



UPDATED

**TRAFFIC NOISE IMPACT ASSESSMENT
PROPOSED PRECINCT 4B (ROL 2) DEVELOPMENT
YARRABILBA**

AMENDED IN RED

By: Gabrielle Shepherd

Date: 18 June 2021



**PLANS AND DOCUMENTS
referred to in the PDA
DEVELOPMENT APPROVAL**

Approval no: DEV2017/904

Date: 23 June 2021



Prepared for:
Lendlease

Prepared by:
MWA Environmental

17 March 2021

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1.0 INTRODUCTION

1.1 STUDY BRIEF

MWA Environmental has been engaged to prepare a Traffic Noise Impact Assessment for the proposed 'Precinct 4B – ROL2' previously referred to as 'Precinct 5B' development at Yarrabilba.

The report has assessed the potential road traffic noise impact and mitigation measures associated with the Arterial Road and Major Collector Road corridors within the Yarrabilba development area based on updated lot reconfiguration plan and civil earthworks design.

Using standard traffic noise assessment methodology and 10 Year Planning Horizon traffic forecasts, this assessment has been conducted using computer noise modelling of the road traffic volumes on the Arterial and Major Collector Roads as part of Yarrabilba development, and considering the following:

- Preliminary design level contours for Precinct 4B - ROL2 by KN Group;
- Proposed ROL for Precinct 4B by KN Group;
- Preliminary civil works levels for the ultimate Arterial and Major Collector Road corridors provided by KN Group; and
- Updated planning horizon traffic design data to Year 2032 for the road corridors as advised by SLR (email correspondence).

1.2 SITE DESCRIPTION

The proposed Precinct 4B – ROL2 development is located in the northern portion of the overall Yarrabilba Precinct 4 development. The site location is shown on **Figure 1**.

The Arterial Road corridor (Town Centre East-West Road) runs adjacent to the south-western portion of the proposed residential allotments within the Precinct 4B with the Eastern Perimeter Link is located along the north-western portion of Precinct 4B.

1.3 PROPOSED DEVELOPMENT

The proposed overall Precinct 4B development comprises approximately 142 residential allotments and associated internal road network.

The development plan is shown on **Figure 2**.

2.0 RELEVANT NOISE CRITERIA

2.1 EXTERNAL NOISE CRITERIA

The Logan Planning Scheme 2015 requirements for the assessment and mitigation of road traffic noise from Council-controlled roadways are limited to regulation of the acoustic treatment of houses within designated 'transport noise corridors' through the Queensland Development Code. There are no external traffic noise criteria in the current Logan Planning Scheme 2015 and there does not appear to be a specific requirement for assessment of road traffic noise for a reconfiguration of lot adjacent to a road that is not a designated 'transport noise corridor'.

Logan City Council has gazetted transport noise corridors under the Building Act 1975 which provides for the regulation of the acoustic treatment of dwellings affected by road traffic noise in accordance with Queensland Development Code Mandatory Part 4.4 '*Buildings in a transport noise corridor*' (**MP4.4**). This process is managed by private certifiers based upon overlay mapping managed by the Queensland Department of Housing and Public Works.

The Arterial and Major Collector road corridors are not currently gazetted as a transport noise corridor but is likely to be at some stage in the future if and when traffic volumes exceed 5,000 vehicles per day. Until such time as the road corridors is gazetted as a 'transport noise corridor' there is unlikely to be a requirement for acoustic treatment of houses in proximity to the road. There is the potential that houses may already be constructed on allotments adjacent to the road prior to a 'transport noise corridor' being gazetted and thus no acoustic treatment requirements would be applied.

This notwithstanding, this assessment has addressed the methodology and criteria of the TMR *Road Traffic Noise Management: Code of Practice* and Queensland Development Code (QDC) *MP4.4 – Buildings in a Transport Noise Corridor and State Code 1: Development in a state-controlled road environment (SDAP)*. The assessment has considered what noise levels would be experienced at the backyard of the proposed allotments to comply with a 60 dB(A) L₁₀ 18 hour noise limit typically applied by the more recent SDAP and the MP4.4 'noise categories' (which define standard of acoustic treatment required) that would be expected within a transport noise corridor if gazetted after completion.

The relevant criteria for the assessment of noise impacts are outlined in *State Code 1: Development in a state-controlled road environment*, as follows:

Performance outcomes	Acceptable outcomes
Noise	
Accommodation activities	
PO23 Development involving an accommodation activity or land for a future accommodation activity minimises noise intrusion from a state-controlled road or type 1 multi-modal corridor in habitable rooms .	AO23.1 A noise barrier or earth mound is provided which is designed, sited and constructed: - to meet the following external noise criteria at all facades of the building envelope: ≤ 60 dB(A) L_{10} (18 hour) façade corrected (measured L_{90} (8 hour) free field between 10pm and 6am ≤ 40 dB(A)) ≤ 63 dB(A) L_{10} (18 hour) façade corrected (measured L_{90} (8 hour) free field between 10pm and 6am > 40 dB(A)) - in accordance with 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.
PO24 Development involving an accommodation activity or land for a future accommodation activity minimises noise intrusion from a state-controlled road or type 1 multi-modal corridor in outdoor spaces for passive recreation .	AO24.1 A noise barrier or earth mound is provided which is designed, sited and constructed: - to meet the following external noise criteria in outdoor spaces for passive recreation: ≤ 57 dB(A) L_{10} (18 hour) free field (measured L_{90} (18 hour) free field between 6am and 12 midnight ≤ 45 dB(A)) ≤ 60 dB(A) L_{10} (18 hour) free field (measured L_{90} (18 hour) free field between 6am and 12 midnight > 45 dB(A)) - in accordance with 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. Note: To demonstrate compliance with the acceptable outcome, it is recommended that a RPEQ certified noise assessment report is provided, prepared in accordance with the State Development Assessment Provisions Supporting Information – Community Amenity (Noise), Department of Transport and Main Roads, 2013.

2.2 QDC MP4.4 NOISE CATEGORIES

Since implementation in August 2010, assessment of internal road traffic noise amenity (i.e. within habitable rooms) for dwellings adjacent to state-controlled roads is regulated by the Queensland Development Code (QDC) MP4.4 *Buildings in a Transport Noise Corridor* (“**QDC MP4.4**”).

An objective of this noise assessment is to determine which QDC MP4.4 noise categories are appropriate for proposed allotments. Under MP4.4 the specific acoustic treatment requirements for proposed dwellings are dependent upon the noise exposure category of the building site, as follows:

Table 1: Summary of QDC MP4.4 Traffic Noise Categories

QDC MP4.4 Noise Category	L_{10} 18 hour* for state-controlled roads
Category 4	≥ 73 dB(A)
Category 3	68 – 72 dB(A)
Category 2	63 – 67 dB(A)
Category 1	58 - 62 dB(A)
Category 0 (no acoustic treatment required)	≤ 57 dB(A)

* measured at 1 m from the façade of the proposed or existing building.

