ACOUSTIC REPORT

Flagstone Development Stages 2-5

Prepared for:

Peet Flagstone City Pty Ltd
Level 2, 167 Eagle Street
Brisbane QLD 4000

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BASIS OF REPORT

This report has been prepared by SLR Consulting Australia Pty Ltd (SLR) with all reasonable skill, care and diligence, and taking account of the timescale and resources allocated to it by agreement with Peet Flagstone City Pty Ltd (the Client). Information reported herein is based on the interpretation of data collected, which has been accepted in good faith as being accurate and valid.

This report is for the exclusive use of the Client. No warranties or guarantees are expressed or should be inferred by any third parties. This report may not be relied upon by other parties without written consent from SLR.

SLR disclaims any responsibility to the Client and others in respect of any matters outside the agreed scope of the work.

DOCUMENT CONTROL

Reference	Date	Prepared	Checked	Authorised
620.10512-R09-v5.1	14 June 2021	Steve Walker	Shane Elkin (RPEQ: 06365)	Shane Elkin (RPEQ: 06365)
620.10512-R09-v5.0	20 May 2021	Steve Walker	Shane Elkin (RPEQ: 06365)	Shane Elkin (RPEQ: 06365)

EXECUTIVE SUMMARY

The Flagstone City Development is a new residential and commercial masterplan development delivered under the Urban Land Development Authority (ULDA) Greater Flagstone Urban Development Area Development Scheme. Economic Development Queensland (EDQ) have approved the priority development area (PDA) development application for Greater Flagstone Stages 2-5, subject to PDA development conditions set out in the PDA Decision Notice. Condition 35 pertains to acoustic requirements.

The condition requires an acoustic compliance assessment for all lots within 100 m of Flagstonian Drive Extension and the future North-South Arterial road; and within 200 m of the rail corridor. With respect to complying with Condition 35, the EDQ requires the design and construction of applicable residential development to be consistent with the Queensland Development Code (QDC), specifically *Mandatory Part 4.4 Buildings in a Transport Corridor* (MP4.4).

Under the QDC, a residential building in a Transport Noise Corridor needs to achieve certain levels of noise reduction depending upon the highest MP4.4 Noise Category in which all or each part of the building sits. For the purpose of design and construction of residential property, the EDQ has conservatively defined Flagstonian Drive, the North-South Arterial road and the rail corridor as Transport Noise Corridors.

The required noise reduction can be achieved by incorporating appropriate building materials to the building envelope (for example windows, walls, roof, floors and entry doors). To assist the building construction, MP4.4 provides acceptable forms of construction for the external elements of the residential building to achieve the minimum noise reduction required for each Noise Category.

This report has been prepared by SLR Consulting Australia Pty Ltd (SLR), on behalf of Peet Flagstone City Ltd, to provide an assessment of the future road and rail transport noise levels from Flagstonian Drive, the North-South Arterial road and the rail corridor within, and adjacent to, the Flagstone City Development.

Detailed in this report are the forecast MP4.4 Noise Categories for each of the Lots within Stages 2-5. This information may assist as part of determining the appropriate building construction for a future residential property.

Based on the predicted future transport noise levels received at development Stages 2-5, there are 114 lots that fall into Noise Category 3, 118 lots that fall into Noise Category 2 and 229 Lots within that fall into Noise Category 1. The remaining 1,196 lots fall into Category 0 (ie no category). Buildings on Category 2 and 3 lots will require above standard building envelope acoustic performance in accordance with the mandatory Rw ratings outlined in QDC MP4.4. Building envelope noise reduction requirements for Category 1, however, can be readily achieved by modern, well-sealed, and insulated building constructions. Buildings in Category 0 do not require any specific acoustic treatment.

Further information on transport noise corridors and the requirements of QDC can be obtained from the Queensland Government Department of Housing and Public Works.

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1 Introduction

1.1 Overview

The Flagstone City Development is a new residential and commercial masterplan development delivered under the Urban Land Development Authority (ULDA) Greater Flagstone Urban Development Area Development Scheme. In 2012, SLR prepared an acoustic assessment to support the development approval for the Flagstone City Development.

Since the time of this assessment the transport noise requirements for the development were formalised as part of the Development Approval and the proposed Lot configurations have been refined.

For these reasons, SLR has prepared a revised assessment of transport noise for Stages 2-5 to assist the development of residential buildings in accordance with the requirements of the Queensland Development Code (QDC), specifically *Mandatory Part 4.4 Buildings in a Transport Corridor* (MP4.4) of the QDC.

To assist the interpretation of technical terms, a glossary of common acoustic terminology is provided in **Appendix A**. The Lot configurations for Stages 2-5 and the general location within the Flagstone City Development are shown in **Appendix B**. The eastern boundary of Stages 2-5 border the Sydney to Brisbane rail corridor which is currently used for daily passenger and freight rail services.

1.2 Report Limitations

The findings of this report are based on the current design for Greater Flagstone Stages 2-5 and estimated future road and rail traffic on the identified transport routes. Should the final subdivision design vary, or assumptions change from those applied to this assessment, the forecast noise levels may differ from the reported findings.

The final shape and form of individual dwellings was not available at time of this acoustic assessment. As such, these buildings were not included in the noise model. In the future, as buildings are constructed adjacent the road and rail transport corridors, they may provide partial acoustic screening to dwellings further back. The quantity of screening could only be confirmed via future model update after all building locations/shapes/sizes have been fixed.

