

Noise Impact Assessment

25 Tall Oak Drive,
Cotswold Hills

CLIENT: RUBY DEVELOPMENTS PTY LTD

PROJECT NO.	J002901
STATUS	FINAL
DATE	8/06/2026
VERSION	5

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01/07/2026
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1 Introduction

Range Environmental Consultants Pty Ltd (Range Environmental) was engaged by Ruby Developments Pty Ltd (hereafter 'the client') to conduct a noise impact assessment for a proposed retirement facility at 25 Tall Oak Drive, Cotswold Hills. The proposed development will be located across the western land parcel comprising a land parcel formally described as Lot 1 SP330786 (hereafter 'the site') (Figure 1).

The purpose of this noise impact assessment was to address the following requirements:

- Potential noise impacts from operational noise sources from the proposed development at offsite sensitive noise receptors to address Performance Outcome 8 (PO8) and PO13 of the Environmental Standards Code of the Toowoomba Regional Planning Scheme (TRPS) 2012 (version 28).
- Road traffic noise from the Warrego Highway/Toowoomba Bypass (north) at the proposed development's residential units (indoors) to address PO40 of the State Development Assessment Provisions (SDAP) State Code 1: Development in a State Controlled Road Environment (version 3.6).



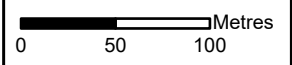
Figure 1 Site locality

Project: Noise
Impact Assessment

Client: Ruby
Developments Pty Ltd

Project No.: J002901

Compiled by: MJW Date: 25/05/2026
Approved by: LMT Date: 25/05/2026



Legend

- Cadastral
- Roads
- Site boundary
- Sewer pump station
- Sewer pump

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Source: Cadastral data sourced from DNRME (2025) and aerial imagery sourced from from NearMap (2026).



2 Project Description

2.1 Site Description

The site is located at 25 Tall Oak Drive, Cotswold Hills and will occur across the western lot of a land parcel formally described as Lot 1 SP330786. The site is zoned as Emerging Community under the TRPS.

Surrounding land zoning and land uses included:

- North: Community Facilities (Hermitage Road and Warrego Highway/Toowoomba Bypass) and Rural (rural residential dwellings and grazing land).
- South: Emerging Community (Essence Estate housing development) and Rural Residential (residential dwellings).
- East: Emerging Community (vacant land and a sewage pump station) and Rural Residential (residential dwellings).
- West: Rural (rural residential dwellings and grazing and cropping uses).

The key existing noise sources in the local area surrounding the site included road traffic noise from the Warrego Highway/Toowoomba Bypass (north) and Gowrie Junction Road (west), domestic noise from nearby residential houses (south), and operational noise from nearby agricultural land uses and the sewage pump station.

2.2 Proposed Development

The proposed development consists of the following key infrastructure which will be constructed over two (2) stages (Appendix B):

Stage 1

- 131 residential lots.
- Pickle ball court.
- 34 visitor carparks.

Stage 2

- 76 residential lots.
- Clubhouse (including indoor bowling, lawn bowls, library, cinema, craft room, music room, club room, games room, golf simulator, indoor lap pool, gym, balcony yoga area, sauna, salon, stage and dancefloor, indoor dining hall, outdoor seating area, lounge, commercial kitchen, entertainment bar, manager's office and workspace, consult room, meeting room, storerooms, and amenities).
- Workshop pavilion (including lounge/seating area, club room, workshop, and amenities).
- Tennis court.
- 27 visitor carparks.

2.3 Hours of Operation

The proposed hours of operation for the site are as follows:

- Clubhouse – 7:00am to 10:00pm.
- Workshop pavilion – 7:00am to 7:00pm.

- Outdoor sporting activities such as pickle ball and tennis – 7:00am to 6:00pm.

2.4 Noise Sources

2.4.1 Operational Noise Sources

Key noise sources from the proposed development considered in this assessment include:

- Breakout noise from the Clubhouse and Workshop Pavilion.
- Outdoor patrons in the communal areas.
- Air conditioning.
- Clubhouse mechanical plant (exhaust fans, refrigeration plant, etc.).
- Light vehicle movements.
- Heavy vehicle movements.
- Car door closures.

2.4.2 Reverse Amenity Noise Sources

Road traffic noise from the Warrego Highway/Toowoomba Bypass, which is located approximately 130 m north of the site, was included in this assessment as it has the potential to impact noise amenity at the proposed development.

2.5 Noise Sensitive Receptors

The nearest most potentially affected noise sensitive receptors are shown in Figure 2 and are described in Table 1.

Table 1 Noise sensitive receptors

Identification	Real Property Description	Street Address	Receptor Type
Receptor 1	Lot 131 A345	177 Gowrie Junction Road, Gowrie Junction	Residential dwelling
Receptor 2	Lot 134 A345	169 Gowrie Junction Road, Gowrie Junction	Residential dwelling
Receptors 3-8	For brevity, Receptor points 3-8 are representative of the existing residential dwellings within the Essence Estate housing development proximate to the point's location.		
Receptor 9	Lot 27 SP173986	8 Phoebe Court, Cotswold Hills	Residential dwelling
Receptor 10	Lot 28 SP173986	10 Phoebe Court, Cotswold Hills	Residential dwelling
Receptor 11	Lot 29 SP173986	12 Phoebe Court, Cotswold Hills	Residential dwelling

Figure 2 Noise sensitive receptors

Project: Noise
Impact Assessment

Client: Ruby
Developments Pty Ltd

Project No.: J002901

Compiled by: MJW Date: 4/06/2026
Approved by: LMT Date: 4/06/2026

0 60 120 Metres

Legend

- Roads
- ▭ Site boundary
- Logger location
- Sensitive receptors

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Source: Cadastral data sourced from DNRME (2026) and aerial imagery sourced from from NearMap (2026).



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Source: Esri, Vantor, Earthstar Geographics, and the GIS User Community

3 Ambient Noise Measurements

3.1 Noise Measurement Standard

The ambient noise survey was undertaken in accordance with Australian Standard *AS1055:2018 – Acoustics – Description and measurement of environmental noise* and the Department of the Environment, Tourism, Science and Innovation's (DETSI) Noise Measurement Manual 2020. Ambient noise levels were recorded from 17 March 2020 to 24 March 2020. The noise measurement method recorded total noise levels from all noise sources.

3.2 Noise Logger

A BSWA 309 sound level meter was used for the ambient noise survey. The instrument was calibrated before and after the logging session and was found to match the reference signal. The instrument and the calibrator hold current calibration certificates from a NATA certified calibration laboratory.

3.3 Noise Logger Location and Siting

The microphone of the noise logger was situated 1.4 m above ground level and in a free field position (Photograph 1). Figure 2 shows the location of the noise logger in relation to the sensitive receptors and the site boundary.



Photograph 1 View to the south of the noise logger in position

3.4 Instrument Settings

The following instrument settings were used for the ambient noise survey:

- 'A' frequency weighting.
- 'Fast' time weighting.
- 15-minute sample integration time.

3.5 External Noise Sources

Weather data was taken from the Toowoomba Airport (weather station ID: 041529). Overall weather conditions during the monitoring period were mostly suitable for noise monitoring. This was confirmed by field readings of wind speed and direction at logger deployment and collection.

However, as shown by the graphical noise survey data provided at Appendix C and the data presented at Table 2 below, the data was significantly affected by an unknown external noise source from approximately 7:30am on 23 March 2020 to 11:45am on 24 March 2020.

3.6 Ambient Noise Levels

3.6.1 Measured Ambient Noise Levels

Ambient noise survey data are presented graphically at Appendix C and average values are summarised in Table 2.

Table 2 Average ambient noise levels (based on Logger)

Time of Day	L _{Amax,15 min}	L _{A01,15 min}	L _{A10,15 min}	L _{Aeq,15 min}	L _{A90,15 min}
All data (10:00am 17/03/2020 to 11:45am 24/03/2020)					
Day (7am-6pm)	72	63	57	54	44
Evening (6pm-10pm)	66	60	55	52	46
Night (10pm-7am)	66	59	53	50	38
Affected data excluded (7:30am 23/3/2020 to 11:45am 24/3/2020)					
Day (7am-6pm)	67	58	51	48	39
Evening (6pm-10pm)	62	56	51	48	43
Night (10pm-7am)	62	55	49	46	35

The dominant noise sources surrounding the logger location included road traffic noise from the Warrego Highway/Toowoomba Bypass (north) and Gowrie Junction Road (west), domestic noise from nearby residential houses (south), and operational noise from nearby agricultural uses.

4 Noise Assessment Criteria

4.1 Operational Noise Sources

PO8 and PO13 of the Environmental Standards Code is presented below.

<p>PO₈ The generation of noise from the premises does not cause Environmental Harm or Nuisance to adjoining properties or other noise sensitive land uses.</p> <p>(a) Development:</p> <ul style="list-style-type: none"> (i) is located in an appropriate zone; (ii) proposes best practice design and construction materials (in relation to noise attenuation); and (iii) proposes operational practices that will minimise noise nuisance for adjoining sensitive land uses. 	<p>AO_{B.1} The development will achieve the following noise levels (when measured at the nearest sensitive receiver):</p> <ul style="list-style-type: none"> (a) Background (L_{90}) + 5dB(A) for variable noise between the hours of 7:00 am to 10:00 pm (measured at the facade of the sensitive land use); (b) Background (L_{90}) + 3dB(A) for variable noise between the hours of 10:00 pm and 7:00 am (measured within bedrooms assuming open windows); (c) Background (L_{90}) for continuous noise sources (measured at the facade of the sensitive land use between 7:00 am and 10:00 pm and within bedrooms assuming open windows from 10:00 pm – 7:00 am); and (d) maximum limit L_{Amax} 45dB(A) inside dwellings; and <p>The development will achieve the Acoustic Quality Objectives listed within the <i>Environmental Protection (Noise) Policy 2008</i>.</p> <p>HOWEVER</p> <p>AO_{B.2} Where a development is unable to meet noise levels specified in AO_{B.1} an acoustic assessment has been undertaken by a suitably qualified and skilled person which demonstrates that the development will not result in environmental nuisance at any existing or likely future residential premises (within a 10 year planning horizon).</p>
<p>PO₁₃ Air conditioning units, refrigeration units and any other form of mechanical ventilation or extraction systems do not adversely impact on the acoustic amenity of surrounding sensitive land uses.</p>	<p>AO_{13.1} Plant of this nature is not elevated, is acoustically shielded (if necessary) and will not be audible at adjoining sensitive receivers.</p> <p>AO_{13.2} Roof-top mounted plant and equipment is located away from surrounding sensitive land uses and is acoustically shielded to achieve a nil increase in background noise levels (L_{90}) at the nearest sensitive receiver.</p>

Noise assessment criteria to be achieved are described in the following sections.

4.1.1 Variable Noise

Noise assessment criteria for variable noise (L_{Aeq}) were based on Acceptable Outcome (AO) AO8.1 (a) and (b) of the Environmental Standards Code of the TRPS and are presented in Table 3.

Table 3 Variable noise assessment criteria

Time of Day	Average ambient noise level (L_{A90}) (dBA) (from Table 2)	Allowable exceedance above ambient background (dBA) (at façade)	Variable noise assessment criteria (L_{Aeq}) (dBA) at the dwelling façade
Day (7am-6pm)	39	5	44
Evening (6pm-10pm)	43	5	48
Night (10pm-7am)	35	3	38

4.1.2 Continuous Noise

Noise assessment criteria for continuous noise described at AO8.1(c) of the Environmental Standards Code of the TRPS are provided in Table 4.

Table 4 Continuous noise assessment criteria

Time of Day	Average ambient noise level (L_{A90}) (dBA) (from Table 2)	Allowable exceedance above ambient background (dBA) (at façade)	Continuous noise assessment criteria (L_{A90}) (dBA) at the dwelling façade
Day (7am-6pm)	39	0	39
Evening (6pm-10pm)	43	0	43
Night (10pm-7am)	35	0	35

4.1.3 Sleep Disturbance

The Environmental Standards Code does not specifically refer to criteria for sleep disturbance, however AO8.1(d) stipulates a noise limit of 45 dBA L_{Amax} inside a dwelling. This is consistent with the nighttime sleep disturbance criteria specified by the EPA (2004). The corresponding external level is 52 dBA L_{Amax} at the façade of a dwelling for a normal, naturally ventilated building with opened windows.¹

4.1.4 Acoustic Quality Objectives (AQO)

AO8.1 requires developments to achieve the AQOs provided at Schedule 1 of the Environmental Protection (Noise) Policy 2019 (EPP Noise) (Table 5). The AQOs noise assessment criteria were used as they are the most stringent criteria for variable noise sources (i.e., day and evening = 42 dBA and night = 37 dBA).

Table 5 Acoustic Quality Objectives from the EPP Noise

Sensitive Receptor	Time of Day	$L_{Aeq,adj,1hr}$	$L_{A10,adj,1hr}$	$L_{A01,adj,1hr}$
Residence (for outdoors)	Day and evening	50	55	65
Residence (for indoors) ¹	Day and evening	42	47	52
	Night	37	42	47

4.2 Reverse Amenity Noise Sources

4.2.1 SDAP State Code 1 Noise Assessment Criteria

As shown in Figure 3, the proposed development is mapped within 25 m of a state-controlled road under SDAP mapping. The Warrego Highway/Toowoomba Bypass (state-controlled road) is not mapped under the State Planning Policy (SPP) transport noise corridor overlay.

The relevant noise assessment criteria under State Code 1: Development in a state-controlled road environment is PO40 – Façade affected criteria for accommodation activity (habitable rooms) = ≤ 60 dB(A) L_{10} (18 hour) façade corrected.

¹ Values have been corrected by 7 dBA to account for the façade attenuation provided by a normal, naturally ventilated building with opened windows (ASK Consulting Engineers, 2011 & EPA, 2004).

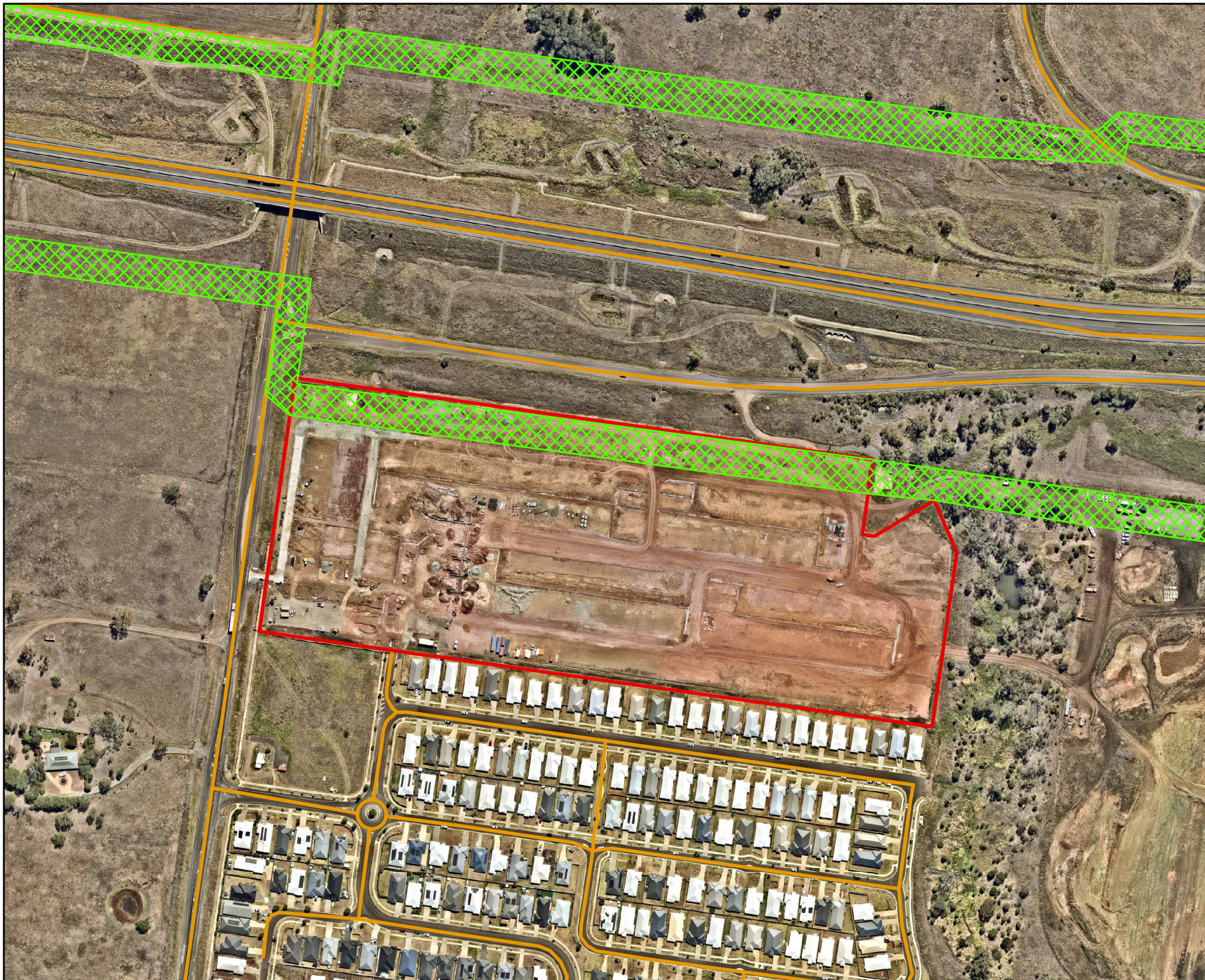


Figure 3
Area within 25 m
of a state-controlled
road

Project: Noise
 Impact Assessment

Client: Ruby
 Developments Pty Ltd

Project No.: J002901

Compiled by: MJW Date: 25/05/2026
 Approved by: LMT Date: 25/05/2026

0 30 60 Metres

Legend

-  Roads
-  Site boundary
-  Area within 25m of
State-controlled
road

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Source: Cadastral data sourced from DNRME (2025) and aerial imagery sourced from from NearMap (2026).



5 Noise Impact Assessment

5.1 Approach

Forecast noise levels from and at the proposed development were calculated with SoundPlan v8.0, using the prediction method ISO 9613-2:1996 which, by default, presents noise levels at the receptor for meteorological conditions which are favourable for propagation from the sound source to the receptor. The predicted noise levels are considered to represent the average propagation under meteorological conditions including wind and temperature inversion.

All prediction models have limits to their accuracy of prediction. This is due to the inherent nature of the calculation algorithms that go into the design of the models, the assumptions made in the implementation of the model, and the availability of good source sound power data. ISO 9613-2 has an estimated accuracy for broadband noise of ± 3 dB at 1000 metres. Atmospheric and meteorological factors are not considered significant at the distances involved.

5.2 Noise Source Levels

Noise source design sound power levels (SWL) and sound pressure levels (SPL) of activities considered representative of those at the proposed development were used (Table 6). The SWLs and SPLs were sourced from SoundPlan v8.0.

Table 6 Design noise source SWLs and SPLs

Name	Descriptor	SWLs and SPLs in dB(Z)								Total in dB(A)
		63 Hz	125 Hz	250 Hz	500 Hz	1 kHz	2 kHz	4 kHz	8 kHz	
Clubhouse breakout noise (SPL)	L _{eq}	87	91	82	81	78	77	75	72	85
Workshop pavilion breakout noise (SPL)	L _{eq}	84	79	76	71	69	66	64	62	75
Outdoor patrons (raised voices) (SWL)	L _{eq}	42	36	36	38	69	65	49	40	71
Outdoor patrons (raised voices) (SWL)	L _{max}	56	50	50	52	83	79	63	54	85
Air conditioning (SWL)	L _{eq} and L ₉₀	56	63	65	59	54	54	51	50	62
Clubhouse rooftop mechanical plant (56kW units) (SWL)	L _{eq} and L ₉₀	92	87	84	79	77	74	72	70	83
Light vehicle movements (SWL)	L _{eq} and L _{max}	78	85	79	76	79	80	76	73	85
Heavy vehicle movements (SWL)	L _{eq} and L _{max}	102	96	92	90	90	86	82	79	94
Car door closures (SWL)	L _{max}	84	87	88	90	90	86	84	79	94

The noise source SPL for the Warrego Highway/Toowoomba Bypass was derived from the ambient noise levels recorded by the sound level meter during the ambient noise survey. As shown in Table 7 below, the SoundPlan model was found to be within an acceptable level of variation from the measured levels.

Table 7 Design noise SPL

Receiver	Measured $L_{10,18hr}$ 2020	SoundPlan $L_{10,18hr}$ 2020	Environment	Difference
Logger	52	52.1	Free field	+0.1

5.3 Input Parameters

The key noise sources from the proposed development considered in this assessment include:

- Breakout noise from inside the Clubhouse and Workshop Pavilion.
- Outdoor patrons at communal areas.
- Air conditioning.
- Clubhouse rooftop mechanical plant.
- Light vehicle movements.
- Heavy vehicle movements.
- Car door closures.

The cumulative noise emissions from the variable noise sources were modelled. Continuous noise emissions from air conditioners and mechanical plant were also modelled.

Reverse amenity impacts from road traffic noise on the Warrego Highway/Toowoomba Bypass was also modelled.

Noise source locations for all sources are presented at Appendix D.