3.0 TRAFFIC NOISE IMPACT ASSESSMENT

3.1 TRAFFIC NOISE ASSESSMENT

In order to assess compliance with the SDAP external noise criteria, 10-year design horizon traffic noise predictions have been predicted across the site. The noise model has represented the design horizon of the development traffic on the Arterial Road and Major Collector roads based upon the design contour of the road and of Precinct 4B allotments.

The SoundPLAN 8.1 model was setup to predict the external L_{10} (18 hour) traffic noise levels under design traffic flow conditions for the Year 2032.

3.1.1 Traffic Volume Data

The design horizon traffic volumes (daily two way total) and speed limits provided by SLR are as indicated in the **Table 2** below with reference points A, B, C, D, E and F as presented in **Attachment 1**.

The 18 hour (6am to Midnight) traffic volume has been approximated as 94% of the daily volume. Heavy vehicle percentage is considered to be a conservative 5% for modelling purposes as advised by SRL.

Table 2: Design Traffic Volume Data

Planning Horizon	Road Section	Daily Vehicles Volume (AADT)	Speed (km/hr)
10 Year Design	A	21,100	60
	B	7,100	
	C	19,400	
	D	19,100	
	E	N/A	
	F	18,700	

The following describes the road section hierarchy:

- A – Yarrabilba Drive – Arterial Road
- B – Eastern Perimeter Link – Major Collector Road
- C to E – Town Centre East-West Road - Arterial Road
- F – Major Collector Road

3.1.2 Predicted Future Traffic Noise Levels – Residential Outdoor Areas

A SoundPLAN 8.1 model was setup to predict the external L_{10} (18 hour) traffic noise levels under 10 year design traffic flow conditions for Ground Level (+1.8m) and Upper Level (+4.6m) receptors **with acoustic barriers**. The recommended acoustic barriers at height of **1.8 metres above the allotment earthworks design levels or on top of the retaining wall** whichever is the higher point as shown on **Figure 3**.

It is noted that some allotments are in cut or in fill with the lot pad level being in the order of 1 metre difference towards the road frontage. As such, if a barrier specified to a height of 1.8 metres above lot level were to be constructed at the top of a 1 metre height retaining wall for an in cut lot, then the actual acoustic fence structure would be 2.8 metres.

The results of the traffic noise modelling for ground level receptors within Precinct 4B indicates that the adopted SDAP noise criterion of 60 dB(A) L₁₀ (18 hour) for outdoor recreation space (backyards) will be complied with at all allotments with the exception of Lot 864.

Alternatively, specific design features (e.g. more shielded locations, operable walls/louvres to shield road traffic noise) may be incorporated in order to comply with the 60 dB(A) L₁₀ (18 hour) noise amenity criteria for outdoor recreational areas. The outdoor recreational spaces this solution can be considered for are shown on **Figure 4**.

As such, Lot 864 outdoor recreational spaces for future dwellings on the Lots described above may be designed to incorporate either:

1. A covered outdoor recreation space (e.g. patio / deck) set into a rear corner of the dwelling with an operable wall/louvre (or similar) along the trafficable lane façade which can be closed by residents during higher traffic noise periods if desired (see **Diagram A** below); or
2. An outdoor recreation area on the front façade of the dwelling (located at front façade facing access road) (see **Diagram B** below); or
3. A more centrally located outdoor recreational area in the form of courtyard to maximise building façade shielding (see **Diagram C** below).

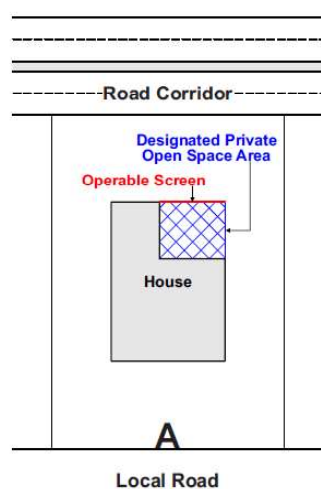


Diagram A – Rear Acoustic Screen

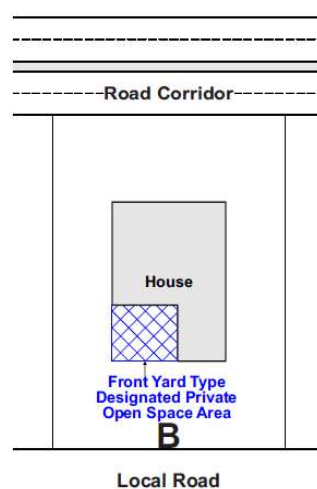


Diagram B - Front Shielded

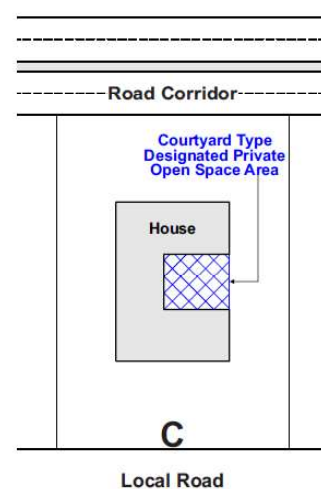


Diagram C – Courtyard Configuration

With the above design feature(s) residents will have access to outdoor recreation space that is compliant with the relevant external noise amenity criteria.

The predicted road traffic noise contour maps which demonstrate areas in compliance of the 60 dB(A) L₁₀ (18 hour) for outdoor spaces are provided in **Attachment 2**.

3.1.3 Predicted Future Traffic Noise Levels – QDC MP4.4 Noise Categories

Under the *Building Act 1975*, the transport Chief Executive may designate land as being within a transport noise corridor and compliance with QDC MP4.4 is required if the land is within:

- 100 metres of a state-controlled road; or
- Up to 250 metres of a state-controlled road if the noise of traffic on the road is at least 58 dB(A).

Effectively, for the purposes of land use planning assessment and the design of future dwellings in accordance with the QDC, acoustic treatment may be required for dwellings located within 250 metres of the roadway if external L₁₀ (18 hour) noise levels exceed 58 dB(A). This notwithstanding, it is noted that this may occur some stage in the future under an ultimate design horizon or when the Southern Infrastructure Corridor is commissioned, however it is expected that up to and after Year 2032 the land within 100 metres of the Arterial Road and Major Collector Road would at some time be designated as being within a transport noise corridor.

