PLANS AND DOCUMENTS
referred to in the PDA
DEVELOPMENT APPROVAL

Approval no: DEV2022/1280

Date: 6 October 2022

Queensland Government

TRAFFIC NOISE IMPACT ASSESSMENT

PROPOSED PRECINCT 4A (SUB-PRECINCT 4E) DEVELOPMENT

YARRABILBA

Prepared for:
Lendlease

Prepared by:
MWA Environmental

4 April 2022

Max Winders & Associates Pty Ltd tas 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

DOCUMENT CONTROL SHEET

MWA Environmental
Level 15 241 Adelaide Street
GPO Box 3137 Brisbane 4001

Telephone: 07 3002 5500
Facsimile 07 3002 5588
Email: mail@mwaenviro.com.au

Job Name: Yarrabilba

Job No: 22-021

Original Date of Issue: 4 April 2022

DOCUMENT DETAILS

Title:	Traffic Noise Impact Assessment – Proposed Precinct 4A (Sub-Precinct 4E) Development, Yarrabilba
Principal Author:	Mr Elton Singh
Client:	Lendlease
Client Address:	GPO Box 2777, Brisbane QLD 4001
Client Contact:	Mr John Kibble

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Destination	Version Number								
	1	2	3	4	5	6	7	8	9
Client (electronic)	1								
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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 4A - Sub-Precinct 4E' 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 4E by KN Group;
- Proposed ROL for Precinct 4E 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 for the road corridors as advised by SLR (email correspondence).

1.2 SITE DESCRIPTION

The proposed Precinct 4E development is located in the southwestern portion of the overall Yarrabilba Precinct 4 development. The site location is shown on **Figure 1.**

The Arterial Road corridor, Wentland Avenue runs adjacent to the eastern side of the proposed residential allotments with the Major Collector Road, North-South Road located along the south-eastern side of Precinct 4E.

1.3 PROPOSED DEVELOPMENT

The proposed overall Precinct 4E development comprises approximately 272 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) L_{10} 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: 1. to meet the following external noise criteria at all facades of the building envelope: a. ≤60 dB(A) L_{10} (18 hour) façade corrected (measured L_{90} (8 hour) free field between 10pm and 6am ≤40 dB(A)) b. ≤63 dB(A) L_{10} (18 hour) façade corrected (measured L_{90} (8 hour) free field between 10pm and 6am >40 dB(A)) 2. 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: 1. to meet the following external noise criteria in **outdoor spaces for passive recreation**: 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)) 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. 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 4E allotments.

The SoundPLAN 8.2 model was setup to predict the external $L_{10\ (18\ hour)}$ traffic noise levels under design traffic flow conditions for the Year 2034.

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.

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 Planning	Wentland Avenue	19,100	60
	North-South Road	18,700	

3.1.2 Predicted Future Traffic Noise Levels – Residential Outdoor Areas

A SoundPLAN 8.2 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 proposed allotment pad level or on top of the retaining wall** whichever is the higher point as shown on **Figure 3.**

It is noted that most allotments are in cut 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 high 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 above pad level and 1.8 metres from road level.

The results of the traffic noise modelling for ground level receptors within Precinct 4E 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 Lots 39 and 220 to 226.

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, Lots 39 and 220 to 226 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).

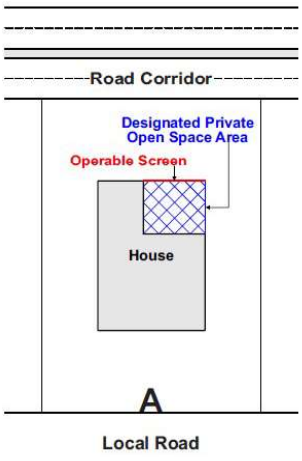


Diagram A – Rear Acoustic Screen

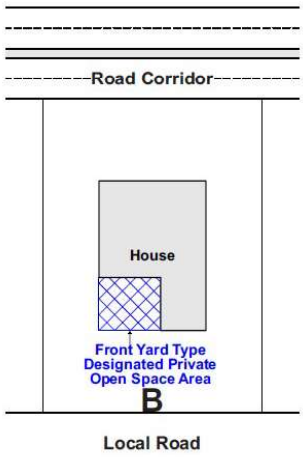


Diagram B - Front Shielded

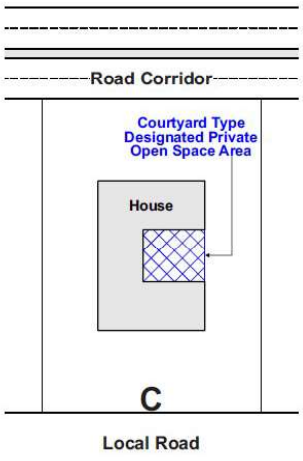


Diagram C – Courtyard Configuration

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) L_{10} (18 hour) for outdoor spaces are provided in **Attachment 1.**

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 L_{10} (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 2034 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 2034 modelling for Precinct 4E, 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 4E 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 4E.