5.4 Model Assumptions

5.4.1 Operational Noise Source Model Assumptions

The noise sources considered in the noise impact assessment are outlined below and in Table 8.

Point receptors were located 1 m from the building façade at a height of 1.8 m above ground level. Forecast noise levels were façade-affected. Topographic information was sourced from Geoscience Australia.

The SPL for the Clubhouse and Workshop Pavilion were modelled as an internal noise source emanating from all walls and the roof of the buildings with a nominal transmission of 34 Rw.

Outdoor patrons in the communal areas at the site were represented by an L_{eq} and L_{max} descriptor. Outdoor patrons were represented by point sources at the pickleball and tennis courts and within the outdoor areas of the Clubhouse (Appendix D).

Air conditioning plant and rooftop mechanical plant (exhaust fans, refrigeration plant, etc.) were represented by the L_{eq} and L_{90} descriptors. The rooftop mechanical plant at the Clubhouse was estimated to be 1.5kW per 10m² = 270kW for ~1800m² = 5 x 56kW point sources (Appendix D).

Light and heavy vehicle movements were represented by a moving point source that was nominated a speed and number of events per hour. The peak hourly movements were understood to be 0.21 movements per dwelling, therefore 39 movements per hour, which was applied to both light and heavy vehicle movements at the site.

Assessment of car door noise emissions was problematic due to the high degree of uncertainty surrounding the frequency and intensity of ‘slamming’ events. It is practically unknowable precisely how often – and how hard – individuals may shut their car doors. Slamming is not a necessary outcome of carparking activity but is likely to occur at some point, although infrequently. As future car door noise is highly uncertain, assessment of noise impacts requires methodological assumptions regarding the indicative ‘design’ level of noise emissions. Car door closures were represented by point sources at each of the proposed residential lots and visitor carparking spaces (Appendix D).

Although the Clubhouse is not proposed to be operational during the nighttime period (10:00pm-7:00am) (Section 2.3), it was considered likely that patrons and vehicles may leave after 10:00pm. L_{max} noise levels were therefore calculated for vehicle associated sources and outdoor patrons at the Clubhouse as a conservative approach.

Table 8 Noise sources considered in the noise impact assessment

Source	Day	Evening	Night	Variable	Continuous	L_{max}
Clubhouse breakout noise (SPL)	100%	100%	-	Yes	-	Yes
Workshop pavilion breakout noise (SPL)	100%	100%	-	Yes	-	Yes
Outdoor patrons L_{eq} (SWL)	50%	-	-	Yes	-	-
Outdoor patrons L_{max} (SWL)	N/A	N/A	-	-	-	Yes
Air conditioning (SWL)	100%	100%	100%	Yes	Yes	-
Clubhouse mechanical plant (SWL)	100%	100%	100%	Yes	Yes	-
Light vehicle movements (SWL)	39vph at 20kph	39vph at 20kph	-	Yes	-	Yes
Heavy vehicle movements (SWL)	39vph at 20kph	-	-	Yes	-	Yes
Car door closures (SWL)	N/A	N/A	-	-	-	Yes

5.4.2 Road Traffic Noise Source Model Assumptions

The noise model used traffic count projection calculations for the year 2034 to account for traffic growth impacts of the Warrego Highway/Toowoomba Bypass at the proposed development. The traffic projection calculations for the Warrego Highway/Toowoomba Bypass are shown in Table 9.

Table 9 Warrego Highway/Toowoomba Bypass traffic projection calculations

Road	Vehicles per 24 hr		Growth (%p.a.)	HV %	Speed (km/hr)	Source Height (m)	Surface ²
	18hr volume is 94% of 24 hr						
	2020	2034					
Warrego Highway / Toowoomba Bypass	10500	15882	3%	20%	100	0.5	DGA

The Warrego Highway/Toowoomba Bypass traffic flows are nominal in the absence of published data (Table 9) and were validated at the noise measurement location (Table 7). Validation was based on the measured $L_{10,18hr}$ from 18 March 2020. The modelled levels were $L_{10,18hr}$ and were façade-affected. The modelled levels for other noise level descriptors (e.g. $L_{eq,1hr}$) were derived from the predicted levels using the measured relationships on 18 March 2020, which are shown below in Table 10.

Table 10 Noise levels measured on 18 March 2020, free field

Time of day	L_{01}	L_{10}	L_{90}	L_{eq}
Day	65	53	42	52
Evening	59	52	43	49
Night	57	48	32	47
Highest Day 1hr	-	-	-	58
Highest Night 1hr	-	-	-	53
Calculation of Road Traffic Noise 18hr	-	52	42	-
24 hr average max / L_{eq}	61	-	-	50

5.5 Noise Attenuation

5.5.1 Operational Noise Sources

The model did not include noise attenuation measures such as acoustic fencing for operational noise sources.

5.5.2 Reverse Amenity Noise Sources

Attenuation measures will be required as follows:

- Façade attenuation for habitable rooms to mitigate road traffic noise from the Warrego Highway/Toowoomba Bypass (north).
- An acoustic barrier, specifications of which are provided at Appendix A, to mitigate reverse amenity noise.

² Dense Graded Asphalt (DGA).

5.6 Weather Conditions

Noise modelling has been made using the prediction methodology ISO9613-2:1996 which, by default, presents noise levels at the receptor for meteorological conditions which are favourable for propagation from the sound source to the receptor. The predicted noise levels are considered to represent the average propagation under meteorological conditions including wind and temperature inversion.

5.7 Predicted Noise Levels at External Noise Sensitive Receptors

Predicted noise levels at noise sensitive receptors from the proposed development and a comparison with the relevant noise assessment criteria are provided in the below sections. Noise level contour diagrams are provided at Appendix E.

5.7.1 Variable Noise Sources

Table 11 Comparison of predicted cumulative variable noise levels with assessment criteria (day)

Receptor	Descriptor	Predicted noise level at the receptor (L_{Aeq})	AQOs noise assessment criteria (L_{Aeq})
Receptor 1	L_{eq}	34	42 (day)
Receptor 2	L_{eq}	34	
Receptor 3	L_{eq}	33	
Receptor 4	L_{eq}	43	
Receptor 5	L_{eq}	39	
Receptor 6	L_{eq}	40	
Receptor 7	L_{eq}	41	
Receptor 8	L_{eq}	42	
Receptor 9	L_{eq}	30	
Receptor 10	L_{eq}	30	
Receptor 11	L_{eq}	31	

Table 12 Comparison of predicted cumulative variable noise levels with assessment criteria (evening)

Receptor	Descriptor	Predicted noise level at the receptor (L_{Aeq})	AQOs noise assessment criteria (L_{Aeq})
Receptor 1	L_{eq}	26	42 (evening)
Receptor 2	L_{eq}	26	
Receptor 3	L_{eq}	26	
Receptor 4	L_{eq}	35	
Receptor 5	L_{eq}	33	
Receptor 6	L_{eq}	34	

Receptor	Descriptor	Predicted noise level at the receptor (L_{Aeq})	AQOs noise assessment criteria (L_{Aeq})
Receptor 7	L_{eq}	37	
Receptor 8	L_{eq}	38	
Receptor 9	L_{eq}	27	
Receptor 10	L_{eq}	27	
Receptor 11	L_{eq}	27	

Table 13 Comparison of predicted cumulative variable noise levels with assessment criteria (night)

Receptor	Descriptor	Predicted noise level at the receptor (L_{Aeq})	AQOs noise assessment criteria (L_{Aeq})
Receptor 1	L_{eq}	18	37 (night)
Receptor 2	L_{eq}	19	
Receptor 3	L_{eq}	21	
Receptor 4	L_{eq}	28	
Receptor 5	L_{eq}	29	
Receptor 6	L_{eq}	29	
Receptor 7	L_{eq}	33	
Receptor 8	L_{eq}	34	
Receptor 9	L_{eq}	22	
Receptor 10	L_{eq}	23	
Receptor 11	L_{eq}	23	

5.7.2 Continuous Noise Sources

Table 14 Comparison of predicted continuous noise levels with assessment criteria (day, evening, and night)

Receptor	Descriptor	Predicted noise level at the receptor (L_{A90})	Continuous noise assessment criteria (L_{A90})
Receptor 1	L_{90}	18	39 (day) 43 (evening) 35 (night)
Receptor 2	L_{90}	19	
Receptor 3	L_{90}	21	
Receptor 4	L_{90}	28	
Receptor 5	L_{90}	29	
Receptor 6	L_{90}	29	

Receptor	Descriptor	Predicted noise level at the receptor (L_{A90})	Continuous noise assessment criteria (L_{A90})
Receptor 7	L_{90}	33	
Receptor 8	L_{90}	34	
Receptor 9	L_{90}	22	
Receptor 10	L_{90}	23	
Receptor 11	L_{90}	23	

5.7.3 Discrete Noise Sources

Table 15 Comparison of predicted discrete noise levels with assessment criteria (night)

Receptor	Descriptor	Predicted noise level at the receptor (L_{Amax})	Sleep disturbance assessment criteria (L_{Amax})
Receptor 1	L_{max}	36	52 (night)
Receptor 2	L_{max}	37	
Receptor 3	L_{max}	36	
Receptor 4	L_{max}	52	
Receptor 5	L_{max}	53	
Receptor 6	L_{max}	53	
Receptor 7	L_{max}	54	
Receptor 8	L_{max}	53	
Receptor 9	L_{max}	28	
Receptor 10	L_{max}	27	
Receptor 11	L_{max}	27	

5.8 Predicted Noise Levels of Road Traffic Noise

Predicted noise levels from road traffic noise from the Warrego Highway/Toowoomba Bypass at the proposed development (indoors) and a comparison with the relevant noise assessment criteria are provided as follows:

- Appendix F provides the full comparison of predicted road traffic noise levels with the relevant assessment criteria. All predicted road traffic noise levels complied with the State Code 1 habitable rooms noise assessment criteria (60 dBA, $L_{A10,18hr}$). The majority of the proposed residential lots at the site also complied with QDC Category 0. The northern facades of proposed lots 16, 87, and 120-122 and the eastern façade of lot 87 complied with QDC Category 1.
- A noise level contour diagram is provided at Appendix E.

6 Discussion

Predicted cumulative variable noise levels during the evening and night-time periods and continuous noise levels during all periods at the proposed development complied with the relevant noise assessment criteria at all receptors.

Predicted exceedances of +1 (daytime at Receptor 4) above the AQO noise assessment criteria and +1 (Receptors 5, 6 & 8) and +2 (Receptor 7) above the sleep disturbance criteria occurred. Practical compliance is predicted to be achieved at all receptors however due to the following reasons:

- The noise modelling represented the worst-case cumulative impacts from all noise sources using the prediction methodology ISO9613-2:1996, which, by default, presents noise levels at the receptor for meteorological conditions which are favourable for propagation from the sound source to the receptor.
- DES (2020) notes that a change in noise level of 1-3 dB(A) is 'just perceptible'. Therefore, the predicted exceedances are unlikely to be perceptible for variable noise sources and discreet noise sources such as car door closures.
- Additionally, although the Clubhouse is not proposed to be operational during the night-time period (10:00pm-7:00am) (Section 2.3), it was considered likely that patrons and vehicles may leave after 10:00pm on occasion. L_{max} noise levels were therefore calculated for vehicle associated sources and outdoor patrons at the Clubhouse as a conservative approach, although not considered to be a regular contributing source. Sleep disturbance is unlikely to occur from a 1-2 dB exceedance proximate to 10:00pm (evening cut-off period).

To minimise the risk of causing noise nuisance at nearby sensitive receptors, the noise management measures outlined at Section 7.1 below shall be implemented.

For proposed lot facades at the site meeting the QDC Category 0 threshold, no additional acoustic treatment is required; standard building assessment provisions however will still apply. The northern facades of proposed lots 16, 87, and 120-122 and the eastern façade of lot 87, which comply with QDC Category 1, are required to meet the acceptable forms of construction requirements for Category 1 under the QDC MP 4.4 – Buildings in a Transport Noise Corridor.

7 Recommendations

7.1 Operational Management Measures

The following operational management measures shall be implemented at the site to minimise the risk of causing noise nuisance at nearby sensitive receptors:

- Adhere to the operating hours outlined at Section 2.3.
- As per Section 440S of the EP Act, the operation of regulated devices such as lawnmowers and leaf blowers must not be audible at nearby sensitive receptors between Monday and Saturday, 7:00pm to 7:00am, or any other day between 7:00pm to 8:00am.
- Mechanical plant and equipment must be selected, sited, and acoustically treated as necessary to satisfy the site-specific noise assessment criteria (Section 4.1.4), Development Approval conditions and the EP Act.

7.2 Building Design Measures

The northern facades of proposed lots 16, 87, and 120-122 and the eastern façade of lot 87, which comply with QDC Category 1, are required to meet the acceptable forms of construction requirements for Category 1 under the QDC MP 4.4 – Buildings in a Transport Noise Corridor.

8 Summary

- A noise impact assessment was completed for a proposed retirement facility at 25 Tall Oak Drive, Cotswold Hills.
- Predicted noise emissions from operational noise sources at the proposed development were assessed against the requirements of the Environmental Standards Code under the TRPS and the relevant provisions of the Environmental Protection (Noise) Policy 2019. Operational noise sources were predicted to achieve practical compliance with the AQOs noise assessment criteria. To minimise the risk of causing noise nuisance at nearby sensitive receptors, the noise management measures outlined at Section 7.1 shall be implemented.
- Predicted noise emissions from the Warrego Highway/Toowoomba Bypass were assessed against the requirements of SDAP State Code 1: Development in a State Controlled Road Environment (version 3.6). Façade attenuation will be required at the northern facades of proposed lots 16, 87, and 120-122 and the eastern façade of lot 87 to meet the acceptable forms of construction requirements for Category 1 under the QDC MP 4.4 – Buildings in a Transport Noise Corridor.

9 References

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ASK Consulting Engineers. 2011. Noise Reduction through Facades with Open Windows, Paper Number 37.

Australian Standard AS1055:2018 – Acoustics – Description and measurement of environmental noise.

Department of the Environment, Tourism, Science and Innovation. 2020. Noise Measurement Manual.

Environmental Protection Agency. 2004. Planning for Noise Control Guideline. State of Queensland. Brisbane, Queensland.

Sheikh et al. 2019 GHD. Indiscernible noise – a review of acoustic criteria for impulsive noise event in presence of background noise.

Appendices

Appendix A Traffic Noise Assessment (Alpha Acoustics, 2026)



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TRAFFIC NOISE ASSESSMENT

**Proposed New Development Tall Oak Drive
Cotswold QLD**

Date: 12 March 2026

Number of Pages: 52 (inc.)

DOCUMENT CONTROL

Revision	Issue Date	Item	Author	Review
0	16/04/2025	Noise Impact Assessment	RF	MF
1	14/05/2025	Include STP reverse amenity	MF	MF
2	25/05/2025	Include EPA Act Pump Criteria	MF	MF
3	04/07/2025	Adjust Acoustic Barrier Location	MF	MF
4	14/07/2025	Describe internal barrier	MF	MF
5	17/11/2025	RFI barrier colours clarified	MF	MF
6	12/03/2026	Acoustic Fence Adjustment and remodel	RF	MF

CLIENT

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We encourage clients to check with us before using materials or equipment that are alternative to those specified in our Acoustical Report.

The integrity of acoustic structures is very dependent on installation techniques. For example, a small crack between the top of a wall and a ceiling can reduce the effective sound transmission loss of a wall from R_w 50 to R_w 40. Therefore, the use of contractors that are experienced in acoustic construction is encouraged. Furthermore, two insulation products may have the same thermal R rating but the sound absorption of one may be entirely deficient, therefore the use of materials and equipment that are supported by acoustic laboratory test data is encouraged.

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EXECUTIVE SUMMARY

Alpha Acoustics has been engaged by Gemstone Lifestyle to carry out a road traffic noise assessment a proposed 207 residential lot subdivision at Proposed New Development Tall Oak Drive Cotswold QLD 4350. This report is an addition to the existing report by Range Environmental Ref J002130 dated 8th November 2024.

This report determines the required height and extent of the boundary traffic noise barrier to meet the minimum requirements of state controlled roads outdoor areas. Additionally the Sewerage Treatment Plant noise emissions are assessed as part of a reverse amenity criteria. Other acoustic matters are dealt with in the Range Environmental acoustic report.

Toowoomba Bypass is adjacent to the proposed subdivision to the north of the site. Due to the sites' proximity to Toowoomba Bypass and the number of lot divisions (207 lots), the proposed development has been assessed against acoustic issues contained within:

- State Development Assessment Provisions (SDAP) Version 3.0

This road traffic noise assessment was undertaken in accordance with the Transport Noise Management Code of Practice Volume 1 - Road Traffic Noise (2013) (hereafter 'RTN Code') to address SDAP State Code 1 Development in a State Controlled Road Environment (version 3).

The following conclusions apply to this assessment:

- The road traffic noise assessment including predicted 2035 traffic noise levels across the site were assessed against the SDAP traffic noise criteria.
- Traffic noise modelling demonstrates all proposed lots satisfy the SDAP Outdoor traffic noise criteria **given an acoustic barrier construction and location is outlined in section 4.4 of this report.**
- A reverse amenity assessment of the existing Sewerage Treatment Plant has been carried out and an **acoustic barrier construction and location is outlined in section 4.4 of this report.**

1 INTRODUCTION AND SITE DESCRIPTION

Alpha Acoustics has been engaged by Gemstone Lifestyle to carry out an SDAP based acoustic assessment for a proposed new lot development at Tall Oak Drive Cotswold QLD 4350, and to determine appropriate acoustic solutions for the development to meet SDAP criteria for the boundary barrier. Additionally a nearby Sewerage Treatment Plant (STP) is assessed to a reverse amenity criteria. The plan consists of a proposed 205 lot residential subdivision and is adjacent to the Toowoomba Bypass (see Figure 1.1 and Figure 1.2 below).

Figure 1.1 Location Map of Site and Measurement Location (SPP Mapping)

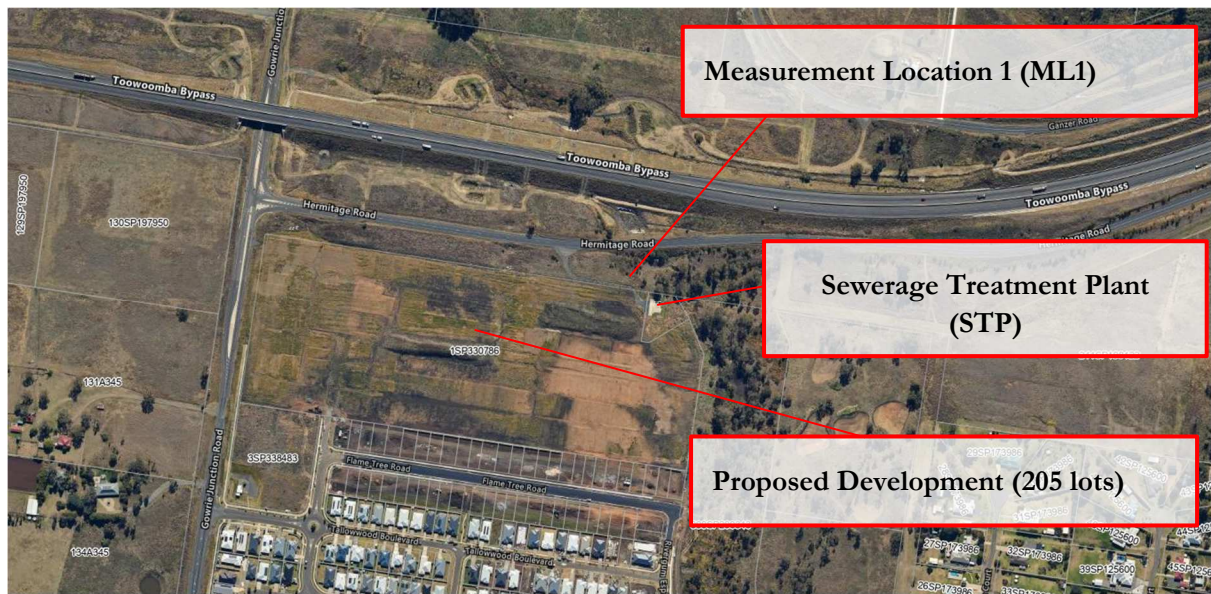
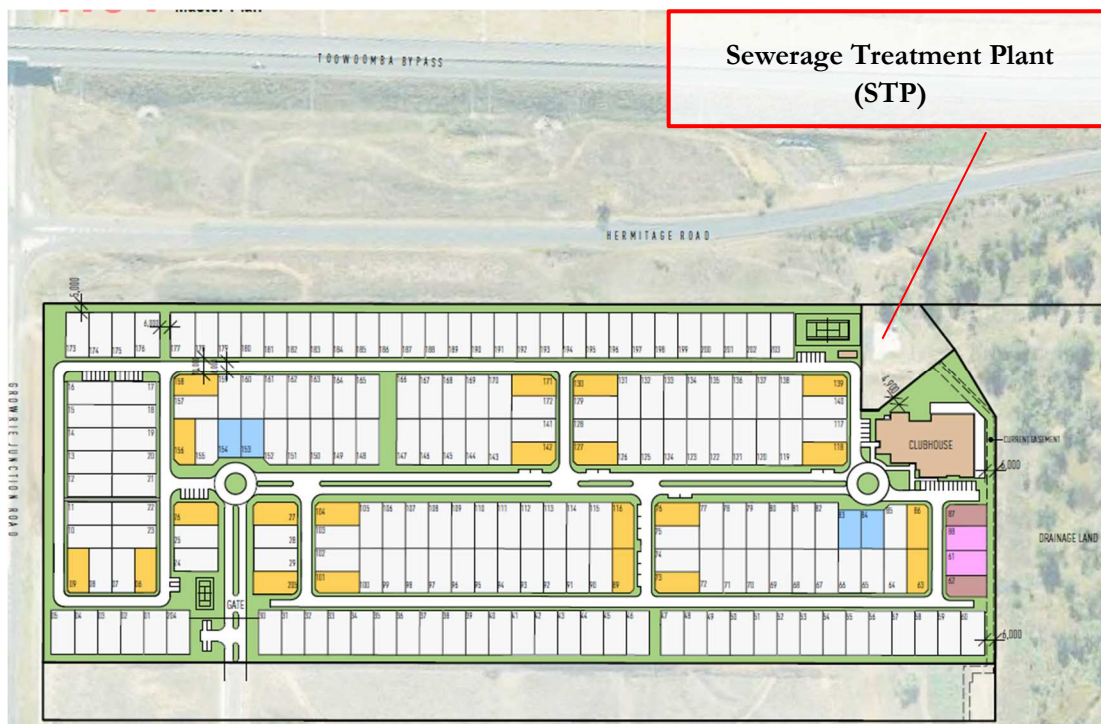


Figure 1.2 Proposed 205 Lot Residential Subdivision (Appendix A Development Plans)



2 NOISE SURVEY AND INSTRUMENTATION

An on-site survey was conducted between 13th March 2025 and 20th March 2025 (weekdays only used). The measurement location (ML1) was located on the new development at Tall Oak Drive Cotswold QLD 4350 at 1.5 m above surface level as seen in Figure 2.1 below and is considered free field.