In the event that major roads were to be gazetted as a 100 metre transport noise corridor then, based upon our 2032 modelling for Precinct 4B ROL2, single-storey dwellings adjoining the road corridor boundaries would be subject to QDC MP4.4 'Noise Category 0 to 2' acoustic treatment requirements.

For the upper level of any two-storey houses within Precinct 4B ROL2 a maximum 'Noise Category 3' acoustic treatment requirement would apply.

Table 3 below presents the affected allotments within a 100 metre transport corridor and the applicable QDC MP4.4 noise categories for any future single or two storey dwellings on the allotments within Precinct 4B.

A copy of the Queensland Development Code (QDC) *MP4.4 – Buildings in a Transport Noise Corridor* is included in **Attachment 3** including indicative acceptable forms of construction.

Table 3: Recommended QDC MP4.4 'Noise Categories' for 'Precinct 4B ROL2' Allotments

QDC MP4.4 Noise Categories PRECINCT 4B		
Lot #	Single storey house / ground floor	Upper floor of two storey house
810	Category 0	Category 1
811	Category 0	Category 1
812	Category 0	Category 1
813	Category 0	Category 1
814	Category 0	Category 0
815	Category 0	Category 1
816	Category 0	Category 1
817	Category 1	Category 3
818	Category 1	Category 3
819	Category 1	Category 3
820	Category 1	Category 3
821	Category 1	Category 3
822	Category 1	Category 3
823	Category 1	Category 3
824	Category 1	Category 3
825	Category 1	Category 3
826	Category 1	Category 3
827	Category 1	Category 3
828	Category 1	Category 3
829	Category 1	Category 3
830	Category 1	Category 3
831	Category 1	Category 3
832	Category 0	Category 1
833	Category 0	Category 1
834	Category 0	Category 0
850	Category 0	Category 0
851	Category 0	Category 0
852	Category 0	Category 0
853	Category 0	Category 0
854	Category 0	Category 0

Table 3 – Continued

QDC MP4.4 Noise Categories PRECINCT 4B		
Lot #	Single storey house / ground floor	Upper floor of two storey house
855	Category 0	Category 0
856	Category 0	Category 0
857	Category 0	Category 0
858	Category 0	Category 0
859	Category 0	Category 0
860	Category 0	Category 0
861	Category 0	Category 1
862	Category 0	Category 1
863	Category 1	Category 3
864	Category 2	Category 3
865	Category 1	Category 2
866	Category 1	Category 2
867	Category 1	Category 2
868	Category 1	Category 2
869	Category 1	Category 2
870	Category 1	Category 2
871	Category 1	Category 2
872	Category 1	Category 2
873	Category 1	Category 2
874	Category 1	Category 2
875	Category 1	Category 2
876	Category 1	Category 2
877	Category 1	Category 2
878	Category 1	Category 2
879	Category 1	Category 2
937	Category 0	Category 1
938	Category 0	Category 1
939	Category 0	Category 1
940	Category 0	Category 1
941	Category 1	Category 1
942	Category 0	Category 1
943	Category 0	Category 1
944	Category 0	Category 1
945	Category 0	Category 1

*Noise Category 0 – No acoustic treatment is required

The SoundPLAN model predictions are presented as plots of predicted Year 2032 L₁₀ (18 hour) traffic noise levels (including +2.5dB façade reflection) over the proposed residential subdivision for ground level (+1.8m) receptors (refer **Attachment 4**).

The SoundPLAN model predictions are also presented as plots of predicted Year 2032 L₁₀ (18 hour) traffic noise levels (including +2.5dB façade reflection) over the proposed residential subdivision for upper level (+4.6m) receptors (refer **Attachment 5**).

4.0 CONCLUSIONS

MWA Environmental has been engaged by Lend Lease to prepare a Traffic Noise Impact Assessment for the proposed 'Precinct 4B – ROL2' previously referred to as 'Precinct 5B' residential development within the Yarrabilba estate development.

The report has assessed the potential road traffic noise impact and mitigation measures associated with the Arterial Road and Major Collector Road corridors within the Yarrabilba P4 development area based on updated lot reconfiguration plan and civil earthworks design.

The road corridors are not currently gazetted as a transport noise corridor but it is likely to be at some stage in the future if and when traffic volumes exceed 5,000 vehicles per day. Until such time as the road corridor is gazetted as a 'transport noise corridor' there is unlikely to be a requirement for acoustic treatment of houses in proximity to the road. There is the potential that houses may be constructed on allotments adjacent to the road prior to a 'transport noise corridor' being gazetted and thus no acoustic treatment requirements would be applied at the time of construction.

This notwithstanding, this assessment has addressed the methodology and criteria of the TMR *Road Traffic Noise Management: Code of Practice, State Code 1: Development in a state-controlled road environment (SDAP)* and Queensland Development Code (QDC) *MP4.4 – Buildings in a Transport Noise Corridor*.

The assessment has considered what noise levels would be experienced at the backyard of the proposed allotments to comply with a 60 dB(A) L_{10} 18 hour noise limit typically applied and the MP4.4 'noise categories' (which define standard of acoustic treatment required) would be expected within a transport noise corridor if gazetted after completion.

The results of the traffic noise modelling for outdoor areas within Precinct 4B indicates that the adopted noise criterion of 60 dB(A) L_{10} (18 hour) for outdoor recreation space (backyards) will achieve compliance at all proposed allotment within Precinct 4B - ROL2 with the inclusion of acoustic barriers at height of **1.8 metres above the allotment earthworks design levels or on top of the retaining wall**, whichever is the higher point as shown on **Figure 3**.

The results of the traffic noise modelling for ground level receptors within Precinct 4B indicates that the adopted SDAP noise criterion of 60 dB(A) L_{10} (18 hour) for outdoor recreation space (backyards) will be complied with at all allotments **with the exception of Lot 864**.

Alternatively, specific design features (e.g. more shielded locations, operable walls/louvres to shield road traffic noise) may be incorporated in order to comply with the 60 dB(A) L_{10} (18 hour) noise amenity criteria for outdoor recreational areas. The outdoor recreational spaces this solution can be considered for are shown on **Figure 4**.

As such, Lot 864 outdoor recreational spaces for future dwellings on the Lots described above may be designed to incorporate either:

1. A covered outdoor recreation space (e.g. patio / deck) set into a rear corner of the dwelling with an operable wall/louvre (or similar) along the trafficable lane façade which can be closed by residents during higher traffic noise periods if desired (see **Diagram A** below); or
2. An outdoor recreation area on the front façade of the dwelling (located at front façade facing access road) (see **Diagram B** below); or
3. A more centrally located outdoor recreational area in the form of courtyard to maximise building façade shielding (see **Diagram C** below).

