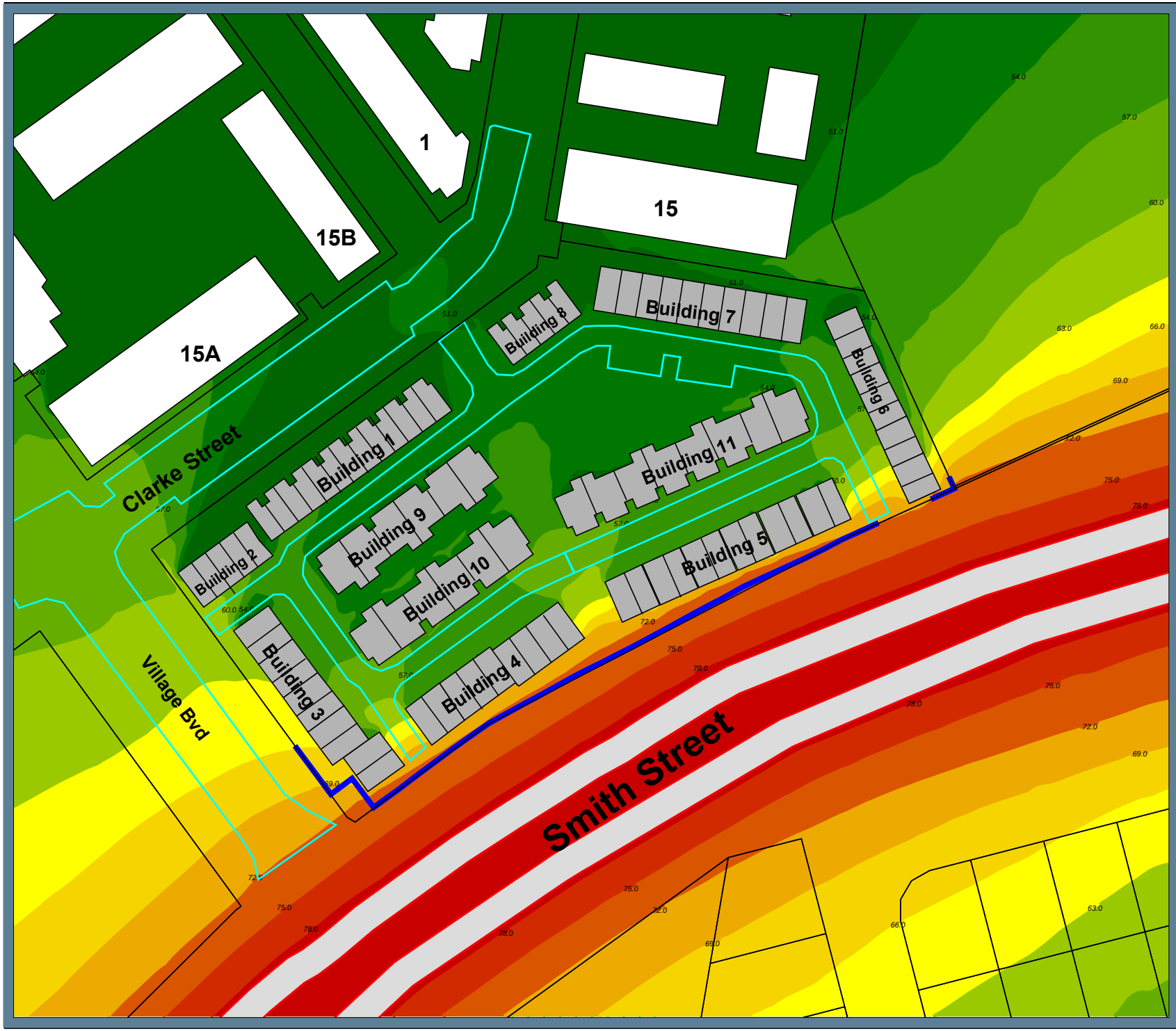
- Adjacent Building
- Ground Absorption
- Lot boundary
- Point receiver
- Proposed Development
- Road
- Foliage
- Acoustic fence

SCALE @ A4 1:1400

0 5 10 20 30 40 50 m

Grid Spacing: 2m
Project Engineer: Bojan Todorovski
Created: 5/12/2025
Processed with SoundPLAN 9.1

