Noise Impact Assessment

Proposed Multi-Unit Development at 1 Clarke Street, Southport

PLANS AND DOCUMENTS
referred to in the PDA
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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 multi-unit development at 1 Clarke Street in Southport.

The proposed multi-unit development is part of the 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 results of the following acoustic assessments:

- Road traffic noise impact assessment considering the traffic noise from the Smith Street within a 10-year planning horizon; and
- The potential noise impact from the established development on the nearest noise sensitive places in accordance with Parklands *PDA Development Scheme* and the requirements of the *Environmental Protection (Noise) Policy 2019.*

1.2 Study Objectives

Study objectives are as follows:

- Site visit and establishment of two (2) automated noise loggers at the subject site to determine existing background noise levels and 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 2035) traffic flows along Smith Street which is a state-controlled transport noise corridor;
- Operational noise propagation modelling using SoundPLAN software considering the noise sources associated with the activities after the proposed development is established (i.e., mechanical plant and car movements);
- Calculation of the traffic noise levels ($L_{10,18hr}$) at the façades and private open spaces of the proposed buildings within a 10-year planning horizon and recommendations of traffic noise mitigation measures;
- Identification of the QDCMP4.4 Noise Categories as applicable to every habitable room of the proposed residential units to inform the acoustic design requirements to prevent road traffic noise intrusion in the units;
- Calculation of the operational noise emissions associated with the activities at the development and assessment of the potential noise impact on the nearest noise sensitive places; and

- Recommendation of noise mitigation measures to prevent operational noise impact from the activities after the development is established on the nearest noise sensitive places in the vicinity 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 m^2 and it 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 consists of four (4) thirteen storey buildings (Buildings 1 to 4) comprising of the following:

- Two (2) storey shared basement carparks (west and east block). Basements 1 and 2 (East) comprising of 146 parking bays each, while Basements 1 and 2 (West) comprising of 144 and 148 parking bays, respectively.
- Ground level carpark with 129 parking bays, recreation, lobbies, active use, gym, retail, office and residential.
- Level 2 podium level recreation (pool), amenities, residents lounge and games room, lobby and residential;
- Level 3 to Level 13 residential units; and
- Rooftop decks with mechanical plant (hot water, solar PV panels) and roof terrace.

The site, floor plans and elevations of the proposed development 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 locations are as follows: • Location 1 (Road Traffic Noise): 27°57'44.0"S 153°23'23.4"E; • Location 2 (Background): 27°57'42.0"S 153°23'21.5"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); • Environmental noise logger – ARL Ngara (Serial No. #87805E); and • 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.

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

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

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
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
11 June 2024 (Tue)	62.3	65.2	50.7	41.3
12 June 2024 (Wed)	61.7	65.0	50.2	42.0

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)
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**

The results of the unattended noise measurements relevant for the **operational noise** impact assessment carried out at 1 Clarke Street, Southport from 6 to 16 June 2024 are presented in Table 2.3.

Table 2.3 Operational Noise Measurement Results

Date	Background noise levels dB(A)			Assessment Background Levels (ABL) dB(A)		
	$L_{90,11hr}$ day (7am–6pm)	$L_{90,4hr}$ evening (6pm–10pm)	$L_{90,9hr}$ night (10pm–7am)	$L_{90,11hr}$ day (7am–6pm)	$L_{90,4hr}$ evening (6pm–10pm)	$L_{90,9hr}$ night (10pm–7am)
6 June 2024 (Thu)	—	48	42	—	48	37
7 June 2024 (Fri)	49	47	43	47	45	39
8 June 2024 (Sat)	49	48	43	48	48	39
9 June 2024 (Sun)	48	48	44	47	47	38
10 June 2024 (Mon)	49	49	44	46	48	39
11 June 2024 (Tue)	48	48	41	46	46	35
12 June 2024 (Wed)	49	48	43	47	46	37
13 June 2024 (Thu)	50	50	45	49	49	39
Arithmetic average	**49**	**48**	**43**	—	—	—
Rating Background Level (RBL)				**47**	**47**	**38**

**Data for periods of inclement weather were disregarded in determination of average noise levels.*

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 3.0 (February 2022), 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 2035), 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 2022), 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:
	  ○ 2022 AADT of 46,819 vehicles per day;
	  ○ 4.3% heavy vehicles; and
	  ○ 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]:
	  ○ Adjustment of -1.7 dB was applied to the calculated façade traffic noise levels;
	  ○ 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 6 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 (%)
	2022 AADT	2024 AADT	2035 AADT (10-Year Planning Horizon)	
Smith Street	46,819	47,760	53,284	4.3%

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 2022. 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	65.0	+2.6

**Free field*

The free-field calculated traffic noise level is overpredicting the measured traffic noise levels by 2.6dB(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 2035) with no additional correction factor.

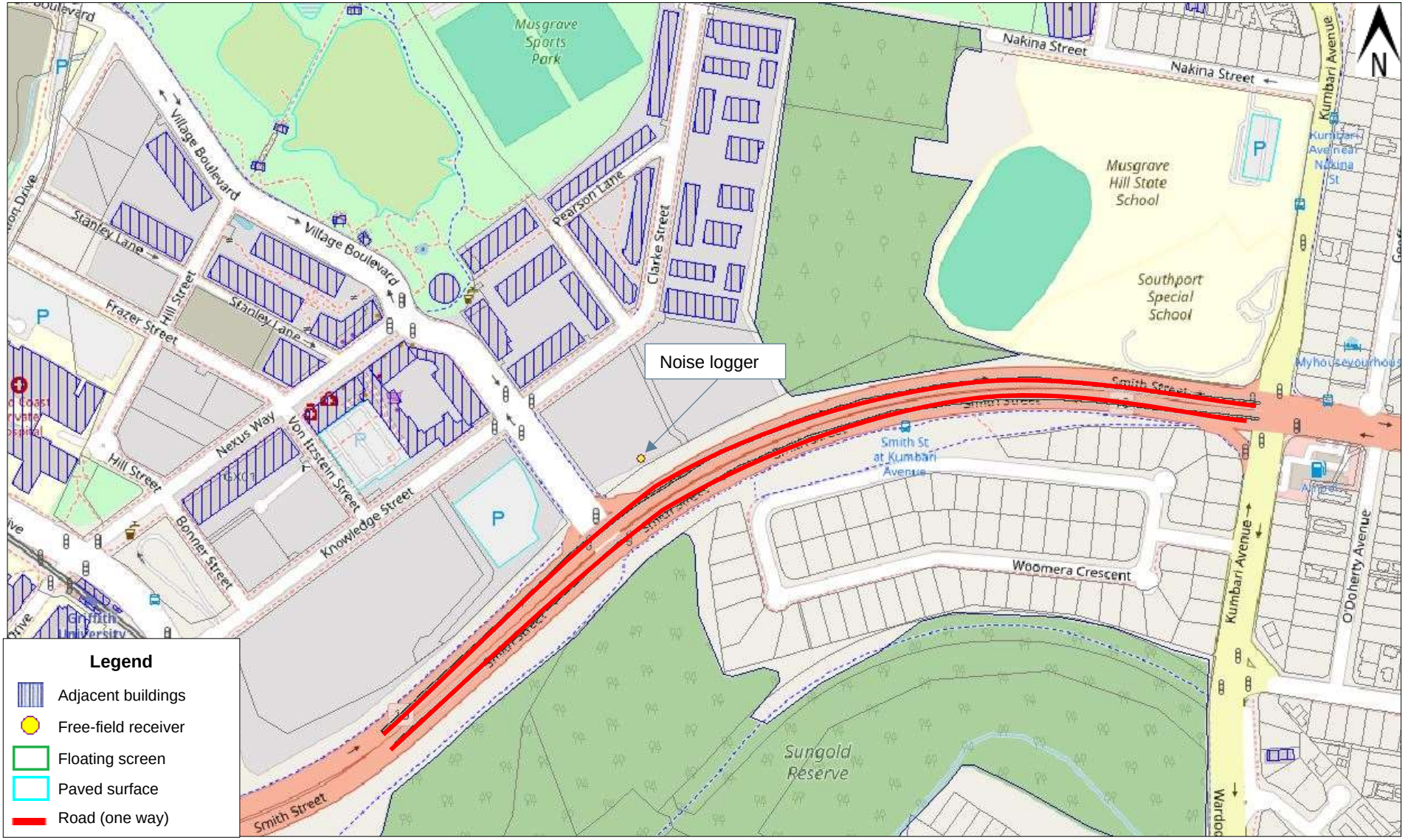

Figure 3.1 3D Traffic Noise Model – SoundPLAN Excerpt – Model Validation

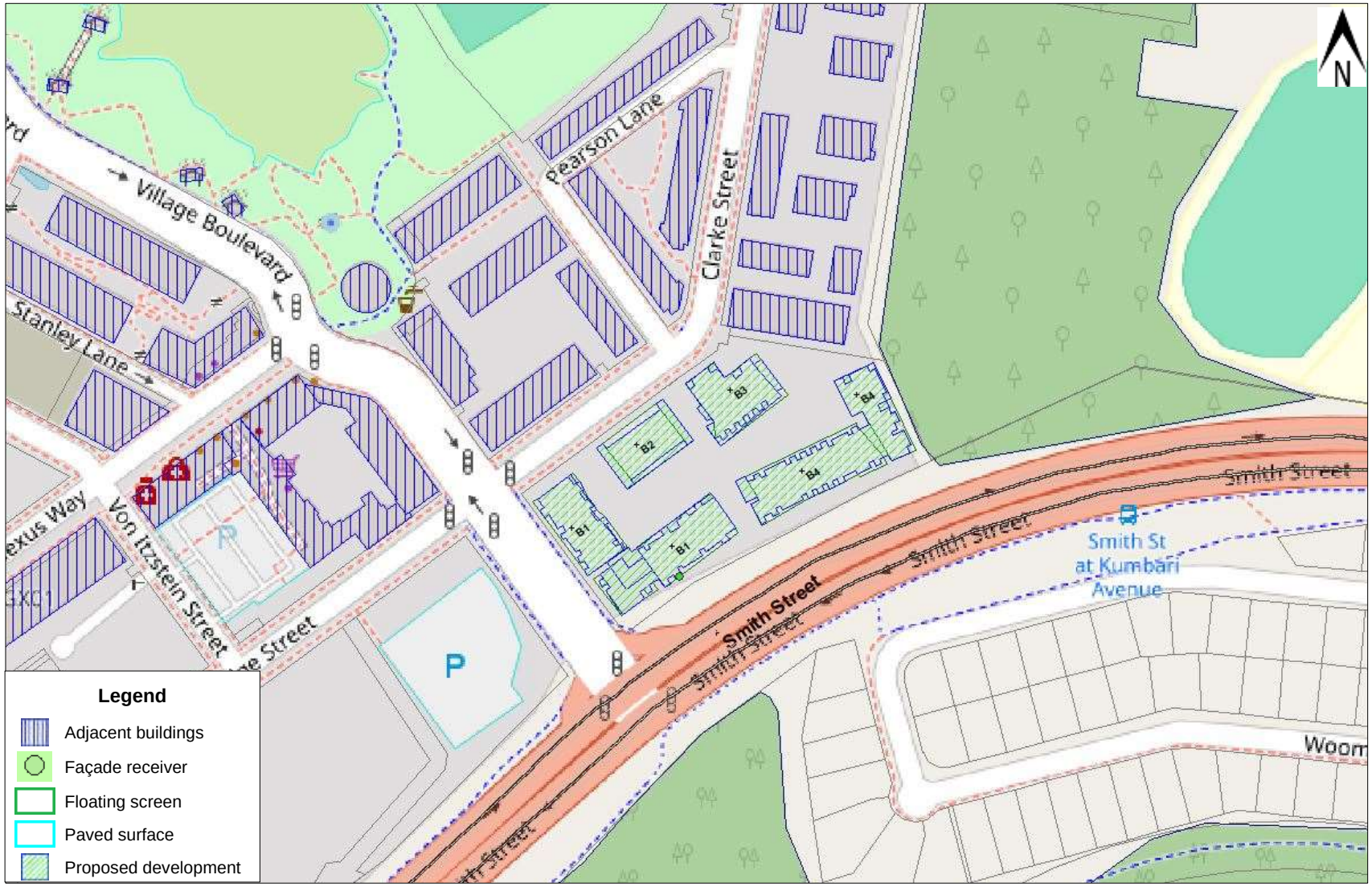

Figure 3.2 3D Traffic Noise Model – SoundPLAN Excerpt – Future Traffic Prediction (2035)

3.6 Traffic Noise Calculation Results

Based on the results from the road traffic noise modelling, Buildings 2 and 3 are not affected by road traffic noise and the noise category is reflective of QDC MP4.4 Noise Category 0. Therefore, Buildings 2 and 3 can be excluded from the road traffic noise impact assessment.

QDCMP4.4 Noise Categories, as applicable to each of the proposed buildings (Buildings 1 and 4), are presented in Table 3.7.

Noise contours showing the propagation of traffic noise across the development site are presented in Appendix G.

Table 3.7 QDCMP4.4 Noise Categories – Buildings façades

Building No.	Floor	Façade Orientation	Noise Category QDC MP4.4
1	Ground Floor	SW	Noise Category 2
		SE	Noise Category 2
		NE	Noise Category 2
		NW	Noise Category 0
	Level 2	SW	Noise Category 3
		SE	Noise Category 3
		NE	Noise Category 3
		NW	Noise Category 0
	Level 3	SW	Noise Category 3
		SE	Noise Category 3
		NE	Noise Category 3
		NW	Noise Category 0
	Level 4	SW	Noise Category 3
		SE	Noise Category 3
		NE	Noise Category 3
		NW	Noise Category 0
	Level 5	SW	Noise Category 3
		SE	Noise Category 3
		NE	Noise Category 3
		NW	Noise Category 0
	Level 6	SW	Noise Category 3
		SE	Noise Category 3
		NE	Noise Category 3

Building No.	Floor	Façade Orientation	Noise Category QDC MP4.4
		NW	Noise Category 0
	Level 7	SW	Noise Category 3
		SE	Noise Category 3
		NE	Noise Category 3
		NW	Noise Category 0
	Level 8	SW	Noise Category 3
		SE	Noise Category 3
		NE	Noise Category 3
		NW	Noise Category 0
	Level 9	SW	Noise Category 3
		SE	Noise Category 3
		NE	Noise Category 3
		NW	Noise Category 0
	Level 10	SW	Noise Category 3
		SE	Noise Category 3
		NE	Noise Category 3
		NW	Noise Category 0
	Level 11	SW	Noise Category 3
		SE	Noise Category 3
		NE	Noise Category 3
		NW	Noise Category 0
	Level 12	SW	Noise Category 3
		SE	Noise Category 3
		NE	Noise Category 3
		NW	Noise Category 0
	Level 13	SW	Noise Category 3
		SE	Noise Category 3
		NE	Noise Category 3
		NW	Noise Category 1

Building No.	Floor	Façade Orientation	Noise Category QDC MP4.4
4	Level 2	SE	Noise Category 3
		SW	Noise Category 3
		NE	Noise Category 0
		NW	Noise Category 0
	Level 3	SE	Noise Category 3
		SW	Noise Category 3
		NE	Noise Category 2
		NW	Noise Category 0
	Level 4	SE	Noise Category 3
		SW	Noise Category 3
		NE	Noise Category 3
		NW	Noise Category 0
	Level 5	SE	Noise Category 3
		SW	Noise Category 3
		NE	Noise Category 3
		NW	Noise Category 0
	Level 6	SE	Noise Category 3
		SW	Noise Category 3
		NE	Noise Category 3
		NW	Noise Category 0
	Level 7	SE	Noise Category 3
		SW	Noise Category 3
		NE	Noise Category 3
		NW	Noise Category 0
	Level 8	SE	Noise Category 3
		SW	Noise Category 3
		NE	Noise Category 3
		NW	Noise Category 0
	Level 9	SE	Noise Category 3
		SW	Noise Category 3
		NE	Noise Category 3

Building No.	Floor	Façade Orientation	Noise Category QDC MP4.4
		NW	Noise Category 0
	Level 10	SE	Noise Category 3
		SW	Noise Category 3
		NE	Noise Category 2
		NW	Noise Category 0
	Level 11	SE	Noise Category 3
		SW	Noise Category 3
		NE	Noise Category 2
		NW	Noise Category 0
	Level 12	SE	Noise Category 3
		SW	Noise Category 3
		NE	Noise Category 2
		NW	Noise Category 0
	Level 13	SE	Noise Category 3
		SW	Noise Category 3
		NE	Noise Category 2
		NW	Noise Category 1

The calculated road traffic noise levels at the private open spaces, for each of the building façades are presented in Table 3.8.

Table 3.8 Traffic Noise Levels – Private and Communal Open Spaces

Building	Floor	Façade	Receiver	Traffic Noise Level $L_{10,18hr}$ dB(A)*	Compliance with ≤60dB(A) $L_{10,18hr}$ criterion?
1	GF	/	/	/	/
	L2	SE	Building 1_L2	67.5	No
	L3	SE	Building 1_L3	68.3	No
	L4	SE	Building 1_L4	68.5	No
	L5	SE	Building 1_L5	68.5	No
	L6	SE	Building 1_L6	68.3	No
	L7	SE	Building 1_L7	68.1	No
	L8	SE	Building 1_L8	67.8	No
	L9	SE	Building 1_L9	67.5	No
	L10	SE	Building 1_L10	67.2	No

Building	Floor	Façade	Receiver	Traffic Noise Level $L_{10,18hr}$ dB(A)*	Compliance with ≤60dB(A) $L_{10,18hr}$ criterion?
	L2	SW	Building 1_L2	62.1	No
	L3	SW	Building 1_L3	62.9	No
	L4	SW	Building 1_L4	63.6	No
	L5	SW	Building 1_L5	63.7	No
	L6	SW	Building 1_L6	63.8	No
	L7	SW	Building 1_L7	63.7	No
	L8	SW	Building 1_L8	63.6	No
	L9	SW	Building 1_L9	63.4	No
	L10	SW	Building 1_L10	63.2	No
	L2	NW	Building 1_L2	37.3	Yes
	L3	NW	Building 1_L3	37.1	Yes
	L4	NW	Building 1_L4	37.1	Yes
	L5	NW	Building 1_L5	37.0	Yes
	L6	NW	Building 1_L6	37.0	Yes
	L7	NW	Building 1_L7	37.6	Yes
	L8	NW	Building 1_L8	39.3	Yes
	L9	NW	Building 1_L9	42.0	Yes
	L10	NW	Building 1_L10	45.6	Yes
4	GF	/	/	/	/
	L2	NE	Building 4_L2	60.2	No
	L3	NE	Building 4_L3	60.3	No
	L4	NE	Building 4_L4	65.5	No
	L5	NE	Building 4_L5	66.4	No
	L6	NE	Building 4_L6	66.0	No
	L7	NE	Building 4_L7	65.5	No
	L8	NE	Building 4_L8	65.1	No
	L9	NE	Building 4_L9	64.5	No
	L10	NE	Building 4_L10	63.7	No
	L11	NE	Building 4_L11	63.2	No
	L12	NE	Building 4_L12	62.8	No
	L13	NE	Building 4_L13	60.2	No
	GF	/	/	/	/
	L2	SE	Building 4_L2	64.6	No

Building	Floor	Façade	Receiver	Traffic Noise Level $L_{10,18hr}$ dB(A)*	Compliance with ≤60dB(A) $L_{10,18hr}$ criterion?
	L3	SE	Building 4_L3	65.8	No
	L4	SE	Building 4_L4	65.8	No
	L5	SE	Building 4_L5	65.6	No
	L6	SE	Building 4_L6	65.1	No
	L7	SE	Building 4_L7	64.5	No
	L8	SE	Building 4_L8	63.7	No
	L9	SE	Building 4_L9	62.9	No
	L10	SE	Building 4_L10	61.9	No
	L11	SE	Building 4_L11	60.5	No
	L12	SE	Building 4_L12	59.8	Yes
	L13	SE	Building 4_L13	59.7	Yes
	GF	/	/	/	/
	L2	NW	Building 4_L2	43.0	Yes
	L3	NW	Building 4_L3	38.1	Yes
	L4	NW	Building 4_L4	37.9	Yes
	L5	NW	Building 4_L5	37.8	Yes
	L6	NW	Building 4_L6	37.6	Yes
	L7	NW	Building 4_L7	37.5	Yes
	L8	NW	Building 4_L8	37.4	Yes
	L9	NW	Building 4_L9	37.3	Yes
	L10	NW	Building 4_L10	37.0	Yes
	L11	NW	Building 4_L11	38.1	Yes
	L12	NW	Building 4_L12	40.3	Yes
	L13	NW	Building 4_L13	44.1	Yes

**Free-field*

4. Operational Noise Impact Assessment

One of the acoustic constraints on the establishment of the development at 1 Clarke Street are potential noise impacts from the proposed development on the nearest noise sensitive places.

As per the EDQ standards and in accordance with *Parklands PDA* the proposed development must ensure adequate visual and noise amenity.

4.1 Nearest Noise Sensitive Places

The nearest noise sensitive land uses to the subject site are a mixture of mid-rise residential apartment buildings. The noise sensitive places are presented in Table 4.1.

Table 4.1 Nearest Noise Sensitive Places

Property Description	Street Address	Zoning	Current / Approved Use
Lot 6 SP275512	15 Clarke Street	Special Purpose (PDA)	Residential apartment buildings
Lot 5 SP275512	1 Perkins Lane	Special Purpose (PDA)	Residential apartment buildings
Lot 43 SP311808	15 Village Boulevard	Special Purpose (PDA)	Residential apartment buildings
Lot 31 SP311807	2 Nexus Way	Special Purpose (PDA)	Residential apartment buildings

The nearest noise sensitive places are identified in Figure 4.1, overlaid over the zoning map from the *Gold Coast City Plan Version 11*.

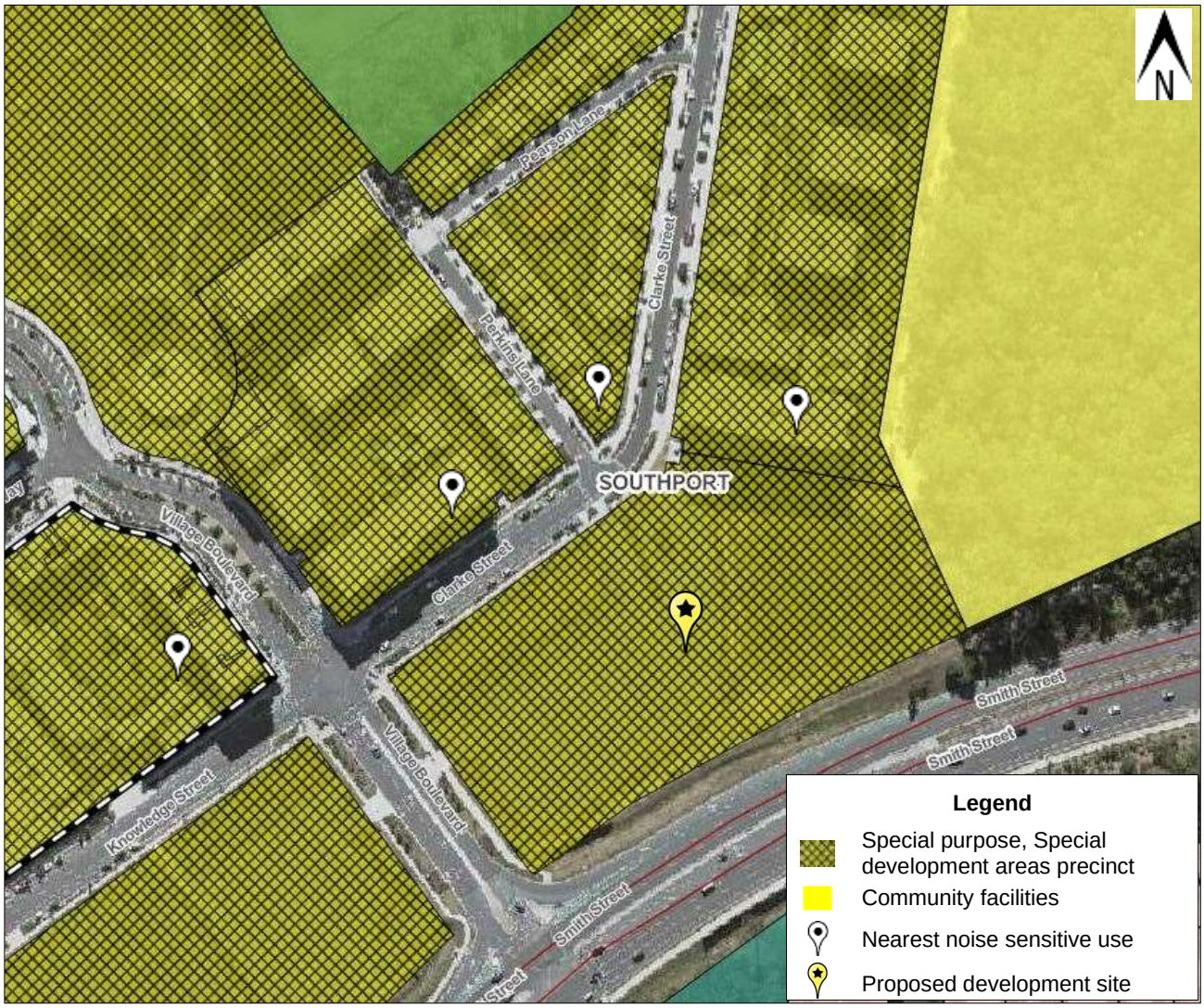

Figure 4.1 Nearest Noise Sensitive Places

4.2 Noise Criteria

4.2.1 Environmental Protection (Noise) Policy 2019

Acoustic Quality Objectives

The *Environmental Protection (Noise) Policy 2019* identifies environmental values for the acoustic environment and sets acoustic quality objectives for sensitive receptors. The purpose of the acoustic quality objectives is to protect the acoustic amenity of the environment.

The criteria from Schedule 1 of the policy are presented in Table 4.2.

Table 4.2 Environmental Noise Criteria

Sensitive Receptor	Location	Period	Acoustic Quality Objectives			Environmental Value
			$L_{Aeq,adj,1\text{-}hr}$	$L_{A10,adj,1\text{-}hr}$	$L_{A01,adj,1\text{-}hr}$	
Dwelling	Indoors	Daytime and evening	35	40	45	Health and wellbeing
		Night-time	30	35	40	Health and wellbeing, in relation to the ability to sleep
	Outdoors	Daytime and evening	50	55	65	Health and wellbeing
		Night-time	37 (30 + 7)	42 (35 + 7)	47 (40 + 7)	Health and wellbeing, in relation to the ability to sleep

The following is noted regarding the acoustic quality objectives:

- Under the *Noise Policy*, daytime is 7am to 6pm, evening is 6pm to 10pm and nighttime is 10pm to 7am.
- The *Noise Policy* does specify outdoor noise criteria for dwellings during night-time, or for commercial uses. However, the outdoor noise criteria have been derived from the internal criteria, assuming 7dB noise reduction by the building envelope with windows open[6].
- The assessment of compliance with the operational noise criteria is based on the results of the noise propagation modelling for a period of 1 hour with maximum noise emissions.

Background Creep

Controlling background creep[7] is an important consideration under the Noise Policy and the background creep criteria states the following:

> *To the extent that it is reasonable to do so, noise from an activity must not be*
>
> – *For noise that is continuous noise measured by $L_{A90,T}$ – more than nil dB(A) greater than the existing acoustic environment measured by $L_{A90,T}$.*

[6] Typical noise reduction for windows partially open, *Planning for Noise Control Guideline*, Dept. of Environment and Science (DES).

[7] Background creep is defined as an increase in the background noise levels due to constant addition of new noise source in the environment. To prevent increase in the background noise level ($L_{90,T}$), which is the main noise amenity descriptor, the Policy has stated noise limits which have to be complied with.

– *For noise that varies over time measured by $L_{Aeq,adj,T}$ – more than 5dB(A) greater than the existing acoustic environment measured by $L_{A90,T}$.*

The background creep criteria, based on the existing rating background levels presented in Table 2.3, are presented in Table 4.3.

Table 4.3 Background Creep Noise Criteria

Noise Characteristic	Background Creep Criteria, $L_{Aeq,adj,T}$		
	Day 7:00am – 6:00pm	**Evening 6:00pm – 10:00pm**	**Night 10:00pm – 7:00am**
Continuous noise	**47** (RBL + 0)	**47** (RBL + 0)	**38** (RBL + 0)
Time-varying noise	**52** (RBL + 5)	**52** (RBL + 5)	**43** (RBL + 5)

4.2.2 Maximum Noise Level Events During Night-time

Maximum noise level (L_{max}) assessment is used for assessment of sleep disturbance during night-time.

Sleep disturbance may be caused by short duration or intermittent noise events. Sleep disturbance is addressed in the *Night Noise Guidelines for Europe* (World Health Organization, 2009). The *Night Noise Guidelines for Europe* states that the likelihood of awakening is related to the maximum instantaneous noise levels (L_{Amax}), ambient noise levels and number of events during night-time. As a rule, in planning for short-term or transient noise events, for good sleep over eight hours, the indoor sound pressure level measured as a maximum instantaneous value should not exceed approximately 45dB(A) L_{max} more than 10-15 times per night. The corresponding external noise criteria is 52dB(A) L_{max} assuming windows partially open and 65dB(A) L_{max} assuming windows closed.

The sleep disturbance noise criteria are presented in Table 4.4.

Table 4.4 Noise criteria – Sleep disturbance

Sensitive receptor	Windows	Sleep disturbance criteria, L_{Amax}
		10:00pm to 7:00am
Dwelling, outdoors	Windows partially open	**52** (45 + 7)
	Windows closed	**65** (45 + 20)

The noise source at the proposed development with potential to generate the highest noise levels during night-time is a car door slam. A car door slam is a short duration, intermittent noise event which should be measured with L_{Amax} in accordance with the Noise Measurement Manual 2020.

4.3 Noise Propagation Modelling

4.3.1 Modelling Methodology

A 3D model of the site and surroundings was developed using SoundPLAN noise propagation software considering the proposed activities at the development and location relative to the nearest noise sensitive places.

The calculations were carried out as per the procedures specified in the International Standard ISO9613 (*Acoustics – Attenuation of sound during propagation outdoors*).

The calculation method for a single frequency is as follows:

$$L_S = [\ L_W + K_0\ ] - [\ A_{dI} + A_{div} + A_{gr} + A_{bar} + A_{atm} + d_{Lrefl} + d_{Lw}\ ]$$

Where:

L_S	Sound pressure for a single frequency
L_W	Sound power of source
K_0	Correction for propagation in limited spatial angle
A_{DI}	Mean directivity correction
A_{div}	Mean attenuation due to geometrical spreading
A_{gr}	Mean attenuation due to ground effect
A_{bar}	Mean attenuation due to screening
A_{atm}	Mean attenuation due to air absorption
d_{Lrefl}	Level increase due to reflections
d_{Lw}	Correction due to source operation time

The noise propagation losses are calculated as a combination of distance attenuation (geometrical spreading), screening, ground attenuation and other factors. More details are shown in Appendix I.

The results of noise modelling as per ISO9613 are in terms of L_{eq}. A conversion factor was applied to L_{eq} to obtain results in terms of the other assessment criteria L_{10} and L_{01}. The conversion factors are presented in Table 4.5.

Table 4.5 Noise Descriptor Conversion Factors

Type of Noise	Conversion Factors	
	L_{eq} to L_{10}	L_{eq} to L_{01}
Non-continuous noise	$L_{10} = L_{eq} + 3$ dB	$L_{01} = L_{eq} + 8$ dB
Continuous noise	$L_{10} = L_{eq}$	$L_{01} = L_{eq}$

The parameters and assumptions considered in the 3D noise propagation model are described in Table 4.6.

Table 4.6 Data and Assumptions – Operational Noise Model

Terrain	• Department of Natural Resources and Mines Airborne Laser Scanning (LiDAR) 1 metre data was used to determine the elevation of the development relative to the surrounds. • Ground surface absorption factor of 0 was applied to all paved surfaces and 1 for all grassed areas.
Buildings	• The proposed residential proposed development was included in the model along with neighbouring buildings. • Development plans are included in Appendix A.
Noise Sources	• Refer to Section 4.3.2 of this report.
Receivers	• Receivers were attached to the façades of the noise sensitive buildings 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. • 5m grid spacing was used for calculation of noise contour maps.
Noise Mitigation Measures	• The recommended noise control measures are discussed in Section 6 of this report.
Distance Attenuation	• 3D model of the subject site and surroundings was developed using cadastral and survey data using SoundPLAN software. The source-receiver distances and geometrical spreading are automatically calculated in SoundPLAN to a high level of accuracy in accordance with the ISO9613 procedure. • Separation distances and distance attenuation values are presented in Appendix H.
Barrier Attenuation / Screening	• Screening by walls and roofs was considered in the model. The screening was calculated in SoundPLAN in accordance with the ISO9613 procedure. • Barrier attenuation / screening values are presented in Appendix H.
Ground Attenuation	• Sound reflecting surfaces such as pavement are modelled with ground absorption coefficient of 0 (no absorption). Grassed and vegetated areas were modelled with ground absorption coefficient of 1 (100% absorption) in accordance with ISO9613. • Ground attenuation values are presented in Appendix H.

4.3.2 Noise Sources

The sound power levels, tonality/impulsiveness adjustment factors, and the operational scenarios for all noise sources considered in the model are presented in Table 4.7.

Table 4.7 Operational Noise Sources

Operational Noise Source	Location	Sound Power Level dB(A) (re 10^{-12}W)	Operational Scenario	Tonality/ Impulsiveness
4x AHU	Rooftop at B1, B2, B3, and B4	2 cooling towers with sound power of 89 dB(A) per unit. ATP Library: AHU Unit (area source)	Continuous Use – 24 hours a day	+5dB for tonality
Proposed vehicle movements	Podium Driveways x2	90dB(A) ATP Library: Car slowly accelerating 10-20km/h (line source)	Daytime (7:00am to 6:00pm) – 50 car movements per hour. Evening (6:00pm to 10:00pm) – 30 car movements per hour. Night-time (10:00pm to 7:00am) – 10 car movements per hour.	n/a
Carpark	Ground level	SoundPLAN calculates[8] noise emissions from parking areas based on the number of parking bays, surface type, and the type of parking lot, and considers the impact noise of a car door closing – 'slam'. The data input for the car parks is as follows: – No. parking bays: 132 – Surface type: Concrete paving Parking lot type: Staff and visitors	Daytime (7:00am to 6:00pm) – 50 car movements per hour. Evening (6:00pm to 10:00pm) – 30 car movements per hour. Night-time (10:00pm to 7:00am) – 10 car movements per hour.	+5dB for impulsiveness
Human voices	L2 Podium	The sound power of 30 people congregating is 86.5dB(A)[9] (area source).	Total of 30 people per hour daytime, evening and nighttime.	n/a
Delivery/Refuse truck – loading	Loading and Refuse bays at ground level	92dB(A) ATP Library: Refuse Wagon Loading (point source x 2)	Delivery and refuse collection 20 seconds between 7:00am and 8:00am.	+5dB for impulsiveness

Excerpt from the 3D noise propagation model developed in Sound PLAN is presented in Figure 4.2, and 4.3.

[8] SoundPLAN uses the methodology of the Bavarian parking lot study (2007) to calculate car park noise emissions. (Bavarian State Agency for the Environment 2007, *Parking Area Noise*, 6th Edition, Bavarian State Ministry for the Environment, Germany).

[9] Hayne, M.J., 2011, Prediction of noise from small to medium sized crowds, Proceedings of ACOUSTICS 2011

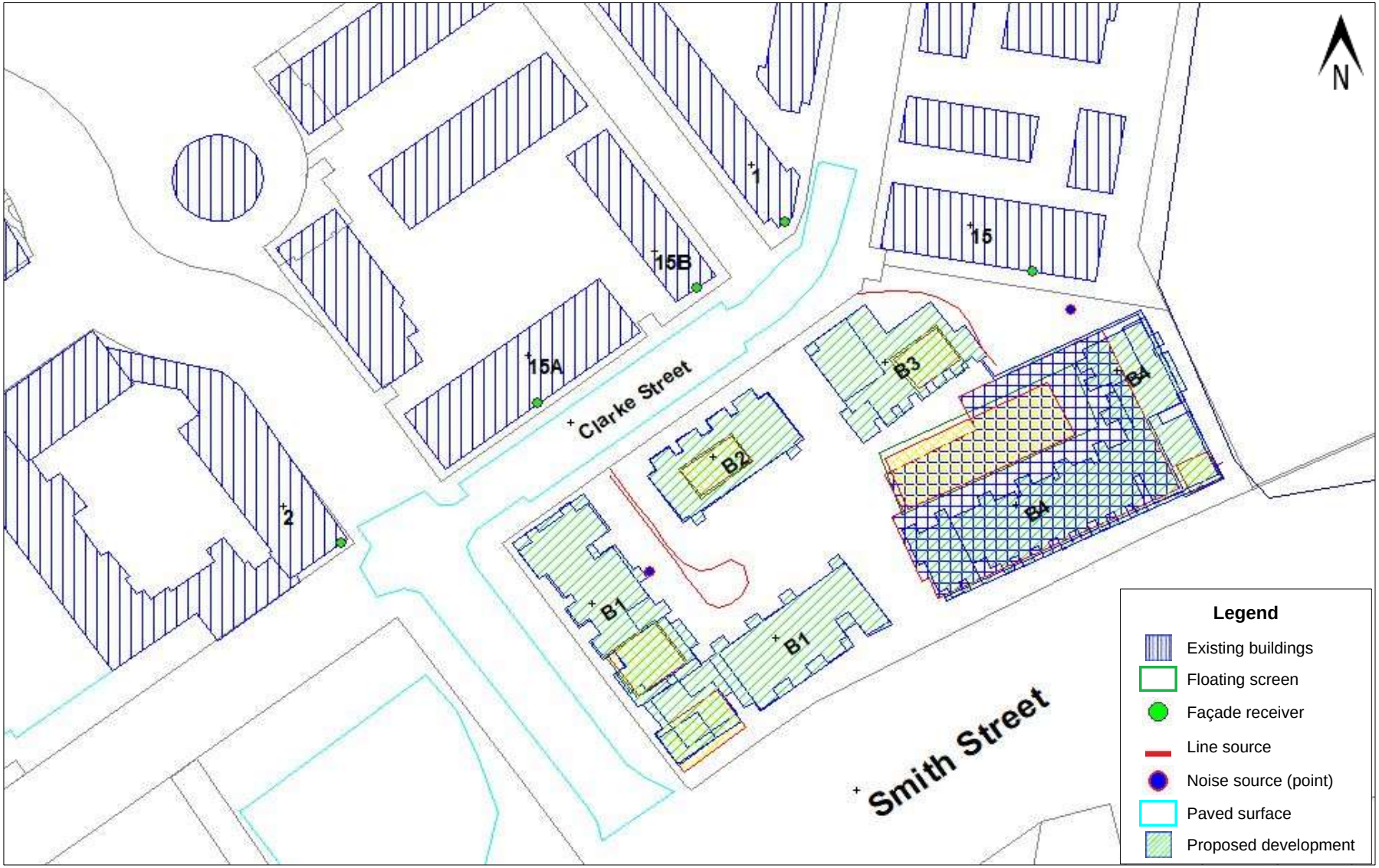

Figure 4.2 3D Operational Noise Model – SoundPLAN Excerpt

Figure 4.3 3D Operational Noise Model – SoundPLAN Excerpt 3D view

5. Discussion and Recommendations

5.1.1 EPP 2019 – Acoustic Quality Objectives

The highest calculated noise levels at the most exposed façades of the nearest noise sensitive places, relative to the acoustic quality objectives, are presented in Table 5.1.

Table 5.1 Operational Noise Levels – Acoustic Quality Objectives

Receiver Name	Calculated Noise Levels									Complies with noise criteria?
	$L_{eq,adj,1hr}$ Day dB(A)	$L_{eq,adj,1hr}$ Evening dB(A)	$L_{eq,adj,1hr}$ Night dB(A)	$L_{10,adj,1hr}$ Day dB(A)	$L_{10,adj,1hr}$ Evening dB(A)	$L_{10,adj,1hr}$ Night dB(A)	$L_{01,adj,1hr}$ Day dB(A)	$L_{01,adj,1hr}$ Evening dB(A)	$L_{01,adj,1hr}$ Night dB(A)	
EPP Noise 2019 Acoustic quality objectives (external criteria) for dwellings:	*50*	*50*	*37*	*55*	*55*	*42*	*65*	*65*	*47*	
1 Perkins Lane	38	37	31	40	39	33	46	45	39	Yes
15 Clarke Street	45	44	37	47	46	39	53	52	45	Yes
15A Village Boulevard	42	40	37	44	42	39	50	48	45	Yes
15B Village Boulevard	40	39	36	42	41	38	48	47	44	Yes
2 Nexus Way	35	34	32	37	36	34	43	42	40	Yes

5.1.2 EPP 2019 – Background Creep Criteria

The highest calculated noise levels at the most exposed façades of the nearest noise sensitive places, relative to the background creep criteria, are presented in Table 5.2.

Table 5.2 Operational Noise Levels – Background Creep Criteria

Receiver name	Calculated noise levels			Complies with noise criteria?
	$L_{eq,adj,15min}$ day dB(A)	$L_{eq,adj,15min}$ evening dB(A)	$L_{eq,adj,15min}$ night dB(A)	
EPP Noise 2019 background creep (external criteria):				
Continuous noise	*47*	*47*	*38*	
Time-varying noise	*52*	*52*	*43*	
1 Perkins Lane	38	37	31	Yes
15 Clarke Street	45	44	37	Yes
15A Village Boulevard	42	40	37	Yes
15B Village Boulevard	40	39	36	Yes
2 Nexus Way	35	34	32	Yes

5.1.3 Detailed Results – Individual Noise Sources

Detailed results are presented in Table 5.3, showing the noise levels associated with each noise source and assessment of compliance against the acoustic quality objectives (with time interval of T = 1hr) and background creep criteria (with time interval of T = 15min).

The calculation parameters listed in Table 5.3 are in accordance with the calculation procedure of ISO9613.

Table 5.3 presents the calculated noise levels at the nearest receptors of different type which are most exposed to noise from the proposed development. The receptors include:

- 15 Clarke Street – Third floor façades (Southern elevation)
- 15A Village Boulevard – Seventh floor façades (Southern elevation)

Full tabulated results of the operational noise assessment are presented in Appendix H, and noise contour maps, showing the propagation of the noise emissions from the proposed development on the most affected floor level, are presented in Appendix I.

Table 5.3 Operational noise levels – Detailed results

Receiver:																	Compliance: Acoustic quality objectives T = 1 hour									Compliance: Background creep T = 15min								
15 Clarke Street, F 3 S																	Day (7am-6pm)			Evening (6pm-10pm)			Night (10pm-7am)			Day (7am-6pm)			Evening (6pm-10pm)			Night (10pm-7am)		
Source	Source type	Sound power per m, m²: L'w dB(A)	Total sound power: Lw dB(A)	Size of source: l or A m,m²	Correction for source impulsiveness: KI dB	Correction for source tonality: KT dB	Correction for propagation in limited spacial angle: Ko dB	Distance source - receiver: S m	Mean attenuation due to geometrical spreading: Adiv dB	Mean attenuation due to ground effect: Agr dB	Mean attenuation due to screening: Abar dB	Mean attenuation due to air absorption: Aatm dB	Mean attenuation due to foliage, industrial areas and building areas: Amisc dB	Mean directivity correction: ADI	Level increase due to reflections: dLrefl dB	Unassessed sound pressure level at receiver: Ls dB(A)	Correction due to source operation time: dLw dB	Assessed sound pressure level for time slice: Lr dB(A)	Compliance	Correction due to source operation time: dLw dB	Assessed sound pressure level for time slice: Lr dB(A)	Compliance	Correction due to source operation time: dLw dB	Assessed sound pressure level for time slice: Lr dB(A)	Compliance	Correction due to source operation time: dLw dB	Assessed sound pressure level for time slice: Lr dB(A)	Compliance	Correction due to source operation time: dLw dB	Assessed sound pressure level for time slice: Lr dB(A)	Compliance	Correction due to source operation time: dLw dB	Assessed sound pressure level for time slice: Lr dB(A)	Compliance
																			50			50			37			52			52			43
Delivery truck loading	Point	92	92	0	5	0	0	141	-54	-1	-17	-1	0	0	10	29	-26	9	Yes	n/a	0	Yes	n/a	0	Yes	-21	13	Yes	n/a	0	Yes	n/a	0	Yes
Internal Driveway North	Line	47	64	51	0	0	0	32	-41	-2	0	0	0	0	1	22	17	39	Yes	15	37	Yes	10	32	Yes	17	39	Yes	15	37	Yes	10	32	Yes
Internal Driveway South	Line	50	71	121	0	0	0	132	-53	-3	-12	0	0	0	5	8	17	25	Yes	15	23	Yes	10	18	Yes	17	25	Yes	15	23	Yes	10	18	Yes
Patron noise_L2 podium	Area	57	87	871	0	0	0	53	-45	0	0	0	0	0	1	42	0	42	Yes	0	42	Yes	n/a	0	Yes	0	42	Yes	0	42	Yes	n/a	0	Yes
Patrons_rooftop	Area	57	82	307	0	0	0	167	-56	0	-23	-1	0	0	14	16	0	16	Yes	0	16	Yes	n/a	0	Yes	0	16	Yes	0	16	Yes	n/a	0	Yes
Refuse truck	Point	92	92	0	5	0	0	20	-37	0	0	-1	0	0	2	55	-26	35	Yes	n/a	0	Yes	n/a	0	Yes	-21	40	Yes	n/a	0	Yes	n/a	0	Yes
Rooftop plant_B1	Area	65	89	242	0	5	0	160	-55	0	-25	-1	0	0	0	9	0	14	Yes	0	14	Yes	-2	12	Yes	0	14	Yes	0	14	Yes	-2	12	Yes
Rooftop plant_B2	Area	67	89	166	0	5	0	108	-52	0	-25	-1	0	0	4	15	0	20	Yes	0	20	Yes	-2	19	Yes	0	20	Yes	0	20	Yes	-2	19	Yes
Rooftop plant_B3	Area	67	89	167	0	5	0	46	-44	0	-22	0	0	0	3	26	0	31	Yes	0	31	Yes	-2	29	Yes	0	31	Yes	0	31	Yes	-2	29	Yes
Rooftop plant_B4	Area	70	89	86	0	5	0	81	-49	0	-20	-1	0	0	2	22	0	27	Yes	0	27	Yes	-2	26	Yes	0	27	Yes	0	27	Yes	-2	26	Yes
Ground level carpark	PLot	56	92	3574	0	0	0	55	-46	-1	-4	0	0	0	1	41	-4	37	Yes	-6	35	Yes	-11	30	Yes	-4	37	Yes	-6	35	Yes	-11	30	Yes
TOTAL																		**45**	**Yes**		**44**	**Yes**		**36**	**Yes**		**46**	**Yes**		**44**	**Yes**		**36**	**Yes**

Receiver:																	Compliance: Acoustic quality objectives T = 1 hour									Compliance: Background creep T = 15min								
15A Village Boulevard, F 7 SE																	Day (7am-6pm)			Evening (6pm-10pm)			Night (10pm-7am)			Day (7am-6pm)			Evening (6pm-10pm)			Night (10pm-7am)		
Source	Source type	Sound power per m, m²: Lw dB(A)	Total sound power: Lw dB(A)	Size of source: l or A m,m²	Correction for source impulsiveness: Kl dB	Correction for source tonality: KT dB	Correction for propagation in limited spacial angle: Ko dB	Distance source - receiver: S m	Mean attenuation due to geometrical spreading: Adiv dB	Mean attenuation due to ground effect: Agr dB	Mean attenuation due to screening: Abar dB	Mean attenuation due to air absorption: Aatm dB	Mean attenuation due to foliage, industrial areas and building areas: Amisc dB	Mean directivity correction: ADI	Level increase due to reflections: dLrefl dB	Unassessed sound pressure level at receiver: Ls dB(A)	Correction due to source operation time: dLw dB	Assessed sound pressure level for time slice: Lr dB(A)	Compliance	Correction due to source operation time: dLw dB	Assessed sound pressure level for time slice: Lr dB(A)	Compliance	Correction due to source operation time: dLw dB	Assessed sound pressure level for time slice: Lr dB(A)	Compliance	Correction due to source operation time: dLw dB	Assessed sound pressure level for time slice: Lr dB(A)	Compliance	Correction due to source operation time: dLw dB	Assessed sound pressure level for time slice: Lr dB(A)	Compliance	Correction due to source operation time: dLw dB	Assessed sound pressure level for time slice: Lr dB(A)	Compliance
																			50			50			37			52			52			43
Delivery truck loading	Point	92	92	0	5	0	0	62	-47	0	0	-2	0	0	1	44	-26	23	Yes	n/a	0	Yes	n/a	0	Yes	-21	28	Yes	n/a	0	Yes	n/a	0	Yes
Internal Driveway North	Line	47	64	51	0	0	0	118	-52	-3	-3	-1	0	0	2	7	17	24	Yes	15	22	Yes	10	17	Yes	17	24	Yes	15	22	Yes	10	17	Yes
Internal Driveway South	Line	50	71	121	0	0	0	55	-46	-2	0	0	0	0	1	23	17	40	Yes	15	38	Yes	10	33	Yes	17	40	Yes	15	38	Yes	10	33	Yes
Patron noise_L2 podium	Area	57	87	871	0	0	0	126	-53	0	-22	0	0	0	7	17	0	17	Yes	0	17	Yes	n/a	0	Yes	0	17	Yes	0	17	Yes	n/a	0	Yes
Patrons_rooftop	Area	57	82	307	0	0	0	109	-52	0	-16	0	0	0	3	16	0	16	Yes	0	16	Yes	n/a	0	Yes	0	16	Yes	0	16	Yes	n/a	0	Yes
Refuse truck	Point	92	92	0	5	0	0	156	-55	-1	-22	-2	0	0	18	31	-26	10	Yes	n/a	0	Yes	n/a	0	Yes	-21	15	Yes	n/a	0	Yes	n/a	0	Yes
Rooftop plant_B1	Area	65	89	242	0	5	0	82	-49	0	-22	0	0	0	3	20	0	25	Yes	0	25	Yes	-2	24	Yes	0	25	Yes	0	25	Yes	-2	24	Yes
Rooftop plant_B2	Area	67	89	166	0	5	0	55	-46	0	-17	0	0	0	3	29	0	34	Yes	0	34	Yes	-2	33	Yes	0	34	Yes	0	34	Yes	-2	33	Yes
Rooftop plant_B3	Area	67	89	167	0	5	0	113	-52	0	-19	0	0	0	0	18	0	23	Yes	0	23	Yes	-2	22	Yes	0	23	Yes	0	23	Yes	-2	22	Yes
Rooftop plant_B4	Area	70	89	86	0	5	0	191	-57	0	-16	-1	0	0	1	17	0	22	Yes	0	22	Yes	-2	21	Yes	0	22	Yes	0	22	Yes	-2	21	Yes
Ground level carpark	PLot	56	92	3574	0	0	0	141	-54	-2	-17	0	0	0	6	24	-4	20	Yes	-6	18	Yes	-11	13	Yes	-4	20	Yes	-6	18	Yes	-11	13	Yes
TOTAL																		**42**	**Yes**		**40**	**Yes**		**37**	**Yes**		**42**	**Yes**		**40**	**Yes**		**37**	**Yes**

5.1.4 L_{max} Single Event Noise Assessment, Night-time

The calculated L_{max} noise levels at the most exposed façades of the nearest noise sensitive places, associated with car door slams at the proposed development, are presented in Table 5.4. The L_{max} noise levels are assessed against the sleep disturbance noise criterion.

Table 5.4 Operational noise levels – Lmax assessment (Car door slam)

Location	Calculated noise levels	Complies with noise criteria?
	L_{AFmax} dB(A) Night (10pm – 7am)	
Nighttime criteria for dwellings – L_{AFmax} noise levels	*52 (windows open)* *65 (windows closed)*	
1 Perkins Lane	30	Yes
15 Clarke Street	42	Yes
15A Village Boulevard	26	Yes
15B Village Boulevard	23	Yes
2 Nexus Way	16	Yes

6. Discussion and Recommendations

6.1 Road Traffic Noise Impact Assessment

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 2035).

Based on the results from the road traffic noise modelling, Buildings 2 and 3 are not affected by road traffic noise and the noise category is reflective of QDC MP4.4 Noise Category 0. Therefore, Buildings 2 and 3 can be excluded from the road traffic noise impact assessment.

As per the requirements of the SDAP State Code 1 (AO24.3), all balconies of Building 1 and Building 4 that are directly exposed to traffic noise from a state-controlled road must have a minimum 1.0m high continuous solid gap-free balustrades (other than gaps for drainage to comply with the Building Code of Australia). The units that require solid balustrades to their balconies are located on the south-eastern façade of Buildings 1 and 4, facing Smith Street and the balconies along the southern-western façade of Building 1 and north-eastern façade of Building 4.

The alignment and the location of the solid balustrades is presented in Figure 6.1.

Figure 6.1 Location of solid gap-free balustrades

It should be noted that toughened glass balustrades are acceptable if there are no gaps between the posts and no gaps to the concrete slab, except for drainage.

The façade road traffic noise criteria from State Code 1 are exceeded at the façades of the proposed Buildings 1 and 4.

As per the requirements of QDC MP4.4, the façades of Building 1 and Building 4 must be designed and constructed to prevent traffic noise impacts.

Each habitable room within Building 1 and 4 must be constructed to comply with the applicable QDCMP4.4 Noise Category, as presented in Table 3.7 and Appendix G.

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.

6.2 Operational Noise Impact Assessment

Detailed noise propagation modelling was carried out considering noise emissions from the proposed development including vehicle movements along the driveways and visitor carpark (car door slams and cars starting), mechanical plant (cooling towers), patron noise from the recreational areas, etc.

The noise levels were assessed against the relevant noise criteria at the nearest noise sensitive places, including the acoustic quality objectives and background creep criteria from the *Environmental Protection (Noise) Policy 2019*, as well as the WHO sleep disturbance (L_{max}) criteria during night-time.

To ensure ongoing protection of the noise amenity at the nearest noise sensitive places the following noise mitigation measures are recommended:

- The hours of operation for the pool and the podium recreational areas, as well as the rooftop terraces, must be limited to ensure compliance with the noise criteria.
- Delivery bays and bin collection areas must be used only during daytime.
- All mechanical plant and equipment must be appropriately located and/or acoustically screened to ensure compliance with the noise criteria at the nearest noise sensitive places, as specified in Section 4.2 of this report. To prevent noise impact from the operation of the mechanical plant, the following noise mitigation measures are recommended.
    - The preferred location for the mechanical plant is in a dedicated acoustic enclosure at the rooftop of the buildings, as indicated on the plans;
    - The acoustic enclosure must be constructed around the full perimeter of the rooftop services area (cooling towers). The top of the acoustic enclosure must be at least 1.0m above the top of the condenser units to ensure sufficient screening.
    - The acoustic enclosure must be constructed of a material with minimum surface density of 12.5kg/m2, such as autoclaved aerated concrete or minimum 9mm thick compressed fibre cement sheeting. There shall be no gaps on the surface or at the base of the acoustic enclosure.
    - The mechanical services must be isolated from the building structure using appropriate vibration isolation mounts to mitigate structure borne noise.
- It is noted that the mechanical plant, has not been selected yet. Should there be a need to locate the mechanical plant at a location other than the rooftop decks or should the mechanical equipment need to have higher combined sound power level than the value of

assumed in this assessment (90 dB(A)), then the mechanical plant and equipment need to be designed to comply with the noise criteria stated in Section 4.2 and an assessment by a qualified consultant be conducted prior to installation. The assessment should include verification that the plant and equipment installed complies with the criteria as stated in Section 4.2.

- At this stage there are not details regarding the air exhaust/intake for the basement carpark. The discharge points for the basement carpark must be located in an area facing away from the noise sensitive uses, preferably along Smith Street and Village Boulevard. Any other locations for installation of the basement exhausts may trigger acoustic assessment to demonstrate compliance with the noise criteria.
- To prevent vibration and structure-borne noise impact, the design of the gym floor must be sufficient to prevent impact transfer associated with the dropping of weights, dropping, and dragging of the ropes, and transfer of exercise machines (i.e., rowing and gym bikes) noise. The main objective of the design for the gym floor is to prevent transfer of impact to the concrete slab, thus a floor covering system with impact insulation properties must be installed. From an acoustic perspective, vibration isolation mats *GenieMat FIT* from *Pliteq* (or equivalent) as presented in Appendix J, will achieve the required vibration and structure borne attenuation required for the gym.
- In addition, the following general recommendations must be considered for the design and installation of all mechanical equipment:
    - Select equipment with low sound power levels;
    - Locate equipment as far away from noise sensitive areas as possible;
    - Construct solid acoustic screens or enclosures around equipment to screen it from noise sensitive areas;
    - Where equipment has directional noise characteristics, point equipment away from noise sensitive areas; and
    - Provide acoustic lining to inside of ventilation ducts and/or provide duct silencers.

With the recommended noise mitigation measures in place, the calculated noise levels comply with the acoustic quality objectives and the background creep criteria at all nearby noise-sensitive receptors.

7. Conclusions

This report presents the results of the following acoustic assessments:

- Road traffic noise impact assessment considering the traffic noise from the Smith Street within a 10-year planning horizon; and
- The potential noise impact from the established development on the nearest noise sensitive places in accordance with Parklands *PDA Development Scheme* and the requirements of the *Environmental Protection (Noise) Policy 2019.*

Recommendations for Traffic Noise Control

To prevent road traffic noise impacts the following noise mitigation measures are recommended:

- As per the requirements of QDC MP4.4, the proposed Building 1 and Building 4 must be designed and constructed to prevent traffic noise impacts. Each habitable room within Buildings 1 and 4 must be constructed to comply with the applicable QDCMP4.4 Noise Category, as presented in Table 3.7 and Appendix G.
- For the architectural treatment for road traffic noise to the buildings façades, ATP recommends floor plan specific acoustic design in accordance with AS3671-1989 to be carried out at the building approval (BA) stage, to ensure compliance with the internal noise criteria.
- The traffic noise modelling results indicate that the noise levels are not complying with the noise criteria at the private outdoor open spaces (balconies on the south-eastern façade of Buildings 1 and 4, facing Smith Street and the balconies along the southern-western façade of Building 1 and north-eastern façade of Building 4. The balconies of the apartments to the rear of the multi-unit buildings (north-western façades) are sufficiently protected from traffic noise impact.
- As per the requirements of the SDAP State Code 1 (AO24.3), all balconies of the proposed Building 1 and Building 4, that are directly exposed to traffic noise from a state-controlled road must have a minimum 1.0m high continuous solid gap-free balustrades (other than gaps for drainage to comply with the Building Code of Australia). The alignment and the location of the solid balustrades is presented in Figure 6.1.

Recommendations for Operational Noise Control

In addition to road traffic noise assessment, detailed noise propagation modelling was carried out considering all potential noise emissions from the proposed residential building including: - car parking, car movements, waste collection, mechanical plant (air conditioning units), and the use of the outdoor communal area.

The noise levels were assessed against the relevant noise criteria at the nearest noise sensitive places, including the acoustic quality objectives and background creep criteria from the *Environmental Protection (Noise) Policy 2019*, as well as the WHO sleep disturbance (L_{max}) criteria during night-time.