All instrumentation used in this assessment holds a current calibration certificate from a certified NATA calibration laboratory. Table 2.1 shows the instruments were used to measure the ambient noise levels.

Table 2.1 Noise Instrumentation

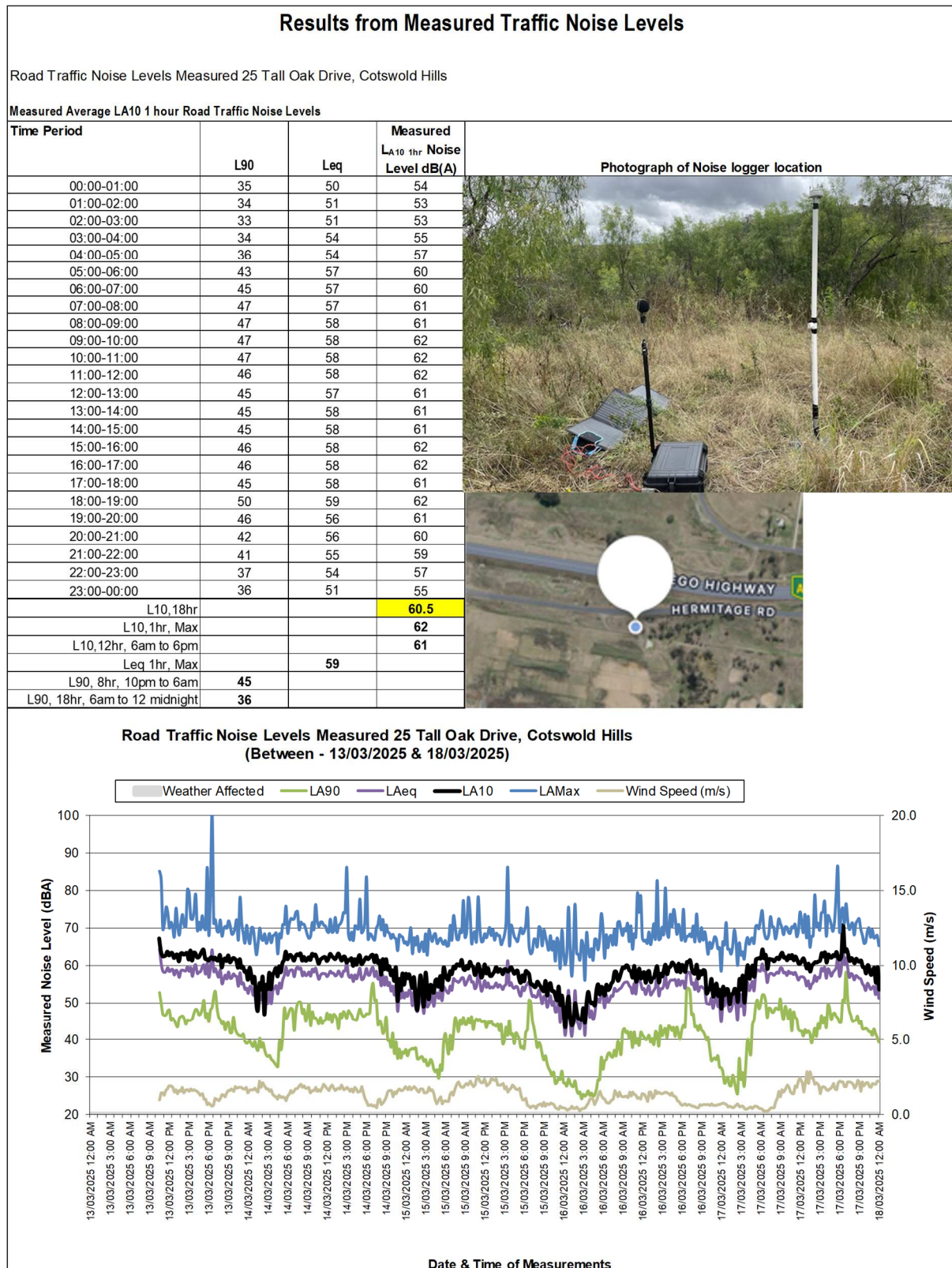
Description	Model No.	Serial No.
Larsen Davis Noise Meter	831	0001156
Condenser Microphone 0.5” diameter	UC-52	133664
Acoustical Calibrator	Larsen Davis	CAL200
Microphone Windscreen	Acoustically transparent foam	

Ambient sound pressure levels were measured generally in accordance with Australian Standard AS1055.1:1997 - ‘Acoustics-Description and measurement of environmental noise - Part 1:

Overall weather conditions during the measurement period were suitable for noise monitoring and days that do not comply with the maximum acceptable values outlined in the RTN Code - average wind speed up to 3 m/s and rainfall of up to 0.3 mm/hr were removed as per requirements of the code.

Meteorological data was collected onsite and shown in Appendix D - Meteorological data

Figure 2.1 Exterior Noise Levels at ML1 (free field)



The observed survey revealed that the noise environment was dominated by emissions from the subject road traffic.

3 CRITERIA

3.1 Traffic Noise State Development Assessment Provisions (SDAP)

As the development involves 6 or more new residential lots (205 lots in total), the noise criteria outlined in this section applies to this development.

The criteria applied is the SDAP Version 3.2 by the Department of State Development, Manufacturing, Infrastructure and Planning. The SDAP State Code 1: Development in a state-controlled road environment sets out matters of interest for the assessment of developments near a state-controlled road or type 1 multi-modal corridor. The applicable criteria for the development requires traffic noise to be assessed in accordance with Table 3.1.1 and 3.1.2 as follows (Table 1.5 and Table 2 of SDAP);

Table 3.1.1 (Table 1.5 of SDAP) Environmental emissions

Performance outcomes	Acceptable outcomes
Reconfiguring a lot	
Involving the creation of 6 or more new residential lots adjacent to a state-controlled road or type 1 multi-modal corridor	
PO38 Reconfiguring a lot minimises free field noise intrusion from a state-controlled road .	AO38.1 Development provides noise barrier or earth mound which is designed, sited and constructed: <ol style="list-style-type: none"> 1. To achieve the maximum free field acoustic levels in reference table 2 (item 2.1); 2. in accordance with: <ol style="list-style-type: none"> 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. <p>OR</p> AO38.2 Development achieves the maximum free field acoustic levels in reference table 2 (item 2.1) by alternative noise attenuation measures where it is not practical to provide a noise barrier or earth mound.

Table 3.1.2 (Table 2 of SDAP): Maximum free field acoustic levels

Applicable use	Acoustic levels
2.1: Private open space for residential lots	a. ≤57 dB(A) L ₁₀ (18 hour) free field (measured L ₉₀ (18 hour) free field between 6am and 12 midnight ≤45 dB(A))
2.2: Private open space for an accommodation activity (including lots created for a future accommodation activity)	OR b. ≤60 dB(A) L ₁₀ (18 hour) free field (measured L ₉₀ (18 hour) free field between 6am and 12 midnight >45 dB(A))
2.3: Outdoor education areas and outdoor play areas in a childcare centre or educational establishment	≤63 dB(A) L ₁₀ (12 hour) free field (between 6am and 6pm)

3.2 Environmental Protection (Noise) Policy – Sewerage Treatment Plant

The Acoustic Quality Objectives of the Environmental Protection (Noise) Policy 2008 (EPP Noise) have been used as the assessment criteria for the reverse amenity of the Sewerage Treatment Plant.. Operation of the existing plant has been assessed against the Acoustic Quality Objectives as shown in **Table 3.2.1**.

Table 3.2.1 Acoustic Quality Objectives of the Environmental Protection Policy 2008

Sensitive Receptor	Time of Day	Acoustic Quality Objective (Measured at the Receptor) dB(A)			Environmental Value
		LA _{eq,adj,1hr}	LA _{10,adj,1hr}	LA _{01,adj,1hr}	
Dwellings (for outdoors)	Daytime and evening (7am to 10pm)	50	55	65	Health and wellbeing
Dwellings (for indoors)	Daytime and evening (7am to 10pm)	35	40	45	Health and wellbeing
Dwellings (for indoors)	Night-time (10pm to 7am)	30	35	40	Health and wellbeing in relation to the ability to sleep

3.3 EPA Act 1994 – 440T Pumps

An occupier of the premises must not use, or permit the use of, the pump on any day—

- (a) before 7a.m, if it makes an audible noise; or
- (b) from 7a.m. to 7p.m, if it makes a noise of more than 5dB(A) above the background level; or
- (c) from 7p.m. to 10p.m, if it makes a noise of more than 3dB(A) above the background level; or
- (d) after 10p.m, if it makes an audible noise.

Inaudible noise is taken as 10 dBA less than the background noise. The background noise at night was LA90 37 dBA. Hence the inaudible noise criteria is LAeq 32 dBA [outside allowing for 5 dBA attenuation through an open window]

3.4 Project Specific Noise Criteria

Considering the criteria discussion above, the project specific noise criteria is summarised in **Table 3.3.1** below.

Table 3.3.1 – Summary of all relevant Noise Assessment Criteria

Criteria	Noise Descriptor	Day	Evening	Night
Environmental Protection Policy 2008 Acoustic Quality Objectives & Background Noise Creep				
Dwelling Outdoors	Leq dB(A) – Time Varying	50	54 ¹	55 ¹
Dwelling Outdoors	Leq dB(A) - Continuous	45	49 ¹	35 ¹
Dwelling Outdoors	L10 dB(A)	55	45 ¹	40 ¹
Dwelling Outdoors	L1 dB(A)	65	50 ¹	45 ¹

Note 1 the night time EPP Noise criteria is based on indoor levels + 5dB(A) to account for an open window

Considering the mechanical plant will mostly be continuous noise, the most appropriate project specific noise criteria that will ensure all noise criteria is met for this for assessment is:

- **L_{Aeq} 32 dBA at anytime at the nearest and most affected residence (assuming a 5 dBA noise reduction through an open window)**

4 NOISE IMPACT ASSESSMENT

4.1 Traffic Noise Intrusion

The 10-year design levels for road traffic noise from the Toowoomba Bypass were calculated in accordance with Australian Standard AS2702-1984 Acoustics - Methods for the measurement of road traffic noise and 'Calculation of Road Traffic Noise', 1975-1988. Predicted levels have been calculated using CoRTN prediction models in SoundPLAN 8.2.

All prediction models have limits to their accuracy of prediction. This is due to the inherent nature of the calculation algorithms that go into the design of the models and the assumptions made in the implementation of the model. Atmospheric and meteorological factors are not considered significant at the distances involved.

The model incorporated the Toowoomba Bypass, approximate 3m high houses within the lots, and elevation contour lines. Toowoomba Bypass Road source parameters were taken from a report named “Noise Impact Assessment 25 Tall Oak Drive, Cotswold Hills Client: Ruby Developments PTY LTD Project No. J002130 Status Final Date 8/11/2024 Version 2” prepared by a company called Range Environmental Consultants. Appendix B – ‘ADDT Derivation’ displays Table 10 and 11 within Range Environmental Consultants’ Project No. J002130 Version 2 report.

Table 4.1.1 Noise Source Parameters

Road Parameters	Toowoomba Bypass
Proximity from Land Parcel to Noise Source	130 m North
Speed Limit of Noise Source	100 km/hr
Traffic Volumes Average over 24-hrs (2025)	11818
Predicted Traffic Volumes Average over 24-hrs (2035)	16359
Traffic Growth Percentage	3 %
Percentage of Traffic Volume Heavy Vehicles	20 %
Surface Type	Dense Graded Asphalt
Calculated Noise Level Increase (2025-2035)	0.86 dB

Table 4.1.2 Predicted Current LA10 18hr (2025) noise levels at dwelling (dBA, free field)

Assessment Location	Measured L _{A10,18hr} 2025	Modelled L _{A10,18hr} 2025
ML1	60.5	60.6

*Modelled noise levels were found to be within +2 dB of measured values. Therefore, the traffic noise model is considered to have a reasonable degree of fit.

4.2 Traffic Noise Model Results

Table 4.2.1 Predicted LA10, 18hr (2035) noise levels (dBA, free field) at receiver locations with no barrier.

Lot Number	Corrected L _{A10,18hr} Noise Level, dB(A)	SDAP Noise Criteria	Meets Criteria?
1	53.6	57	Yes
2	53.5	57	Yes
3	53.6	57	Yes
4	53.7	57	Yes
5	54.5	57	Yes
6	54	57	Yes
7	52.6	57	Yes
8	49	57	Yes
9	52	57	Yes
10	49.3	57	Yes
11	51.2	57	Yes
12	49.9	57	Yes
13	50.5	57	Yes
14	49.9	57	Yes
15	50.3	57	Yes
16	56.9	57	Yes
17	57	57	Yes
18	53.3	57	Yes
19	52	57	Yes
20	52.5	57	Yes
21	51.2	57	Yes
22	52.2	57	Yes
23	52.3	57	Yes
24	50.4	57	Yes
25	51.4	57	Yes
26	55.6	57	Yes
27	55.5	57	Yes
28	50.6	57	Yes
29	49.2	57	Yes

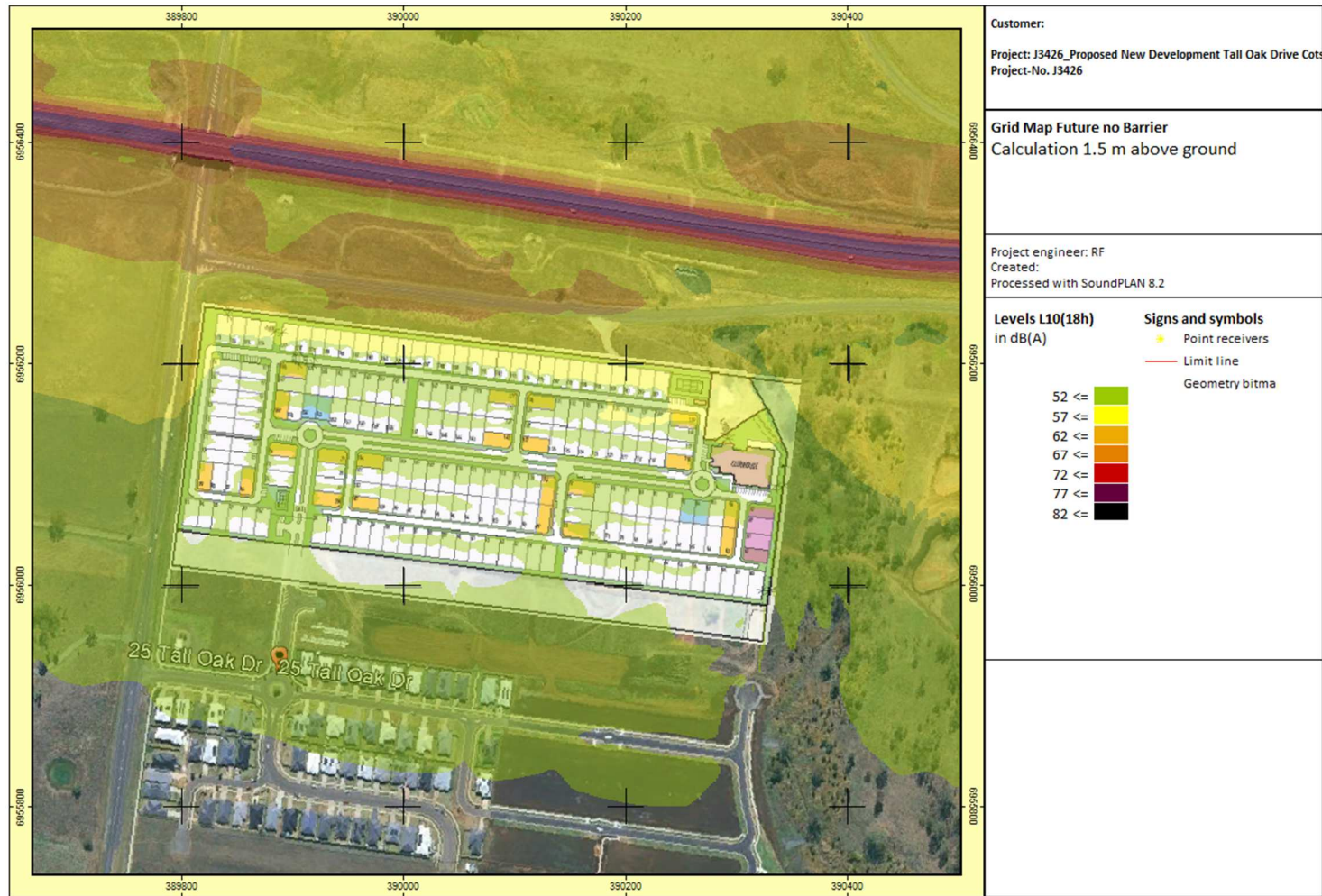
30	53.3	57	Yes
31	52.5	57	Yes
32	52.1	57	Yes
33	51	57	Yes
34	51.8	57	Yes
35	52.2	57	Yes
36	52.6	57	Yes
37	52.5	57	Yes
38	52.9	57	Yes
39	53.2	57	Yes
40	52.8	57	Yes
41	52.7	57	Yes
42	53.5	57	Yes
43	53.4	57	Yes
44	53.7	57	Yes
45	53.6	57	Yes
46	53.3	57	Yes
47	52.3	57	Yes
48	53.5	57	Yes
49	53.8	57	Yes
50	53.6	57	Yes
51	53.5	57	Yes
52	53.4	57	Yes
53	52.9	57	Yes
54	52.8	57	Yes
55	52.7	57	Yes
56	52.3	57	Yes
57	51.9	57	Yes
58	51.8	57	Yes
59	50.7	57	Yes
60	50.1	57	Yes
61	44.9	57	Yes
62	45.6	57	Yes
63	50.3	57	Yes
64	48.6	57	Yes
65	48.8	57	Yes
66	49.5	57	Yes
67	51.8	57	Yes
68	52	57	Yes
69	52.3	57	Yes
70	52.9	57	Yes
71	54.3	57	Yes
72	55.1	57	Yes
73	54.4	57	Yes
74	54.7	57	Yes

75	54.7	57	Yes
76	55.2	57	Yes
77	56.1	57	Yes
78	56.2	57	Yes
79	56.4	57	Yes
80	56.2	57	Yes
81	56.1	57	Yes
82	55.6	57	Yes
83	55.6	57	Yes
84	55.6	57	Yes
85	55	57	Yes
86	54.6	57	Yes
87	52.8	57	Yes
88	45.7	57	Yes
89	51.1	57	Yes
90	50.8	57	Yes
91	51.3	57	Yes
92	51.8	57	Yes
93	50.9	57	Yes
94	52.1	57	Yes
95	52.8	57	Yes
96	53.6	57	Yes
97	53.2	57	Yes
98	54.4	57	Yes
99	53.9	57	Yes
100	53.1	57	Yes
101	46.8	57	Yes
102	49.5	57	Yes
103	51.5	57	Yes
104	55.9	57	Yes
105	56	57	Yes
106	56.2	57	Yes
107	55.5	57	Yes
108	55.6	57	Yes
109	55.5	57	Yes
110	55	57	Yes
111	55	57	Yes
112	55	57	Yes
113	54.5	57	Yes
114	54.1	57	Yes
115	53.1	57	Yes
116	52.5	57	Yes
117	50.8	57	Yes
118	50.1	57	Yes
119	52.9	57	Yes