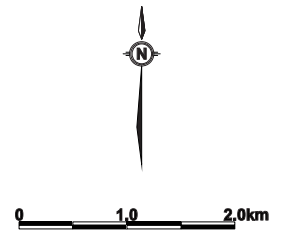
In the event that major roads were to be gazetted as a 100 metre transport noise corridor then, based upon our 2032 modelling for Precinct 4B, single-storey dwellings adjoining the road corridor boundaries would be subject to QDC MP4.4 'Noise Category 0 and 2' acoustic treatment requirements. For the upper level of any two-storey houses within Precinct 4B a maximum 'Noise Category 3' acoustic treatment requirements would apply. **Table 3** of this report presents the affected allotments and the applicable QDC MP4.4 noise categories for any future single or double storey dwellings on the allotment within Precinct 4B ROL2.

MWA Environmental
17 March 2021

FIGURES



LEGEND
— PROPERTY BOUNDARY
— SITE BOUNDARY - PRECINCT 4
DRAWING REFERENCES
© THE STATE OF QUEENSLAND QLDGLOBE



CLIENT LENDLEASE
PROJECT
**TRAFFIC NOISE
IMPACT ASSESSMENT
PROPOSED RESIDENTIAL
DEVELOPMENT
PRECINCT 4B
YARRABILBA QLD**
TITLE
SITE LOCATION

JOB	YARRABILBA	FIGURE 1
JOB NO.	18-011	
DATE	17/03/21	DRAWING NUMBER
SCALE	1:70,000 (A4)	18-011-1
REV.		

PRECINCT FOUR - APPLICATION TWO BOUNDARY
STAGE BOUNDARY

LOCAL STAGE ROAD
PATHWAY CONNECTION

LOT YIELD			LOT AREA		
Lot Type	No. Lots	% Total Lots	Average Size	% of Total Area	Area
T1	4	2.82%	674m ²	4.48%	2696m ²
T3	8	5.63%	606m ²	8.07%	4850m ²
C2	30	21.13%	490m ²	24.46%	14706m ²
C3	12	8.45%	579m ²	11.57%	6955m ²
PV	19	13.38%	419m ²	13.26%	7975m ²
V	8	5.63%	341m ²	4.54%	2728m ²
TCY2	13	9.15%	401m ²	8.68%	5219m ²
TCY3	6	4.23%	428m ²	4.28%	2573m ²
TPV	10	7.04%	332m ²	5.52%	3320m ²
TV	14	9.86%	276m ²	6.44%	3871m ²
SMT	1	0.70%	344m ²	0.57%	344m ²
TCD	14	9.86%	227m ²	5.29%	3178m ²
MFS	3	2.11%	572m ²	2.85%	1716m ²
Total Number of Lots		142			

LAND USE	AREA (ha)
Residential Road - Local Street	6.01 ha 2.56 ha
TOTAL	8.57 ha

MINIMUM RESIDENTIAL DENSITY - 8.57 ha
142 dw
16.6 dw/ha
MAXIMUM RESIDENTIAL DENSITY - 8.57 ha
148 dw
17.3 dw/ha

CLIENT LENDLEASE

PROJECT
TRAFFIC NOISE
IMPACT ASSESSMENT
PROPOSED RESIDENTIAL
DEVELOPMENT
PRECINCT 4B
YARRABILBA QLD

TITLE
PRECINCT 4B
SITE PLAN

JOB	YARRABILBA	FIGURE 2
JOB NO.	18-011	
DATE	17/03/21	DRAWING NUMBER
SCALE	1:2000 (A3)	
REV.		18-011-2

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ABN 94 010 833 084

NOTE:
MINIMUM DWELLINGS is based on the development of one dwelling on each single family and multi-family strata (MFS) lot.
MAXIMUM DWELLINGS is based on the development of one dwelling on each single family lot, and three dwellings on each multi family strata (MFS).

DENSITY calculations include the area of residential lots, local roads and credited neighbourhood park. The boundaries, roads and pathways shown hereon are subject to detailed engineering design, final survey and approval of subsequent development applications by the relevant authorities.

PRECINCT FOUR - APPLICATION TWO RECONFIGURATION OF A LOT

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1.8m high standard screen fence
(excluding Lot 864)

AMENDED IN RED

By: Gabrielle Shepherd

Date: 18 June 2021



Queensland
Government



PRECINCT FOUR - APPLICATION TWO BOUNDARY

STAGE BOUNDARY

LOCAL STAGE ROAD

PATHWAY CONNECTION

LOT YIELD			LOT AREA		
Lot Type	No. Lots	% Total Lots	Average Size	% of Total Area	Area
T1	4	2.82%	674m ²	4.48%	2696m ²
T3	8	5.63%	606m ²	8.07%	4850m ²
C2	30	21.13%	490m ²	24.46%	14706m ²
C3	12	8.45%	579m ²	11.57%	6955m ²
PV	19	13.38%	419m ²	13.26%	7975m ²
V	8	5.63%	341m ²	4.54%	2728m ²
TCY2	13	9.15%	401m ²	8.68%	5219m ²
TCY3	6	4.23%	428m ²	4.28%	2573m ²
TPV	10	7.04%	332m ²	5.52%	3320m ²
TV	14	9.86%	276m ²	6.44%	3871m ²
SMT	1	0.70%	344m ²	0.57%	344m ²
TCD	14	9.86%	227m ²	5.29%	3178m ²
MFS	3	2.11%	572m ²	2.85%	1716m ²
Total Number of Lots		142			

LEGEND

1.8m BARRIER HEIGHT ABOVE PAD LEVEL OR ON TOP OF RETAINING WALL WHICHEVER IS THE HIGHER ACOUSTIC BARRIER

CLIENT LENDLEASE

PROJECT

TRAFFIC NOISE
IMPACT ASSESSMENT
PROPOSED RESIDENTIAL
DEVELOPMENT
PRECINCT 4B
YARRABILBA QLD

TITLE

ACOUSTIC BARRIER
LOCATIONS

JOB	YARRABILBA	FIGURE 3
JOB NO.	18-011	
DATE	17/03/21	DRAWING NUMBER
SCALE	1:2000 (A3)	
REV.		18-011-3



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W www.mwaenviro.com.au
ABN 94 010 833 084

LAND USE	AREA (ha)
Residential Road - Local Street	6.01 ha 2.56 ha
TOTAL	8.57 ha

MINIMUM RESIDENTIAL DENSITY - 8.57 ha
142 dw
16.6 dw/ha
MAXIMUM RESIDENTIAL DENSITY - 8.57 ha
148 dw
17.3 dw/ha

NOTE:

MINIMUM DWELLINGS is based on the development of one dwelling on each single family and multi-family strata (MFS) lot.

