APPENDIX J

Road Traffic Noise Assessment

Reference: HO76_CED06678

Prepared by Cardno

dated 8 October 2019

Road Traffic Noise Assessment

Neighbourhoods 3A and 3B, Flinders Precinct 1

H076_CEB06678

Prepared for
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Executive Summary

This noise impact assessment was conducted on behalf of Pacifiq for a proposed residential subdivsion located within Neighbourhoods 3A and 3B of Flinders Precinct 1. Road traffic noise impacting the proposed residential allotments was assessed to determine any acoustic treatment requirements for proposed future 1 to 3 storey dwellings.

Currently, the site and surrounding area is relatively undeveloped, with nearby roads including the proposed Flinders Lake Drive yet to be constructed and current local roads set to become redundant. On this basis, the 3D traffic noise modelling has been based upon the projected traffic volumes for the future local road network. However, as the roads are not yet constructed, the noise model, constructed for the assessment, has not been verified against measured noise levels.

In addition, the proposed pavement surfaces for the new roads is not currently known, so corrections in the noise model were based on the assumption that future road surfaces will consist of Dense Graded Asphalt (DGA), as the most likely pavement option.

Road traffic noise has been assessed against EDQ noise criteria referenced from a previous Development Approval for the Flagstone Whole of Site MCU (ref: DEV2012/209/15). QDC MP 4.4 noise categories were previously specified on the basis of the internal noise limit of 35 dBA $L_{Aeq, 1h\ max}$. 1.2 metre high acoustic barriers have been recommended in order to reduce noise category requirements at ground floor receiver locations. Barriers higher than 1.2 metres are not proposed due to their impact on impact visual amenity.

Assessment Conclusions

The assessment has resulted in the following conclusions;

> Based on the predicted road traffic noise levels, lots in the vicinity of the future Flinders Lake Drive will require acoustic building treatments to comply with the EDQ internal noise objective, with QDC MP4.4 noise categories specified on the basis of the predicted traffic noise reduction (TNR).

> Noise categories for dwellings have been recommended on the condition that 1.2 metre high acoustic barriers are constructed as detailed in the recommendations section of this report.

> QDC nominates acceptable forms of construction for each noise category. Alternative building systems can be used, provided it can be demonstrated they achieve the required weighted sound reduction index (Rw).

> As an alternative to constructing dwellings in accordance with QDC MP4.4, individual dwellings may also be designed in accordance with Australian Standard *AS3671:1989, Acoustics – Road Traffic Noise Intrusion – Building Siting & Construction*. If this alternative methodology is adopted, dwelling plans will be required to be assessed by a suitably qualified acoustic consultant prior to construction in order to determine acoustic treatments for compliance with the internal criteria nominated in Section 2.1 of this report (35 dBA $L_{eq, 1hour\ max}$).

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Figures

1 Introduction

This noise impact assessment was conducted on behalf of Pacifiq for a proposed residential subdivsion located at Lot 3 Mount Elliott Road, Flinders Lake.

The site is located in a relatively undeveloped location, with future main roads yet to be constructed. Therefore the assessment was undertaken using SoundPLAN 8.1 modelling software to predict road traffic noise levels impacting the site. Acoustic treatments have been recommended in cases where the predicted noise levels exceed the adopted project criteria.

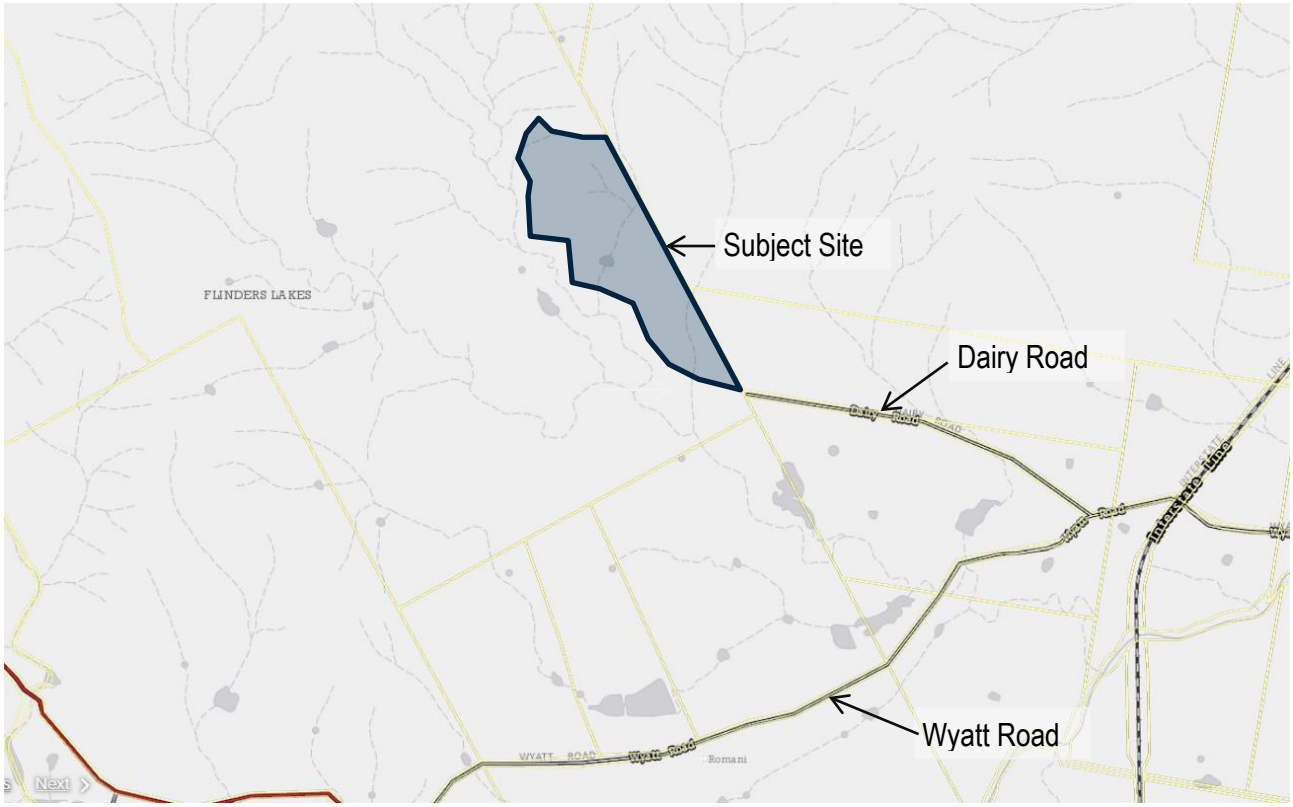
1.1 Site Location

The site is described as follows:

Part of Lot 3, on S311896
Lot 3 Mount Elliott Road Flinders Lakes

The site location is shown in Figure 1-1:

Figure 1-1 Subject Site Location



1.2 Site Environment

Stages 3A and 3B are located within a relatively undeveloped rural area of the Flinders Estate and the Greater Flagstone PDA. Future development is planned for the land surrounding the subject site.

1.3 Proposal Details

The proposal is to construct a residential subdivision consisting of the following;

> Neighbourhood 3A is located on the northern portion of the site and will comprise of 288 lots.

> Neighbourhood 3B is located on the southern portion of the site and will comprise of 138 lots.

> The allotments within both neighbourhoods will allow for the construction on 1 and 2 storey dwellings, with some lots permitting 3 storey dwellings.

> Open space will be provided in approximately 6 separate locations throughout the development.

> Site access will be via 3 intersections with the proposed new road Flinders Lakes Drive.

A plan of the development presented in Figure 1-2 (Neighbourhood 3A) and Figure 1-3 (Neighbourhood 3B).

Figure 1-2 Plan of Development – Neighbourhood 3A

Figure 1-3 Plan of Development – Neighbourhood 3B

2 Criteria

2.1 Economic Development Queensland (EDQ) MCU Development Approval

Road traffic noise has been assessed in accordance with the requirements applicable to previous approvals within the Greater Flagstone PDA. SLR Consulting undertook an assessment for Stages 1i and 1j of the Flagstone Development (SLR ref: 620.10512-R01), with the SLR report referencing the following condition taken from the Development Approval for the Flagstone Whole of Site MCU (ref: DEV2012/209/15) as follows;

Condition 31

> *Submit to EDQ Development Assessment, DSDMIP for compliance assessment a Noise Mitigation Report, certified by a RPEQ, for all lots with 100m from Road 01, the future North-South Arterial road and the railway corridor achieving a ≤ 35dB(A) for 1 hour max, over a 24 hour period for all habitable rooms.*
>
> *Where a ≤ 35dBA for 1 hour max, over a 24 hour period for all habitable rooms cannot be achieved, the Noise Mitigation Report is to provide the proposed noise mitigation measures. If any noise barriers are proposed, the detailed design/construction plans certified by a RPEQ are to be provided.*

It is assumed the *35dB(A) for 1 hour max, over a 24 hour period* is equivalent to the maximum $L_{Aeq, 1h}$ over a 24 hour period.

2.2 Queensland Development Code Mandatory Part 4.4 (QDC MP4.4)

Class 1-4 buildings located within designated Transport Noise Corridors are required to comply with *Queensland Development Code Mandatory Part 4.4 – Buildings in a Transport Noise Corridor* (QDC MP 4.4).

A noise affected property search was conducted on the Department of Housing and Public Works website, which found that the subject site was not currently located with a designated Transport Noise Corridor, for road or rail. The search results are presented in Appendix B.

Although the site is not located within a designated transport noise corridor, EDQ may accept application of the code as one acceptable solution to achieving the internal noise objective nominated in Section 2.1. Refer to Table 2-1 for QDC requirements in relation to traffic noise.

Table 2-1 QDC requirements

Noise Category	QDC Minimum transport noise reduction (dBA) required for habitable rooms	Level of transport noise * (LA10, 18hr) for State controlled roads and designated local government roads
Category 4	40	≥ 73 dBA
Category 3	35	68 – 72 dBA
Category 2	30	63 – 67 dBA
Category 1	25	58 – 62 dBA
Category 0	N/A	≤ 57 dBA

2.3 Australian Standards

An alternative solution to the application of QDC MP 4.4 Noise categories is the adoption of the methodology detailed in Australian Standard AS3671:1989, "Acoustics – Road Traffic Noise Intrusion – Building Siting & Construction". AS 3671, which provides methods to determine the required Traffic Noise Reduction and the types of construction required to

achieve this reduction, to determine suitable alternative building constructions to achieve the required EDQ internal noise levels.