120	53.3	57	Yes
121	53.2	57	Yes
122	55	57	Yes
123	55.1	57	Yes
124	55.1	57	Yes
125	53.7	57	Yes
126	53.1	57	Yes
127	51.9	57	Yes
128	52.2	57	Yes
129	52.6	57	Yes
130	55.5	57	Yes
131	55.8	57	Yes
132	56.8	57	Yes
133	57	57	No
134	57.6	57	No
135	57.8	57	No
136	57.4	57	No
137	57.4	57	No
138	57.4	57	No
139	57.6	57	No
140	53.4	57	Yes
141	51.4	57	Yes
142	50.7	57	Yes
143	53.3	57	Yes
144	53.6	57	Yes
145	54	57	Yes
146	54.5	57	Yes
147	54.7	57	Yes
148	54.8	57	Yes
149	54.2	57	Yes
150	54.6	57	Yes
151	54.3	57	Yes
152	53.7	57	Yes
153	54.2	57	Yes
154	54.6	57	Yes
155	53.7	57	Yes
156	55.8	57	Yes
157	54.8	57	Yes
158	57	57	No
159	57.2	57	No
160	57.4	57	No
161	57	57	No
162	57.2	57	No
163	57	57	No
164	57.2	57	No

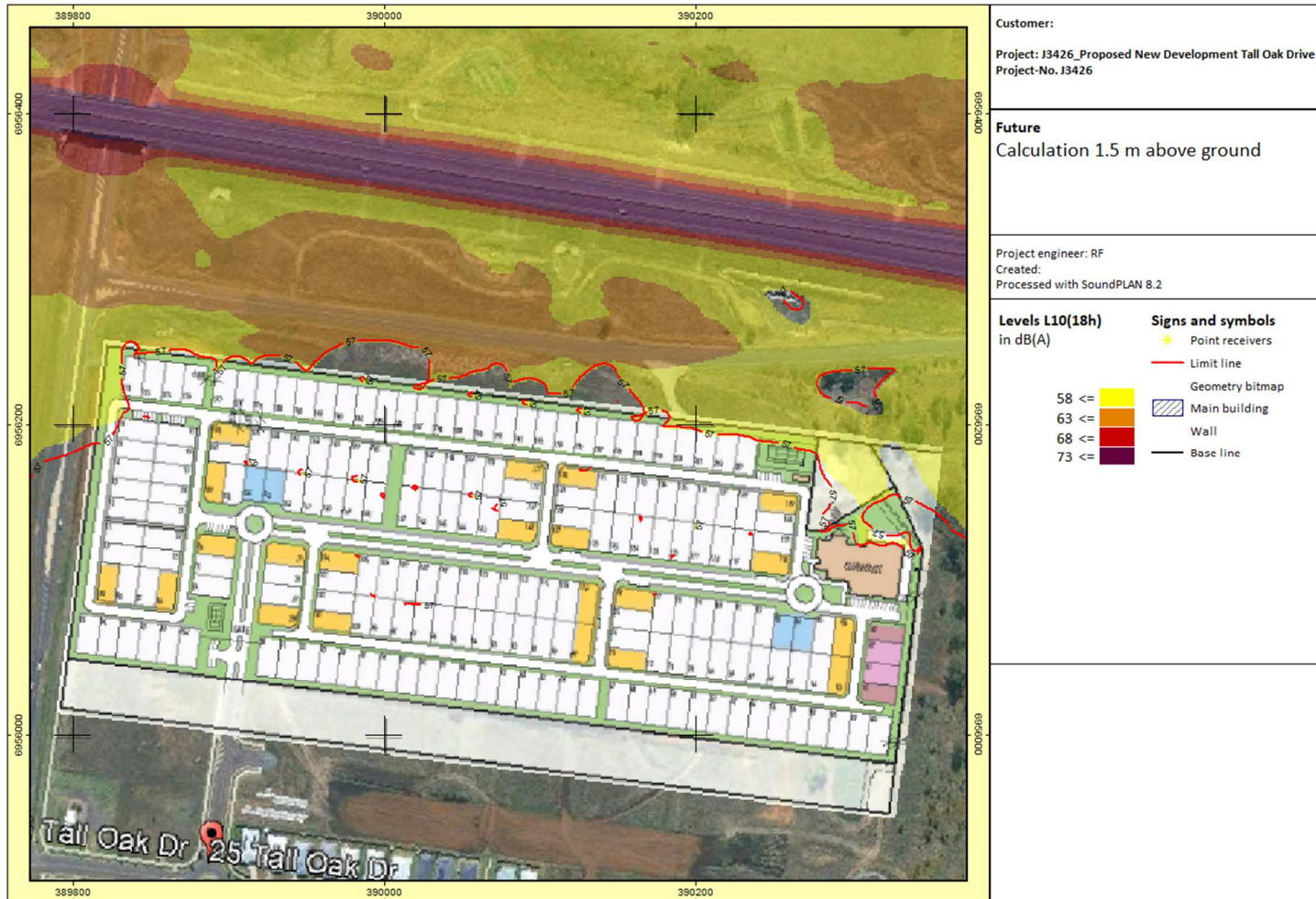
165	57.1	57	No
166	56.5	57	Yes
167	57.1	57	No
168	57.3	57	No
169	57.1	57	No
170	56.7	57	Yes
171	56.2	57	Yes
172	52	57	Yes
173	60.3	57	No
174	60.1	57	No
175	59.8	57	No
176	59.7	57	No
177	59.7	57	No
178	59.7	57	No
179	59.3	57	No
180	60.6	57	No
181	60.7	57	No
182	60.8	57	No
183	60.7	57	No
184	60.7	57	No
185	60.6	57	No
186	60.7	57	No
187	60.7	57	No
188	60.7	57	No
189	60.8	57	No
190	60.6	57	No
191	60.6	57	No
192	60.6	57	No
193	60.5	57	No
194	60.5	57	No
195	60.3	57	No
196	60.4	57	No
197	60.4	57	No
198	60.1	57	No
199	60.5	57	No
200	60.3	57	No
201	60.4	57	No
202	60.2	57	No
203	60.1	57	No
204	54.1	57	Yes
205	49.7	57	Yes
206	56.8	57	Yes
207	54.7	57	Yes

Figure 4.2.1 Noise Model, Noise Contour lines of Private Open Space (1.5 m above ground level) (with no barrier)



After noise barriers are installed, all lots comply with the Private Open Space noise criteria of LA10 57 dBA as shown in Figure 4.2.2 below.

Figure 4.2.2 Noise Model, Noise Contour lines of Private Open Space (1.5 m above ground level) (with barriers) (with compliance Red line)



4.3 Sewerage Treatment Plant Noise Model Results

Additionally the Sewerage Treatment Plant noise emissions are assessed as part of a reverse amenity criteria. Noise measurements of the Sewerage Treatment Plant have been carried out over a week between the 13th March 2025 and 18th March 2025.

Sound power level of the Sewerage Treatment Plant are listed in Table 4.3.1 below. The sound sources have been modelled in SoundPLAN. The noise emissions used for the various noise sources (taken from Alpha Acoustics Sound Library) are presented in **Table 5.1** below as sound power levels.

Table 4.3.1 Summary of Sewerage Treatment Plant Noise Emissions (Sound Power levels, dBA)

63	125	250	500	1000	2000	4000	8000	dBA
87	83	77	83	82	77	77	79	86

Knowing the source sound power level (see above Table 5.1), the sound pressure level can be calculated at a remote location using suitable formulae to account for distance losses, ground absorption, sound barriers, atmospheric effects, etc.

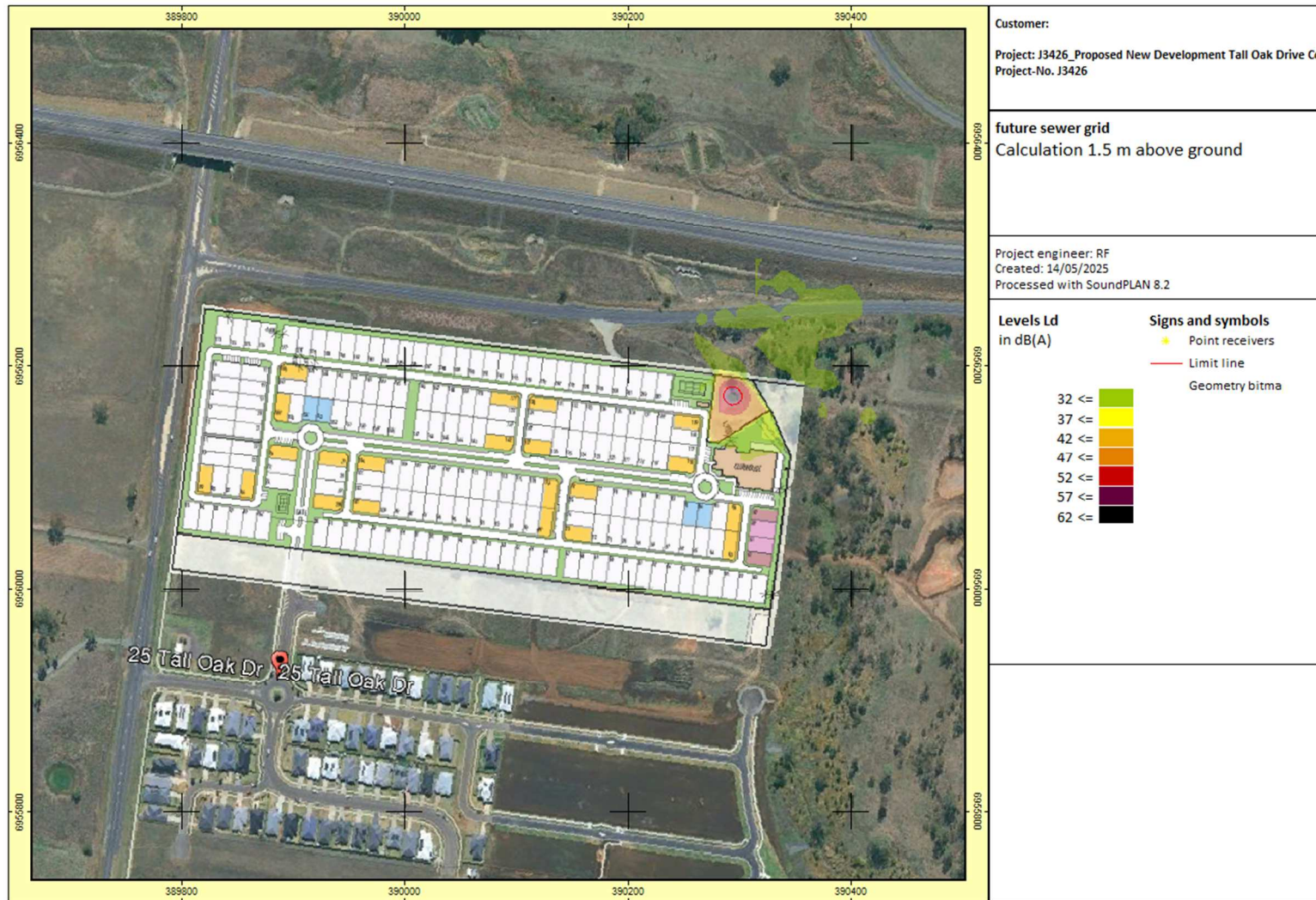
Noise modelling has been conducted using SoundPLAN v8.2 and the prediction methodology *ISO 9613-2: 1996* incorporating manufacturer published sound emission data. We would expect the order of uncertainty to be in the range of +/- 2 dB(A).

The calculated noise levels at the worst affected lots at the subject site (with noise controls) are modelled and shown in Table 4.3.2 below. Noise Controls are shown in Section 4.4.

Table 4.3.2 Modelled noise levels at nearest and most affected sensitive receivers

87Receiver	Type	Address	LAeq, dBA Criteria	LAeq, dBA	Pass ?
R1	Residential	Lot 283	32	25	Yes
R2	Residential	Lot 129	32	26	Yes
R3	Residential	Lot 140	32	26	Yes
R4	Residential	Lot 117	32	27	Yes
R5	Residential	Lot 118	32	26	Yes
R6	Residential	Lot 87	32	16	Yes
R7	Recreation	Clubhouse North	32	30	Yes
R8	Recreation	Clubhouse East	32	20	Yes

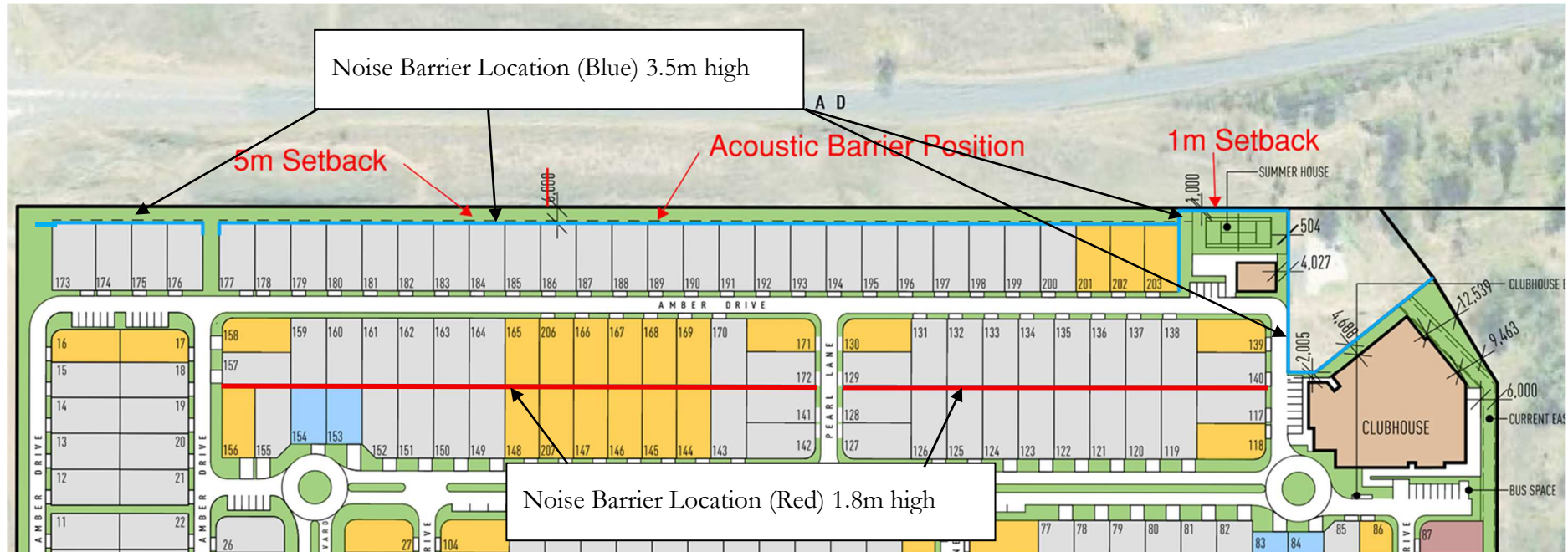
Figure 4.3.1 Noise Model, Noise Contour lines of Reverse Amenity Sewerage Treatment Plant Assessment (with barrier) (with compliance line)



4.4 Noise Barrier Location (Red, Blue)

Figure 4.4.1 shows the noise barrier locations.

Figure 4.4.1 – Noise Barrier Locations



The northern 3.5m-high Red noise barrier is proposed to be situated 5m south of the Property Boundary (PB). This barrier is proposed to extend 5m beyond Lot 173. There is a discontinuity between Lot 176 and 177, incorporating a return wall that extends approx. 5m on the Lot Boundary (LB) of Lot 176 and 177, still at 3.5m-high. The 1.8m-high Blue noise barrier is to be placed on the higher southern lot.

- The 3.5m high boundary noise barrier construction must strictly adhere to the 'Technical Specification - MRTS15 Noise Fences, Transport and Main Roads, 2019.' This specification comprehensively details the required material standards, construction methodologies, and quality control measures necessary to ensure the effective acoustic performance and long-term durability of the noise barriers.

- The 1.8m high internal noise barrier may be constructed from a gap free 25mm thick lapped timber fence or other material with a surface density of at least 15 kg/m².



Approximate barrier top height requirements are presented in Table 4.4.1. These barrier top heights are calculated based on the assumed barrier base level and the acoustically required barrier height. The barrier top height represents the critical dimension for achieving the specified acoustic performance of the barrier.

Table 4.4.1: Barrier Base, Height, and Top Levels

Lot #	Barrier base	Barrier height	Barrier top
173	523.83	3.5	527.33
174	523.45	3.5	526.95
175	523.42	3.5	526.92
176	523.23	3.5	526.73
177	523.24	3.5	526.74
178	523.05	3.5	526.55
179	522.82	3.5	526.32
180	522.64	3.5	526.14
181	522.47	3.5	525.97
182	522.43	3.5	525.93
183	522.24	3.5	525.74
184	522.05	3.5	525.55
185	522.02	3.5	525.52
186	521.85	3.5	525.35
187	521.67	3.5	525.17
188	521.63	3.5	525.13
189	521.45	3.5	524.95
190	521.28	3.5	524.78
191	521.24	3.5	524.74
192	521.02	3.5	524.52
193	520.84	3.5	524.34
194	520.65	3.5	524.15
195	520.62	3.5	524.12
196	520.45	3.5	523.95
197	520.33	3.5	523.83
198	520.43	3.5	523.93
199	520.3	3.5	523.8
200	520.17	3.5	523.67
201	520.04	3.5	523.54
202	519.91	3.5	523.41
203	519.78	3.5	523.28
around tennis court	519.5	3.5	523
tennis to clubhouse	519.5	3.5	523
156	524.34	1.8	526.14
155	524.66	1.8	526.46
154	525.03	1.8	526.83

153	525.05	1.8	526.85
152	525.28	1.8	527.08
151	525.14	1.8	526.94
150	524.98	1.8	526.78
149	524.82	1.8	526.62
148	524.66	1.8	526.46
207	524.44	1.8	526.24
147	524.39	1.8	526.19
146	524.23	1.8	526.03
145	524.07	1.8	525.87
144	523.91	1.8	525.71
143	523.74	1.8	525.54
141	522.58	1.8	524.38
128	522.58	1.8	524.38
126	522.87	1.8	524.67
125	522.71	1.8	524.51
124	522.55	1.8	524.35
123	522.4	1.8	524.2
122	522.24	1.8	524.04
121	522.08	1.8	523.88
120	521.92	1.8	523.72
119	521.77	1.8	523.57
117	520.33	1.8	522.13

5 CONCLUSION

Alpha Acoustics has been engaged by Gemstone Lifestyle to carry out a road traffic noise assessment a proposed 207 residential lot subdivision at Proposed New Development Tall Oak Drive Cotswold QLD 4350.

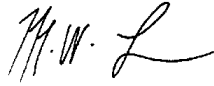
This report is an addition to the existing report by Range Environmental Ref J002130 dated 8th November 2024. This report determines the required height and extent of the boundary traffic noise barrier to meet the minimum requirements of state-controlled roads outdoor areas. Additionally, the Sewerage Treatment Plant noise emissions are assessed as part of a reverse amenity criteria. Other acoustic matters are dealt within the Range Environmental acoustic report. Toowoomba Bypass is adjacent to the proposed subdivision to the north of the site. Due to the sites' proximity to Toowoomba Bypass and the number of lot divisions (205 lots), the proposed development has been assessed against acoustic issues contained within:

- State Development Assessment Provisions (SDAP) Version 3.0

This road traffic noise assessment was undertaken in accordance with the Transport Noise Management Code of Practice Volume 1 - Road Traffic Noise (2013) (hereafter 'RTN Code') to address SDAP State Code 1 Development in a State Controlled Road Environment (version 3).