A copy of the Queensland Development Code (QDC) *MP4.4 – Buildings in a Transport Noise Corridor* is included in **Attachment 2** including indicative acceptable forms of construction**.**

Table 3: **Recommended QDC MP4.4 'Noise Categories' for 'Precinct 4E' Allotments**

QDC MP4.4 Noise Categories PRECINCT 4E		
Lot #	**Single storey house / ground floor**	**Upper floor of two storey house**
24	Category 0	Category 1
25	Category 0	Category 0
26	Category 0	Category 0
34	Category 0	Category 0
35	Category 0	Category 1
36	Category 0	Category 1
37	Category 1	Category 1
38	Category 1	Category 2
39	Category 2	Category 3
40	Category 1	Category 3
41	Category 1	Category 3
42	Category 1	Category 3
43	Category 1	Category 3
180	Category 1	Category 3
181	Category 1	Category 3
182	Category 1	Category 3
183	Category 1	Category 3
184	Category 1	Category 3
185	Category 1	Category 3
186	Category 1	Category 3
187	Category 1	Category 3
188	Category 1	Category 3
189	Category 1	Category 3
190	Category 1	Category 3
191	Category 1	Category 3
192	Category 1	Category 3
193	Category 1	Category 3
194	Category 1	Category 3
195	Category 1	Category 1
196	Category 0	Category 1
197	Category 0	Category 1
198	Category 0	Category 1

*Noise Category 0 – No acoustic treatment is required

Table 3 – Continued

QDC MP4.4 Noise Categories PRECINCT 4E		
Lot #	**Single storey house / ground floor**	**Upper floor of two storey house**
205	Category 0	Category 0
206	Category 0	Category 1
207	Category 0	Category 1
208	Category 0	Category 1
209	Category 0	Category 1
210	Category 0	Category 0
212	Category 0	Category 0
213	Category 0	Category 0
214	Category 0	Category 1
220	Category 2	Category 3
221	Category 2	Category 3
222	Category 2	Category 3
223	Category 2	Category 3
224	Category 2	Category 3
225	Category 2	Category 3
226	Category 2	Category 3
228	Category 0	Category 0
229	Category 0	Category 1
230	Category 0	Category 1
231	Category 1	Category 1
232	Category 2	Category 2
233	Category 2	Category 2
234	Category 2	Category 2
235	Category 2	Category 2
236	Category 2	Category 2
237	Category 1	Category 1
238	Category 0	Category 1
239	Category 0	Category 1
240	Category 0	Category 0
247	Category 0	Category 0
248	Category 0	Category 1
249	Category 1	Category 1
250	Category 1	Category 1
251	Category 1	Category 1

*Noise Category 0 – No acoustic treatment is required

The SoundPLAN model predictions are presented as plots of predicted Year 2034 L_{10} (18 hour) traffic noise levels (including +2.5dB façade reflection) over the proposed residential subdivision for ground level (+1.8m) receptors (refer ***Attachment 3)***.

The SoundPLAN model predictions are also presented as plots of predicted Year 2034 L_{10} (18 hour) traffic noise levels (including +2.5dB façade reflection) over the proposed residential subdivision for upper level (+4.6m) receptors (refer ***Attachment 4***).

4.0 CONCLUSIONS

MWA Environmental has been engaged by Lend Lease to prepare a Traffic Noise Impact Assessment for the proposed 'Precinct 4A - Sub-Precinct 4E' 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.

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 4E indicates that the adopted noise criterion of 60 dB(A) L_{10} (18 hour) for outdoor recreation space (backyards) will achieve compliance at most of the proposed allotment within Precinct 4E with the inclusion of acoustic barriers at height of **1.8 metres above the allotment pad level or on top of the retaining wall,** whichever is the higher point as shown on **Figure 3, with the exception of Lots 39 and 220 to 226.**

Alternatively, specific design features (e.g. more shielded locations, operable walls/louvres to shield road traffic noise) may be incorporated for Lots 39 and 220 to 226 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, Lots 39 and 220 to 226 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