To ensure ongoing protection of the noise amenity at the nearest noise sensitive places the following noise mitigation measures are recommended:

- The hours of operation for the pool and the podium recreational areas, as well as the rooftop terraces, must be limited to ensure compliance with the noise criteria.
- Delivery bays and bin collection areas must be used only during daytime.
- All mechanical plant and equipment must be appropriately located and/or acoustically screened to ensure compliance with the noise criteria at the nearest noise sensitive places, as specified in Section 4.2 of this report. To prevent noise impact from the operation of the mechanical plant, the following noise mitigation measures are recommended.
    - The preferred location for the mechanical plant is in a dedicated acoustic enclosure at the rooftop of the buildings, as indicated on the plans;
    - The acoustic enclosure must be constructed around the full perimeter of the rooftop services area (cooling towers). The top of the acoustic enclosure must be at least 1.0m above the top of the condenser units to ensure sufficient screening.
    - The acoustic enclosure must be constructed of a material with minimum surface density of 12.5kg/m2, such as autoclaved aerated concrete or minimum 9mm thick compressed fibre cement sheeting. There shall be no gaps on the surface or at the base of the acoustic enclosure.
    - The mechanical services must be isolated from the building structure using appropriate vibration isolation mounts to mitigate structure borne noise.
- It is noted that the mechanical plant, has not been selected yet. Should there be a need to locate the mechanical plant at a location other than the rooftop decks or should the mechanical equipment need to have higher combined sound power level than the value of assumed in this assessment (90 dB(A)), then the mechanical plant and equipment need to be designed to comply with the noise criteria stated in Section 4.2 and an assessment by a qualified consultant be conducted prior to installation. The assessment should include verification that the plant and equipment installed complies with the criteria as stated in Section 4.2.
- At this stage there are not details regarding the air exhaust/intake for the basement carpark. The discharge points for the basement carpark must be located in an area facing away from the noise sensitive uses, preferably along Smith Street and Village Boulevard. Any other locations for installation of the basement exhausts will require an acoustic assessment to demonstrate compliance with the noise criteria.
- To prevent vibration and structure-borne noise impact, the design of the gym floor must be sufficient to prevent impact transfer associated with the dropping of weights, dropping, and dragging of the ropes, and transfer of exercise machines (i.e., rowing and gym bikes) noise. The main objective of the design for the gym floor is to prevent transfer of impact to the concrete slab, thus a floor covering system with impact insulation properties must be installed. From an acoustic perspective, vibration isolation mats *GenieMat FIT* from *Pliteq* (or

equivalent) as presented in Appendix J, will achieve the required vibration and structure borne attenuation required for the gym.

- In addition, the following general recommendations must be considered for the design and installation of all mechanical equipment:
    - Select equipment with low sound power levels;
    - Locate equipment as far away from noise sensitive areas as possible;
    - Construct solid acoustic screens or enclosures around equipment to screen it from noise sensitive areas;
    - Where equipment has directional noise characteristics, point equipment away from noise sensitive areas; and
    - Provide acoustic lining to inside of ventilation ducts and/or provide duct silencers.

Provided the noise mitigation measures recommended in this report are fully implemented in the detailed design and construction, there will be no further acoustic constraints on the establishment of the proposed development at 1 Clarke Street, Southport.

8. 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, February 2020, *State Development Assessment Provisions* (Version 2.6)*, 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, 2013*, 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

9. Appendices

Appendix A – Development Plans
Appendix B – Site Photos
Appendix C – Meteorological Data
Appendix D – Background Noise Measurement Results
Appendix E – Validation of CoRTN Traffic Noise Model
Appendix F – Tabulated Traffic Noise Levels
Appendix G – Traffic Noise Contour Maps
Appendix H – Tabulated Operational Noise Levels
Appendix I – Operational Noise Contours
Appendix J – Pliteq GenieMat FIT Brochure

Appendix A – Development Plans

DEVELOPMENT SUMMARY

SITE COVER (GCCC)

PODIUM SITE COVER = 7660m² (44.2%)
TOWER SITE COVER = 7996m² (46.13%)

SITE AREA = 17332m²

RETAIL & COMMERCIAL (NLA)

LEVEL	AREA
GROUND/LEVEL 01 (WEST)	233.6 m²

RESIDENTIAL AMENITY

LEVEL	INT	EXT	AREA
GROUND/LEVEL 01 (WEST)	1225.5 m²	902.8 m²	2128.3 m²
GROUND/LEVEL 01 (EAST)	158.7 m²	269.6 m²	428.3 m²
LEVEL 02/PODIUM TOP (EAST)	338.5 m²	2030.1 m²	2368.6 m²
LEVEL 12 (EAST)	0.0 m²	348.3 m²	348.3 m²
LEVEL 13 (WEST)	70.3 m²	192.7 m²	263.1 m²
ROOF (EAST)	97.4 m²	216.6 m²	314.0 m²
TOTAL	1890.4 m²	3960.2 m²	5850.6 m²

GROSS FLOOR AREA (GCCC)

LEVEL	B1	B2
GROUND/LEVEL 01 (WEST)	1535.5 m²	486.1 m²
LEVEL 02/PODIUM (WEST)	2343.8 m²	810.5 m²
LEVEL 03 (WEST)	2485.1 m²	836.0 m²
LEVEL 04 (WEST)	2485.1 m²	836.0 m²
LEVEL 05 (WEST)	2485.1 m²	836.0 m²
LEVEL 06 (WEST)	2485.1 m²	836.0 m²
LEVEL 07 (WEST)	2485.1 m²	836.0 m²
LEVEL 08 (WEST)	2485.1 m²	836.0 m²
LEVEL 09 (WEST)	2485.1 m²	836.0 m²
LEVEL 10 (WEST)	2485.1 m²	0.0 m²
LEVEL 11 (WEST)	441.5 m²	0.0 m²
LEVEL 12 (WEST)	441.5 m²	0.0 m²
LEVEL 13 (WEST)	70.8 m²	0.0 m²
TOTAL	24713.5 m²	7149.0 m²

LEVEL	B3	B4
GROUND/LEVEL 01 (EAST)	0.0 m²	0.0 m²
LEVEL 02/PODIUM TOP (EAST)	829.8 m²	1592.0 m²
LEVEL 03 (EAST)	919.7 m²	2254.8 m²
LEVEL 04 (EAST)	919.7 m²	2254.8 m²
LEVEL 05 (EAST)	919.7 m²	2254.8 m²
LEVEL 06 (EAST)	919.7 m²	2254.8 m²
LEVEL 07 (EAST)	919.7 m²	2254.8 m²
LEVEL 08 (EAST)	919.7 m²	2254.8 m²
LEVEL 09 (EAST)	919.7 m²	2254.8 m²
LEVEL 10 (EAST)	919.7 m²	2254.8 m²
LEVEL 11 (EAST)	919.7 m²	2254.8 m²
LEVEL 12 (EAST)	0.0 m²	1975.1 m²
LEVEL 13 (EAST)	0.0 m²	1975.1 m²
ROOF (EAST)	0.0 m²	80.7 m²
TOTAL	9107.0 m²	25916.4 m²

SCHEDULE OF ACCOMMODATION

BUILDING 1

LEVEL	STUDIO	1 BED	2 BED	3 BED	TOTAL
GROUND/LEVEL 01 (WEST)	1	6	0	0	7
LEVEL 02/PODIUM (WEST)	8	12	4	6	30
LEVEL 03 (WEST)	11	12	4	6	33
LEVEL 04 (WEST)	11	12	4	6	33
LEVEL 05 (WEST)	11	12	4	6	33
LEVEL 06 (WEST)	11	12	4	6	33
LEVEL 07 (WEST)	11	12	4	6	33
LEVEL 08 (WEST)	11	12	4	6	33
LEVEL 09 (WEST)	11	12	4	6	33
LEVEL 10 (WEST)	11	12	4	6	33
LEVEL 11 (WEST)	7	0	0	0	7
LEVEL 12 (WEST)	7	0	0	0	7
TOTAL	111	114	36	54	315

BUILDING 2

LEVEL	STUDIO	1 BED	2 BED	3 BED	TOTAL
GROUND/LEVEL 01 (WEST)	0	3	2	0	5
LEVEL 02/PODIUM (WEST)	7	4	3	0	14
LEVEL 03 (WEST)	7	4	3	0	14
LEVEL 04 (WEST)	7	4	3	0	14
LEVEL 05 (WEST)	7	4	3	0	14
LEVEL 06 (WEST)	7	4	3	0	14
LEVEL 07 (WEST)	7	4	3	0	14
LEVEL 08 (WEST)	7	4	3	0	14
LEVEL 09 (WEST)	7	4	3	0	14
TOTAL	56	35	26	0	117

BUILDING 3

LEVEL	STUDIO	1 BED	2 BED	3 BED	TOTAL
LEVEL 02/PODIUM TOP (EAST)	1	4	2	2	9
LEVEL 03 (EAST)	1	7	2	2	12
LEVEL 04 (EAST)	1	7	2	2	12
LEVEL 05 (EAST)	1	7	2	2	12
LEVEL 06 (EAST)	1	7	2	2	12
LEVEL 07 (EAST)	1	7	2	2	12
LEVEL 08 (EAST)	1	7	2	2	12
LEVEL 09 (EAST)	1	7	2	2	12
LEVEL 10 (EAST)	1	7	2	2	12
LEVEL 11 (EAST)	1	7	2	2	12
TOTAL	10	67	20	20	117

BUILDING 4

LEVEL	STUDIO	1 BED	2 BED	3 BED	TOTAL
LEVEL 02/PODIUM TOP (EAST)	2	11	1	4	18
LEVEL 03 (EAST)	7	14	2	6	29
LEVEL 04 (EAST)	7	14	2	6	29
LEVEL 05 (EAST)	7	14	2	6	29
LEVEL 06 (EAST)	7	14	2	6	29
LEVEL 07 (EAST)	7	14	2	6	29
LEVEL 08 (EAST)	7	14	2	6	29
LEVEL 09 (EAST)	7	14	2	6	29
LEVEL 10 (EAST)	7	14	2	6	29
LEVEL 11 (EAST)	7	14	2	6	29
LEVEL 12 (EAST)	7	11	1	6	25
LEVEL 13 (EAST)	7	11	1	6	25
TOTAL	79	159	21	70	329

TOTAL

STUDIO	1 BED	2 BED	3 BED	TOTAL
256	375	103	144	878

CARPARKING

LEVEL	VISITOR	RESIDENTIAL	TOTAL
BASEMENT 02 (WEST)	0	148	148
BASEMENT 02 (EAST)	0	147	147
BASEMENT 01 (WEST)	15	129	144
BASEMENT 01 (EAST)	0	147	147
GROUND/LEVEL 01 (WEST)	5	0	5
GROUND/LEVEL 01 (EAST)	28	103	131
LEVEL 02/PODIUM TOP (EAST)	2	0	2
TOTAL	50	674	724

BICYCLES

LEVEL	RESIDENT BIKES	VISITOR BIKES	TOTAL
AHD	0	28	28
BASEMENT 02 (WEST)	22	0	22
BASEMENT 02 (EAST)	20	0	20
BASEMENT 01 (WEST)	28	0	28
BASEMENT 01 (EAST)	20	0	20
GROUND/LEVEL 01 (WEST)	0	10	10
GROUND/LEVEL 01 (WEST)	95	0	95
GROUND/LEVEL 01 (EAST)	0	10	10
GROUND/LEVEL 01 (EAST)	102	0	102
LEVEL 02/PODIUM TOP (EAST)	0	10	10
LEVEL 02/PODIUM TOP (EAST)	38	0	38
TOTAL	325	58	383

REFUSE - BINS

LOCATION	BIN TYPE	TOTAL
	BIN 1500L	4
	BIN 2000L	5
BUILDING ONE	BIN 1100L	2
BUILDING ONE	BIN 1500L	11
BUILDING ONE	BIN 2000L	22
BUILDING TWO	BIN 1500L	2
BUILDING TWO	BIN 2000L	2

LANDSCAPING		
LEVEL	TYPE	AREA

SITE COVER DEFINITION
OF A DEVELOPMENT, THE PORTION OF THE SITE, EXPRESSED AS A PERCENTAGE, AFTER THE DEVELOPMENT IS CARIED OUT, OTHER THAN A BUILDING OR STRUCTURE, OR PART OF A BUILDING OR STRUCTURE, THAT IS:
(A) IN A LANDSCAPED OR OPEN SPACE AREA, INCLUDING, FOR EXAMPLE, A GAZEBO OR SHADE STRUCTURE; OR
(B) A BASEMENT THAT IS COMPLETELY BELOW GROUND LEVEL AND USED FOR CAR PARKING; OR
(C) THE EAVES OF A BUILDING; OR
(D) A SUN SHADE.

GROSS FLOOR AREA DEFINITION
FOR A BUILDING, THE TOTAL FLOOR AREA OF ALL STOREYS OF A BUILDING, MEASURED FROM THE OUTSIDE OF THE EXTERNAL WALLS AND THE CENTRE OF ANY COMMON WALLS OF THE BUILDING, OTHER THAN AREAS USED FOR:
(A) BUILDING SERVICES, PLANT OR EQUIPMENT; OR
(B) ACCESS BETWEEN LEVELS; OR
(C) GROUND FLOOR PUBLIC LOBBY; OR
(D) A MALL; OR
(E) PARKING, LOADING AND MANEUVERING OF VEHICLES; OR
(F) UNENCLOSED PRIVATE BALCONIES WHETHER ROOFED OR NOT.

*For preliminary feasibility purposes. Areas are not to be used for purpose of lease or sale agreements. Layouts may not comply with building regulations or other regulatory requirements. The information contained in this schedule is believed to be correct at the time of printing.

NOTES

1. INFORMATION ON CONTEXT HAS BEEN EXTRACTED FROM **GOLD COAST CITY COUNCIL** INTERACTIVE MAPPING SERVICE - TO BE CONFIRMED BY QUALIFIED SURVEYOR.

2. PROPERTY BOUNDARIES, CONTOURS AND EXISTING CONDITIONS ARE APPROXIMATE - SUBJECT TO SITE SURVEY FROM QUALIFIED SURVEYOR.

3. SUBJECT TO FURTHER TOWN PLANNING ADVICE AND TRAFFIC ENGINEERING ADVICE.

4. ALL AREAS ARE APPROXIMATE.

5. SUBJECT TO ENGINEER AND SERVICES ADVICE.

PRELIMINARY

Revisions / P1 24.07.2024 Final Draft OB

Project / **1 CLARKE STREET**
1 CLARKE STREET, SOUTHPORT

Drawing / **Development Summary**

Project No / **223256**

Author / **Author**

Scale: @ A3 / **As indicated**

Drawing No. / **TP00.01**

P1

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PRELIMINARY

Revisions

P7	28.06.2024	For Review	FC
P8	11.07.2024	Issue to Client	FC
P9	12.07.2024	Consultant Review 05	FC
P10	16.07.2024	Issue to Client	FC
P11	19.07.2024	Issue to Consultants	JS
P12	24.07.2024	Traffic & Waste	FC
P13	24.07.2024	Final Draft	OB

24/07/2024 10:41:36 PM

Project: **1 CLARKE STREET**

1 CLARKE STREET, SOUTHPORT

Drawing: **Basement 02 Plan**

Project No: **223256**

Author: **CW**

Scale: @ A3 **1 : 750**

Drawing No.: **TP01.01**

P13

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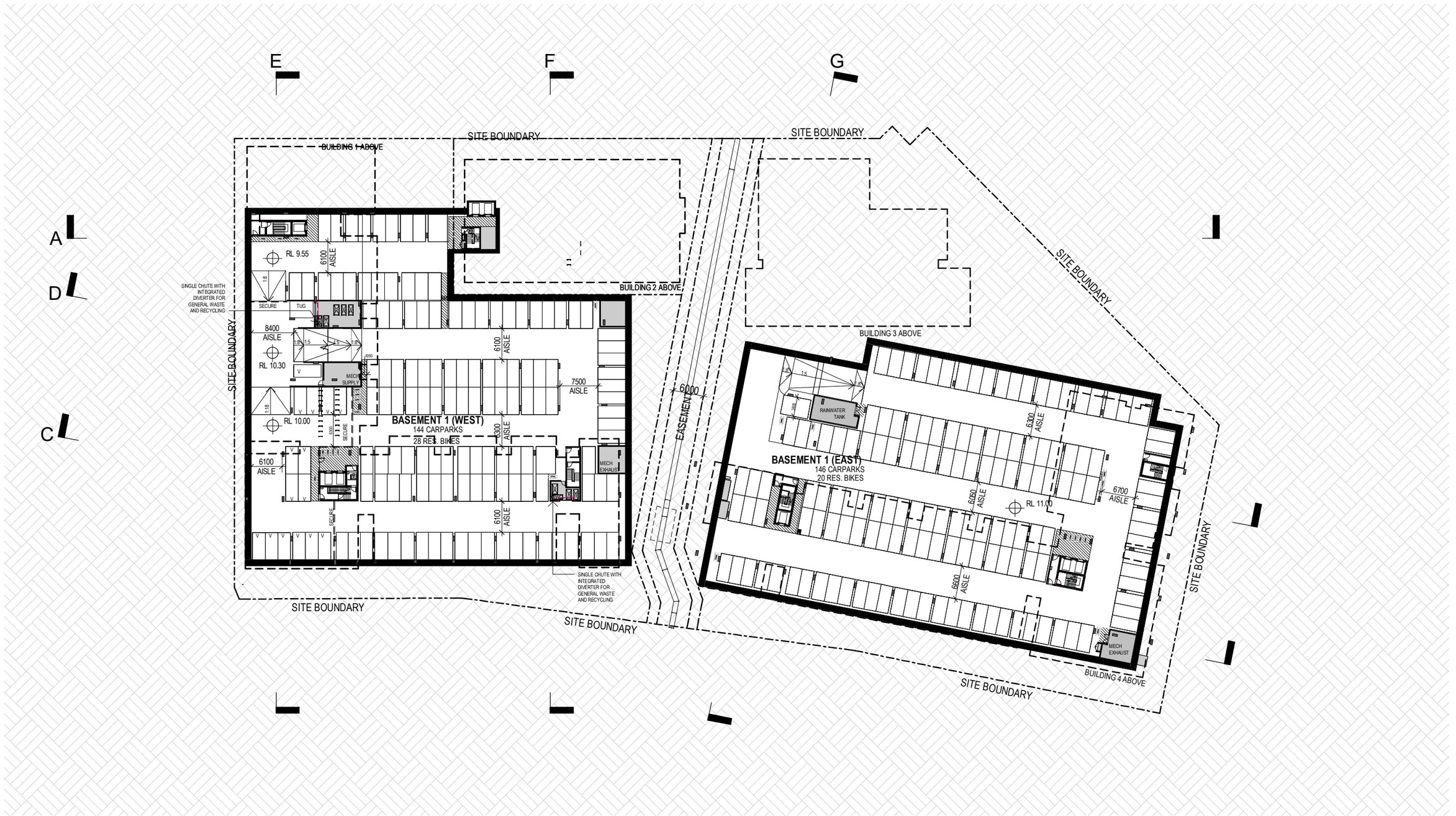

PRELIMINARY

Revisions

P6	28.06.2024	For Review	FC
P7	11.07.2024	Issue to Client	FC
P8	12.07.2024	Consultant Review 05	FC
P9	16.07.2024	Issue to Client	FC
P10	19.07.2024	Issue to Consultants	JS
P11	24.07.2024	Traffic & Waste	FC
P12	24.07.2024	Final Draft	OB

24/07/2024 10:41:42 PM

Project: **1 CLARKE STREET**

1 CLARKE STREET, SOUTHPORT

Drawing: **Basement 01 Plan**

Project No: **223256**

Author: **CW**

Scale: @ A3: **1 : 750**

Drawing No.: **TP01.02**

P12

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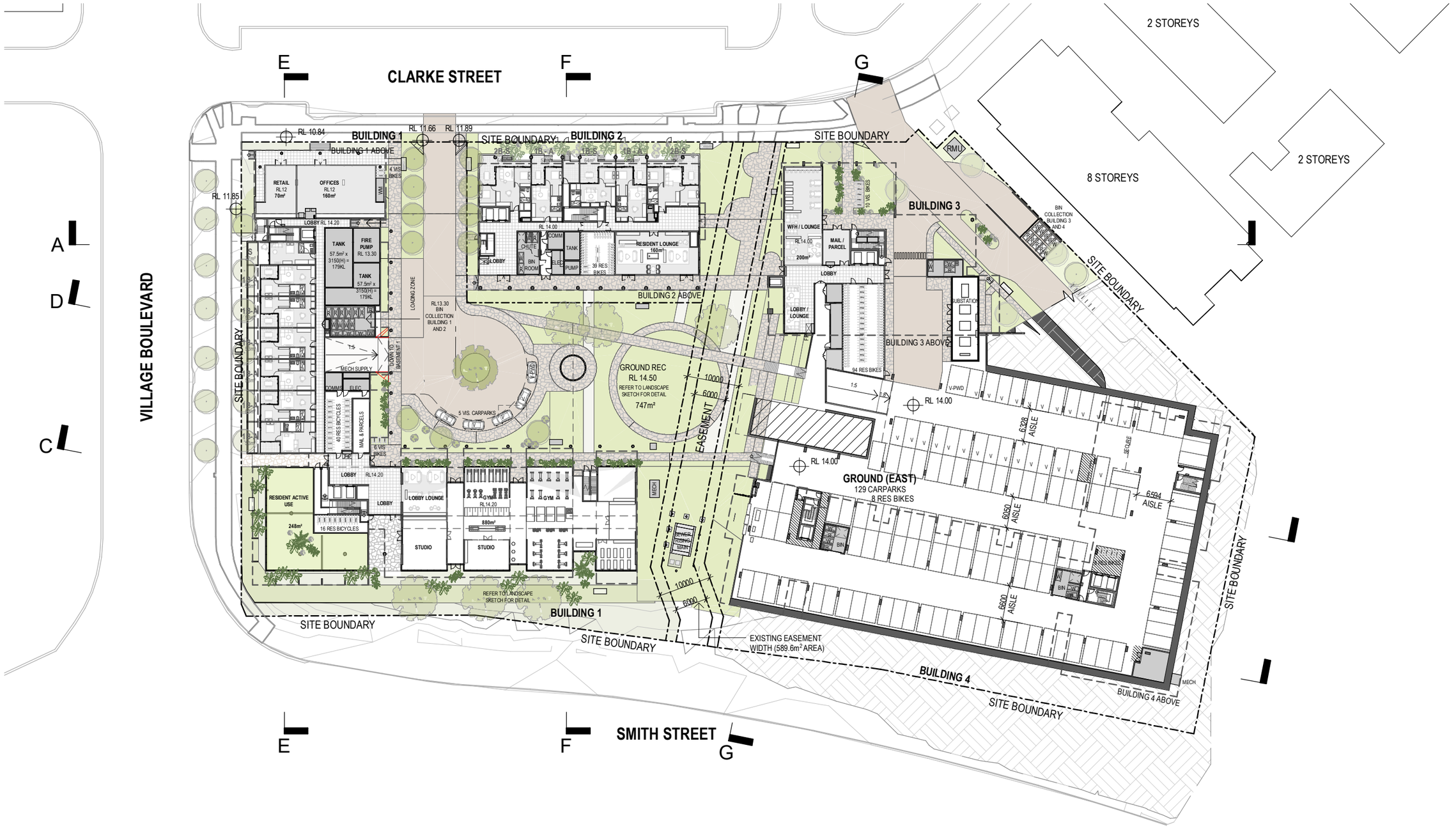

PRELIMINARY

Revisions

P8	28.06.2024	For Review	FC
P9	11.07.2024	Issue to Client	FC
P10	12.07.2024	Consultant Review 05	FC
P11	16.07.2024	Issue to Client	FC
P12	19.07.2024	Issue to Consultants	JS
P13	24.07.2024	Traffic & Waste	FC
P14	24.07.2024	Final Draft	OB

24/07/2024 10:41:54 PM

Project: **1 CLARKE STREET**

1 CLARKE STREET, SOUTHPORT

Drawing: **Ground Plan**

Project No: **223256**

Author: **CW**

Scale: @ A3: **1 : 750**

Drawing No.: **TP01.03**

P14

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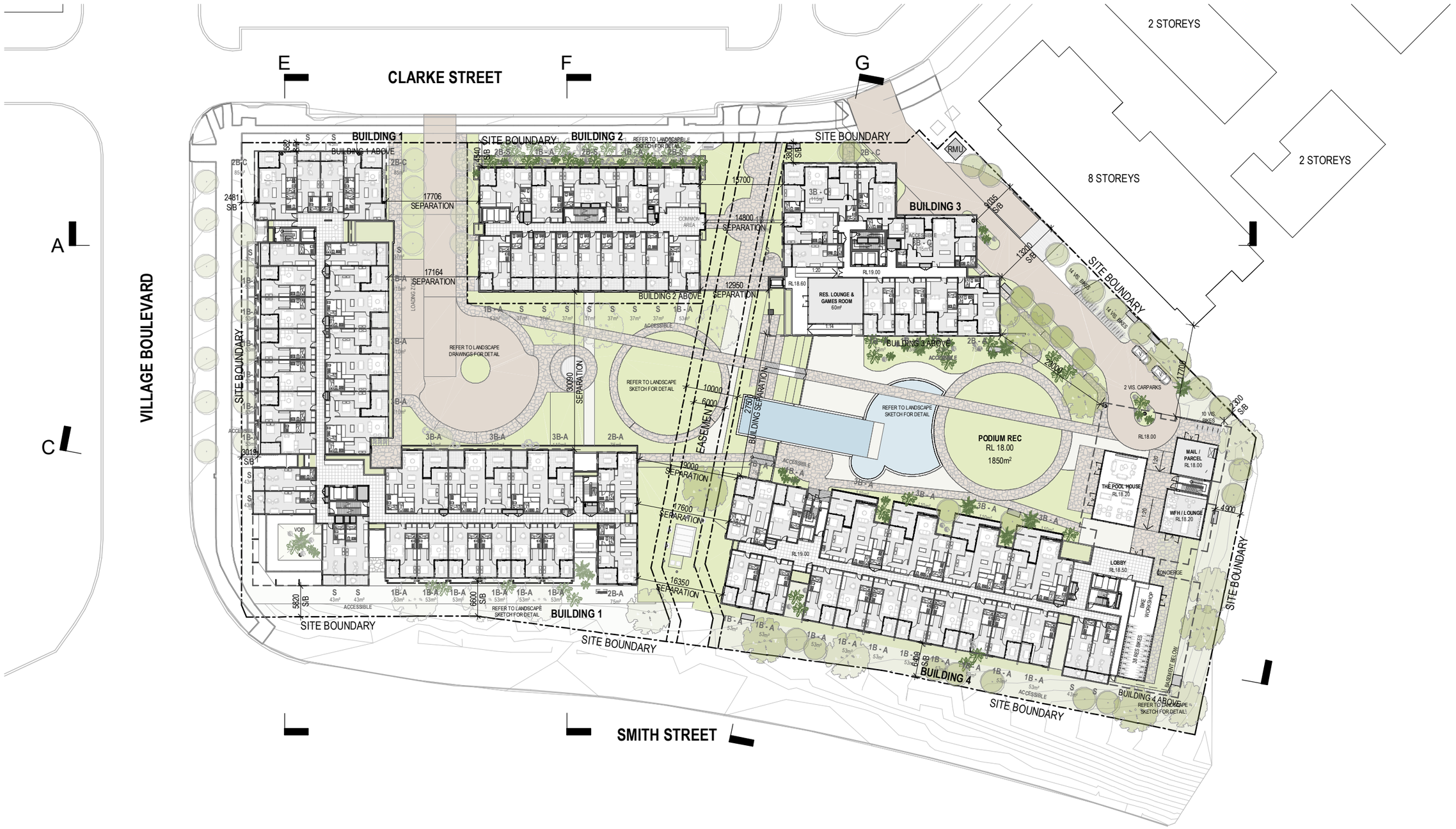

PRELIMINARY

Revisions			
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P7	28.06.2024	For Review	FC
P8	12.07.2024	Consultant Review 05	FC
P9	16.07.2024	Issue to Client	FC
P10	19.07.2024	Issue to Consultants	JS
P11	24.07.2024	Traffic & Waste	FC
P12	24.07.2024	Final Draft	OB

24/07/2024 10:42:12 PM

Project: **1 CLARKE STREET**

1 CLARKE STREET, SOUTHPORT

Drawing: **Level 02 Plan - Podium**

Project No: **223256**

Author: **CW**

Scale: @ A3 **1 : 750**

Drawing No.: **TP01.04**

P12

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PRELIMINARY

Revisions			
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P6	27.06.2024	Consultant Review 04	CW
P7	28.06.2024	For Review	FC
P8	11.07.2024	Issue to Client	FC
P9	12.07.2024	Consultant Review 05	FC
P10	16.07.2024	Issue to Client	FC
P11	19.07.2024	Issue to Consultants	JS

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Project / **1 CLARKE STREET**

1 CLARKE STREET, SOUTHPORT

Drawing / **Level 04**

Project No / **223256**

Author / **CW**

Scale: @ A3 / **1 : 750**

Drawing No. / **TP01.06**

P11

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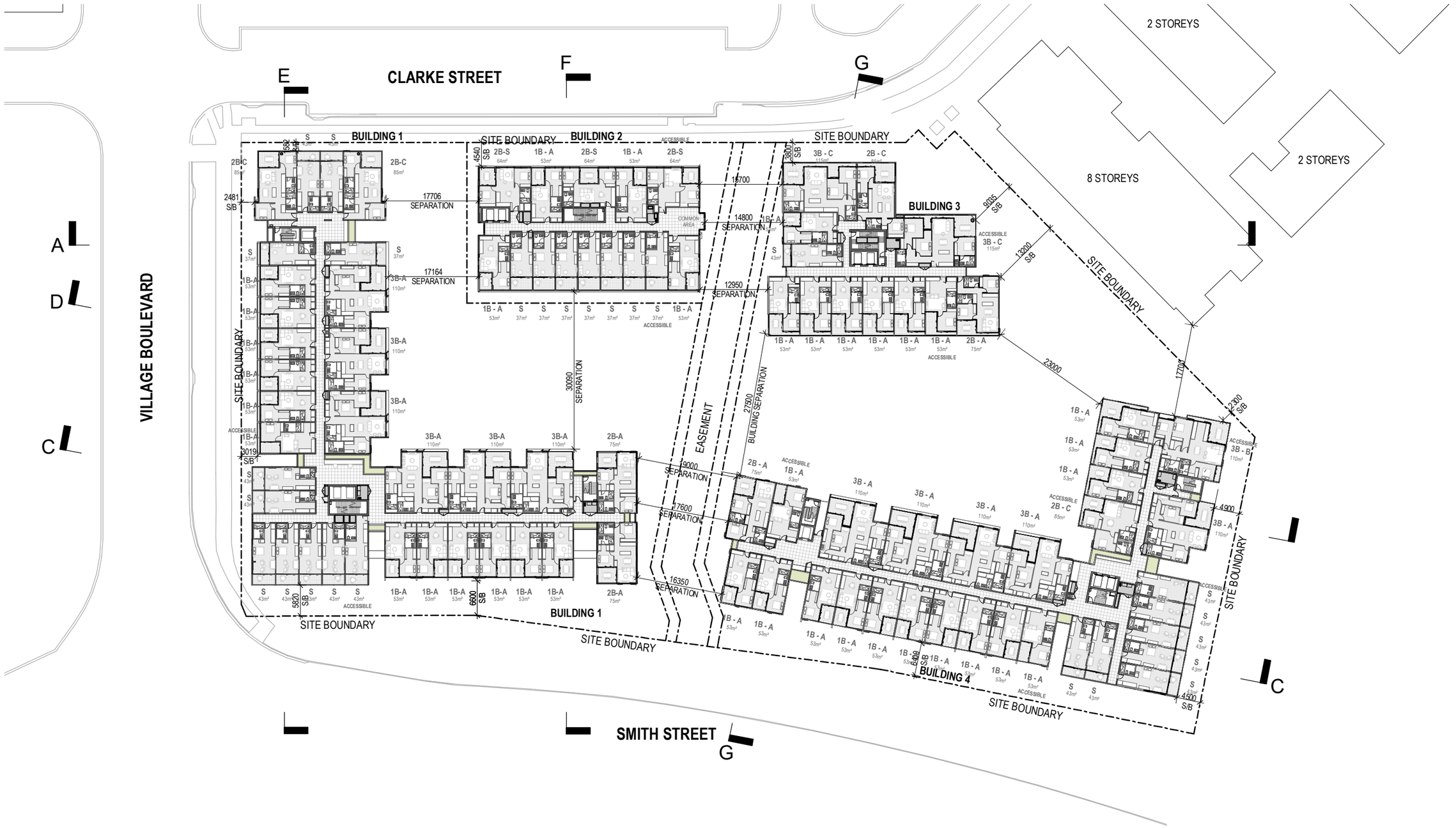

PRELIMINARY

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P4	21.06.2024	Consultant Review 03	FC
P5	25.06.2024	Prelodgement Meeting 02	FC
P6	27.06.2024	Consultant Review 04	CW
P7	28.06.2024	For Review	FC
P8	24.07.2024	Final Draft	OB

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Project / **1 CLARKE STREET**

1 CLARKE STREET, SOUTHPORT

Drawing / **Level 06 (03-09 Typical) Plan**

Project No / **223256**

Author / **CW**

Scale: @ A3 / **1 : 750**

Drawing No. / **TP01.08**

P8

- MECHANICAL
- HYDRAULIC
- ELECTRICAL
- FIRE SERVICES

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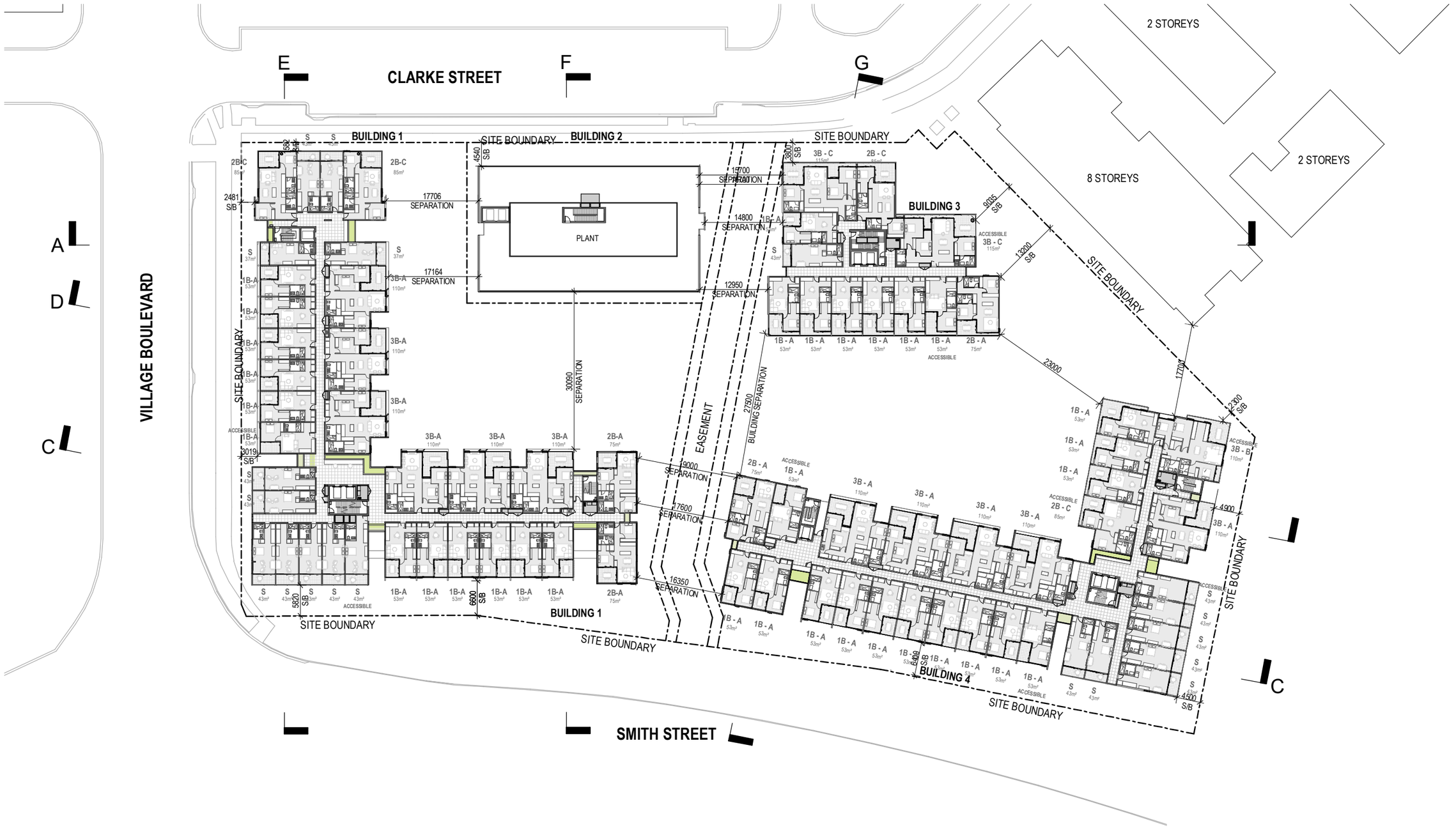

PRELIMINARY

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P7	28.06.2024	For Review	FC
P8	12.07.2024	Consultant Review 05	FC
P9	16.07.2024	Issue to Client	FC
P10	19.07.2024	Issue to Consultants	JS
P11	24.07.2024	Final Draft	OB

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Project: **1 CLARKE STREET**

1 CLARKE STREET, SOUTHPORT

Drawing: **Level 10 Plan**

Project No: **223256**

Author: **CW**

Scale: @ A3 **1 : 750**

Drawing No.: **TP01.12**

P11

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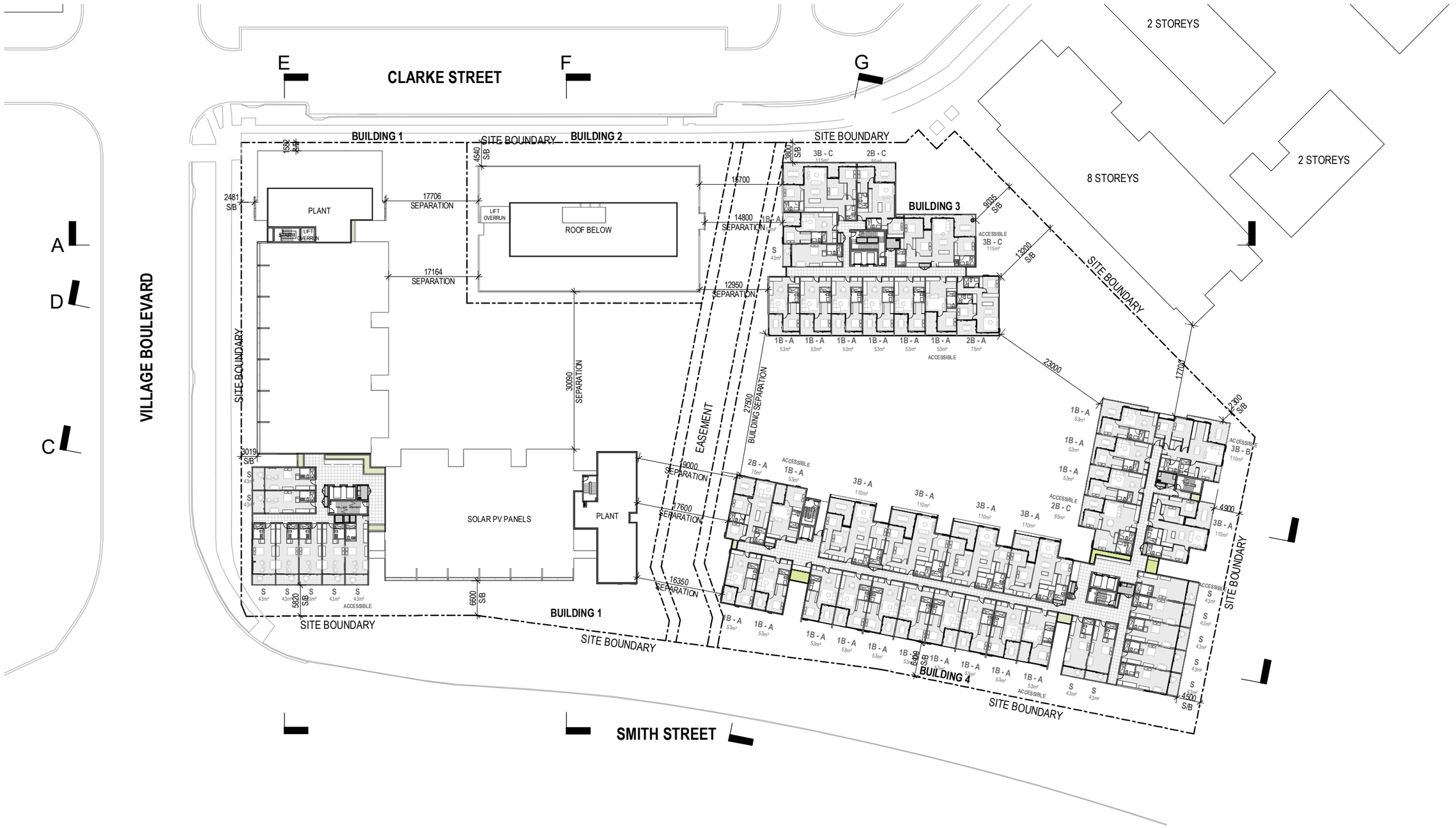

PRELIMINARY

Revisions			
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P6	27.06.2024	Consultant Review 04	CW
P7	28.06.2024	For Review	FC
P8	12.07.2024	Consultant Review 05	FC
P9	16.07.2024	Issue to Client	FC
P10	19.07.2024	Issue to Consultants	JS
P11	24.07.2024	Final Draft	OB

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Project: **1 CLARKE STREET**

1 CLARKE STREET, SOUTHPORT

Drawing: **Level 11 Plan**

Project No: **223256** Author: **CW** Scale: @ A3 **1 : 750**

Drawing No.: **TP01.13** **P11**

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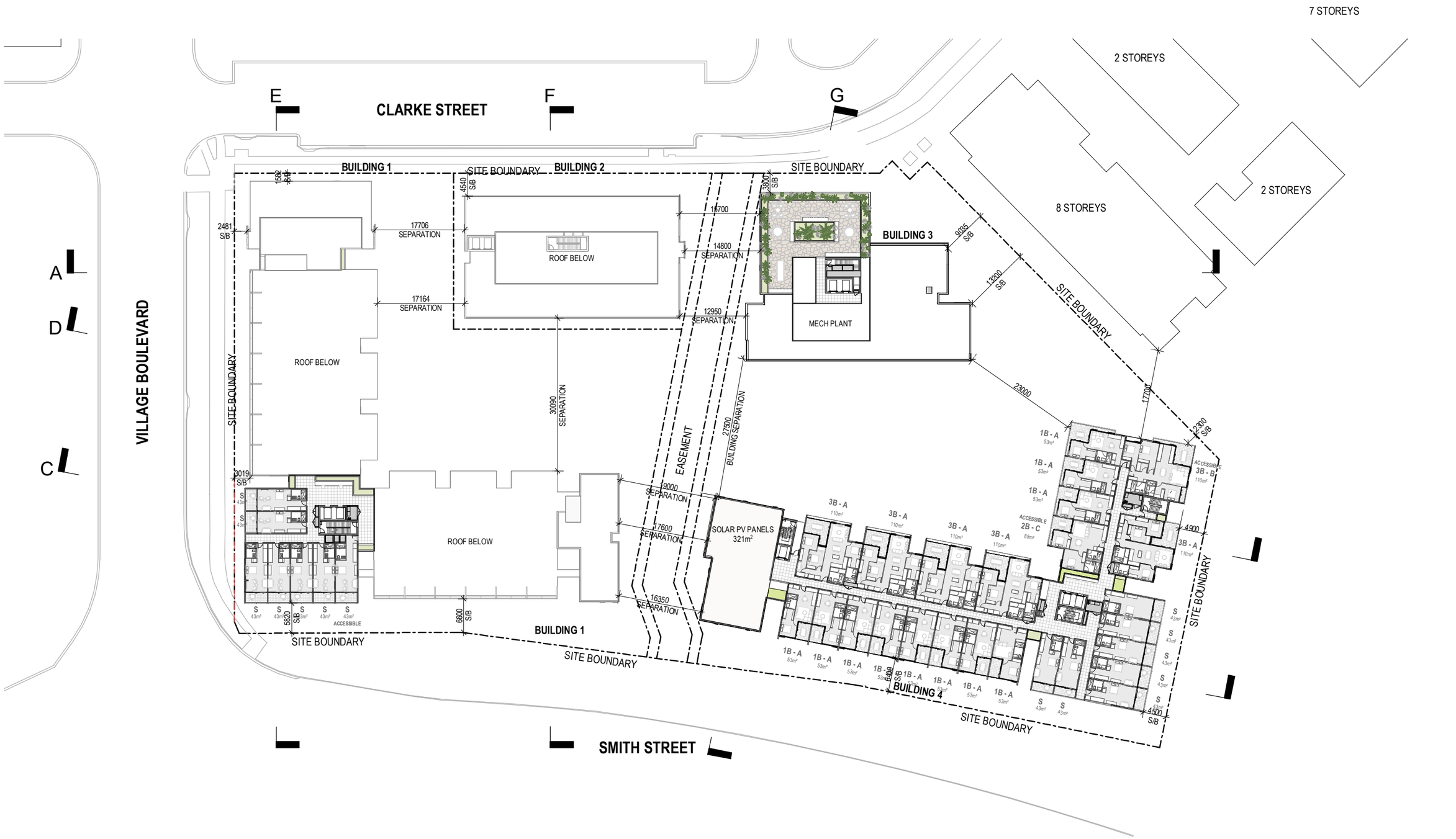

PRELIMINARY

Revisions

P5	25.06.2024	Prelodgement Meeting 02	FC
P6	27.06.2024	Consultant Review 04	CW
P7	28.06.2024	For Review	FC
P8	12.07.2024	Consultant Review 05	FC
P9	16.07.2024	Issue to Client	FC
P10	19.07.2024	Issue to Consultants	JS
P11	24.07.2024	Final Draft	OB

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Project / **1 CLARKE STREET**

1 CLARKE STREET, SOUTHPORT

Drawing / **Level 12 Plan**

Project No / **223256**

Author / **CW**

Scale: @ A3 / **1 : 750**

Drawing No. / **TP01.14**

P11

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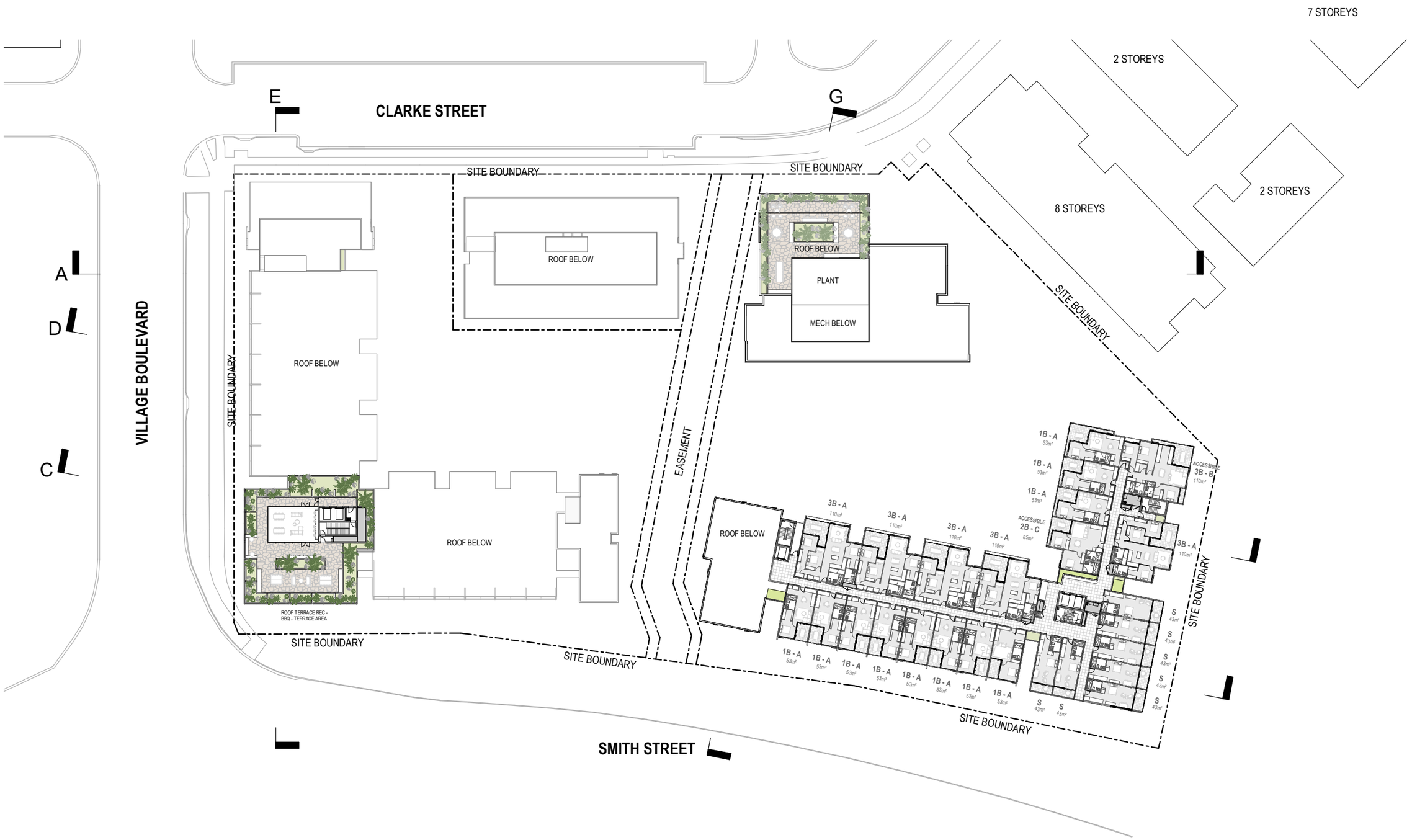

PRELIMINARY

Revisions

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P3	27.06.2024	Consultant Review 04	CW
P4	28.06.2024	For Review	FC
P5	12.07.2024	Consultant Review 05	FC
P6	16.07.2024	Issue to Client	FC
P7	19.07.2024	Issue to Consultants	JS
P8	24.07.2024	Final Draft	OB

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Project / **1 CLARKE STREET**

1 CLARKE STREET, SOUTHPORT

Drawing / **Level 13 Plan**

Project No / **223256**

Author / **CW**

Scale: @ A3 / **1 : 750**

Drawing No. / **TP01.15**

P8

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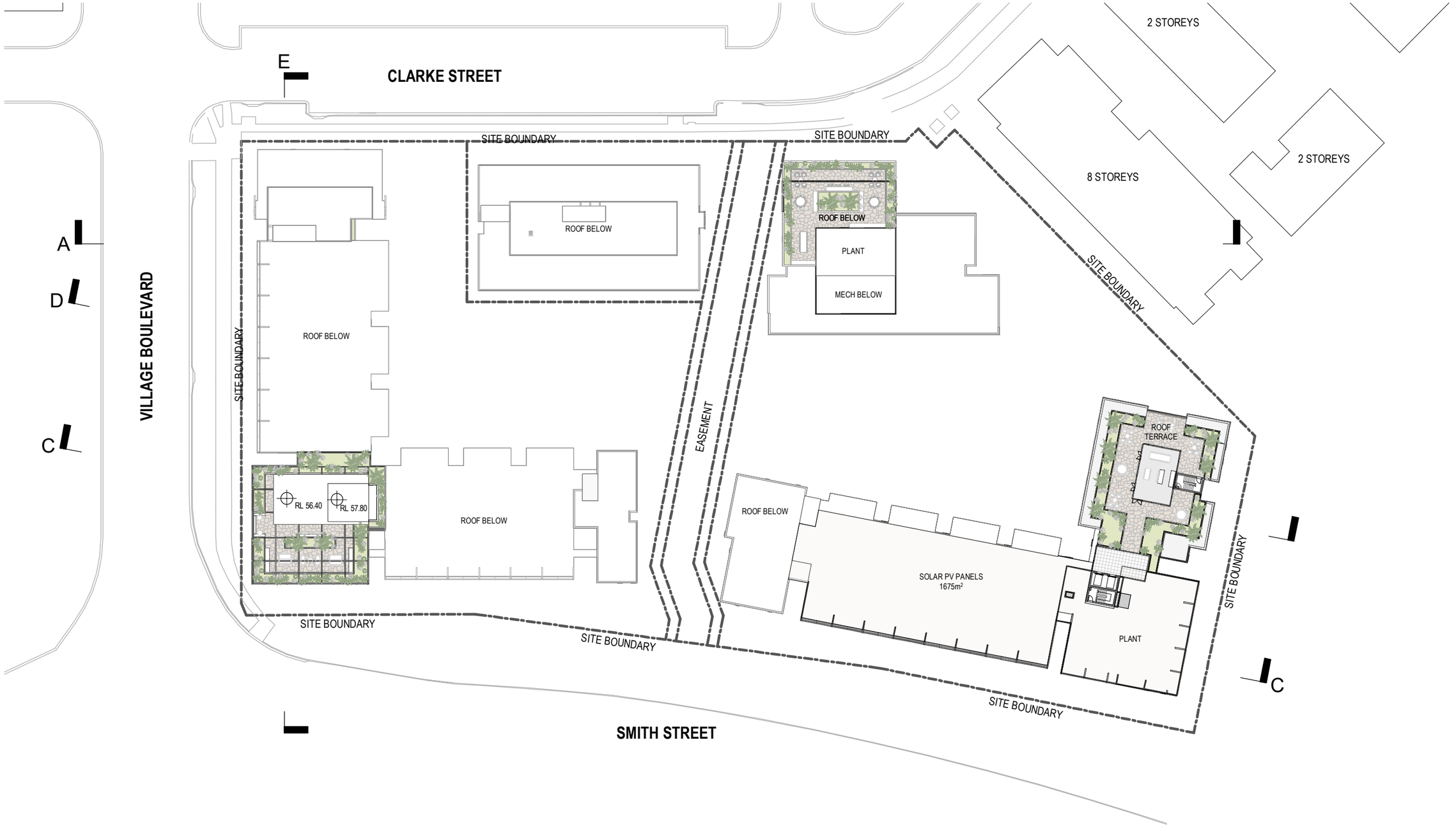

PRELIMINARY

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P2	16.07.2024	Issue to Client	FC
P3	19.07.2024	Issue to Consultants	JS
P4	24.07.2024	Final Draft	OB

Project: **1 CLARKE STREET**

1 CLARKE STREET, SOUTHPORT

Drawing: **Level 14 Plan**

Project No: **223256**

Author: **FC**

Scale: @ A3: **1 : 750**

Drawing No.: **TP01.16**

P4

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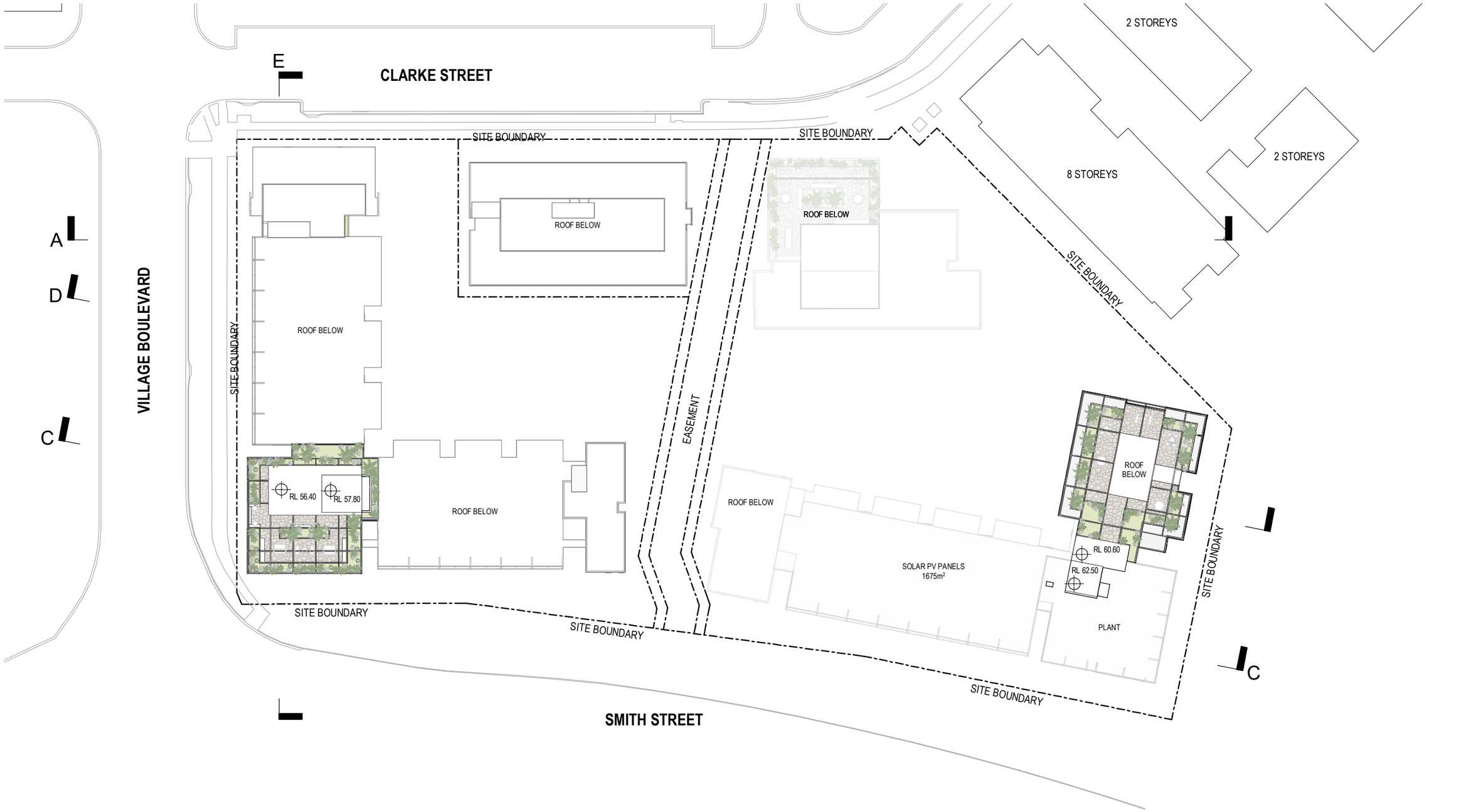

PRELIMINARY

Revisions				
P1	12.07.2024	Consultant Review 05	FC
P2	16.07.2024	Issue to Client	FC
P3	19.07.2024	Issue to Consultants	JS
P4	24.07.2024	Final Draft	OB