The following conclusions apply to this assessment:

- The road traffic noise assessment including predicted 2035 traffic noise levels across the site were assessed against the SDAP traffic noise criteria.
- Traffic noise modelling demonstrates all proposed lots satisfy the SDAP Outdoor traffic noise criteria **given an acoustic barrier construction and location is outlined in section 4.4 of this report.**
- A reverse amenity assessment of the existing Sewerage Treatment Plant has been carried out and an **acoustic barrier construction and location is outlined in section 4.4 of this report.**



MATTHEW FISHBURN BE(Mech) Hons, MAAS, MIEAust, CPEng, RPEQ [14356]

Principal Consulting Acoustical Engineer

ALPHA ACOUSTICS

(Member firm of the Association of Australian Acoustical Consultants)

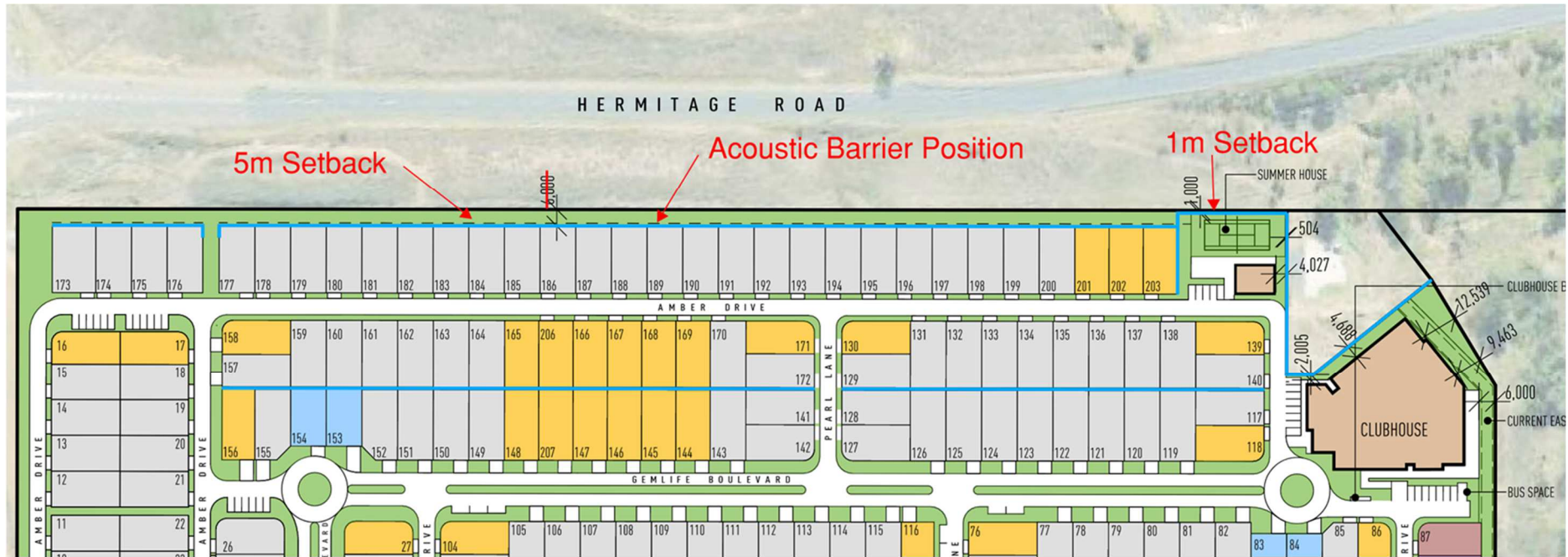
M: 0420 935 874

E: info@alphaacoustics.com.au



APPENDIX A – DEVELOPMENT PLANS

LOT SUBDIVISION PLAN



APPENDIX B – ADDT DERIVATION

The traffic volume information used in this report was sourced and extrapolated from another report named “Noise Impact Assessment 25 Tall Oak Drive, Cotswold Hills Client: Ruby Developments PTY LTD Project No. J002130 Status Final Date 8/11/2024 Version 2” prepared by a company called Range Environmental Consultants. The following tables (Table 10 and 11) is an exert from that report.

Table 10 Warrego Highway/Toowoomba Bypass traffic projection calculations

Road	Vehicles per 24 hr		Growth (%p.a.)	HV %	Speed (km/hr)	Source Height (m)	Surface ³
	18hr volume is 94% of 24 hr						
	2020	2034					
Warrego Highway / Toowoomba Bypass	10500	15882	3%	20%	100	0.5	DGA

The Warrego Highway/Toowoomba Bypass traffic flows are nominal in the absence of published data (Table 10) and were validated at the noise measurement location (Table 8). Validation was based on the measured $L_{10,18hr}$ from 18 March 2020. The modelled levels were $L_{10,18hr}$ and were façade-affected. The modelled levels for other noise level descriptors (e.g. $L_{eq,1hr}$) were derived from the predicted levels using the measured relationships on 18 March 2020, which are shown below in Table 11.

Table 11 Noise levels measured on 18 March 2020, free field

Time of day	L_{01}	L_{10}	L_{90}	L_{eq}
Day	65	53	42	52
Evening	59	52	43	49
Night	57	48	32	47
Highest Day 1hr	-	-	-	58
Highest Night 1hr	-	-	-	53
Calculation of Road Traffic Noise 18hr	-	52	42	-
24 hr average max / L_{eq}	61	-	-	50

APPENDIX C – NOISE MODEL OUTPUTS

EXISTING

J3426_Proposed New Development Tall Oak Drive Cotswold QLD 4350 Assessed receiver levels	2
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Receiver	L10(18h) dB(A)	
Cal pt	60.6	

FUTURE NO BARRIER

<p>J3426_Proposed New Development Tall Oak Drive Cotswold QLD 4350 Assessed receiver levels</p>	2
---	----------

Receiver	L10(18h) dB(A)	
1	53.6	
2	53.5	
3	53.6	
4	53.7	
5	54.5	
6	54.0	
7	52.6	
8	49.0	
9	52.0	
10	49.3	
11	51.2	
12	49.9	
13	50.5	
14	49.9	
15	50.3	
16	56.9	
17	57.0	
18	53.3	
19	52.0	
20	52.5	
21	51.2	
22	52.2	
23	52.3	
24	50.4	
25	51.4	
26	55.6	
27	55.5	
28	50.6	
29	49.2	
30	53.3	
31	52.5	
32	52.1	
33	51.0	
34	51.8	
35	52.2	
36	52.6	
37	52.5	
38	52.9	
39	53.2	
40	52.8	
41	52.7	



J3426_Proposed New Development Tall Oak Drive 2
Cotswold QLD 4350
Assessed receiver levels

Receiver	L10(18h) dB(A)	
42	53.5	
43	53.4	
44	53.7	
45	53.6	
46	53.3	
47	52.3	
48	53.5	
49	53.8	
50	53.6	
51	53.5	
52	53.4	
53	52.9	
54	52.8	
55	52.7	
56	52.3	
57	51.9	
58	51.8	
59	50.7	
60	50.1	
61	44.9	
62	45.6	
63	50.3	
64	48.6	
65	48.8	
66	49.5	
67	51.8	
68	52.0	
69	52.3	
70	52.9	
71	54.3	
72	55.1	
73	54.4	
74	54.7	
75	54.7	
76	55.2	
77	56.1	
78	56.2	
79	56.4	
80	56.2	
81	56.1	
82	55.6	



J3426_Proposed New Development Tall Oak Drive
Cotswold QLD 4350
Assessed receiver levels

2

Receiver	L10(18h) dB(A)	
83	55.6	
84	55.6	
85	55.0	
86	54.6	
87	52.8	
88	45.7	
89	51.1	
90	50.8	
91	51.3	
92	51.8	
93	50.9	
94	52.1	
95	52.8	
96	53.6	
97	53.2	
98	54.4	
99	53.9	
100	53.1	
101	46.8	
102	49.5	
103	51.5	
104	55.9	
105	56.0	
106	56.2	
107	55.5	
108	55.6	
109	55.5	
110	55.0	
111	55.0	
112	55.0	
113	54.5	
114	54.1	
115	53.1	
116	52.5	
117	50.8	
118	50.1	
119	52.9	
120	53.3	
121	53.2	
122	55.0	
123	55.1	



J3426_Proposed New Development Tall Oak Drive 2
Cotswold QLD 4350
Assessed receiver levels

Receiver	L10(18h) dB(A)	
124	55.1	
125	53.7	
126	53.1	
127	51.9	
128	52.2	
129	52.6	
130	55.5	
131	55.8	
132	56.8	
133	57.0	
134	57.6	
135	57.8	
136	57.4	
137	57.4	
138	57.4	
139	57.6	
140	53.4	
141	51.4	
142	50.7	
143	53.3	
144	53.6	
145	54.0	
146	54.5	
147	54.7	
148	54.8	
149	54.2	
150	54.6	
151	54.3	
152	53.7	
153	54.2	
154	54.6	
155	53.7	
156	55.8	
157	54.8	
158	57.0	
159	57.2	
160	57.4	
161	57.0	
162	57.2	
163	57.0	
164	57.2	



J3426_Proposed New Development Tall Oak Drive
Cotswold QLD 4350
Assessed receiver levels

2

Receiver	L10(18h) dB(A)	
165	57.1	
166	56.5	
167	57.1	
168	57.3	
169	57.1	
170	56.7	
171	56.2	
172	52.0	
173	60.3	
174	60.1	
175	59.8	
176	59.7	
177	59.7	
178	59.7	
179	59.3	
180	60.6	
181	60.7	
182	60.8	
183	60.7	
184	60.7	
185	60.6	
186	60.7	
187	60.7	
188	60.7	
189	60.8	
190	60.6	
191	60.6	
192	60.6	
193	60.5	
194	60.5	
195	60.3	
196	60.4	
197	60.4	
198	60.1	
199	60.5	
200	60.3	
201	60.4	
202	60.2	
203	60.1	
204	54.1	
205	49.7	



APPENDIX D – METEOROLOGICAL DATA

Date	Time	Wind Speed (m/s)	Rain (mm)
13/03/2025	10:30:00 AM	0.9566094	0
13/03/2025	10:45:00 AM	1.461556	0
13/03/2025	11:00:00 AM	1.459334	0
13/03/2025	11:15:00 AM	1.304	0
13/03/2025	11:30:00 AM	1.576001	0
13/03/2025	11:45:00 AM	1.697776	0
13/03/2025	12:00:00 PM	1.905889	0
13/03/2025	12:15:00 PM	1.905111	0
13/03/2025	12:30:00 PM	1.827335	0
13/03/2025	12:45:00 PM	1.483444	0
13/03/2025	1:00:00 PM	1.634333	0
13/03/2025	1:15:00 PM	1.390666	0
13/03/2025	1:30:00 PM	1.602221	0
13/03/2025	1:45:00 PM	1.540445	0
13/03/2025	2:00:00 PM	1.82611	0
13/03/2025	2:15:00 PM	1.423666	0
13/03/2025	2:30:00 PM	1.640556	0
13/03/2025	2:45:00 PM	1.651668	0
13/03/2025	3:00:00 PM	1.554777	0
13/03/2025	3:15:00 PM	1.679221	0
13/03/2025	3:30:00 PM	1.622333	0
13/03/2025	3:45:00 PM	1.630667	0
13/03/2025	4:00:00 PM	1.582443	0
13/03/2025	4:15:00 PM	1.526443	0
13/03/2025	4:30:00 PM	1.444221	0
13/03/2025	4:45:00 PM	1.280334	0
13/03/2025	5:00:00 PM	1.406222	0
13/03/2025	5:15:00 PM	1.033778	0
13/03/2025	5:30:00 PM	1.039444	0
13/03/2025	5:45:00 PM	0.6800001	0
13/03/2025	6:00:00 PM	0.7683338	0
13/03/2025	6:15:00 PM	0.6834452	0
13/03/2025	6:30:00 PM	0.5323333	0
13/03/2025	6:45:00 PM	0.6184444	0
13/03/2025	7:00:00 PM	1.052445	0
13/03/2025	7:15:00 PM	1.015667	0
13/03/2025	7:30:00 PM	0.9382222	0
13/03/2025	7:45:00 PM	1.094111	0
13/03/2025	8:00:00 PM	1.325667	0
13/03/2025	8:15:00 PM	1.312669	0
13/03/2025	8:30:00 PM	1.166111	0
13/03/2025	8:45:00 PM	1.442112	0



13/03/2025	9:00:00 PM	1.598335	0
13/03/2025	9:15:00 PM	1.597112	0
13/03/2025	9:30:00 PM	1.702557	0
13/03/2025	9:45:00 PM	1.557445	0
13/03/2025	10:00:00 PM	1.859443	0
13/03/2025	10:15:00 PM	1.754222	0
13/03/2025	10:30:00 PM	1.78289	0
13/03/2025	10:45:00 PM	1.785221	0
13/03/2025	11:00:00 PM	1.808332	0
13/03/2025	11:15:00 PM	1.696	0
13/03/2025	11:30:00 PM	1.706334	0
13/03/2025	11:45:00 PM	1.803	0
14/03/2025	12:00:00 AM	1.432668	0
14/03/2025	12:15:00 AM	1.662111	0
14/03/2025	12:30:00 AM	1.628443	0
14/03/2025	12:45:00 AM	1.663223	0
14/03/2025	1:00:00 AM	1.732001	0
14/03/2025	1:15:00 AM	1.593776	0
14/03/2025	1:30:00 AM	1.475222	0
14/03/2025	1:45:00 AM	2.246998	0
14/03/2025	2:00:00 AM	1.826222	0
14/03/2025	2:15:00 AM	2.097443	0
14/03/2025	2:30:00 AM	1.853001	0
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14/03/2025	5:15:00 AM	1.204106	0
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14/03/2025	6:15:00 AM	1.347333	0
14/03/2025	6:30:00 AM	1.592445	0
14/03/2025	6:45:00 AM	1.468075	0
14/03/2025	7:00:00 AM	1.54373	0
14/03/2025	7:15:00 AM	1.722	0
14/03/2025	7:30:00 AM	1.755778	0
14/03/2025	7:45:00 AM	1.927892	0
14/03/2025	8:00:00 AM	2.007677	0



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14/03/2025	8:45:00 AM	1.758112	0
14/03/2025	9:00:00 AM	1.757222	0
14/03/2025	9:15:00 AM	1.784667	0
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18/03/2025	6:15:00 AM	1.883778	0
18/03/2025	6:30:00 AM	1.879779	0
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20/03/2025	12:15:00 PM	2.003892	0
20/03/2025	12:30:00 PM	1.922	0
20/03/2025	12:45:00 PM	2.174113	0
20/03/2025	1:00:00 PM	1.902445	0
20/03/2025	1:15:00 PM	1.902779	0
20/03/2025	1:30:00 PM	1.879778	0
20/03/2025	1:45:00 PM	1.476546	0



APPENDIX E – GLOSSARY OF ACOUSTIC TERMS

The following is a brief description of the technical terms used to describe traffic noise to assist in understanding the technical issues presented in this document.

Event maximum sound pressure level ($L_{A\%,adj,T}$), L01

The L01 level is calculated as the noise level equalled and exceeded for 1% of the measurement time, for example 9 seconds in any 15 minute interval. L01 is an appropriate level to characterise single events, such as from impulsive or distinctive pass-by noise. In this Report, the measured L01 levels for day/evening/night are not averaged but are arranged from low to high in the relevant day/evening/night interval and the value that is found at the 90th percentile (L10 of L01 sample) in the interval is recorded as its “L01” level. The level can be adjusted for tonality or impulsiveness.

Average maximum sound pressure level ($L_{A\%,adj,T}$), L10

The “L10” level is an indicator of “steady-state” noise or intrusive noise conditions from traffic, music and other relatively non-impulsive noise sources. The L10 level is calculated as the noise level equalled and exceeded for 10% the measurement time, for example 90 seconds in any 15 minute interval. The measured L10 time-intervals for day/evening/night are arithmetically averaged to present the “average maximum” levels of the environment for day/evening/night. The level can be adjusted for tonality or impulsiveness.

Background sound pressure level ($L_{A90,T}$), L90

Commonly called the "L90" or "background" level and is an indicator of the quietest times of day, evening or night. The L90 level is calculated as the noise level equalled and exceeded for 90% the measurement time. The measured L90 time-intervals are arithmetically averaged to present the “average background” levels of the environment for day/evening/night. The level is recorded in the absence of any noise under investigation. The level is not adjusted for tonality or impulsiveness.

Equivalent Continuous or time average sound pressure level ($L_{Aeq,T}$), Leq

Commonly called the "Leq" level it is the logarithmic average noise level from all sources far and near. The maximum 1-hour levels within the day/evening/night time intervals are referenced for building design. The level can be adjusted for tonality.

Façade-adjusted level

A sound level that is measured at a distance of 1.0 metre from a wall or facade. The level is nominally 2.5 dB higher than the free-field level.

Free-field level

A sound level that is measured at a distance of more than 3.5 metres from a wall or facade.

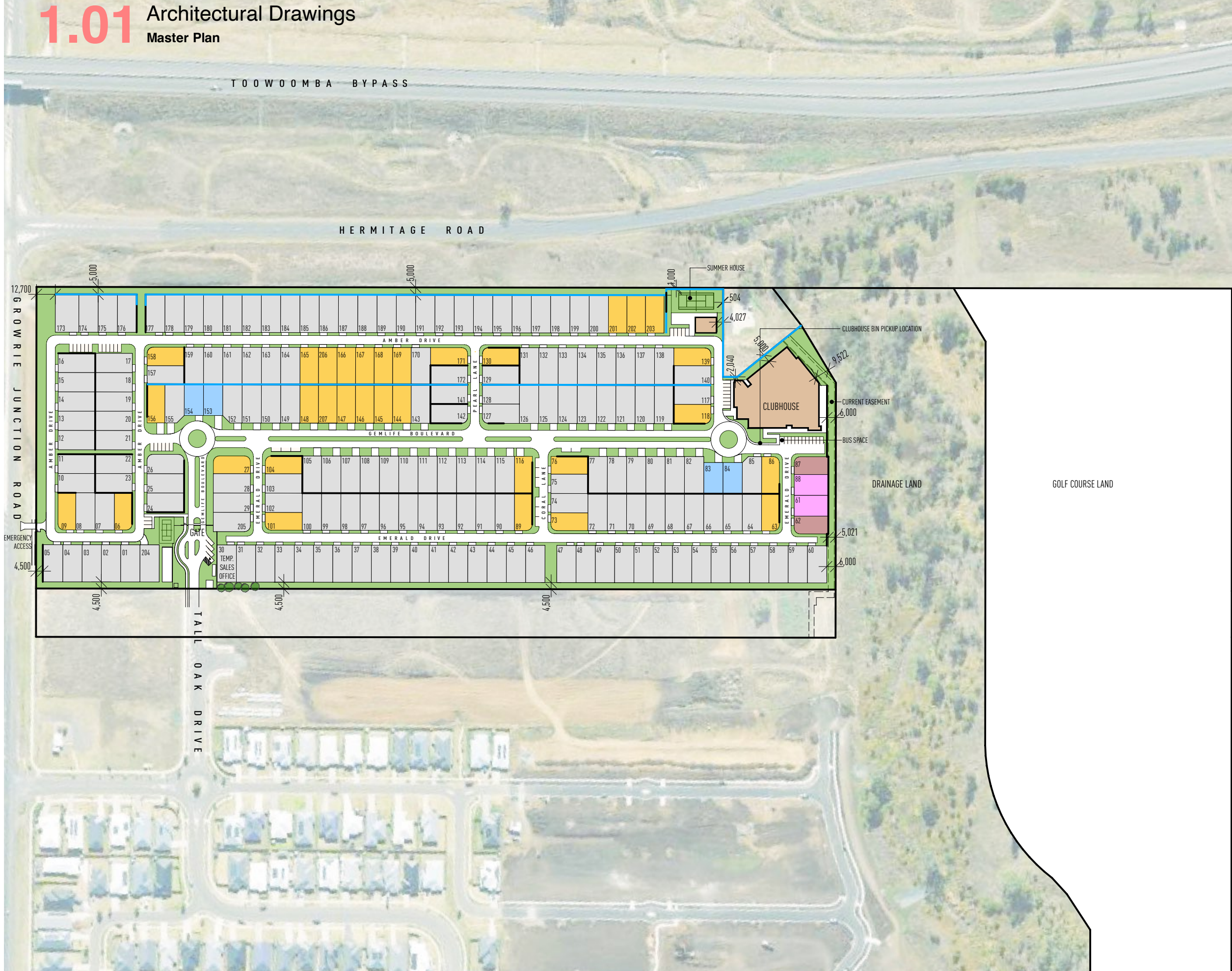
Weighted Sound Reduction Index, R_w

A single number value used to compare the sound reduction index of building elements. Similar to the Sound Transmission Class (STC) rating that is still in common use. R_w and STC are not identical though may be considered, for most applications, as being interchangeable. A high R_w indicates high sound reduction.