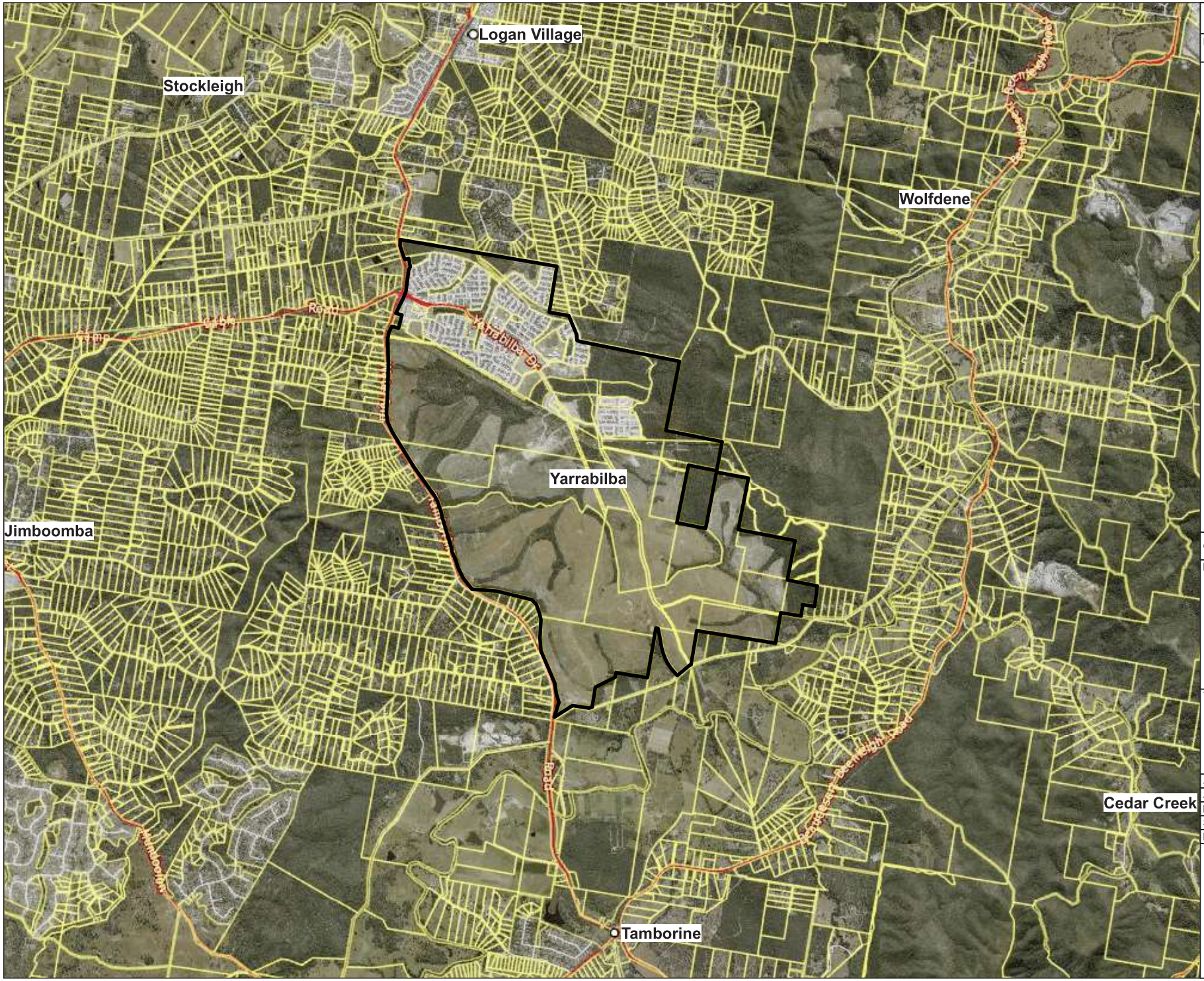
2. An outdoor recreation area on the front façade of the dwelling (located at front façade facing access road) (see **Diagram B** below); or

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 2034 modelling for Precinct 4E, 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 4E 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 4E.

MWA Environmental
4 April 2022

FIGURES



LEGEND

PROPERTY BOUNDARY

DRAWING REFERENCE
© THE STATE OF QUEENSLAND QLDGLOBE

N

0 1.0 2.0km

CLIENT **LENDLEASE**

PROJECT

TRAFFIC NOISE IMPACT ASSESSMENT PROPOSED PRECINCT 4A (SUB-PRECINCT 4E) YARRABILBA QLD

TITLE

SITE LOCATION

JOB	YARRABILBA	**FIGURE 1**
JOB NO.	22-021	
DATE	04/04/22	DRAWING NUMBER
SCALE	1:70,000 (A4)	**22-021-1**
REV.		

mwa ENVIRONMENTAL

Max Winders & Associates Pty Ltd tas 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
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CLIENT	**LENDLEASE**
PROJECT	**TRAFFIC NOISE IMPACT ASSESSMENT PROPOSED PRECINCT 4A (SUB-PRECINCT 4E) YARRABILBA QLD**
TITLE	**SITE PLAN PRECINCT 4E**

JOB	YARRABILBA	**FIGURE 2**
JOB NO.	22-021	
DATE	04/04/22	DRAWING NUMBER
SCALE	1:2500 (A3)	**22-021-2**
REV.		