MAXIMUM DWELLINGS is based on the development of one dwelling on each single family lot, and three dwellings on each multi family strata (MFS).

DENSITY calculations include the area of residential lots, local roads and credited neighbourhood park. The boundaries, roads and pathways shown hereon are subject to detailed engineering design, final survey and approval of subsequent development applications by the relevant authorities.

PRECINCT FOUR - APPLICATION TWO
RECONFIGURATION OF A LOT

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PRECINCT FOUR - APPLICATION TWO BOUNDARY
STAGE BOUNDARY

LOCAL STAGE ROAD
PATHWAY CONNECTION

LOT YIELD			LOT AREA		
Lot Type	No. Lots	% Total Lots	Average Size	% of Total Area	Area
T1	4	2.82%	674m ²	4.48%	2696m ²
T3	8	5.63%	606m ²	8.07%	4850m ²
C2	30	21.13%	490m ²	24.46%	14706m ²
C3	12	8.45%	579m ²	11.57%	6955m ²
PV	19	13.38%	419m ²	13.26%	7975m ²
V	8	5.63%	341m ²	4.54%	2728m ²
TCY2	13	9.15%	401m ²	8.68%	5219m ²
TCY3	6	4.23%	428m ²	4.28%	2573m ²
TPV	10	7.04%	332m ²	5.52%	3320m ²
TV	14	9.86%	276m ²	6.44%	3871m ²
SMT	1	0.70%	344m ²	0.57%	344m ²
TCD	14	9.86%	227m ²	5.29%	3178m ²
MFS	3	2.11%	572m ²	2.85%	1716m ²
Total Number of Lots		142			

LAND USE	AREA (ha)
Residential Road - Local Street	6.01 ha 2.56 ha
TOTAL	8.57 ha

MINIMUM RESIDENTIAL DENSITY - 8.57 ha
142 dw
16.6 dw/ha
MAXIMUM RESIDENTIAL DENSITY - 8.57 ha
148 dw
17.3 dw/ha

LEGEND

ALLOTMENT REQUIRING DESIGNATED PRIVATE OPEN SPACE

CLIENT

LENDELEASE

PROJECT

TRAFFIC NOISE
IMPACT ASSESSMENT
PROPOSED RESIDENTIAL
DEVELOPMENT
PRECINCT 4B
YARRABILBA QLD

TITLE

ALLOTMENTS
REQUIRING DESIGNATED
PRIVATE OPEN SPACE

JOB

YARRABILBA

FIGURE 4

JOB NO.

18-011

DRAWING NUMBER

DATE

17/03/21

18-011-4

SCALE

1:2000 (A3)

REV.

Max Winders & Associates Pty Ltd t/as MWA Environmental
Level 15, 241 Adelaide St, Brisbane. GPO BOX 3137, Brisbane Qld 4001
P 07 3002 5500 F 07 3002 5588 E mail@mwaenviro.com.au
W www.mwaenviro.com.au
ABN 94 010 833 084

NOTE:
MINIMUM DWELLINGS is based on the development of one dwelling on each single family and multi-family strata (MFS) lot.
MAXIMUM DWELLINGS is based on the development of one dwelling on each single family lot, and three dwellings on each multi family strata (MFS).
DENSITY calculations include the area of residential lots, local roads and credited neighbourhood park. The boundaries, roads and pathways shown hereon are subject to detailed engineering design, final survey and approval of subsequent development applications by the relevant authorities.