Appendix B Development Plans

1.01 Architectural Drawings

Master Plan



SITE 1

TOTAL NUMBER OF LOTS 207

LOT SIZE	YIELD	%
13.0m x 25.0m STANDARD LOTS	167	82
12.0m x 25.0m SMALL LOTS	17	8
13.0m x 21.0m SMALL LOTS	4	1
12.0m x 23.0m SMALL LOTS	2	1
14.0m x 23.0m SMALL LOTS	17	8
— ACOUSTIC FENCE (REFER STATEMENT OF LANDSCAPE INTENT)		

STATISTICS

VISITOR CAR PARKING	57 + 1 MINI BUS SPACE
SITE AREA	106 526 m ² (approx)
SITE COVER	40 556 m ²
TOTAL SITE OVER (LOTS + ROADS + FACILITIES)	58 845 m ²
SITE PERIMETER	1 517 m

LAND BUDGET

SITE AREA	14.545 ha	100%
MHE LOTS	7.560 ha	52%
COMMUNITY FACILITIES	0.340 ha	2%
GOLF COURSE	3.937 ha	27%
LANDSCAPING / PEDESTRIAN CONNECTION / STORMWATER	0.979 ha	7%
INTERNAL DRIVEWAYS	1.729 ha	12%

VIRAGE ARCHITECTS

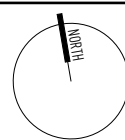
LEVEL 1 33 ELKHORN AVENUE
SURFERS PARADISE, QLD. 4217 AUSTRALIA
PO BOX 42, ISLE OF CAPRI, QLD. 4217

TEL 07 5527 5300
EMAIL INFO@JPD.COM.AU
WEB WWW.JPD.COM.AU



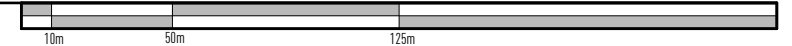
ISSUE	DATE	DESCRIPTION
V	01.05.26	Master plan updated
U1	12.03.26	Master plan updated
U	13.10.25	Master plan updated
T	12.09.25	Master plan updated
S	07.08.25	Entry statement amended
R	30.07.25	Entry statement amended
Q	22.07.25	Bin pickup location added

PROJECT Proposed New Development
Tall Oak Drive Cotswold QLD
CLIENT GemLife



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DRAWING TITLE BP1495/1.01



SCALE 1:2500 @ A3
Master Plan

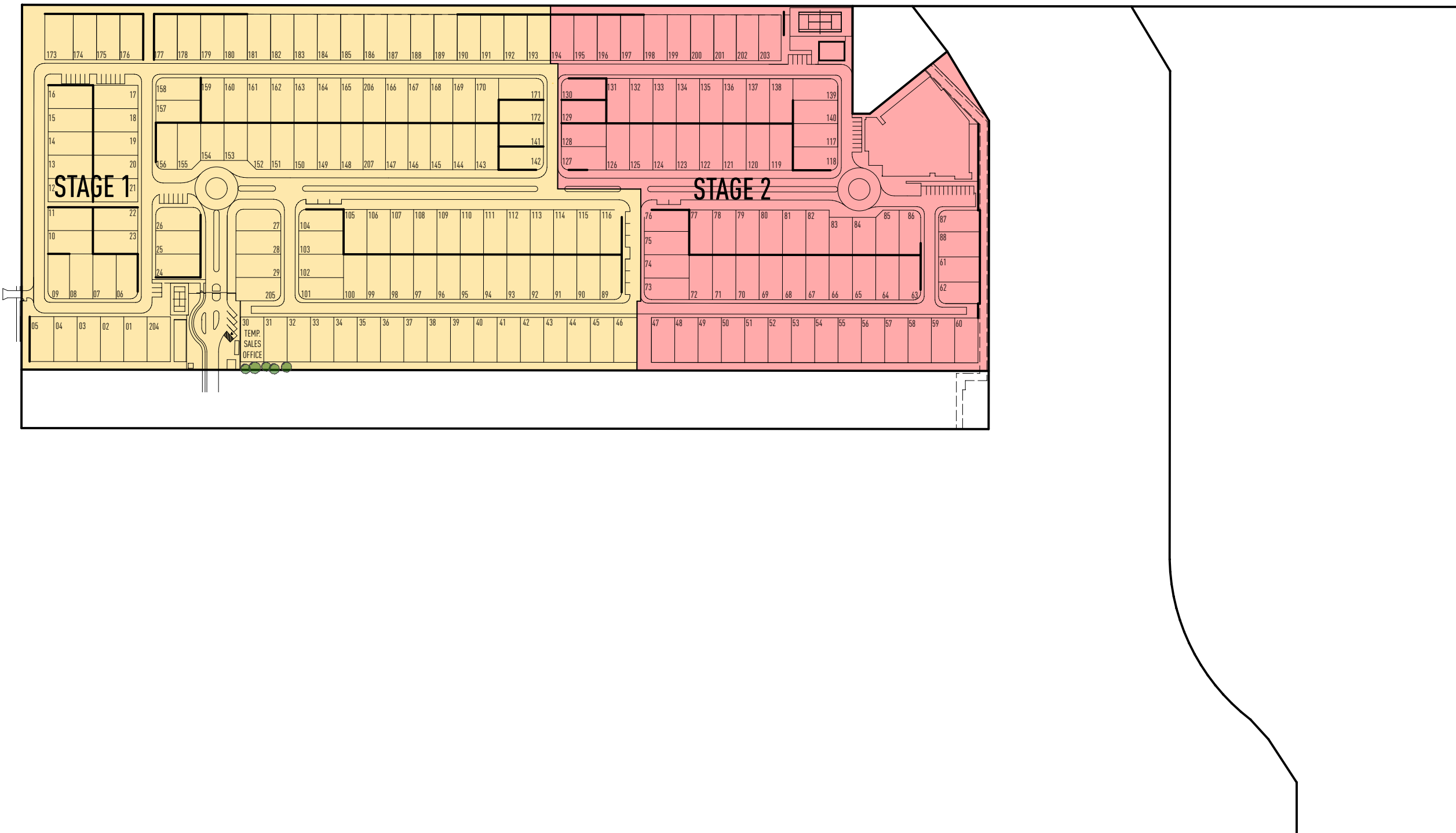


1.04 Architectural Drawings

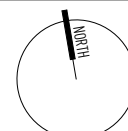
Staging Plan

TABLE

	STAGE 1	131 + PICKLE BALL COURT AND ENTRY
	STAGE 2	76 + CLUBHOUSE AND TENNIS COURT



ISSUE	DATE	DESCRIPTION
G	01.05.26	Staging revised
F	12.09.25	Layout revised
E	10.07.25	Layout revised
D	04.09.24	Updated plans
C	04.09.24	Updated plans
B	14.08.24	Updated plans
A	21.06.24	Updated plans

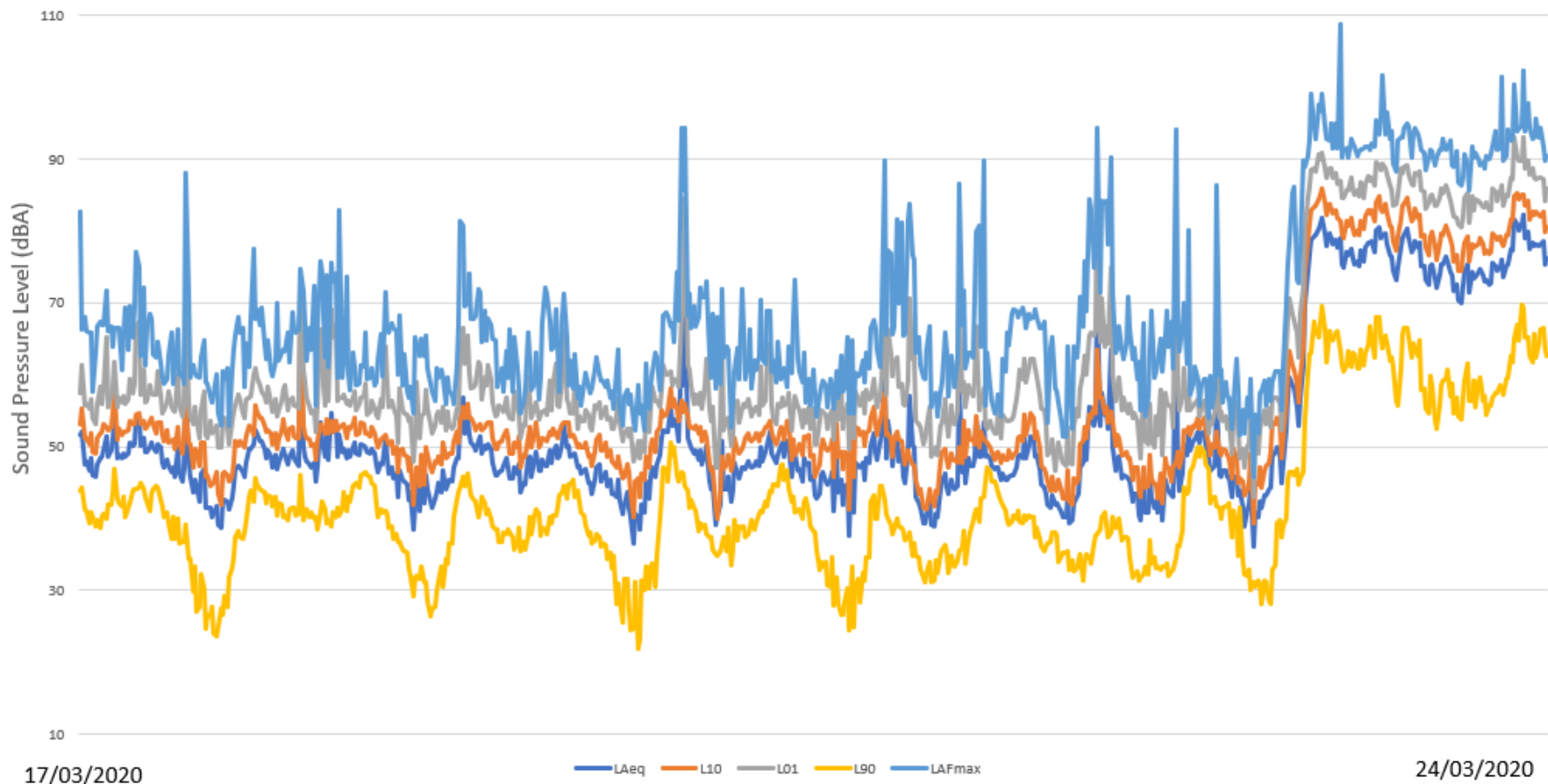


THE WORKS DESCRIBED ON THIS AND ACCOMPANYING DRAWINGS ASSOCIATED WITH THIS PROJECT PRODUCED BY JARED POOLE DESIGN ARE COVERED BY COPYRIGHT. THE WORKS DESCRIBED ARE APPLICABLE TO THE PROJECT SITE ONLY AND MUST NOT BE USED FOR ANY OTHER PURPOSE. WORKS CANNOT BE COPIED OR REPRODUCED BY ANY MEANS WITHOUT WRITTEN PERMISSION OF JARED POOLE DESIGN.

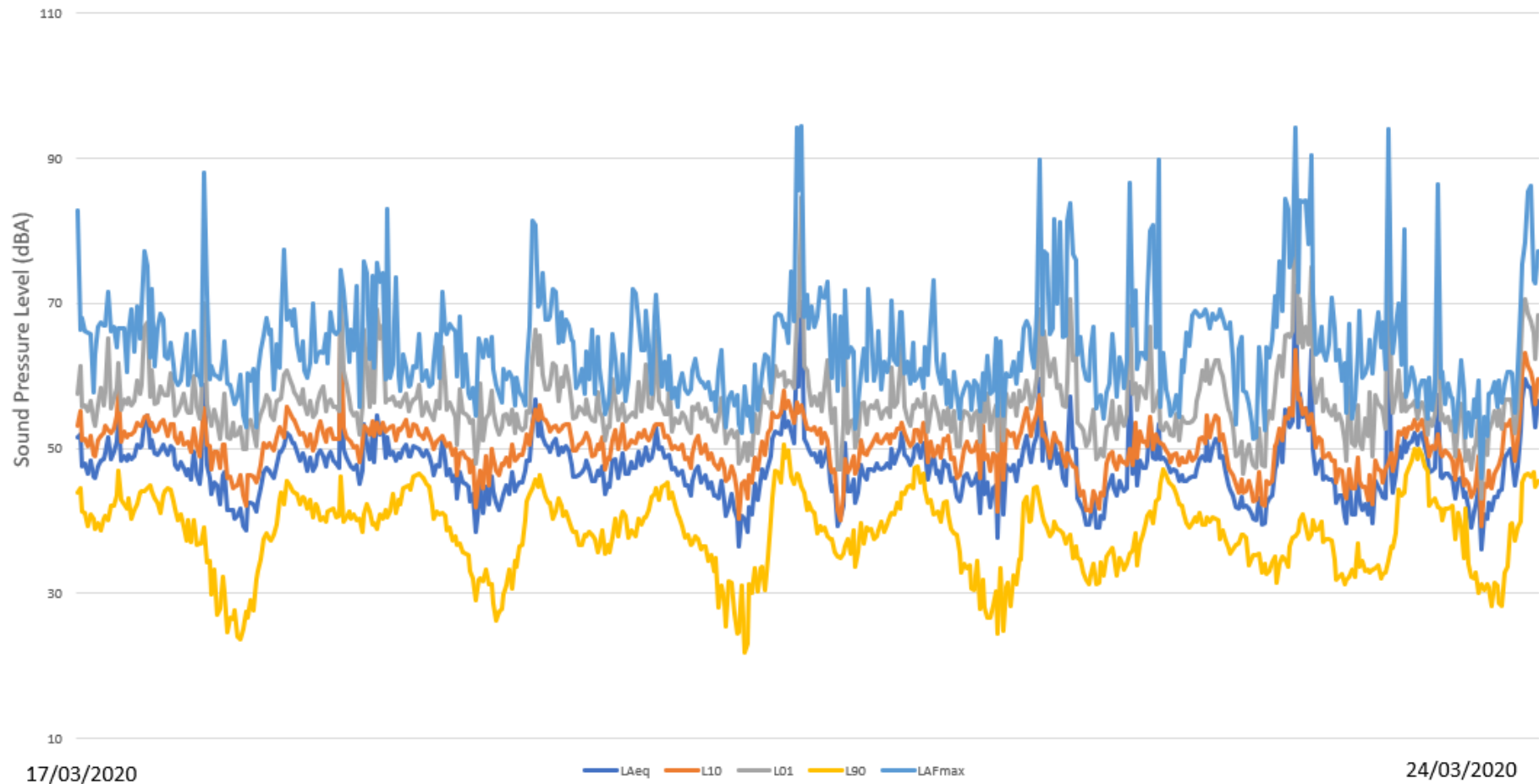


Appendix C Ambient Noise Survey Data

Time Series Data (15 minute data)
Country Club Living
Gowrie Junction Road, Cotswold Hills
17/03/2020 - 24/03/2020



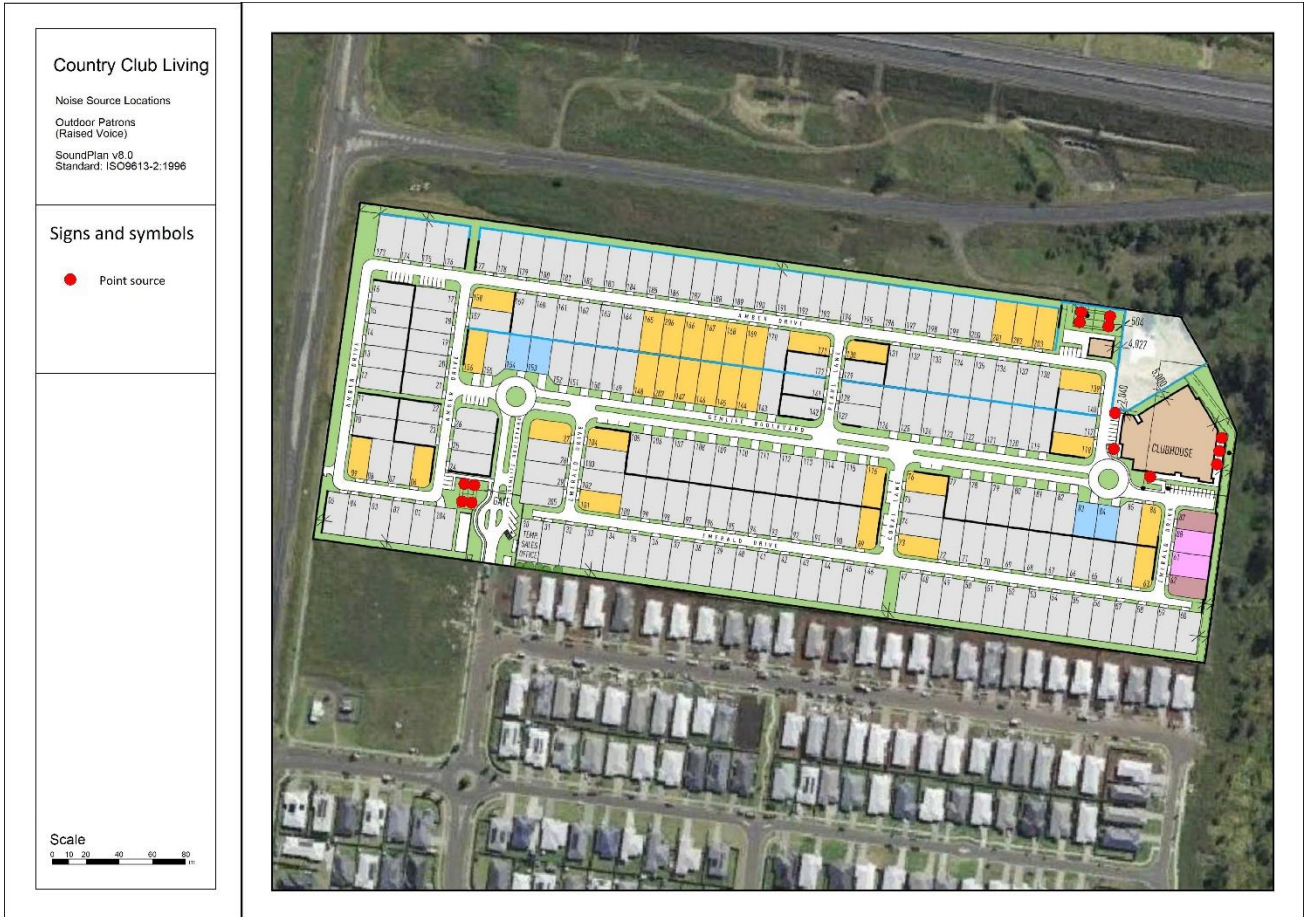
Time Series Data (15 minute data)
Country Club Living
Gowrie Junction Road, Cotswold Hills
17/03/2020 - 24/03/2020
Affected data excluded (7:30am 23/3/2020 to 11:45am 24/3/2020)