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



ATP250934

Proposed Development
1 Clarke Street, Southport

Traffic Noise Modelling
Year 2036

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

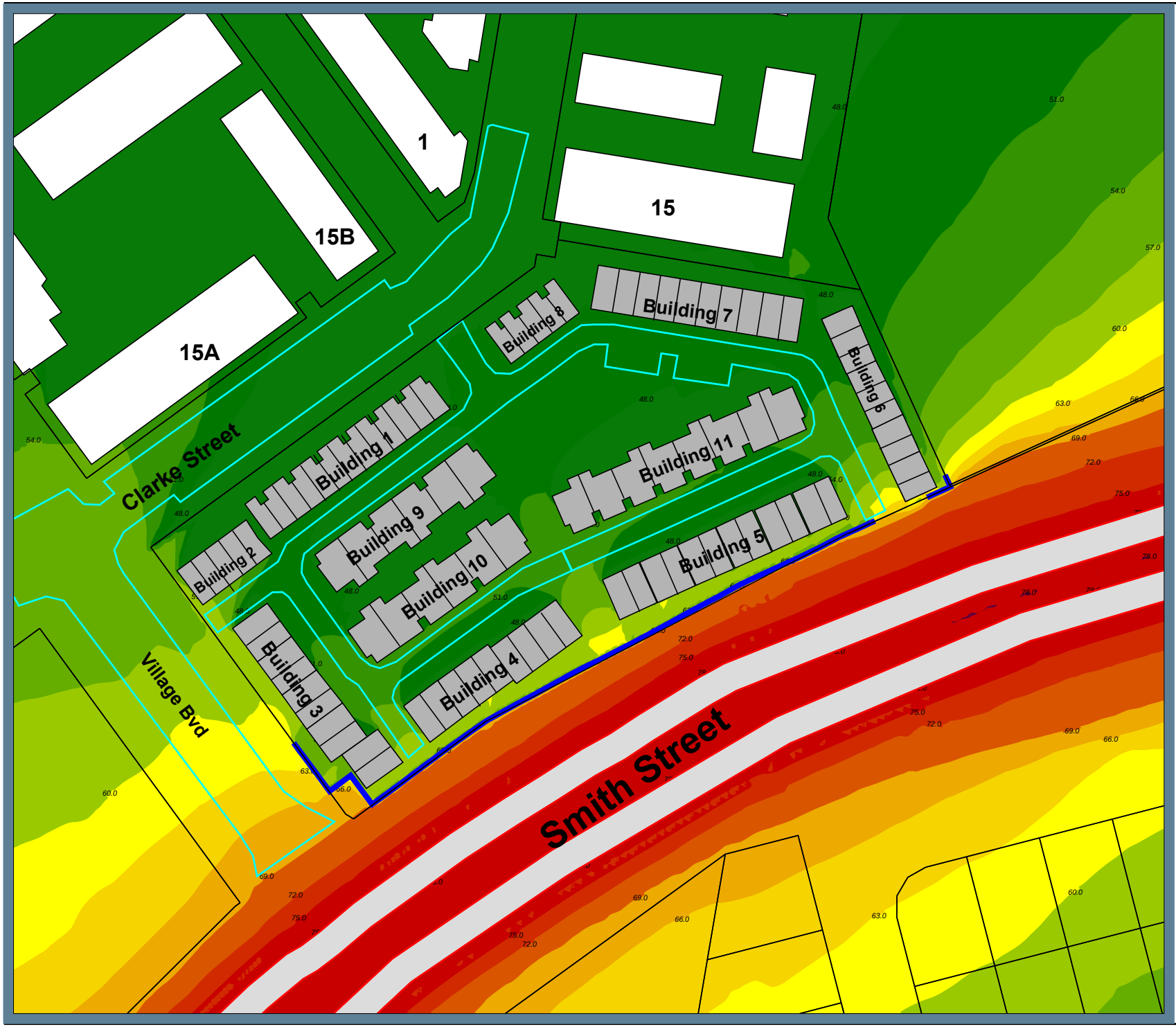
- Adjacent Building
- Ground Absorption
- Lot boundary
- Point receiver
- Proposed Development
- Road
- Foliage
- Acoustic fence

SCALE @ A4 1:1400

0 5 10 20 30 40 50 m

Grid Spacing: 2m
Project Engineer: Bojan Todorovski
Created: 5/12/2025
Processed with SoundPLAN 9.1

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



ATP250934

Proposed Development
1 Clarke Street, Southport

Traffic Noise Modelling
Year 2036

Private Open Spaces
(1.5m AGL)

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

	<= 48
48 <	<= 51
51 <	<= 54
54 <	<= 57
57 <	<= 60
60 <	<= 63
63 <	<= 66
66 <	<= 69
69 <	<= 72
72 <	<= 75
75 <	<= 78
78 <	<= 81
81 <	