In accordance with Clause 3.2 of AS3671, the worst case Traffic Noise Reduction (TNR) can be calculated and associated category construction adopted.

The required construction categories are defined as follows:

3.2.1 Category 1*. Standard construction; openings, including open windows and doors may comprise up to 10% of the exposed facade. TNR of approximately 10 dBA is expected.*

3.2.2 Category 2. *Standard construction, except for lightweight elements, such as fibrous cement, or metal cladding, or all glass facades. Windows, doors and other openings must be closed. TNR of approximately 25 dBA is expected.*

3.2.3 Category 3. *Special construction, chosen in accordance with Clause 3.4. Windows, doors and other openings must be closed. TNR between 25 and 35 dBA is expected.*

3.2.4 Category 4*. TNR greater than 35 dBA is required; special acoustic advice should be sought.*

3 Road Traffic Noise

SoundPLAN 8.1 computer modelling software was used to predict noise levels from the future Flinders Lake Drive impacting the proposed subdivision.

3.1 Noise Modelling Inputs & Assumptions

Table 3-1 details the modelling inputs and assumptions used in the prediction of road traffic noise levels.

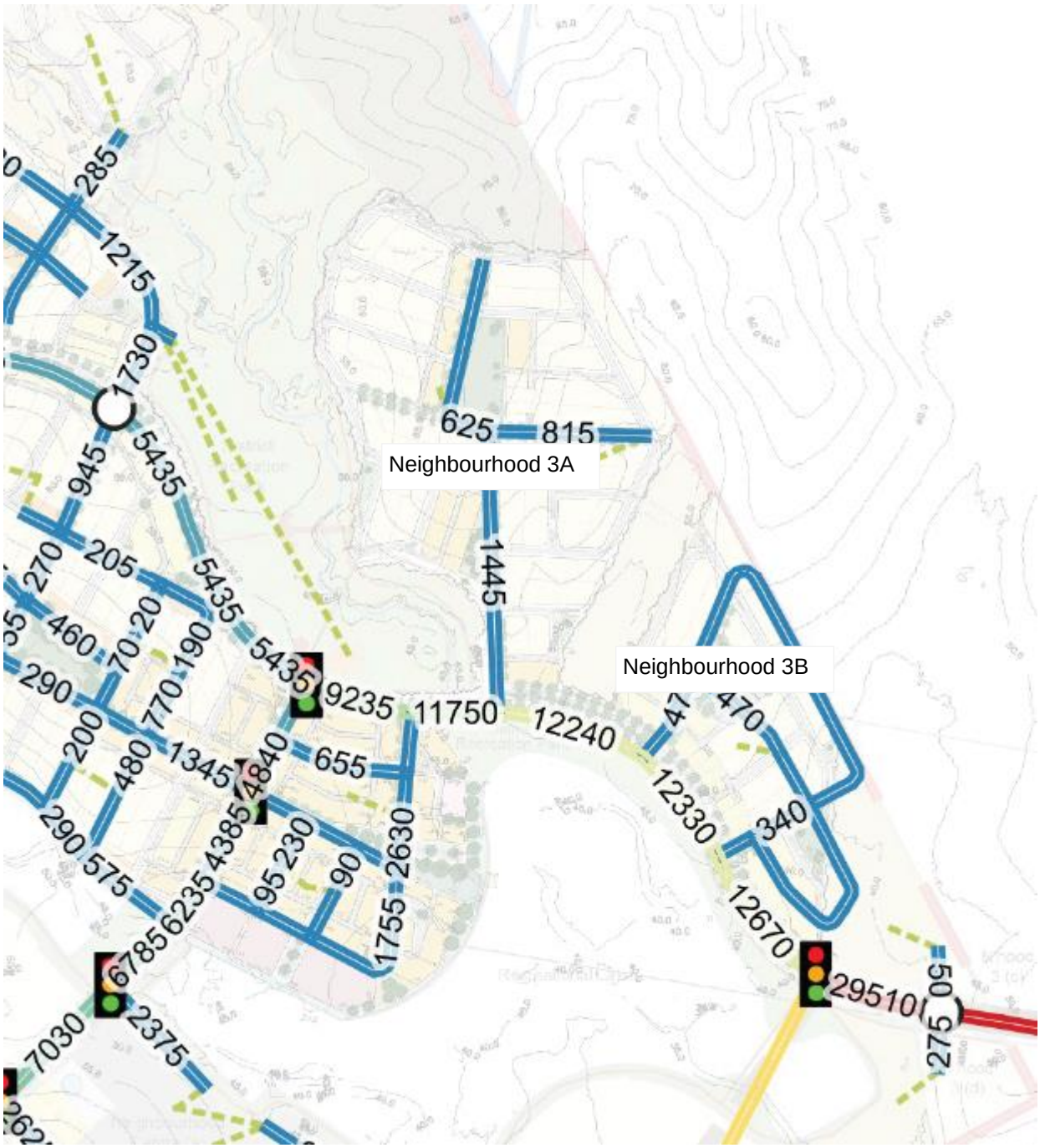
Table 3-1 Road Traffic Noise Modelling Inputs and Assumptions

Input Parameter	Source Reference
Ground elevation geometry	Proposed finished earthworks levels provided by Mortons Urban Solutions
Road Alignment	Provided by Mortons Urban Solutions
Traffic volumes	Refer to Section 3.2
Percentage of Heavy Vehicles	3% as advised by Cardno (Traffic and Transport)
Road traffic speeds	60 km/h
Road Surface	Modelling has assumed a pavement surface of dense grade asphalt indicating a correction factor of 0 dBA to be applied to all modelling scenarios
Ground Absorption	Predominately soft ground
Correction to CoRTN for Australian Conditions	-1.7 dB(A) CoRTN correction for Australian conditions (for facade corrected receiver points located within 1 metre of a receiver building)
Façade correction	+ 2.5 dB(A)
Receiver Height	1.8, 4.6 and 7.4 metres above ground level, accounting for dwellings 1 to 3 storeys in height.

3.2 Traffic Volumes

Future traffic volumes were obtained from Cardno (Traffic and Transport) and are presented in Figure 3-1. Note that Flinders Lakes Drive is not yet constructed, and that the heavy vehicle composition is predicted to be 3%.

Figure 3-1 Flinders Lake Drive Traffic Volumes



3.3 Model Scenarios

To determine any requirements for acoustic treatments, noise models were created for the following scenarios;

1. **Predicted Road Traffic Noise Level $L_{10, 18h}$, No Mitigation:** Future traffic volumes for Flinders Lakes Drive were used to predict traffic noise impacts at ground, first and second floor receiver locations.
2. **Predicted Road Traffic Noise Level $L_{10, 18h}$, With Mitigation:** Future traffic volumes for Flinders Lakes Drive were used to predict traffic noise impacts at ground, first and second floor receiver locations. The model includes acoustic barriers as recommended in Section 4.1 to reduce requirements for upgraded dwelling construction.

3.4 Scenario 1 -Predicted Road Traffic Noise Levels – No Mitigation

Predicted road traffic noise levels for the ground, first and second floors are presented in Figure 3-2 to Figure 3-4.