Max Winders & Associates Pty Ltd tas 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

YARRABILBA

- PRECINCT FOUR - APPLICATION FOUR BOUNDARY
- STAGE BOUNDARY
- OPEN SPACE
- LOCAL STAGE ROAD
- PATHWAY CONNECTION
- VILLAGE ROAD
- MAJOR ROAD

LAND USE	AREA (ha)
Residential	10.23 ha
Open Space	0.64 ha
Road - Major Road	1.66 ha
Road - Collector Road	0.52 ha
Road - Local Street	4.11 ha
TOTAL	17.16 ha

MINIMUM RESIDENTIAL DENSITY - 15.50 ha, 230 dw, 14.8 dw/ha

MAXIMUM RESIDENTIAL DENSITY - 15.50 ha, 236 dw, 15.2 dw/ha

LOT YIELD BY LOT TYPE

LOT TYPE	No.	No.%	AREA	AREA%	MINIMUM	MAXIMUM	AVERAGE
T1	13	5,65%	9093,38m²	8,89%	640,00m²	812,26m²	699,49m²
T3	9	3,91%	6231,63m²	6,09%	600,00m²	930,74m²	692,40m²
C2	46	20,00%	22802,54m²	22,29%	420,00m²	763,98m²	495,71m²
C3	25	10,87%	14195,11m²	13,88%	512,00m²	859,66m²	567,80m²
PV	41	17,83%	16453,65m²	16,09%	375,00m²	504,75m²	401,31m²
V	9	3,91%	3079,21m²	3,01%	312,00m²	446,10m²	342,13m²
TCY2	17	7,39%	6884,88m²	6,73%	350,00m²	618,95m²	404,99m²
TCY3	11	4,78%	5236,91m²	5,12%	400,00m²	558,76m²	476,08m²
TPV	28	12,17%	9638,56m²	9,42%	312,50m²	493,02m²	344,23m²
TV	6	2,61%	1564,26m²	1,53%	260,00m²	264,26m²	260,71m²
TCF	22	9,57%	5032,15m²	4,92%	189,00m²	365,56m²	228,73m²
MFS	3	1,30%	2079,40m²	2,03%	524,73m²	803,92m²	693,16m²
TOTALS	230	100%	102291,75m²	100%	189,00m²	930,74m²	444,75m²

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 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 FOUR
RECONFIGURATION OF A LOT

0 25 50 75 100 125m

Scale 1:2,500 at A3

North

lendlease

File No. YAR-P04 Dgn No. YAR-P04-ROL4-ROL-220325 Date 25 MAR 2022

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 PRECINCT 4A (SUB-PRECINCT 4E) YARRABILBA QLD

TITLE

ACOUSTIC BARRIER LOCATIONS

JOB	YARRABILBA	**FIGURE 3**
JOB NO.	22-021	
DATE	04/04/22	DRAWING NUMBER
SCALE	1:2500 (A3)	**22-021-3**
REV.		

Max Winders & Associates Pty Ltd tas 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
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YARRABILBA

- PRECINCT FOUR - APPLICATION FOUR BOUNDARY
- STAGE BOUNDARY
- OPEN SPACE
- LOCAL STAGE ROAD
- PATHWAY CONNECTION
- VILLAGE ROAD
- MAJOR ROAD

LAND USE	AREA (ha)
Residential	10.23 ha
Open Space	0.64 ha
Road - Major Road	1.66 ha
Road - Collector Road	0.52 ha
Road - Local Street	4.11 ha
TOTAL	17.16 ha

MINIMUM RESIDENTIAL DENSITY - 15.50 ha, 230 dw, 14.8 dw/ha

MAXIMUM RESIDENTIAL DENSITY - 15.50 ha, 236 dw, 15.2 dw/ha

LOT YIELD BY LOT TYPE							
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C2	46	20,00%	22802,54m²	22,29%	420,00m²	763,98m²	495,71m²
C3	25	10,87%	14195,11m²	13,88%	512,00m²	859,66m²	567,80m²
PV	41	17,83%	16453,65m²	16,09%	375,00m²	504,75m²	401,31m²
V	9	3,91%	3079,21m²	3,01%	312,00m²	446,10m²	342,13m²
TCY2	17	7,39%	6884,88m²	6,73%	350,00m²	618,95m²	404,99m²
TCY3	11	4,78%	5236,91m²	5,12%	400,00m²	558,76m²	476,08m²
TPV	28	12,17%	9638,56m²	9,42%	312,50m²	493,02m²	344,23m²
TV	6	2,61%	1564,26m²	1,53%	260,00m²	264,26m²	260,71m²
TCF	22	9,57%	5032,15m²	4,92%	189,00m²	365,56m²	228,73m²
MFS	3	1,30%	2079,40m²	2,03%	524,73m²	803,92m²	693,16m²
TOTALS	230	100%	102291,75m²	100%	189,00m²	930,74m²	444,75m²