Project: **1 CLARKE STREET**
1 CLARKE STREET, SOUTHPORT

Drawing: **Level 15 Plan**

Project No: **223256**

Author: **FC**

Scale: @ A3: **1 : 750**

Drawing No.: **TP01.17**

P4

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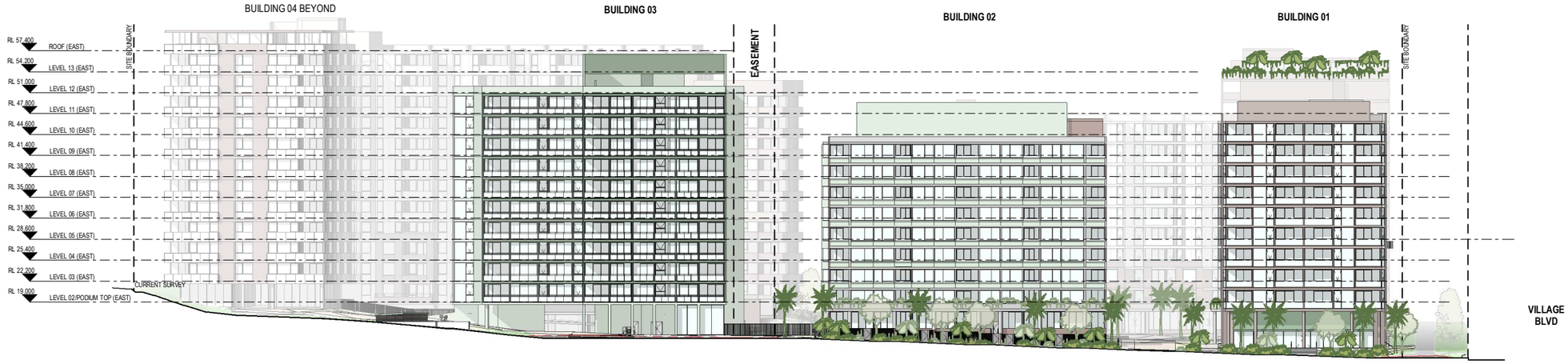
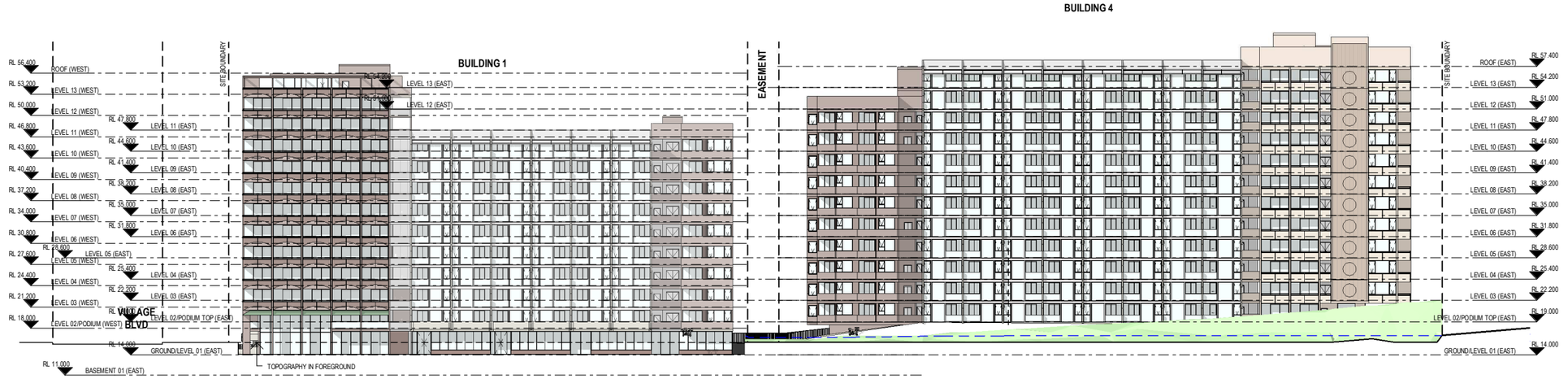
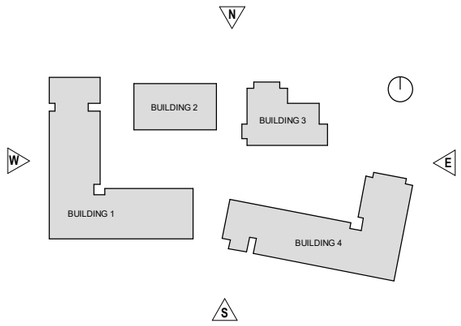


North Elevation



South Elevation



PRELIMINARY

Revisions				
P1	24.05.2024	Consultant Review 01	JS	
P2	24.07.2024	Final Draft	OB	

Project: **1 CLARKE STREET**

1 CLARKE STREET, SOUTHPORT

Drawing: **North (Clarke Street) & South Elevation (Smith Street)**

Project No: **223256** Author: **AG** Scale: @ A3: **1 : 750**

Drawing No.: **TP02.01** **P2**

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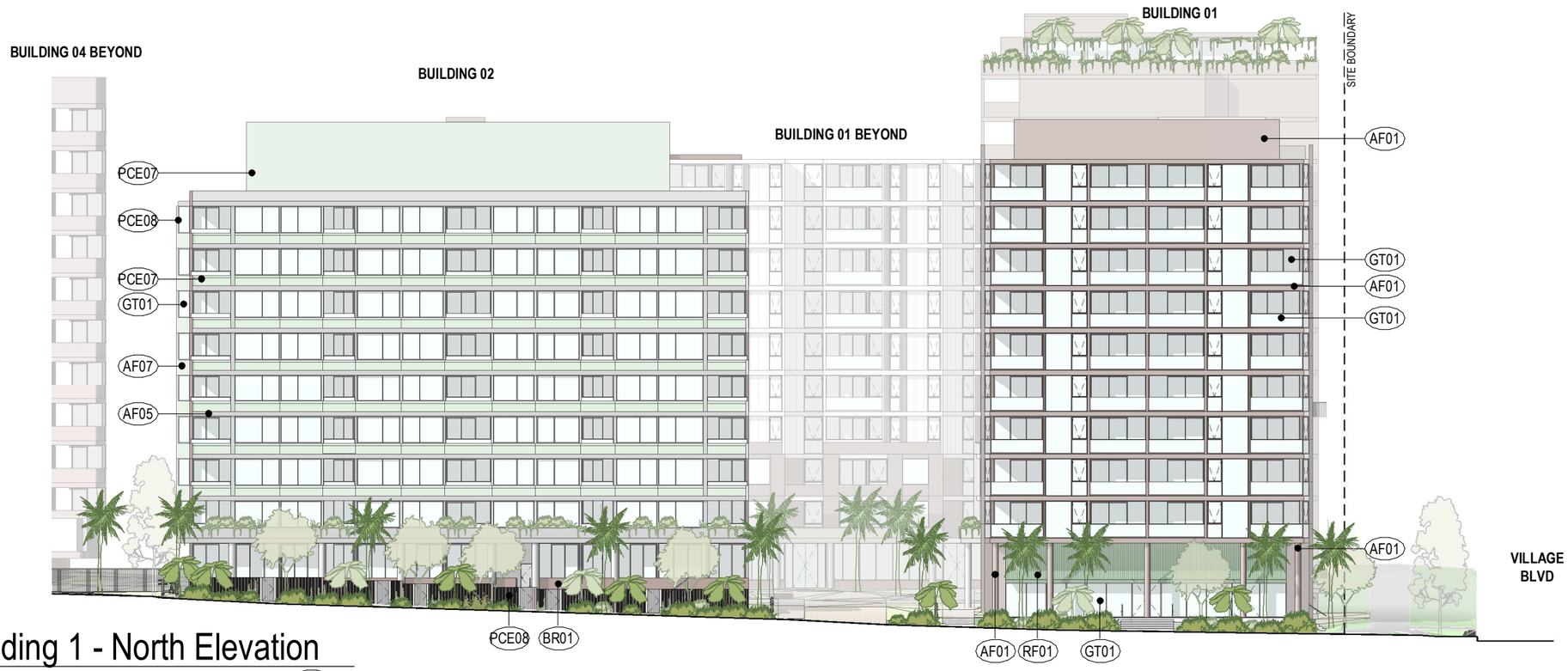
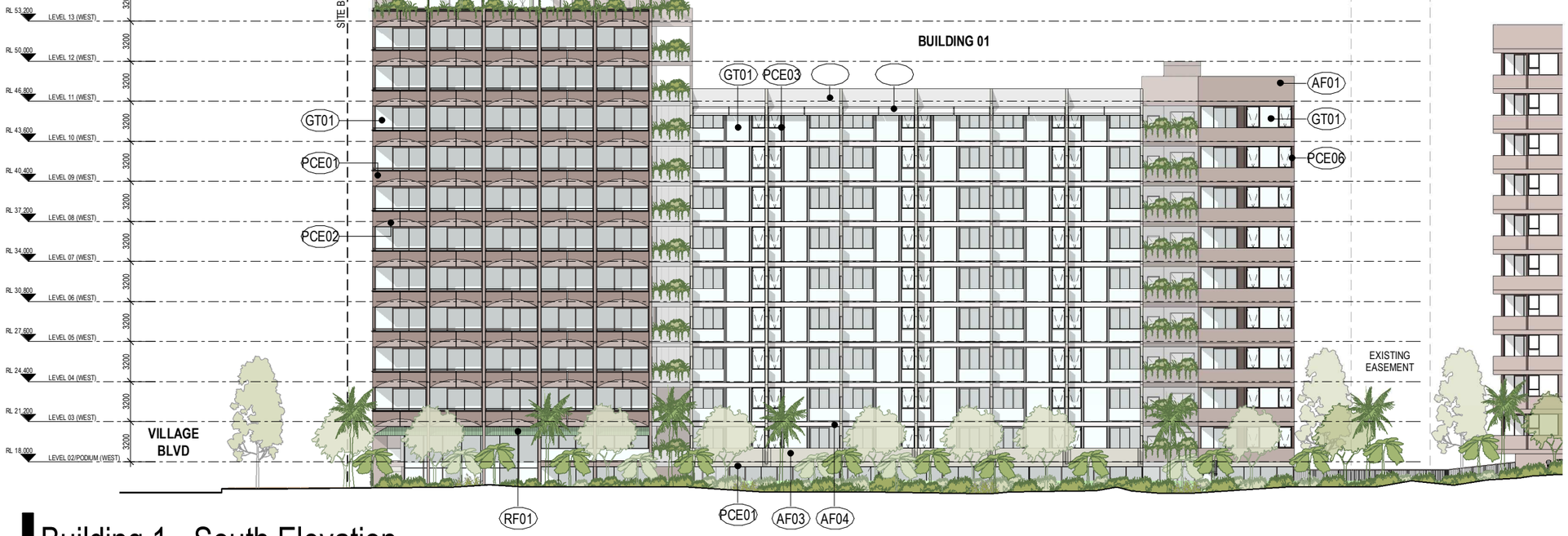
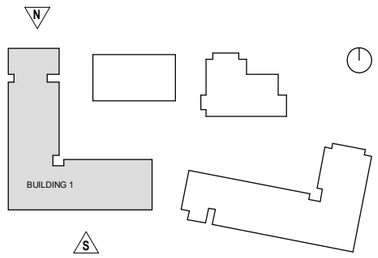


Building 1 - North Elevation





Building 1 - South Elevation

PRELIMINARY

Revisions			
P1	24.05.2024	Consultant Review 01	JS
P2	24.07.2024	Final Draft	OB

Project: **1 CLARKE STREET**
1 CLARKE STREET, SOUTHPORT

Drawing: **Building 1 North and South Elevations**

Project No: **223256** Author: **AG** Scale: @ A3: **1 : 400**

Drawing No.: **TP02.05** **P2**

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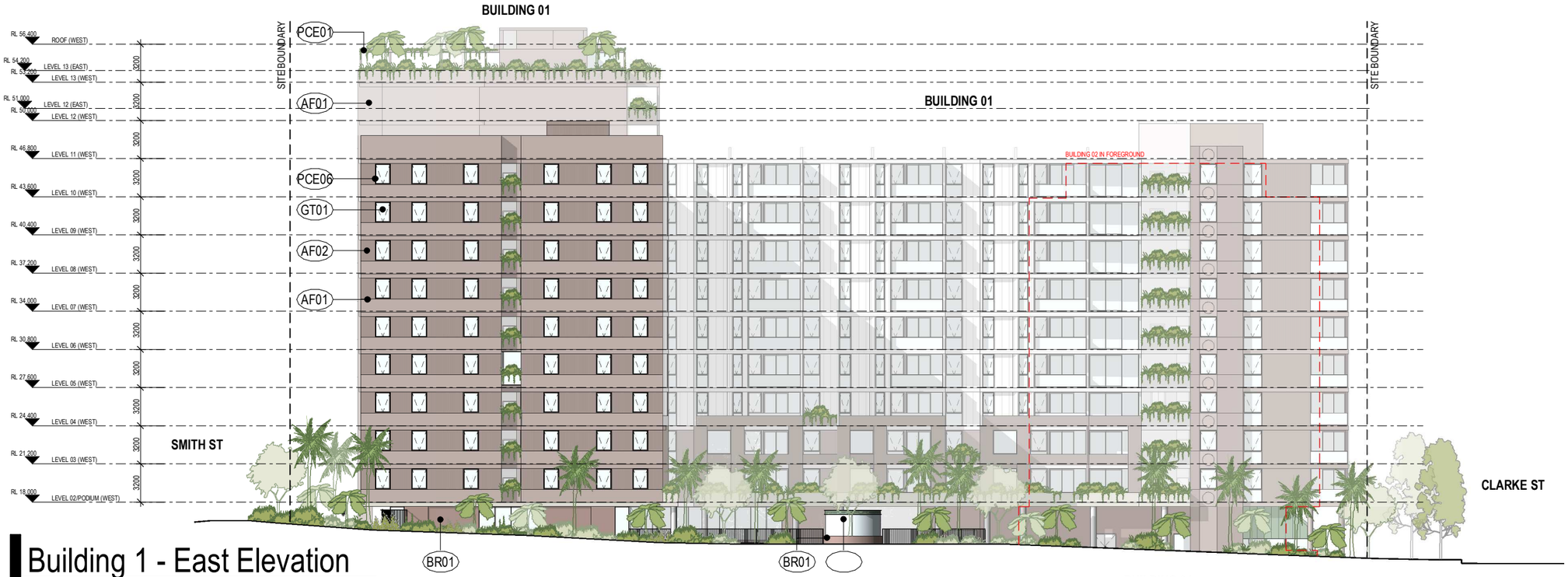
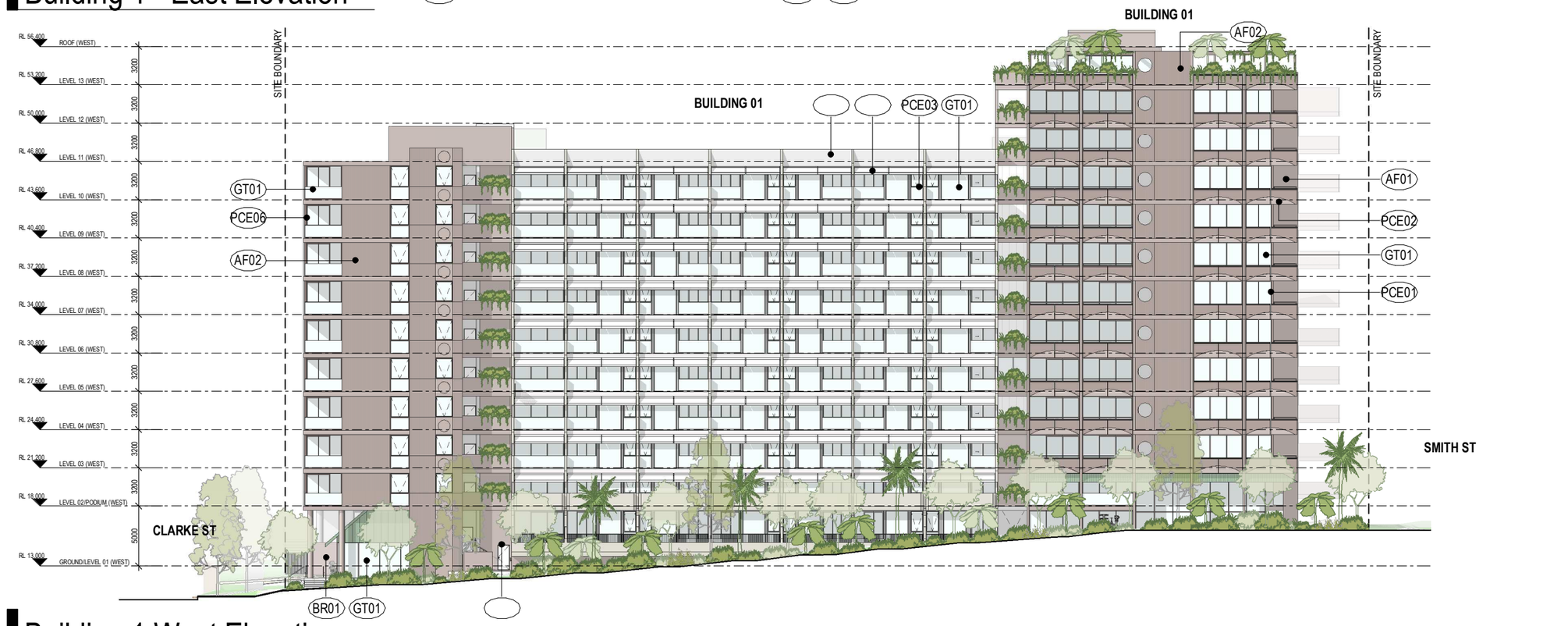
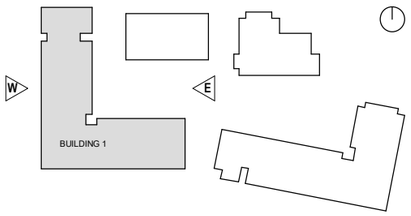


Building 1 - East Elevation





Building 1 West Elevation

PRELIMINARY

Revisions			
P1	24.05.2024	Consultant Review 01	JS
P2	24.07.2024	Final Draft	OB

Project: **1 CLARKE STREET**
1 CLARKE STREET, SOUTHPORT

Drawing: **Building 1 East and West Elevations**

Project No: **223256** Author: **AG** Scale: @ A3: **1 : 400**

Drawing No.: **TP02.07** **P2**

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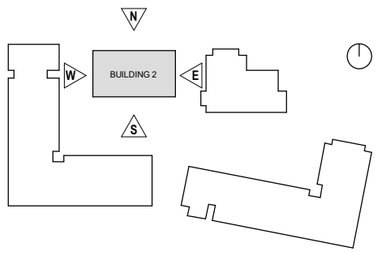
Building 2 - North Elevation

Building 2 - East Elevation



Building 2 - South Elevation

Building 2 - West Elevation

PRELIMINARY

Revisions

P1	24.05.2024	Consultant Review 01	JS
P2	24.07.2024	Final Draft	OB

Project: **1 CLARKE STREET**

1 CLARKE STREET, SOUTHPORT

Drawing: **Building 2 Elevations**

Project No: **223256**

Author: **AG**

Scale: @ A3: **1 : 400**

Drawing No.: **TP02.09**

P2

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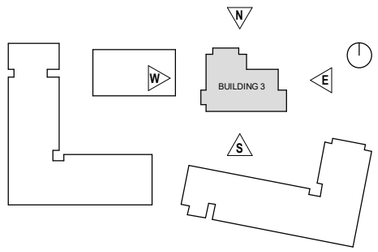
Building 3 - North Elevation

Building 3 - East Elevation



Building 3 - South Elevation

Building 3 - West Elevation

PRELIMINARY

Revisions

P1	24.05.2024	Consultant Review 01	JS
P2	24.07.2024	Final Draft	OB

Project: **1 CLARKE STREET**

1 CLARKE STREET, SOUTHPORT

Drawing: **Building 3 Elevations**

Project No: **223256**

Author: **AG**

Scale: @ A3: **1 : 400**

Drawing No.: **TP02.13**

P2

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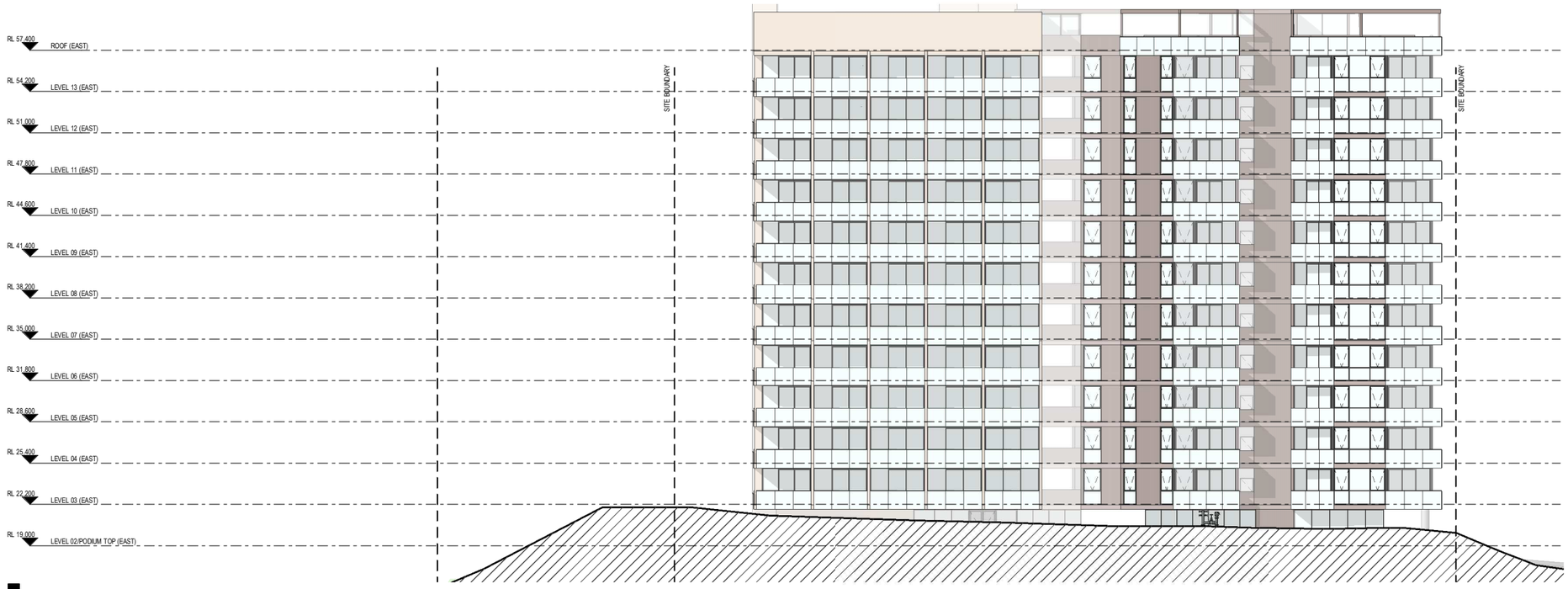
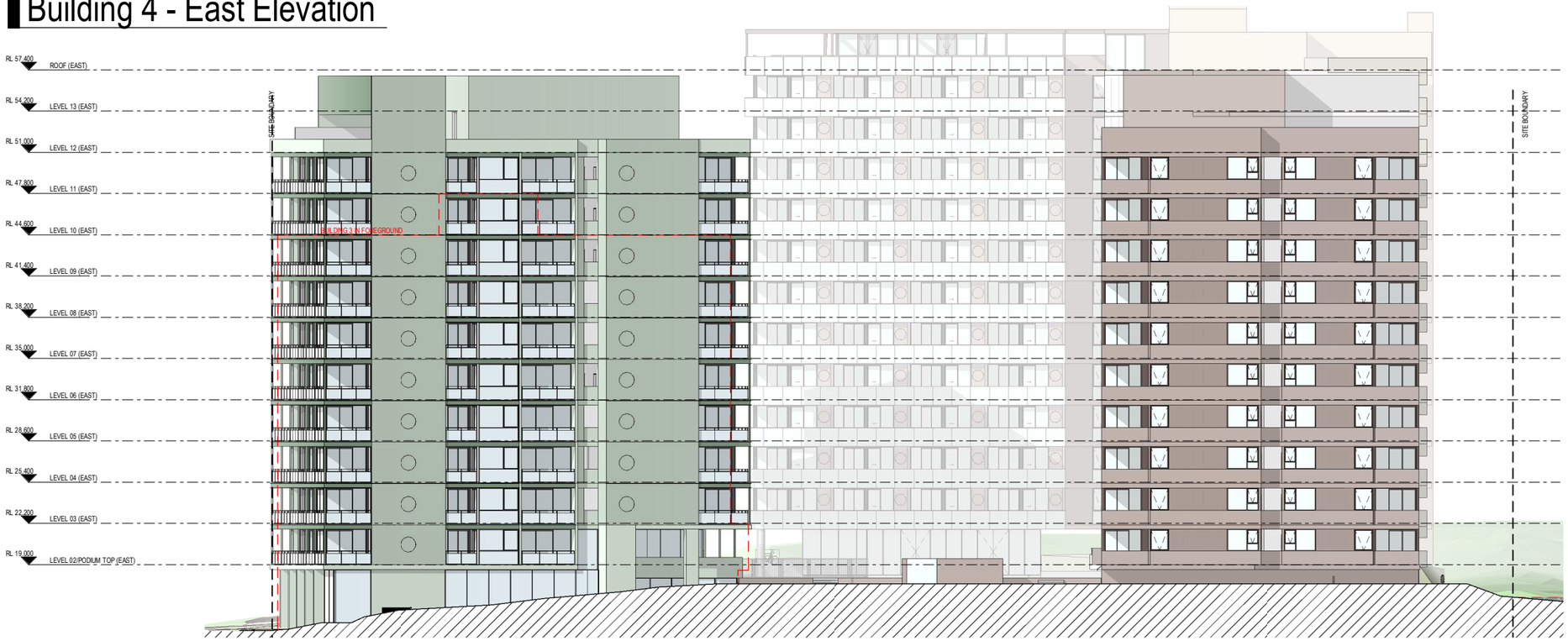
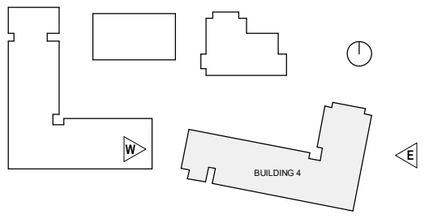


Building 4 - East Elevation





Building 4 - West Elevation

PRELIMINARY

Revisions			
P1	24.05.2024	Consultant Review 01	JS
P2	24.07.2024	Final Draft	OB

Project: **1 CLARKE STREET**

1 CLARKE STREET, SOUTHPORT

Drawing: **Building 4 East and West Elevaitons**

Project No: **223256** Author: **AG** Scale: @ A3 **1 : 400**

Drawing No.: **TP02.19** **P2**

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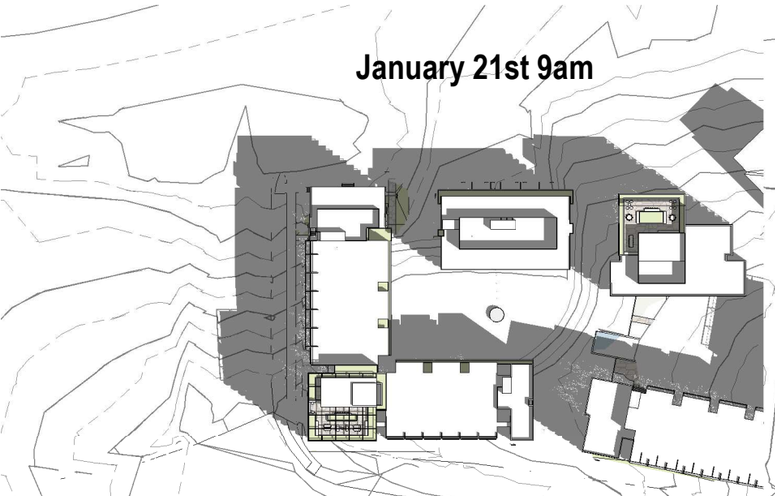

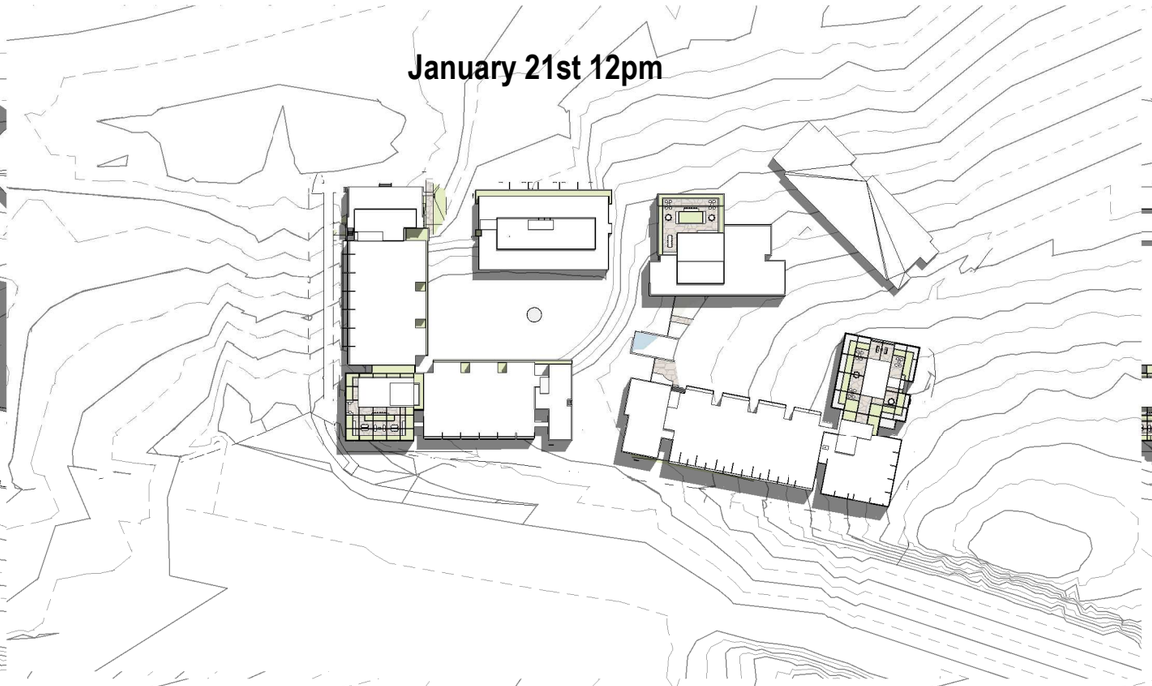

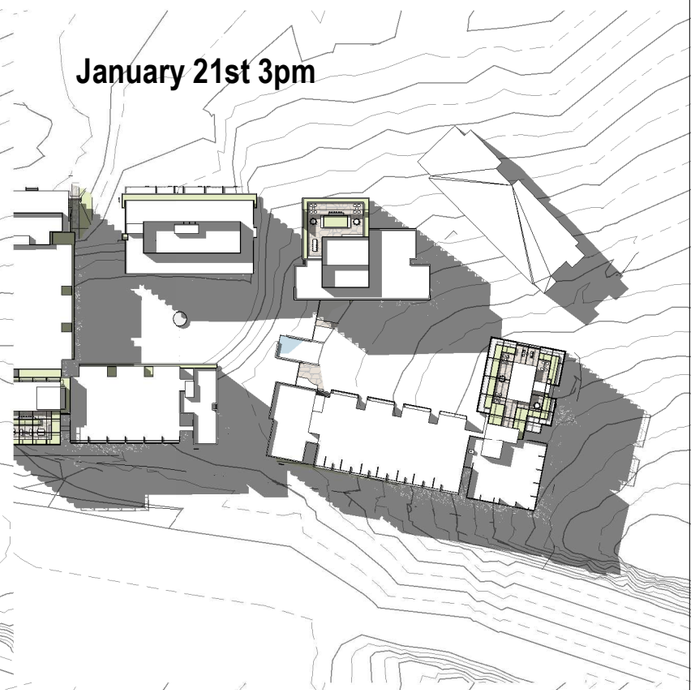

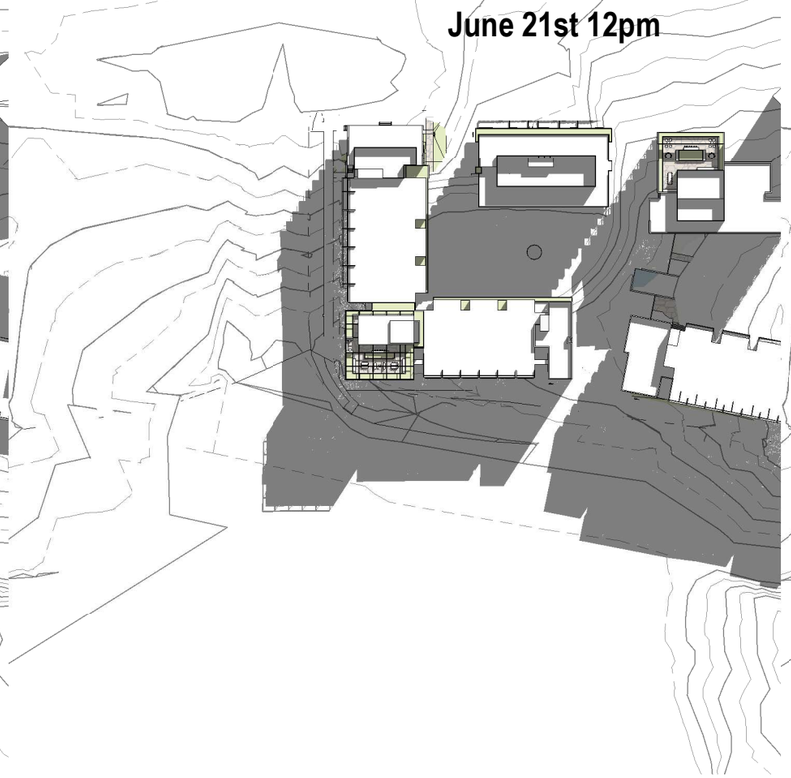

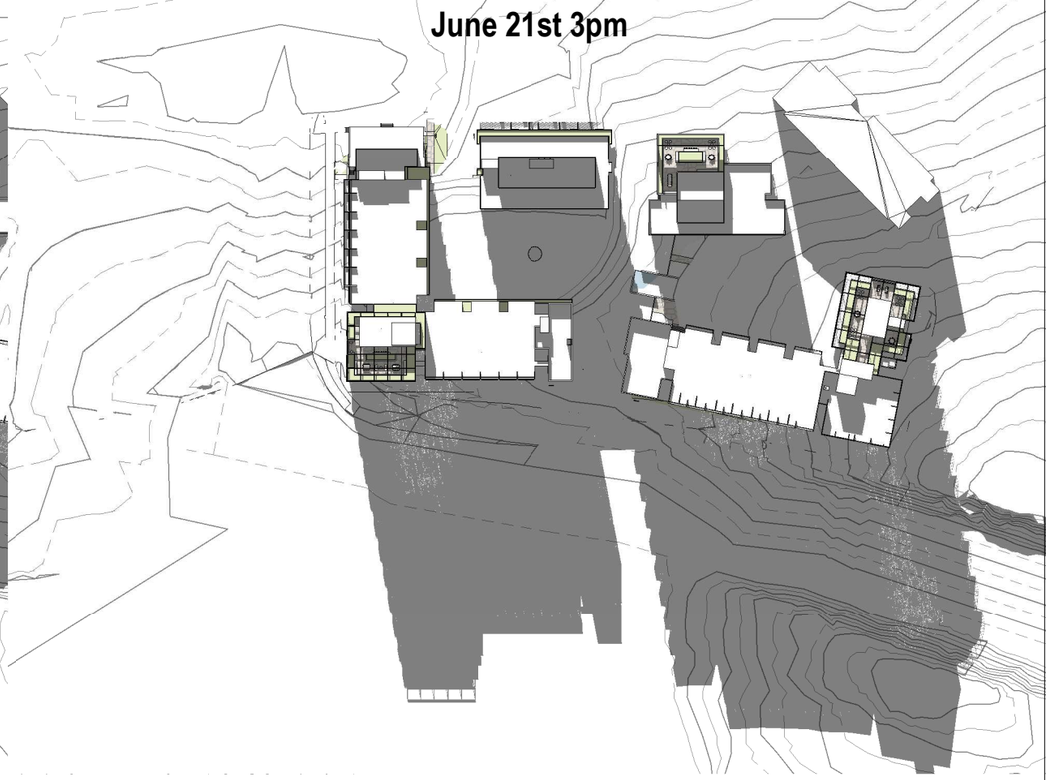

PRELIMINARY

Revisions
P1 24.07.2024 Final Draft

OB

Project
1 CLARKE STREET

1 CLARKE STREET, SOUTHPORT

Drawing
Shadow Studies

Project No
223256

Author
BM

Scale: @ A3

Drawing No.
TP05.01

P1

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Appendix B – Site Photos

Photo: Logger Location 1 – Road Traffic Noise Measurements

Photo: Logger Location 2 – Background 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 – Background 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

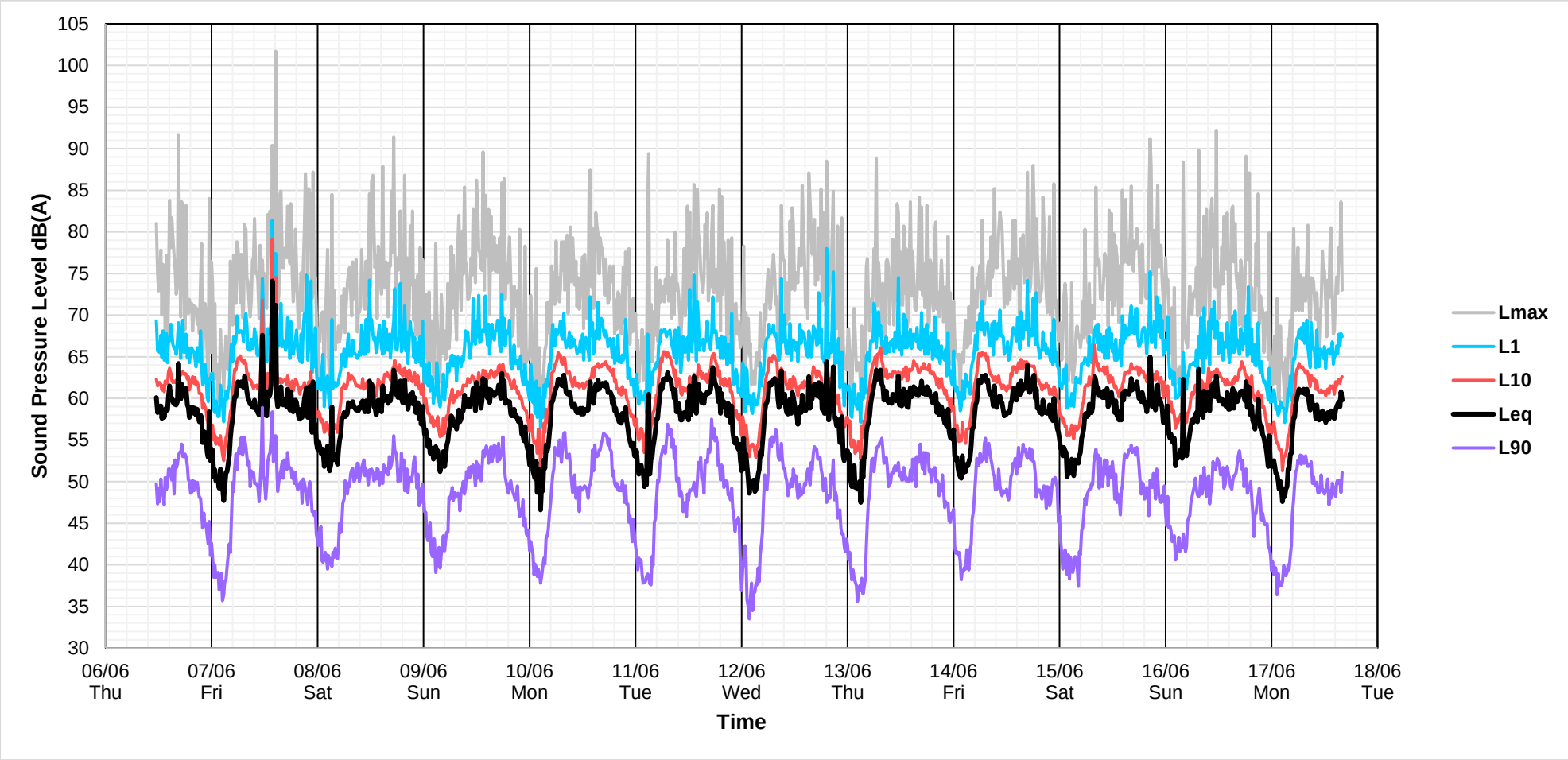
		$L_{A10,T}$			$L_{Aeq,T}$		$L_{A90,T}$	
Date	**Day**	**18hr day 6am-12am**	**1hr max 6am-12am**	**Time for 1hr max**	**18hr day 6am-12am**	**8hr night 10pm-6am**	**18hr day 6am-12am**	**8hr night 10pm-6am**
6/06/2024	Thursday	—	—	—	—	54	—	42
7/06/2024	Friday	62.8	68.2	0.6	60.2	55.1	51.0	43.3
8/06/2024	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

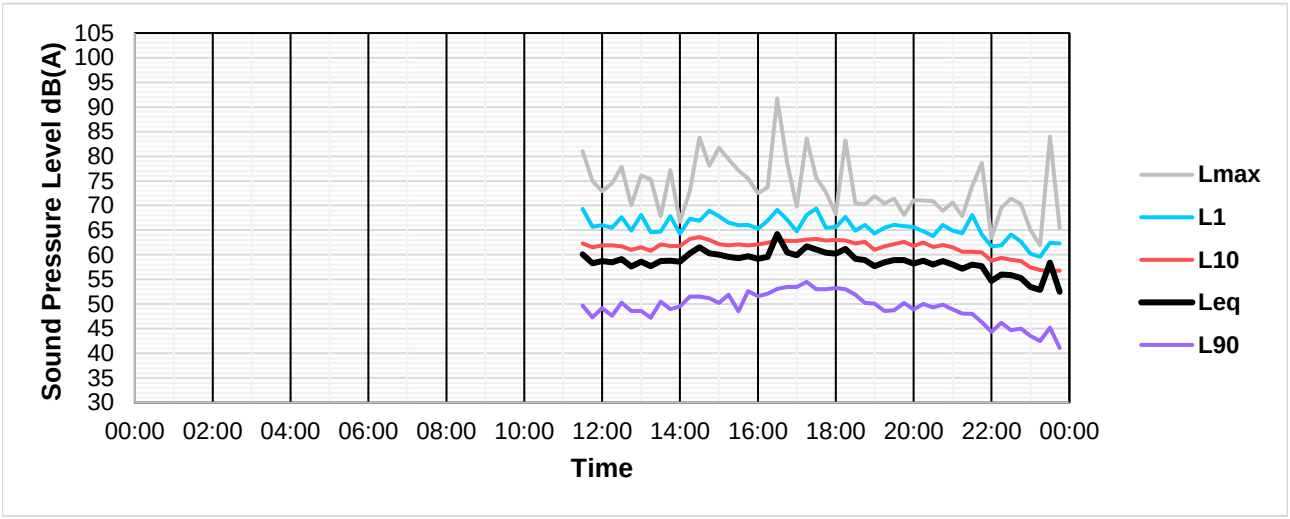
— No noise data available

Rainfall recorded on this day

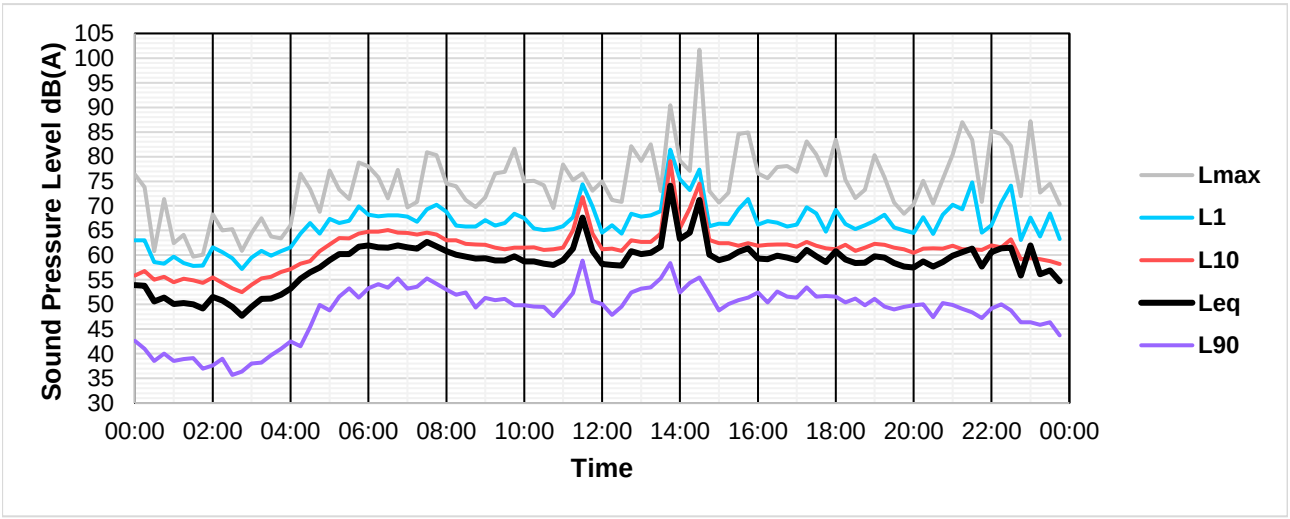
Unattended Noise Measurements
6 to 17 June 2024



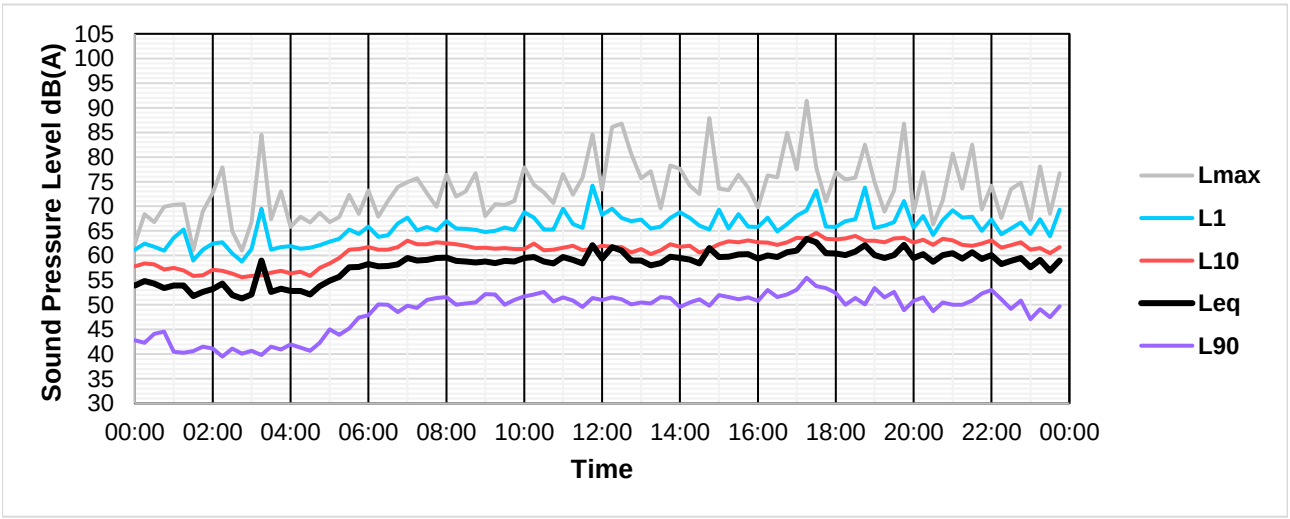
Unattended Noise Measurements
Thursday 6 June 2024



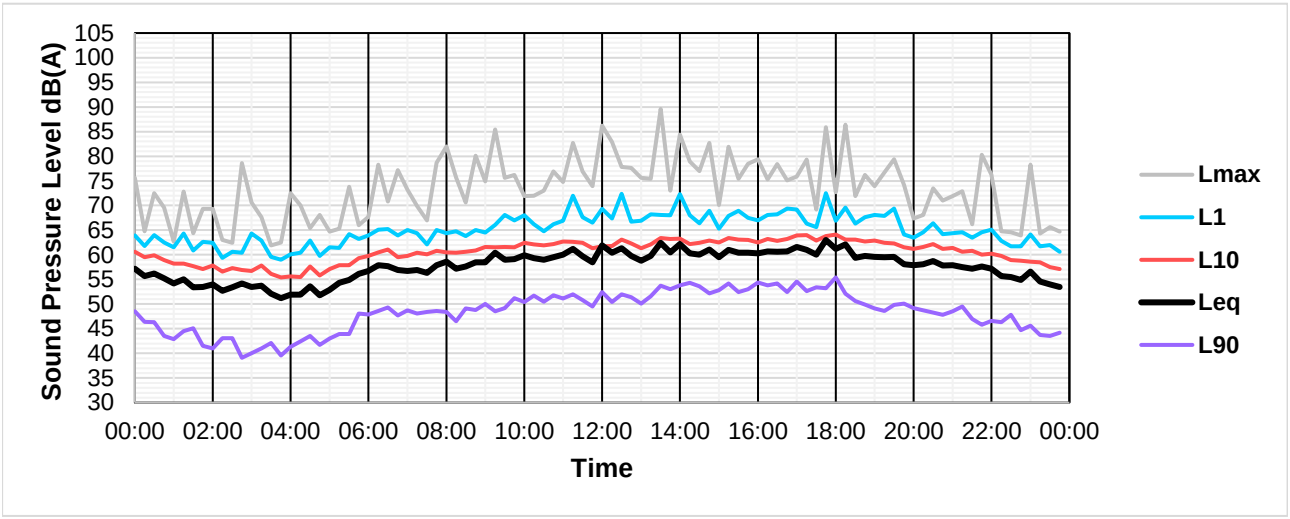
Unattended Noise Measurements
Friday 7 June 2024



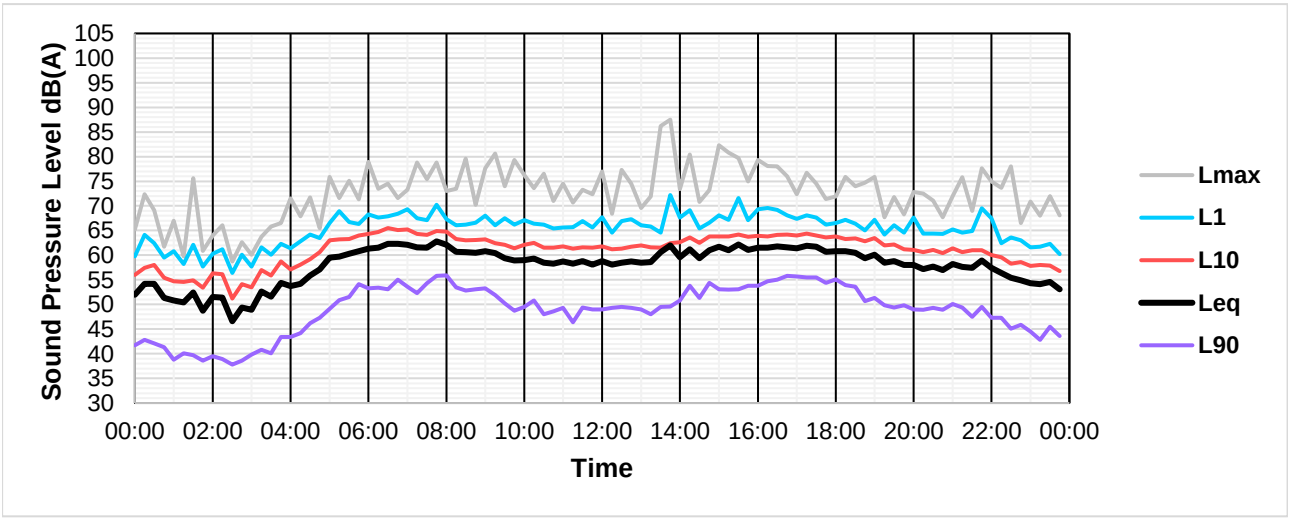
Unattended Noise Measurements
Saturday 8 June 2024



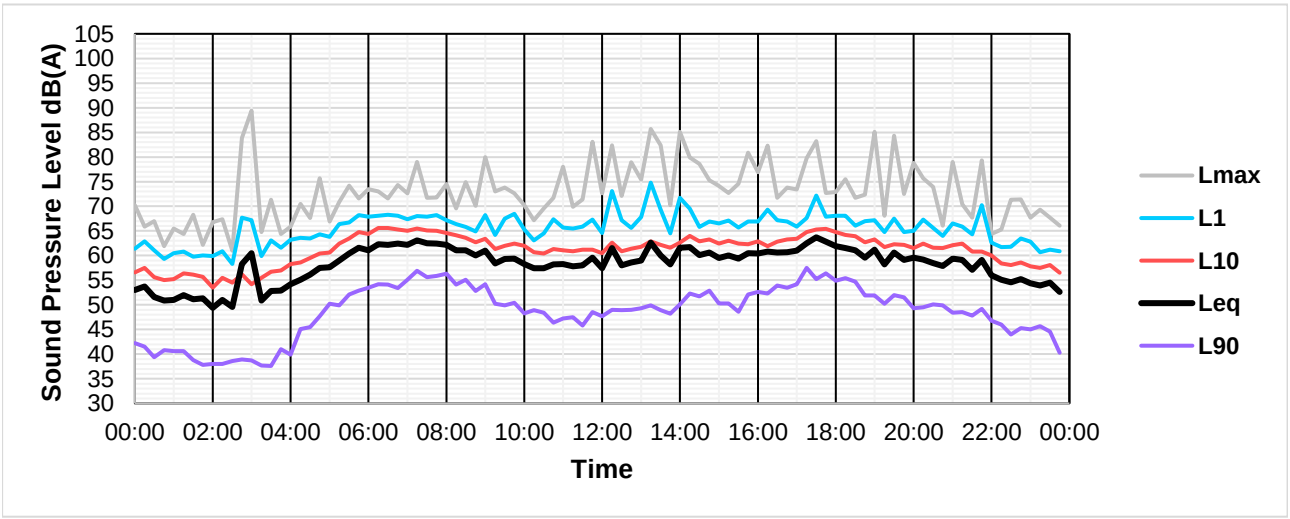
Unattended Noise Measurements
Sunday 9 June 2024



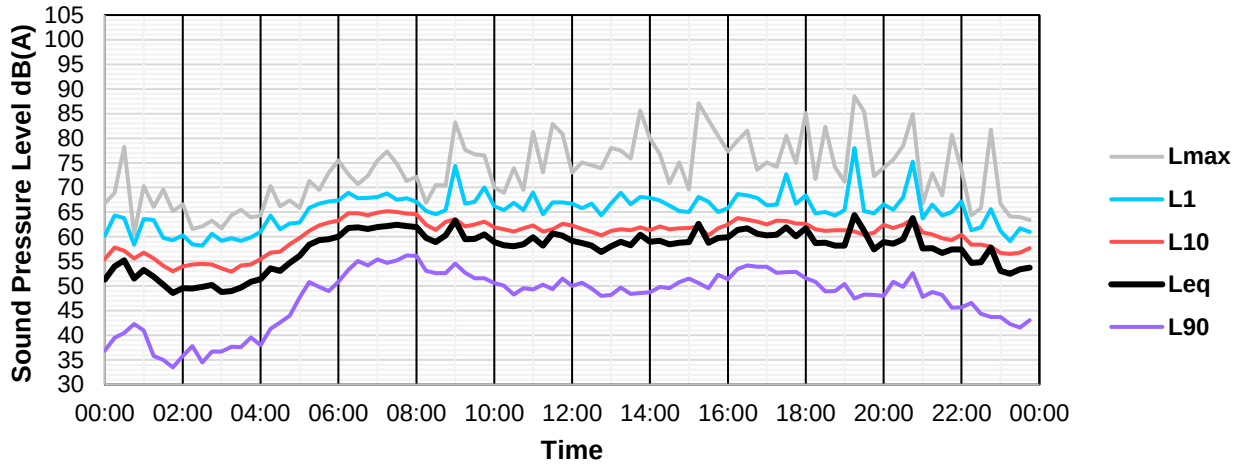
Unattended Noise Measurements
Monday 10 June 2024



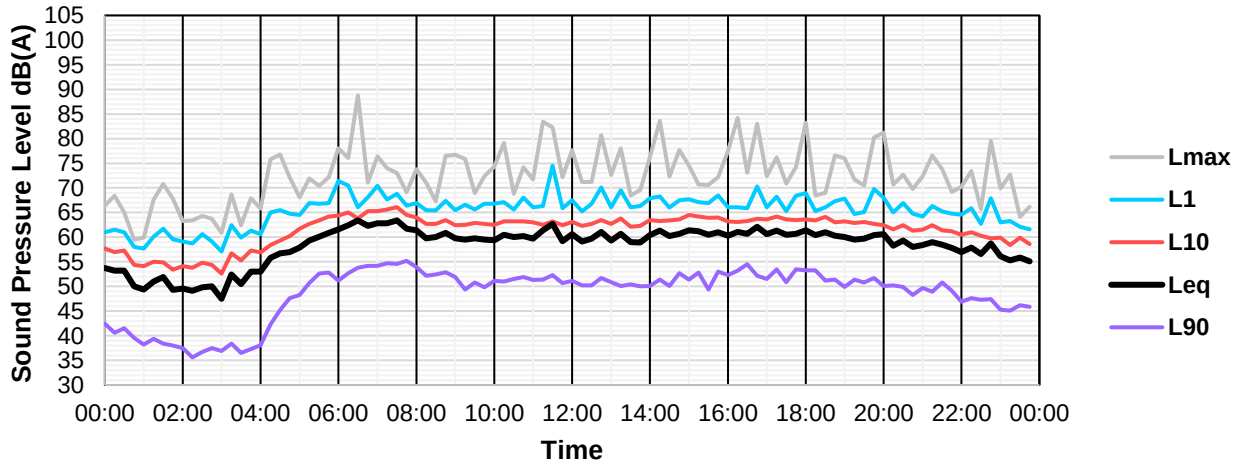
Unattended Noise Measurements
Tuesday 11 June 2024



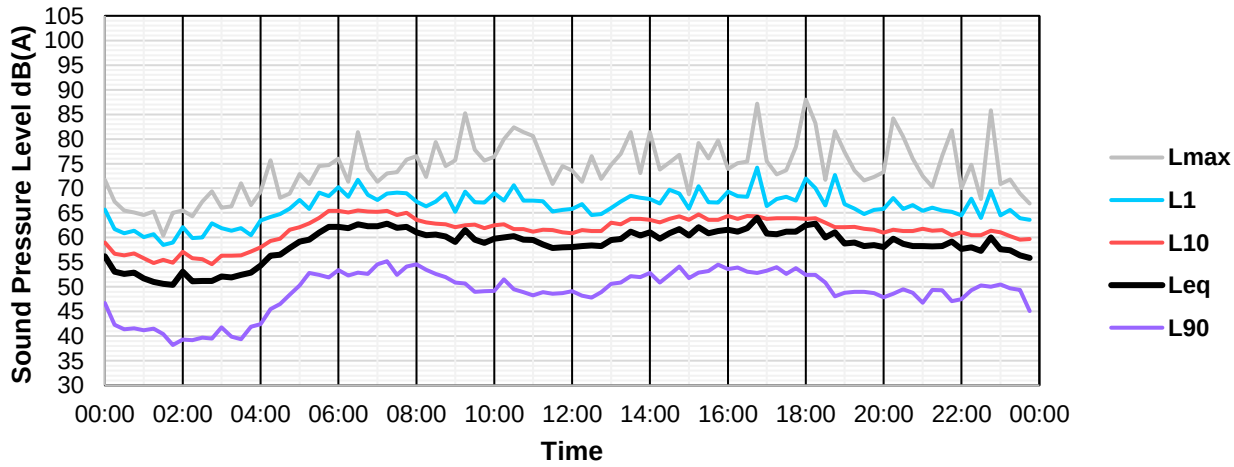
Unattended Noise Measurements
Wednesday 12 June 2024