Figure 3-2 Predicted Road Traffic Noise Levels – Ground Floor Level

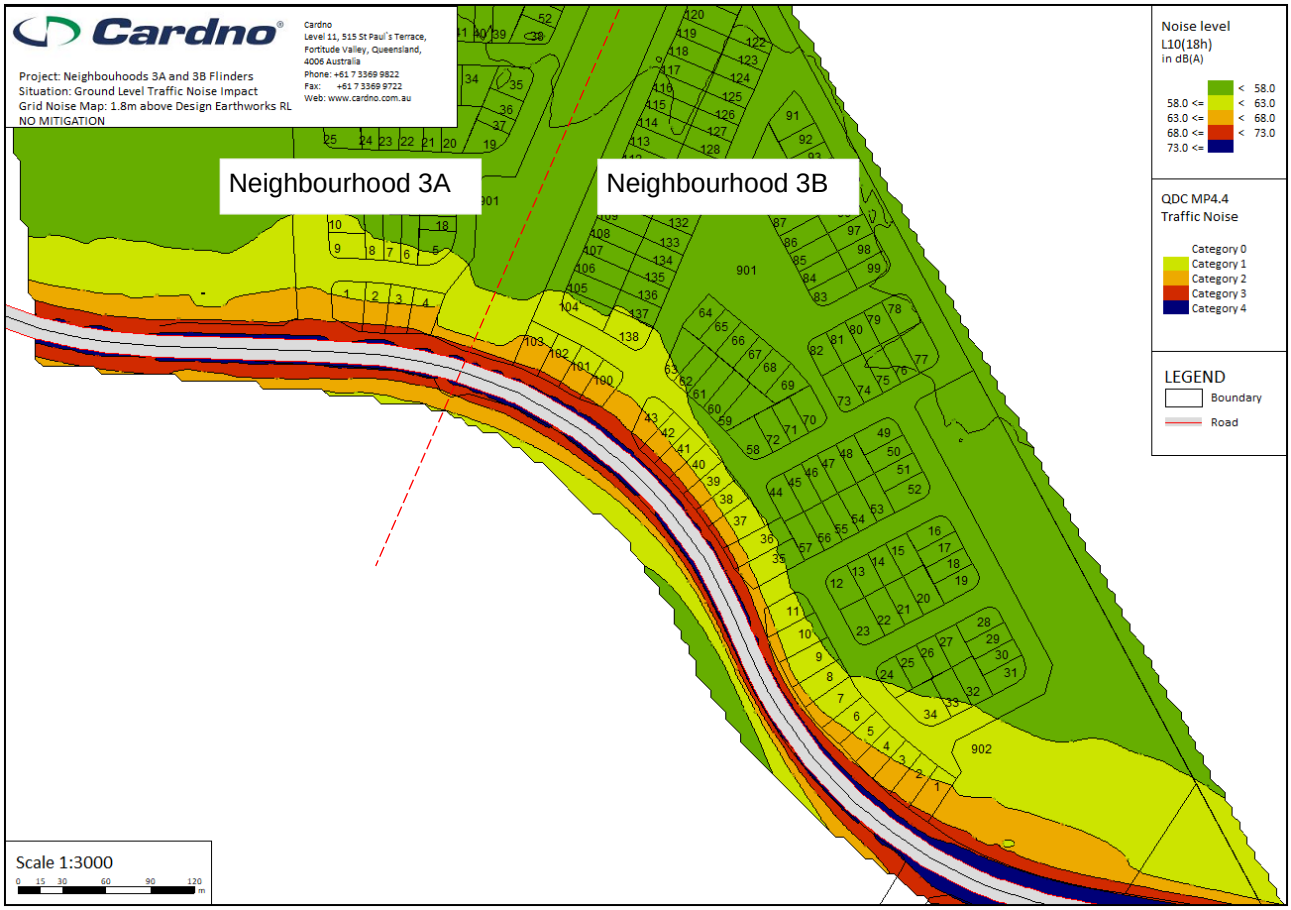


Figure 3-3 Predicted Road Traffic Noise Levels – First Floor Level

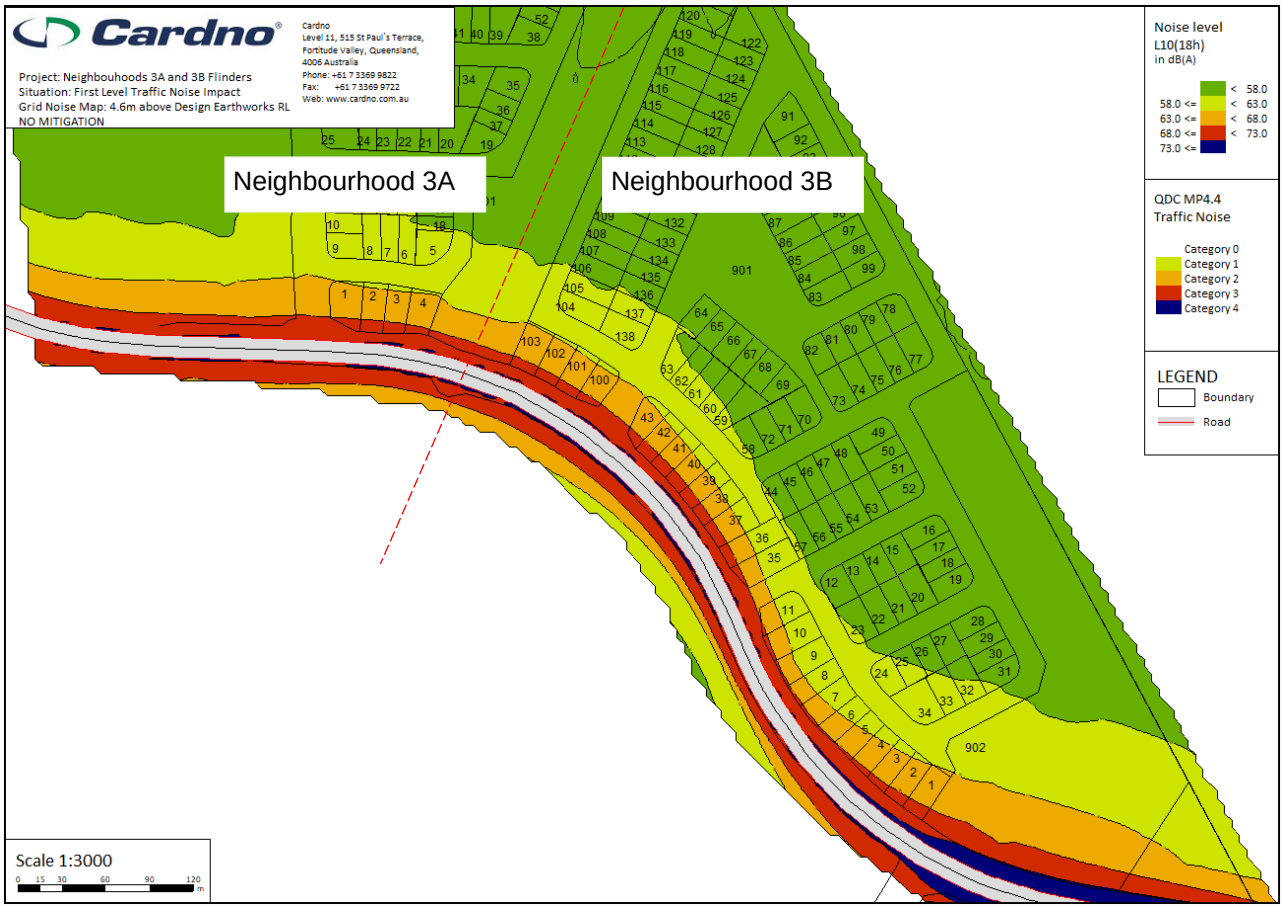
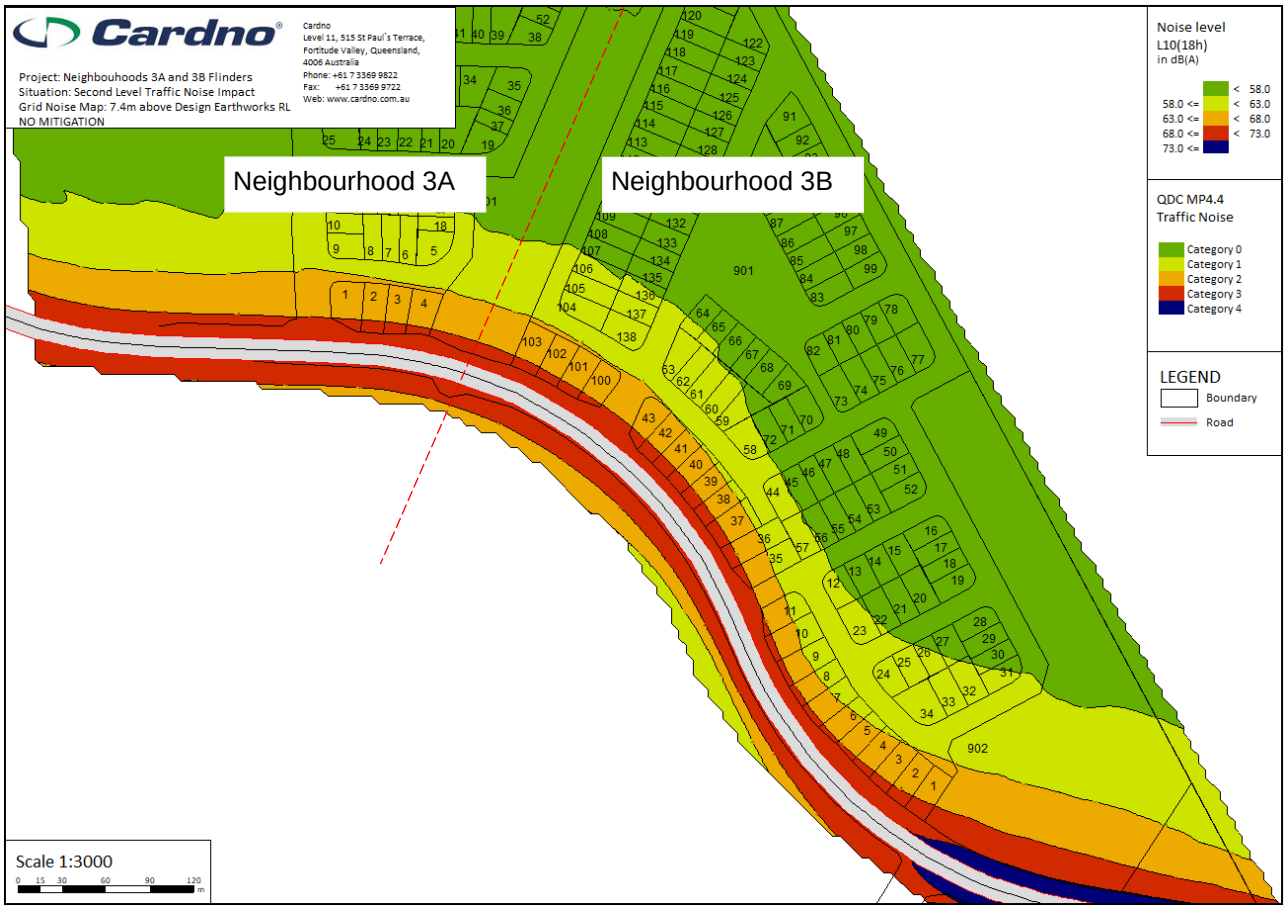


Figure 3-4 Predicted Road Traffic Noise Levels – Second Floor Level



To reduce requirements relating to Noise Category 3 construction for single storey dwellings, further modelling was conducted incorporating acoustic barriers, with the results presented in Section 3.5.

3.5 Scenario 2 -Predicted Road Traffic Noise Levels – With Mitigation

Predicted road traffic noise levels for the ground, first and second floors are presented in Figure 3-5 to Figure 3-7. Predicted road traffic noise levels assume the acoustic barrier recommended in Section 7.1 has been incorporated into the development.

Figure 3-5 Predicted Road Traffic Noise Levels with 1.2m Acoustic Barrier – Ground Floor Level