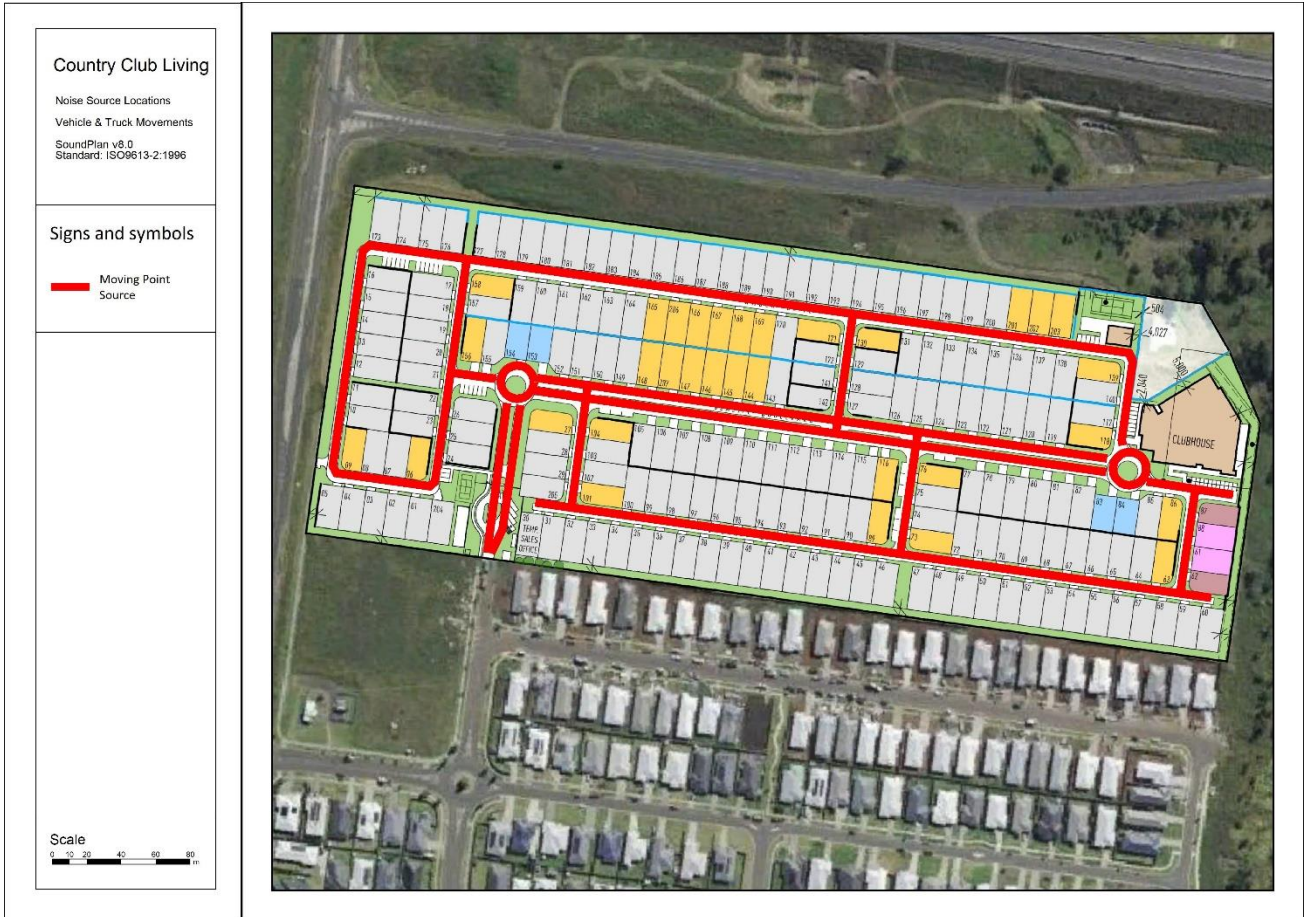
Appendix D Noise Source Locations



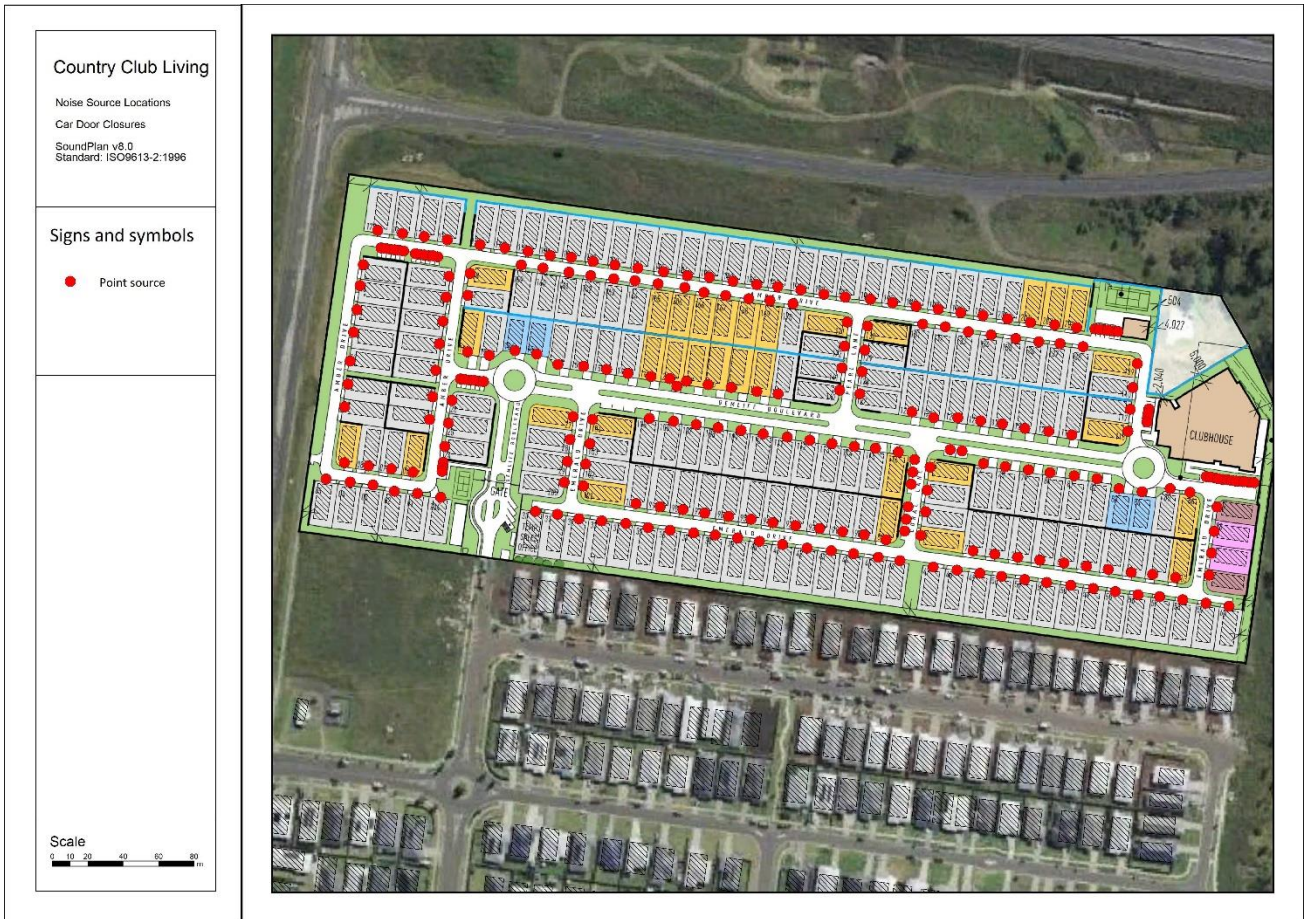
Clubhouse (including rooftop mechanical plant) noise source locations



Outdoor patrons source locations



Light and heavy vehicle movements source locations



Car door closures noise source locations

Appendix E Noise Contour Diagrams

Variable Noise Sources

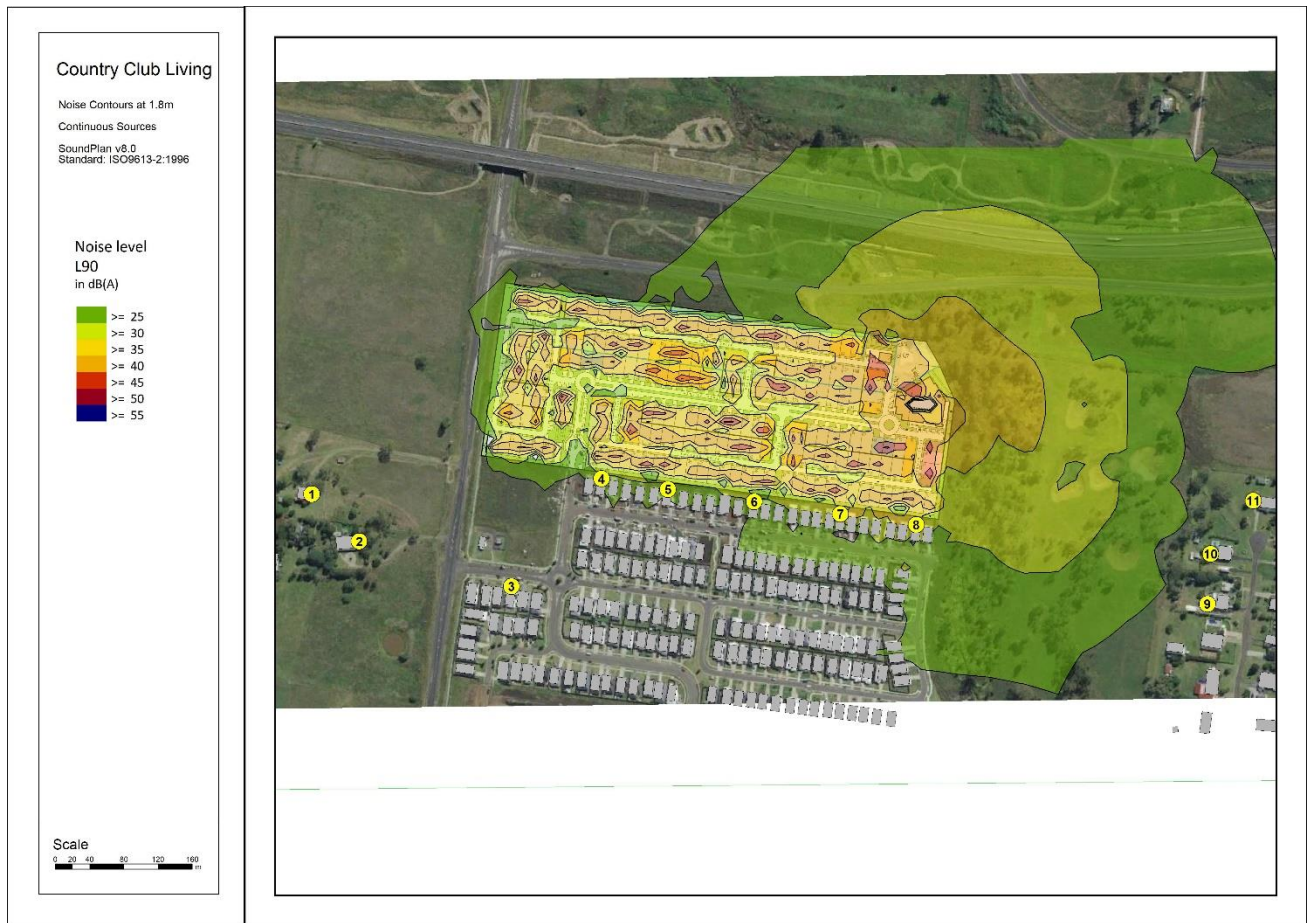


Noise contours at 1.8m for daytime cumulative variable noise sources. Levels are in dB(A), $L_{eq,1hr}$



Noise contours at 1.8m for evening cumulative variable noise sources. Levels are in dB(A), $L_{eq,1hr}$

Continuous Noise Sources



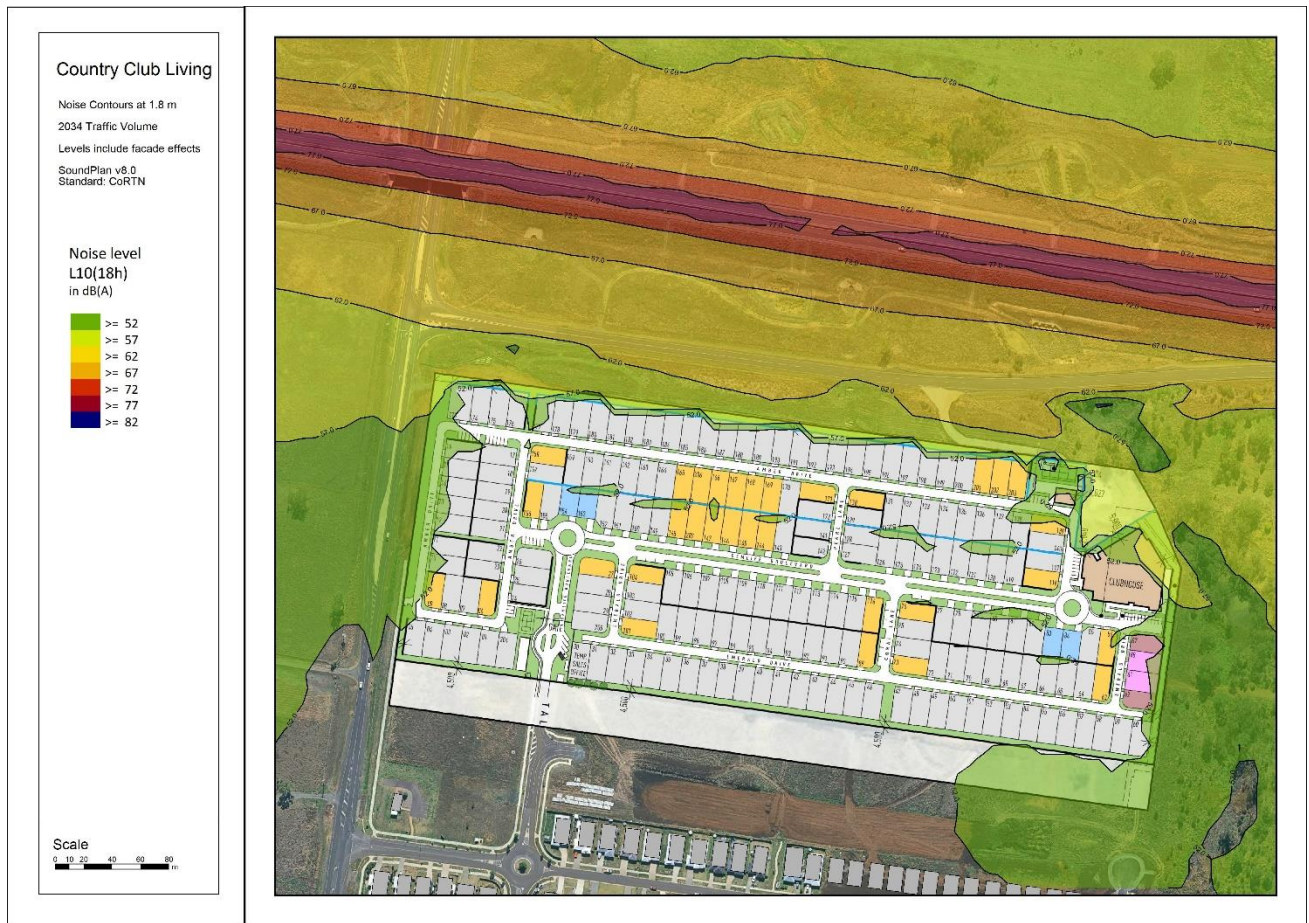
Noise contours at 1.8m for continuous noise sources during all periods. Levels are in dB(A), $L_{90,1hr}$

Discrete Noise Sources



Noise contours at 1.8m for discrete noise sources during the night-time period. Levels are in dB(A), L_{max}

Reverse Amenity Noise Sources



Noise contours at 1.8m for the Warrego Highway/Toowoomba Bypass noise source during all periods. Levels are in dB(A), L₁₀, 18hr

Appendix F Predicted Road Traffic Noise Levels (Warrego Highway/Toowoomba Bypass)

Comparison of predicted road traffic noise levels with the habitable rooms noise assessment criteria

Proposed Lot Number	Façade Direction	Floor	Predicted 2034 noise levels (LA10,18hr) (free-field)	QDC Category	SDAP State Code 1 habitable rooms noise assessment criteria (LA10,18hr)
1	E	G	48	0	60
1	S	G	43	0	60
1	W	G	47	0	60
1	N	G	51	0	60
2	E	G	47	0	60
2	S	G	43	0	60
2	W	G	47	0	60
2	N	G	51	0	60
3	E	G	47	0	60
3	S	G	43	0	60
3	W	G	47	0	60
3	N	G	51	0	60
4	E	G	48	0	60
4	S	G	43	0	60
4	W	G	51	0	60
4	N	G	53	0	60
5	E	G	47	0	60
5	S	G	43	0	60
5	W	G	53	0	60
5	N	G	54	0	60
6	E	G	50	0	60
6	S	G	44	0	60
6	W	G	48	0	60
6	N	G	52	0	60
7	E	G	48	0	60
7	S	G	43	0	60
7	W	G	47	0	60

Proposed Lot Number	Façade Direction	Floor	Predicted 2034 noise levels (LA10,18hr) (free-field)	QDC Category	SDAP State Code 1 habitable rooms noise assessment criteria (LA10,18hr)
7	N	G	52	0	60
8	E	G	48	0	60
8	S	G	44	0	60
8	W	G	48	0	60
8	N	G	51	0	60
9	E	G	48	0	60
9	S	G	44	0	60
9	W	G	54	0	60
9	N	G	55	0	60
10	N	G	51	0	60
10	E	G	50	0	60
10	S	G	44	0	60
10	W	G	55	0	60
11	N	G	52	0	60
11	E	G	51	0	60
11	S	G	44	0	60
11	W	G	55	0	60
12	N	G	51	0	60
12	E	G	51	0	60
12	S	G	44	0	60
12	W	G	56	0	60
13	N	G	52	0	60
13	E	G	51	0	60
13	S	G	45	0	60
13	W	G	56	0	60
14	N	G	52	0	60
14	E	G	51	0	60
14	S	G	45	0	60
14	W	G	56	0	60

Proposed Lot Number	Façade Direction	Floor	Predicted 2034 noise levels (LA10,18hr) (free-field)	QDC Category	SDAP State Code 1 habitable rooms noise assessment criteria (LA10,18hr)
15	N	G	50	0	60
15	E	G	51	0	60
15	S	G	45	0	60
15	W	G	57	0	60
16	N	G	58	1	60
16	E	G	51	0	60
16	S	G	46	0	60
16	W	G	57	0	60
17	N	G	54	0	60
17	E	G	52	0	60
17	S	G	46	0	60
17	W	G	53	0	60
18	N	G	51	0	60
18	E	G	51	0	60
18	S	G	46	0	60
18	W	G	49	0	60
19	N	G	51	0	60
19	E	G	51	0	60
19	S	G	45	0	60
19	W	G	48	0	60
20	N	G	50	0	60
20	E	G	50	0	60
20	S	G	45	0	60
20	W	G	48	0	60
22	N	G	51	0	60
22	E	G	50	0	60
22	S	G	44	0	60
22	W	G	48	0	60
23	N	G	50	0	60

Proposed Lot Number	Façade Direction	Floor	Predicted 2034 noise levels (LA10,18hr) (free-field)	QDC Category	SDAP State Code 1 habitable rooms noise assessment criteria (LA10,18hr)
23	E	G	50	0	60
23	S	G	44	0	60
23	W	G	47	0	60
24	S	G	44	0	60
24	W	G	49	0	60
24	N	G	50	0	60
24	E	G	49	0	60
25	N	G	51	0	60
25	E	G	49	0	60
25	S	G	44	0	60
25	W	G	50	0	60
26	N	G	52	0	60
26	E	G	50	0	60
26	S	G	44	0	60
26	W	G	50	0	60
27	N	G	53	0	60
27	E	G	52	0	60
27	S	G	44	0	60
27	W	G	51	0	60
28	N	G	50	0	60
28	E	G	50	0	60
28	S	G	44	0	60
28	W	G	51	0	60
29	N	G	50	0	60
29	E	G	50	0	60
29	S	G	44	0	60
29	W	G	50	0	60
30	E	G	48	0	60
30	S	G	43	0	60

Proposed Lot Number	Façade Direction	Floor	Predicted 2034 noise levels (LA10,18hr) (free-field)	QDC Category	SDAP State Code 1 habitable rooms noise assessment criteria (LA10,18hr)
30	W	G	50	0	60
30	N	G	51	0	60
31	E	G	47	0	60
31	S	G	43	0	60
31	W	G	47	0	60
31	N	G	51	0	60
32	E	G	47	0	60
32	S	G	43	0	60
32	W	G	47	0	60
32	N	G	51	0	60
33	E	G	47	0	60
33	S	G	43	0	60
33	W	G	47	0	60
33	N	G	51	0	60
34	E	G	47	0	60
34	S	G	43	0	60
34	W	G	47	0	60
34	N	G	50	0	60
35	E	G	47	0	60
35	S	G	43	0	60
35	W	G	47	0	60
35	N	G	51	0	60
36	E	G	47	0	60
36	S	G	43	0	60
36	W	G	47	0	60
36	N	G	51	0	60
37	E	G	47	0	60
37	S	G	43	0	60
37	W	G	47	0	60

Proposed Lot Number	Façade Direction	Floor	Predicted 2034 noise levels (LA10,18hr) (free-field)	QDC Category	SDAP State Code 1 habitable rooms noise assessment criteria (LA10,18hr)
37	N	G	51	0	60
38	E	G	48	0	60
38	S	G	43	0	60
38	W	G	47	0	60
38	N	G	51	0	60
39	E	G	47	0	60
39	S	G	43	0	60
39	W	G	47	0	60
39	N	G	51	0	60
40	E	G	48	0	60
40	S	G	43	0	60
40	W	G	47	0	60
40	N	G	51	0	60
41	E	G	48	0	60
41	S	G	43	0	60
41	W	G	47	0	60
41	N	G	51	0	60
42	E	G	47	0	60
42	S	G	43	0	60
42	W	G	47	0	60
42	N	G	51	0	60
43	E	G	48	0	60
43	S	G	43	0	60
43	W	G	47	0	60
43	N	G	51	0	60
44	E	G	48	0	60
44	S	G	43	0	60
44	W	G	47	0	60
44	N	G	52	0	60

Proposed Lot Number	Façade Direction	Floor	Predicted 2034 noise levels (LA10,18hr) (free-field)	QDC Category	SDAP State Code 1 habitable rooms noise assessment criteria (LA10,18hr)
45	E	G	48	0	60
45	S	G	43	0	60
45	W	G	47	0	60
45	N	G	52	0	60
46	E	G	50	0	60
46	S	G	43	0	60
46	W	G	47	0	60
46	N	G	52	0	60
47	E	G	48	0	60
47	S	G	43	0	60
47	W	G	48	0	60
47	N	G	51	0	60
48	E	G	48	0	60
48	S	G	43	0	60
48	W	G	47	0	60
48	N	G	51	0	60
49	E	G	48	0	60
49	S	G	43	0	60
49	W	G	47	0	60
49	N	G	51	0	60
50	E	G	48	0	60
50	S	G	43	0	60
50	W	G	47	0	60
50	N	G	51	0	60
51	E	G	48	0	60
51	S	G	43	0	60
51	W	G	47	0	60
51	N	G	52	0	60
52	E	G	48	0	60

Proposed Lot Number	Façade Direction	Floor	Predicted 2034 noise levels (LA10,18hr) (free-field)	QDC Category	SDAP State Code 1 habitable rooms noise assessment criteria (LA10,18hr)
52	S	G	43	0	60
52	W	G	47	0	60
52	N	G	52	0	60
53	E	G	48	0	60
53	S	G	43	0	60
53	W	G	47	0	60
53	N	G	52	0	60
54	E	G	49	0	60
54	S	G	43	0	60
54	W	G	47	0	60
54	N	G	52	0	60
55	E	G	48	0	60
55	S	G	43	0	60
55	W	G	48	0	60
55	N	G	52	0	60
56	E	G	49	0	60
56	S	G	43	0	60
56	W	G	47	0	60
56	N	G	52	0	60
57	E	G	49	0	60
57	S	G	43	0	60
57	W	G	48	0	60
57	N	G	53	0	60
58	E	G	49	0	60
58	S	G	43	0	60
58	W	G	47	0	60
58	N	G	52	0	60
59	E	G	49	0	60
59	S	G	43	0	60

Proposed Lot Number	Façade Direction	Floor	Predicted 2034 noise levels (LA10,18hr) (free-field)	QDC Category	SDAP State Code 1 habitable rooms noise assessment criteria (LA10,18hr)
59	W	G	48	0	60
59	N	G	52	0	60
60	E	G	56	0	60
60	S	G	43	0	60
60	W	G	48	0	60
60	N	G	56	0	60
61	N	G	51	0	60
61	E	G	57	0	60
61	S	G	44	0	60
61	W	G	50	0	60
62	N	G	50	0	60
62	E	G	57	0	60
62	S	G	44	0	60
62	W	G	50	0	60
63	E	G	53	0	60
63	S	G	44	0	60
63	W	G	49	0	60
63	N	G	54	0	60
64	E	G	50	0	60
64	S	G	44	0	60
64	W	G	50	0	60
64	N	G	54	0	60
65	E	G	51	0	60
65	S	G	44	0	60
65	W	G	49	0	60
65	N	G	56	0	60
66	E	G	51	0	60
66	S	G	44	0	60
66	W	G	49	0	60