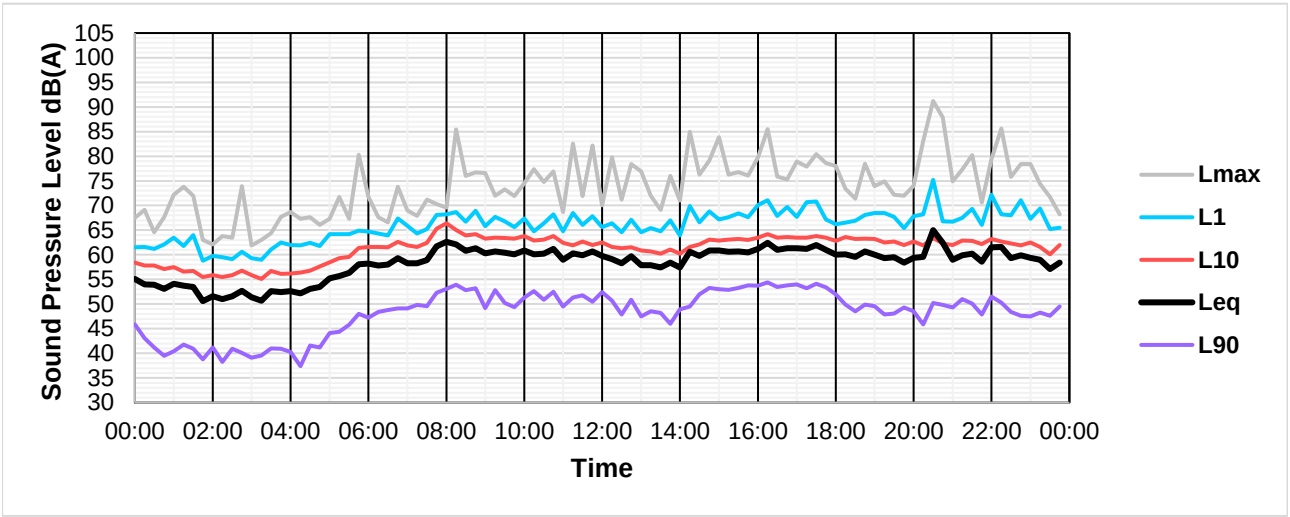
Unattended Noise Measurements
Thursday 13 June 2024



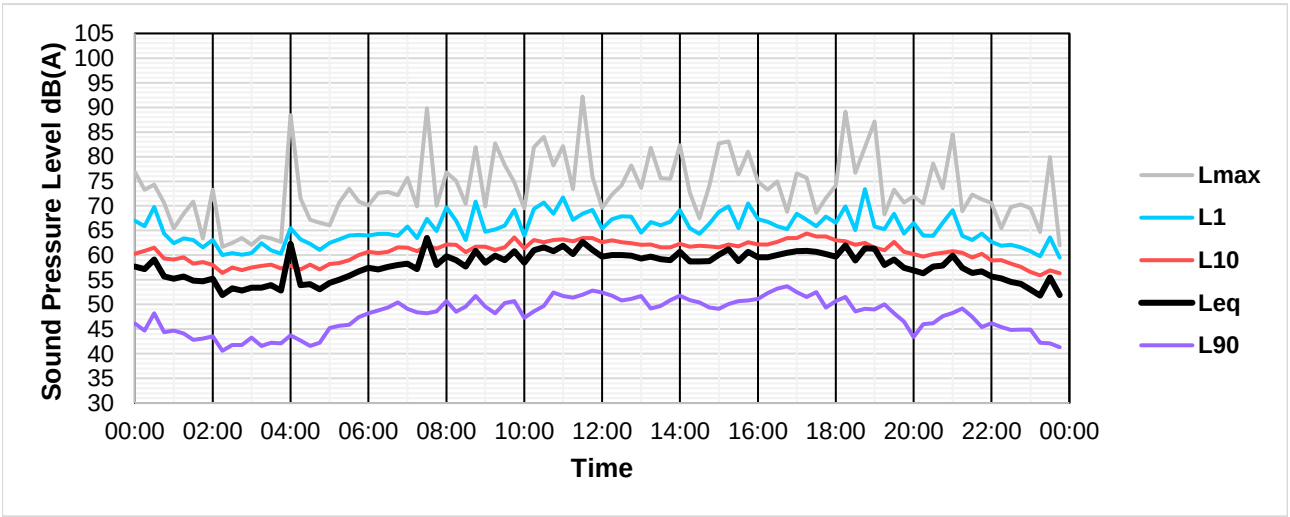
Unattended Noise Measurements
Friday 14 June 2024



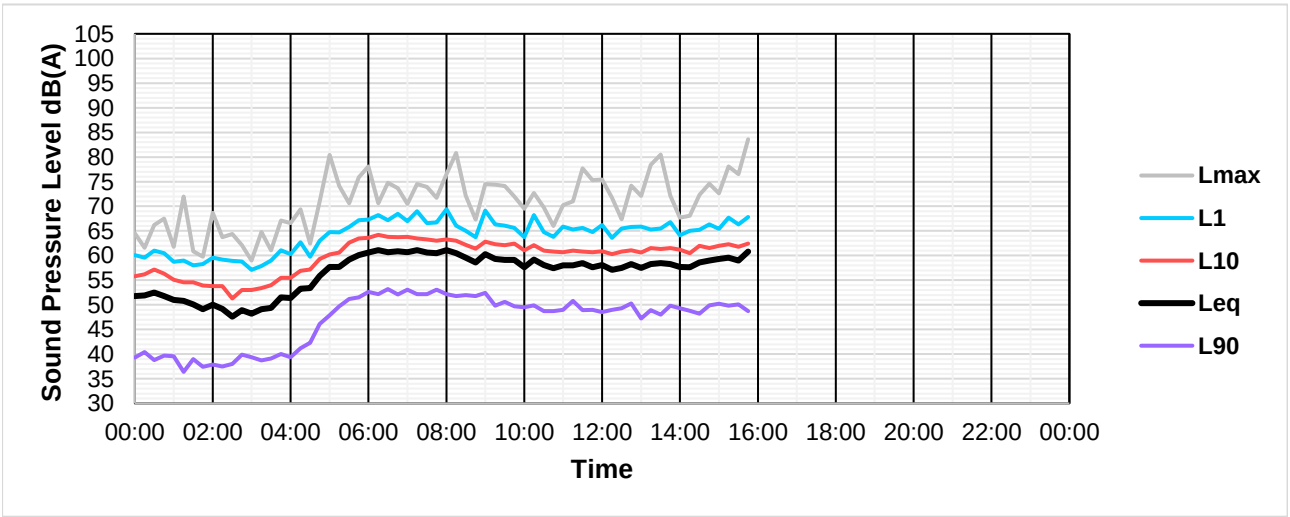
Unattended Noise Measurements
Saturday 15 June 2024



Unattended Noise Measurements
Sunday 16 June 2024



Unattended Noise Measurements
Monday 17 June 2024



Unattended Noise Measurements
1 Clarke Street, Southport

Environmental Noise Levels Day, Evening and Night

Logger Location - 2
27°57'42.0"S 153°23'21.5"E

ARL Environmental Noise Logger	
Logger Serial Number	87805E
Measurement Title	20240606_090449
Measurement started at	06/06/2024 - 09:04:51
Measurement stopped at	17/06/2024 - 16:02:39
Frequency Weighting	A
Time Averaging	Fast
Statistical Interval	15 min
Pre-measurement Ref.	94.0
Post-measurement Ref.	93.9
Engineering Units	dB SPL

		$L_{Aeq,T}$ dB(A)			$L_{A01,T}$ dB(A)			$L_{A10,T}$ dB(A)			$L_{A90,T}$ dB(A)			Assessment Background Levels dB(A)		
Date	**Day**	**D**	**E**	**N**	**D**	**E**	**N**	**D**	**E**	**N**	**D**	**E**	**N**	**D**	**E**	**N**
6/06/2024	Thursday	—	53	48	—	59	54	—	55	50	—	48	42	—	48	37
7/06/2024	Friday	53	52	49	60	59	56	55	54	51	49	47	43	47	45	39
8/06/2024	Saturday	54	53	49	61	60	55	56	55	51	49	48	43	48	48	39
9/06/2024	Sunday	54	53	49	61	59	55	55	55	52	48	48	44	47	47	38
10/06/2024	Monday	54	54	51	61	60	58	55	56	53	49	49	44	46	48	39
11/06/2024	Tuesday	54	53	47	61	60	54	55	55	49	48	48	41	46	46	35
12/06/2024	Wednesday	54	53	49	61	61	55	56	55	51	49	48	43	47	46	37
13/06/2024	Thursday	55	54	50	62	60	56	57	56	52	50	50	45	49	49	39
Average		**54**	**53**	**49**	**61**	**60**	**56**	**56**	**55**	**51**	**49**	**48**	**43**	—	—	—

Rating Background Level (RBL) dBA	**47**	**47**	**38**

Note

— No noise data available

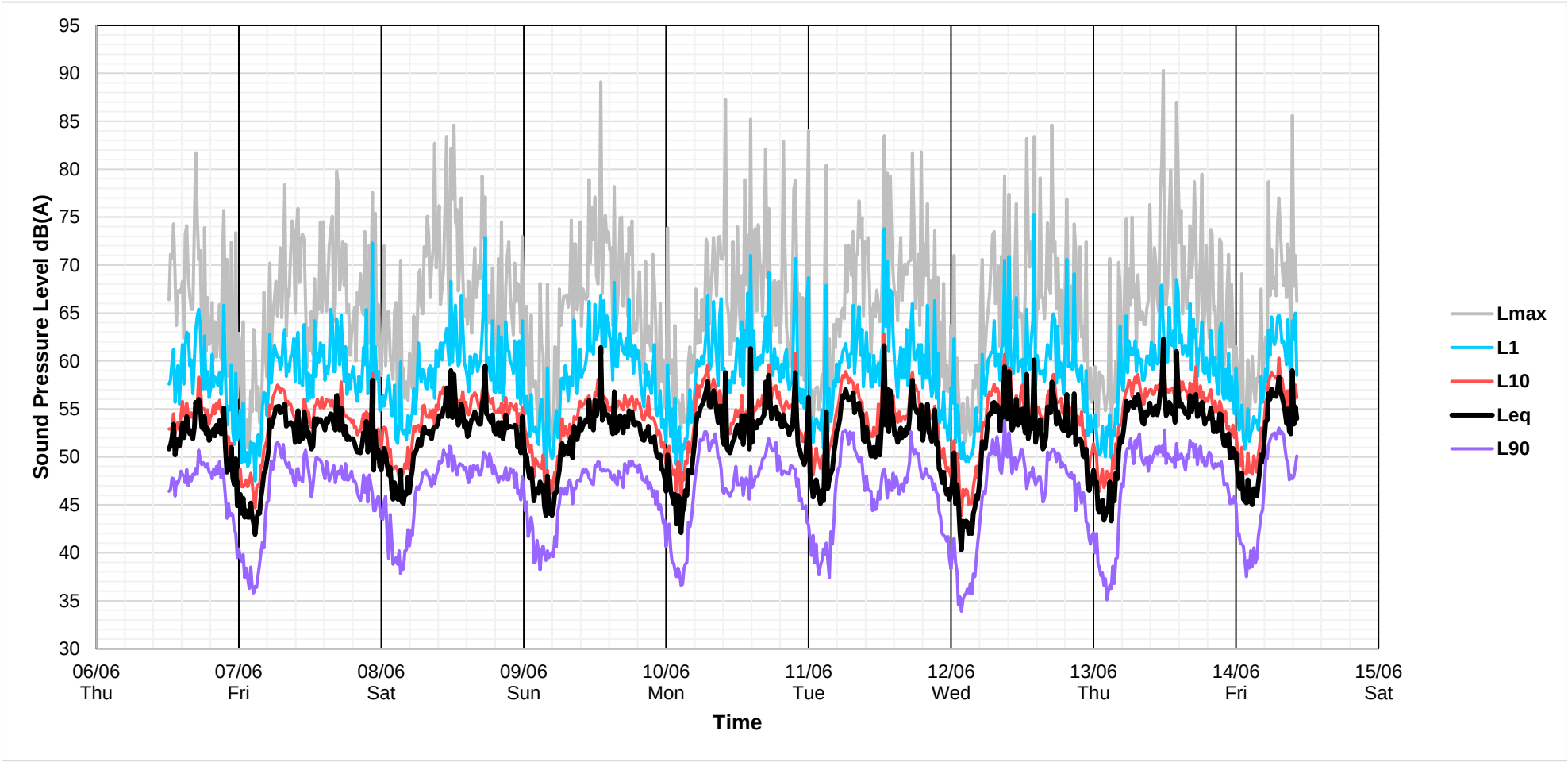
Day (D): 7:00am to 6:00pm

Evening (E): 6:00pm to 10:00pm

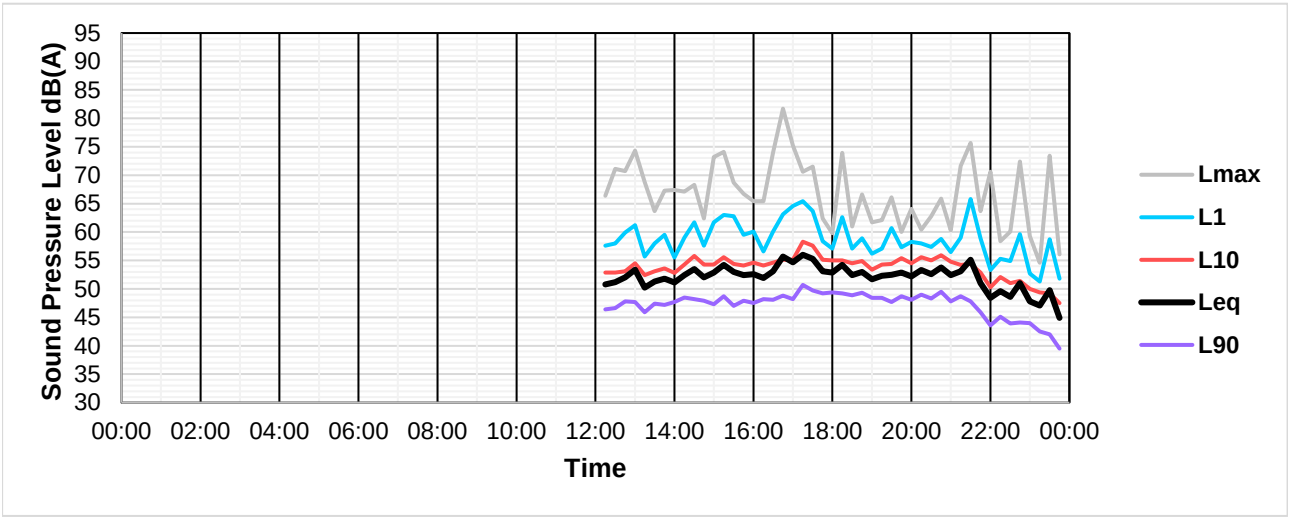
Night (N): 10:00pm to 7:00am

Rainfall recorded on this day

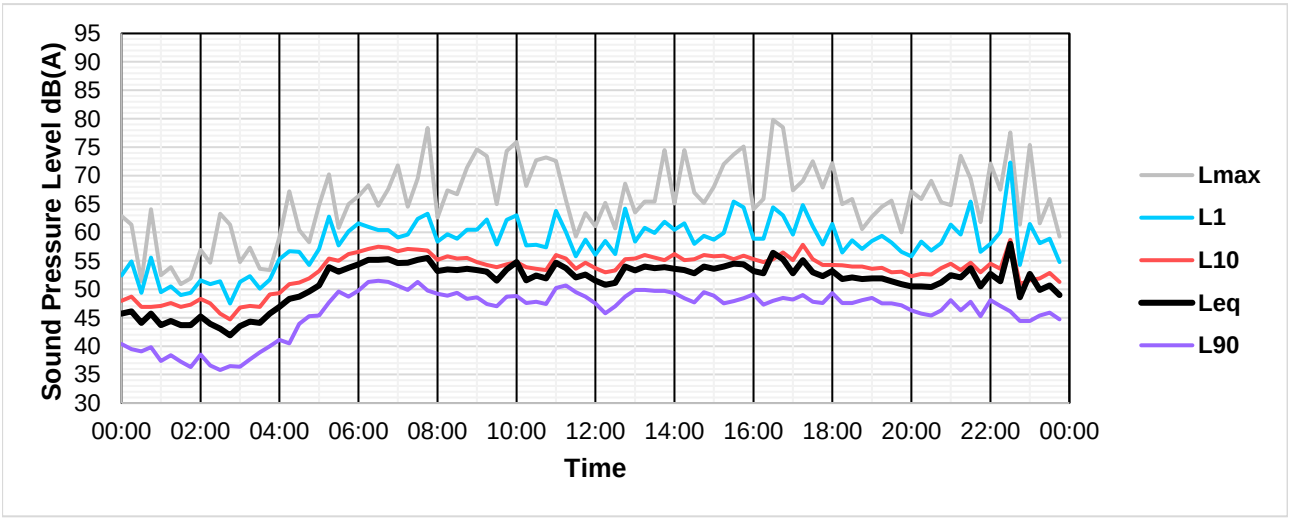
Unattended Noise Measurements
6 to 14 June 2024



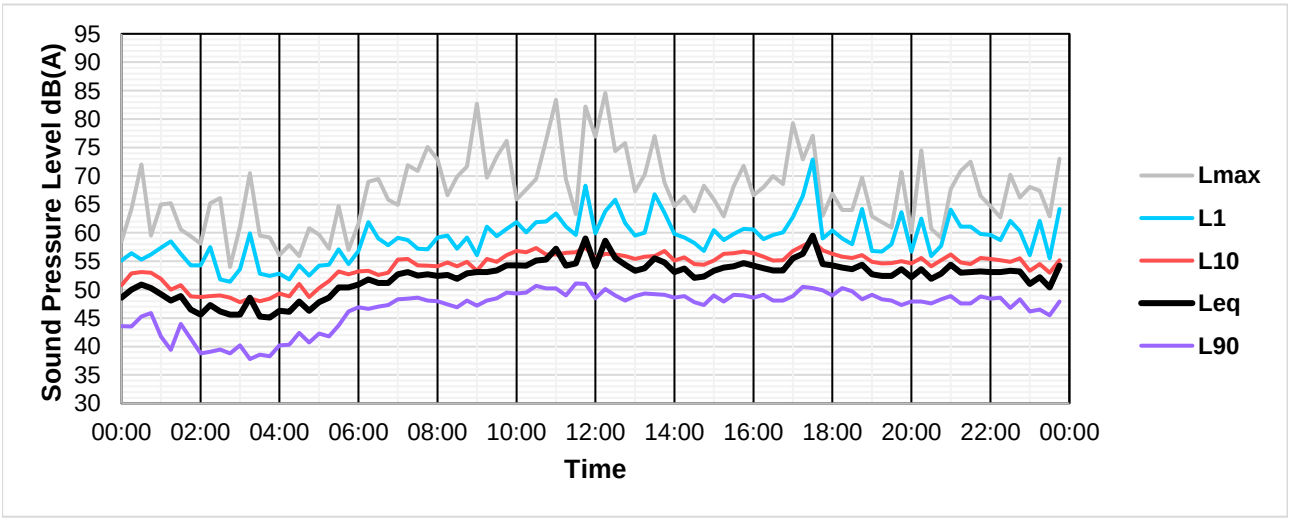
Unattended Noise Measurements
Thursday 6 June 2024



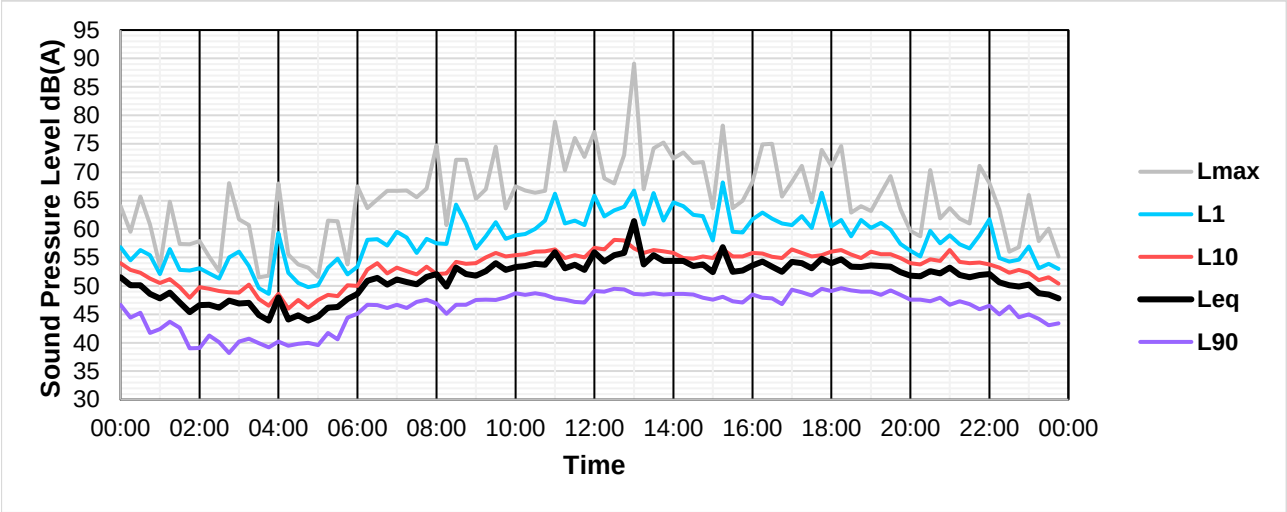
Unattended Noise Measurements
Friday 7 June 2024



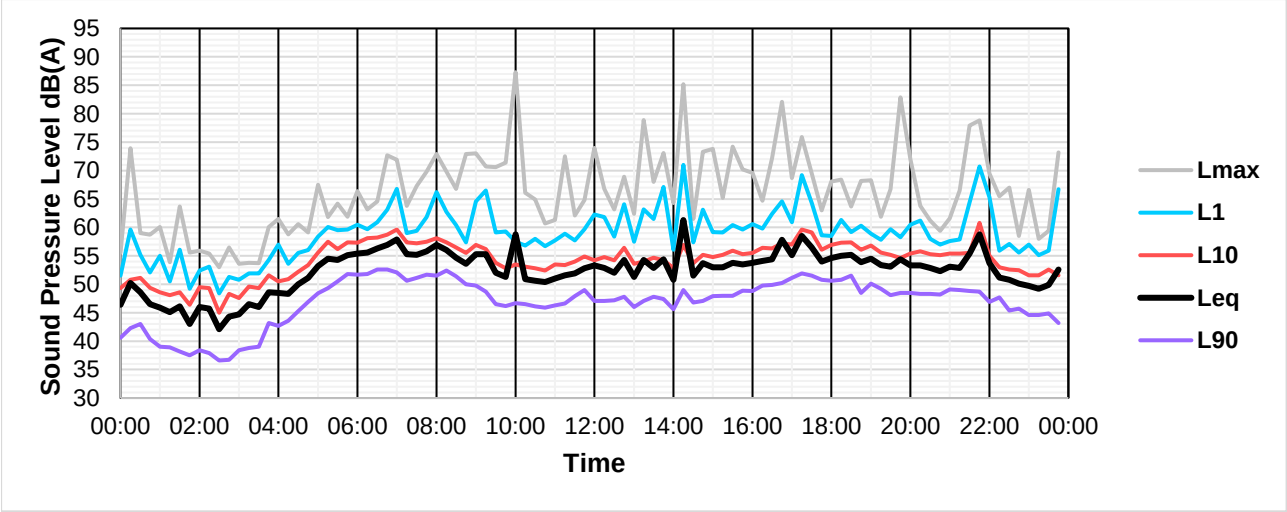
Unattended Noise Measurements
Saturday 8 June 2024



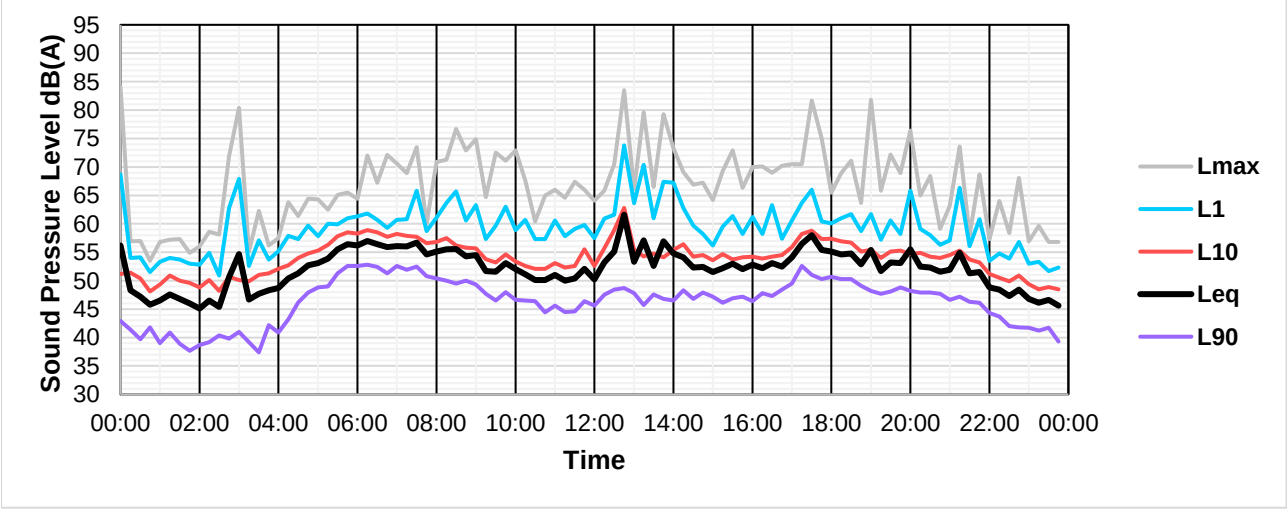
Unattended Noise Measurements
Sunday 9 June 2024



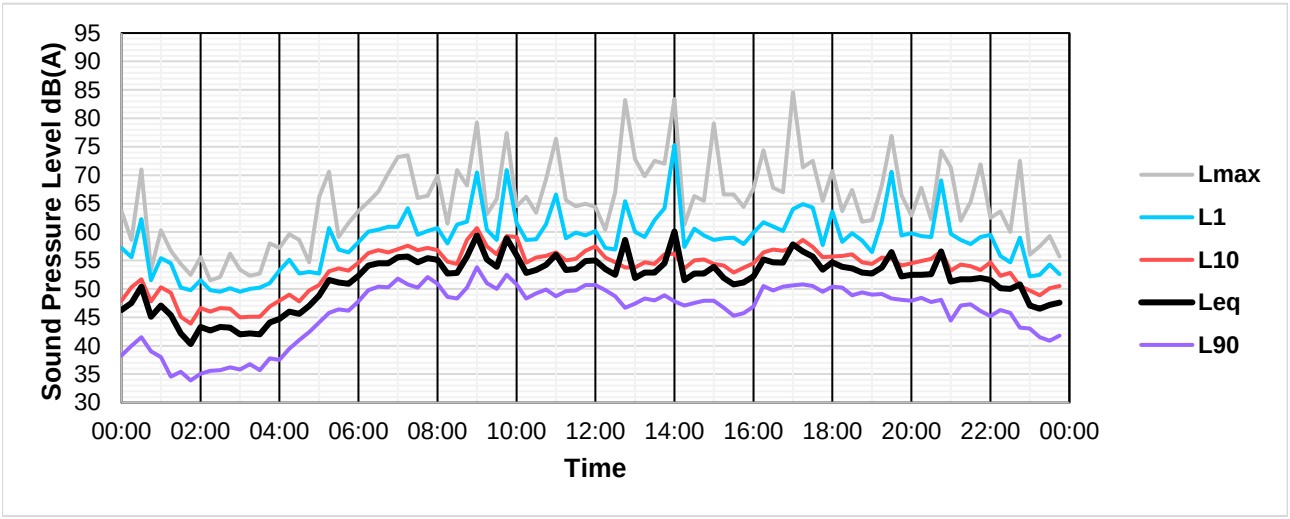
Unattended Noise Measurements
Monday 10 June 2024



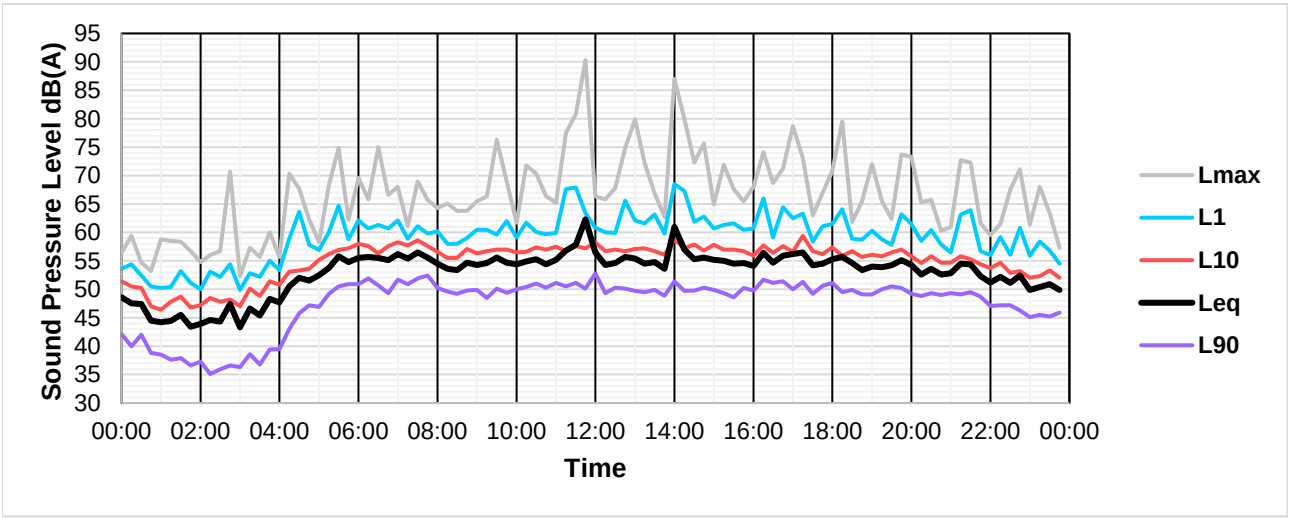
Unattended Noise Measurements
Tuesday 11 June 2024



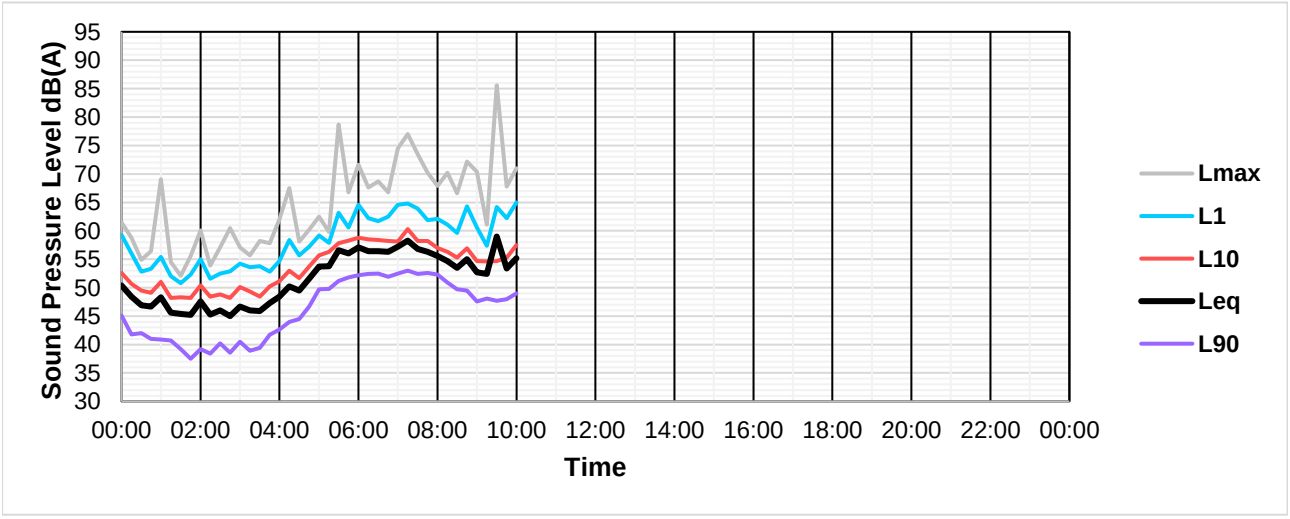
Unattended Noise Measurements
Wednesday 12 June 2024



Unattended Noise Measurements
Thursday 13 June 2024



Unattended Noise Measurements
Friday 14 June 2024



Appendix E – Validation of CoRTN Traffic Noise Model

1 Clarke Street, Southport
Calculated Traffic Noise Levels
RTNA Validation

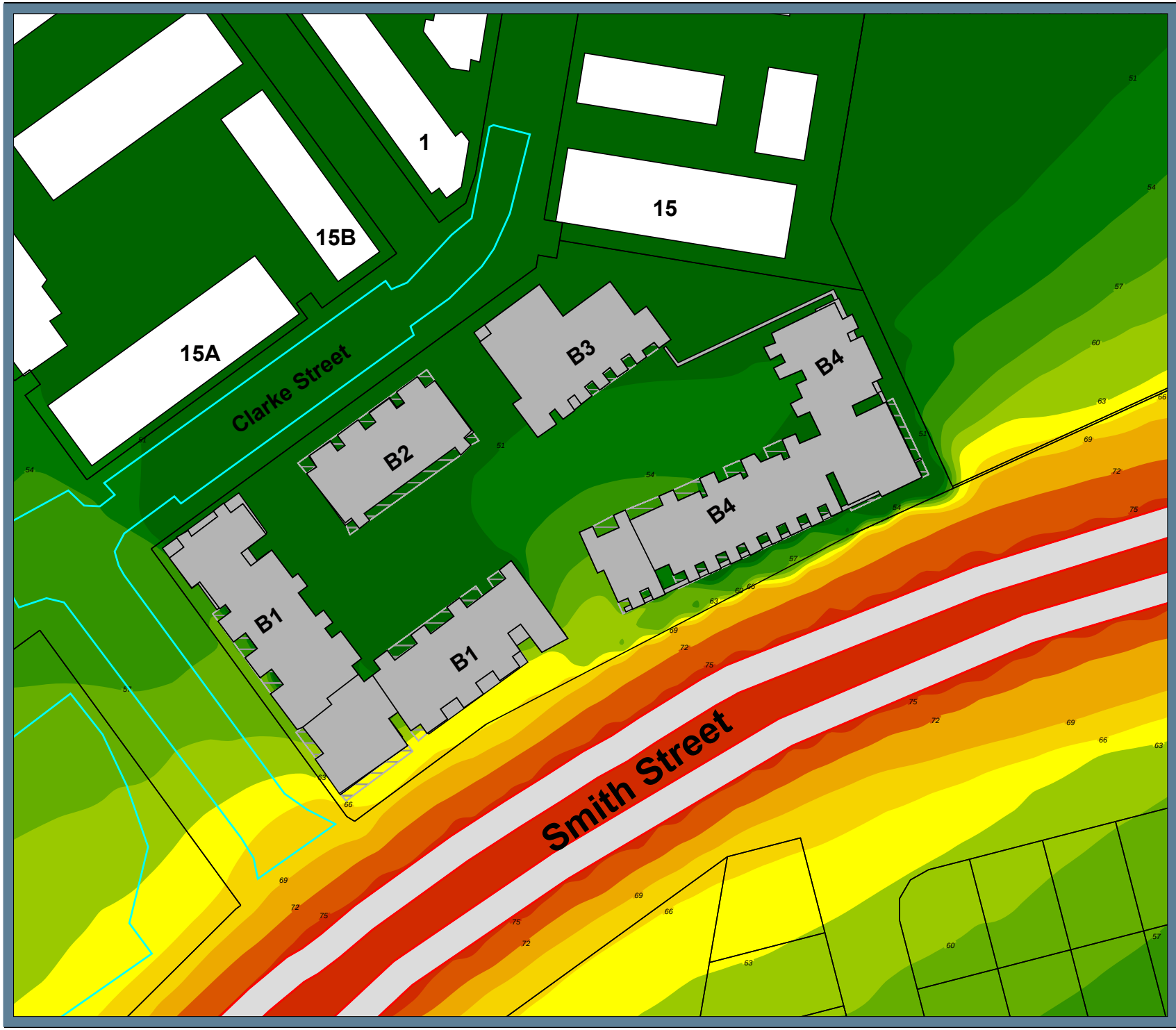
Receiver	L10(18h) dB(A)
Noise logger	65.0

Appendix F – Tabulated Traffic Noise Levels

Proposed Residential Development
1 Clarke Street, Southport
Calculated Traffic Noise Levels
Predicted 2035 Traffic Noise Levels - Outdoor Private Open Spaces

Receiver Name	L10(18h) dB(A)
Building 1_L2_SE	67.5
Building 1_L2_SW	62.1
Building 1_L3_SE	68.3
Building 1_L3_SW	62.9
Building 1_L4_SE	68.5
Building 1_L4_SW	63.6
Building 1_L5_SE	68.5
Building 1_L5_SW	63.7
Building 1_L6_SE	68.3
Building 1_L6_SW	63.8
Building 1_L7_SE	68.1
Building 1_L7_SW	63.7
Building 1_L8_SE	67.8
Building 1_L8_SW	63.6
Building 1_L9_SE	67.5
Building 1_L9_SW	63.4
Building 1_L10_SE	67.2
Building 1_L10_SW	63.2
Building 4_L2_NE	60.2
Building 4_L2_SE	64.6
Building 4_L3_NE	59.6
Building 4_L3_SE	65.8
Building 4_L4_NE	65.5
Building 4_L4_SE	65.8
Building 4_L5_NE	66.4
Building 4_L5_SE	65.6
Building 4_L6_NE	66.0
Building 4_L6_SE	65.1
Building 4_L7_NE	65.5
Building 4_L7_SE	64.5
Building 4_L8_NE	65.1
Building 4_L8_SE	63.7
Building 4_L9_NE	64.5
Building 4_L9_SE	62.9
Building 4_L10_NE	64.0
Building 4_L10_SE	61.9
Building 4_L11_NE	63.7
Building 4_L11_SE	61.2
Building 4_L12_NE	63.2
Building 4_L12_SE	60.5
Building 4_L13_NE	62.8
Building 4_L13_SE	59.8

Appendix G – Traffic Noise Contour Maps



ATP CONSULTING ENGINEERS

ATP240541

Proposed Development
1 Clarke Street, Southport
Building 1

Traffic Noise Modelling
Year 2035

GF Private Open Spaces
(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

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

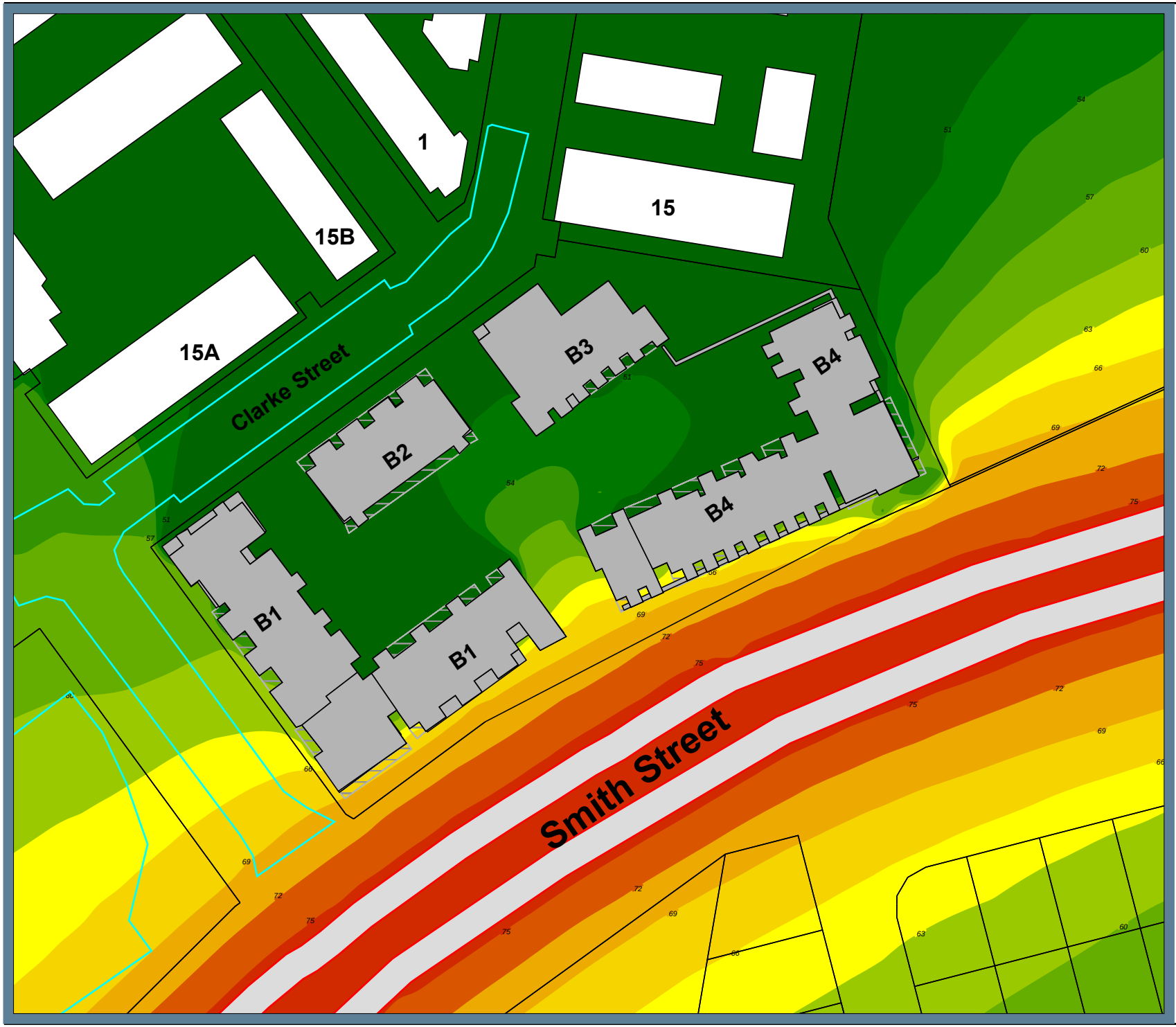
SCALE @ A4 1:1400

0 5 10 20 30 40 m

N

Grid Spacing: 5m
Project Engineer: Bojan Todorovski
Created: 25/07/2024
Processed with SoundPLAN 8.2

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



ATP CONSULTING ENGINEERS

ATP240541

Proposed Development
1 Clarke Street, Southport
Building 1

Traffic Noise Modelling
Year 2035

Level 2 Private Open Spaces
(5.5m 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

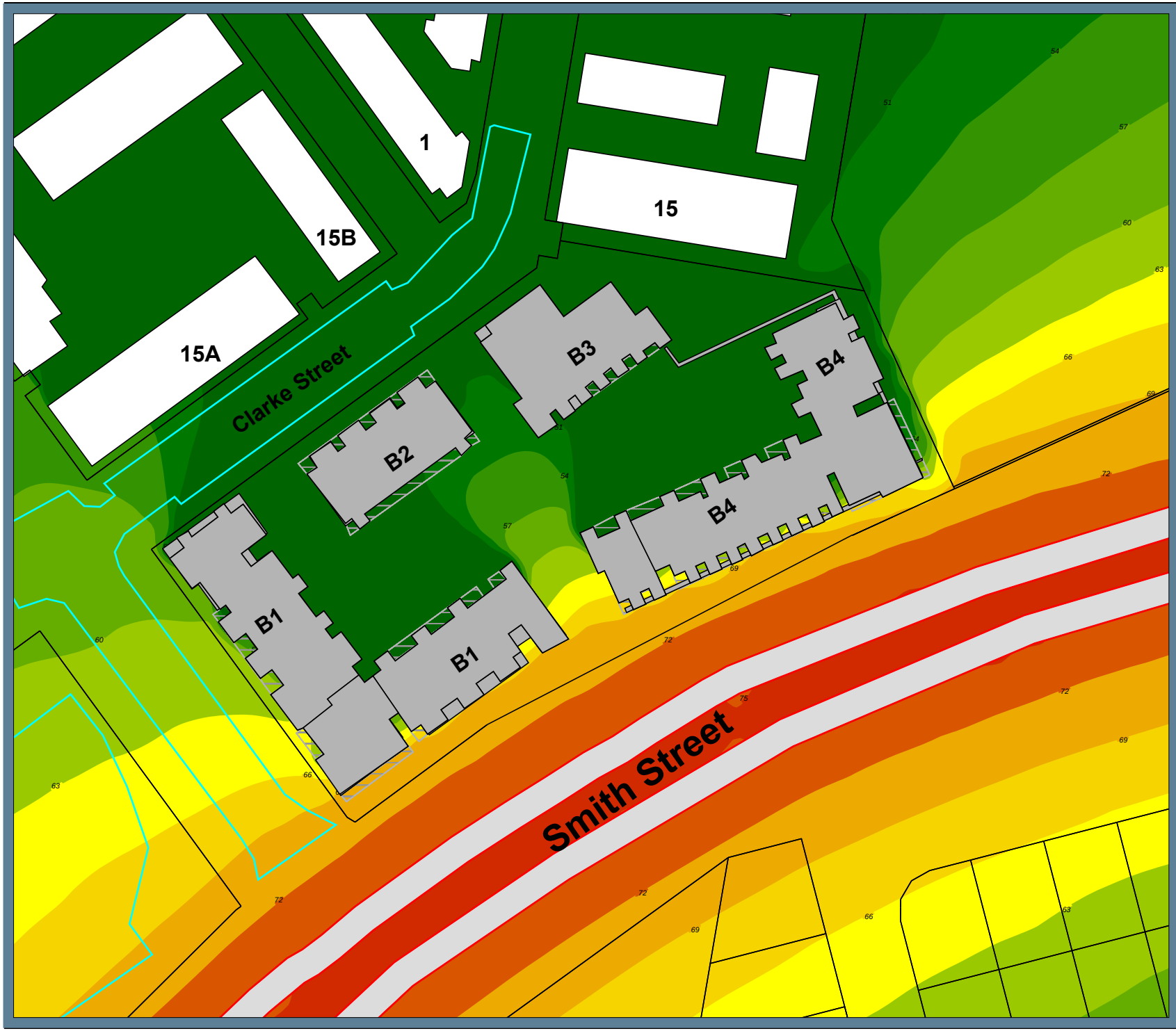
- Adjacent Building
- Ground Absorption
- Lot boundary
- Point receiver
- Proposed Development
- Road
- Surface
- Foliage

SCALE @ A4 1:1400

0 5 10 20 30 40 m

Grid Spacing: 5m
Project Engineer: Bojan Todorovski
Created: 25/07/2024
Processed with SoundPLAN 8.2

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



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ATP240541

Proposed Development
1 Clarke Street, Southport
Building 1

Traffic Noise Modelling
Year 2035

Level 3 Private Open Spaces
(8.7m 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

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

SCALE @ A4 1:1400

0 5 10 20 30 40 m

Grid Spacing: 5m
Project Engineer: Bojan Todorovski
Created: 25/07/2024
Processed with SoundPLAN 8.2

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

ATP CONSULTING ENGINEERS

ATP240541

Proposed Development
1 Clarke Street, Southport
Building 1

Traffic Noise Modelling
Year 2035

Level 4 Private Open Spaces
(11.9m 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

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

SCALE @ A4 1:1400

0 5 10 20 30 40 m

Grid Spacing: 5m
Project Engineer: Bojan Todorovski
Created: 25/07/2024
Processed with SoundPLAN 8.2

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

ATP CONSULTING ENGINEERS

ATP240541

Proposed Development
1 Clarke Street, Southport
Building 1

Traffic Noise Modelling
Year 2035

Level 5 Private Open Spaces
(15.1m 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

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

SCALE @ A4 1:1400

0 5 10 20 30 40 m

Grid Spacing: 5m
Project Engineer: Bojan Todorovski
Created: 25/07/2024
Processed with SoundPLAN 8.2

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

ATP CONSULTING ENGINEERS

ATP240541

Proposed Development
1 Clarke Street, Southport
Building 1

Traffic Noise Modelling
Year 2035

Level 6 Private Open Spaces
(18.3m 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

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

SCALE @ A4 1:1400

0 5 10 20 30 40 m

N

Grid Spacing: 5m
Project Engineer: Bojan Todorovski
Created: 25/07/2024
Processed with SoundPLAN 8.2

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

ATP CONSULTING ENGINEERS

ATP240541

Proposed Development
1 Clarke Street, Southport
Building 1

Traffic Noise Modelling
Year 2035

Level 7 Private Open Spaces
(21.5m 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

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

SCALE @ A4 1:1400

0 5 10 20 30 40 m

N

Grid Spacing: 5m
Project Engineer: Bojan Todorovski
Created: 25/07/2024
Processed with SoundPLAN 8.2

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

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Proposed Development
1 Clarke Street, Southport
Building 1

Traffic Noise Modelling
Year 2035

Level 8 Private Open Spaces
(24.7m 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

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

SCALE @ A4 1:1400

0 5 10 20 30 40 m

Grid Spacing: 5m
Project Engineer: Bojan Todorovski
Created: 25/07/2024
Processed with SoundPLAN 8.2

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

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Proposed Development
1 Clarke Street, Southport
Building 1

Traffic Noise Modelling
Year 2035

Level 9 Private Open Spaces
(27.9m 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

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

SCALE @ A4 1:1400

0 5 10 20 30 40 m

Grid Spacing: 5m
Project Engineer: Bojan Todorovski
Created: 25/07/2024
Processed with SoundPLAN 8.2

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

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Proposed Development
1 Clarke Street, Southport
Building 1

Traffic Noise Modelling
Year 2035

Level 10 Private Open Spaces
(31.1m 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

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

SCALE @ A4 1:1400

0 5 10 20 30 40 m

Grid Spacing: 5m
Project Engineer: Bojan Todorovski
Created: 25/07/2024
Processed with SoundPLAN 8.2

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

ATP CONSULTING ENGINEERS

ATP240541

Proposed Development
1 Clarke Street, Southport
Building 1

Traffic Noise Modelling
Year 2035

Level 11 Private Open Spaces
(34.3m 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

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

SCALE @ A4 1:1400

0 5 10 20 30 40 m

N

Grid Spacing: 5m
Project Engineer: Bojan Todorovski
Created: 25/07/2024
Processed with SoundPLAN 8.2

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

ATP240541

Proposed Development
1 Clarke Street, Southport
Building 1

Traffic Noise Modelling
Year 2035

Level 12 Private Open Spaces
(37.5m 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

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

SCALE @ A4 1:1400

0 5 10 20 30 40 m

Grid Spacing: 5m
Project Engineer: Bojan Todorovski
Created: 25/07/2024
Processed with SoundPLAN 8.2

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

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ATP240541

Proposed Development
1 Clarke Street, Southport
Building 1

Traffic Noise Modelling
Year 2035

Level 13 Private Open Spaces
(40.7m 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

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

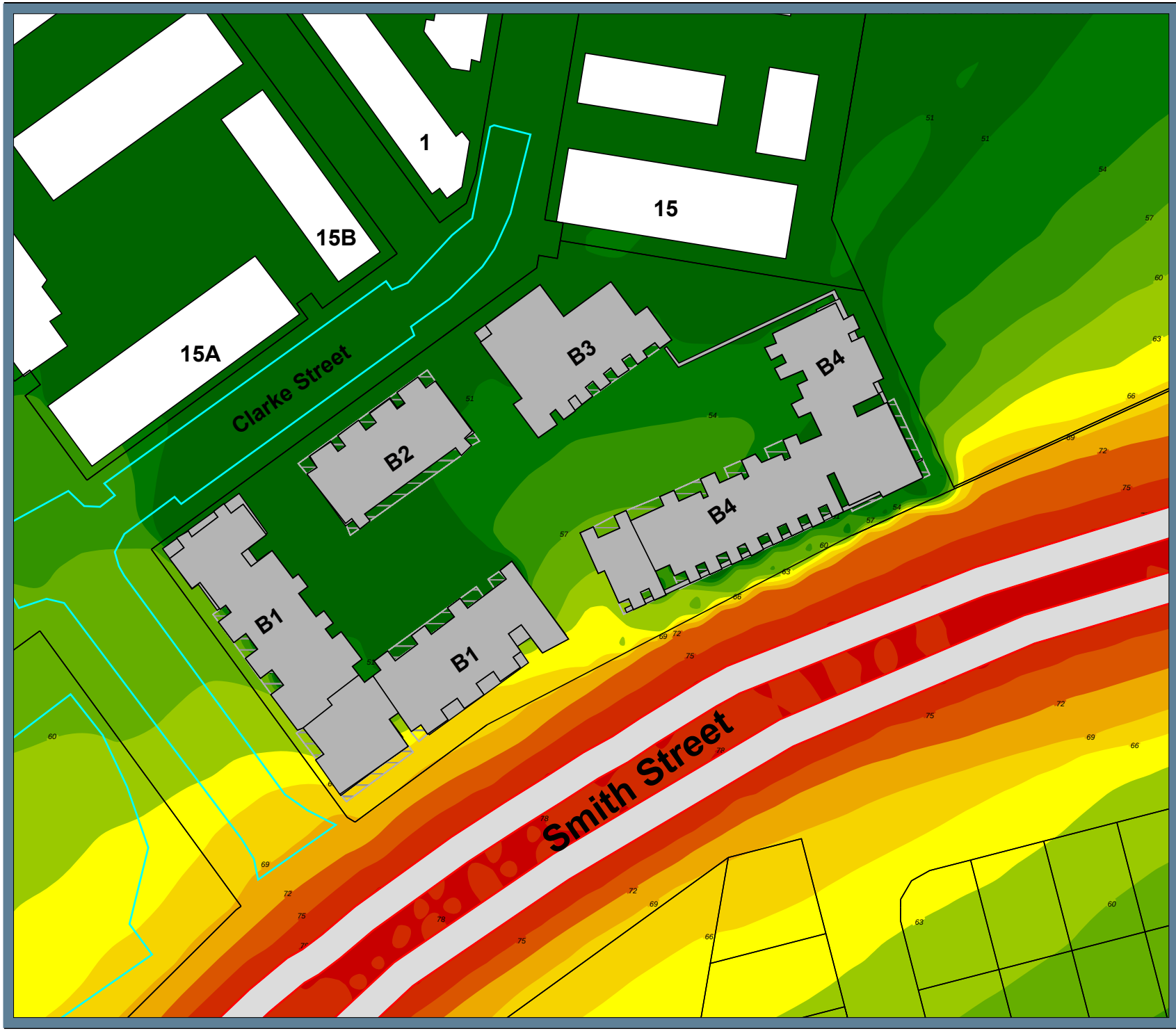
SCALE @ A4 1:1400

0 5 10 20 30 40 m

N

Grid Spacing: 5m
Project Engineer: Bojan Todorovski
Created: 25/07/2024
Processed with SoundPLAN 8.2

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



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Proposed Development
1 Clarke Street, Southport
Building 1

Traffic Noise Modelling
Year 2035

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

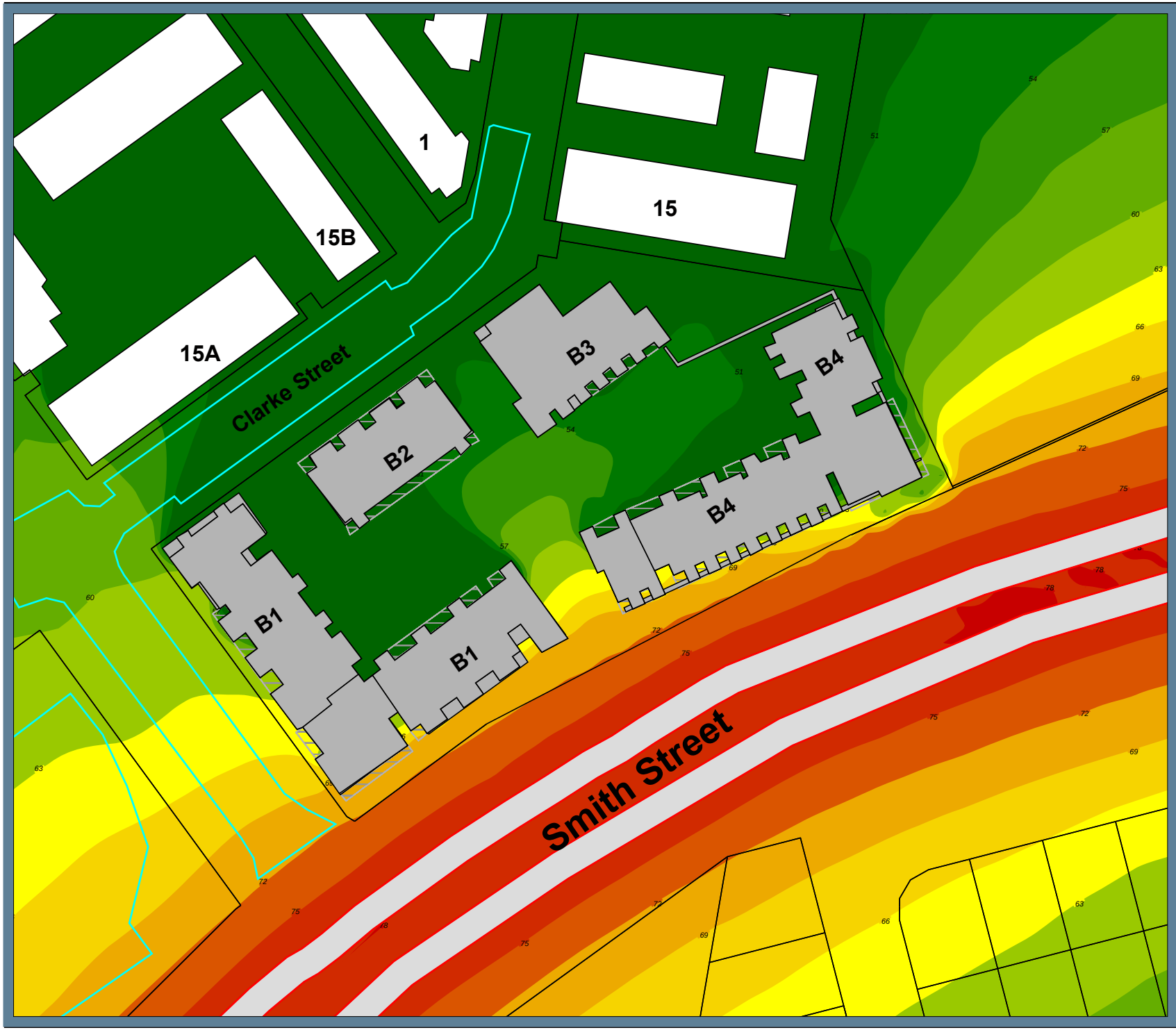
- Adjacent Building
- Ground Absorption
- Lot boundary
- Point receiver
- Proposed Development
- Road
- Surface
- Foliage

SCALE @ A4 1:1400

0 5 10 20 30 40 m

Grid Spacing: 5m
Project Engineer: Bojan Todorovski
Created: 25/07/2024
Processed with SoundPLAN 8.2

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



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Proposed Development
1 Clarke Street, Southport
Building 1