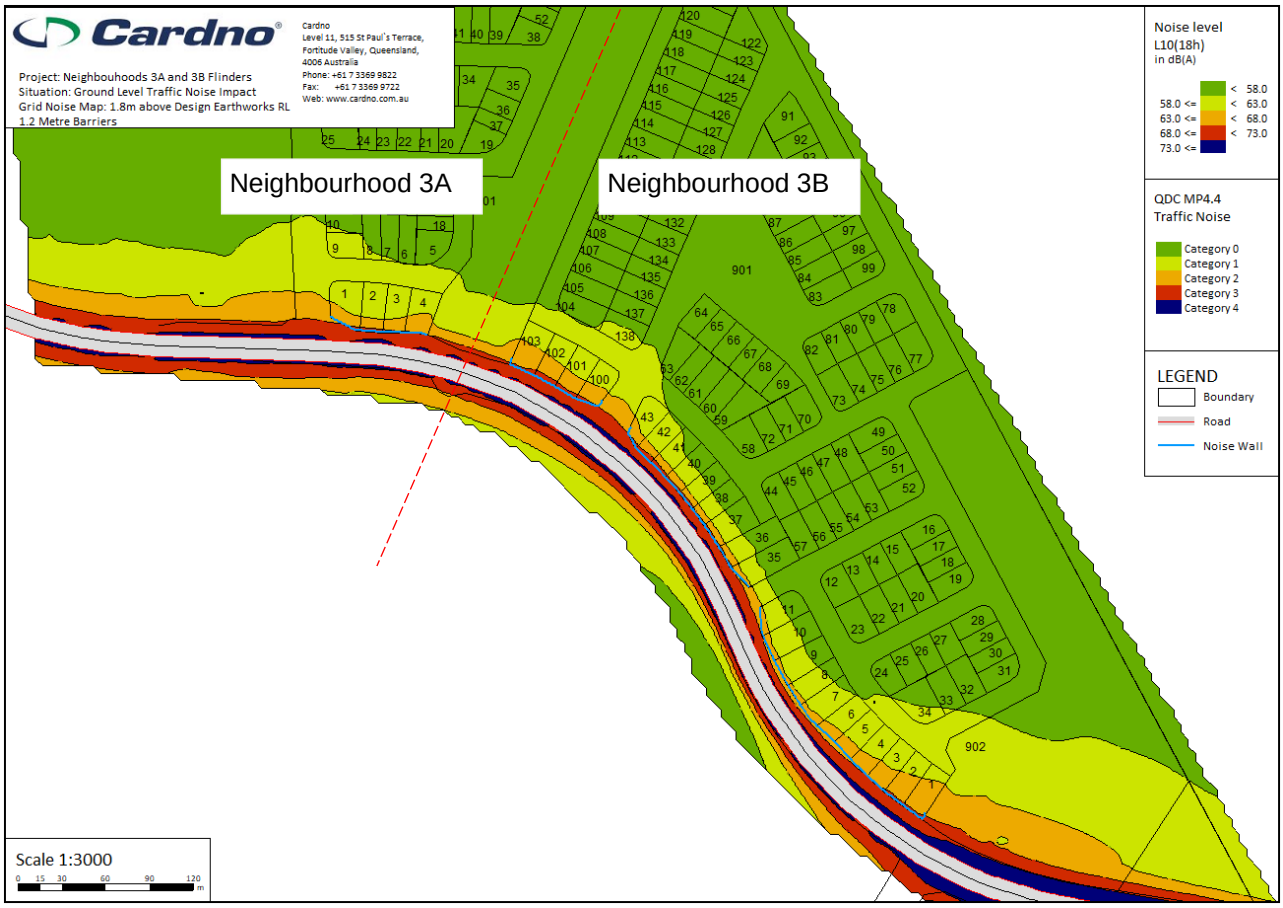


Figure 3-6 Predicted Road Traffic Noise Levels with 1.2m Acoustic Barrier – First Floor Level

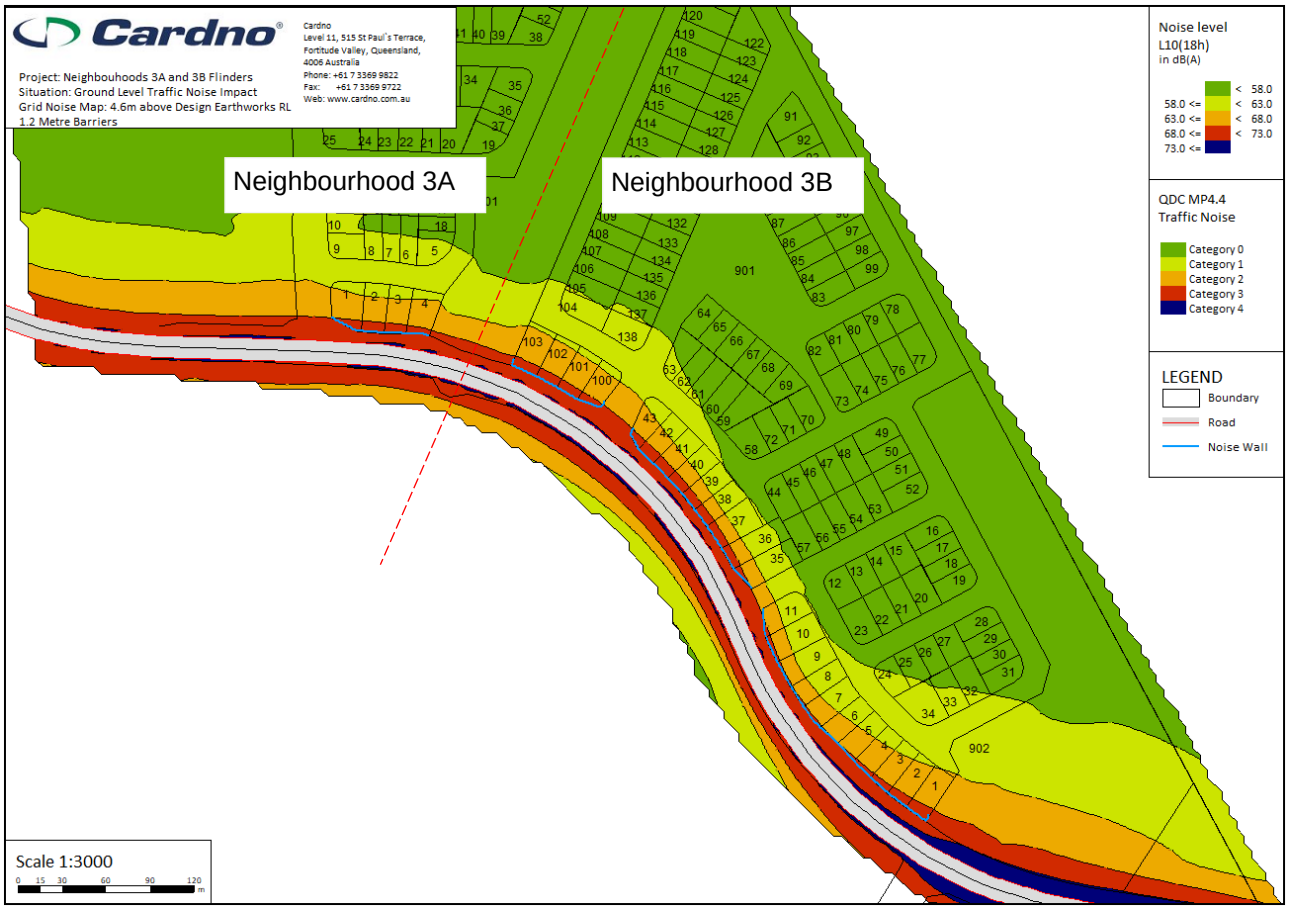
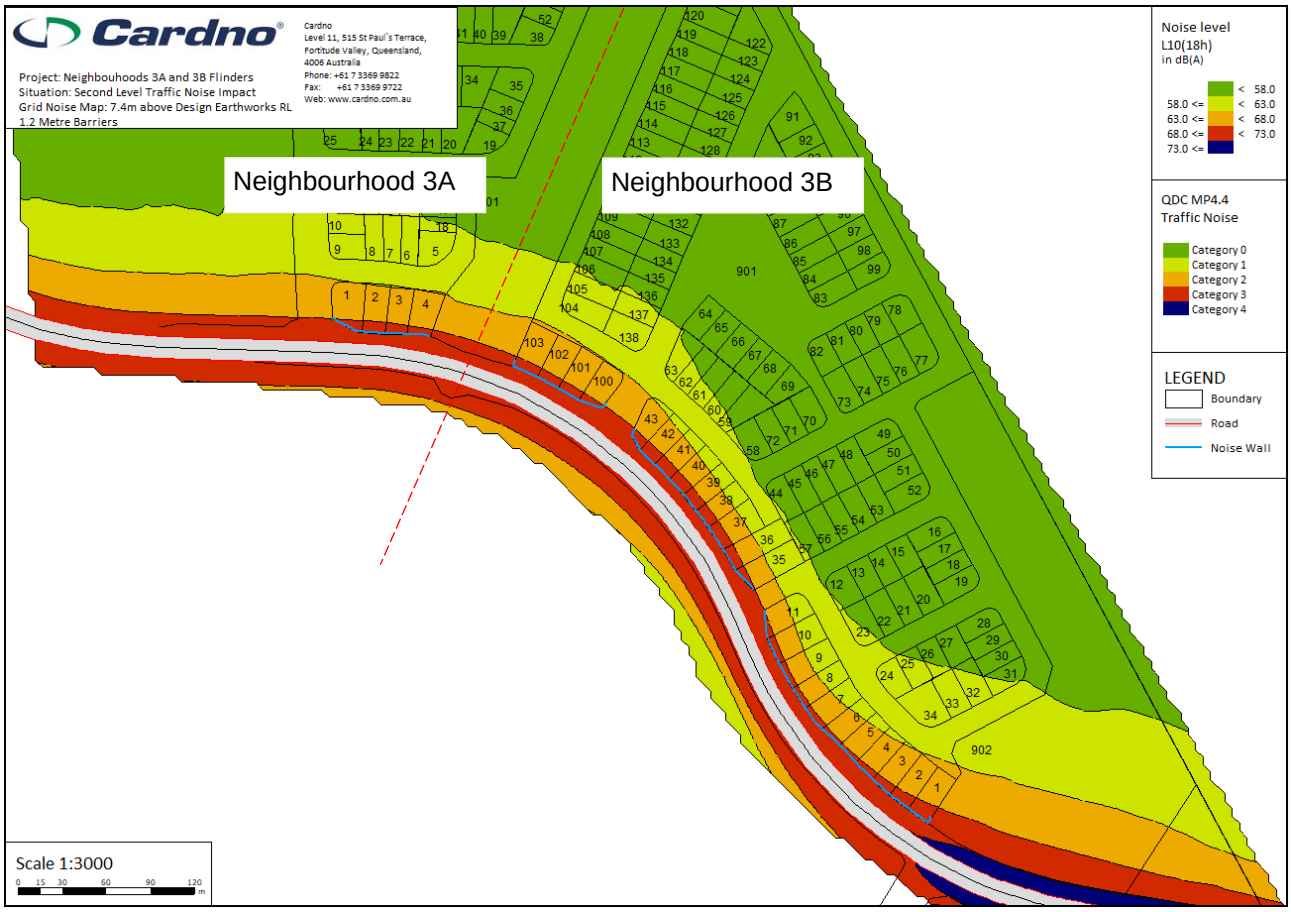


Figure 3-7 Predicted Road Traffic Noise Levels with 1.2m Acoustic Barrier – Second Floor Level



Based on the predicted levels with inclusion of 1.2 metre high acoustic barriers, acoustic treatment to future dwelling facades will be required. Refer to Section 4 for acoustic treatment recommendations.