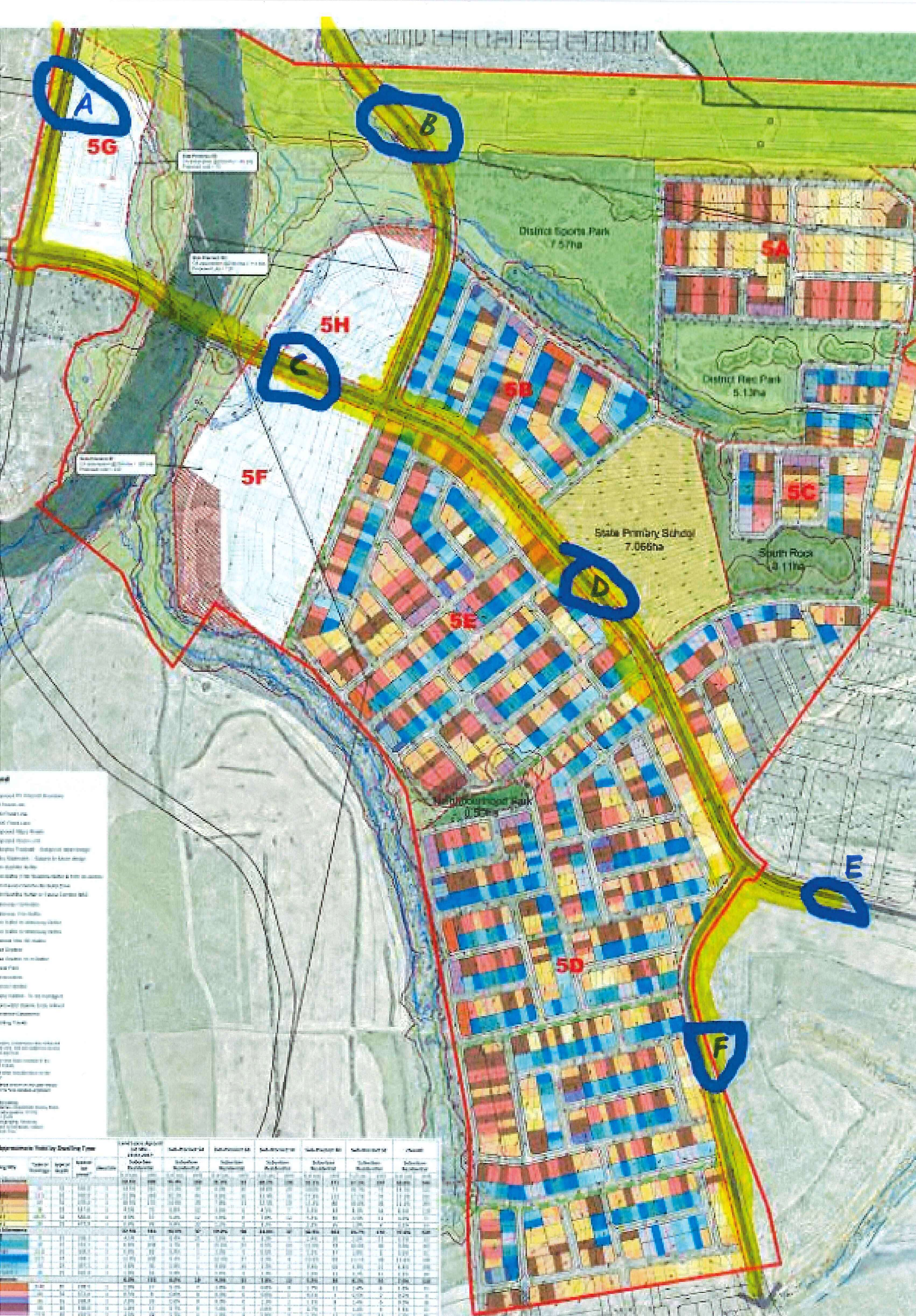


PRECINCT FOUR - APPLICATION TWO
RECONFIGURATION OF A LOT

NOTE: This plan is indicative only, and specific uses, road alignment, boundaries, setbacks, and building layout shown may vary due to detailed design consideration. © 2021 Lendlease Communities (Australia). All rights reserved. Except as permitted by Lendlease, no part of this publication may be reproduced or distributed in any form or by any means, or stored in a database or retrieval system, without the permission of Lendlease.

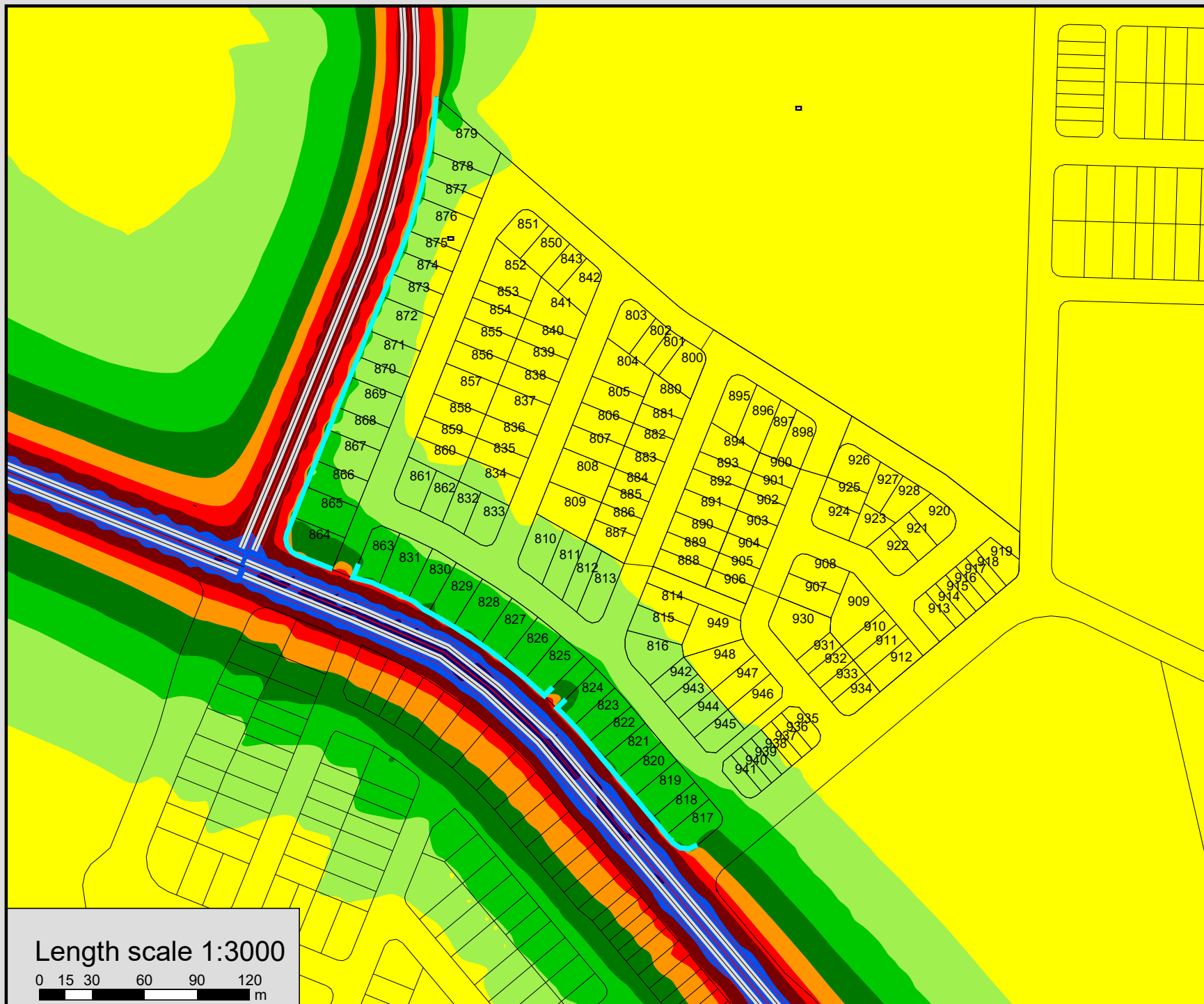
ATTACHMENT 1

Traffic Volume Sections



Attachment 2

*SoundPLAN 7.3 Modelling
Design Horizon Traffic Noise Predictions – Outdoor Recreation Space*



Noise level
L10(18hr)
in dB(A)

	<= 54
54 <	<= 57
57 <	<= 60
60 <	<= 63
63 <	<= 66
66 <	<= 69
69 <	<= 72
72 <	<= 75

Legend

- Cadastral
- Surface
- Wall
- Limit line

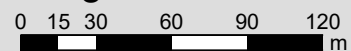
**Yarrabilba 18-011
Precinct 4B - ROL2**

Traffic Noise Levels

**Outdoor Recreational
Noise Impact With
Barriers**

March 2021

Length scale 1:3000



Attachment 3

QDC MP4.4 – Acceptable Solutions

Schedule 1

Noise category	Minimum <i>transport noise reduction</i> (dB (A)) required for <i>habitable rooms</i>	Component of building's <i>external envelope</i>	Minimum R_w required for each component
Category 4	40	Glazing	43
		External walls	52
		Roof	45
		Floors	51
		Entry doors	35
Category 3	35	Glazing	38 (where total area of glazing for a <i>habitable room</i> is greater than 1.8m ²)
			35 (where total area of glazing for a <i>habitable room</i> is less than or equal to 1.8m ²)
		External walls	47
		Roof	41
		Floors	45
		Entry doors	33

Noise category	Minimum transport noise reduction (dB (A)) required for habitable rooms	Component of building's external envelope	Minimum R_w required for each component
Category 2	30	Glazing	35 (where total area of glazing for a <i>habitable room</i> is greater than 1.8m ²)
			32 (where total area of glazing for a <i>habitable room</i> is less than or equal to 1.8m ²)
		External walls	41
		Roof	38
		Floors	45
		Entry doors	33
Category 1	25	Glazing	27 (where total area of glazing for a <i>habitable room</i> is greater than 1.8m ²)
			24 (where total area of glazing for a <i>habitable room</i> is less than or equal to 1.8m ²)
		External walls	35
		Roof	35
		Entry Doors	28
Category 0	No additional acoustic treatment required – standard building assessment provisions apply.		