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 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 FOUR RECONFIGURATION OF A LOT

0 25 50 75 100 125m

Scale 1:2,500 at A3

North

lendlease

LEGEND

ALLOTMENT REQUIRING DESIGNATED PRIVATE OPEN SPACE

CLIENT **LENDLEASE**

PROJECT

TRAFFIC NOISE IMPACT ASSESSMENT PROPOSED PRECINCT 4A (SUB-PRECINCT 4E) YARRABILBA QLD

TITLE

ALLOTMENTS REQUIRING DESIGNATED PRIVATE OPEN SPACE

JOB	YARRABILBA	**FIGURE 4**
JOB NO.	22-021	
DATE	04/04/22	DRAWING NUMBER
SCALE	1:2500 (A3)	**22-021-4**
REV.		

Max Winders & Associates Pty Ltd tas 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

YARRABILBA

- PRECINCT FOUR - APPLICATION FOUR BOUNDARY
- STAGE BOUNDARY
- OPEN SPACE
- LOCAL STAGE ROAD
- PATHWAY CONNECTION
- VILLAGE ROAD
- MAJOR ROAD

LAND USE	AREA (ha)
Residential	10.23 ha
Open Space	0.64 ha
Road - Major Road	1.66 ha
Road - Collector Road	0.52 ha
Road - Local Street	4.11 ha
TOTAL	17.16 ha

MINIMUM RESIDENTIAL DENSITY - 15.50 ha, 230 dw, 14.8 dw/ha

MAXIMUM RESIDENTIAL DENSITY - 15.50 ha, 236 dw, 15.2 dw/ha

LOT YIELD BY LOT TYPE							
LOT TYPE	No.	No.%	AREA	AREA%	MINIMUM	MAXIMUM	AVERAGE
T1	13	5,65%	9093,38m²	8,89%	640,00m²	812,26m²	699,49m²
T3	9	3,91%	6231,63m²	6,09%	600,00m²	930,74m²	692,40m²
C2	46	20,00%	22802,54m²	22,29%	420,00m²	763,98m²	495,71m²
C3	25	10,87%	14195,11m²	13,88%	512,00m²	859,66m²	567,80m²
PV	41	17,83%	16453,65m²	16,09%	375,00m²	504,75m²	401,31m²
V	9	3,91%	3079,21m²	3,01%	312,00m²	446,10m²	342,13m²
TCY2	17	7,39%	6884,88m²	6,73%	350,00m²	618,95m²	404,99m²
TCY3	11	4,78%	5236,91m²	5,12%	400,00m²	558,76m²	476,08m²
TPV	28	12,17%	9638,56m²	9,42%	312,50m²	493,02m²	344,23m²
TV	6	2,61%	1564,26m²	1,53%	260,00m²	264,26m²	260,71m²
TCF	22	9,57%	5032,15m²	4,92%	189,00m²	365,56m²	228,73m²
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TOTALS	230	100%	102291,75m²	100%	189,00m²	930,74m²	444,75m²

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 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 FOUR RECONFIGURATION OF A LOT