4 Recommendations

4.1 Acoustic Barriers

To reduce building treatment requirements, we recommend the construction of 1.2 metre high (above pad level) noise barriers as detailed in Appendix A. The design and construction of the noise barriers should be free of gaps or holes, including along the base of the barrier. The selected barrier material(s) should achieve a minimum surface density of 12.5 kg/m^2. Small drainage holes may be present at the base, provided the openings do not exceed 1% of the total surface area. Suitable materials may include the following:

> Toughened safety glass;

> Overlapped timber palings with a 40mm overlap;

> Concrete;

> Masonry;

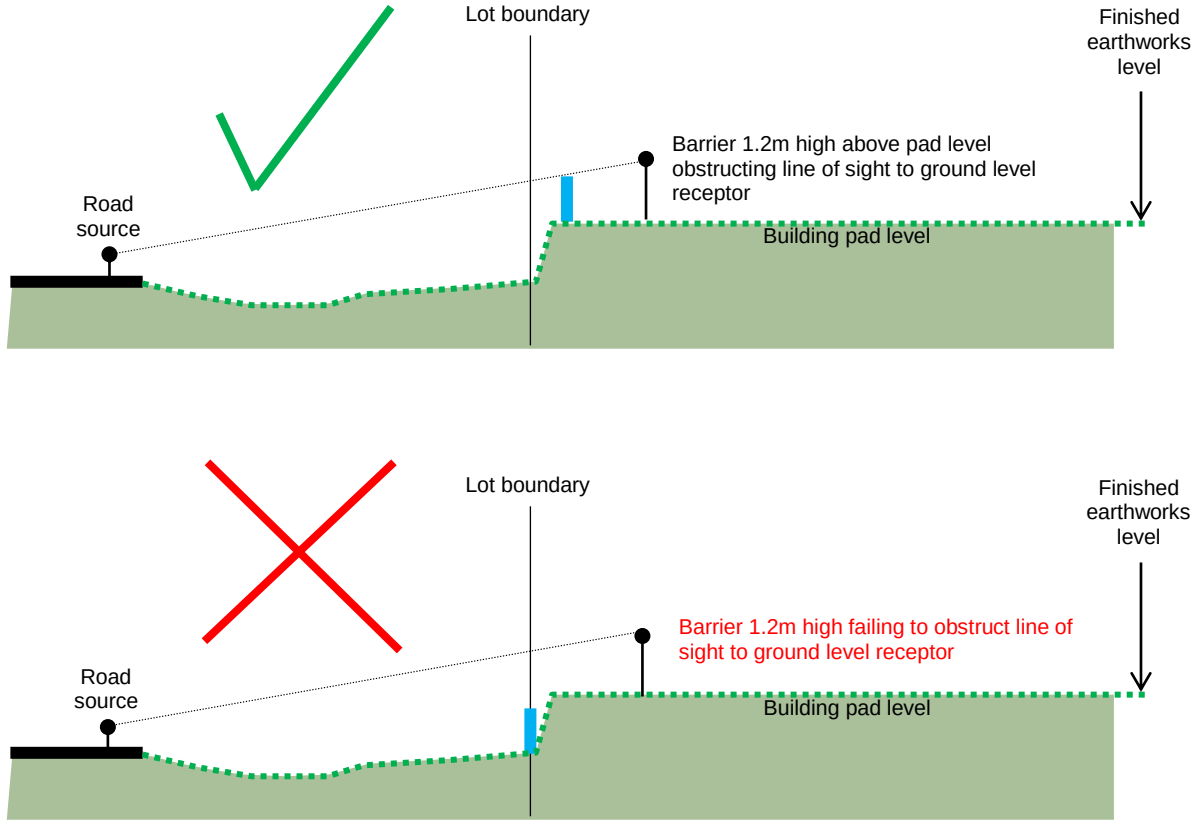
> Fibre cement sheet;

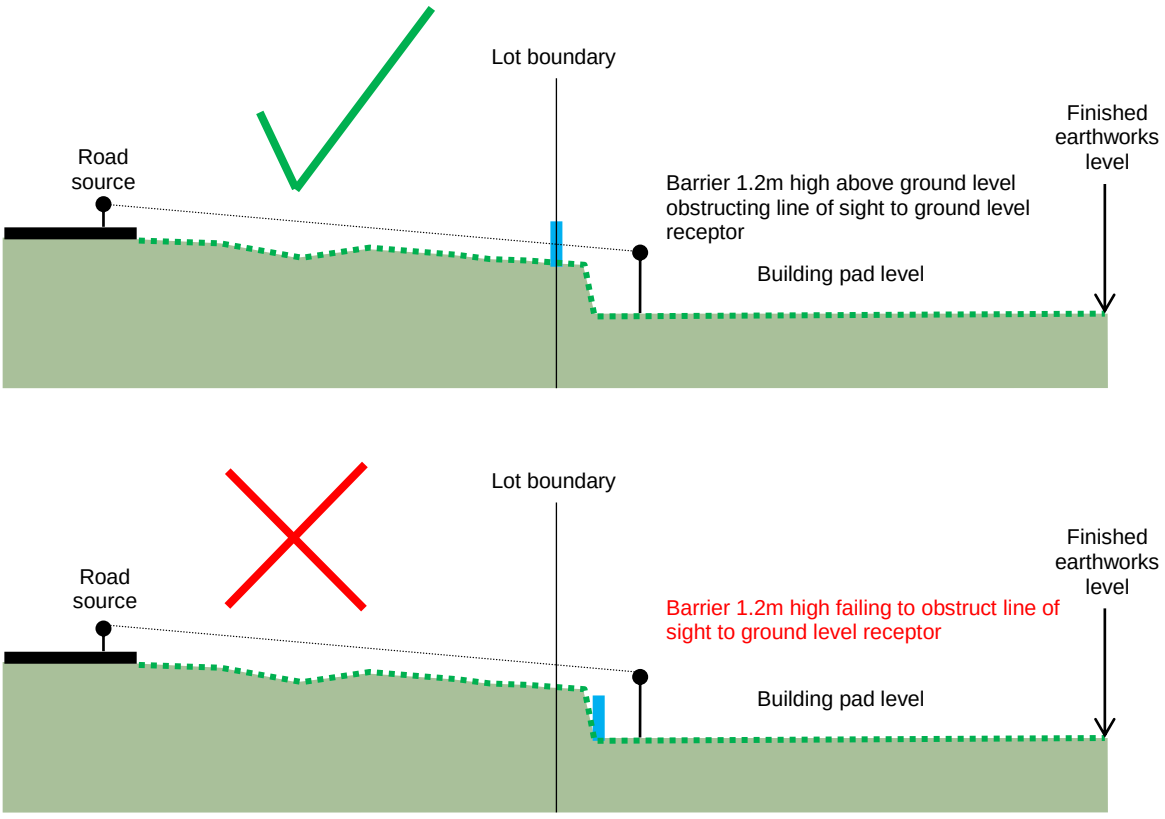
> Earth mounding;

> A combination of the above.

Due to the proximity of retaining walls or batters to the recommended barriers, the alignment should be moved to inside the property boundary in cases where the height of the building pad exceeds the ground level at the lot boundary as shown in Figure 4-1.

Figure 4-1 Recommended barrier alignment, section view (not to scale)





4.2 Building Façade Treatments

4.2.1 Recommended QDC MP 4.4 Noise Categories

To predict compliance with EDQ internal noise objectives, QDC MP 4.4. was applied to determine acoustic treatments to future dwelling facades. The recommended noise categories are summarised in Table 4-2 (without the recommended acoustic barriers) and Table 4-2 (with inclusion of the 1.2 metre high acoustic barriers).

Table 4-1 Recommended QDC MP 4.4 Noise Categories – Road Traffic Noise – Without Acoustic Barriers

QDC Noise Category	Transport Noise Reduction	(1) (2) Ground Floor Locations	(1)) (2) First Floor Locations	(1)) (2) Second Floor Locations
4	40	Nil	Nil	Nil
3	35	Neighbourhood 3A: Lots 1-4 Neighbourhood 3B: 1-3, 36-43, 100-103	Neighbourhood 3A: 1-4 Neighbourhood 3B: 1-11, 35-43, 100-103	Neighbourhood 3A: 1-4 Neighbourhood 3B: 1-11, 35-43, 100-103
2	30	Neighbourhood 3B: 4-11, 35	Nil	Nil
1	25	Neighbourhood 3A: 5-10 Neighbourhood 3B: 24, 33-34, 62-63, 104, 137, 138	Neighbourhood 3A: 5-11, 13-15, 18 Neighbourhood 3B: 23-26, 30-34, 44, 57-64, 104-106, 136-138	Neighbourhood 3A: 5-15, 17-18 Neighbourhood 3B: 12, 22-27, 30-34, 44-45, 56-66, 104-106, 136-138
0	N/A	All remaining locations		

Notes:

(1) The recommended noise categories assume that the recommended acoustic barrier has not been constructed.

(2) Refer to Table 4-3 for a list of building envelope setback distances (for building envelopes backing onto Flinders Lake Drive) in order to reduce noise category 3 construction requirements to noise category 2 requirements.

Table 4-2 Recommended QDC MP 4.4 Noise Categories – Road Traffic Noise – With Acoustic Barriers

QDC Noise Category	Transport Noise Reduction	(1) (2) Ground Floor Locations	(1)) (2) First Floor Locations	(1)) (2) Second Floor Locations
4	40	Nil	Nil	Nil
3	35	Neighbourhood 3A: Lots 1-3 Neighbourhood 3B: 1-3, 36-43, 100-103	Neighbourhood 3A: 1 to 4 Neighbourhood 3B: 1-5, 7-11, 35-43, 100-103	Neighbourhood 3A: 1 to 4 Neighbourhood 3B: 1-11, 35-43, 100-103
2	30	Neighbourhood 3A: Lot 4 Neighbourhood 3B: 4-11, 35	Neighbourhood 3B: 6	Nil
1	25	Neighbourhood 3A: 7-10 Neighbourhood 3B: 33-34, 104, 138	Neighbourhood 3A: 5 to 11, 13 Neighbourhood 3B: 24-25, 32-34, 61-63, 104-105, 137-138	Neighbourhood 3A: 5-10 Neighbourhood 3B: 12, 23-26, 31-34, 44, 58-63, 104-106, 136-138
0	N/A	All remaining locations		

Notes:

(3) The recommended noise categories assume the noise barriers recommended in Section 4.1 have been constructed.

(4) Refer to Table 4-3 for a list of building envelope setback distances (for building envelopes backing onto Flinders Lake Drive) in order to reduce noise category 3 construction requirements to noise category 2 requirements.