Legend

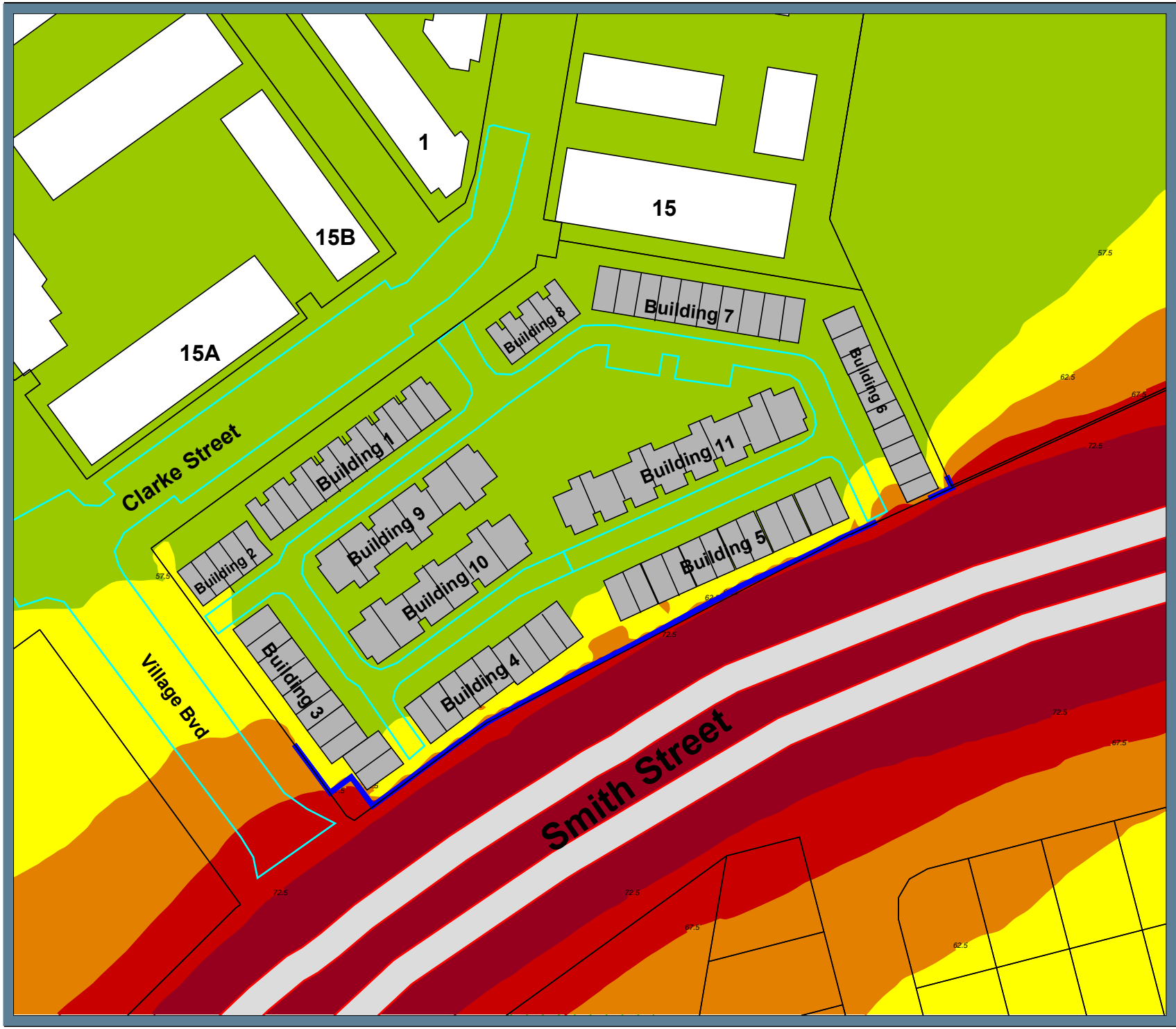
- Adjacent Building
- Ground Absorption
- Lot boundary
- Point receiver
- Proposed Development
- Road
- Foliage
- Acoustic fence

SCALE @ A4 1:1400

0 5 10 20 30 40 m

Grid Spacing: 2m
Project Engineer: Bojan Todorovski
Created: 5/12/2025
Processed with SoundPLAN 9.1