Traffic Noise Modelling
Year 2035

Level 2
(5.8m 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

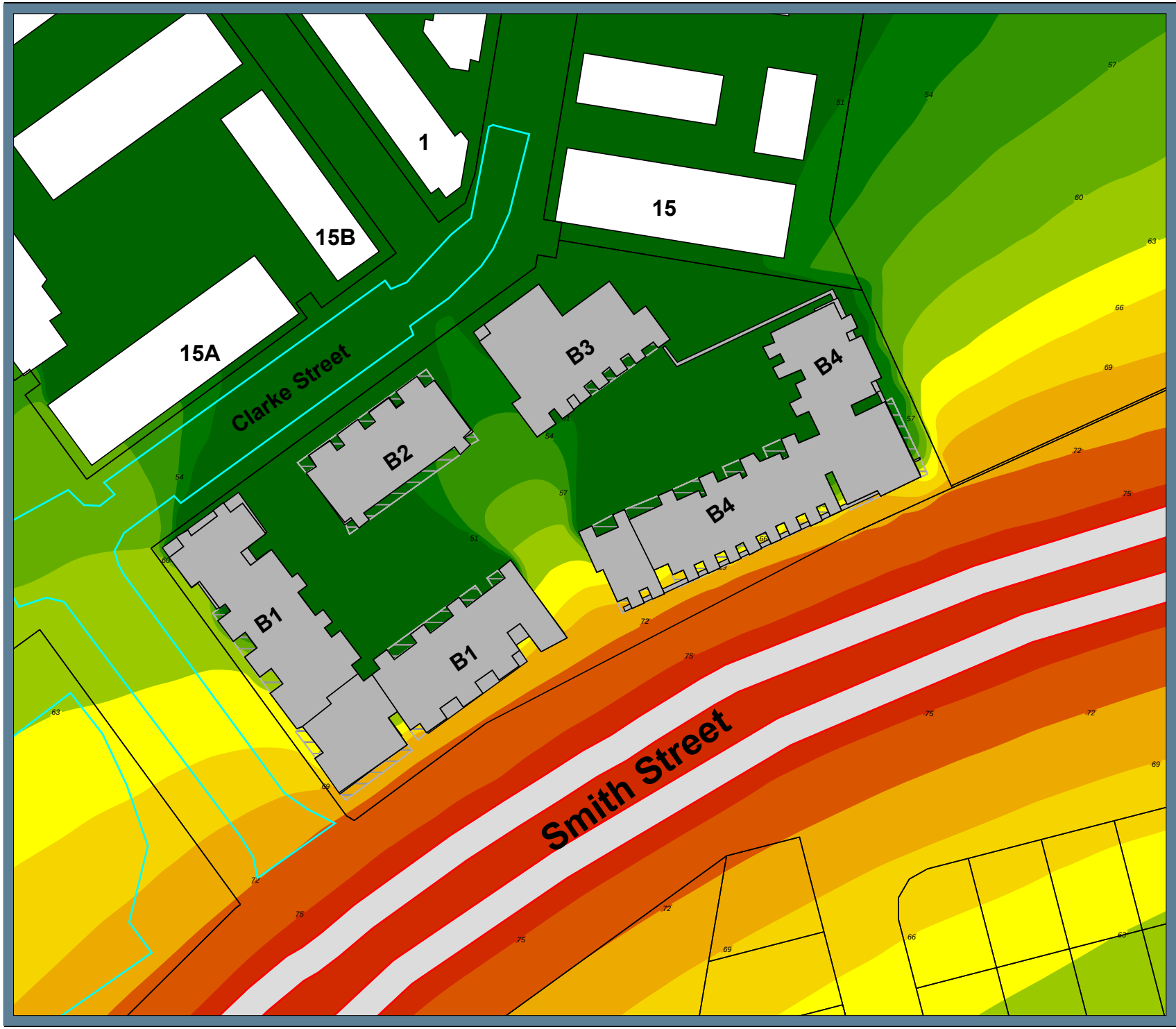
- Adjacent Building
- Ground Absorption
- Lot boundary
- Point receiver
- Proposed Development
- Road
- Surface
- Foliage

SCALE @ A4 1:1400

0 5 10 20 30 40 m

Grid Spacing: 5m
Project Engineer: Bojan Todorovski
Created: 25/07/2024
Processed with SoundPLAN 8.2

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



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Proposed Development
1 Clarke Street, Southport
Building 1

Traffic Noise Modelling
Year 2035

Level 3
(9m 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
- Surface
- Foliage

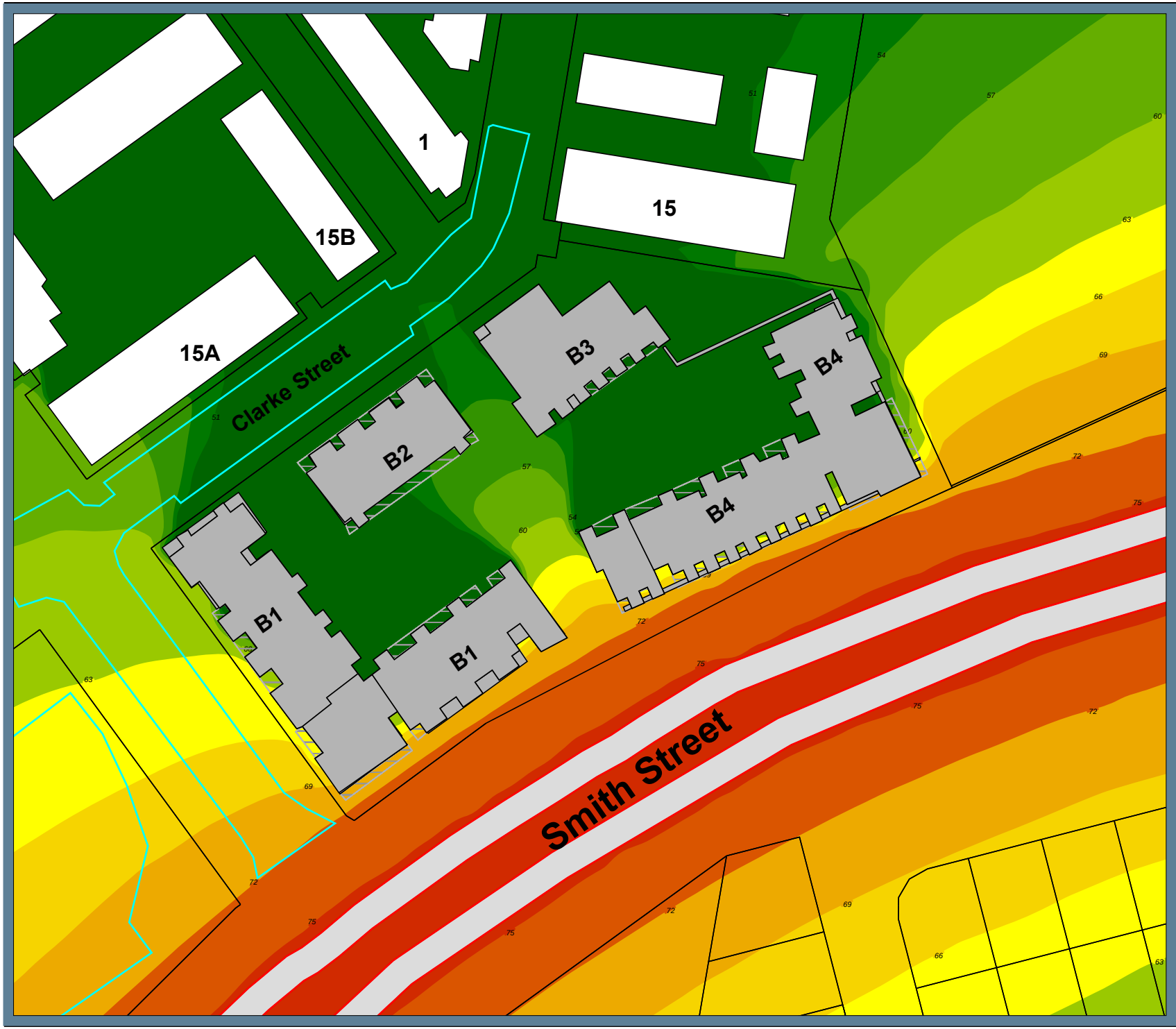
SCALE @ A4 1:1400

0 5 10 20 30 40 m

N

Grid Spacing: 5m
Project Engineer: Bojan Todorovski
Created: 25/07/2024
Processed with SoundPLAN 8.2

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



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ATP240541

Proposed Development
1 Clarke Street, Southport
Building 1

Traffic Noise Modelling
Year 2035

Level 4
(15.4m 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
- Surface
- Foliage

SCALE @ A4 1:1400

0 5 10 20 30 40 m

N

Grid Spacing: 5m
Project Engineer: Bojan Todorovski
Created: 25/07/2024
Processed with SoundPLAN 8.2

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

ATP CONSULTING ENGINEERS

ATP240541

Proposed Development
1 Clarke Street, Southport
Building 1

Traffic Noise Modelling
Year 2035

Level 5
(15.4m 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
- Surface
- Foliage

SCALE @ A4 1:1400

0 5 10 20 30 40 m

Grid Spacing: 5m
Project Engineer: Bojan Todorovski
Created: 25/07/2024
Processed with SoundPLAN 8.2

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

ATP CONSULTING ENGINEERS

ATP240541

Proposed Development
1 Clarke Street, Southport
Building 1

Traffic Noise Modelling
Year 2035

Level 6
(18.6m 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
- Surface
- Foliage

SCALE @ A4 1:1400

0 5 10 20 30 40 m

N

Grid Spacing: 5m
Project Engineer: Bojan Todorovski
Created: 25/07/2024
Processed with SoundPLAN 8.2

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

CONSULTING ENGINEERS

ATP240541

Proposed Development
1 Clarke Street, Southport
Building 1

Traffic Noise Modelling
Year 2035

Level 7
(21.8m 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
- Surface
- Foliage

SCALE @ A4 1:1400

0 5 10 20 30 40 m

N

Grid Spacing: 5m
Project Engineer: Bojan Todorovski
Created: 25/07/2024
Processed with SoundPLAN 8.2

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

ATP CONSULTING ENGINEERS

ATP240541

Proposed Development
1 Clarke Street, Southport
Building 1

Traffic Noise Modelling
Year 2035

Level 8
(25m 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
- Surface
- Foliage

SCALE @ A4 1:1400

0 5 10 20 30 40 m

Grid Spacing: 5m
Project Engineer: Bojan Todorovski
Created: 25/07/2024
Processed with SoundPLAN 8.2

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

ATP CONSULTING ENGINEERS

ATP240541

Proposed Development
1 Clarke Street, Southport
Building 1

Traffic Noise Modelling
Year 2035

Level 9
(28.2m 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
- Surface
- Foliage

SCALE @ A4 1:1400

0 5 10 20 30 40 m

N

Grid Spacing: 5m
Project Engineer: Bojan Todorovski
Created: 25/07/2024
Processed with SoundPLAN 8.2

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

ATP CONSULTING ENGINEERS

ATP240541

Proposed Development
1 Clarke Street, Southport
Building 1

Traffic Noise Modelling
Year 2035

Level 10
(31.4m 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
- Surface
- Foliage

SCALE @ A4 1:1400

0 5 10 20 30 40 m

N

Grid Spacing: 5m
Project Engineer: Bojan Todorovski
Created: 25/07/2024
Processed with SoundPLAN 8.2

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

ATP CONSULTING ENGINEERS

ATP240541

Proposed Development
1 Clarke Street, Southport
Building 1

Traffic Noise Modelling
Year 2035

Level 11
(34.6m 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
- Surface
- Foliage

SCALE @ A4 1:1400

0 5 10 20 30 40 m

N

Grid Spacing: 5m
Project Engineer: Bojan Todorovski
Created: 25/07/2024
Processed with SoundPLAN 8.2

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

ATP CONSULTING ENGINEERS

ATP240541

Proposed Development
1 Clarke Street, Southport
Building 1

Traffic Noise Modelling
Year 2035

Level 12
(37.8m 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
- Surface
- Foliage

SCALE @ A4 1:1400

0 5 10 20 30 40 m

Grid Spacing: 5m
Project Engineer: Bojan Todorovski
Created: 25/07/2024
Processed with SoundPLAN 8.2

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

ATP CONSULTING ENGINEERS

ATP240541

Proposed Development
1 Clarke Street, Southport
Building 1

Traffic Noise Modelling
Year 2035

Level 13
(41m 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
- Surface
- Foliage

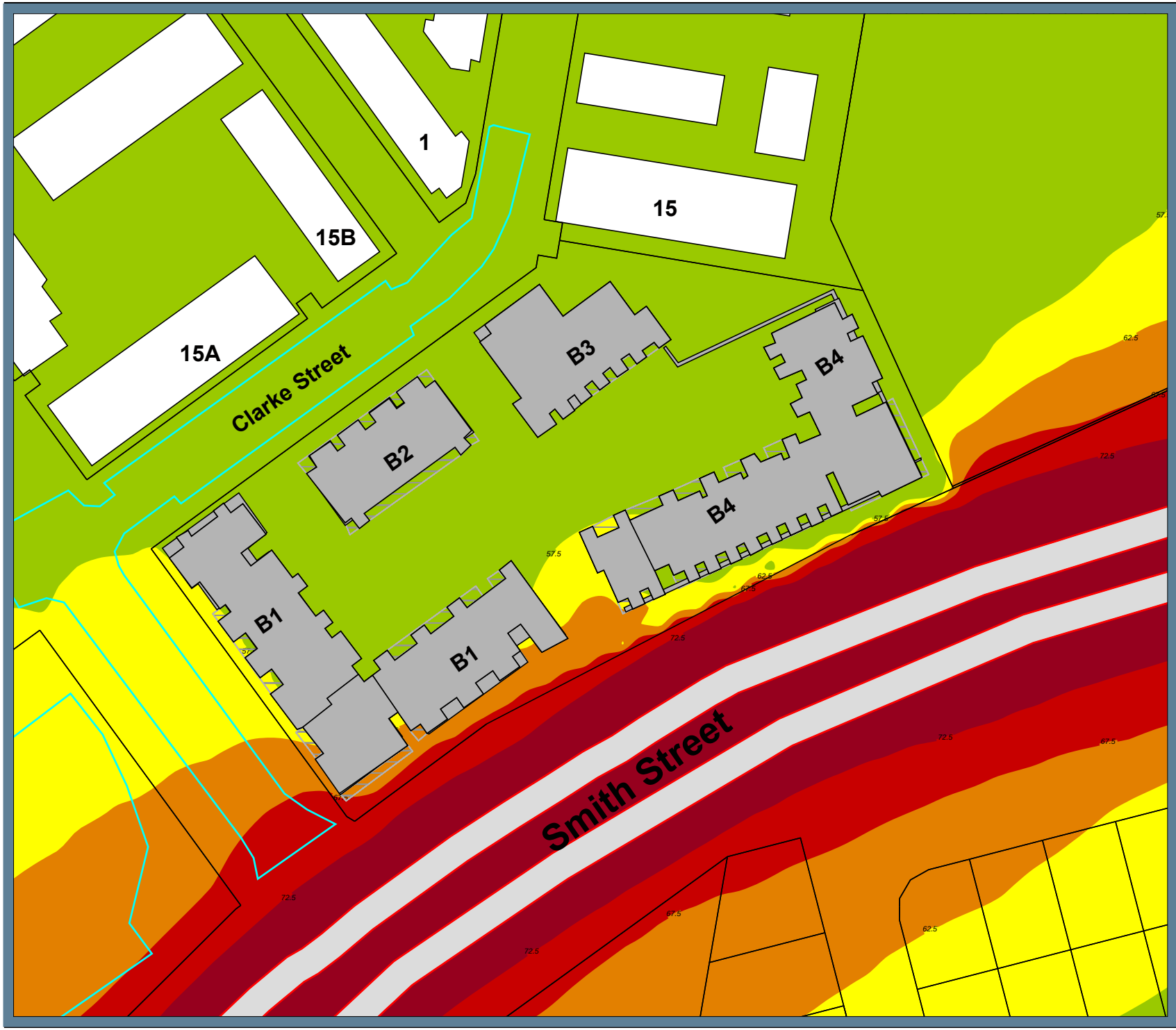
SCALE @ A4 1:1400

0 5 10 20 30 40 m

N

Grid Spacing: 5m
Project Engineer: Bojan Todorovski
Created: 25/07/2024
Processed with SoundPLAN 8.2

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



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ATP240541

Proposed Development
1 Clarke Street, Southport
Building 1

Traffic Noise Modelling
Year 2035

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
- Surface
- Foliage

SCALE @ A4 1:1400

0 5 10 20 30 40 m

Grid Spacing: 5m
Project Engineer: Bojan Todorovski
Created: 25/07/2024
Processed with SoundPLAN 8.2

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

ATP CONSULTING ENGINEERS

ATP240541

Proposed Development
1 Clarke Street, Southport
Building 1

Traffic Noise Modelling
Year 2035

Level 2
(5.8m 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
- Surface
- Foliage

SCALE @ A4 1:1400

0 5 10 20 30 40 m

Grid Spacing: 5m
Project Engineer: Bojan Todorovski
Created: 25/07/2024
Processed with SoundPLAN 8.2

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

ATP CONSULTING ENGINEERS

ATP240541

Proposed Development
1 Clarke Street, Southport
Building 1

Traffic Noise Modelling
Year 2035

Level 3
(12.2m 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
- Surface
- Foliage

SCALE @ A4 1:1400

0 5 10 20 30 40 m

N

Grid Spacing: 5m
Project Engineer: Bojan Todorovski
Created: 25/07/2024
Processed with SoundPLAN 8.2

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

ATP CONSULTING ENGINEERS

ATP240541

Proposed Development
1 Clarke Street, Southport
Building 1

Traffic Noise Modelling
Year 2035

Level 4
(12.2m 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
- Surface
- Foliage

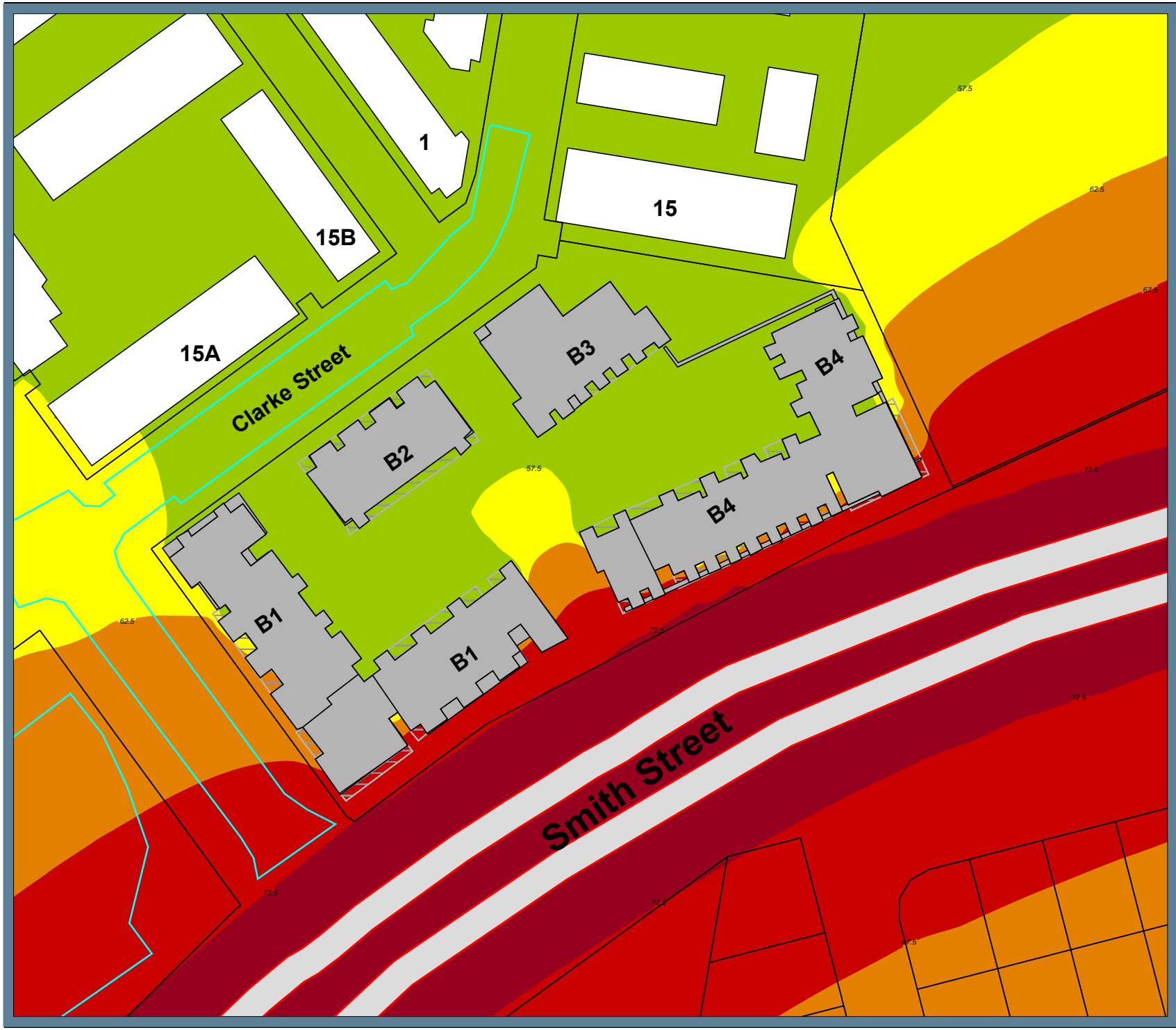
SCALE @ A4 1:1400

0 5 10 20 30 40 m

N

Grid Spacing: 5m
Project Engineer: Bojan Todorovski
Created: 25/07/2024
Processed with SoundPLAN 8.2

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



ATP CONSULTING ENGINEERS

ATP240541

Proposed Development
1 Clarke Street, Southport
Building 1

Traffic Noise Modelling
Year 2035

Level 5
(15.4m 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
- Surface
- Foliage

SCALE @ A4 1:1400

0 5 10 20 30 40 m

N

Grid Spacing: 5m
Project Engineer: Bojan Todorovski
Created: 25/07/2024
Processed with SoundPLAN 8.2

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

ATP CONSULTING ENGINEERS

ATP240541

Proposed Development
1 Clarke Street, Southport
Building 1

Traffic Noise Modelling
Year 2035

Level 6
(18.6m 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
- Surface
- Foliage

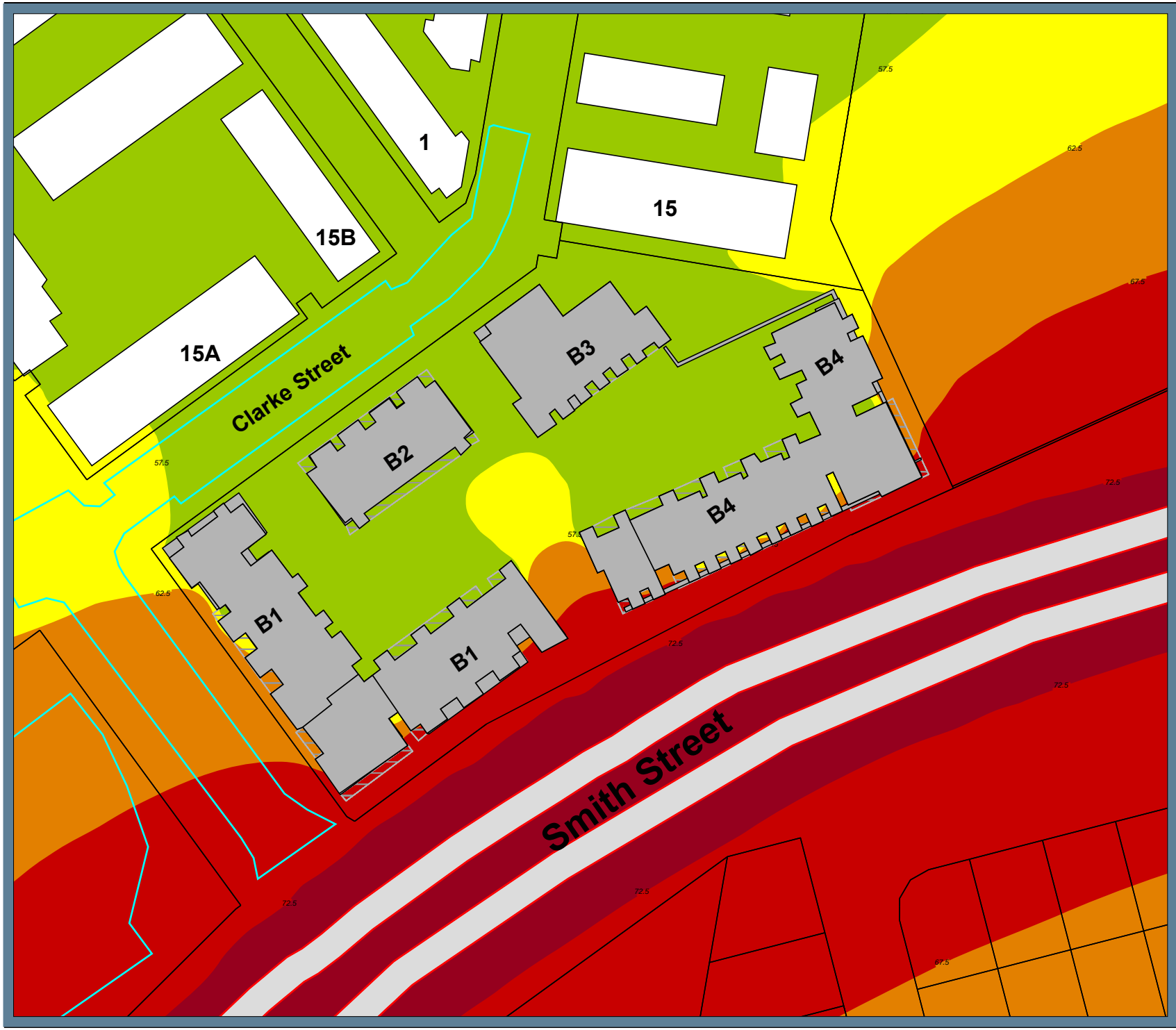
SCALE @ A4 1:1400

0 5 10 20 30 40 m

N

Grid Spacing: 5m
Project Engineer: Bojan Todorovski
Created: 25/07/2024
Processed with SoundPLAN 8.2

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



ATP CONSULTING ENGINEERS

ATP240541

Proposed Development
1 Clarke Street, Southport
Building 1

Traffic Noise Modelling
Year 2035

Level 7
(21.8m AGL)

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

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

Legend

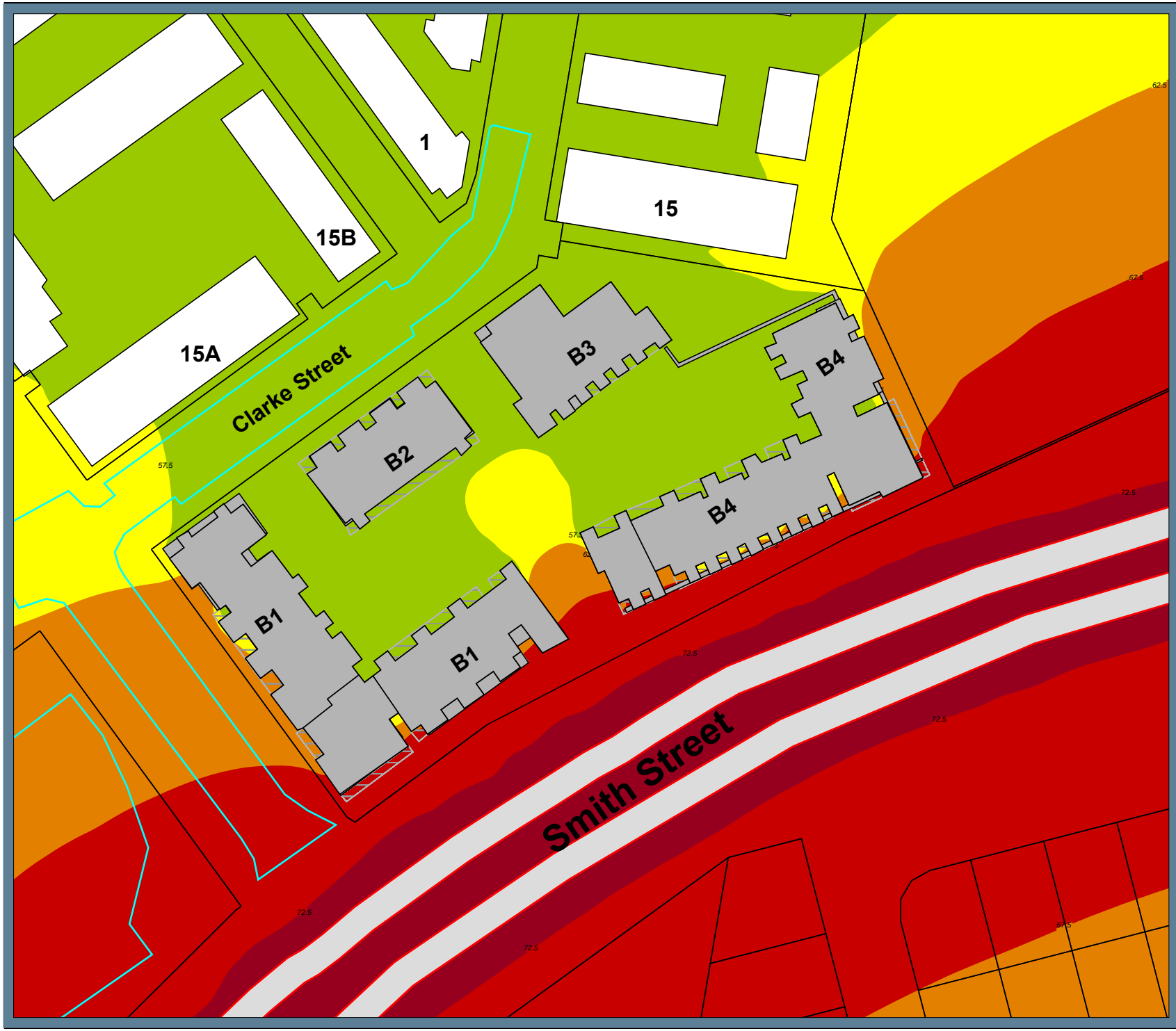
- Adjacent Building
- Ground Absorption
- Lot boundary
- Point receiver
- Proposed Development
- Road
- Surface
- Foliage

SCALE @ A4 1:1400

0 5 10 20 30 40 m

Grid Spacing: 5m
Project Engineer: Bojan Todorovski
Created: 25/07/2024
Processed with SoundPLAN 8.2

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



ATP CONSULTING ENGINEERS

ATP240541

Proposed Development
1 Clarke Street, Southport
Building 1

Traffic Noise Modelling
Year 2035

Level 8
(25m 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
- Surface
- Foliage

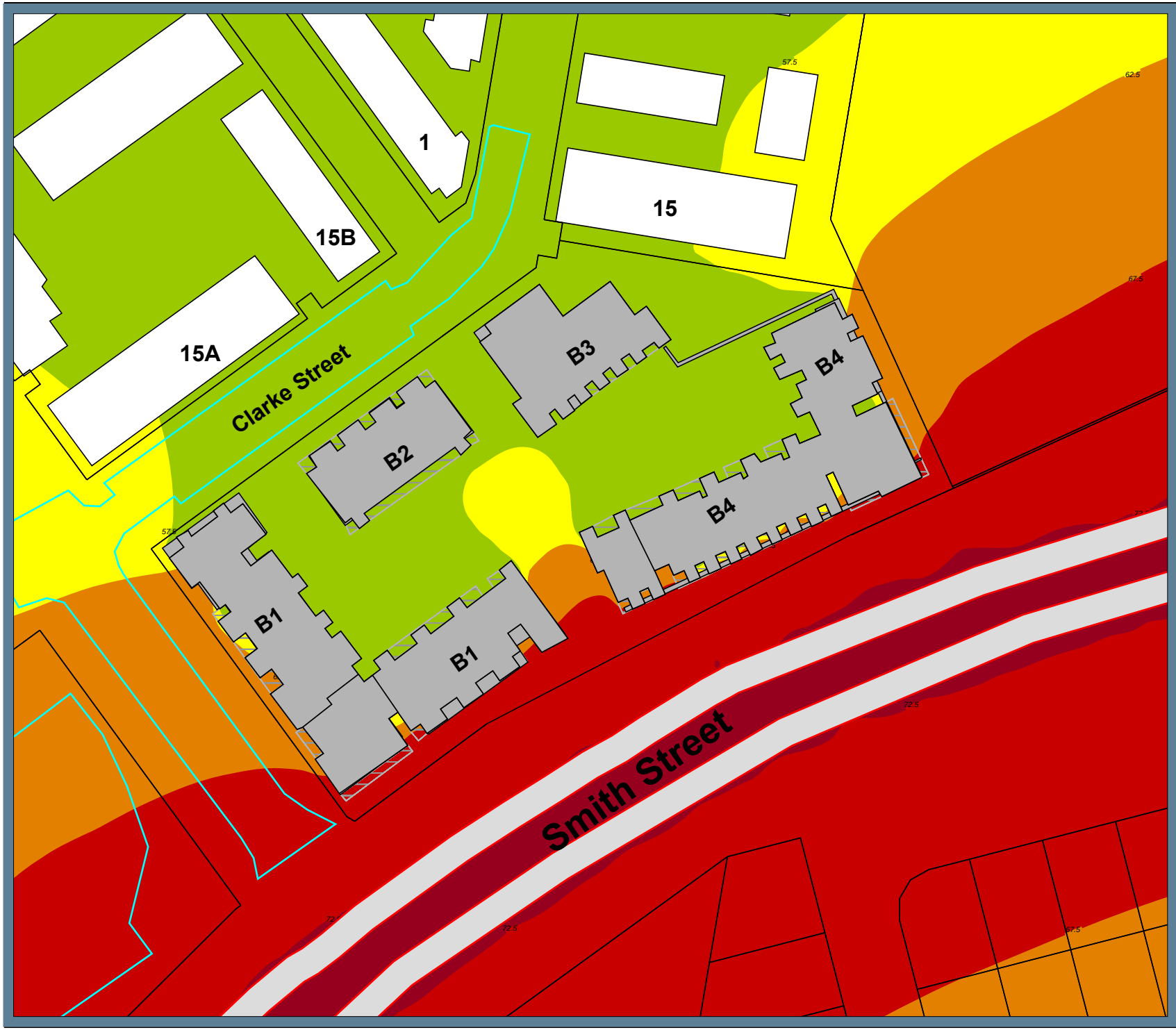
SCALE @ A4 1:1400

0 5 10 20 30 40 m

N

Grid Spacing: 5m
Project Engineer: Bojan Todorovski
Created: 25/07/2024
Processed with SoundPLAN 8.2

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



ATP CONSULTING ENGINEERS

ATP240541

Proposed Development
1 Clarke Street, Southport
Building 1

Traffic Noise Modelling
Year 2035

Level 9
(28.2m 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
- Surface
- Foliage

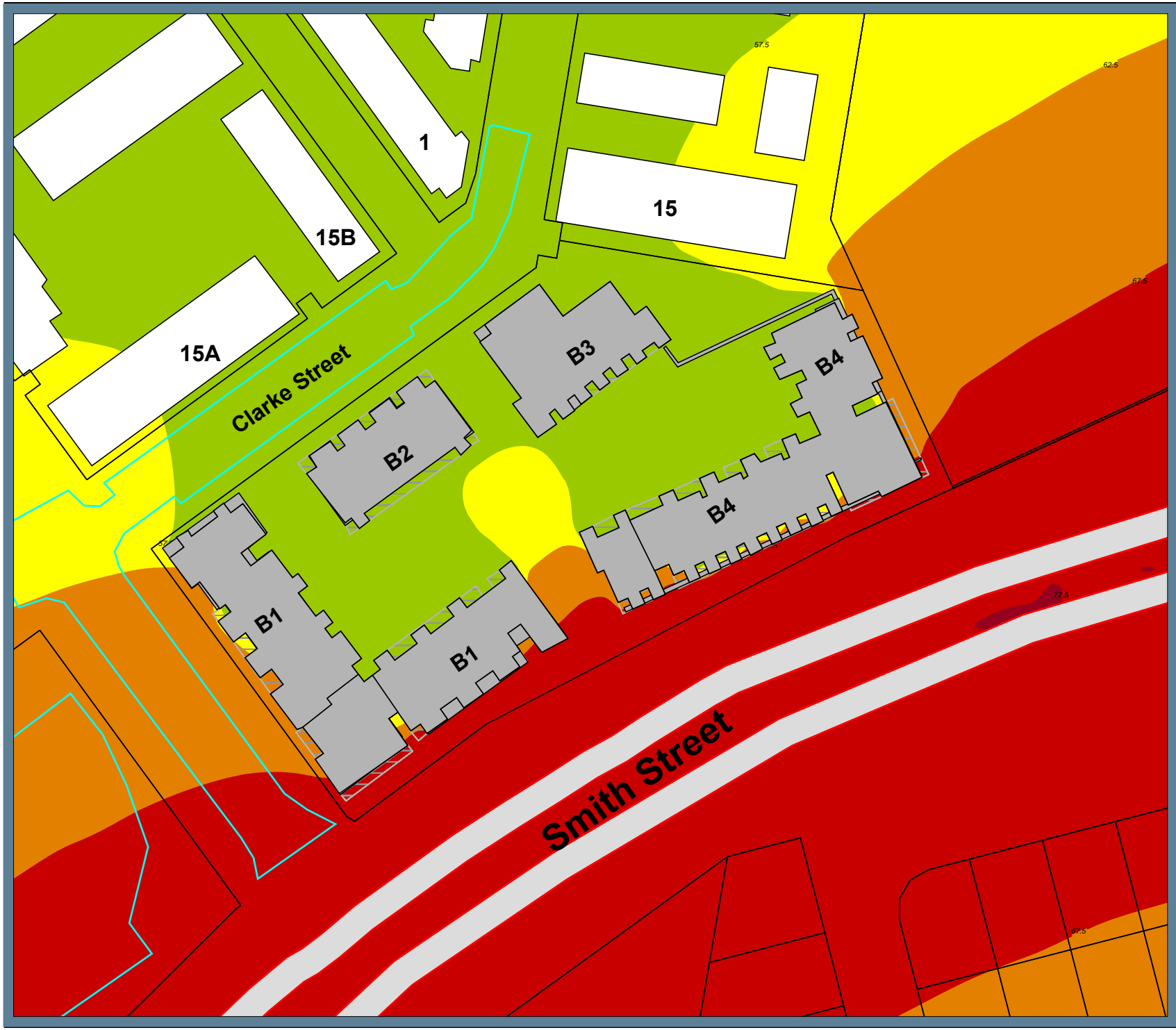
SCALE @ A4 1:1400

0 5 10 20 30 40 m

N

Grid Spacing: 5m
Project Engineer: Bojan Todorovski
Created: 25/07/2024
Processed with SoundPLAN 8.2

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



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ATP240541

Proposed Development
1 Clarke Street, Southport
Building 1

Traffic Noise Modelling
Year 2035

Level 10
(31.4m 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
- Surface
- Foliage

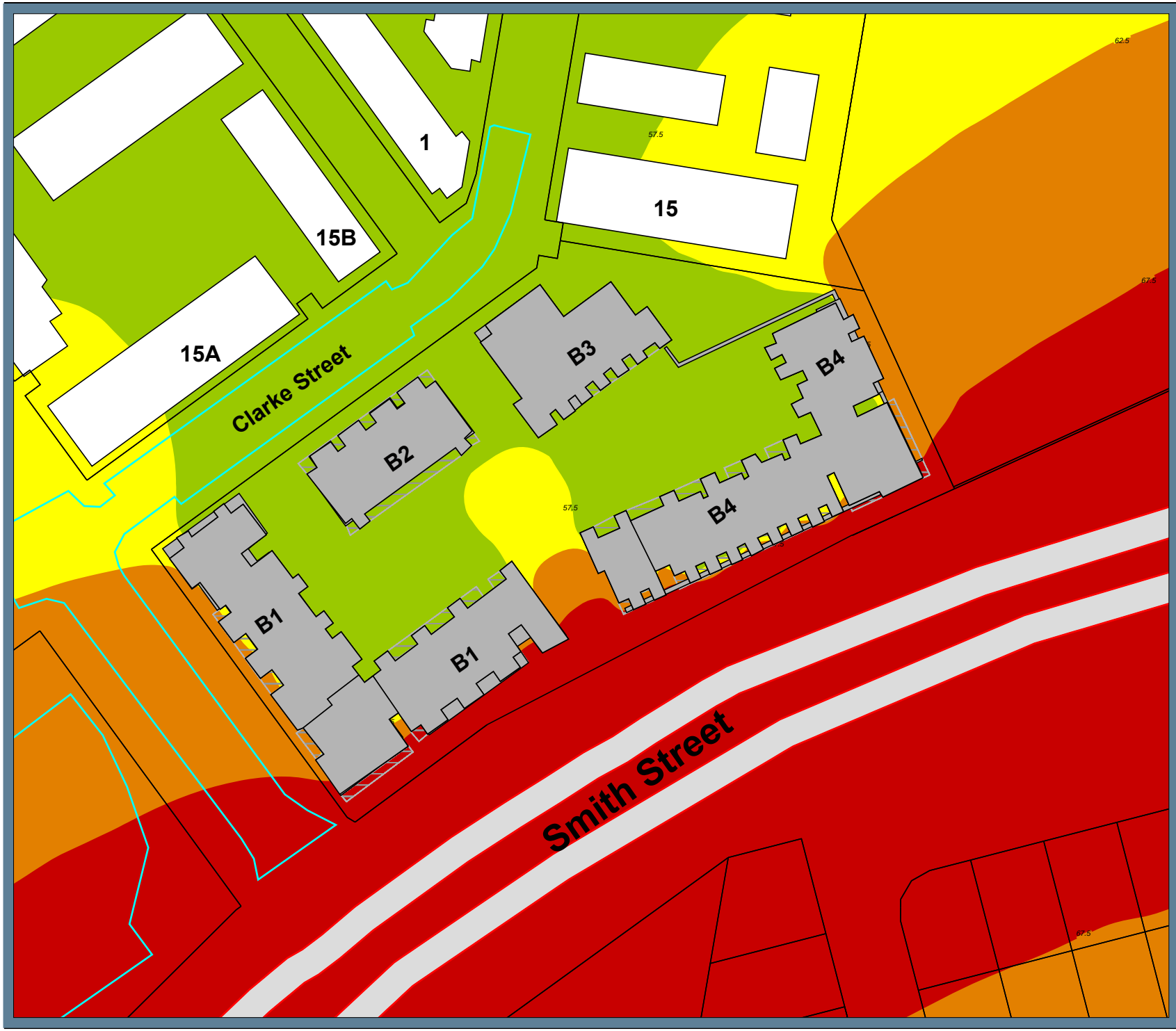
SCALE @ A4 1:1400

0 5 10 20 30 40 m

N

Grid Spacing: 5m
Project Engineer: Bojan Todorovski
Created: 25/07/2024
Processed with SoundPLAN 8.2

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



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ATP240541

Proposed Development
1 Clarke Street, Southport
Building 1

Traffic Noise Modelling
Year 2035

Level 11
(34.6m 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
- Surface
- Foliage

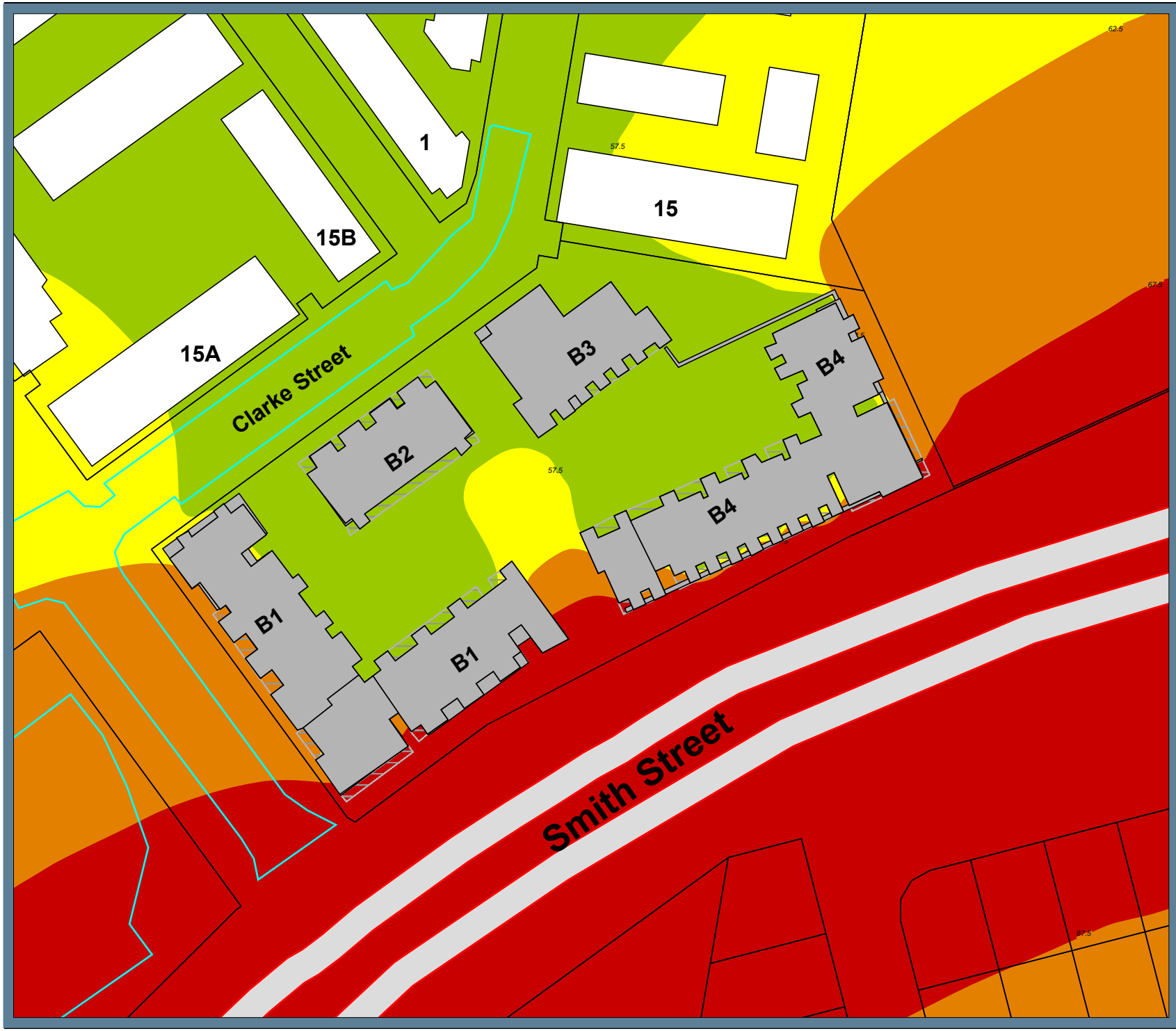
SCALE @ A4 1:1400

0 5 10 20 30 40 m

N

Grid Spacing: 5m
Project Engineer: Bojan Todorovski
Created: 25/07/2024
Processed with SoundPLAN 8.2

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



CONSULTING ENGINEERS

ATP240541

Proposed Development
1 Clarke Street, Southport
Building 1

Traffic Noise Modelling
Year 2035

Level 12
(37.8m 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
- Surface
- Foliage

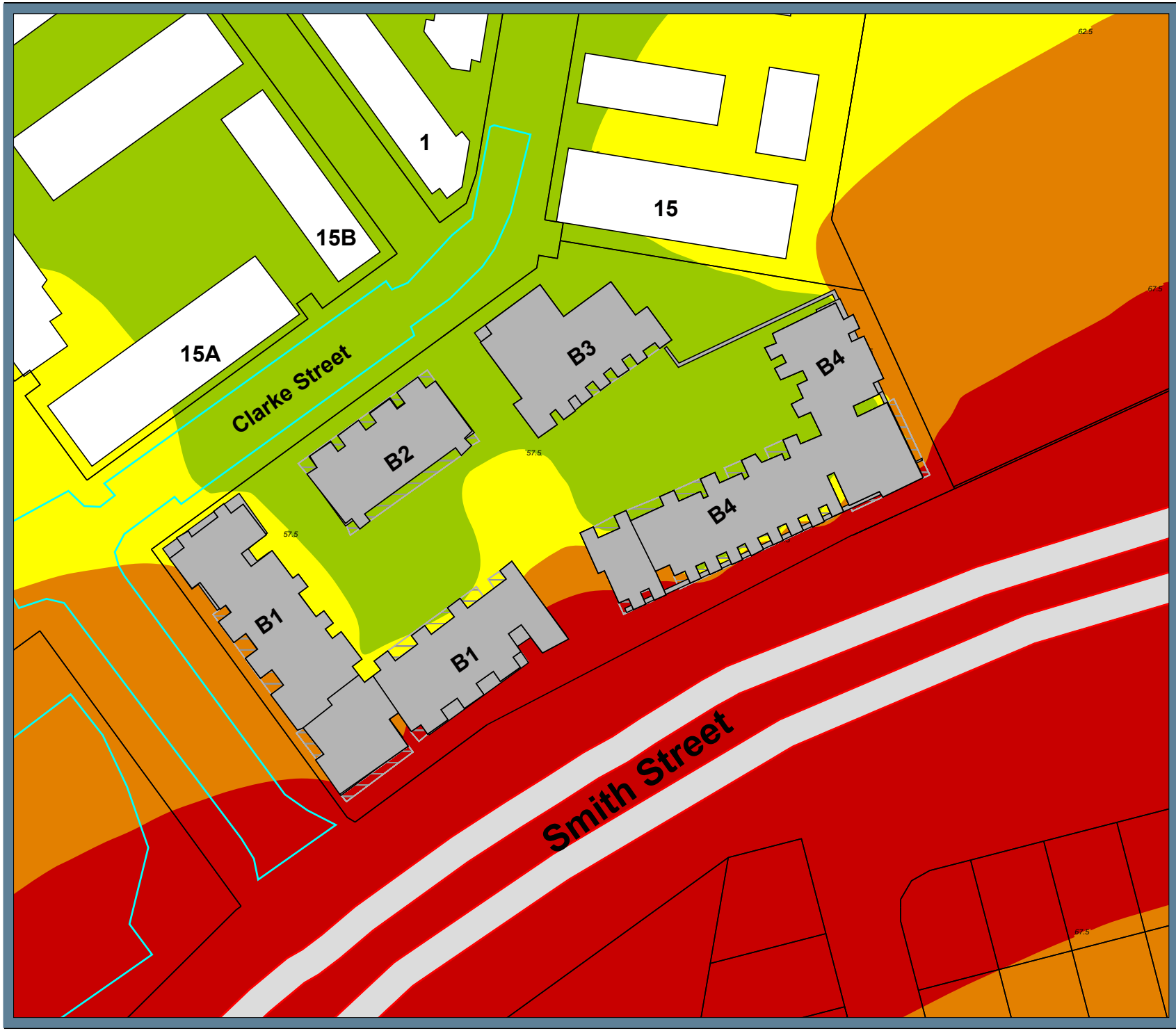
SCALE @ A4 1:1400

0 5 10 20 30 40 m

N

Grid Spacing: 5m
Project Engineer: Bojan Todorovski
Created: 25/07/2024
Processed with SoundPLAN 8.2

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



ATP CONSULTING ENGINEERS

ATP240541

Proposed Development
1 Clarke Street, Southport
Building 1

Traffic Noise Modelling
Year 2035

Level 13
(41m 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
- Surface
- Foliage

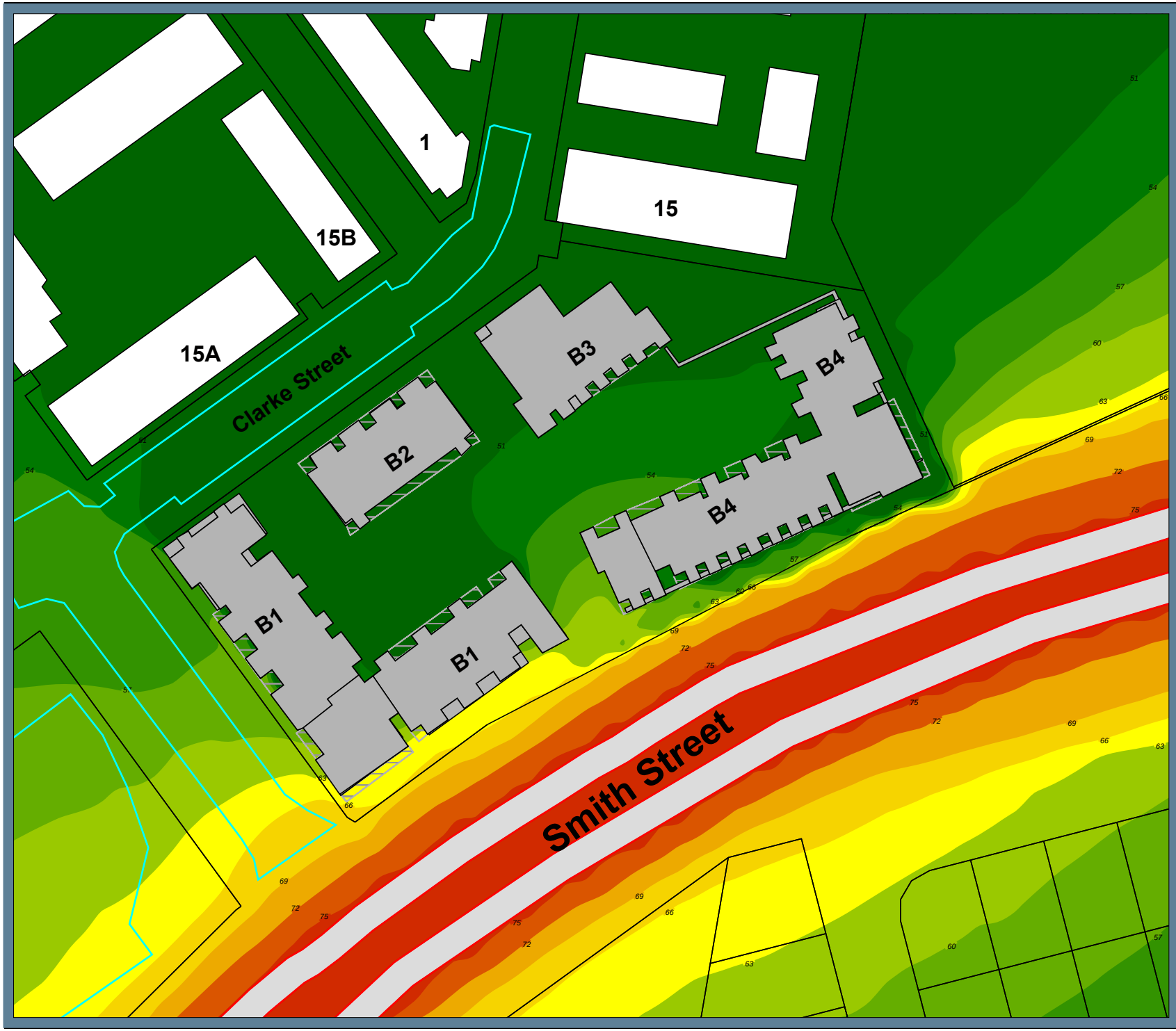
SCALE @ A4 1:1400

0 5 10 20 30 40 m

N

Grid Spacing: 5m
Project Engineer: Bojan Todorovski
Created: 25/07/2024
Processed with SoundPLAN 8.2

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



ATP CONSULTING ENGINEERS

ATP240541

Proposed Development
1 Clarke Street, Southport
Building 4

Traffic Noise Modelling
Year 2035

GF Private Open Spaces
(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

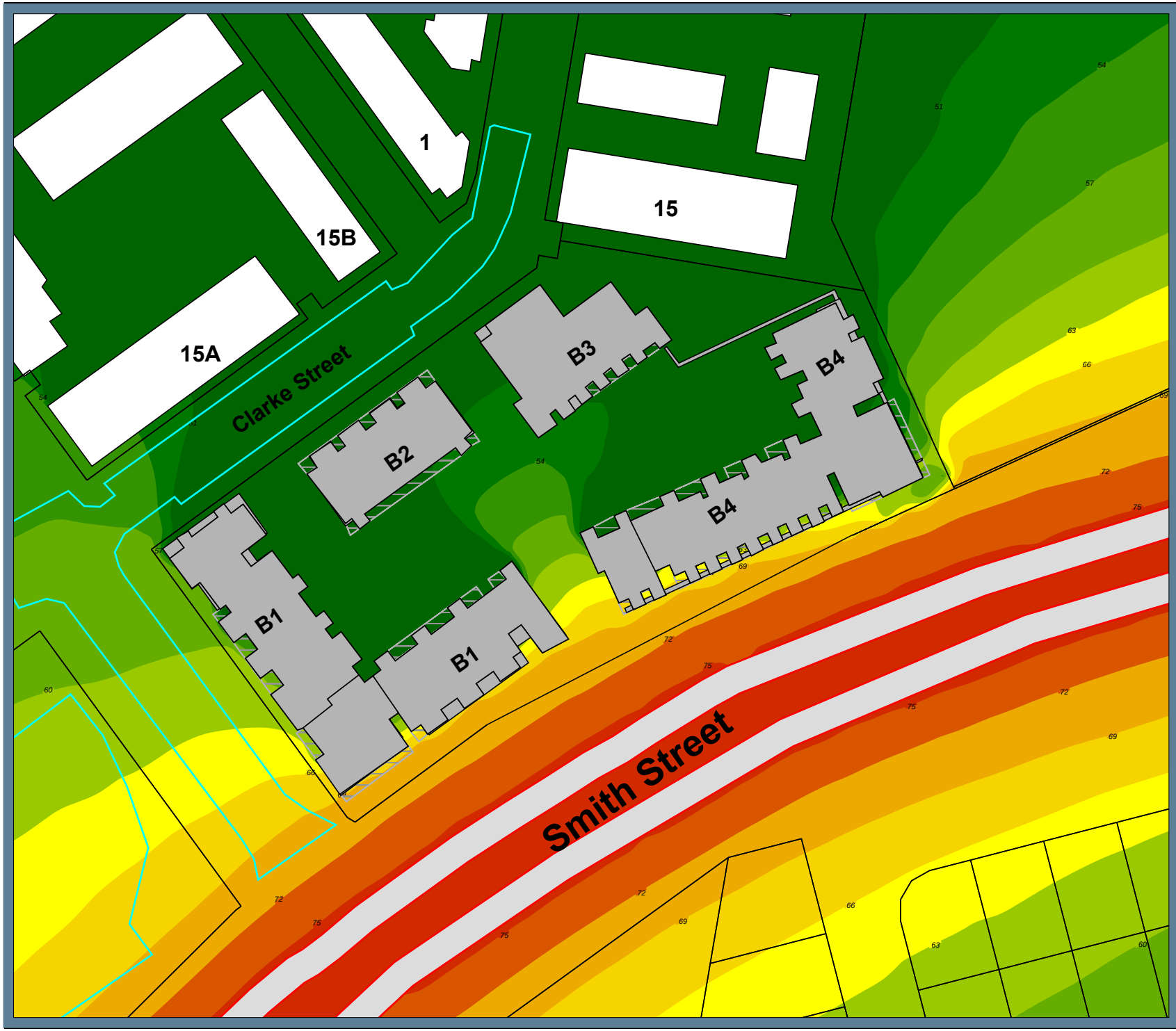
- Adjacent Building
- Ground Absorption
- Lot boundary
- Point receiver
- Proposed Development
- Road
- Surface
- Foliage

SCALE @ A4 1:1400

0 5 10 20 30 40 m

Grid Spacing: 5m
Project Engineer: Bojan Todorovski
Created: 25/07/2024
Processed with SoundPLAN 8.2

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



ATP CONSULTING ENGINEERS

ATP240541

Proposed Development
1 Clarke Street, Southport
Building 1

Traffic Noise Modelling
Year 2035

Level 2 Private Open Spaces
(5.5m 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