Table 4-3 Recommended building envelope setback distances to preclude noise category 3 requirements

Lots	Ground Floor Minimum Building Envelope Setback Distance from Lot Boundary fronting Flinders Lake Drive for Noise Category 2 (metres)			
	Without recommended acoustic barriers		With recommended 1.2 metre acoustic barriers	
	Ground Floor	First and Second Floors	Ground Floor	First and Second Floors
Neighbourhood 3A				
1	8	14	4	8
2	8	14	4	8
3	8	13	3	8
4	6	12	3	7
Neighbourhood 3B				
1	9	19	4	11
2	7	16	3	9
3	5	13	3	7
4	3	11	3	5
5	3	9	3	4
6	3	7	3	3
7	3	7	3	3
8	3	7	3	3
9	3	7	3	3
10	3	8	3	4

Lots	Ground Floor Minimum Building Envelope Setback Distance from Lot Boundary fronting Flinders Lake Drive for Noise Category 2 (metres)			
	Without recommended acoustic barriers		With recommended 1.2 metre acoustic barriers	
	Ground Floor	First and Second Floors	Ground Floor	First and Second Floors
11	3	8	3	4
35	5	11	3	7
36	5	12	3	7
37	6	12	3	8
38	6	13	3	8
39	6	13	3	8
40	7	14	3	8
41	7	14	4	9
42	8	14	4	9
43	8	14	3	9
100	7	12	4	8
101	7	12	4	8
102	7	12	5	8
103	7	13	5	8

4.2.1.2 Glazing

Based on the recommended noise categories nominated in Table 4-2, QDC MP 4.4 nominates glazing treatments as presented in Table 4-4.

Table 4-4 QDC MP 4.4 Acceptable Glazing

Noise Category	Rw Requirement	QDC Acceptable Glazing	Acoustic Seals?
3	**38** (where total area of glazing for a habitable room is greater than 1.8m^2)	14.38mm Laminate	Yes
	35 (where total area of glazing for a habitable room is less than or equal to 1.8m^2)	10.38mm Laminate	Yes
2	**35** (where total area of glazing for a habitable room is greater than 1.8m^2)	10.38mm Laminate	Yes
	32 (where total area of glazing for a habitable room is less than or equal to 1.8m^2)	6.38mm Laminate	Yes
1	**27** (where total area of glazing for a habitable room is greater than 1.8m^2)	4mm Float	Yes
	24 (where total area of glazing for a habitable room is less than or equal to 1.8m^2)	4mm Float	No
0	N/A	N/A	N/A

4.2.1.3 External Walls

Based on the recommended noise categories presented in Table 4-2, QDC nominates acceptable wall treatment as presented in Table 4-5.

Table 4-5 QDC MP 4.4 Acceptable Wall Construction

Noise Category	Rw Requirement	QDC Acceptable Wall Construction
3	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 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/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.
2	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/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.
1	35	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) One layer of plasterboard at least 10mm thick fixed to outside face of

Noise Category	Rw Requirement	QDC Acceptable Wall Construction
		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.
0	N/A	N/A

Note that alternative systems are acceptable provided they meet the minimum Rw requirement.

4.2.1.4 Roof/Ceiling

Based on the recommended noise categories presented in Table 4-2, QDC nominates acceptable roof/ceilings treatments as presented in Table 4-6.

Table 4-6 QDC MP 4.4 Acceptable Roof/Ceiling Construction

Noise Category	Rw Requirement	QDC Acceptable Roof/Ceiling Construction
3	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.
2	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.
1	35	Concrete or terracotta tile or metal sheet roof with sarking, plasterboard ceiling at least 10mm thick fixed to ceiling cavity.
0	N/A	N/A

Note that alternative systems are acceptable provided they meet the minimum Rw requirement.

4.2.1.5 External Doors

Based on the recommended noise categories presented in Table 4-2, QDC nominates acceptable external door treatments as presented in Table 4-7.

Table 4-7 QDC MP 4.4 Acceptable External Door Construction

Noise Category	Rw Requirement	QDC Acceptable External Door Construction
2-3	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.
1	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

Noise Category	Rw Requirement	QDC Acceptable External Door Construction
		acoustically rated seals.
0	N/A	N/A

Note that alternative systems are acceptable provided they meet the minimum Rw requirement.

4.2.1.6 Exposed Floors

Based on the applicable noise categories presented in Table 4-2, QDC nominates acceptable exposed floor treatments as presented in Table 4-8.

Table 4-8 QDC MP 4.4 Acceptable Exposed Floor Construction

Noise Category	Rw Requirement	QDC Acceptable Exposed Floor Construction
2-3	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/m3 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/m3 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.
1	N/A	N/A
0	N/A	N/A

Note that alternative systems are acceptable provided they meet the minimum Rw requirement.

4.3 Alternative Ventilation

Facade glazing will need to be closed in order to exclude noise, therefore provision of mechanical ventilation such as air conditioning or alternative ventilation may be required for habitable rooms requiring Noise Category 1 to 3 construction.

4.4 Alternative Construction Methodology – AS3671

An alternative to the construction methodology of QDC MP 4.4 is the application of AS3671 to determine building façade treatments. Application of AS3671 to design dwellings may result in reduced construction costs as acoustic treatments may be tailored to the proposed dwelling materials. If this methodology is adopted, the dwelling plans will be required to be assessed by a suitably qualified acoustic consultant prior to construction in order to determine acoustic treatments for compliance with the internal criteria nominated in Section 2.1 of this report (35 dBA $L_{eq,\ 1hour\ max}$).

5 Conclusion

A full road traffic noise assessment for the proposed subdivision located at Neighbourhoods 3A and 3B of Flinders Precinct 1 was conducted. Provided the recommendations in Section 4 are implemented, compliance with the criteria in Section 2 are predicted to be achieved. The findings of the assessment are summarised as follows;

> Based on the predicted road traffic noise levels, lots in the vicinity of the future Flinders Lake Drive will require acoustic building treatments to comply with the EDQ internal noise objective, with QDC MP4.4 noise categories specified on the basis of the predicted traffic noise reduction (TNR).

> Noise categories for dwellings have been recommended on the condition that 1.2 metre high acoustic barriers are constructed as detailed in the recommendations section of this report.

> QDC nominates acceptable forms of construction for each noise category. Alternative building systems can be used, provided it can be demonstrated they achieve the required weighted sound reduction index (Rw).

> As an alternative to constructing dwellings in accordance with QDC MP4.4, individual dwellings may also be designed in accordance with Australian Standard *AS3671:1989, Acoustics – Road Traffic Noise Intrusion – Building Siting & Construction*. If this methodology is adopted, the dwelling plans will be required to be assessed by a suitably qualified acoustic consultant prior to construction in order to determine acoustic treatments for compliance with the internal criteria nominated in Section 2.1 of this report (35 dBA $L_{eq,\ 1hour\ max}$).