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



ATP250934

Proposed Development
1 Clarke Street, Southport

Traffic Noise Modelling
Year 2036

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

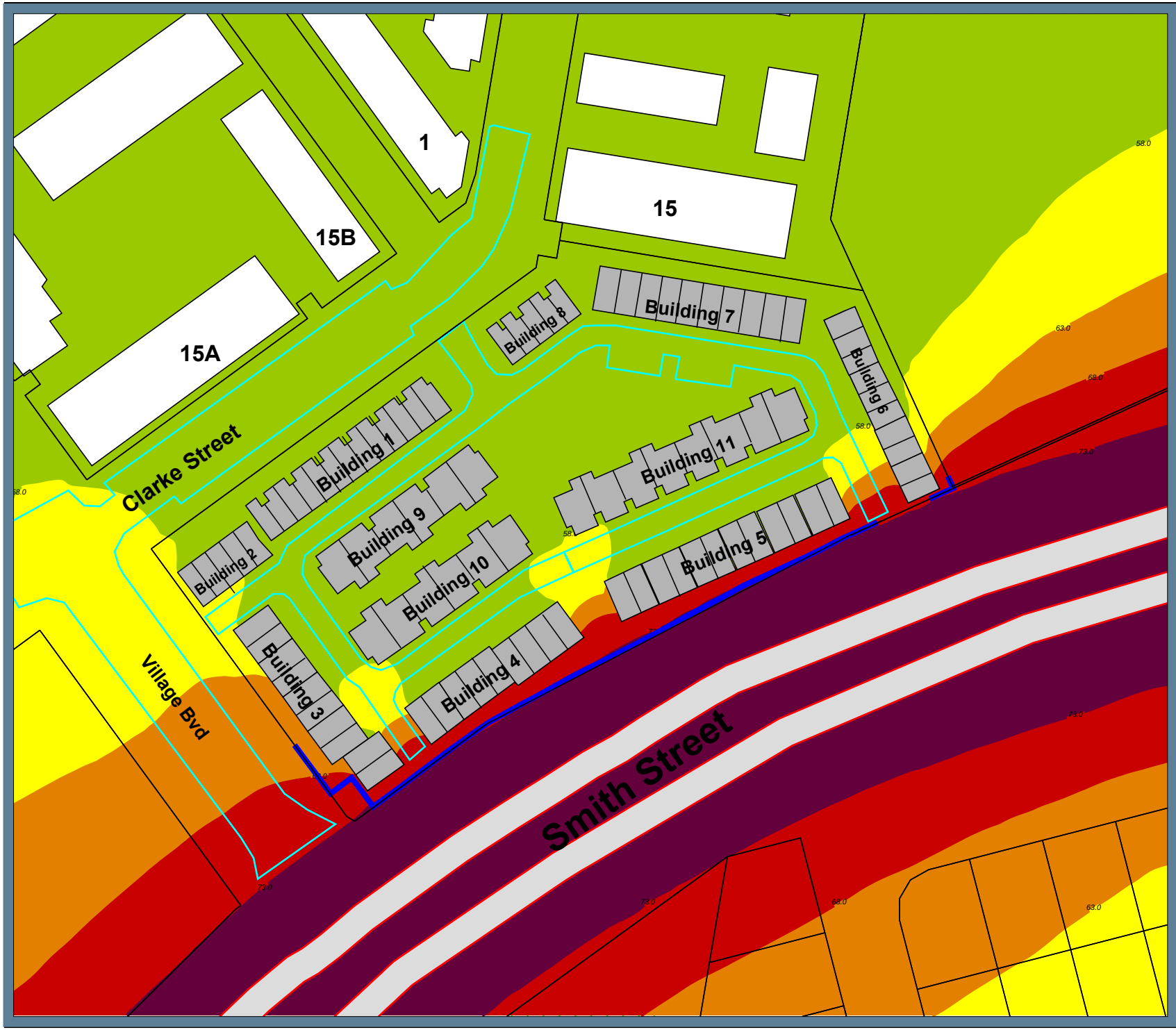
- Adjacent Building
- Ground Absorption
- Lot boundary
- Point receiver
- Proposed Development
- Road
- Foliage
- Acoustic fence

SCALE @ A4 1:1400

0 5 10 20 30 40 m

Grid Spacing: 2m
Project Engineer: Bojan Todorovski
Created: 5/12/2025
Processed with SoundPLAN 9.1