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

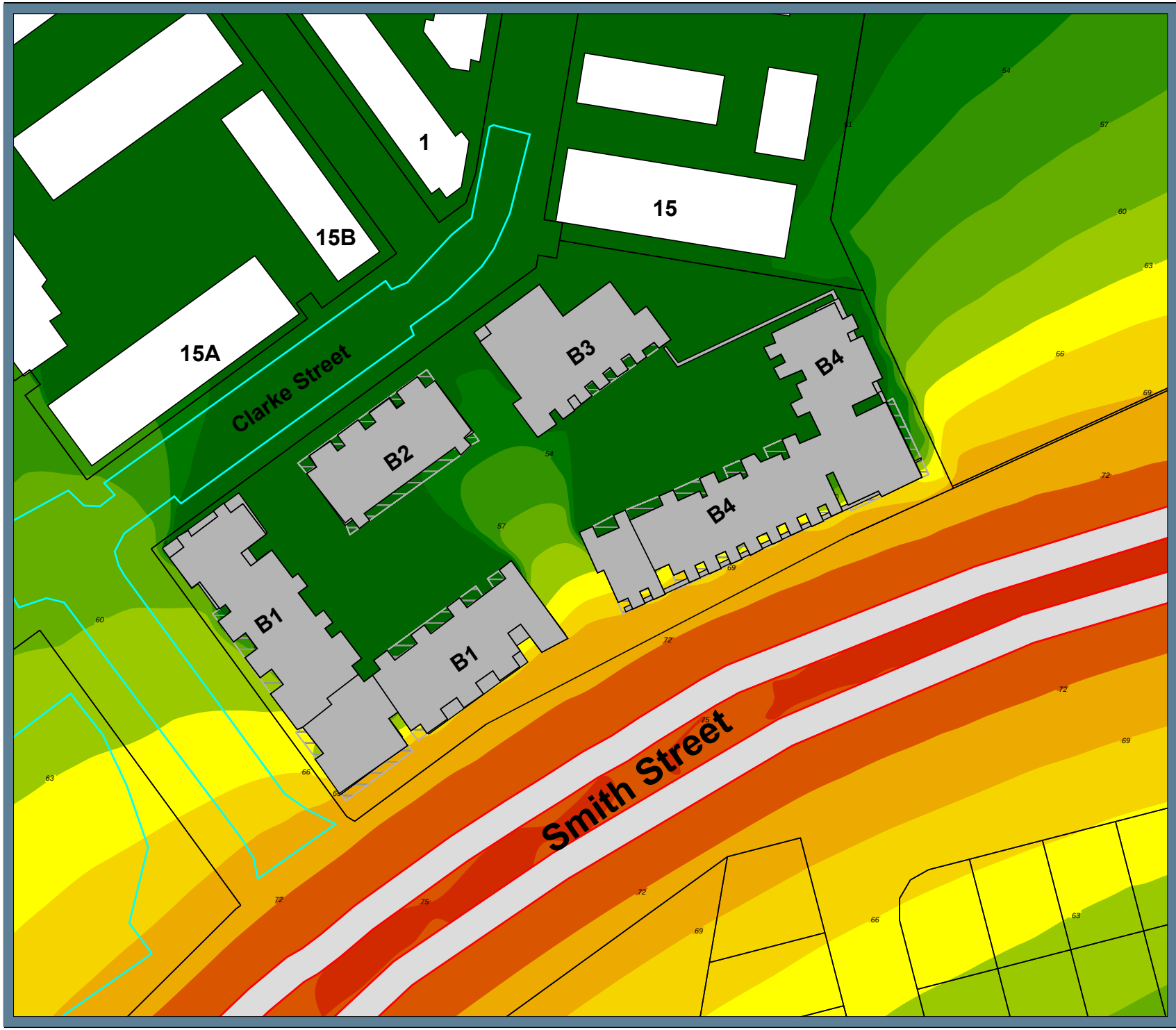
SCALE @ A4 1:1400

0 5 10 20 30 40 m

N

Grid Spacing: 5m
Project Engineer: Bojan Todorovski
Created: 25/07/2024
Processed with SoundPLAN 8.2

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



ATP CONSULTING ENGINEERS

ATP240541

Proposed Development
1 Clarke Street, Southport
Building 4

Traffic Noise Modelling
Year 2035

Level 3 Private Open Spaces
(9.7m 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

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

SCALE @ A4 1:1400

0 5 10 20 30 40 m

Grid Spacing: 5m
Project Engineer: Bojan Todorovski
Created: 25/07/2024
Processed with SoundPLAN 8.2

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

ATP CONSULTING ENGINEERS

ATP240541

Proposed Development
1 Clarke Street, Southport
Building 4

Traffic Noise Modelling
Year 2035

Level 4 Private Open Spaces
(12.9m 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

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

SCALE @ A4 1:1400

0 5 10 20 30 40 m

Grid Spacing: 5m
Project Engineer: Bojan Todorovski
Created: 25/07/2024
Processed with SoundPLAN 8.2

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

ATP CONSULTING ENGINEERS

ATP240541

Proposed Development
1 Clarke Street, Southport
Building 4

Traffic Noise Modelling
Year 2035

Level 5 Private Open Spaces
(16.1m 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

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

SCALE @ A4 1:1400

0 5 10 20 30 40 m

N

Grid Spacing: 5m
Project Engineer: Bojan Todorovski
Created: 25/07/2024
Processed with SoundPLAN 8.2

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

ATP CONSULTING ENGINEERS

ATP240541

Proposed Development
1 Clarke Street, Southport
Building 4

Traffic Noise Modelling
Year 2035

Level 6 Private Open Spaces
(19.3m 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

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

SCALE @ A4 1:1400

0 5 10 20 30 40 m

Grid Spacing: 5m
Project Engineer: Bojan Todorovski
Created: 25/07/2024
Processed with SoundPLAN 8.2

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

ATP CONSULTING ENGINEERS

ATP240541

Proposed Development
1 Clarke Street, Southport
Building 4

Traffic Noise Modelling
Year 2035

Level 7 Private Open Spaces
(22.5m 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

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

SCALE @ A4 1:1400

0 5 10 20 30 40 m

Grid Spacing: 5m
Project Engineer: Bojan Todorovski
Created: 25/07/2024
Processed with SoundPLAN 8.2

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

ATP CONSULTING ENGINEERS

ATP240541

Proposed Development
1 Clarke Street, Southport
Building 4

Traffic Noise Modelling
Year 2035

Level 8 Private Open Spaces
(25.7m 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

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

SCALE @ A4 1:1400

0 5 10 20 30 40 m

Grid Spacing: 5m
Project Engineer: Bojan Todorovski
Created: 25/07/2024
Processed with SoundPLAN 8.2

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

ATP CONSULTING ENGINEERS

ATP240541

Proposed Development
1 Clarke Street, Southport
Building 4

Traffic Noise Modelling
Year 2035

Level 9 Private Open Spaces
(28.9m 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

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

SCALE @ A4 1:1400

0 5 10 20 30 40 m

Grid Spacing: 5m
Project Engineer: Bojan Todorovski
Created: 25/07/2024
Processed with SoundPLAN 8.2

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

ATP CONSULTING ENGINEERS

ATP240541

Proposed Development
1 Clarke Street, Southport
Building 4

Traffic Noise Modelling
Year 2035

Level 10 Private Open Spaces
(32.1m 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

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

SCALE @ A4 1:1400

0 5 10 20 30 40 m

Grid Spacing: 5m
Project Engineer: Bojan Todorovski
Created: 25/07/2024
Processed with SoundPLAN 8.2

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

ATP CONSULTING ENGINEERS

ATP240541

Proposed Development
1 Clarke Street, Southport
Building 4

Traffic Noise Modelling
Year 2035

Level 11 Private Open Spaces
(35.3m 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

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

SCALE @ A4 1:1400

0 5 10 20 30 40 m

N

Grid Spacing: 5m
Project Engineer: Bojan Todorovski
Created: 25/07/2024
Processed with SoundPLAN 8.2

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

ATP CONSULTING ENGINEERS

ATP240541

Proposed Development
1 Clarke Street, Southport
Building 4

Traffic Noise Modelling
Year 2035

Level 12 Private Open Spaces
(38.5m 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

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

SCALE @ A4 1:1400

0 5 10 20 30 40 m

Grid Spacing: 5m
Project Engineer: Bojan Todorovski
Created: 25/07/2024
Processed with SoundPLAN 8.2

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

ATP240541

Proposed Development
1 Clarke Street, Southport
Building 4

Traffic Noise Modelling
Year 2035

Level 13 Private Open Spaces
(41.7m 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

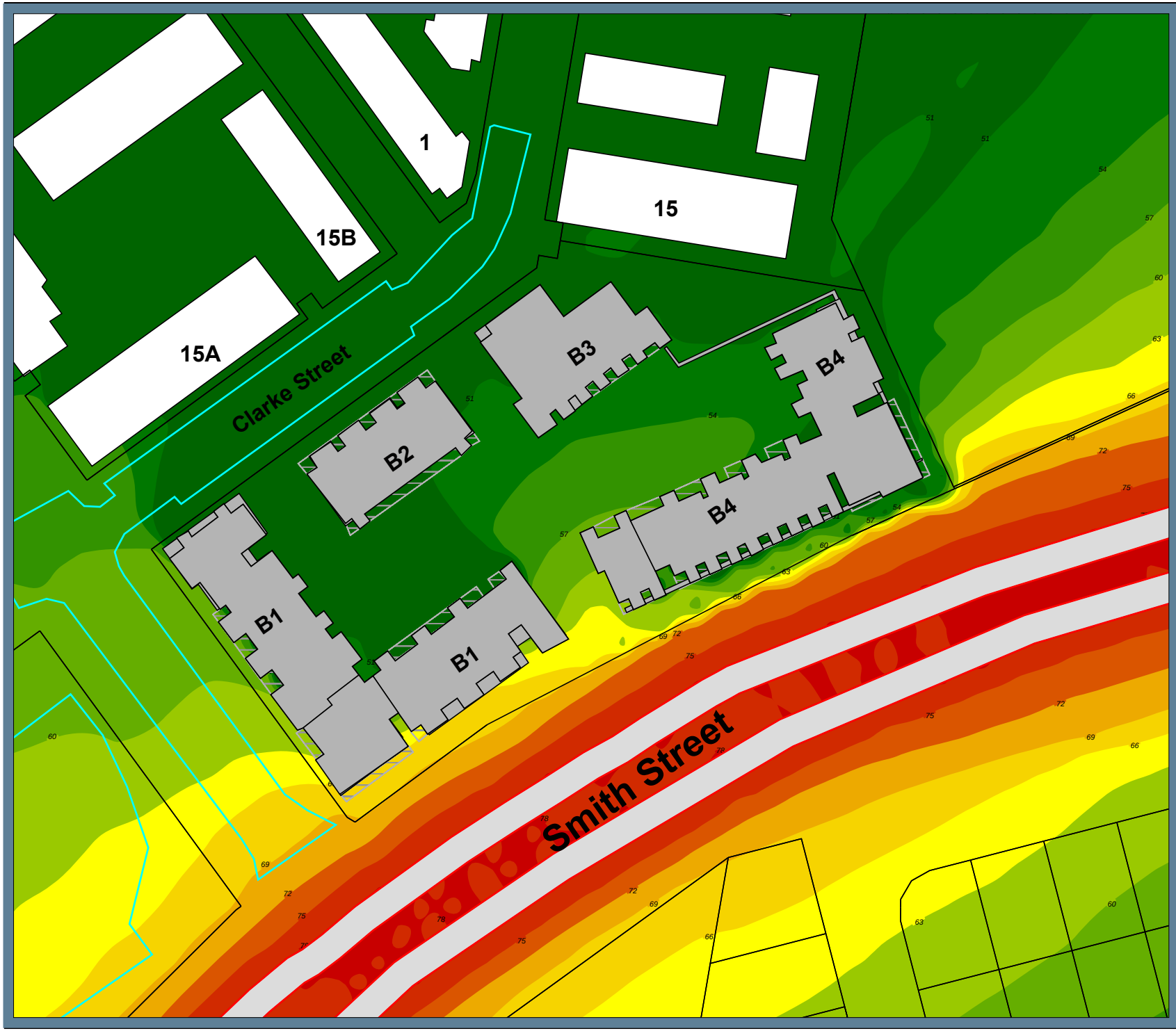
- Adjacent Building
- Ground Absorption
- Lot boundary
- Point receiver
- Proposed Development
- Road
- Surface
- Foliage

SCALE @ A4 1:1400

0 5 10 20 30 40 m

Grid Spacing: 5m
Project Engineer: Bojan Todorovski
Created: 25/07/2024
Processed with SoundPLAN 8.2

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



ATP CONSULTING ENGINEERS

ATP240541

Proposed Development
1 Clarke Street, Southport
Building 4

Traffic Noise Modelling
Year 2035

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

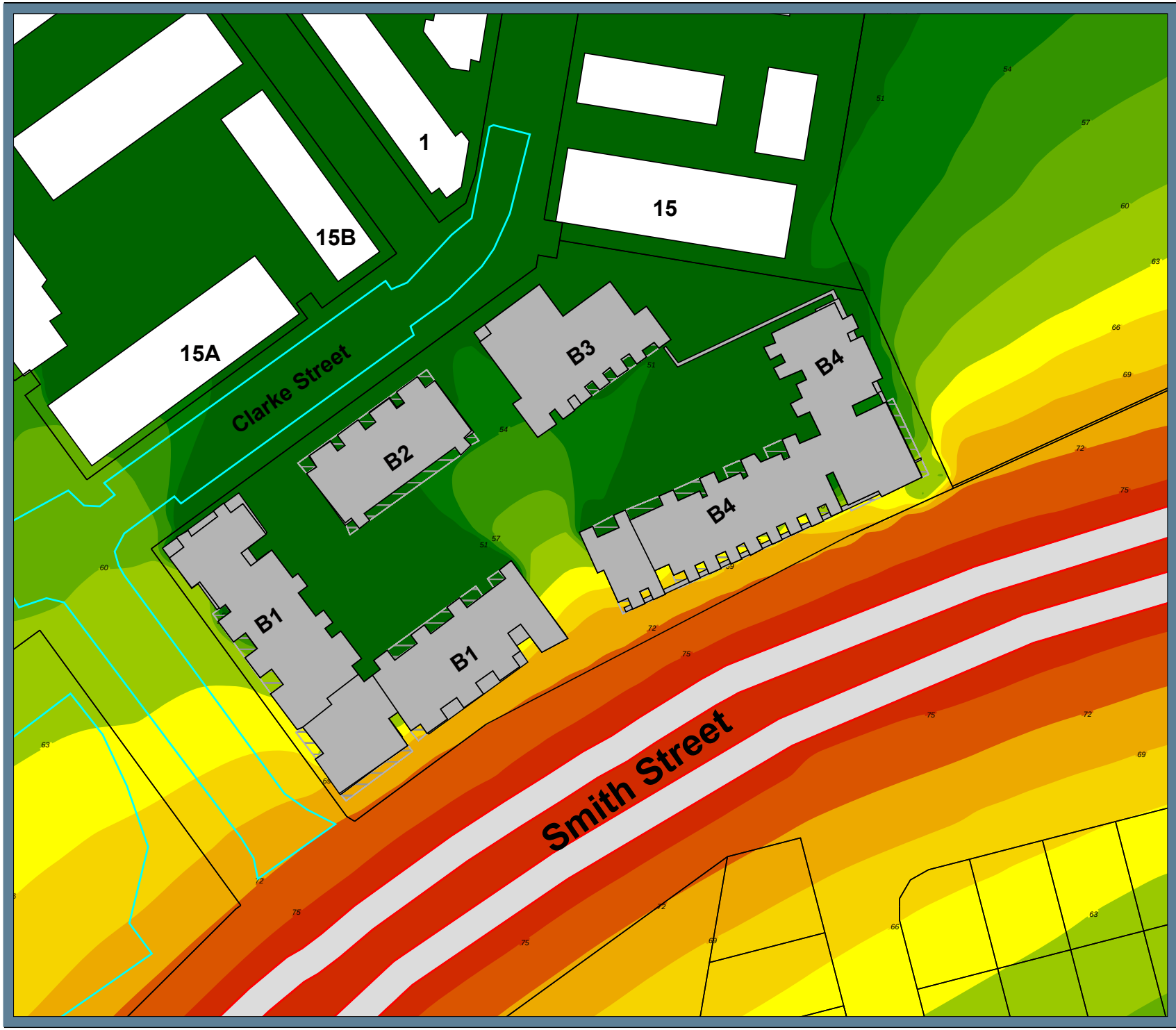
- Adjacent Building
- Ground Absorption
- Lot boundary
- Point receiver
- Proposed Development
- Road
- Surface
- Foliage

SCALE @ A4 1:1400

0 5 10 20 30 40 m

Grid Spacing: 5m
Project Engineer: Bojan Todorovski
Created: 25/07/2024
Processed with SoundPLAN 8.2

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



ATP240541

Proposed Development
1 Clarke Street, Southport
Building 4

Traffic Noise Modelling
Year 2035

Level 2
(6.8m 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

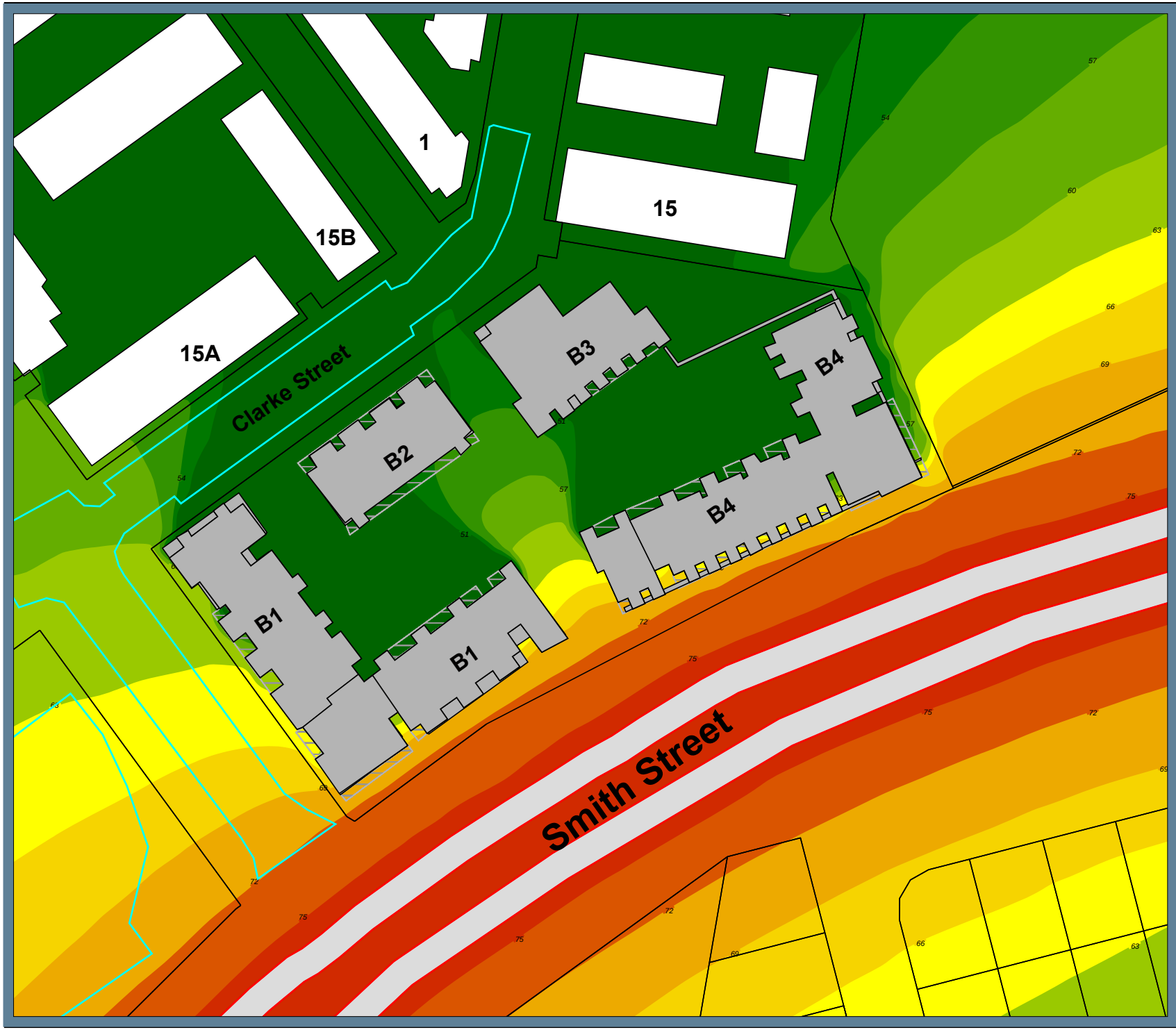
- Adjacent Building
- Ground Absorption
- Lot boundary
- Point receiver
- Proposed Development
- Road
- Surface
- Foliage

SCALE @ A4 1:1400

0 5 10 20 30 40 m

Grid Spacing: 5m
Project Engineer: Bojan Todorovski
Created: 25/07/2024
Processed with SoundPLAN 8.2

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



ATP CONSULTING ENGINEERS

ATP240541

Proposed Development
1 Clarke Street, Southport
Building 4

Traffic Noise Modelling
Year 2035

Level 3
(10m 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
- Surface
- Foliage

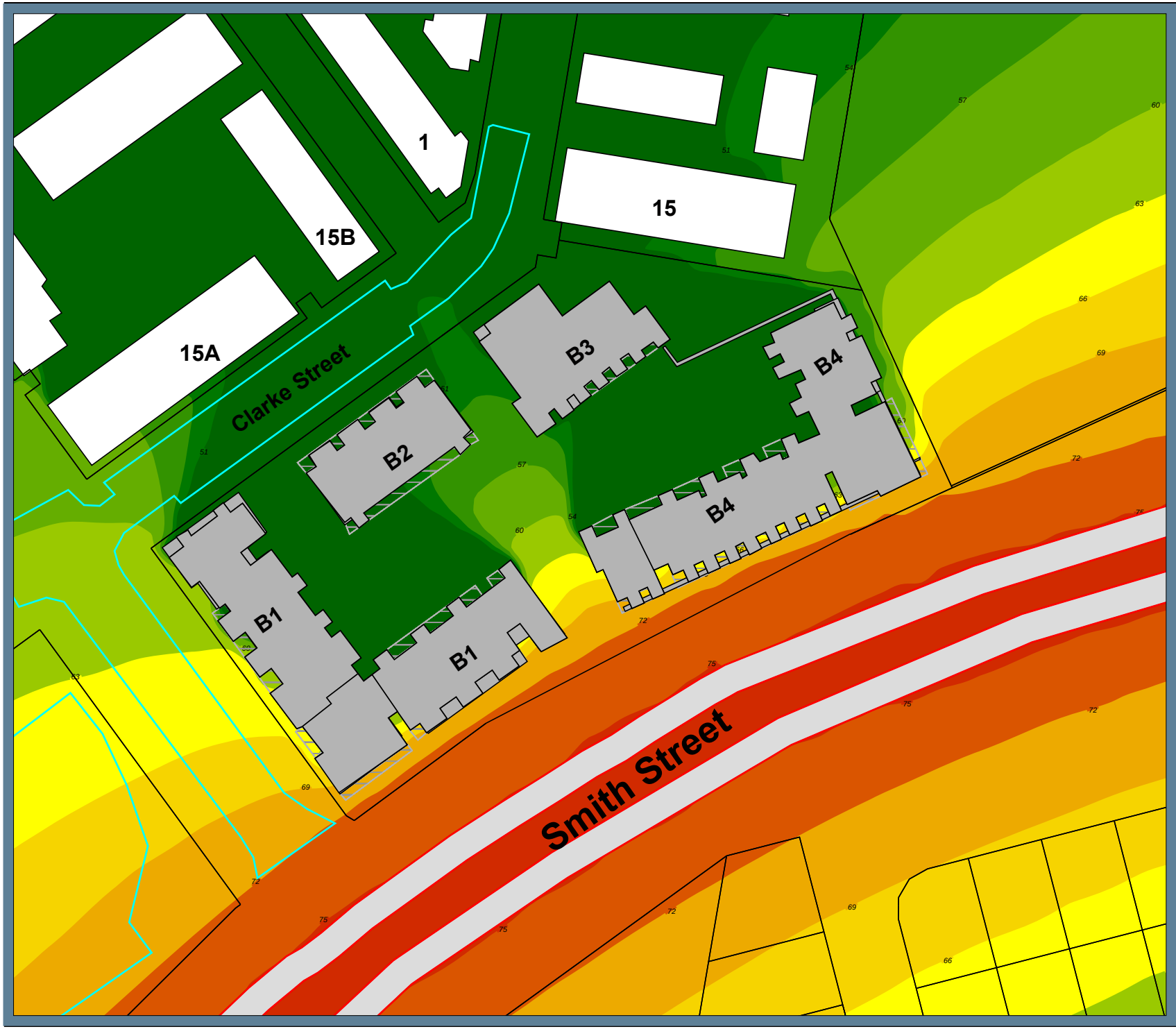
SCALE @ A4 1:1400

0 5 10 20 30 40 m

N

Grid Spacing: 5m
Project Engineer: Bojan Todorovski
Created: 25/07/2024
Processed with SoundPLAN 8.2

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



CONSULTING ENGINEERS

ATP240541

Proposed Development
1 Clarke Street, Southport
Building 4

Traffic Noise Modelling
Year 2035

Level 4
(13.2m 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
- Surface
- Foliage

SCALE @ A4 1:1400

0 5 10 20 30 40 m

Grid Spacing: 5m
Project Engineer: Bojan Todorovski
Created: 25/07/2024
Processed with SoundPLAN 8.2

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

ATP CONSULTING ENGINEERS

ATP240541

Proposed Development
1 Clarke Street, Southport
Building 4

Traffic Noise Modelling
Year 2035

Level 5
(16.4m 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
- Surface
- Foliage

SCALE @ A4 1:1400

0 5 10 20 30 40 m

Grid Spacing: 5m
Project Engineer: Bojan Todorovski
Created: 25/07/2024
Processed with SoundPLAN 8.2

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

ATP CONSULTING ENGINEERS

ATP240541

Proposed Development
1 Clarke Street, Southport
Building 4

Traffic Noise Modelling
Year 2035

Level 6
(19.6m 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
- Surface
- Foliage

SCALE @ A4 1:1400

0 5 10 20 30 40 m

N

Grid Spacing: 5m
Project Engineer: Bojan Todorovski
Created: 25/07/2024
Processed with SoundPLAN 8.2

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

ATP CONSULTING ENGINEERS

ATP240541

Proposed Development
1 Clarke Street, Southport
Building 4

Traffic Noise Modelling
Year 2035

Level 7
(22.8m 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
- Surface
- Foliage

SCALE @ A4 1:1400

0 5 10 20 30 40 m

Grid Spacing: 5m
Project Engineer: Bojan Todorovski
Created: 25/07/2024
Processed with SoundPLAN 8.2

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

ATP CONSULTING ENGINEERS

ATP240541

Proposed Development
1 Clarke Street, Southport
Building 4

Traffic Noise Modelling
Year 2035

Level 8
(26m 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
- Surface
- Foliage

SCALE @ A4 1:1400

0 5 10 20 30 40 m

N

Grid Spacing: 5m
Project Engineer: Bojan Todorovski
Created: 25/07/2024
Processed with SoundPLAN 8.2

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

CONSULTING ENGINEERS

ATP240541

Proposed Development
1 Clarke Street, Southport
Building 4

Traffic Noise Modelling
Year 2035

Level 9
(29.2m 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
- Surface
- Foliage

SCALE @ A4 1:1400

0 5 10 20 30 40 m

N

Grid Spacing: 5m
Project Engineer: Bojan Todorovski
Created: 25/07/2024
Processed with SoundPLAN 8.2

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

ATP CONSULTING ENGINEERS

ATP240541

Proposed Development
1 Clarke Street, Southport
Building 4

Traffic Noise Modelling
Year 2035

Level 10
(32.4m 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
- Surface
- Foliage

SCALE @ A4 1:1400

0 5 10 20 30 40 m

N

Grid Spacing: 5m
Project Engineer: Bojan Todorovski
Created: 25/07/2024
Processed with SoundPLAN 8.2

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

ATP CONSULTING ENGINEERS

ATP240541

Proposed Development
1 Clarke Street, Southport
Building 4

Traffic Noise Modelling
Year 2035

Level 11
(35.6m 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
- Surface
- Foliage

SCALE @ A4 1:1400

0 5 10 20 30 40 m

N

Grid Spacing: 5m
Project Engineer: Bojan Todorovski
Created: 25/07/2024
Processed with SoundPLAN 8.2

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

ATP CONSULTING ENGINEERS

ATP240541

Proposed Development
1 Clarke Street, Southport
Building 4

Traffic Noise Modelling
Year 2035

Level 12
(38.8m 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
- Surface
- Foliage

SCALE @ A4 1:1400

0 5 10 20 30 40 m

Grid Spacing: 5m
Project Engineer: Bojan Todorovski
Created: 25/07/2024
Processed with SoundPLAN 8.2

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

CONSULTING ENGINEERS

ATP240541

Proposed Development
1 Clarke Street, Southport
Building 4

Traffic Noise Modelling
Year 2035

Level 13
(42m 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
- Surface
- Foliage

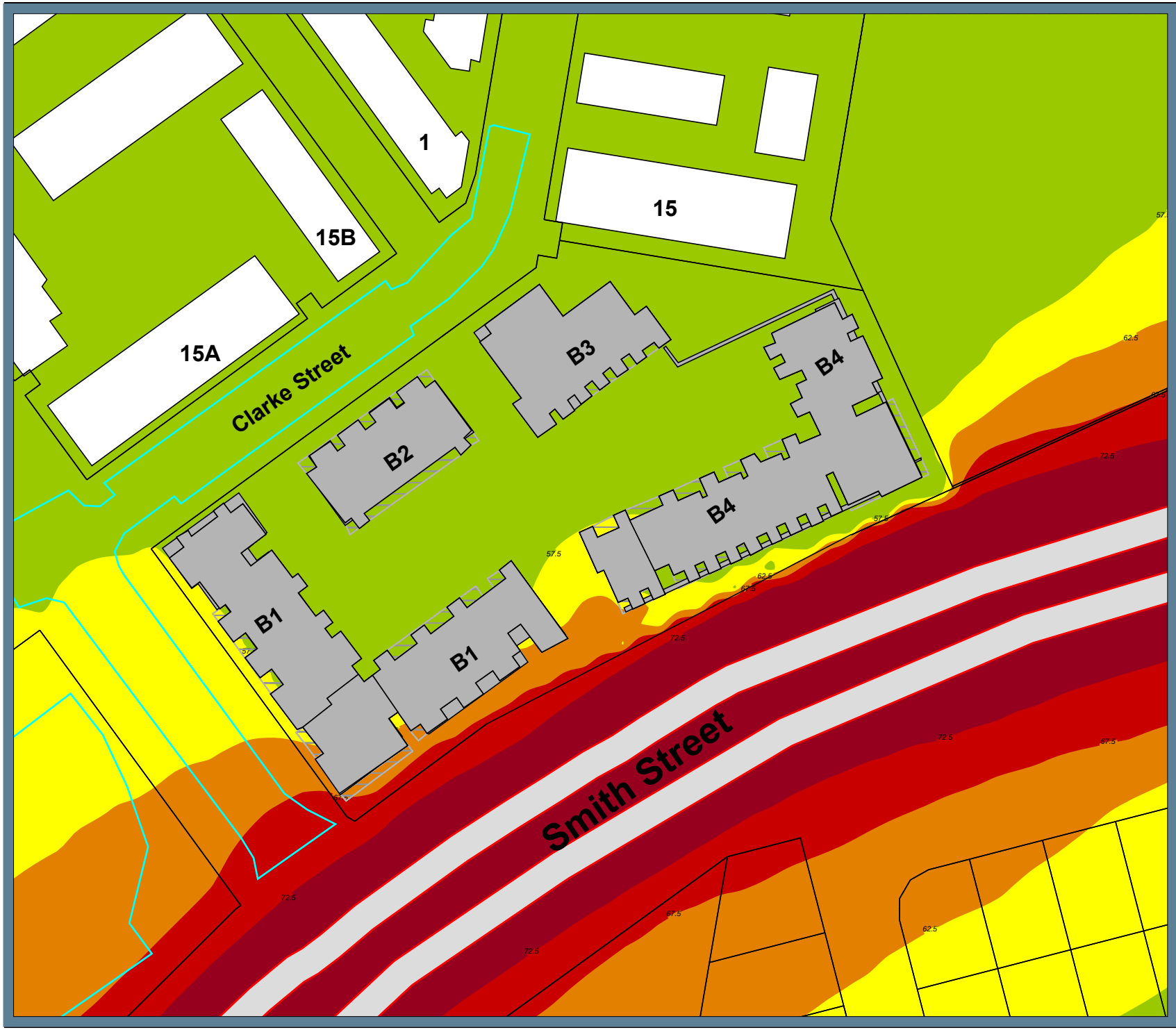
SCALE @ A4 1:1400

0 5 10 20 30 40 m

N

Grid Spacing: 5m
Project Engineer: Bojan Todorovski
Created: 25/07/2024
Processed with SoundPLAN 8.2

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



CONSULTING ENGINEERS

ATP240541

Proposed Development
1 Clarke Street, Southport
Building 4

Traffic Noise Modelling
Year 2035

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

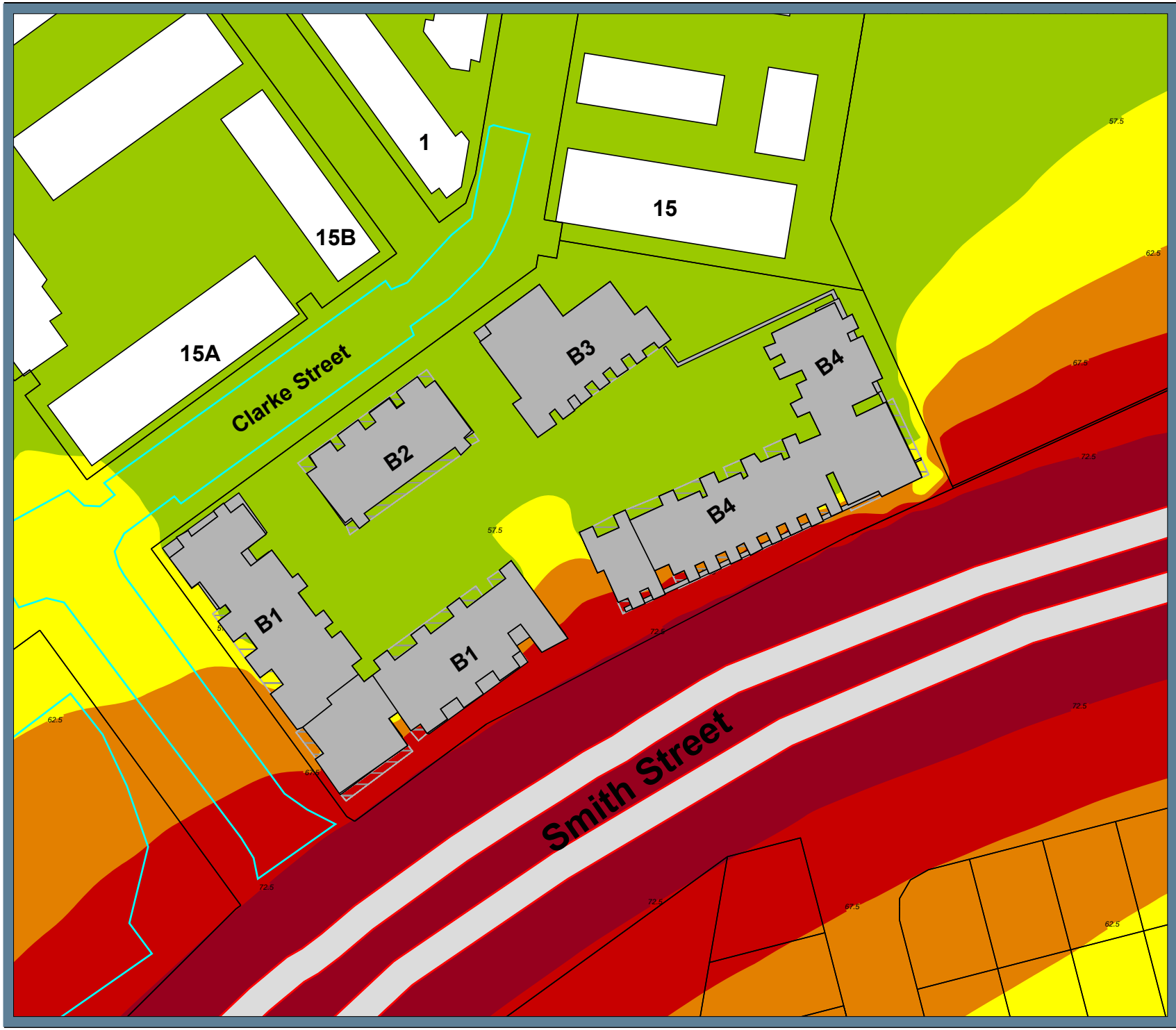
- Adjacent Building
- Ground Absorption
- Lot boundary
- Point receiver
- Proposed Development
- Road
- Surface
- Foliage

SCALE @ A4 1:1400

0 5 10 20 30 40 m

Grid Spacing: 5m
Project Engineer: Bojan Todorovski
Created: 25/07/2024
Processed with SoundPLAN 8.2

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



ATP CONSULTING ENGINEERS

ATP240541

Proposed Development
1 Clarke Street, Southport
Building 4

Traffic Noise Modelling
Year 2035

Level 2
(6.8m 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
- Surface
- Foliage

SCALE @ A4 1:1400

0 5 10 20 30 40 m

N

Grid Spacing: 5m
Project Engineer: Bojan Todorovski
Created: 25/07/2024
Processed with SoundPLAN 8.2

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

ATP CONSULTING ENGINEERS

ATP240541

Proposed Development
1 Clarke Street, Southport
Building 4

Traffic Noise Modelling
Year 2035

Level 3
(13.2m AGL)

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

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

Legend

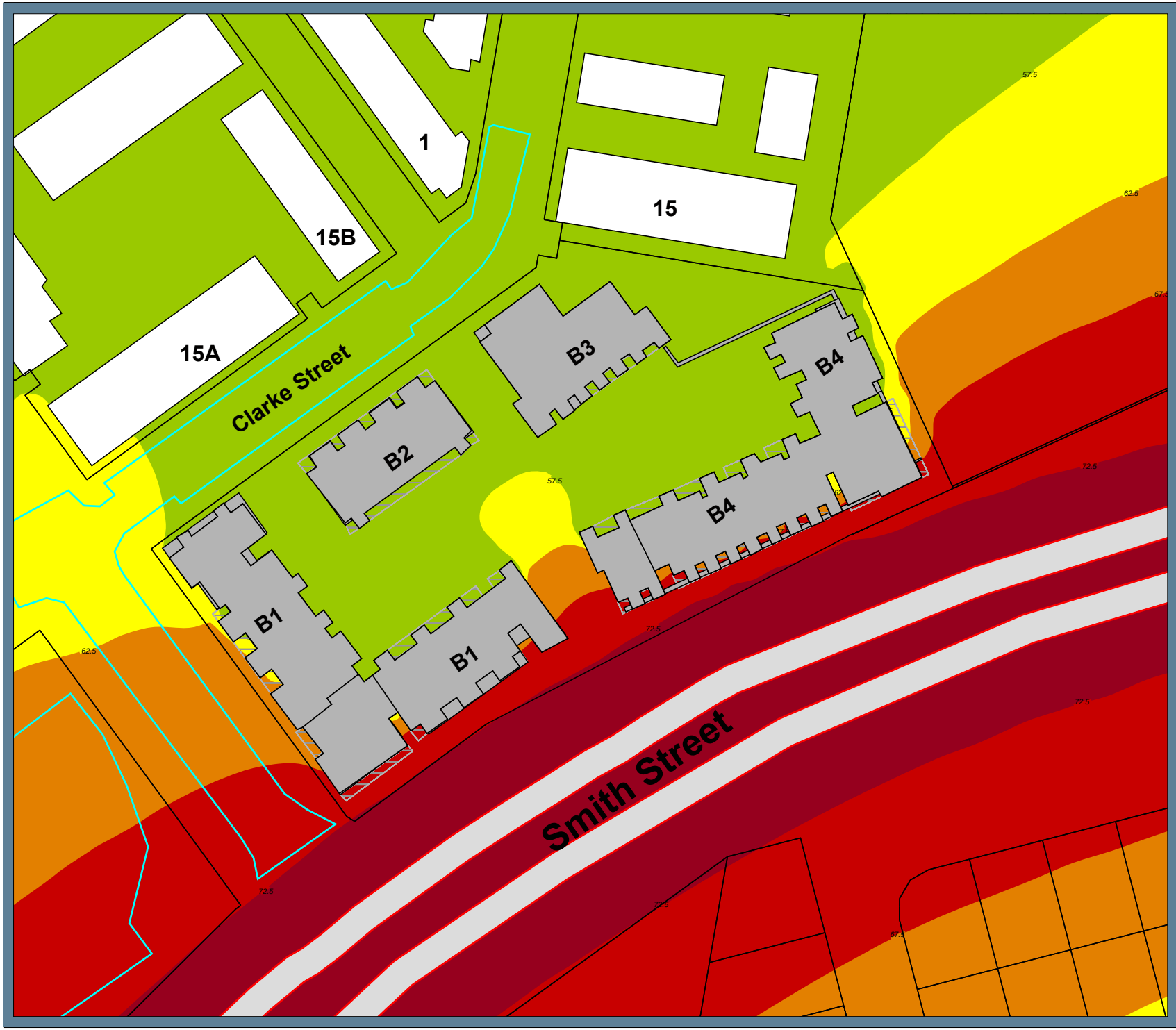
- Adjacent Building
- Ground Absorption
- Lot boundary
- Point receiver
- Proposed Development
- Road
- Surface
- Foliage

SCALE @ A4 1:1400

0 5 10 20 30 40 m

Grid Spacing: 5m
Project Engineer: Bojan Todorovski
Created: 25/07/2024
Processed with SoundPLAN 8.2

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



ATP CONSULTING ENGINEERS

ATP240541

Proposed Development
1 Clarke Street, Southport
Building 4

Traffic Noise Modelling
Year 2035

Level 4
(13.2m 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
- Surface
- Foliage

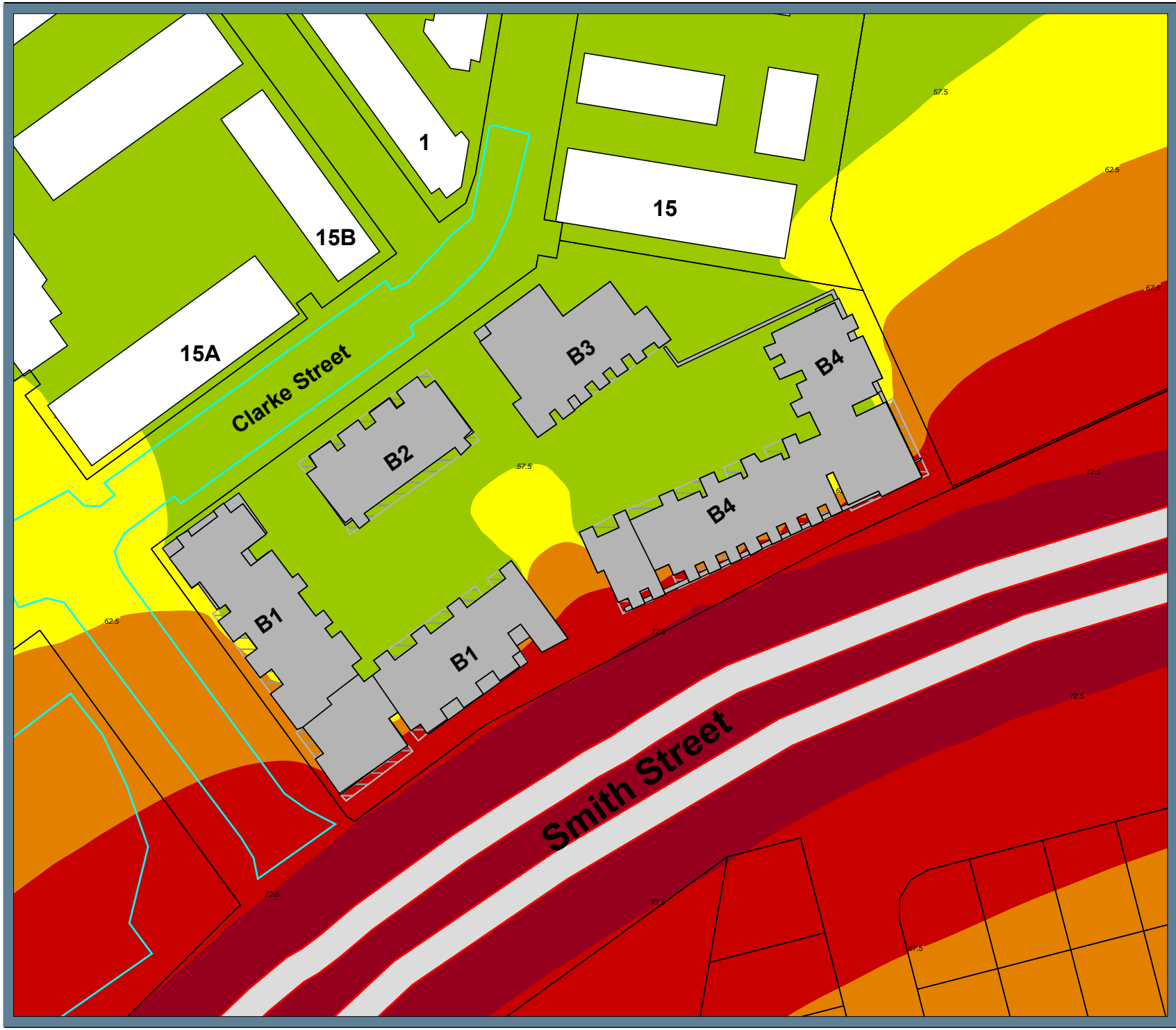
SCALE @ A4 1:1400

0 5 10 20 30 40 m

N

Grid Spacing: 5m
Project Engineer: Bojan Todorovski
Created: 25/07/2024
Processed with SoundPLAN 8.2

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



ATP CONSULTING ENGINEERS

ATP240541

Proposed Development
1 Clarke Street, Southport
Building 4

Traffic Noise Modelling
Year 2035

Level 5
(16.4m AGL)

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

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

Legend

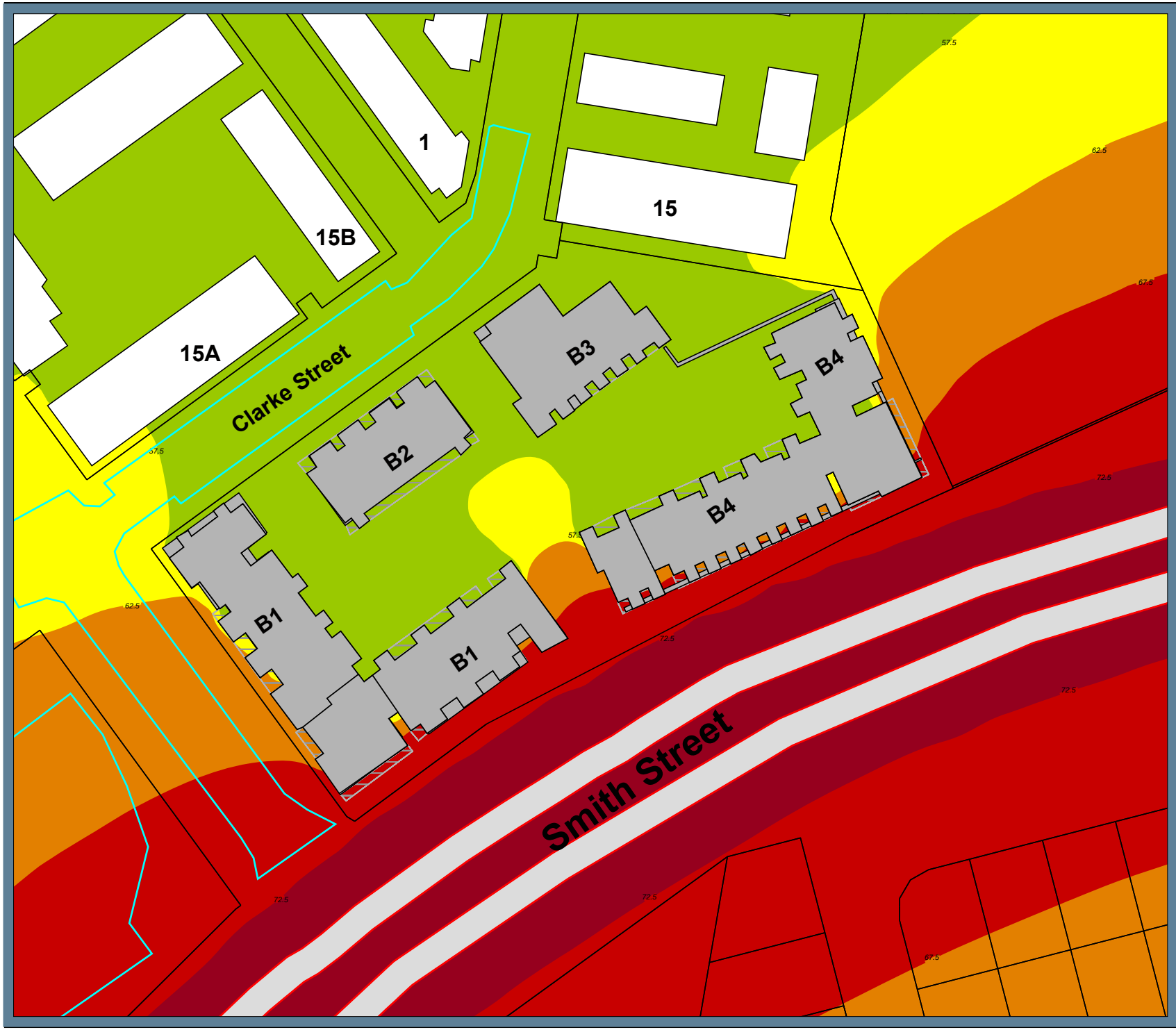
- Adjacent Building
- Ground Absorption
- Lot boundary
- Point receiver
- Proposed Development
- Road
- Surface
- Foliage

SCALE @ A4 1:1400

0 5 10 20 30 40 m

Grid Spacing: 5m
Project Engineer: Bojan Todorovski
Created: 25/07/2024
Processed with SoundPLAN 8.2

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



ATP CONSULTING ENGINEERS

ATP240541

Proposed Development
1 Clarke Street, Southport
Building 4

Traffic Noise Modelling
Year 2035

Level 6
(19.6m 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
- Surface
- Foliage

SCALE @ A4 1:1400

0 5 10 20 30 40 m

N

Grid Spacing: 5m
Project Engineer: Bojan Todorovski
Created: 25/07/2024
Processed with SoundPLAN 8.2

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

ATP CONSULTING ENGINEERS

ATP240541

Proposed Development
1 Clarke Street, Southport
Building 4

Traffic Noise Modelling
Year 2035

Level 7
(22.8m 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
- Surface
- Foliage

SCALE @ A4 1:1400

0 5 10 20 30 40 m

Grid Spacing: 5m
Project Engineer: Bojan Todorovski
Created: 25/07/2024
Processed with SoundPLAN 8.2

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

ATP CONSULTING ENGINEERS

ATP240541

Proposed Development
1 Clarke Street, Southport
Building 4

Traffic Noise Modelling
Year 2035

Level 8
(26m AGL)

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

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

Legend

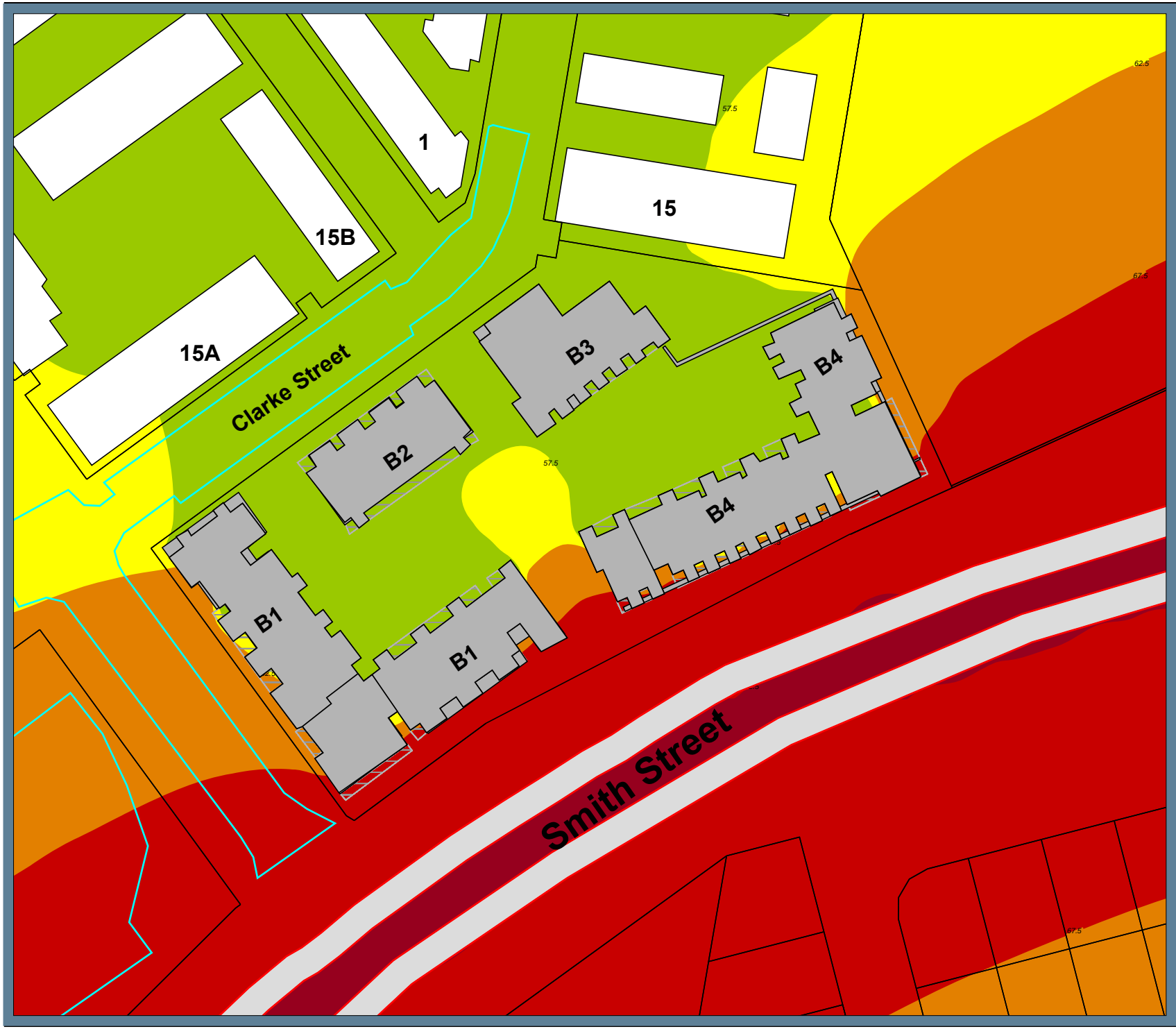
- Adjacent Building
- Ground Absorption
- Lot boundary
- Point receiver
- Proposed Development
- Road
- Surface
- Foliage

SCALE @ A4 1:1400

0 5 10 20 30 40 m

Grid Spacing: 5m
Project Engineer: Bojan Todorovski
Created: 25/07/2024
Processed with SoundPLAN 8.2

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



ATP CONSULTING ENGINEERS

ATP240541

Proposed Development
1 Clarke Street, Southport
Building 4

Traffic Noise Modelling
Year 2035

Level 9
(29.2m 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
- Surface
- Foliage

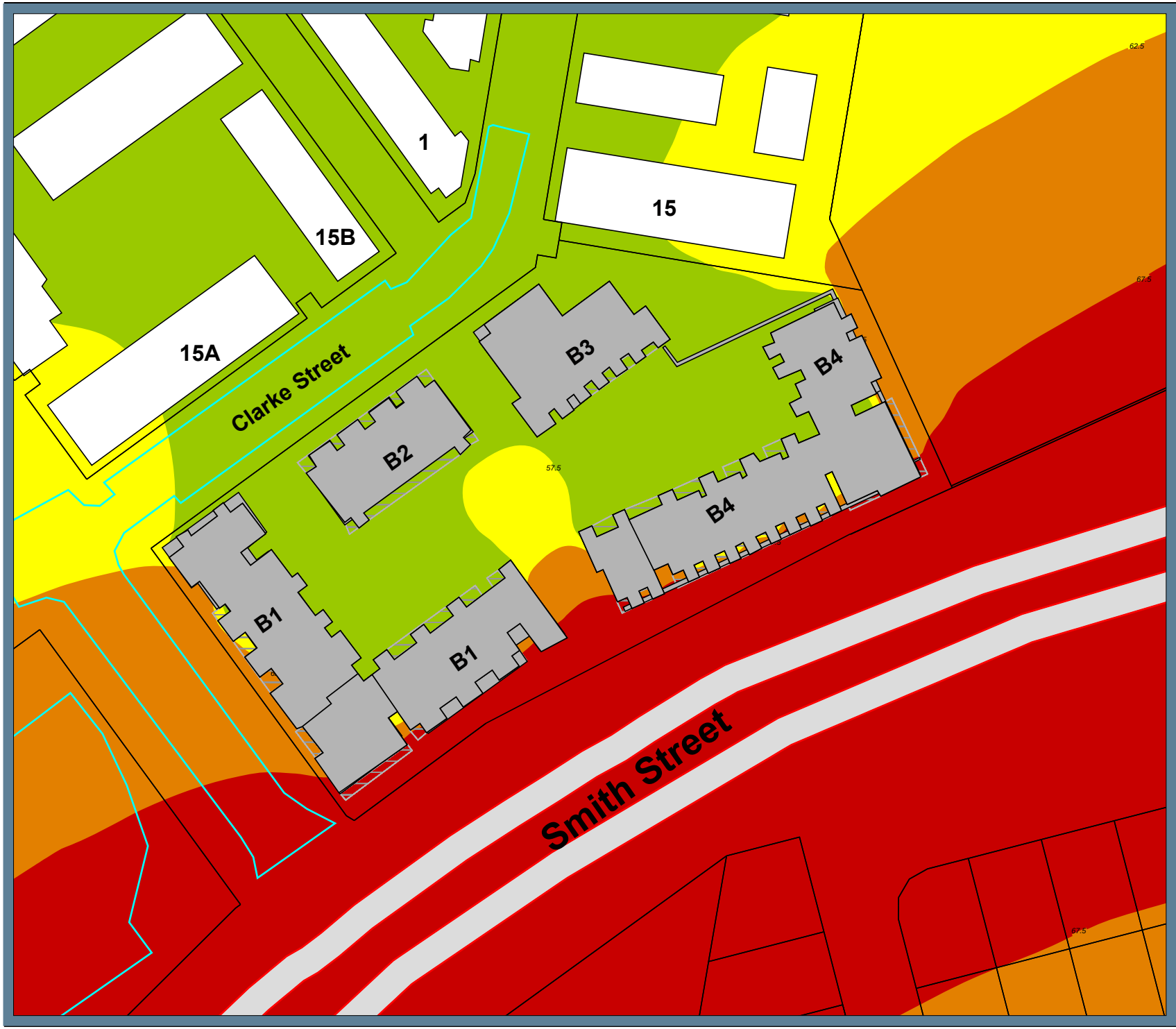
SCALE @ A4 1:1400

0 5 10 20 30 40 m

N

Grid Spacing: 5m
Project Engineer: Bojan Todorovski
Created: 25/07/2024
Processed with SoundPLAN 8.2

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



ATP CONSULTING ENGINEERS

ATP240541

Proposed Development
1 Clarke Street, Southport
Building 4

Traffic Noise Modelling
Year 2035

Level 10
(32.4m 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
- Surface
- Foliage