Neighbourhoods 3A and 3B, Flinders Precinct 1

APPENDIX A
RECOMMENDED ACOUSTIC BARRIER

Cardno
Shaping the Future

Figure A5-1 Recommended Acoustic Barriers Whole of Site

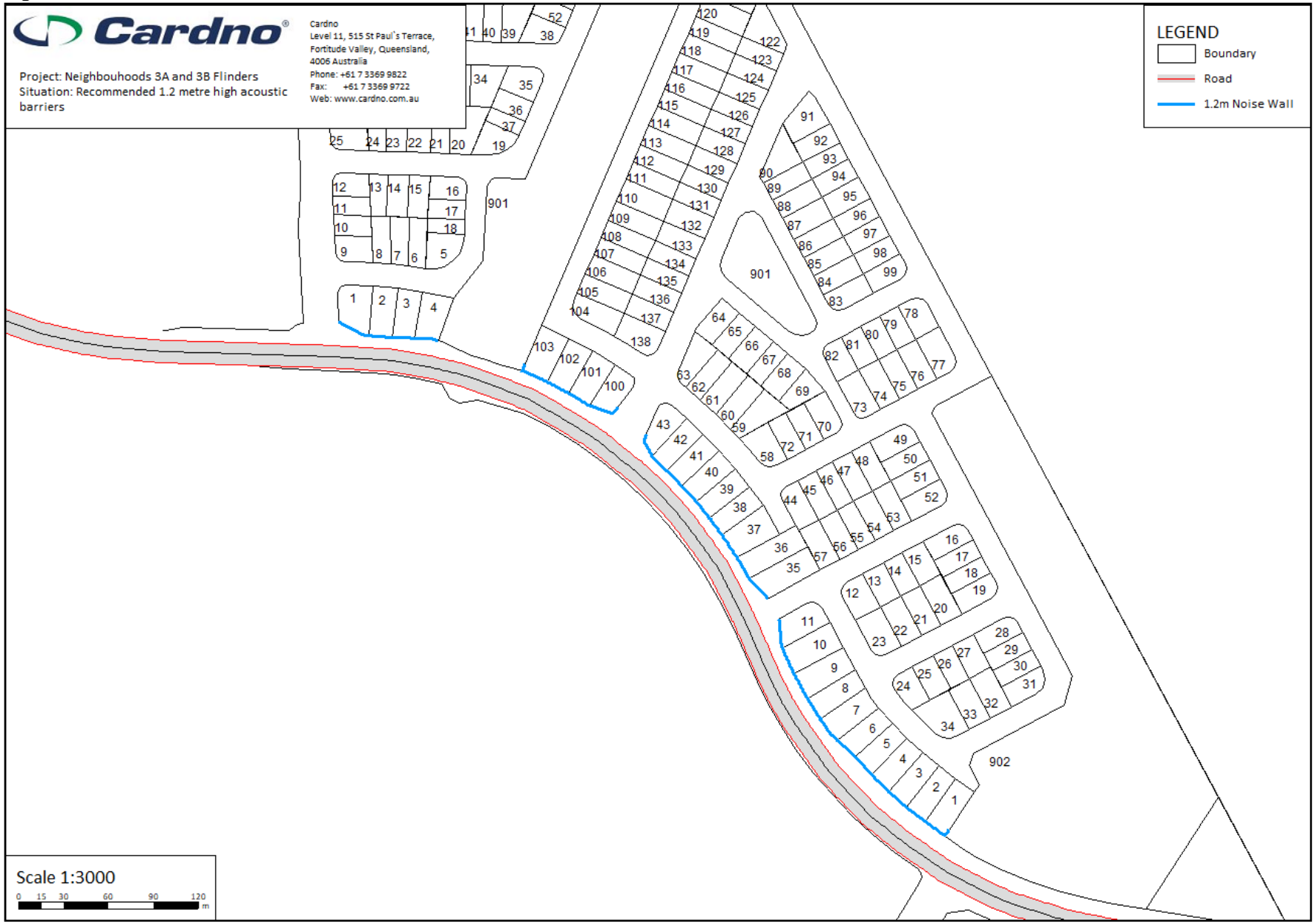


Figure A5-2 Recommended Acoustic Barrier – Lots 1-4

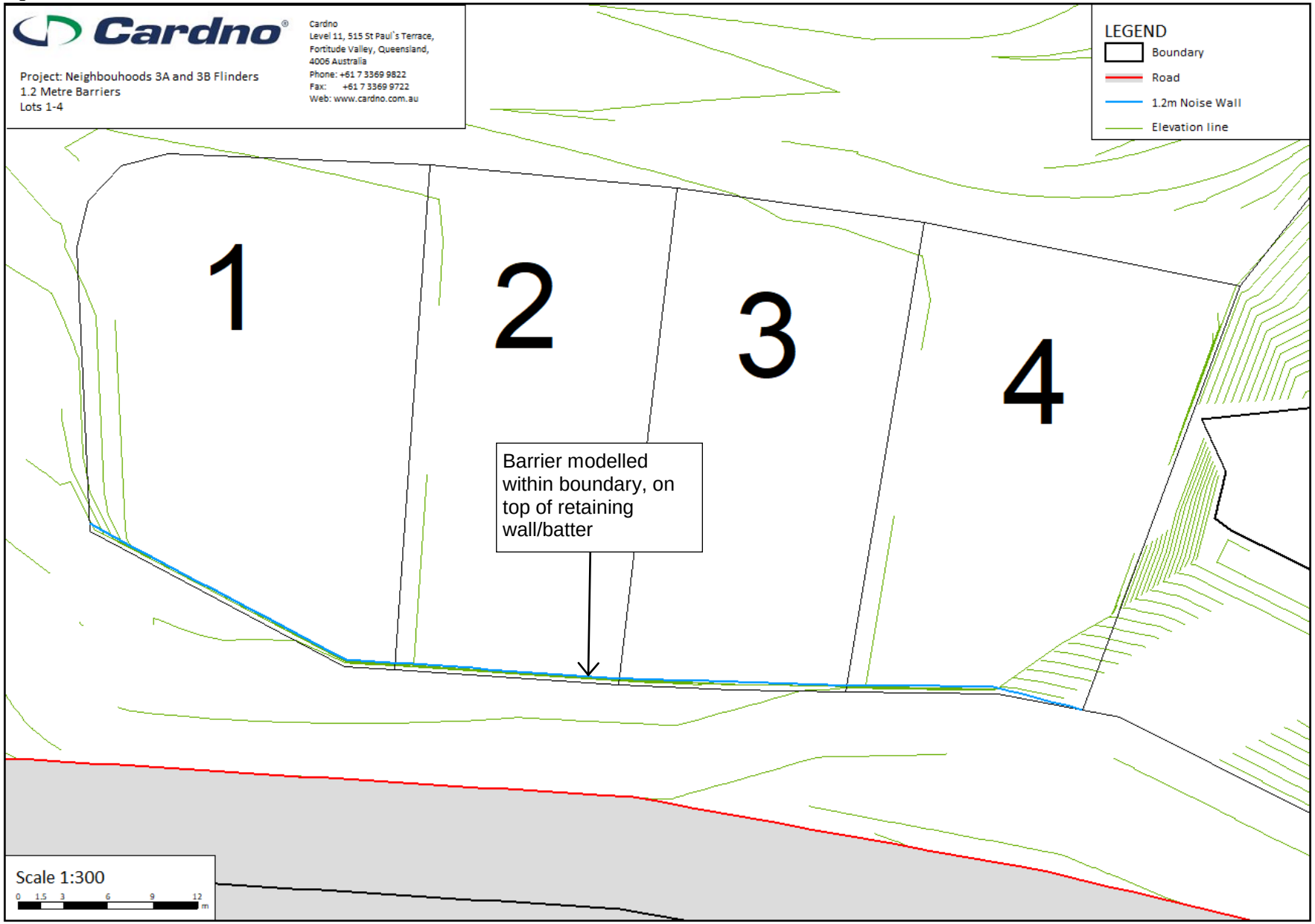


Figure A5-3 Recommended Acoustic Barrier – Lots 100-103

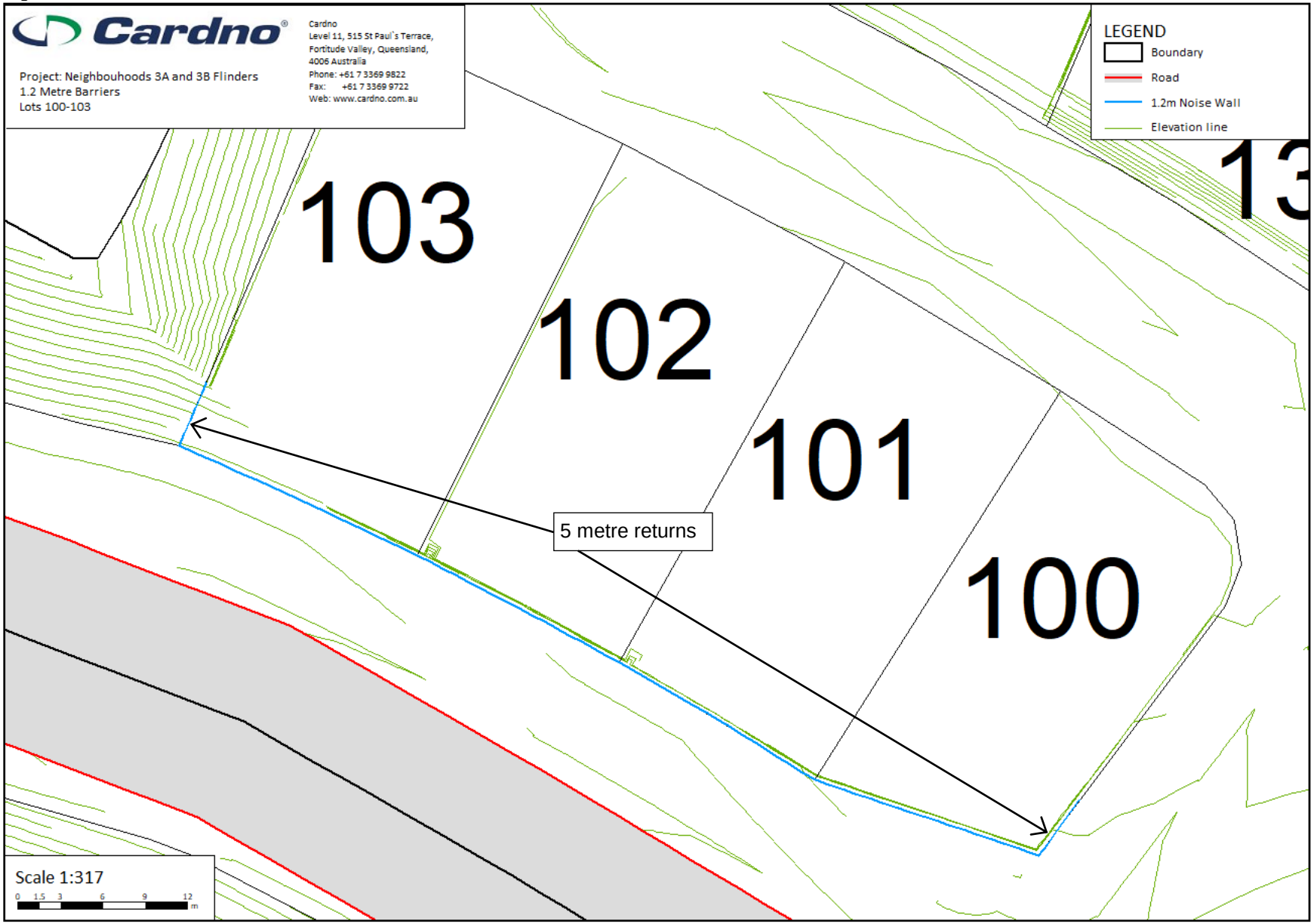


Figure A5-4 Recommended Acoustic Barrier Lots 35-43

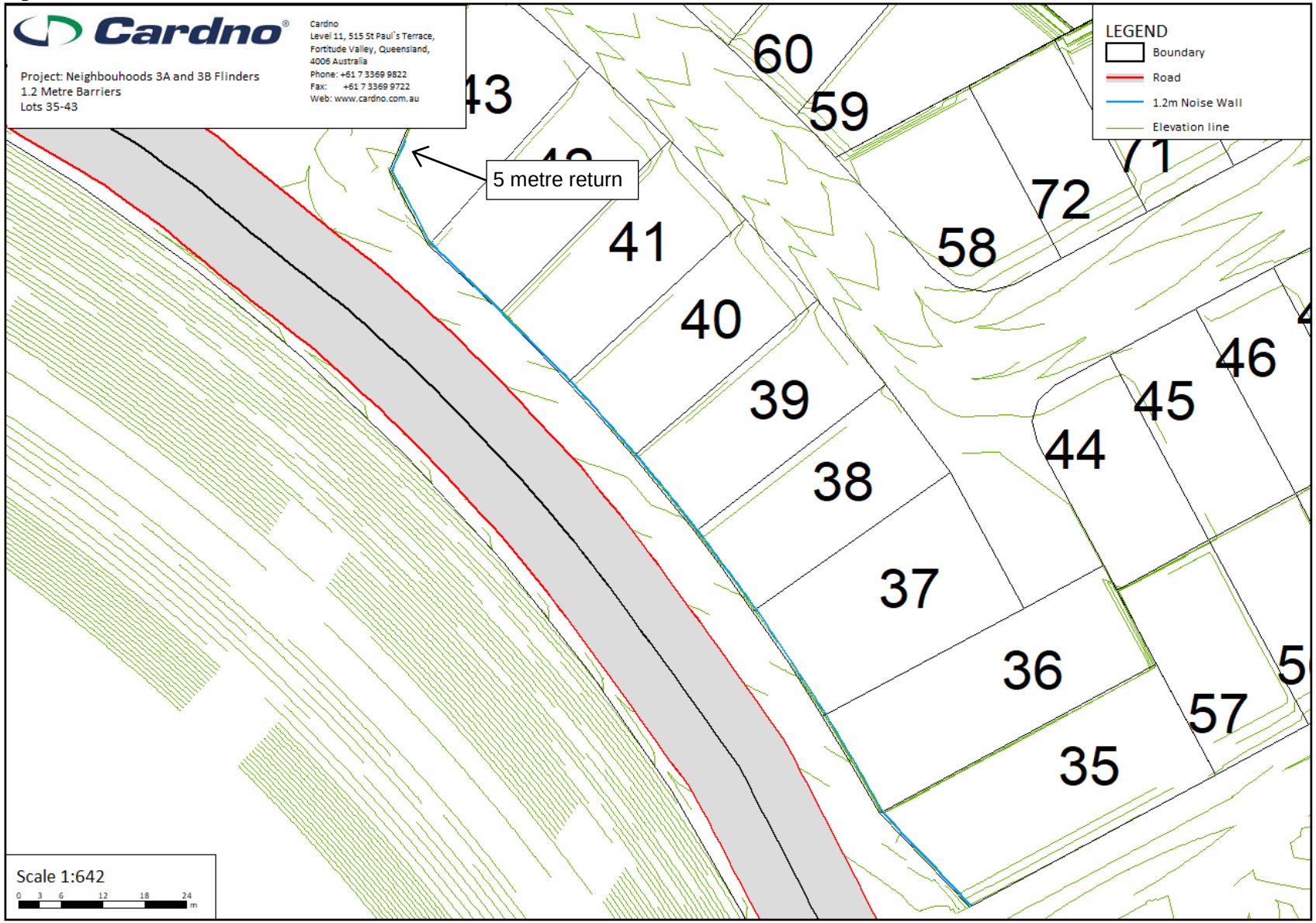
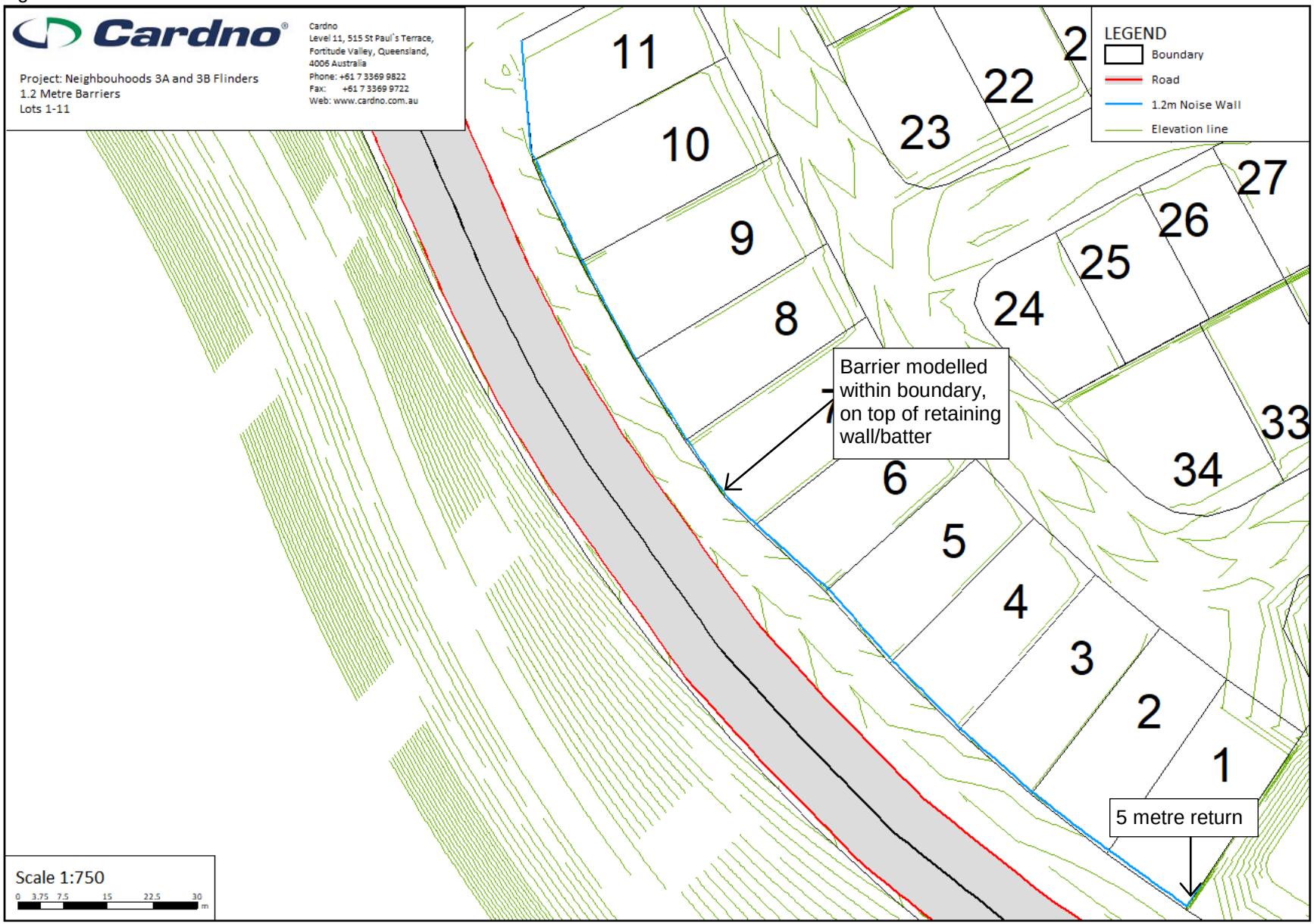


Figure A5-5 Recommended Acoustic Barrier Lots 1-11



Stages 3A and 3B,
Flinders Precinct 1

APPENDIX B
TRANSPORT NOISE CORRIDOR SEARCH

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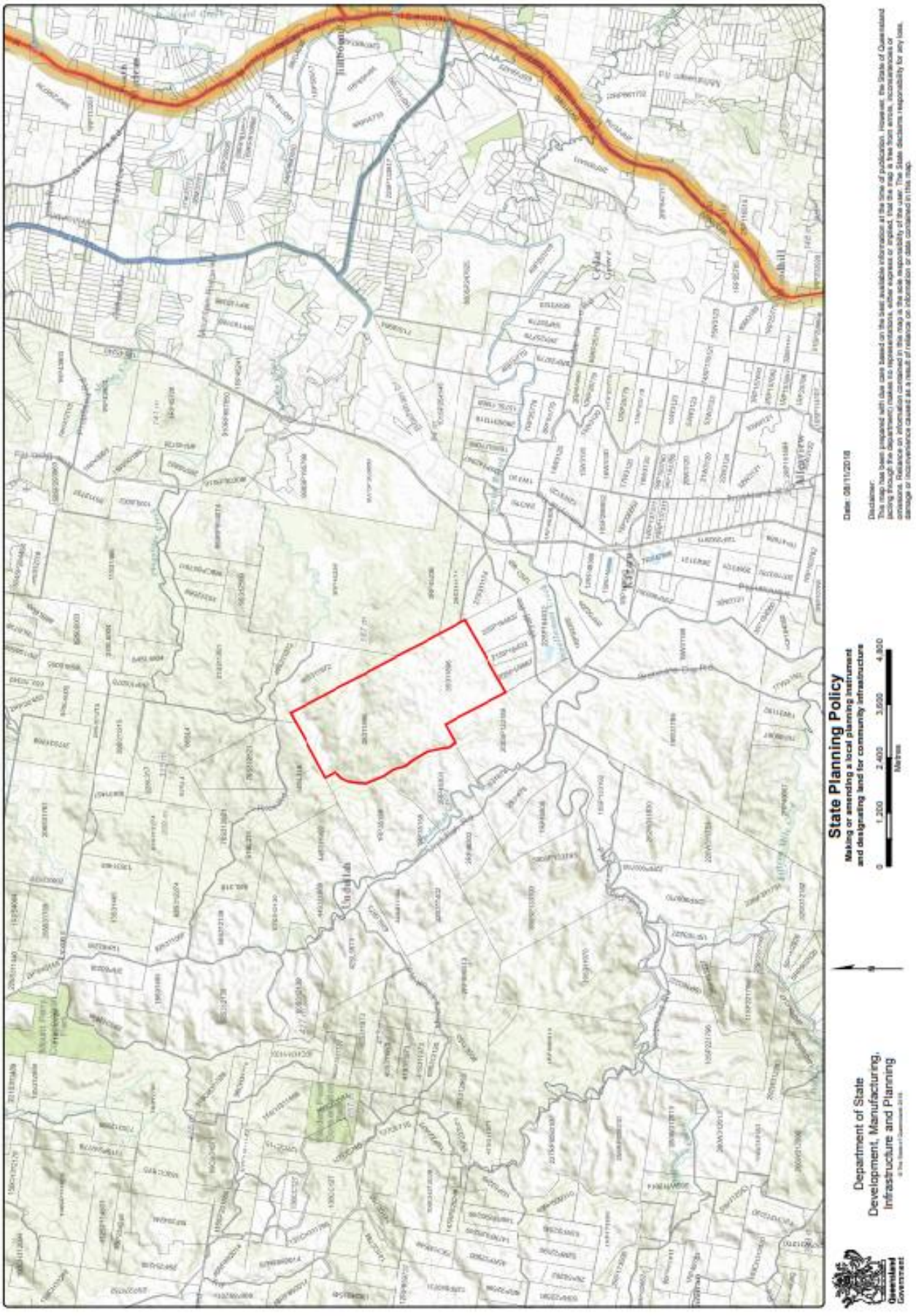
State Planning Policy
Making or amending a local planning instrument and designating land for community infrastructure
0 1,200 2,400 3,600 4,800
Metres
Department of State Development, Manufacturing, Infrastructure and Planning
Queensland Government
Date: 08/11/2018
Disclaimer:

Legend
Drawn Polygon Layer
Override 1
Cadastre (100k)
Cadastre (100k)
Noise corridor centreline - local government road