Schedule 2

Component of building's external envelope	Minimum R_w	Acceptable forms of construction
Glazing	43	Double glazing consisting of two panes of minimum 5mm thick glass with at least 100mm air gap and full perimeter <i>acoustically rated seals</i> .
	38	Minimum 14.38mm thick laminated glass, with full perimeter <i>acoustically rated seals</i> ; OR Double glazing consisting of one pane of minimum 5mm thick glass and one pane of minimum 6mm thick glass with at least 44mm air gap, and full perimeter <i>acoustically rated seals</i>
	35	Minimum 10.38mm thick laminated glass, with full perimeter <i>acoustically rated seals</i> .
	32	Minimum 6.38mm thick laminated glass with full perimeter <i>acoustically rated seals</i> .
	27	Minimum 4mm thick glass with full perimeter <i>acoustically rated seals</i>
	24	Minimum 4mm thick glass with standard weather seals

Component of building's external envelope	Minimum R_w	Acceptable forms of construction
External walls	52	Two leaves of clay brick masonry, at least 270mm in total, with subfloor vents fitted with noise attenuators.
	47	Two leaves of clay brick masonry at least 110mm thick with: (i) cavity not less than 50mm between leaves; and (ii) 50mm thick mineral insulation or 50mm thick glass wool insulation with a density of 11kg/m³ or 50mm thick polyester insulation with a density of 20kg/m³ in the cavity. OR Two leaves of clay brick masonry at least 110mm thick with: (i) cavity not less than 50mm between leaves; and (ii) at least 13mm thick cement render on each face OR Single leaf of clay brick masonry at least 110mm thick with: (i) a row of at least 70mm x 35mm timber studs or 64mm steel studs at 600mm centres, spaced at least 20mm from the masonry wall; and (ii) Mineral insulation or glass wool insulation at least 50mm thick with a density of at least 11 kg/m³ positioned between studs; and (iii) One layer of plasterboard at least 13mm thick fixed to outside face of studs. OR Single leaf of minimum 150mm thick masonry of hollow, dense concrete blocks, with mortar joints laid to prevent moisture bridging.

Component of building's external envelope	Minimum R_w	Acceptable forms of construction
	41	Two leaves of clay brick masonry at least 110mm thick with cavity not less than 50mm between leaves OR Single leaf of clay brick masonry at least 110mm thick with: (i) a row of at least 70mm x 35mm timber studs or 64mm steel studs at 600mm centres, spaced at least 20mm from the masonry wall; and (ii) mineral insulation or glass wool insulation at least 50mm thick with a density of at least 11 kg/m³ positioned between studs; and (iii) One layer of plasterboard at least 10mm thick fixed to outside face of studs OR Single leaf of brick masonry at least 110mm thick with at least 13mm thick render on each face OR Concrete brickwork at least 110mm thick OR In-situ concrete at least 100mm thick OR Precast concrete at least 100mm thick and without joints.

Component of building's external envelope	Minimum R_w	Acceptable forms of construction
	35	Single leaf of clay brick masonry at least 110mm thick with: (i) a row of at least 70mm x 35mm timber studs or 64mm steel studs at 600mm centres, spaced at least 20mm from the masonry wall; and (ii) One layer of plasterboard at least 10mm thick fixed to outside face of studs OR Minimum 6mm thick fibre cement sheeting or weatherboards or plank cladding externally, minimum 90mm deep timber stud or 92mm metal stud, standard plasterboard at least 13mm thick internally.
Roof	45	Concrete or terracotta tile or sheet metal roof with sarking, <i>acoustically rated plasterboard</i> ceiling at least 13mm thick fixed to ceiling joists, cellulose fibre insulation at least 100mm thick with a density of at least 45kg/m³ in the cavity. OR Concrete or terracotta tile or sheet metal roof with sarking, 2 layers of <i>acoustically rated plasterboard</i> at least 16mm thick fixed to ceiling joists, glass wool insulation at least 50mm thick with a density of at least 11kg/m³ or polyester insulation at least 50mm thick with a density of at least 20kg/m³ in the cavity.
	41	Concrete or terracotta tile or metal sheet roof with sarking, plasterboard ceiling at least 10mm thick fixed to ceiling joists, glass wool insulation at least 50mm thick with a density of at least 11kg/m³ or polyester insulation at least 50mm thick with a density of at least 20kg/m³ in the cavity. OR Concrete suspended slab at least 100mm thick.
	38	Concrete or terracotta tile or metal sheet roof with sarking, plasterboard ceiling at least 10mm thick fixed to ceiling cavity, mineral insulation or glass wool insulation at least 50mm thick with a density of at least 11 kg/m³.

Component of building's external envelope	Minimum R_w	Acceptable forms of construction
	35	Concrete or terracotta tile or metal sheet roof with sarking, plasterboard ceiling at least 10mm thick fixed to ceiling cavity.
Floors	51	Concrete slab at least 150mm thick.
	45	Concrete slab at least 100mm thick OR Tongued and grooved boards at least 19mm thick with: (i) timber joists not less than 175mm x 50mm; and (ii) mineral insulation or glass wool insulation at least 75mm thick with a density of at least 11kg/m ³ positioned between joists and laid on plasterboard at least 10mm thick fixed to underside of joists; and (iii) mineral insulation or glass wool insulation at least 25mm thick with a density of at least 11kg/m ³ laid over entire floor, including tops of joists before flooring is laid; and (iv) secured to battens at least 75mm x 50mm; and (v) the assembled flooring laid over the joists, but not fixed to them, with battens lying between the joists.
Entry Doors	35	Solid core timber not less than 45mm thick, fixed so as to overlap the frame or rebate of the frame by not less than 10mm, with full perimeter <i>acoustically rated seals</i> .
	33	Fixed so as to overlap the frame or rebate of the frame by not less than 10mm, fitted with full perimeter <i>acoustically rated seals</i> and constructed of - (i) solid core, wood, particleboard or blockboard not less than 45mm thick; and/or (ii) acoustically laminated glass not less than 10.38mm thick.