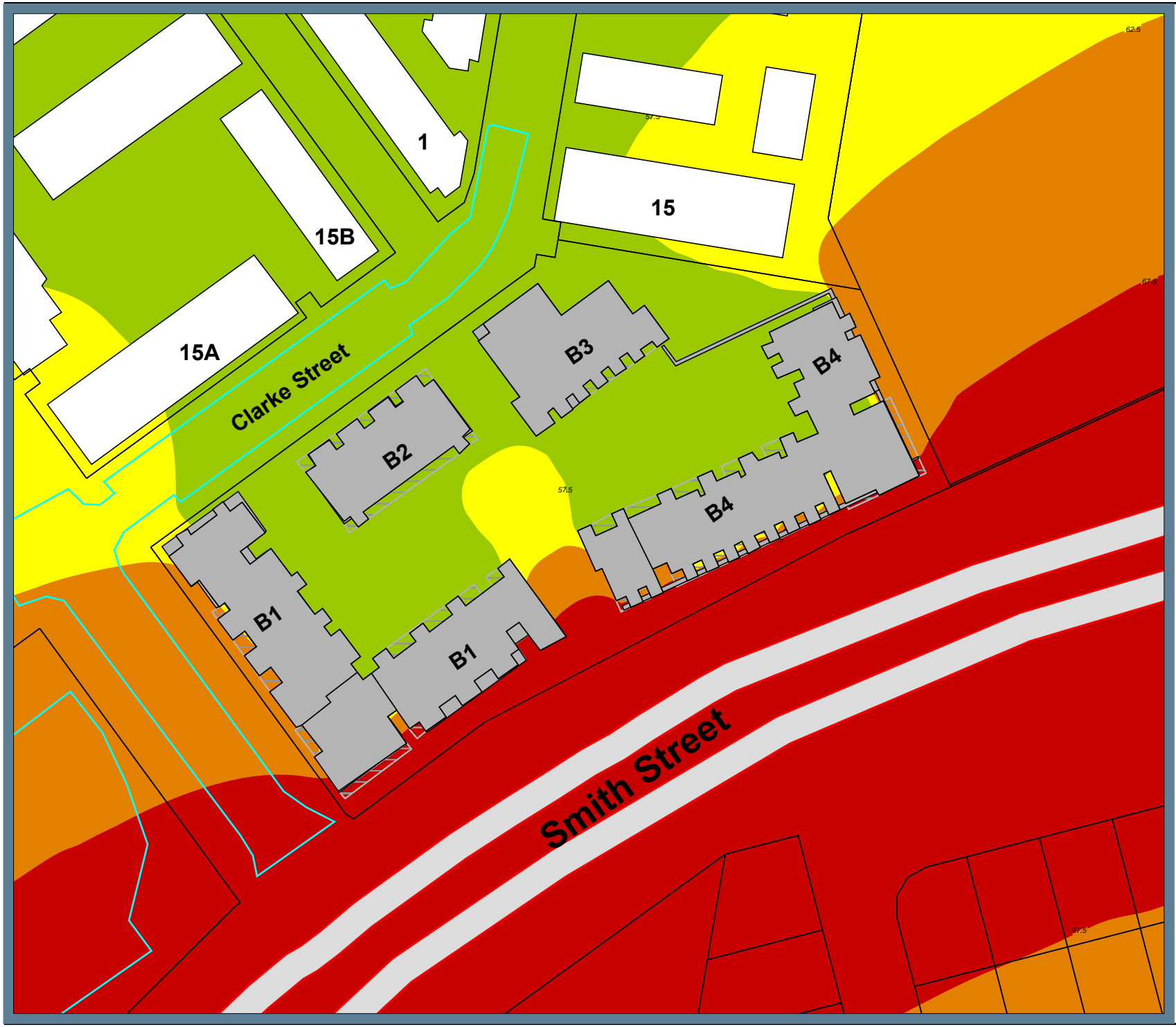
SCALE @ A4 1:1400

0 5 10 20 30 40 m

N

Grid Spacing: 5m
Project Engineer: Bojan Todorovski
Created: 25/07/2024
Processed with SoundPLAN 8.2

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



ATP CONSULTING ENGINEERS

ATP240541

Proposed Development
1 Clarke Street, Southport
Building 4

Traffic Noise Modelling
Year 2035

Level 11
(35.6m 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
- Surface
- Foliage

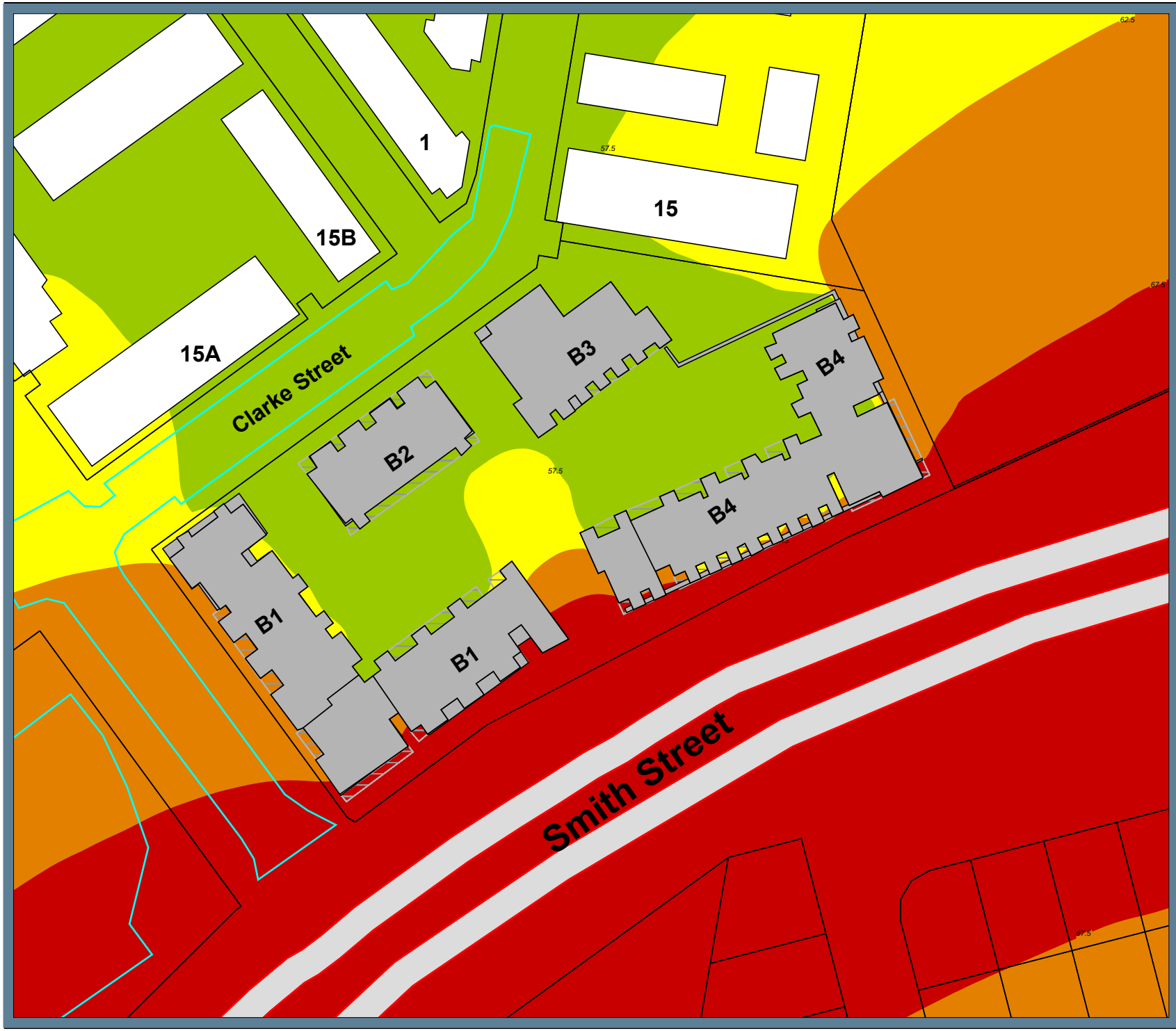
SCALE @ A4 1:1400

0 5 10 20 30 40 m

N

Grid Spacing: 5m
Project Engineer: Bojan Todorovski
Created: 25/07/2024
Processed with SoundPLAN 8.2

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



ATP CONSULTING ENGINEERS

ATP240541

Proposed Development
1 Clarke Street, Southport
Building 4

Traffic Noise Modelling
Year 2035

Level 12
(38.8m 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
- Surface
- Foliage

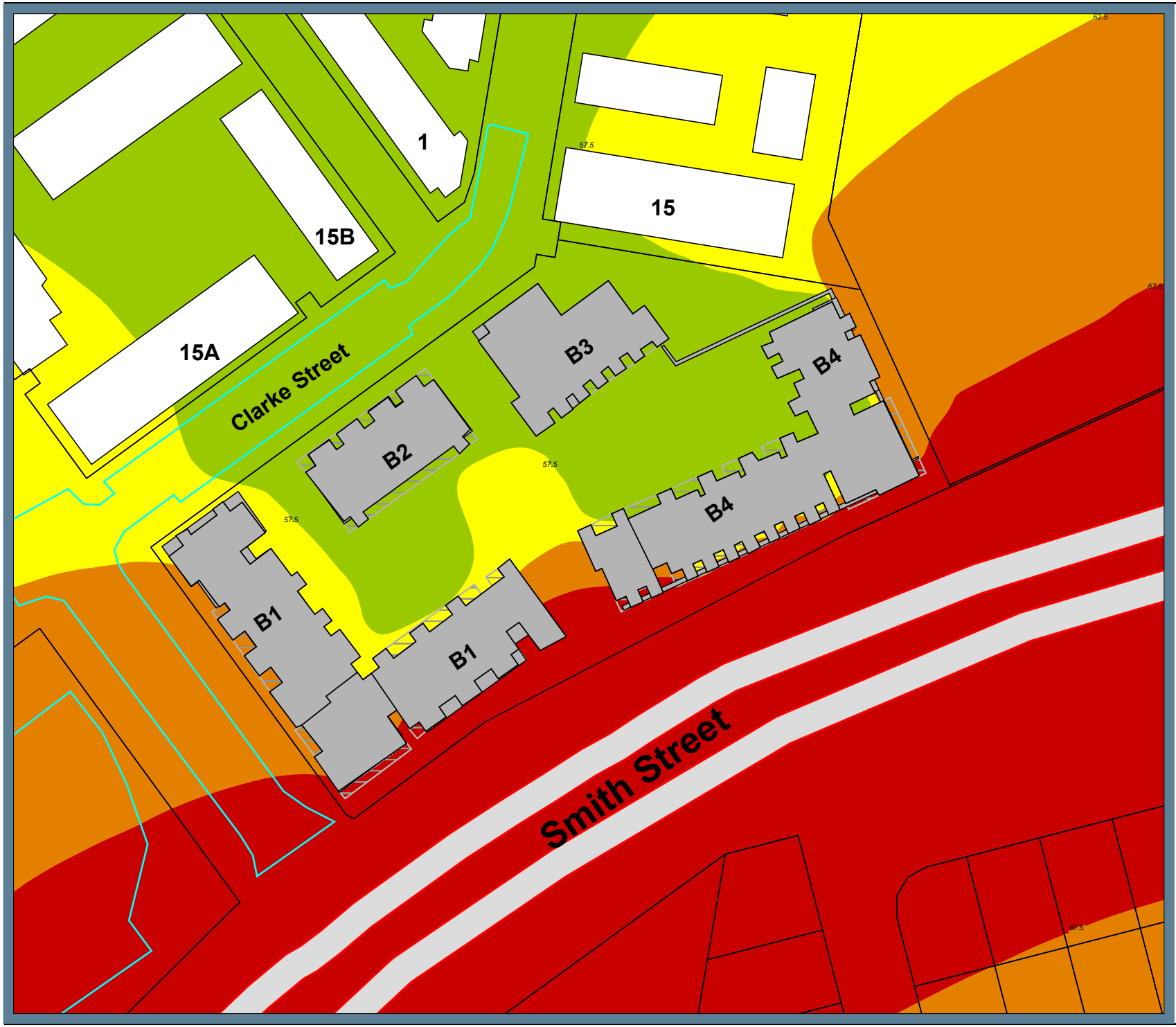
SCALE @ A4 1:1400

0 5 10 20 30 40 m

N

Grid Spacing: 5m
Project Engineer: Bojan Todorovski
Created: 25/07/2024
Processed with SoundPLAN 8.2

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



ATP CONSULTING ENGINEERS

ATP240541

Proposed Development
1 Clarke Street, Southport
Building 4

Traffic Noise Modelling
Year 2035

Level 13
(42m 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
- Surface
- Foliage

SCALE @ A4 1:1400

0 5 10 20 30 40 m

N

Grid Spacing: 5m
Project Engineer: Bojan Todorovski
Created: 25/07/2024
Processed with SoundPLAN 8.2

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

Appendix H – Tabulated Operational Noise Levels

1 Clarke Street, Southport
ISO9613 Calculation Method
Predicted Operational Noise Levels at Adjacent Uses From Activities at Proposed Development
Environmental Protection (Noise) Policy 2019 - Acoustic Quality Objectives

Legend

Source		Source name
Source type		Type of source (point, line, area)
L'w	dB(A)	Sound power level per m, m²
Lw	dB(A)	Sound power level per unit
l or A	m,m²	Size of source (length or area)
KI	dB	Correction for source impulsiveness
KT	dB	Correction for source tonality
Ko	dB	Correction for propagation in limited spacial angle
S	m	Distance source - receiver
Adiv	dB	Mean attenuation due to geometrical spreading
Agr	dB	Mean attenuation due to ground effect
Abar	dB	Mean attenuation due to screening
Aatm	dB	Mean attenuation due to air absorption
Amisc	dB	Mean attenuation due to foliage, industrial areas and building areas
ADI	dB	Mean directivity correction
dLrefl	dB	Level increase due to reflections
Ls	dB(A)	Unassessed sound pressure level at receiver Ls=Lw+Ko+ADI+Adiv+Agr+Abar+Aatm+Afol_site_house+Awind+dLrefl
dLw 1hr,D	dB	Correction due to source operation time
dLw 1hr,E	dB	Correction due to source operation time
dLw 1hr,N	dB	Correction due to source operation time
Leq 1hr,D	dB(A)	Leq,adjacent,1hr Day
Leq 1hr,E	dB(A)	Leq,adjacent,1hr Evening
Leq 1hr,N	dB(A)	Leq,adjacent,1hr Night

1 Clarke Street, Southport
ISO9613 Calculation Method
Predicted Operational Noise Levels at Adjacent Uses From Activities at Proposed Development
Environmental Protection (Noise) Policy 2019 - Acoustic Quality Objectives

Source	Source type	L'w	Lw	l or A	KI	KT	Ko	S	Adiv	Agr	Abar	Aatm	Amisc	ADI	dLrefl	Ls	dLw 1hr,D	dLw 1hr,E	dLw 1hr,N	Leq 1hr,D	Leq 1hr,E	Leq 1hr,N
		dB(A)	dB(A)	m,m²	dB	dB	dB	m	dB	dB	dB	dB	dB	dB	dB	dB(A)	dB	dB	dB	dB(A)	dB(A)	dB(A)
Receiver 1 Perkins Lane Fl GF Dir SE Leq 1hr,D 38 dB(A) Leq 1hr,E 37 dB(A) Leq 1hr,N 31 dB(A)																						
Delivery truck loading	Point	92.0	92.0		5.0	0.0	0	110.49	-51.9	-0.5	-22.4	-1.5		0.0	16.3	31.9	-25.6			11.4		
Internal Driveway North	Line	47.1	64.1	50.5	0.0	0.0	0	45.95	-44.2	-1.9	-3.6	-0.3		0.0	0.2	14.3	17.0	14.8	10.0	31.3	29.1	24.3
Internal Driveway South	Line	50.1	70.9	121.3	0.0	0.0	0	100.84	-51.1	-2.7	-7.1	-0.8		0.0	3.8	13.1	17.0	14.8	10.0	30.1	27.9	23.1
Patron noise_L2 podium	Area	57.1	86.5	870.7	0.0	0.0	0	86.91	-49.8	-0.1	-6.2	-0.3		0.0	2.0	32.0	0.0	0.0		32.0	32.0	
Patrons_rooftop	Area	56.6	81.5	307.3	0.0	0.0	0	156.42	-54.9	-0.1	-22.2	-0.5		0.0	0.0	3.8	0.0	0.0		3.8	3.8	
Refuse truck	Point	92.0	92.0		5.0	0.0	0	85.73	-49.7	-0.5	-9.8	-0.8		0.0	6.9	38.1	-25.6			17.5		
Rooftop plant_B1	Area	65.4	89.3	242.1	0.0	5.0	0	138.08	-53.8	-0.1	-24.0	-0.9		0.0	1.5	12.1	0.0	0.0	-1.5	17.1	17.1	15.5
Rooftop plant_B2	Area	67.1	89.3	166.4	0.0	5.0	0	79.11	-49.0	-0.1	-21.5	-0.4		0.0	3.0	21.4	0.0	0.0	-1.5	26.4	26.4	24.8
Rooftop plant_B3	Area	67.0	89.3	167.2	0.0	5.0	0	66.50	-47.4	-0.1	-22.8	-0.4		0.0	0.1	18.7	0.0	0.0	-1.5	23.7	23.7	22.1
Rooftop plant_B4	Area	69.9	89.3	86.3	0.0	5.0	0	144.98	-54.2	-0.1	-24.0	-0.9		0.0	1.2	11.2	0.0	0.0	-1.5	16.2	16.2	14.6
Ground level carpark	PLot	56.4	91.9	3574.4	0.0	0.0	0	100.52	-51.0	-2.1	-3.8	-0.9		0.0	1.8	35.8	-4.2	-6.4	-11.0	31.6	29.4	24.8
Receiver 15 Clarke Street Fl F 2 Dir S Leq 1hr,D 45 dB(A) Leq 1hr,E 44 dB(A) Leq 1hr,N 36 dB(A)																						
Delivery truck loading	Point	92.0	92.0		5.0	0.0	0	141.09	-54.0	-0.5	-13.8	-1.0		0.0	7.3	29.9	-25.6			9.4		
Internal Driveway North	Line	47.1	64.1	50.5	0.0	0.0	0	31.19	-40.9	-1.5	-0.2	-0.2		0.0	1.1	22.4	17.0	14.8	10.0	39.4	37.2	32.4
Internal Driveway South	Line	50.1	70.9	121.3	0.0	0.0	0	131.29	-53.4	-2.7	-9.2	-0.3		0.0	3.9	9.2	17.0	14.8	10.0	26.2	24.0	19.2
Patron noise_L2 podium	Area	57.1	86.5	870.7	0.0	0.0	0	52.35	-45.4	0.0	-0.6	-0.2		0.0	1.0	41.3	0.0	0.0		41.3	41.3	
Patrons_rooftop	Area	56.6	81.5	307.3	0.0	0.0	0	167.77	-55.5	0.0	-23.3	-0.5		0.0	13.0	15.2	0.0	0.0		15.2	15.2	
Refuse truck	Point	92.0	92.0		5.0	0.0	0	18.16	-36.2	-0.2	-6.2	-0.4		0.0	3.6	52.7	-25.6			32.1		
Rooftop plant_B1	Area	65.4	89.3	242.1	0.0	5.0	0	160.29	-55.1	0.0	-24.6	-1.1		0.0	0.2	8.7	0.0	0.0	-1.5	13.7	13.7	12.1
Rooftop plant_B2	Area	67.1	89.3	166.4	0.0	5.0	0	108.49	-51.7	0.0	-24.8	-0.8		0.0	3.0	14.9	0.0	0.0	-1.5	19.9	19.9	18.4
Rooftop plant_B3	Area	67.0	89.3	167.2	0.0	5.0	0	47.55	-44.5	0.0	-22.6	-0.3		0.0	3.0	24.9	0.0	0.0	-1.5	29.9	29.9	28.3
Rooftop plant_B4	Area	69.9	89.3	86.3	0.0	5.0	0	82.41	-49.3	0.0	-19.6	-0.7		0.0	2.4	22.1	0.0	0.0	-1.5	27.1	27.1	25.5
Ground level carpark	PLot	56.4	91.9	3574.4	0.0	0.0	0	53.90	-45.6	-1.6	-4.7	-0.3		0.0	1.4	41.1	-4.2	-6.4	-11.0	36.9	34.7	30.1

1 Clarke Street, Southport
ISO9613 Calculation Method
Predicted Operational Noise Levels at Adjacent Uses From Activities at Proposed Development
Environmental Protection (Noise) Policy 2019 - Acoustic Quality Objectives

Source	Source type	L'w	Lw	l or A	KI	KT	Ko	S	Adiv	Agr	Abar	Aatm	Amisc	ADI	dLrefl	Ls	dLw 1hr,D	dLw 1hr,E	dLw 1hr,N	Leq 1hr,D	Leq 1hr,E	Leq 1hr,N
		dB(A)	dB(A)	m,m²	dB	dB	dB	m	dB	dB	dB	dB	dB	dB	dB	dB(A)	dB	dB	dB	dB(A)	dB(A)	dB(A)
Receiver 15 Clarke Street Fl F 6 Dir S Leq 1hr,D 45 dB(A) Leq 1hr,E 44 dB(A) Leq 1hr,N 36 dB(A)																						
Delivery truck loading	Point	92.0	92.0		5.0	0.0	0	142.37	-54.1	-0.5	-18.8	-2.1		0.0	11.2	27.7	-25.6			7.2		
Internal Driveway North	Line	47.1	64.1	50.5	0.0	0.0	0	37.35	-42.4	-1.4	0.0	-0.3		0.0	0.9	20.9	17.0	14.8	10.0	37.9	35.7	30.9
Internal Driveway South	Line	50.1	70.9	121.3	0.0	0.0	0	132.76	-53.5	-2.5	-14.1	-0.3		0.0	6.6	7.2	17.0	14.8	10.0	24.1	21.9	17.2
Patron noise_L2 podium	Area	57.1	86.5	870.7	0.0	0.0	0	55.33	-45.9	0.0	-0.4	-0.2		0.0	1.6	41.6	0.0	0.0		41.6	41.6	
Patrons_rooftop	Area	56.6	81.5	307.3	0.0	0.0	0	166.12	-55.4	0.0	-17.2	-0.5		0.0	8.4	16.8	0.0	0.0		16.8	16.8	
Refuse truck	Point	92.0	92.0		5.0	0.0	0	26.30	-39.4	-0.2	0.0	-0.7		0.0	1.7	53.3	-25.6			32.8		
Rooftop plant_B1	Area	65.4	89.3	242.1	0.0	5.0	0	159.01	-55.0	0.0	-24.5	-1.1		0.0	0.2	8.8	0.0	0.0	-1.5	13.8	13.8	12.3
Rooftop plant_B2	Area	67.1	89.3	166.4	0.0	5.0	0	106.97	-51.6	0.0	-24.4	-0.8		0.0	3.9	16.5	0.0	0.0	-1.5	21.5	21.5	19.9
Rooftop plant_B3	Area	67.0	89.3	167.2	0.0	5.0	0	41.77	-43.4	0.0	-19.3	-0.2		0.0	2.0	28.3	0.0	0.0	-1.5	33.3	33.3	31.8
Rooftop plant_B4	Area	69.9	89.3	86.3	0.0	5.0	0	78.44	-48.9	0.0	-19.4	-0.6		0.0	2.3	22.7	0.0	0.0	-1.5	27.7	27.7	26.1
Ground level carpark	PLot	56.4	91.9	3574.4	0.0	0.0	0	58.78	-46.4	-1.1	-3.2	-0.5		0.0	0.8	41.6	-4.2	-6.4	-11.0	37.4	35.2	30.6
Receiver 15 Clarke Street Fl F 7 Dir S Leq 1hr,D 45 dB(A) Leq 1hr,E 44 dB(A) Leq 1hr,N 37 dB(A)																						
Delivery truck loading	Point	92.0	92.0		5.0	0.0	0	142.84	-54.1	-0.5	-18.8	-2.2		0.0	11.7	28.1	-25.6			7.5		
Internal Driveway North	Line	47.1	64.1	50.5	0.0	0.0	0	39.33	-42.9	-1.5	0.0	-0.3		0.0	1.0	20.5	17.0	14.8	10.0	37.5	35.3	30.5
Internal Driveway South	Line	50.1	70.9	121.3	0.0	0.0	0	133.30	-53.5	-2.5	-14.4	-0.3		0.0	6.8	7.1	17.0	14.8	10.0	24.1	21.8	17.1
Patron noise_L2 podium	Area	57.1	86.5	870.7	0.0	0.0	0	56.49	-46.0	0.0	-0.4	-0.2		0.0	1.6	41.4	0.0	0.0		41.4	41.4	
Patrons_rooftop	Area	56.6	81.5	307.3	0.0	0.0	0	165.83	-55.4	0.0	-14.8	-0.5		0.0	1.7	12.5	0.0	0.0		12.5	12.5	
Refuse truck	Point	92.0	92.0		5.0	0.0	0	28.76	-40.2	-0.2	0.0	-0.8		0.0	2.3	53.2	-25.6			32.6		
Rooftop plant_B1	Area	65.4	89.3	242.1	0.0	5.0	0	158.85	-55.0	0.0	-23.8	-0.9		0.0	0.1	9.6	0.0	0.0	-1.5	14.6	14.6	13.1
Rooftop plant_B2	Area	67.1	89.3	166.4	0.0	5.0	0	106.80	-51.6	0.0	-23.8	-0.7		0.0	4.4	17.6	0.0	0.0	-1.5	22.6	22.6	21.1
Rooftop plant_B3	Area	67.0	89.3	167.2	0.0	5.0	0	40.77	-43.2	0.0	-18.5	-0.2		0.0	2.2	29.6	0.0	0.0	-1.5	34.6	34.6	33.0
Rooftop plant_B4	Area	69.9	89.3	86.3	0.0	5.0	0	77.69	-48.8	0.0	-19.0	-0.5		0.0	2.1	23.1	0.0	0.0	-1.5	28.1	28.1	26.5
Ground level carpark	PLot	56.4	91.9	3574.4	0.0	0.0	0	60.35	-46.6	-1.1	-3.0	-0.5		0.0	0.8	41.5	-4.2	-6.4	-11.0	37.3	35.1	30.6

1 Clarke Street, Southport
ISO9613 Calculation Method
Predicted Operational Noise Levels at Adjacent Uses From Activities at Proposed Development
Environmental Protection (Noise) Policy 2019 - Acoustic Quality Objectives

Source	Source type	L'w	Lw	l or A	Kl	KT	Ko	S	Adiv	Agr	Abar	Aatm	Amisc	ADI	dLrefl	Ls	dLw 1hr,D	dLw 1hr,E	dLw 1hr,N	Leq 1hr,D	Leq 1hr,E	Leq 1hr,N
		dB(A)	dB(A)	m,m²	dB	dB	dB	m	dB	dB	dB	dB	dB	dB	dB	dB(A)	dB	dB	dB	dB(A)	dB(A)	dB(A)
Receiver 15A Village Boulevard Fl F 3 Dir SE Leq 1hr,D 42 dB(A) Leq 1hr,E 40 dB(A) Leq 1hr,N 36 dB(A)																						
Delivery truck loading	Point	92.0	92.0		5.0	0.0	0	59.56	-46.5	-0.4	0.0	-1.5		0.0	0.4	44.0	-25.6			23.4		
Internal Driveway North	Line	47.1	64.1	50.5	0.0	0.0	0	116.45	-52.3	-2.5	-4.4	-0.8		0.0	1.7	5.9	17.0	14.8	10.0	22.9	20.7	15.9
Internal Driveway South	Line	50.1	70.9	121.3	0.0	0.0	0	51.03	-45.1	-1.9	-0.1	-0.4		0.0	0.5	23.9	17.0	14.8	10.0	40.9	38.7	33.9
Patron noise_L2 podium	Area	57.1	86.5	870.7	0.0	0.0	0	124.74	-52.9	0.0	-20.8	-0.4		0.0	5.0	17.4	0.0	0.0		17.4	17.4	
Patrons_rooftop	Area	56.6	81.5	307.3	0.0	0.0	0	111.60	-51.9	0.0	-21.4	-0.3		0.0	6.3	14.1	0.0	0.0		14.1	14.1	
Refuse truck	Point	92.0	92.0		5.0	0.0	0	154.65	-54.8	-0.5	-18.4	-1.5		0.0	12.9	29.7	-25.6			9.1		
Rooftop plant_B1	Area	65.4	89.3	242.1	0.0	5.0	0	84.96	-49.6	0.0	-24.5	-0.6		0.0	3.0	17.5	0.0	0.0	-1.5	22.5	22.5	20.9
Rooftop plant_B2	Area	67.1	89.3	166.4	0.0	5.0	0	58.00	-46.3	0.0	-21.2	-0.3		0.0	4.9	26.5	0.0	0.0	-1.5	31.5	31.5	29.9
Rooftop plant_B3	Area	67.0	89.3	167.2	0.0	5.0	0	115.31	-52.2	0.0	-21.7	-0.5		0.0	0.1	15.0	0.0	0.0	-1.5	20.0	20.0	18.4
Rooftop plant_B4	Area	69.9	89.3	86.3	0.0	5.0	0	192.80	-56.7	0.0	-22.6	-0.9		0.0	2.5	11.6	0.0	0.0	-1.5	16.6	16.6	15.1
Ground level carpark	PLot	56.4	91.9	3574.4	0.0	0.0	0	139.48	-53.9	-1.6	-14.6	-0.2		0.0	3.6	25.3	-4.2	-6.4	-11.0	21.1	18.9	14.3
Receiver 15B Village Boulevard Fl F 3 Dir SE Leq 1hr,D 39 dB(A) Leq 1hr,E 37 dB(A) Leq 1hr,N 33 dB(A)																						
Delivery truck loading	Point	92.0	92.0		5.0	0.0	0	85.77	-49.7	-0.5	-20.2	-1.0		0.0	19.6	40.2	-25.6			19.6		
Internal Driveway North	Line	47.1	64.1	50.5	0.0	0.0	0	66.94	-47.5	-2.1	-1.4	-0.5		0.0	0.3	12.9	17.0	14.8	10.0	29.9	27.7	22.9
Internal Driveway South	Line	50.1	70.9	121.3	0.0	0.0	0	76.33	-48.6	-2.2	-4.7	-0.5		0.0	3.4	18.2	17.0	14.8	10.0	35.2	33.0	28.2
Patron noise_L2 podium	Area	57.1	86.5	870.7	0.0	0.0	0	92.79	-50.3	0.0	-7.0	-0.3		0.0	1.0	29.8	0.0	0.0		29.8	29.8	
Patrons_rooftop	Area	56.6	81.5	307.3	0.0	0.0	0	133.41	-53.5	0.0	-20.7	-0.4		0.0	0.6	7.5	0.0	0.0		7.5	7.5	
Refuse truck	Point	92.0	92.0		5.0	0.0	0	107.50	-51.6	-0.5	0.0	-2.3		0.0	2.0	39.6	-25.6			19.1		
Rooftop plant_B1	Area	65.4	89.3	242.1	0.0	5.0	0	112.15	-52.0	0.0	-22.5	-0.6		0.0	2.8	17.1	0.0	0.0	-1.5	22.1	22.1	20.5
Rooftop plant_B2	Area	67.1	89.3	166.4	0.0	5.0	0	55.39	-45.9	0.0	-19.6	-0.2		0.0	0.5	24.0	0.0	0.0	-1.5	29.0	29.0	27.5
Rooftop plant_B3	Area	67.0	89.3	167.2	0.0	5.0	0	72.92	-48.2	0.0	-23.6	-0.5		0.0	1.0	18.0	0.0	0.0	-1.5	23.0	23.0	21.5
Rooftop plant_B4	Area	69.9	89.3	86.3	0.0	5.0	0	156.18	-54.9	0.0	-23.9	-1.0		0.0	5.2	14.7	0.0	0.0	-1.5	19.7	19.7	18.2
Ground level carpark	PLot	56.4	91.9	3574.4	0.0	0.0	0	108.52	-51.7	-1.5	-6.6	-0.7		0.0	1.0	32.5	-4.2	-6.4	-11.0	28.3	26.1	21.5

1 Clarke Street, Southport
ISO9613 Calculation Method
Predicted Operational Noise Levels at Adjacent Uses From Activities at Proposed Development
Environmental Protection (Noise) Policy 2019 - Acoustic Quality Objectives

Source	Source type	L'w	Lw	l or A	KI	KT	Ko	S	Adiv	Agr	Abar	Aatm	Amisc	ADI	dLrefl	Ls	dLw 1hr,D	dLw 1hr,E	dLw 1hr,N	Leq 1hr,D	Leq 1hr,E	Leq 1hr,N
		dB(A)	dB(A)	m,m²	dB	dB	dB	m	dB	dB	dB	dB	dB	dB	dB	dB(A)	dB	dB	dB	dB(A)	dB(A)	dB(A)
Receiver 15B Village Boulevard Fl F 7 Dir SE Leq 1hr,D 40 dB(A) Leq 1hr,E 39 dB(A) Leq 1hr,N 36 dB(A)																						
Delivery truck loading	Point	92.0	92.0		5.0	0.0	0	88.14	-49.9	-0.5	-20.2	-1.0		0.0	19.4	39.9	-25.6			19.3		
Internal Driveway North	Line	47.1	64.1	50.5	0.0	0.0	0	70.52	-48.0	-2.1	-1.2	-0.5		0.0	0.2	12.6	17.0	14.8	10.0	29.6	27.4	22.6
Internal Driveway South	Line	50.1	70.9	121.3	0.0	0.0	0	79.33	-49.0	-2.2	-4.8	-0.5		0.0	3.6	18.0	17.0	14.8	10.0	35.0	32.8	28.0
Patron noise_L2 podium	Area	57.1	86.5	870.7	0.0	0.0	0	94.64	-50.5	0.0	-10.2	-0.3		0.0	2.6	28.1	0.0	0.0		28.1	28.1	
Patrons_rooftop	Area	56.6	81.5	307.3	0.0	0.0	0	131.48	-53.4	0.0	-9.0	-0.4		0.0	0.0	18.8	0.0	0.0		18.8	18.8	
Refuse truck	Point	92.0	92.0		5.0	0.0	0	109.40	-51.8	-0.5	0.0	-2.3		0.0	2.4	39.8	-25.6			19.3		
Rooftop plant_B1	Area	65.4	89.3	242.1	0.0	5.0	0	110.62	-51.9	0.0	-16.3	-0.4		0.0	1.1	21.9	0.0	0.0	-1.5	26.9	26.9	25.3
Rooftop plant_B2	Area	67.1	89.3	166.4	0.0	5.0	0	52.83	-45.5	0.0	-13.4	-0.2		0.0	0.2	30.3	0.0	0.0	-1.5	35.3	35.3	33.8
Rooftop plant_B3	Area	67.0	89.3	167.2	0.0	5.0	0	69.75	-47.9	0.0	-20.2	-0.3		0.0	0.7	21.6	0.0	0.0	-1.5	26.6	26.6	25.1
Rooftop plant_B4	Area	69.9	89.3	86.3	0.0	5.0	0	154.23	-54.8	0.0	-19.7	-0.5		0.0	0.6	14.9	0.0	0.0	-1.5	19.9	19.9	18.3
Ground level carpark	PLot	56.4	91.9	3574.4	0.0	0.0	0	110.67	-51.9	-1.5	-8.1	-0.7		0.0	1.1	31.0	-4.2	-6.4	-11.0	26.8	24.6	20.0
Receiver 2 Nexus Way Fl F 7 Dir SE Leq 1hr,D 35 dB(A) Leq 1hr,E 34 dB(A) Leq 1hr,N 32 dB(A)																						
Delivery truck loading	Point	92.0	92.0		5.0	0.0	0	90.05	-50.1	-0.5	-23.6	-1.6		0.0	3.3	19.6	-25.6			-0.9		
Internal Driveway North	Line	47.1	64.1	50.5	0.0	0.0	0	183.76	-56.3	-2.6	-5.0	-1.3		0.0	2.8	1.7	17.0	14.8	10.0	18.7	16.5	11.7
Internal Driveway South	Line	50.1	70.9	121.3	0.0	0.0	0	95.96	-50.6	-2.4	-8.6	-0.6		0.0	2.5	11.3	17.0	14.8	10.0	28.3	26.1	21.3
Patron noise_L2 podium	Area	57.1	86.5	870.7	0.0	0.0	0	183.04	-56.2	0.0	-21.4	-0.6		0.0	5.6	13.8	0.0	0.0		13.8	13.8	
Patrons_rooftop	Area	56.6	81.5	307.3	0.0	0.0	0	118.08	-52.4	0.0	-6.4	-0.4		0.0	0.3	22.5	0.0	0.0		22.5	22.5	
Refuse truck	Point	92.0	92.0		5.0	0.0	0	219.78	-57.8	-0.5	-23.1	-2.6		0.0	2.3	10.2	-25.6			-10.4		
Rooftop plant_B1	Area	65.4	89.3	242.1	0.0	5.0	0	94.26	-50.5	0.0	-15.9	-0.4		0.0	2.1	24.7	0.0	0.0	-1.5	29.7	29.7	28.1
Rooftop plant_B2	Area	67.1	89.3	166.4	0.0	5.0	0	109.44	-51.8	0.0	-13.4	-0.4		0.0	0.8	24.5	0.0	0.0	-1.5	29.5	29.5	28.0
Rooftop plant_B3	Area	67.0	89.3	167.2	0.0	5.0	0	176.43	-55.9	0.0	-16.0	-0.5		0.0	0.0	16.8	0.0	0.0	-1.5	21.8	21.8	20.2
Rooftop plant_B4	Area	69.9	89.3	86.3	0.0	5.0	0	246.62	-58.8	0.0	-18.3	-0.8		0.0	0.5	11.9	0.0	0.0	-1.5	16.9	16.9	15.3
Ground level carpark	PLot	56.4	91.9	3574.4	0.0	0.0	0	196.06	-56.8	-1.7	-16.1	-0.3		0.0	3.9	20.9	-4.2	-6.4	-11.0	16.7	14.5	9.9

1 Clarke Street, Southport
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Environmental Protection (Noise) Policy 2019 - Background Creep

Legend

Source		Source name
Source type		Type of source (point, line, area)
L'w	dB(A)	Sound power level per m, m²
Lw	dB(A)	Sound power level per unit
l or A	m,m²	Size of source (length or area)
KI	dB	Correction for source impulsiveness
KT	dB	Correction for source tonality
Ko	dB	Correction for propagation in limited spacial angle
S	m	Distance source - receiver
Adiv	dB	Mean attenuation due to geometrical spreading
Agr	dB	Mean attenuation due to ground effect
Abar	dB	Mean attenuation due to screening
Aatm	dB	Mean attenuation due to air absorption
Amisc	dB	Mean attenuation due to foliage, industrial areas and building areas
ADI	dB	Mean directivity correction
dLrefl	dB	Level increase due to reflections
Ls	dB(A)	Unassessed sound pressure level at receiver Ls=Lw+Ko+ADI+Adiv+Agr+Abar+Aatm+Afol_site_house+Awind+dLrefl
dLw 15m,D	dB	Correction due to source operation time
dLw 15m,E	dB	Correction due to source operation time
dLw 15m,N	dB	Correction due to source operation time
Leq 15m,D	dB(A)	Leq,adjacent,15min, Day
Leq 15m,E	dB(A)	Leq,adjacent,15min, Evening
Leq 15m,N	dB(A)	Leq,adjacent,15min, Night

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Source	Source type	L'w	Lw	l or A	Kl	KT	Ko	S	Adiv	Agr	Abar	Aatm	Amisc	ADI	dLrefl	Ls	dLw 15m,D	dLw 15m,E	dLw 15m,N	Leq 15m,D	Leq 15m,E	Leq 15m,N
		dB(A)	dB(A)	m,m²	dB	dB	dB	m	dB	dB	dB	dB	dB	dB	dB	dB(A)	dB	dB	dB	dB(A)	dB(A)	dB(A)
Receiver 1 Perkins Lane Fl GF Dir SE Leq 15m,D 38 dB(A) Leq 15m,E 37 dB(A) Leq 15m,N 31 dB(A)																						
Delivery truck loading	Point	92.0	92.0		5.0	0.0	0	110.49	-51.9	-0.5	-22.4	-1.5		0.0	16.3	31.9	-20.8			16.2		
Internal Driveway North	Line	47.1	64.1	50.5	0.0	0.0	0	45.95	-44.2	-1.9	-3.6	-0.3		0.0	0.2	14.3	17.0	14.8	10.0	31.3	29.1	24.3
Internal Driveway South	Line	50.1	70.9	121.3	0.0	0.0	0	100.84	-51.1	-2.7	-7.1	-0.8		0.0	3.8	13.1	17.0	14.8	10.0	30.1	27.9	23.1
Patron noise_L2 podium	Area	57.1	86.5	870.7	0.0	0.0	0	86.91	-49.8	-0.1	-6.2	-0.3		0.0	2.0	32.0	0.0	0.0		32.0	32.0	
Patrons_rooftop	Area	56.6	81.5	307.3	0.0	0.0	0	156.42	-54.9	-0.1	-22.2	-0.5		0.0	0.0	3.8	0.0	0.0		3.8	3.8	
Refuse truck	Point	92.0	92.0		5.0	0.0	0	85.73	-49.7	-0.5	-9.8	-0.8		0.0	6.9	38.1	-20.8			22.3		
Rooftop plant_B1	Area	65.4	89.3	242.1	0.0	5.0	0	138.08	-53.8	-0.1	-24.0	-0.9		0.0	1.5	12.1	0.0	0.0	-1.5	17.1	17.1	15.5
Rooftop plant_B2	Area	67.1	89.3	166.4	0.0	5.0	0	79.11	-49.0	-0.1	-21.5	-0.4		0.0	3.0	21.4	0.0	0.0	-1.5	26.4	26.4	24.8
Rooftop plant_B3	Area	67.0	89.3	167.2	0.0	5.0	0	66.50	-47.4	-0.1	-22.8	-0.4		0.0	0.1	18.7	0.0	0.0	-1.5	23.7	23.7	22.1
Rooftop plant_B4	Area	69.9	89.3	86.3	0.0	5.0	0	144.98	-54.2	-0.1	-24.0	-0.9		0.0	1.2	11.2	0.0	0.0	-1.5	16.2	16.2	14.6
Ground level carpark	PLot	56.4	91.9	3574.4	0.0	0.0	0	100.52	-51.0	-2.1	-3.8	-0.9		0.0	1.8	35.8	-4.2	-6.4	-11.0	31.6	29.4	24.8
Receiver 15 Clarke Street Fl F 2 Dir S Leq 15m,D 45 dB(A) Leq 15m,E 44 dB(A) Leq 15m,N 36 dB(A)																						
Delivery truck loading	Point	92.0	92.0		5.0	0.0	0	141.09	-54.0	-0.5	-13.8	-1.0		0.0	7.3	29.9	-20.8			14.1		
Internal Driveway North	Line	47.1	64.1	50.5	0.0	0.0	0	31.19	-40.9	-1.5	-0.2	-0.2		0.0	1.1	22.4	17.0	14.8	10.0	39.4	37.2	32.4
Internal Driveway South	Line	50.1	70.9	121.3	0.0	0.0	0	131.29	-53.4	-2.7	-9.2	-0.3		0.0	3.9	9.2	17.0	14.8	10.0	26.2	24.0	19.2
Patron noise_L2 podium	Area	57.1	86.5	870.7	0.0	0.0	0	52.35	-45.4	0.0	-0.6	-0.2		0.0	1.0	41.3	0.0	0.0		41.3	41.3	
Patrons_rooftop	Area	56.6	81.5	307.3	0.0	0.0	0	167.77	-55.5	0.0	-23.3	-0.5		0.0	13.0	15.2	0.0	0.0		15.2	15.2	
Refuse truck	Point	92.0	92.0		5.0	0.0	0	18.16	-36.2	-0.2	-6.2	-0.4		0.0	3.6	52.7	-20.8			36.9		
Rooftop plant_B1	Area	65.4	89.3	242.1	0.0	5.0	0	160.29	-55.1	0.0	-24.6	-1.1		0.0	0.2	8.7	0.0	0.0	-1.5	13.7	13.7	12.1
Rooftop plant_B2	Area	67.1	89.3	166.4	0.0	5.0	0	108.49	-51.7	0.0	-24.8	-0.8		0.0	3.0	14.9	0.0	0.0	-1.5	19.9	19.9	18.4
Rooftop plant_B3	Area	67.0	89.3	167.2	0.0	5.0	0	47.55	-44.5	0.0	-22.6	-0.3		0.0	3.0	24.9	0.0	0.0	-1.5	29.9	29.9	28.3
Rooftop plant_B4	Area	69.9	89.3	86.3	0.0	5.0	0	82.41	-49.3	0.0	-19.6	-0.7		0.0	2.4	22.1	0.0	0.0	-1.5	27.1	27.1	25.5
Ground level carpark	PLot	56.4	91.9	3574.4	0.0	0.0	0	53.90	-45.6	-1.6	-4.7	-0.3		0.0	1.4	41.1	-4.2	-6.4	-11.0	36.9	34.7	30.1

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Environmental Protection (Noise) Policy 2019 - Background Creep

Source	Source type	L'w	Lw	l or A	Kl	KT	Ko	S	Adiv	Agr	Abar	Aatm	Amisc	ADI	dLrefl	Ls	dLw 15m,D	dLw 15m,E	dLw 15m,N	Leq 15m,D	Leq 15m,E	Leq 15m,N
		dB(A)	dB(A)	m,m²	dB	dB	dB	m	dB	dB	dB	dB	dB	dB	dB	dB(A)	dB	dB	dB	dB(A)	dB(A)	dB(A)
Receiver 15 Clarke Street Fl F 6 Dir S Leq 15m,D 45 dB(A) Leq 15m,E 44 dB(A) Leq 15m,N 36 dB(A)																						
Delivery truck loading	Point	92.0	92.0		5.0	0.0	0	142.37	-54.1	-0.5	-18.8	-2.1		0.0	11.2	27.7	-20.8			12.0		
Internal Driveway North	Line	47.1	64.1	50.5	0.0	0.0	0	37.35	-42.4	-1.4	0.0	-0.3		0.0	0.9	20.9	17.0	14.8	10.0	37.9	35.7	30.9
Internal Driveway South	Line	50.1	70.9	121.3	0.0	0.0	0	132.76	-53.5	-2.5	-14.1	-0.3		0.0	6.6	7.2	17.0	14.8	10.0	24.1	21.9	17.2
Patron noise_L2 podium	Area	57.1	86.5	870.7	0.0	0.0	0	55.33	-45.9	0.0	-0.4	-0.2		0.0	1.6	41.6	0.0	0.0		41.6	41.6	
Patrons_rooftop	Area	56.6	81.5	307.3	0.0	0.0	0	166.12	-55.4	0.0	-17.2	-0.5		0.0	8.4	16.8	0.0	0.0		16.8	16.8	
Refuse truck	Point	92.0	92.0		5.0	0.0	0	26.30	-39.4	-0.2	0.0	-0.7		0.0	1.7	53.3	-20.8			37.5		
Rooftop plant_B1	Area	65.4	89.3	242.1	0.0	5.0	0	159.01	-55.0	0.0	-24.5	-1.1		0.0	0.2	8.8	0.0	0.0	-1.5	13.8	13.8	12.3
Rooftop plant_B2	Area	67.1	89.3	166.4	0.0	5.0	0	106.97	-51.6	0.0	-24.4	-0.8		0.0	3.9	16.5	0.0	0.0	-1.5	21.5	21.5	19.9
Rooftop plant_B3	Area	67.0	89.3	167.2	0.0	5.0	0	41.77	-43.4	0.0	-19.3	-0.2		0.0	2.0	28.3	0.0	0.0	-1.5	33.3	33.3	31.8
Rooftop plant_B4	Area	69.9	89.3	86.3	0.0	5.0	0	78.44	-48.9	0.0	-19.4	-0.6		0.0	2.3	22.7	0.0	0.0	-1.5	27.7	27.7	26.1
Ground level carpark	PLot	56.4	91.9	3574.4	0.0	0.0	0	58.78	-46.4	-1.1	-3.2	-0.5		0.0	0.8	41.6	-4.2	-6.4	-11.0	37.4	35.2	30.6
Receiver 15 Clarke Street Fl F 7 Dir S Leq 15m,D 45 dB(A) Leq 15m,E 44 dB(A) Leq 15m,N 37 dB(A)																						
Delivery truck loading	Point	92.0	92.0		5.0	0.0	0	142.84	-54.1	-0.5	-18.8	-2.2		0.0	11.7	28.1	-20.8			12.3		
Internal Driveway North	Line	47.1	64.1	50.5	0.0	0.0	0	39.33	-42.9	-1.5	0.0	-0.3		0.0	1.0	20.5	17.0	14.8	10.0	37.5	35.3	30.5
Internal Driveway South	Line	50.1	70.9	121.3	0.0	0.0	0	133.30	-53.5	-2.5	-14.4	-0.3		0.0	6.8	7.1	17.0	14.8	10.0	24.1	21.8	17.1
Patron noise_L2 podium	Area	57.1	86.5	870.7	0.0	0.0	0	56.49	-46.0	0.0	-0.4	-0.2		0.0	1.6	41.4	0.0	0.0		41.4	41.4	
Patrons_rooftop	Area	56.6	81.5	307.3	0.0	0.0	0	165.83	-55.4	0.0	-14.8	-0.5		0.0	1.7	12.5	0.0	0.0		12.5	12.5	
Refuse truck	Point	92.0	92.0		5.0	0.0	0	28.76	-40.2	-0.2	0.0	-0.8		0.0	2.3	53.2	-20.8			37.4		
Rooftop plant_B1	Area	65.4	89.3	242.1	0.0	5.0	0	158.85	-55.0	0.0	-23.8	-0.9		0.0	0.1	9.6	0.0	0.0	-1.5	14.6	14.6	13.1
Rooftop plant_B2	Area	67.1	89.3	166.4	0.0	5.0	0	106.80	-51.6	0.0	-23.8	-0.7		0.0	4.4	17.6	0.0	0.0	-1.5	22.6	22.6	21.1
Rooftop plant_B3	Area	67.0	89.3	167.2	0.0	5.0	0	40.77	-43.2	0.0	-18.5	-0.2		0.0	2.2	29.6	0.0	0.0	-1.5	34.6	34.6	33.0
Rooftop plant_B4	Area	69.9	89.3	86.3	0.0	5.0	0	77.69	-48.8	0.0	-19.0	-0.5		0.0	2.1	23.1	0.0	0.0	-1.5	28.1	28.1	26.5
Ground level carpark	PLot	56.4	91.9	3574.4	0.0	0.0	0	60.35	-46.6	-1.1	-3.0	-0.5		0.0	0.8	41.5	-4.2	-6.4	-11.0	37.3	35.1	30.6

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Source	Source type	L'w	Lw	l or A	Kl	KT	Ko	S	Adiv	Agr	Abar	Aatm	Amisc	ADI	dLrefl	Ls	dLw 15m,D	dLw 15m,E	dLw 15m,N	Leq 15m,D	Leq 15m,E	Leq 15m,N
		dB(A)	dB(A)	m,m²	dB	dB	dB	m	dB	dB	dB	dB	dB	dB	dB	dB(A)	dB	dB	dB	dB(A)	dB(A)	dB(A)
Receiver 15A Village Boulevard Fl F 6 Dir SE Leq 15m,D 42 dB(A) Leq 15m,E 40 dB(A) Leq 15m,N 36 dB(A)																						
Delivery truck loading	Point	92.0	92.0		5.0	0.0	0	61.25	-46.7	-0.4	0.0	-1.5		0.0	0.7	44.1	-20.8			28.3		
Internal Driveway North	Line	47.1	64.1	50.5	0.0	0.0	0	117.42	-52.4	-2.5	-3.6	-0.9		0.0	1.8	6.6	17.0	14.8	10.0	23.6	21.4	16.6
Internal Driveway South	Line	50.1	70.9	121.3	0.0	0.0	0	53.99	-45.6	-1.9	0.0	-0.4		0.0	0.5	23.5	17.0	14.8	10.0	40.5	38.3	33.5
Patron noise_L2 podium	Area	57.1	86.5	870.7	0.0	0.0	0	125.36	-53.0	0.0	-22.2	-0.4		0.0	6.8	17.7	0.0	0.0		17.7	17.7	
Patrons_rooftop	Area	56.6	81.5	307.3	0.0	0.0	0	109.42	-51.8	0.0	-18.2	-0.3		0.0	5.5	16.8	0.0	0.0		16.8	16.8	
Refuse truck	Point	92.0	92.0		5.0	0.0	0	155.31	-54.8	-0.5	-22.0	-1.9		0.0	16.9	29.6	-20.8			13.9		
Rooftop plant_B1	Area	65.4	89.3	242.1	0.0	5.0	0	82.79	-49.4	0.0	-23.2	-0.5		0.0	2.9	19.2	0.0	0.0	-1.5	24.2	24.2	22.6
Rooftop plant_B2	Area	67.1	89.3	166.4	0.0	5.0	0	55.23	-45.8	0.0	-18.2	-0.2		0.0	3.5	28.6	0.0	0.0	-1.5	33.6	33.6	32.0
Rooftop plant_B3	Area	67.0	89.3	167.2	0.0	5.0	0	113.36	-52.1	0.0	-19.5	-0.4		0.0	0.1	17.4	0.0	0.0	-1.5	22.4	22.4	20.9
Rooftop plant_B4	Area	69.9	89.3	86.3	0.0	5.0	0	191.35	-56.6	0.0	-17.8	-0.6		0.0	0.9	15.2	0.0	0.0	-1.5	20.2	20.2	18.6
Ground level carpark	PLot	56.4	91.9	3574.4	0.0	0.0	0	140.35	-53.9	-1.5	-17.6	-0.2		0.0	5.4	24.0	-4.2	-6.4	-11.0	19.8	17.6	13.0
Receiver 15B Village Boulevard Fl F 3 Dir SE Leq 15m,D 39 dB(A) Leq 15m,E 37 dB(A) Leq 15m,N 33 dB(A)																						
Delivery truck loading	Point	92.0	92.0		5.0	0.0	0	85.77	-49.7	-0.5	-20.2	-1.0		0.0	19.6	40.2	-20.8			24.4		
Internal Driveway North	Line	47.1	64.1	50.5	0.0	0.0	0	66.94	-47.5	-2.1	-1.4	-0.5		0.0	0.3	12.9	17.0	14.8	10.0	29.9	27.7	22.9
Internal Driveway South	Line	50.1	70.9	121.3	0.0	0.0	0	76.33	-48.6	-2.2	-4.7	-0.5		0.0	3.4	18.2	17.0	14.8	10.0	35.2	33.0	28.2
Patron noise_L2 podium	Area	57.1	86.5	870.7	0.0	0.0	0	92.79	-50.3	0.0	-7.0	-0.3		0.0	1.0	29.8	0.0	0.0		29.8	29.8	
Patrons_rooftop	Area	56.6	81.5	307.3	0.0	0.0	0	133.41	-53.5	0.0	-20.7	-0.4		0.0	0.6	7.5	0.0	0.0		7.5	7.5	
Refuse truck	Point	92.0	92.0		5.0	0.0	0	107.50	-51.6	-0.5	0.0	-2.3		0.0	2.0	39.6	-20.8			23.8		
Rooftop plant_B1	Area	65.4	89.3	242.1	0.0	5.0	0	112.15	-52.0	0.0	-22.5	-0.6		0.0	2.8	17.1	0.0	0.0	-1.5	22.1	22.1	20.5
Rooftop plant_B2	Area	67.1	89.3	166.4	0.0	5.0	0	55.39	-45.9	0.0	-19.6	-0.2		0.0	0.5	24.0	0.0	0.0	-1.5	29.0	29.0	27.5
Rooftop plant_B3	Area	67.0	89.3	167.2	0.0	5.0	0	72.92	-48.2	0.0	-23.6	-0.5		0.0	1.0	18.0	0.0	0.0	-1.5	23.0	23.0	21.5
Rooftop plant_B4	Area	69.9	89.3	86.3	0.0	5.0	0	156.18	-54.9	0.0	-23.9	-1.0		0.0	5.2	14.7	0.0	0.0	-1.5	19.7	19.7	18.2
Ground level carpark	PLot	56.4	91.9	3574.4	0.0	0.0	0	108.52	-51.7	-1.5	-6.6	-0.7		0.0	1.0	32.5	-4.2	-6.4	-11.0	28.3	26.1	21.5

1 Clarke Street, Southport
ISO9613 Calculation Method
Predicted Operational Noise Levels at Adjacent Uses From Activities at Proposed Development
Environmental Protection (Noise) Policy 2019 - Background Creep

Source	Source type	L'w	Lw	l or A	Kl	KT	Ko	S	Adiv	Agr	Abar	Aatm	Amisc	ADI	dLrefl	Ls	dLw 15m,D	dLw 15m,E	dLw 15m,N	Leq 15m,D	Leq 15m,E	Leq 15m,N
		dB(A)	dB(A)	m,m²	dB	dB	dB	m	dB	dB	dB	dB	dB	dB	dB	dB(A)	dB	dB	dB	dB(A)	dB(A)	dB(A)
Receiver 15B Village Boulevard Fl F 7 Dir SE Leq 15m,D 40 dB(A) Leq 15m,E 39 dB(A) Leq 15m,N 36 dB(A)																						
Delivery truck loading	Point	92.0	92.0		5.0	0.0	0	88.14	-49.9	-0.5	-20.2	-1.0		0.0	19.4	39.9	-20.8			24.1		
Internal Driveway North	Line	47.1	64.1	50.5	0.0	0.0	0	70.52	-48.0	-2.1	-1.2	-0.5		0.0	0.2	12.6	17.0	14.8	10.0	29.6	27.4	22.6
Internal Driveway South	Line	50.1	70.9	121.3	0.0	0.0	0	79.33	-49.0	-2.2	-4.8	-0.5		0.0	3.6	18.0	17.0	14.8	10.0	35.0	32.8	28.0
Patron noise_L2 podium	Area	57.1	86.5	870.7	0.0	0.0	0	94.64	-50.5	0.0	-10.2	-0.3		0.0	2.6	28.1	0.0	0.0		28.1	28.1	
Patrons_rooftop	Area	56.6	81.5	307.3	0.0	0.0	0	131.48	-53.4	0.0	-9.0	-0.4		0.0	0.0	18.8	0.0	0.0		18.8	18.8	
Refuse truck	Point	92.0	92.0		5.0	0.0	0	109.40	-51.8	-0.5	0.0	-2.3		0.0	2.4	39.8	-20.8			24.0		
Rooftop plant_B1	Area	65.4	89.3	242.1	0.0	5.0	0	110.62	-51.9	0.0	-16.3	-0.4		0.0	1.1	21.9	0.0	0.0	-1.5	26.9	26.9	25.3
Rooftop plant_B2	Area	67.1	89.3	166.4	0.0	5.0	0	52.83	-45.5	0.0	-13.4	-0.2		0.0	0.2	30.3	0.0	0.0	-1.5	35.3	35.3	33.8
Rooftop plant_B3	Area	67.0	89.3	167.2	0.0	5.0	0	69.75	-47.9	0.0	-20.2	-0.3		0.0	0.7	21.6	0.0	0.0	-1.5	26.6	26.6	25.1
Rooftop plant_B4	Area	69.9	89.3	86.3	0.0	5.0	0	154.23	-54.8	0.0	-19.7	-0.5		0.0	0.6	14.9	0.0	0.0	-1.5	19.9	19.9	18.3
Ground level carpark	PLot	56.4	91.9	3574.4	0.0	0.0	0	110.67	-51.9	-1.5	-8.1	-0.7		0.0	1.1	31.0	-4.2	-6.4	-11.0	26.8	24.6	20.0
Receiver 2 Nexus Way Fl F 7 Dir SE Leq 15m,D 35 dB(A) Leq 15m,E 34 dB(A) Leq 15m,N 32 dB(A)																						
Delivery truck loading	Point	92.0	92.0		5.0	0.0	0	90.05	-50.1	-0.5	-23.6	-1.6		0.0	3.3	19.6	-20.8			3.8		
Internal Driveway North	Line	47.1	64.1	50.5	0.0	0.0	0	183.76	-56.3	-2.6	-5.0	-1.3		0.0	2.8	1.7	17.0	14.8	10.0	18.7	16.5	11.7
Internal Driveway South	Line	50.1	70.9	121.3	0.0	0.0	0	95.96	-50.6	-2.4	-8.6	-0.6		0.0	2.5	11.3	17.0	14.8	10.0	28.3	26.1	21.3
Patron noise_L2 podium	Area	57.1	86.5	870.7	0.0	0.0	0	183.04	-56.2	0.0	-21.4	-0.6		0.0	5.6	13.8	0.0	0.0		13.8	13.8	
Patrons_rooftop	Area	56.6	81.5	307.3	0.0	0.0	0	118.08	-52.4	0.0	-6.4	-0.4		0.0	0.3	22.5	0.0	0.0		22.5	22.5	
Refuse truck	Point	92.0	92.0		5.0	0.0	0	219.78	-57.8	-0.5	-23.1	-2.6		0.0	2.3	10.2	-20.8			-5.6		
Rooftop plant_B1	Area	65.4	89.3	242.1	0.0	5.0	0	94.26	-50.5	0.0	-15.9	-0.4		0.0	2.1	24.7	0.0	0.0	-1.5	29.7	29.7	28.1
Rooftop plant_B2	Area	67.1	89.3	166.4	0.0	5.0	0	109.44	-51.8	0.0	-13.4	-0.4		0.0	0.8	24.5	0.0	0.0	-1.5	29.5	29.5	28.0
Rooftop plant_B3	Area	67.0	89.3	167.2	0.0	5.0	0	176.43	-55.9	0.0	-16.0	-0.5		0.0	0.0	16.8	0.0	0.0	-1.5	21.8	21.8	20.2
Rooftop plant_B4	Area	69.9	89.3	86.3	0.0	5.0	0	246.62	-58.8	0.0	-18.3	-0.8		0.0	0.5	11.9	0.0	0.0	-1.5	16.9	16.9	15.3
Ground level carpark	PLot	56.4	91.9	3574.4	0.0	0.0	0	196.06	-56.8	-1.7	-16.1	-0.3		0.0	3.9	20.9	-4.2	-6.4	-11.0	16.7	14.5	9.9