Noise corridor centreline - local government road
Noise corridor centreline - State-controlled road
Noise corridor centreline - State-controlled road
Noise corridor - local government road
Cat 1: 58 dB(A) - 62 dB(A)
Cat 2: 63 dB(A) - 67 dB(A)
Cat 3: 68 dB(A) -72 dB(A)
Cat 4: Noise Level >= 73 dB(A)
Noise corridor - State-controlled road (MANDATORY area)
Cat 0: Noise Level <= 57 dB(A)
Cat 1: 58 dB(A) - 62 dB(A)
Cat 2: 63 dB(A) - 67 dB(A)
Cat 3: 68 dB(A) - 72 dB(A)
Cat 4: Noise Level >= 73 dB(A)
Noise corridor - State-controlled road (VOLUNTARY area)
Cat 0: Noise Level <= 57 dB(A)
Cat 1: 58 dB(A) - 62 dB(A)
Cat 2: 63 dB(A) - 67 dB(A)
Cat 3: 68 dB(A) - 72 dB(A)
Cat 4: Noise Level >= 73 dB(A)
Noise corridor - rail network
Cat 1: 70 dB(A) - 74 dB(A)
Cat 2: 75 dB(A) - 79 dB(A)
Cat 3: 80 dB(A) - 84 dB(A)
Cat 4: Noise Level >= 85 dB(A)
Queensland Government
Department of State Development, Manufacturing, Infrastructure and Planning
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State Planning Policy
Making or amending a local planning instrument and designating land for community infrastructure
Date: 08/11/2018
Disclaimer:
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