0 25 50 75 100 125m

Scale 1:2,500 at A3

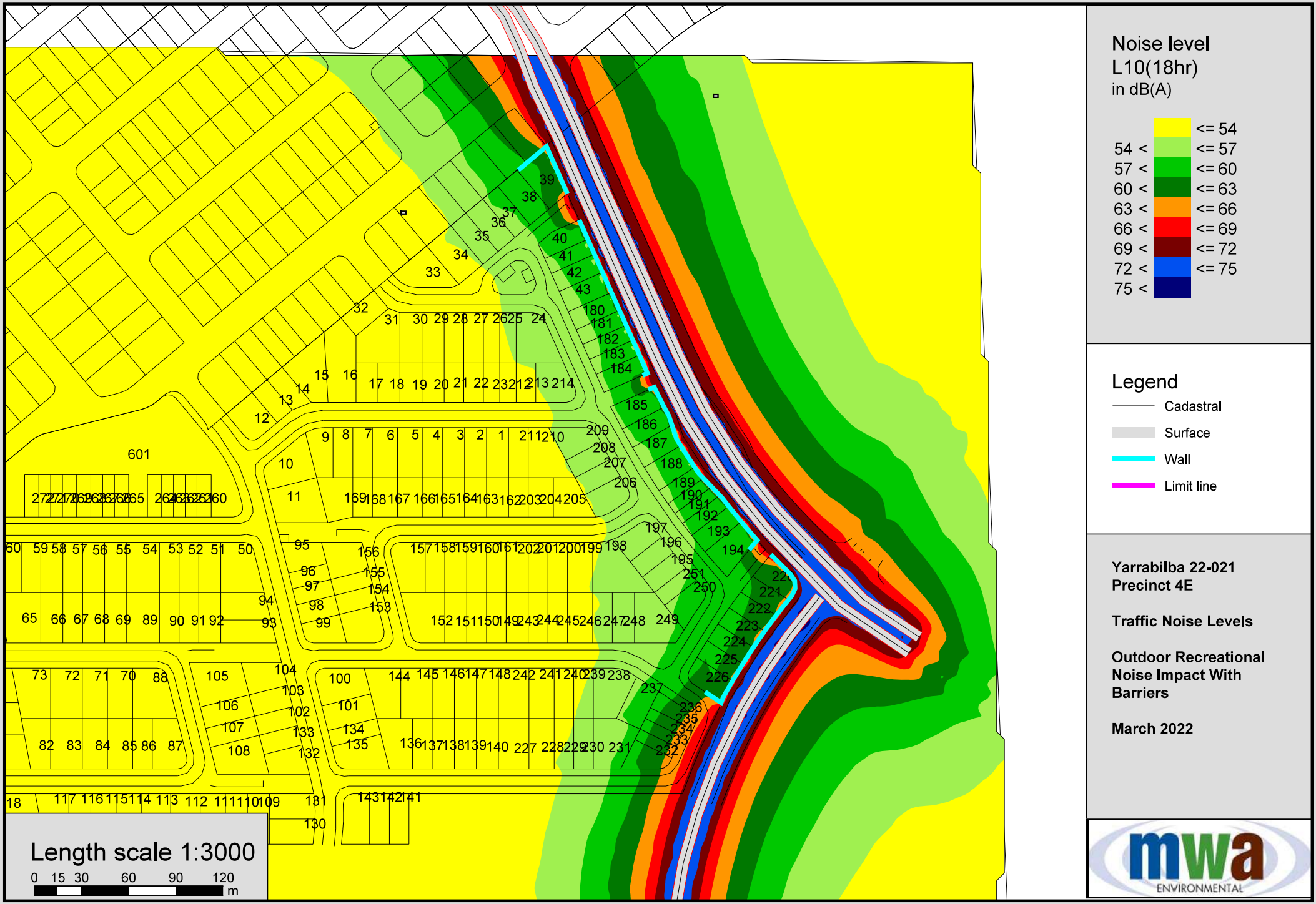
North

lendlease

File No. YAR-P04 Dgn No. YAR-P04-ROL4-ROL-220325 Date 25 MAR 2022

Attachment 1

SoundPLAN 8.2 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
75 <
Legend
Cadastral
Surface
Wall
Limit line
Yarrabilba 22-021
Precinct 4E
Traffic Noise Levels
Outdoor Recreational
Noise Impact With
Barriers
March 2022
Length scale 1:3000
0 15 30 60 90 120
m
mwa
ENVIRONMENTAL

Attachment 2

QDC MP4.4 – Acceptable Solutions

Schedule 1

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 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 *habitable room* is greater than 1.8m^2)
			35 (where total area of glazing for a *habitable room* 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 *habitable room* is greater than 1.8m^2)
			32 (where total area of glazing for a *habitable room* 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 *habitable room* is greater than 1.8m^2)
			24 (where total area of glazing for a *habitable room* 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 *acoustically rated seals*.
	38	Minimum 14.38mm thick laminated glass, with full perimeter *acoustically rated seals*; 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 *acoustically rated seals*
	35	Minimum 10.38mm thick laminated glass, with full perimeter *acoustically rated seals*.
	32	Minimum 6.38mm thick laminated glass with full perimeter *acoustically rated seals*.
	27	Minimum 4mm thick glass with full perimeter *acoustically rated seals*
	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/m^3 or 50mm thick polyester insulation with a density of 20kg/m^3 in the cavity. OR Two leaves of clay brick masonry at last 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/m^3 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 last 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/m^3 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.