Proposed Lot Number	Façade Direction	Floor	Predicted 2034 noise levels (LA10,18hr) (free-field)	QDC Category	SDAP State Code 1 habitable rooms noise assessment criteria (LA10,18hr)
66	N	G	56	0	60
67	E	G	52	0	60
67	S	G	44	0	60
67	W	G	49	0	60
67	N	G	56	0	60
68	E	G	51	0	60
68	S	G	44	0	60
68	W	G	48	0	60
68	N	G	56	0	60
69	E	G	50	0	60
69	S	G	44	0	60
69	W	G	49	0	60
69	N	G	56	0	60
70	E	G	51	0	60
70	S	G	44	0	60
70	W	G	49	0	60
70	N	G	55	0	60
71	E	G	50	0	60
71	S	G	44	0	60
71	W	G	49	0	60
71	N	G	55	0	60
72	E	G	50	0	60
72	S	G	44	0	60
72	W	G	49	0	60
72	N	G	54	0	60
73	N	G	49	0	60
73	E	G	49	0	60
73	S	G	44	0	60
73	W	G	49	0	60

Proposed Lot Number	Façade Direction	Floor	Predicted 2034 noise levels (LA10,18hr) (free-field)	QDC Category	SDAP State Code 1 habitable rooms noise assessment criteria (LA10,18hr)
74	N	G	52	0	60
74	E	G	50	0	60
74	S	G	44	0	60
74	W	G	50	0	60
75	N	G	51	0	60
75	E	G	51	0	60
75	S	G	44	0	60
75	W	G	50	0	60
76	N	G	55	0	60
76	E	G	54	0	60
76	S	G	44	0	60
76	W	G	50	0	60
77	E	G	49	0	60
77	S	G	44	0	60
77	W	G	48	0	60
77	N	G	54	0	60
78	E	G	50	0	60
78	S	G	44	0	60
78	W	G	48	0	60
78	N	G	55	0	60
79	E	G	50	0	60
79	S	G	44	0	60
79	W	G	48	0	60
79	N	G	55	0	60
80	E	G	50	0	60
80	S	G	44	0	60
80	W	G	48	0	60
80	N	G	55	0	60
81	E	G	50	0	60

Proposed Lot Number	Façade Direction	Floor	Predicted 2034 noise levels (LA10,18hr) (free-field)	QDC Category	SDAP State Code 1 habitable rooms noise assessment criteria (LA10,18hr)
81	S	G	44	0	60
81	W	G	48	0	60
81	N	G	55	0	60
82	E	G	52	0	60
82	S	G	44	0	60
82	W	G	49	0	60
82	N	G	55	0	60
83	E	G	50	0	60
83	S	G	44	0	60
83	W	G	49	0	60
83	N	G	55	0	60
84	E	G	49	0	60
84	S	G	44	0	60
84	W	G	49	0	60
84	N	G	54	0	60
85	E	G	49	0	60
85	S	G	44	0	60
85	W	G	50	0	60
85	N	G	54	0	60
86	E	G	54	0	60
86	S	G	44	0	60
86	W	G	49	0	60
86	N	G	54	0	60
87	N	G	58	1	60
87	E	G	58	1	60
87	S	G	45	0	60
87	W	G	51	0	60
88	N	G	51	0	60
88	E	G	57	0	60

Proposed Lot Number	Façade Direction	Floor	Predicted 2034 noise levels (LA10,18hr) (free-field)	QDC Category	SDAP State Code 1 habitable rooms noise assessment criteria (LA10,18hr)
88	S	G	44	0	60
88	W	G	51	0	60
89	E	G	52	0	60
89	S	G	44	0	60
89	W	G	48	0	60
89	N	G	54	0	60
90	E	G	49	0	60
90	S	G	44	0	60
90	W	G	49	0	60
90	N	G	54	0	60
91	E	G	49	0	60
91	S	G	44	0	60
91	W	G	48	0	60
91	N	G	54	0	60
92	E	G	49	0	60
92	S	G	44	0	60
92	W	G	48	0	60
92	N	G	54	0	60
93	E	G	49	0	60
93	S	G	44	0	60
93	W	G	48	0	60
93	N	G	54	0	60
94	E	G	49	0	60
94	S	G	44	0	60
94	W	G	48	0	60
94	N	G	54	0	60
95	E	G	49	0	60
95	S	G	44	0	60
95	W	G	48	0	60

Proposed Lot Number	Façade Direction	Floor	Predicted 2034 noise levels (LA10,18hr) (free-field)	QDC Category	SDAP State Code 1 habitable rooms noise assessment criteria (LA10,18hr)
95	N	G	54	0	60
96	E	G	49	0	60
96	S	G	44	0	60
96	W	G	48	0	60
96	N	G	54	0	60
97	E	G	49	0	60
97	S	G	44	0	60
97	W	G	48	0	60
97	N	G	53	0	60
98	E	G	48	0	60
98	S	G	44	0	60
98	W	G	48	0	60
98	N	G	53	0	60
99	E	G	48	0	60
99	S	G	44	0	60
99	W	G	48	0	60
99	N	G	53	0	60
100	E	G	49	0	60
100	S	G	44	0	60
100	W	G	48	0	60
100	N	G	53	0	60
101	N	G	49	0	60
101	E	G	48	0	60
101	S	G	44	0	60
101	W	G	49	0	60
102	N	G	51	0	60
102	E	G	49	0	60
102	S	G	44	0	60
102	W	G	49	0	60

Proposed Lot Number	Façade Direction	Floor	Predicted 2034 noise levels (LA10,18hr) (free-field)	QDC Category	SDAP State Code 1 habitable rooms noise assessment criteria (LA10,18hr)
103	N	G	50	0	60
103	E	G	50	0	60
103	S	G	44	0	60
103	W	G	50	0	60
104	N	G	54	0	60
104	E	G	50	0	60
104	S	G	44	0	60
104	W	G	50	0	60
105	E	G	49	0	60
105	S	G	44	0	60
105	W	G	48	0	60
105	N	G	53	0	60
106	E	G	48	0	60
106	S	G	44	0	60
106	W	G	48	0	60
106	N	G	53	0	60
107	E	G	48	0	60
107	S	G	44	0	60
107	W	G	48	0	60
107	N	G	53	0	60
108	E	G	49	0	60
108	S	G	44	0	60
108	W	G	48	0	60
108	N	G	53	0	60
109	E	G	49	0	60
109	S	G	44	0	60
109	W	G	48	0	60
109	N	G	54	0	60
110	E	G	49	0	60

Proposed Lot Number	Façade Direction	Floor	Predicted 2034 noise levels (LA10,18hr) (free-field)	QDC Category	SDAP State Code 1 habitable rooms noise assessment criteria (LA10,18hr)
110	S	G	44	0	60
110	W	G	48	0	60
110	N	G	54	0	60
111	E	G	49	0	60
111	S	G	44	0	60
111	W	G	48	0	60
111	N	G	54	0	60
112	E	G	49	0	60
112	S	G	44	0	60
112	W	G	48	0	60
112	N	G	53	0	60
113	E	G	49	0	60
113	S	G	44	0	60
113	W	G	48	0	60
113	N	G	54	0	60
114	E	G	49	0	60
114	S	G	44	0	60
114	W	G	48	0	60
114	N	G	54	0	60
115	E	G	49	0	60
115	S	G	44	0	60
115	W	G	49	0	60
115	N	G	54	0	60
116	E	G	51	0	60
116	S	G	44	0	60
116	W	G	48	0	60
116	N	G	54	0	60
117	N	G	52	0	60
117	E	G	54	0	60

Proposed Lot Number	Façade Direction	Floor	Predicted 2034 noise levels (LA10,18hr) (free-field)	QDC Category	SDAP State Code 1 habitable rooms noise assessment criteria (LA10,18hr)
117	S	G	46	0	60
117	W	G	50	0	60
118	N	G	52	0	60
118	E	G	53	0	60
118	S	G	45	0	60
118	W	G	49	0	60
119	E	G	53	0	60
119	S	G	45	0	60
119	W	G	51	0	60
119	N	G	57	0	60
120	E	G	53	0	60
120	S	G	45	0	60
120	W	G	50	0	60
120	N	G	58	1	60
121	E	G	51	0	60
121	S	G	45	0	60
121	W	G	50	0	60
121	N	G	58	1	60
122	E	G	51	0	60
122	S	G	45	0	60
122	W	G	50	0	60
122	N	G	58	1	60
123	E	G	52	0	60
123	S	G	45	0	60
123	W	G	50	0	60
123	N	G	57	0	60
124	E	G	52	0	60
124	S	G	45	0	60
124	W	G	50	0	60

Proposed Lot Number	Façade Direction	Floor	Predicted 2034 noise levels (LA10,18hr) (free-field)	QDC Category	SDAP State Code 1 habitable rooms noise assessment criteria (LA10,18hr)
124	N	G	57	0	60
125	E	G	51	0	60
125	S	G	45	0	60
125	W	G	50	0	60
125	N	G	57	0	60
126	E	G	51	0	60
126	S	G	45	0	60
126	W	G	50	0	60
126	N	G	57	0	60
127	N	G	51	0	60
127	E	G	50	0	60
127	S	G	45	0	60
127	W	G	51	0	60
128	N	G	55	0	60
128	E	G	52	0	60
128	S	G	46	0	60
128	W	G	51	0	60
129	N	G	53	0	60
129	E	G	52	0	60
129	S	G	46	0	60
129	W	G	51	0	60
130	N	G	55	0	60
130	E	G	52	0	60
130	S	G	46	0	60
130	W	G	51	0	60
131	E	G	50	0	60
131	S	G	46	0	60
131	W	G	49	0	60
131	N	G	54	0	60

Proposed Lot Number	Façade Direction	Floor	Predicted 2034 noise levels (LA10,18hr) (free-field)	QDC Category	SDAP State Code 1 habitable rooms noise assessment criteria (LA10,18hr)
132	E	G	50	0	60
132	S	G	46	0	60
132	W	G	49	0	60
132	N	G	54	0	60
133	E	G	51	0	60
133	S	G	46	0	60
133	W	G	50	0	60
133	N	G	54	0	60
134	E	G	51	0	60
134	S	G	46	0	60
134	W	G	50	0	60
134	N	G	54	0	60
135	E	G	50	0	60
135	S	G	46	0	60
135	W	G	50	0	60
135	N	G	54	0	60
136	E	G	51	0	60
136	S	G	46	0	60
136	W	G	49	0	60
136	N	G	55	0	60
137	E	G	52	0	60
137	S	G	46	0	60
137	W	G	50	0	60
137	N	G	56	0	60
138	E	G	51	0	60
138	S	G	46	0	60
138	W	G	50	0	60
138	N	G	56	0	60
139	N	G	57	0	60

Proposed Lot Number	Façade Direction	Floor	Predicted 2034 noise levels (LA10,18hr) (free-field)	QDC Category	SDAP State Code 1 habitable rooms noise assessment criteria (LA10,18hr)
139	E	G	54	0	60
139	S	G	46	0	60
139	W	G	51	0	60
140	N	G	52	0	60
140	E	G	54	0	60
140	S	G	46	0	60
140	W	G	51	0	60
141	N	G	53	0	60
141	E	G	52	0	60
141	S	G	45	0	60
141	W	G	50	0	60
142	N	G	51	0	60
142	E	G	52	0	60
142	S	G	45	0	60
142	W	G	49	0	60
143	E	G	51	0	60
143	S	G	45	0	60
143	W	G	50	0	60
143	N	G	56	0	60
144	E	G	50	0	60
144	S	G	45	0	60
144	W	G	50	0	60
144	N	G	56	0	60
145	E	G	51	0	60
145	S	G	45	0	60
145	W	G	50	0	60
145	N	G	57	0	60
146	E	G	50	0	60
146	S	G	45	0	60

Proposed Lot Number	Façade Direction	Floor	Predicted 2034 noise levels (LA10,18hr) (free-field)	QDC Category	SDAP State Code 1 habitable rooms noise assessment criteria (LA10,18hr)
146	W	G	49	0	60
146	N	G	57	0	60
147	E	G	49	0	60
147	S	G	45	0	60
147	W	G	51	0	60
147	N	G	57	0	60
148	E	G	51	0	60
148	S	G	45	0	60
148	W	G	50	0	60
148	N	G	56	0	60
149	E	G	50	0	60
149	S	G	45	0	60
149	W	G	50	0	60
149	N	G	56	0	60
150	E	G	51	0	60
150	S	G	45	0	60
150	W	G	50	0	60
150	N	G	56	0	60
151	E	G	50	0	60
151	S	G	45	0	60
151	W	G	50	0	60
151	N	G	56	0	60
152	E	G	50	0	60
152	S	G	45	0	60
152	W	G	50	0	60
152	N	G	56	0	60
153	E	G	50	0	60
153	S	G	45	0	60
153	W	G	50	0	60

Proposed Lot Number	Façade Direction	Floor	Predicted 2034 noise levels (LA10,18hr) (free-field)	QDC Category	SDAP State Code 1 habitable rooms noise assessment criteria (LA10,18hr)
153	N	G	56	0	60
154	E	G	50	0	60
154	S	G	45	0	60
154	W	G	50	0	60
154	N	G	56	0	60
155	E	G	49	0	60
155	S	G	45	0	60
155	W	G	50	0	60
155	N	G	54	0	60
156	E	G	49	0	60
156	S	G	45	0	60
156	W	G	52	0	60
156	N	G	53	0	60
157	S	G	45	0	60
157	W	G	52	0	60
157	N	G	52	0	60
157	E	G	50	0	60
158	S	G	46	0	60
158	W	G	53	0	60
158	N	G	54	0	60
158	E	G	51	0	60
159	E	G	50	0	60
159	S	G	46	0	60
159	W	G	49	0	60
159	N	G	53	0	60
160	E	G	49	0	60
160	S	G	46	0	60
160	W	G	50	0	60
160	N	G	53	0	60

Proposed Lot Number	Façade Direction	Floor	Predicted 2034 noise levels (LA10,18hr) (free-field)	QDC Category	SDAP State Code 1 habitable rooms noise assessment criteria (LA10,18hr)
161	E	G	50	0	60
161	S	G	46	0	60
161	W	G	49	0	60
161	N	G	53	0	60
162	E	G	50	0	60
162	S	G	46	0	60
162	W	G	49	0	60
162	N	G	53	0	60
163	E	G	50	0	60
163	S	G	46	0	60
163	W	G	49	0	60
163	N	G	53	0	60
164	E	G	50	0	60
164	S	G	46	0	60
164	W	G	50	0	60
164	N	G	53	0	60
165	E	G	49	0	60
165	S	G	46	0	60
165	W	G	49	0	60
165	N	G	53	0	60
166	E	G	50	0	60
166	S	G	46	0	60
166	W	G	49	0	60
166	N	G	53	0	60
167	E	G	50	0	60
167	S	G	46	0	60
167	W	G	49	0	60
167	N	G	53	0	60
168	E	G	50	0	60

Proposed Lot Number	Façade Direction	Floor	Predicted 2034 noise levels (LA10,18hr) (free-field)	QDC Category	SDAP State Code 1 habitable rooms noise assessment criteria (LA10,18hr)
168	S	G	46	0	60
168	W	G	49	0	60
168	N	G	53	0	60
169	E	G	50	0	60
169	S	G	46	0	60
169	W	G	50	0	60
169	N	G	53	0	60
170	E	G	50	0	60
170	S	G	46	0	60
170	W	G	49	0	60
170	N	G	53	0	60
171	N	G	54	0	60
171	E	G	53	0	60
171	S	G	46	0	60
171	W	G	50	0	60
172	N	G	53	0	60
172	E	G	52	0	60
172	S	G	46	0	60
172	W	G	50	0	60
173	E	G	51	0	60
173	S	G	46	0	60
173	W	G	57	0	60
173	N	G	53	0	60
174	E	G	51	0	60
174	S	G	46	0	60
174	W	G	50	0	60
174	N	G	53	0	60
175	E	G	51	0	60
175	S	G	46	0	60

Proposed Lot Number	Façade Direction	Floor	Predicted 2034 noise levels (LA10,18hr) (free-field)	QDC Category	SDAP State Code 1 habitable rooms noise assessment criteria (LA10,18hr)
175	W	G	51	0	60
175	N	G	52	0	60
176	E	G	54	0	60
176	S	G	46	0	60
176	W	G	50	0	60
176	N	G	52	0	60
177	E	G	51	0	60
177	S	G	46	0	60
177	W	G	55	0	60
177	N	G	53	0	60
178	E	G	51	0	60
178	S	G	46	0	60
178	W	G	50	0	60
178	N	G	52	0	60
179	E	G	51	0	60
179	S	G	46	0	60
179	W	G	51	0	60
179	N	G	52	0	60
180	E	G	51	0	60
180	S	G	47	0	60
180	W	G	50	0	60
180	N	G	52	0	60
181	E	G	51	0	60
181	S	G	46	0	60
181	W	G	50	0	60
181	N	G	53	0	60
182	E	G	51	0	60
182	S	G	47	0	60
182	W	G	50	0	60

Proposed Lot Number	Façade Direction	Floor	Predicted 2034 noise levels (LA10,18hr) (free-field)	QDC Category	SDAP State Code 1 habitable rooms noise assessment criteria (LA10,18hr)
182	N	G	53	0	60
183	E	G	51	0	60
183	S	G	46	0	60
183	W	G	51	0	60
183	N	G	53	0	60
184	E	G	51	0	60
184	S	G	47	0	60
184	W	G	50	0	60
184	N	G	53	0	60
185	E	G	51	0	60
185	S	G	47	0	60
185	W	G	51	0	60
185	N	G	53	0	60
186	E	G	51	0	60
186	S	G	46	0	60
186	W	G	51	0	60
186	N	G	53	0	60
187	E	G	51	0	60
187	S	G	47	0	60
187	W	G	51	0	60
187	N	G	53	0	60
188	E	G	51	0	60
188	S	G	46	0	60
188	W	G	50	0	60
188	N	G	53	0	60
189	E	G	51	0	60
189	S	G	47	0	60
189	W	G	51	0	60
189	N	G	53	0	60

Proposed Lot Number	Façade Direction	Floor	Predicted 2034 noise levels (LA10,18hr) (free-field)	QDC Category	SDAP State Code 1 habitable rooms noise assessment criteria (LA10,18hr)
190	E	G	51	0	60
190	S	G	47	0	60
190	W	G	50	0	60
190	N	G	53	0	60
191	E	G	51	0	60
191	S	G	47	0	60
191	W	G	51	0	60
191	N	G	53	0	60
192	E	G	51	0	60
192	S	G	47	0	60
192	W	G	51	0	60
192	N	G	53	0	60
193	E	G	51	0	60
193	S	G	47	0	60
193	W	G	50	0	60
193	N	G	53	0	60
194	E	G	51	0	60
194	S	G	47	0	60
194	W	G	51	0	60
194	N	G	53	0	60
195	E	G	51	0	60
195	S	G	47	0	60
195	W	G	51	0	60
195	N	G	53	0	60
196	E	G	51	0	60
196	S	G	47	0	60
196	W	G	51	0	60
196	N	G	53	0	60
197	E	G	51	0	60

Proposed Lot Number	Façade Direction	Floor	Predicted 2034 noise levels (LA10,18hr) (free-field)	QDC Category	SDAP State Code 1 habitable rooms noise assessment criteria (LA10,18hr)
197	S	G	47	0	60
197	W	G	51	0	60
197	N	G	53	0	60
198	E	G	52	0	60
198	S	G	47	0	60
198	W	G	51	0	60
198	N	G	53	0	60
199	E	G	52	0	60
199	S	G	47	0	60
199	W	G	51	0	60
199	N	G	53	0	60
200	E	G	51	0	60
200	S	G	47	0	60
200	W	G	51	0	60
200	N	G	53	0	60
201	E	G	52	0	60
201	S	G	47	0	60
201	W	G	51	0	60
201	N	G	54	0	60
202	E	G	52	0	60
202	S	G	47	0	60
202	W	G	51	0	60
202	N	G	53	0	60
203	E	G	52	0	60
203	S	G	47	0	60
203	W	G	51	0	60
203	N	G	53	0	60
204	E	G	48	0	60
204	S	G	43	0	60

Proposed Lot Number	Façade Direction	Floor	Predicted 2034 noise levels (LA10,18hr) (free-field)	QDC Category	SDAP State Code 1 habitable rooms noise assessment criteria (LA10,18hr)
204	W	G	48	0	60
204	N	G	51	0	60
205	N	G	50	0	60
205	E	G	49	0	60
205	S	G	44	0	60
205	W	G	50	0	60
206	E	G	50	0	60
206	S	G	46	0	60
206	W	G	49	0	60
206	N	G	53	0	60
207	E	G	49	0	60
207	S	G	45	0	60
207	W	G	48	0	60
207	N	G	52	0	60



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