1 Clarke Street, Southport
Predicted Noise Levels at Adjacent Uses
Night-time Noise Assessment (10pm to 7am)

Receiver	Location	Dir	Lmax dB(A)
1 Perkins Lane	GF	SE	30
2 Nexus Way	GF	SE	14
	F 1		15
	F 2		15
	F 3		16
	F 4		16
	F 5		16
	F 6		16
	F 7		16
15 Clarke Street	GF	S	34
	F 1		37
	F 2		37
	F 3		39
	F 4		39
	F 5		41
	F 6		42
	F 7		42
15A Village Boulevard	GF	SE	23
	F 1		25
	F 2		26
	F 3		26
	F 4		23
	F 5		22
	F 6		21
	F 7		24
15B Village Boulevard	GF	SE	23
	F 1		22
	F 2		21
	F 3		19
	F 4		18
	F 5		18
	F 6		18
	F 7		18

Appendix I – Operational Noise Contours

ATP CONSULTING ENGINEERS

ATP240541

Proposed Development
1 Clarke Street, Southport

Noise Levels Associated with Proposed Development

Third Floor
(10.2m AGL)

Operational noise level
$L_{eq,adj,1hr}$ Day dB(A)

	<= 38
38 <	<= 41
41 <	<= 44
44 <	<= 47
47 <	<= 50
50 <	<= 53
53 <	<= 56
56 <	<= 59
59 <	<= 62
62 <	<= 65
65 <	<= 68
68 <	<= 71
71 <	

Legend

- Adjacent building
- Noise source (area)
- Noise source (parking lot)
- Noise source (point)
- Point receiver
- Main building
- Road surface
- Line
- Noise source (line)

SCALE @ A4 1:1150

0 5 10 20 30 40 50 m

N

Grid Spacing: 5m
Project Engineer: Bojan Todorovski
Created: 26/07/2024
Processed with SoundPLAN 8.2

ATP CONSULTING ENGINEERS

ATP240541

Proposed Residential Development
1 Clarke Street, Southport

Noise Levels Associated with Proposed Development

Third Floor
(10.2m AGL)

Operational noise level
$L_{eq,adj,1hr}$ Evening dB(A)

	<= 38
38 <	<= 41
41 <	<= 44
44 <	<= 47
47 <	<= 50
50 <	<= 53
53 <	<= 56
56 <	<= 59
59 <	<= 62
62 <	<= 65
65 <	<= 68
68 <	<= 71
71 <	

Legend

- Adjacent building
- Noise source (area)
- Noise source (parking lot)
- Noise source (point)
- Point receiver
- Main building
- Road surface
- Line
- Noise source (line)
- Noise barrier fence

SCALE @ A4 1:1150

0 5 10 20 30 40 50 m

N

Grid Spacing: 5m
Project Engineer: Bojan Todorovski
Created: 26/07/2024
Processed with SoundPLAN 8.2

ATP CONSULTING ENGINEERS

ATP240541

Proposed Residential Development
1 Clarke Street, Southport

Noise Levels Associated with Proposed Development

Third Floor
(10.2m AGL)

Operational noise level
$L_{eq,adj,1hr}$ Night dB(A)

	<= 38
38 <	<= 41
41 <	<= 44
44 <	<= 47
47 <	<= 50
50 <	<= 53
53 <	<= 56
56 <	<= 59
59 <	<= 62
62 <	<= 65
65 <	<= 68
68 <	<= 71
71 <	

Legend

- Adjacent building
- Noise source (area)
- Noise source (parking lot)
- Noise source (point)
- Point receiver
- Main building
- Road surface
- Line
- Noise source (line)
- Noise barrier fence

SCALE @ A4 1:1150

0 5 10 20 30 40 50 m

N

Grid Spacing: 5m
Project Engineer: Bojan Todorovski
Created: 26/07/2024
Processed with SoundPLAN 8.2

Appendix J – Pliteq GenieMat FIT Brochure

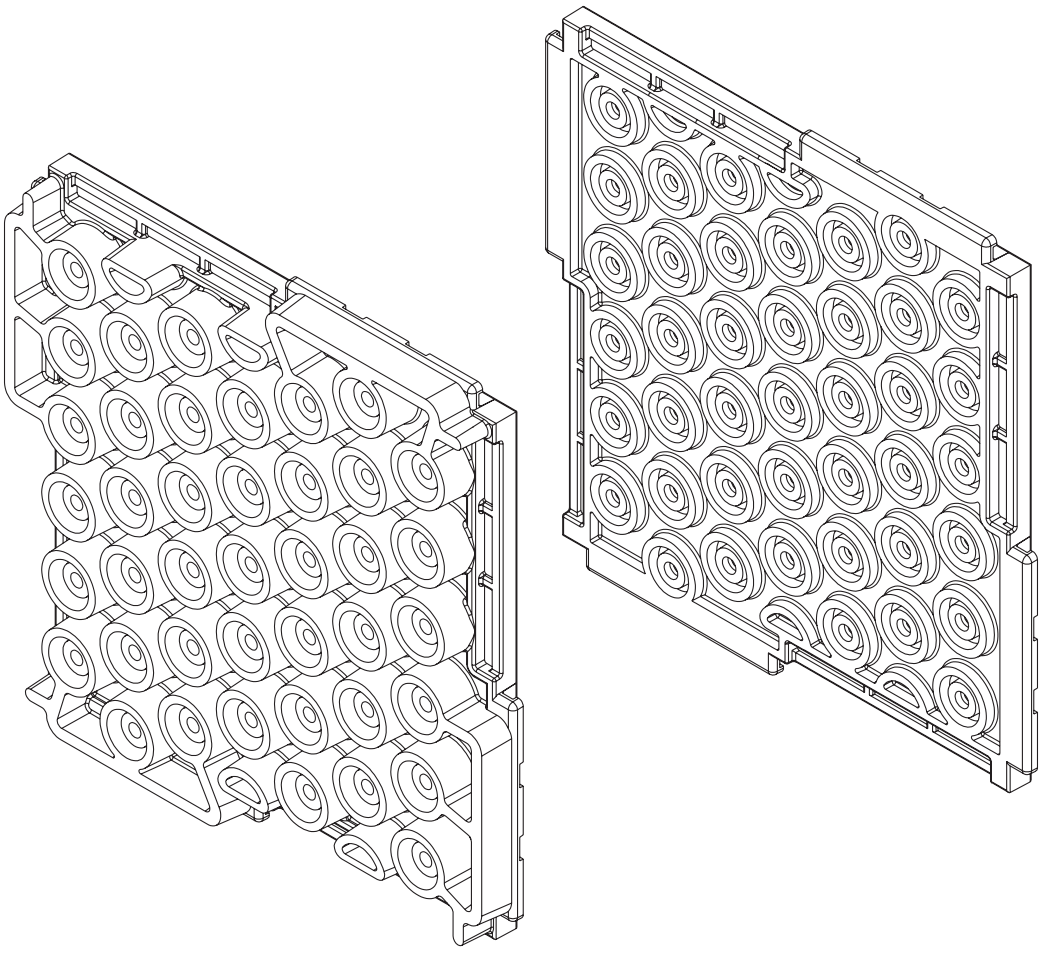
PLITEQ®

It's not magic, it's engineering.®

Impact Sound Control

GenieMat® FIT

For Weight Drop Impact Insulation



Patent Pending

GenieMat® FIT

All-in-one fitness flooring

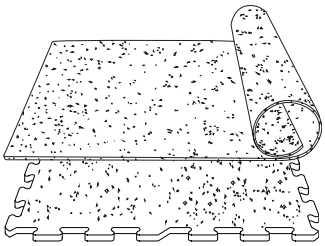
PRODUCT FEATURES

GenieMat FIT is an all-in-one fitness floor made from recycled rubber, engineered to reduce structure-borne sound and vibration transmission in concrete, wood frame and metal deck construction.

GenieMat FIT floors dramatically reduce low frequency impact noise in free weight areas, under cardio equipment and in fitness studios.

	GenieMat FIT08		GenieMat FIT30	GenieMat FIT70
Weight/sf	1.7 - 2.2 lb (0.8 - 1.0 kg)		5.2 lb (2.3 kg)	9.2 lb (4.2 kg)
Thickness	5/16" (8 mm)		1 1/4" (30 mm)	2 3/4" (70 mm)
Installed Dimension	48" x 25' (1220 mm x 7620 mm)	23 1/8" x 23 1/8" (587 mm x 587 mm)	23 7/8" x 23 7/8" (607 mm x 607 mm)	23 7/8" x 23 7/8" (607 mm x 607 mm)
Product Type	Roll	Puzzle	Interlocking Tile	Interlocking Tile

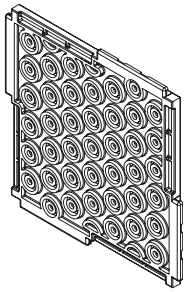
All listed dimensions are nominal.
GenieMat FIT30 and **GenieMat FIT70** have a product and installed dimension tolerance of +/- 1/8".



GenieMat® FIT08

Applications

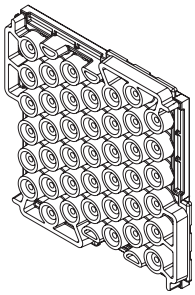
- Entryways/corridors
- Group fitness areas
- Locker rooms
- Spinning studios



GenieMat FIT30

Applications

- Cardio studios
- Personal training areas
- Machine areas



GenieMat FIT70

Applications

- High impact studios
- Free weight/dumbbell areas

ENGINEERED FOR PERFORMANCE

GenieMat® FIT DESIGN CRITERIA

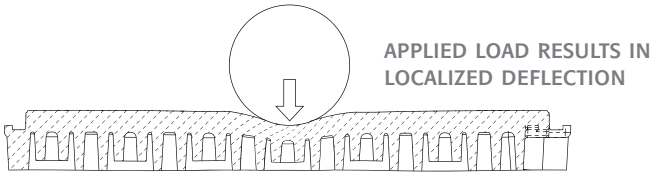
SIGNIFICANTLY REDUCES STRUCTURE-BORNE VIBRATION

- Low dynamic stiffness for improved low frequency response
- Engineered dual cylinder pedestals reduce vibration transmission
- Decreased impact force exposure level as measured using heavy/hard impact sources

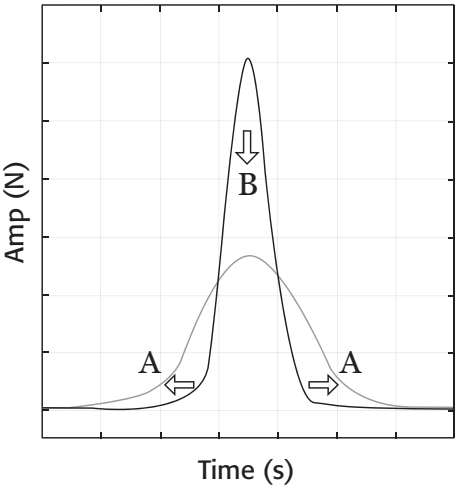
SEAMLESS, INTERLOCKING FIT

- Tiles are installed in compression to have a seamless aesthetic and eliminate seam separation over time
- Seam compression of 59 lbf/in (10.3 N/mm)

DESIGN OBJECTIVES OF A LOCALLY REACTIVE TILE



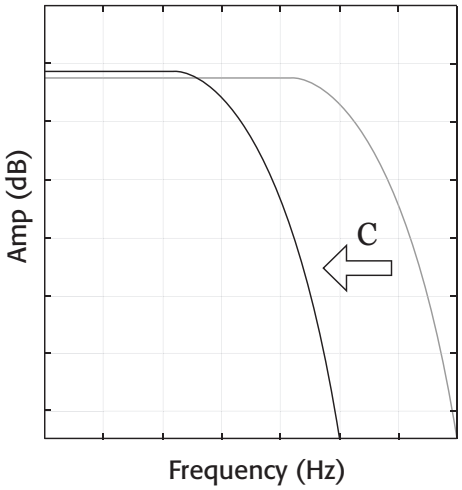
TIME DOMAIN FORCE PULSE



A. Extending contact time improves lower frequency attenuation

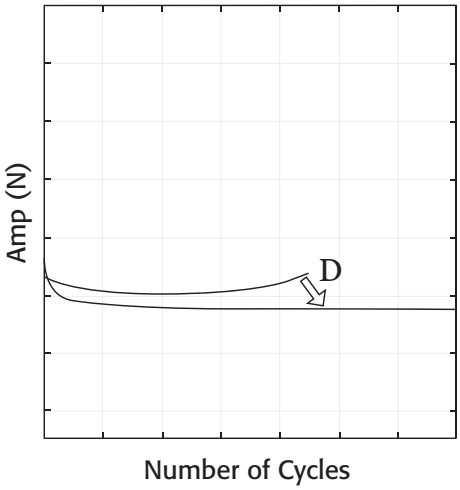
B. Reducing peak force value reduces overall sound pressure level

FREQUENCY DOMAIN FORCE PULSE



C. Reducing 3 dB down point frequency improves lower frequency attenuation

DURABILITY

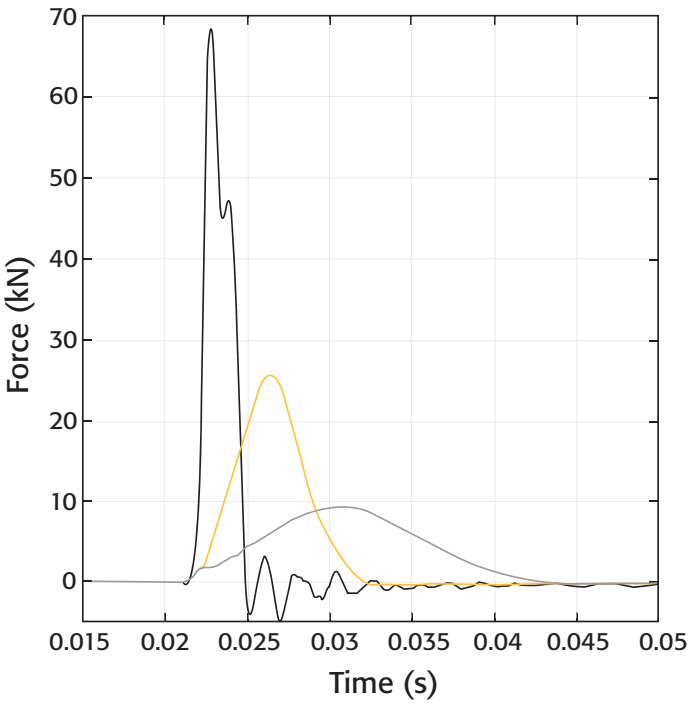


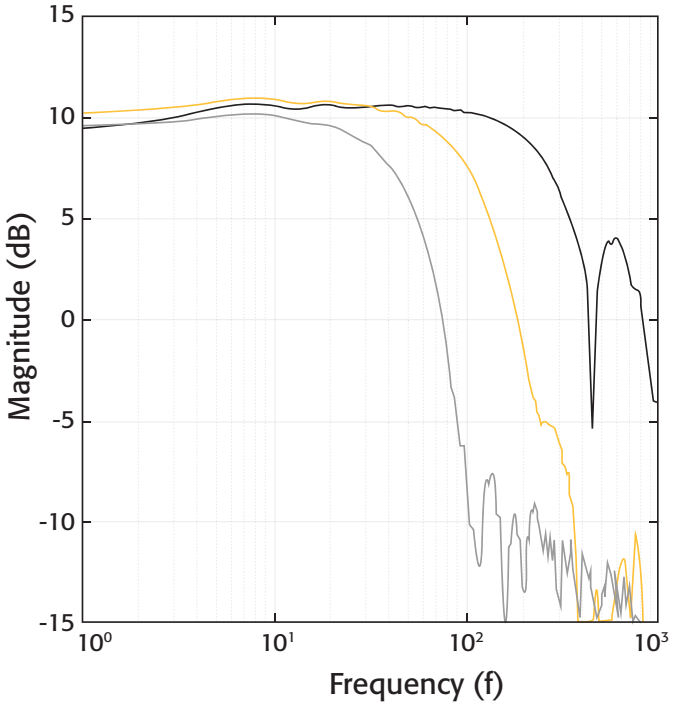
D. Flattening out durability curve equates to improved product lifetime

- Plot of peak force values taken from repeated force pulse measurements

FORCE PULSE MEASUREMENTS OF GENIEMAT® FIT SYSTEMS

- Can be used to predict in-situ performance. Contact **Pliteq** for *Internoise 2018* paper and methodology





GenieMat FIT08
GenieMat FIT30
GenieMat FIT70

GenieMat FIT08
GenieMat FIT30
GenieMat FIT70

ENGINEERING DESIGN CHARACTERISTICS

TEST RESULTS				
TEST DESCRIPTION	STANDARD REFERENCE	**GenieMat FIT08**	**GenieMat FIT30**	**GenieMat FIT70**
Slip Resistance	ASTM D2047	0.90	0.81	0.81
Tensile Strength	ASTM D412	>300 psi	107 psi	92 psi
CHPS Section 01350	ASTM D5116	Pass	Pass	Pass
Chemical Resistance	ASTM F925	No Change	No Change	No Change
Impact Force Exposure Level	ISO 10140 - Part 5	43 dB	41 dB	39 dB
Critical Radiant Flux	ASTM E648	Class I /Class II*	Class I /Class II*	Class I /Class II*

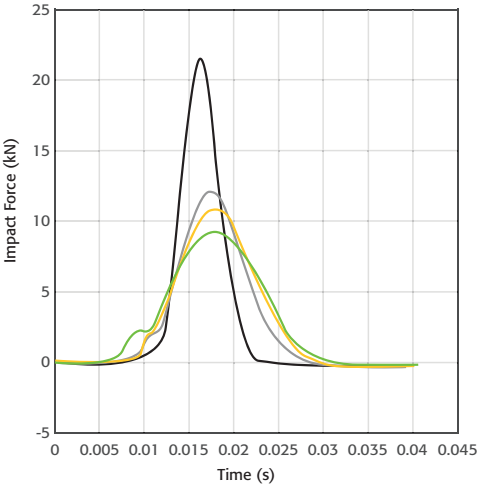
*Class I available upon request.

GenieMat® xFIT

GenieMat xFIT TESTING

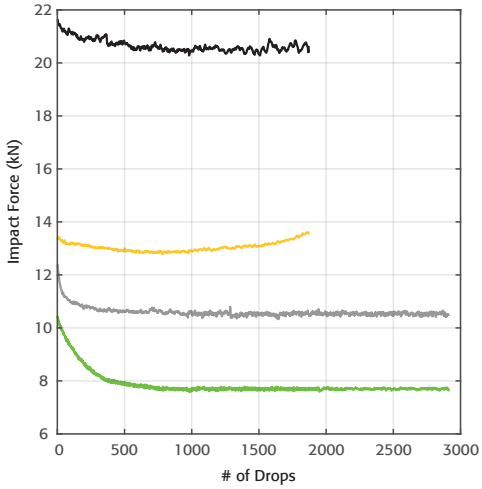
US Patent: US 10,676,920 B2

FORCE PULSE



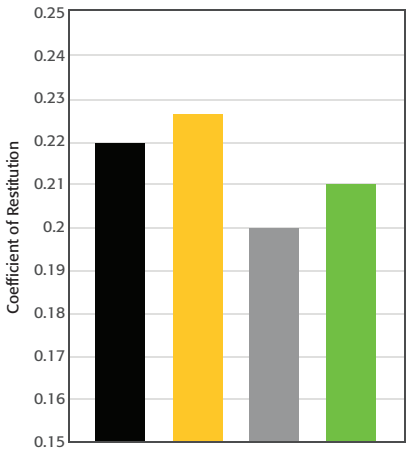
- GenieMat FIT30
- GenieMat FIT70
- GenieMat xFIT70
- GenieMat xFIT100

FATIGUE TESTING



- GenieMat FIT30
- GenieMat FIT70
- GenieMat xFIT70
- GenieMat xFIT100

REBOUND PLOTS

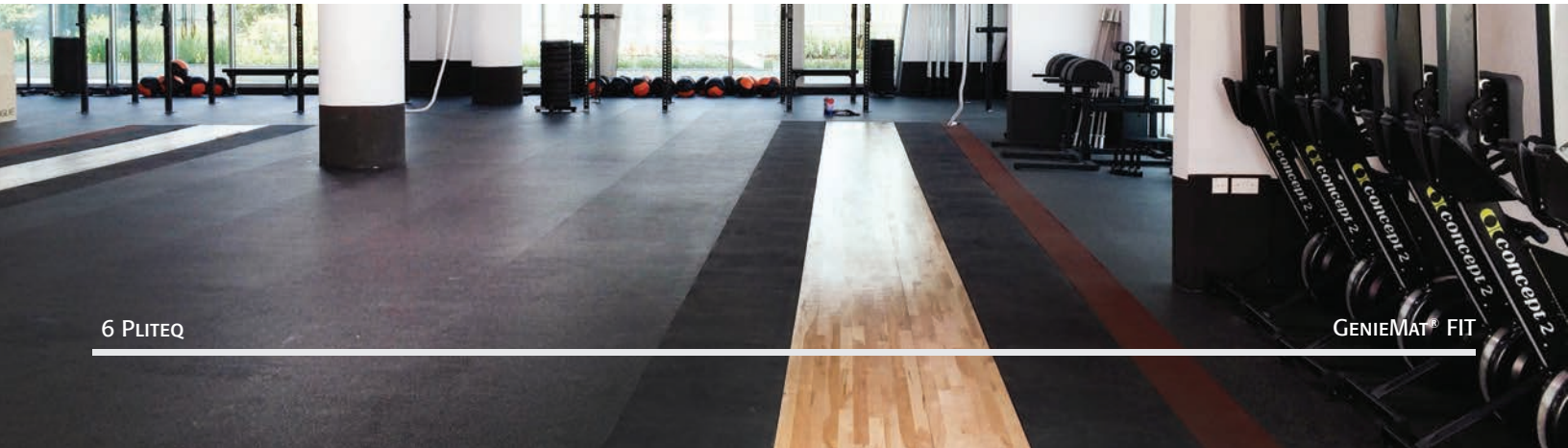


- GenieMat FIT30
- GenieMat FIT70
- GenieMat xFIT70
- GenieMat xFIT100

ENGINEERING DESIGN CHARACTERISTICS

	GenieMat xFIT70	GenieMat xFIT100
Weight/sf	9.3 lb/sf (4.2 kg/sf)	11.6 lb/sf (5.3 kg/sf)
Thickness	2 3/4" (70 mm)	4" (100 mm)
Product Finish	Interlocking Tile	Interlocking Tile

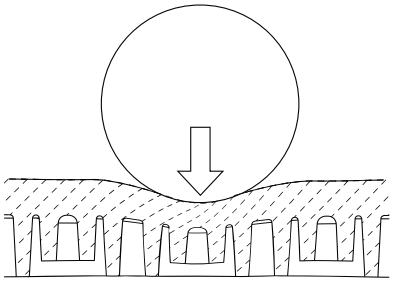
PLATFORMS



HYBRID SYSTEM
WITH **GenieMat® FIT** AND **GenieMat FF**

LOCALLY REACTIVE

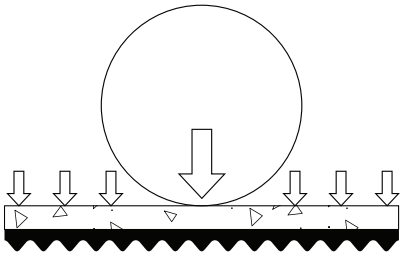
APPLIED LOAD RESULTS IN LOCALIZED DEFLECTION



RESILIENT TILE

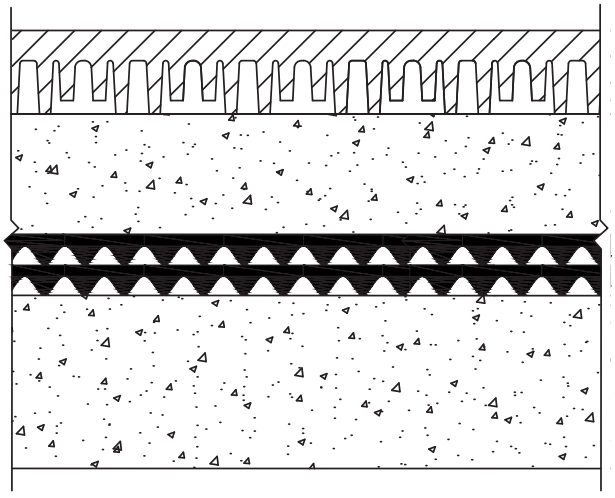
RESONANTLY REACTIVE

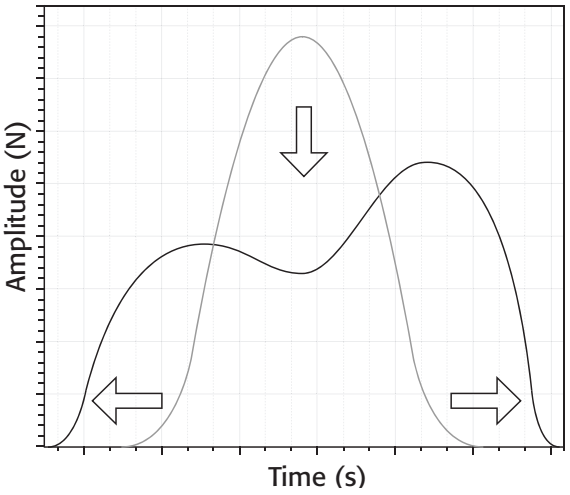
APPLIED LOAD RESULTS IN DISTRIBUTED DEFLECTION



RIGID LAYER & RESILIENT UNDERLAYMENT

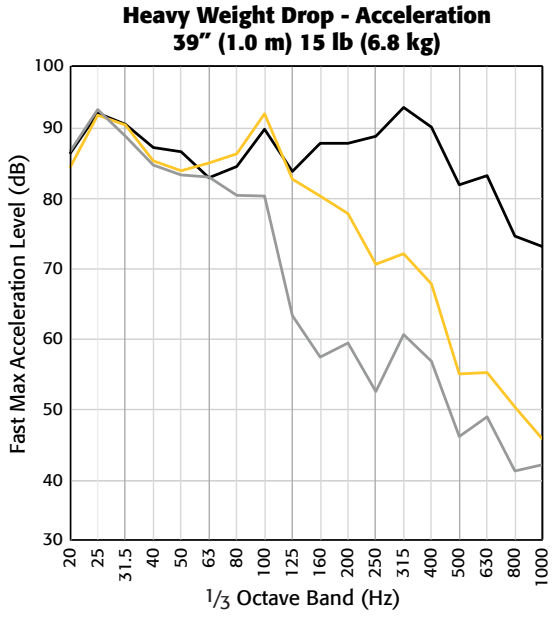
LOCALLY REACTIVE ABOVE RESONANTLY REACTIVE CREATES A HYBRID SYSTEM



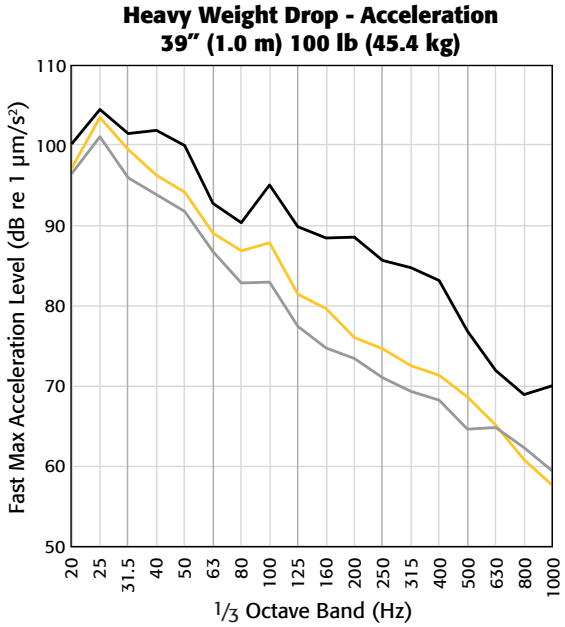


- Helps reduce impact force amplitude and increase force impulse duration
- Ideal for rhythmic excitation such as dance studios and treadmill bays

TILE DATA

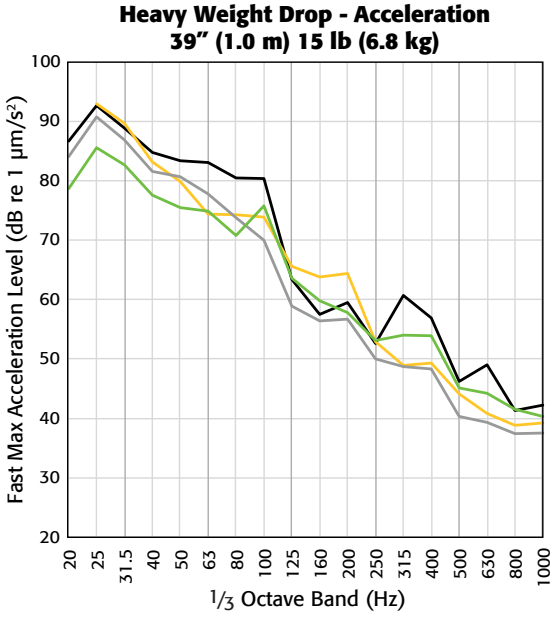


- E5600.12 **GenieMat FIT08**
- E5600.14 **GenieMat FIT30**
- E5600.15 **GenieMat FIT70**

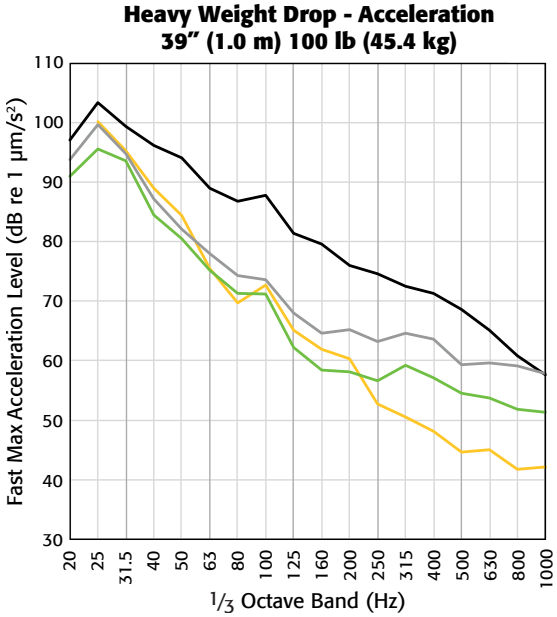


- E5600.15 **GenieMat FIT70**
- E5600.16 **GenieMat xFIT70**
- E5600.17 **GenieMat xFIT100**

PLYWOOD HYBRID



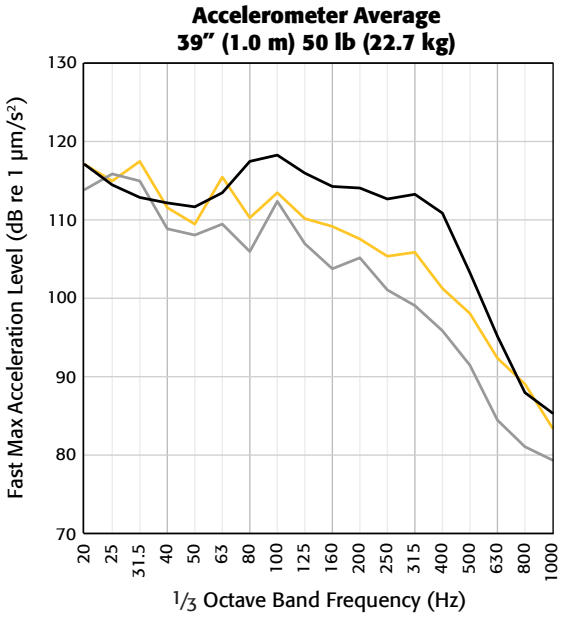
- E5600.15 **GenieMat FIT70**
- E5600.26 **GenieMat FIT70**, 1/2" Cement Board, **GenieMat FF25**
- E5600.29 **GenieMat FIT70**, 3/4" Plywood, **GenieMat FF70**
- E5600.31 **GenieMat FIT70**, 3/4" Plywood, **GenieMat FF70LDM**



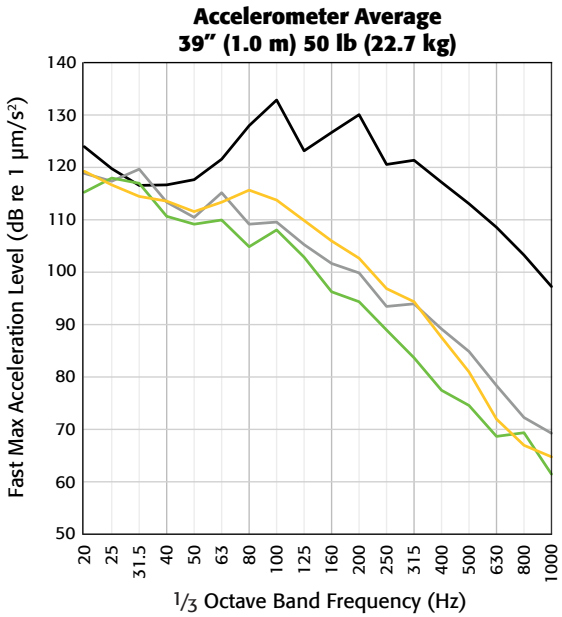
- E5600.16 **GenieMat xFIT70**
- E5600.27 **GenieMat xFIT70**, 1/2" Cement Board, **GenieMat FF25**
- E5600.30 **GenieMat xFIT70**, 3/4" Plywood, **GenieMat FF70**
- E5600.32 **GenieMat xFIT70**, 3/4" Plywood, **GenieMat FF70LDM**

NOTE: FCS - Floating Concrete Slab

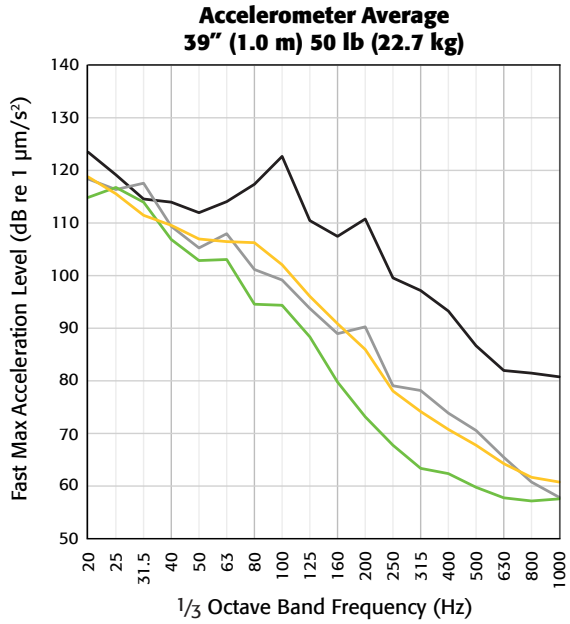
CONCRETE HYBRID



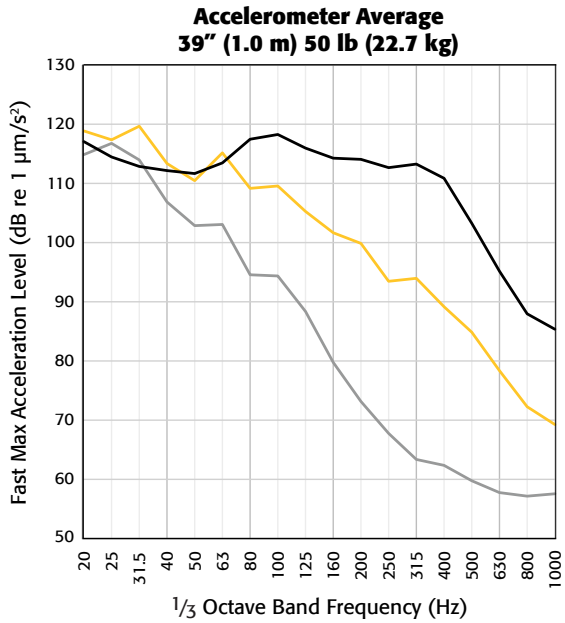
- A1-008867-01F **GenieMat FIT08**, 4" FCS, **GenieMat FF50**
- A1-008867-04F **GenieMat FIT08**, 4" FCS, **GenieMat FF70**
- A1-008867-05F **GenieMat FIT08**, 4" FCS, **GenieMat FF70LDM**



- A1-008867-00F **GenieMat FIT30**
- A1-008867-01F **GenieMat FIT30**, 4" FCS, **GenieMat FF50**
- A1-008867-04F **GenieMat FIT30**, 4" FCS, **GenieMat FF70**
- A1-008867-05F **GenieMat FIT30**, 4" FCS, **GenieMat FF70LDM**



- A1-008867-00F **GenieMat FIT70**
- A1-008867-01F **GenieMat FIT70**, 4" FCS, **GenieMat FF50**
- A1-008867-04F **GenieMat FIT70**, 4" FCS, **GenieMat FF70**
- A1-008867-05F **GenieMat FIT70**, 4" FCS, **GenieMat FF70LDM**

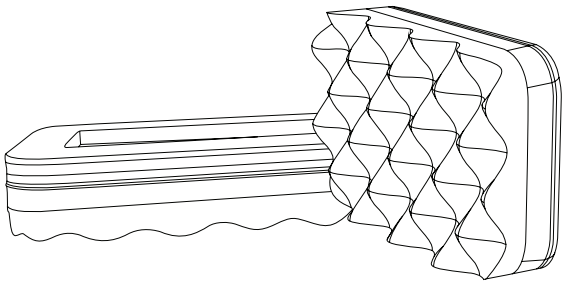


- A1-008867-01F **GenieMat FIT08**, 4" FCS, **GenieMat FF50**
- A1-008867-04F **GenieMat FIT30**, 4" FCS, **GenieMat FF70**
- A1-008867-05F **GenieMat FIT70**, 4" FCS, **GenieMat FF70LDM**

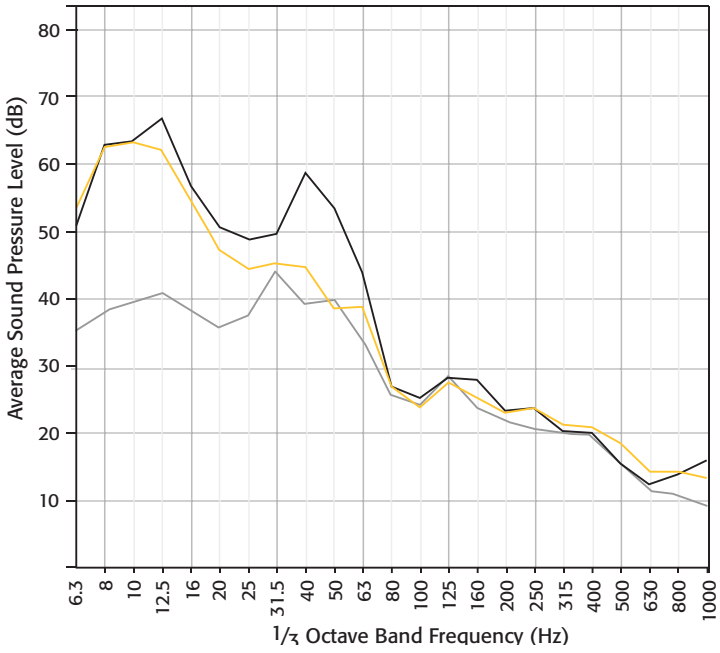
GenieMat® TMIP
TREADMILL ISOLATION PADS

U.S Patent No.: 8,113,495
Canadian Patent No.: 2,505,938

GenieMat TMIP are inherently non-slip. Custom sizes are available for other special applications.



STANDARD THICKNESS	2″
STANDARD SIZES	5″ x 18″ – Front Mounts 5″ x 7″ – Rear Mounts
STATIC DEFLECTION	Lightweight case: 100 lb user 1.46 psi deflection 1 to 2 cm Heavyweight case: 300 lb user 2.76 psi deflection 2 to 3 cm



ENGINEERED TO REDUCE LOW FREQUENCY IMPACT

Field Measured Average Sound Pressure Levels

- Running with 1 layer of 3/4″ rubber
- Running with **GenieMat® TMIP** on 1 layer of 3/4″ rubber
- Ambient sound level, no running

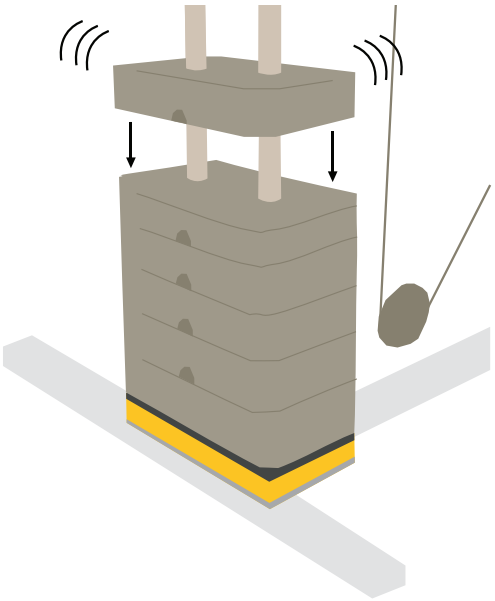
GenieMat® WSI

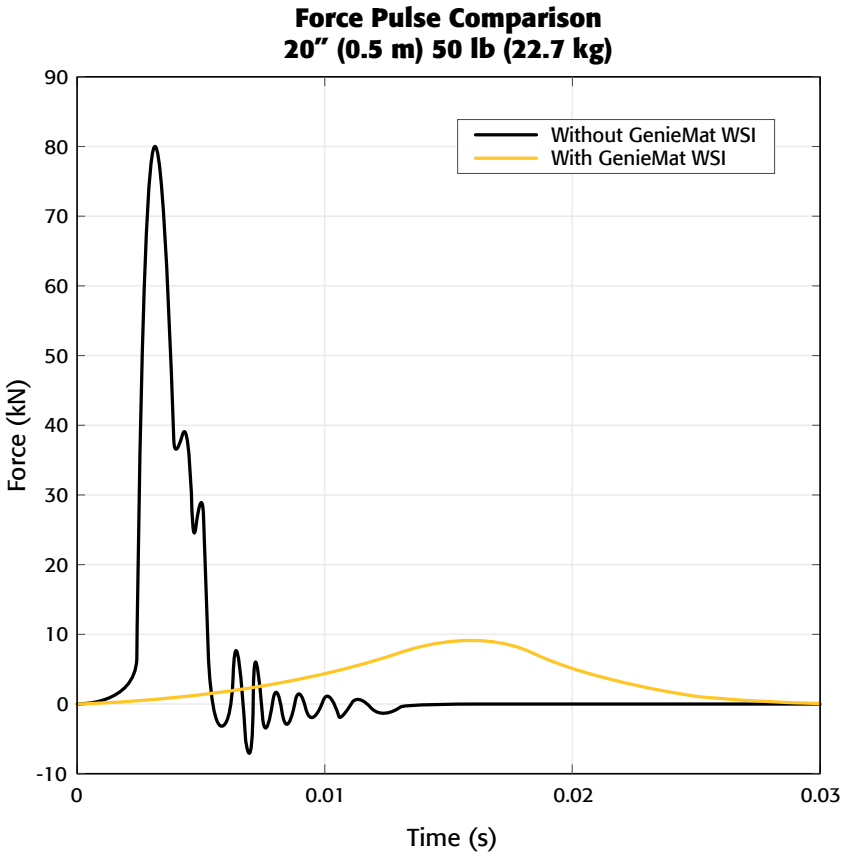
WEIGHT STACK ISOLATORS

Patent pending

GenieMat WSI isolates impact noise from selectorized machines.

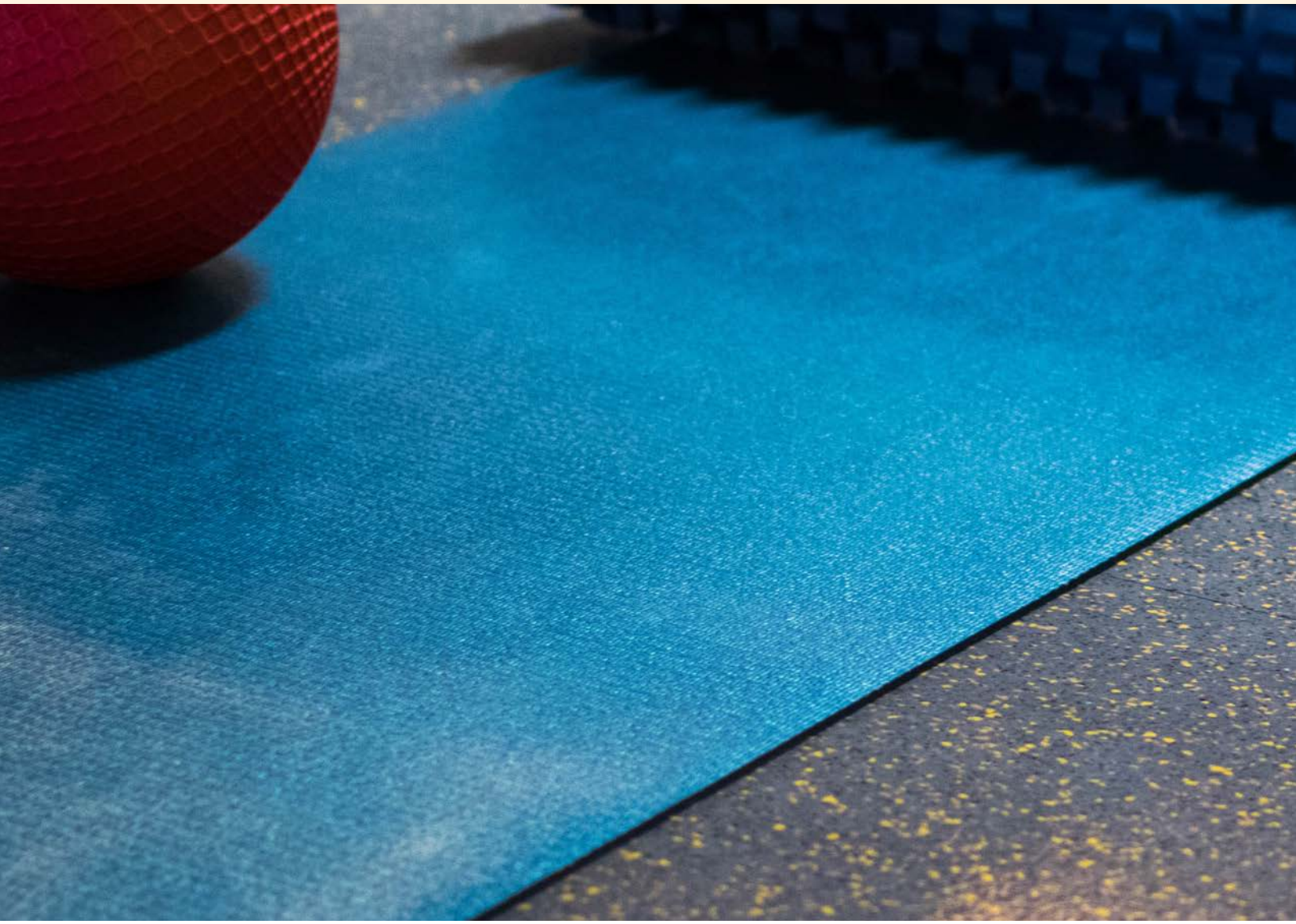
- Reduce impact noise at the source
- Customized size to fit every weight stack
- Installation does not require machine disassembly





GenieMat® FIT ACCESSORIES

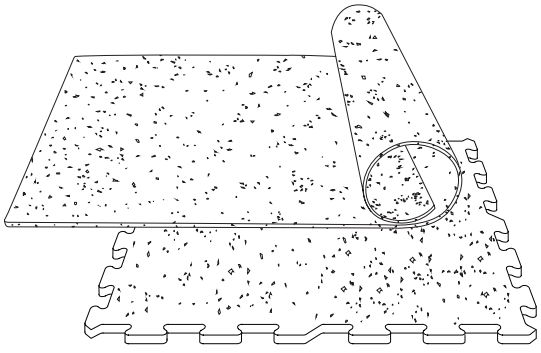
- Customized on site to accomodate any threshold
- Accessories for all installation types
- Corner transitions created in the field
- **GenieMat FASHM** adhesive
- ADA compliant ramps available
- Load plates available to accomodate high point loads



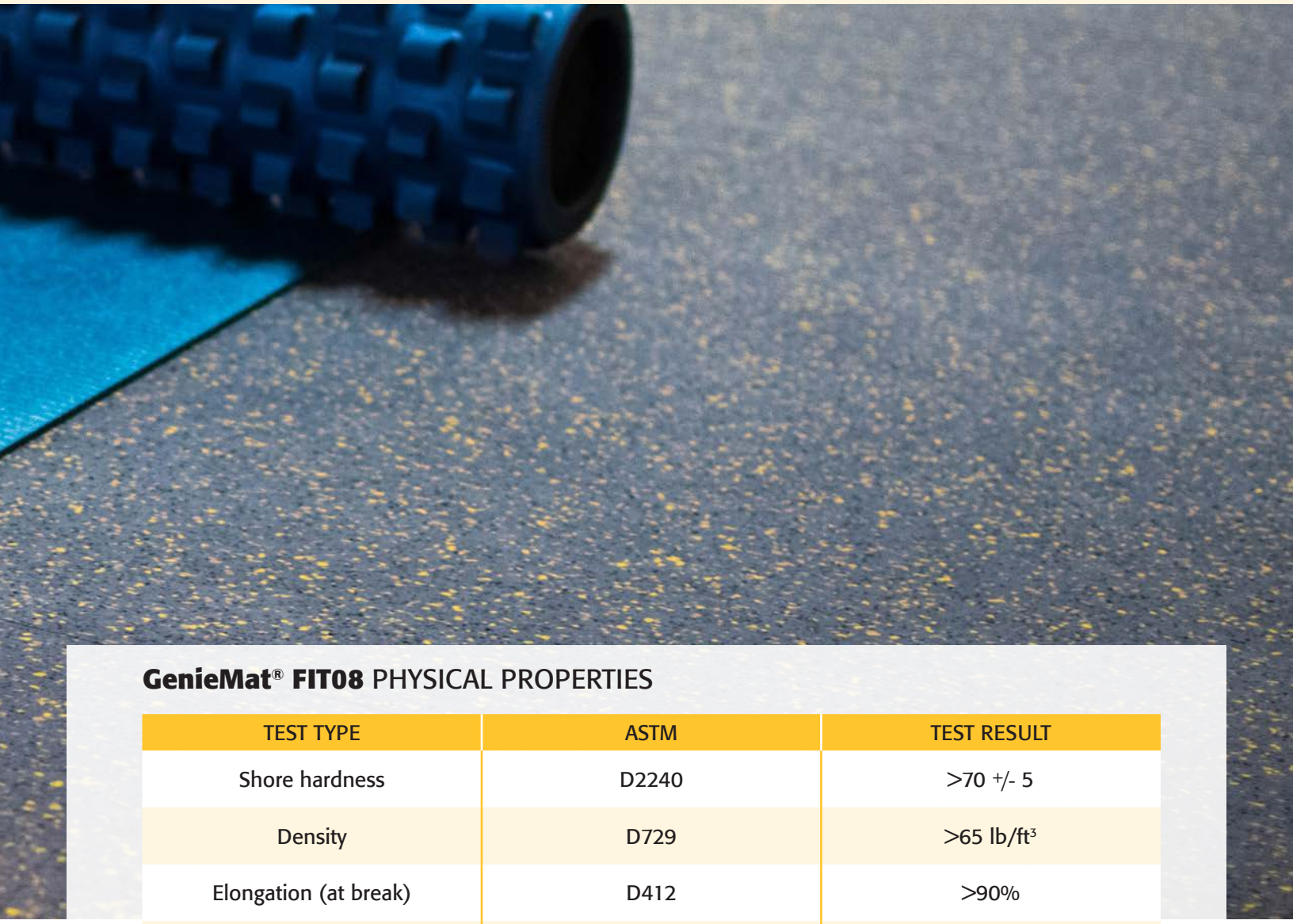
GenieMat® FIT08

Fitness Flooring Rolls & Puzzle Tiles

A protective, wear-resistant finished floor used in entryways, corridors, group fitness areas, locker rooms and spinning studios.



Our standard, the **GenieMat® FIT08** (8 mm) is also available in 6mm and 10mm nominal thicknesses. Custom orders can be made for any other thickness and combination of EPDM colors. See page 15 for EPDM color options.



GenieMat® FIT08 PHYSICAL PROPERTIES

TEST TYPE	ASTM	TEST RESULT
Shore hardness	D2240	>70 +/- 5
Density	D729	>65 lb/ft^3
Elongation (at break)	D412	>90%
Tensile strength	D412	>300 psi
Taber abrasion	C501	0.45
Critical radiant flux	D395	Class I/II*
Flame spread	E84	135**
Smoke density	E84	<450**
Compression set	ISO 815	5% @ 72 Hrs
Coefficient of friction	D1894-95	Wet 1.20 / Dry 1.20
Tear	D624	5.71 lbf/in
Chemical resistance	F925-02	No Change

* Class I available upon request.
** Same as carpet and wood.

COLOR SELECTION

GenieMat® FIT30 & GenieMat FIT70

FUSION SERIES

GenieMat FIT tiles are manufactured by fusing a durable wear layer to a recycled rubber crumb base. This provides superior acoustic performance in combination with excellent wear and grip.

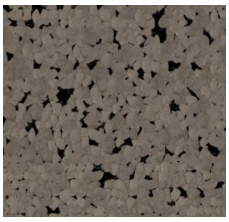
STANDARD

BLACK

3 ALTERNATIVE COLORS:

OCEAN BLUE

SILVER GRAY



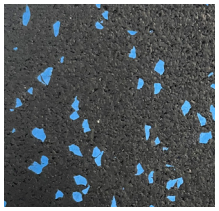
MID GRAY

GenieMat® FIT08

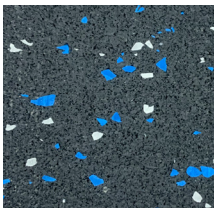
EXPRESS COLORS

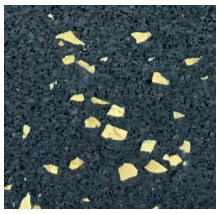
Available in 8 express colors in roll and puzzle tile format. For more customizable flooring color options, see below for our selection of EPDM colors.


BLACK

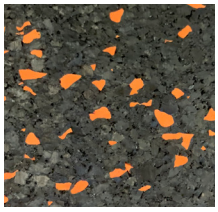

OCEAN BLUE

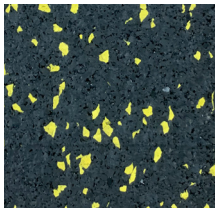

SILVER GRAY


OBL + SGY


CORK


LAVA


ORANGE

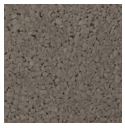

LEMON

EPDM COLORS FOR ANY GENIEMAT® FIT FLOORING

Choose from our selection of 19 colors and combine them together to create a custom flooring blend for your project. (Minimums Apply)


Black Crumb Rubber


Coal


Mid Gray

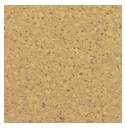

Silver Gray


Ivory


Mid Brown


Light Brown


Khaki


Cork


Lemon

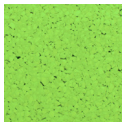

Lava

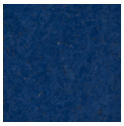

Bright Red

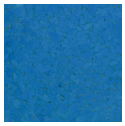

Orange

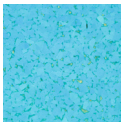

Forest Green


Eco Green


Lime Green


Royal Blue


Ocean Blue


Baby Blue

Product colors may vary.
*Images are for representation purpose only. Other combinations can be customized.

TEST RESULTS

TEST RESULTS				
TEST REPORT NUMBER	FINISH FLOOR	SUBFLOOR SYSTEM*	15 lb HARD IMPACT SOURCE (SPL OF COMBINED 63 Hz OCTAVE BAND IN dB)	100 lb HARD IMPACT SOURCE (SPL OF COMBINED 63 Hz OCTAVE BAND IN dB)
E5600.11	Bare	None		
E5600.12	**GenieMat® FIT08**	None		
E5600.14	**GenieMat FIT30**	None	84	95
E5600.15	**GenieMat FIT70**	None	81	84
E5600.16	**GenieMat xFIT70**	None	81	88
E5600.17	**GenieMat xFIT100**	None	80	80
E5600.26	**GenieMat FIT70**	½" Cement Board, **GenieMat FF25**	80	76
E5600.27	**GenieMat xFIT70**	½" Cement Board, **GenieMat FF25**	79	82
E5600.28	**GenieMat FIT30**	¾" Plywood, **GenieMat FF70**	82	86
E5600.29	**GenieMat FIT70**	¾" Plywood, **GenieMat FF70**	80	76
E5600.30	**GenieMat xFIT70**	¾" Plywood, **GenieMat FF70**	78	81
E5600.31	**GenieMat FIT70**	¾" Plywood, **GenieMat FF70LDM**	74	72
E5600.32	**GenieMat xFIT70**	¾" Plywood, **GenieMat FF70LDM**	72	75
E5600.33	Bare	¾" Plywood on 2" x 4" Sleepers, Mason MFS Springs	74	89
E5600.34	**GenieMat FIT70**	¾" Plywood on 2" x 4" Sleepers, Mason MFS Springs	72	80
E5600.35	**GenieMat xFIT70**	¾" Plywood on 2" x 4" Sleepers, Mason MFS Springs	69	82

* All assemblies on 6" concrete slab with no ceiling.

Contact Us

For Your Project Specific Questions
T. 416.449.0049 | **E.** info@pliteq.com

03.22

www.pliteq.com