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



ATP250934

Proposed Development
1 Clarke Street, Southport

Traffic Noise Modelling
Year 2036

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

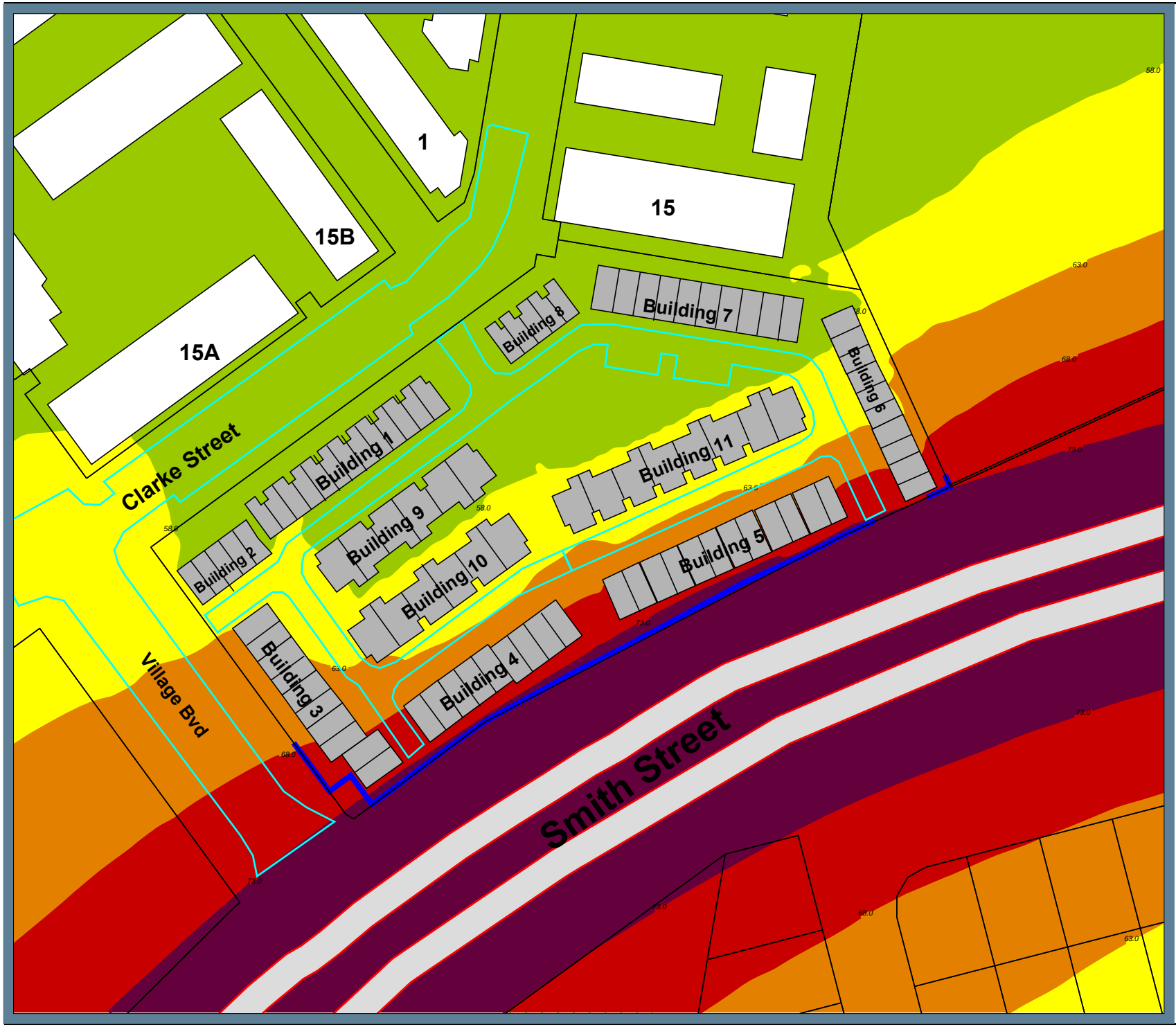
- Adjacent Building
- Ground Absorption
- Lot boundary
- Point receiver
- Proposed Development
- Road
- Foliage
- Acoustic fence

SCALE @ A4 1:1400

0 5 10 20 30 40 50 m

Grid Spacing: 2m
Project Engineer: Bojan Todorovski
Created: 5/12/2025
Processed with SoundPLAN 9.1

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



ATP250934

Proposed Development
1 Clarke Street, Southport

Traffic Noise Modelling
Year 2036

Second Floor
(7.4m AGL)

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

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

Legend

- Adjacent Building
- Ground Absorption
- Lot boundary
- Point receiver
- Proposed Development
- Road
- Foliage
- Acoustic fence

SCALE @ A4 1:1400

0 5 10 20 30 40 50 m

Grid Spacing: 2m
Project Engineer: Bojan Todorovski
Created: 5/12/2025
Processed with SoundPLAN 9.1

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