Component of building's external envelope	Minimum R_w	Acceptable forms of construction
	28	Fixed so as to overlap the frame or rebate of the frame, constructed of - (i) Wood, particleboard or blockboard not less than 33mm thick; or (ii) Compressed fibre reinforced sheeting not less than 9mm thick; or (iii) Other suitable material with a mass per unit area not less than 24.4kg/m²; or (iv) Solid core timber door not less than 35mm thick fitted with full perimeter <i>acoustically rated seals</i>.

Schedule 3

The objective of the *noise assessment* is to clearly demonstrate that the *noise category* that is applicable to a particular part of or entire building, or site. The criteria for determining the relevant *noise category* are given below in Table 1:

Table 1 – Noise category levels

<i>Noise Category</i>	<i>Level of transport noise * ($L_{A10, 18hr}$) for State-controlled roads and designated local government roads</i>	<i>Single event maximum noise* (L_{Amax}) for railway land</i>
Category 4	≥ 73 dB(A)	≥ 85 dB(A)
Category 3	68 - 72 dB(A)	80 – 84 dB(A)
Category 2	63 – 67 dB(A)	75 – 79 dB(A)
Category 1	58 - 62 dB(A)	70 - 74 dB(A)
Category 0	≤ 57 dB(A)	≤ 69 dB(A)

* measured at 1 m from the façade of the proposed building.

Noise assessment requirements – *State-controlled Roads* and *Local Government roads*:

A *noise assessment* for *State-controlled roads* and *Local Government roads* must be undertaken in accordance with the Transport Noise Management Code of Practice Volume 1 – Road Traffic Noise (Department of Transport and Main Roads, 2013).

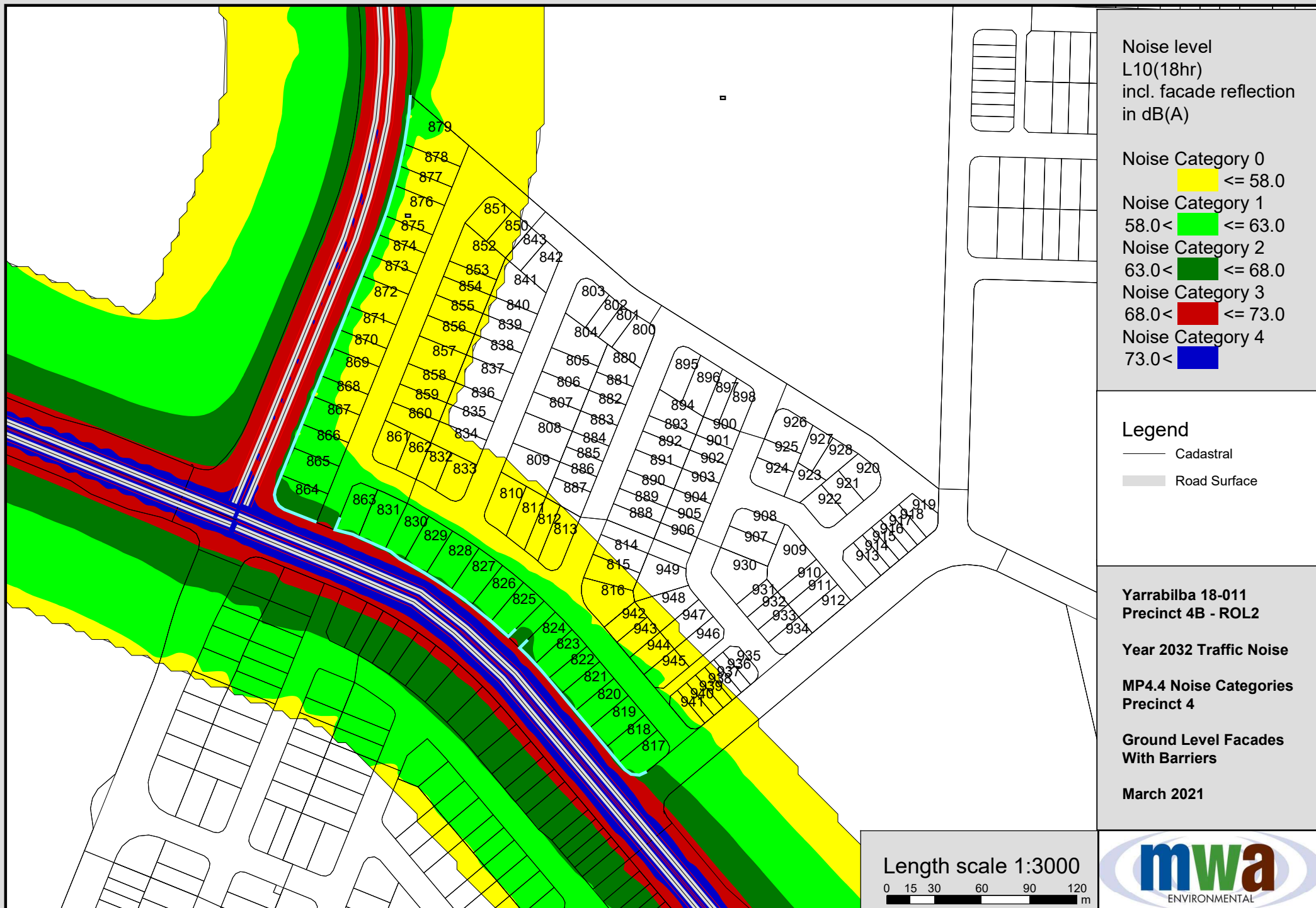
In addition, the *noise assessment* must contain the following information as a minimum:

1) Background Information and Existing Acoustic Environment

- A brief description of the project.
- A brief description of the current noise environment.
- Documentation of noise monitoring equipment and procedures.
- A site plan showing:
 - Location of *transport noise corridor*;

Attachment 4

*SoundPLAN 7.3 Modelling
Design Horizon Traffic Noise Predictions –
Ground Level QDC MP4.4 Noise Categories*



Noise level
L10(18hr)
incl. facade reflection
in dB(A)

Noise Category 0
≤ 58.0
Noise Category 1
58.0 < ≤ 63.0
Noise Category 2
63.0 < ≤ 68.0
Noise Category 3
68.0 < ≤ 73.0
Noise Category 4
73.0 <

Legend

— Cadastral
— Road Surface

**Yarrabilba 18-011
Precinct 4B - ROL2**

Year 2032 Traffic Noise

**MP4.4 Noise Categories
Precinct 4**

**Ground Level Facades
With Barriers**

March 2021

Length scale 1:3000

0 15 30 60 90 120
m



ATTACHMENT 5

*SoundPLAN 7.3 Modelling
Design Horizon Traffic Noise Predictions –
Upper Level QDC MP4.4 Noise Categories*