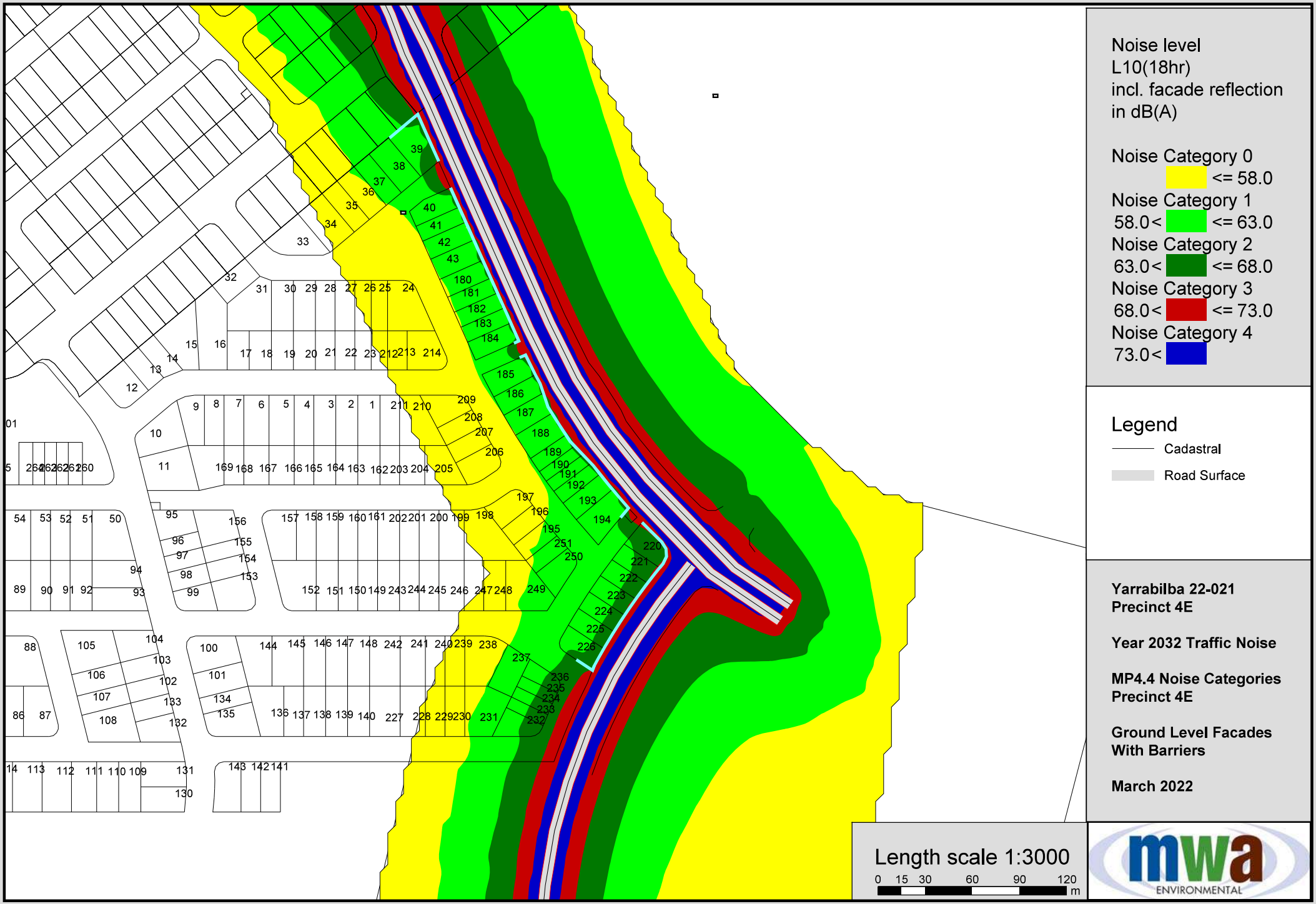
Component of building's *external envelope*	Minimum R_w	Acceptable forms of construction
	35	Single leaf of clay brick masonry at least 110mm thick with: (i) a row of at least 70mm x 35mm timber studs or 64mm steel studs at 600mm centres, spaced at least 20mm from the masonry wall; and (ii) One layer 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, *acoustically rated plasterboard* ceiling at least 13mm thick fixed to ceiling joists, cellulose fibre insulation at least 100mm thick with a density of at least 45kg/m^3 in the cavity. OR Concrete or terracotta tile or sheet metal roof with sarking, 2 layers of *acoustically rated plasterboard* at least 16mm thick fixed to ceiling joists, glass wool insulation at least 50mm thick with a density of at least 11kg/m^3 or polyester insulation at least 50mm thick with a density of at least 20kg/m^3 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/m^3 or polyester insulation at least 50mm thick with a density of at least 20kg/m^3 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/m^3.

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 *acoustically rated seals*.
	33	Fixed so as to overlap the frame or rebate of the frame by not less than 10mm, fitted with full perimeter *acoustically rated seals* 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/m^2; or (iv) Solid core timber door not less than 35mm thick fitted with full perimeter *acoustically rated seals*.

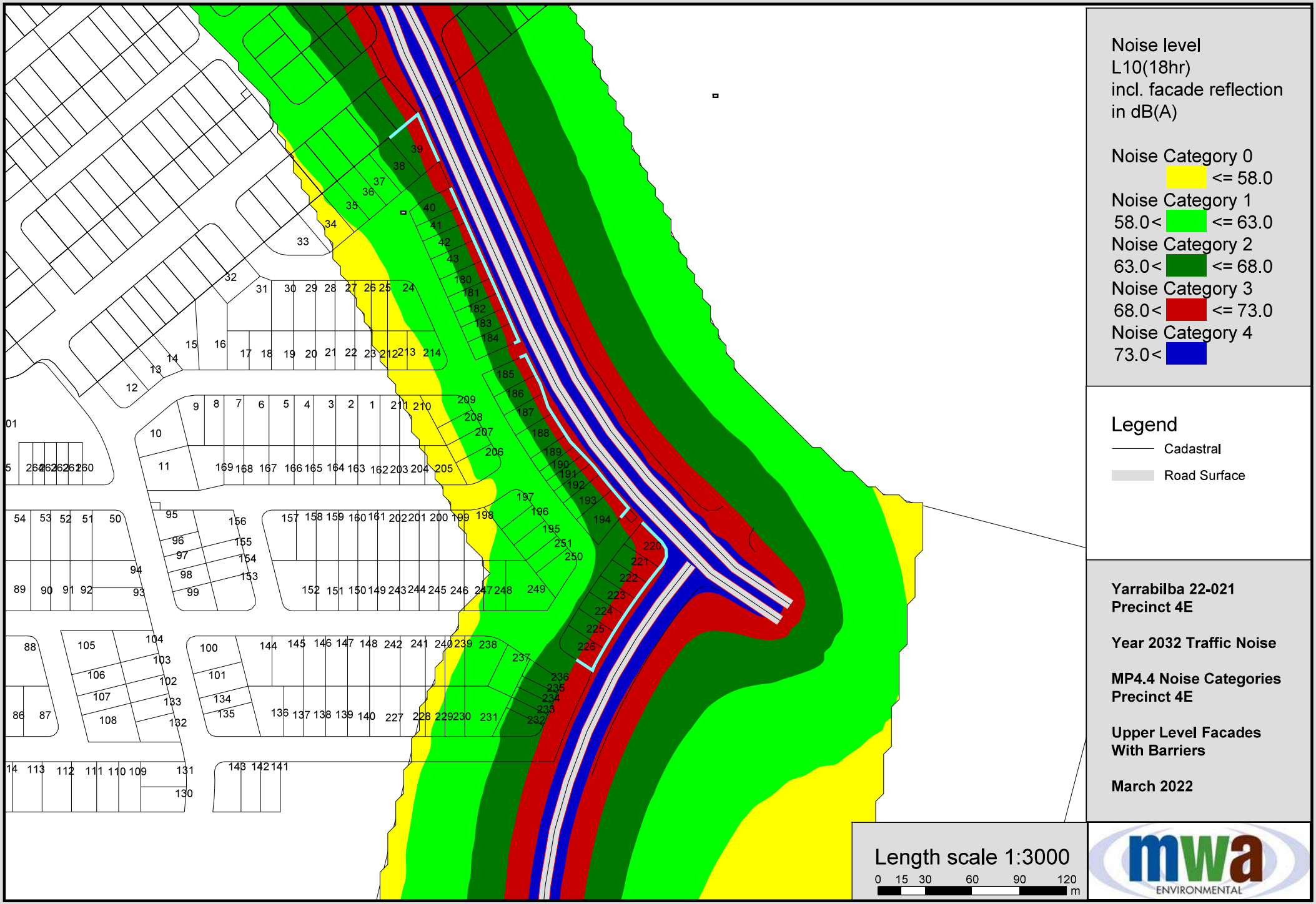
Attachment 3

SoundPLAN 8.2 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 22-021
Precinct 4E
Year 2032 Traffic Noise
MP4.4 Noise Categories
Precinct 4E
Ground Level Facades
With Barriers
March 2022
Length scale 1:3000
0 15 30 60 90 120
m
mwa
ENVIRONMENTAL

ATTACHMENT 4

SoundPLAN 8.2 Modelling
Design Horizon Traffic Noise Predictions –
Upper 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 22-021
Precinct 4E
Year 2032 Traffic Noise
MP4.4 Noise Categories
Precinct 4E
Upper Level Facades
With Barriers
March 2022
Length scale 1:3000
0 15 30 60 90 120
m
mwa
ENVIRONMENTAL