Information presented in this report is based on the interpretation of data collected at the time of the assessment, which has been accepted in good faith as being accurate and valid. No warranties or guarantees are expressed or should be inferred by any third parties. The assessment report was initially prepared in 2018 and this version includes updates for amendment to the Stage 2-5 Lot arrangement.

2 Acoustic Requirements

Economic Development Queensland (EDQ) have approved the priority development area (PDA) development application for Greater Flagstone Stages 2-5, subject to PDA development conditions set out in the PDA Decision Notice (dated 10 Dec 2020).

Condition 35 is relevant to Acoustic Compliance and is reproduced below as per the EDQ PDA Decision Notice – Approval.

Condition 35 – Compliance Assessment – Acoustic Treatment (Noise Barrier)

a) Submit to EDQ Development Assessment DSDMIP for compliance assessment a Noise Mitigation Report, certified by a RPEQ, for all lots within 100m from Flagstonian Drive Extension, the future North-South Arterial road and 200m from the railway corridor achieving a ≤ 35dBA 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 generally in accordance with QDC MP4.4 – Buildings in a Noise Transport Corridor. If any noise barriers are proposed, the detailed design/construction plans certified by a RPEQ are to be provided including how passive surveillance of the streetscape can be maintained.

b) For lots fronting Flagstonian Drive, the acoustic fence must be no higher than that specified in the approved plan of development.

EDQ considered the application of MP4.4 at residential lots to achieve the acoustic requirements of Condition 35. Whilst MP4.4 does not provide internal noise limits or targets, the minimum building constructions in MP4.4 would typically achieve an internal transport noise level of approximately 35 dBA within habitable rooms.

MP4.4 applies to residential buildings that are constructed within designated Transport Noise Corridors.

EDQ also considered for the purpose of assessing transport noise, the North-South Arterial Road, Flagstonian Drive and the Sydney to Brisbane rail line to be Transport Noise Corridors applicable to the Flagstone City Development.

Under the QDC when building in a Transport Noise Corridor, the residential building needs to achieve certain levels of noise reduction, dependent upon the highest MP4.4 Noise Category in which all or each part of the building sits. The noise reduction can be achieved through incorporating appropriate building materials to the building envelope to achieve the required noise reduction in habitable rooms.

MP4.4 provides acceptable forms of construction for the external elements of the building to assist in achieving a building design and construction which meets the required noise reduction for each Noise Category. The acceptable forms of construction in MP4.4 are provided in **Appendix D** of this report.

Reproduced from MP4.4, the Noise Categories, minimum noise reduction requirements and minimum sound reduction index (R_W) for external building elements are shown in **Table 1**. The R_W is a measure of the sound insulation properties of a specific building material element.

Table 1 QDC MP4.4 Noise Categories and Minimum Noise Reduction for Transport Noise

Noise Category	Transport Noise Level	Minimum Transport Noise Reduction for Habitable Rooms	Building External Envelope Component	Minimum Rw Required for Each Component
4	Road traffic noise ≥73 dBA $L_{A10(18hour)}$ Railway noise ≥85 dBA L_{Amax}	40 dBA	Glazing	43
			External Walls	52
			Roof	45
			Floors	51
			Entry doors	35

Noise Category	Transport Noise Level	Minimum Transport Noise Reduction for Habitable Rooms	Building External Envelope Component	Minimum Rw Required for Each Component	
3	Road traffic noise 68 – 72 dBA $L_{A10(18hour)}$ Railway noise 80 – 84 dBA L_{Amax}	35 dBA	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 than 1.8m^2
			External walls	47	
			Roof	41	
			Floors	45	
			Entry doors	33	
2	Road traffic noise 63 – 67 dBA $L_{A10(18hour)}$ Railway noise 75 – 79 dBA L_{Amax}	30 dBA	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 than 1.8m^2
			External walls	41	
			Roof	38	
			Floors	45	
			Entry doors	33	
1	Road traffic noise 58 – 62 dBA $L_{A10(18hour)}$ Railway noise 70 – 74 dBA L_{Amax}	25 dBA	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 than 1.8m^2
			External walls	35	
			Roof	35	
			Entry doors	28	
0	Road traffic noise ≤57 dBA $L_{A10(18hour)}$ Railway noise ≤69 dBA L_{Amax}	No additional acoustic treatment required – standard building assessment provisions apply.			

Note dBA is an abbreviation for decibels on the A-weighted scale.

3 Assessment of Transport Noise

A transport noise prediction model for the road network at Flagstone and the Sydney to Brisbane rail line has been developed utilising the SoundPLAN version 8.1 noise prediction software. The SoundPLAN software is widely used in Australia and internationally to calculate road and rail traffic noise levels in accordance with recognised transport noise assessment methodologies.

Acoustic fencing (solid, continuous fence with no air gaps or opening) has been modelled as detailed in the Plan of Development (POD), which is a requirement of the development approval, as per Section 35 (b). The POD details 'solid timber fence' along the boundary of lots adjacent Flagstonian Drive at a height of 2 m in Stage 4 and Stage 5, and at a height of 1.5 - 1.8 m in Stage 2.

The location and heights of the boundary fences are shown in **Figure 1** to **Figure 6**. The acoustic fence alignments were originally supplied in AutoCAD and PDF format from RPS (Precinct 1 Stage 2-5 Combined_Rev G, dated 24 July 2019 and 29 July 2019, respectively) and subsequently amended based on discussions with PEET. The acoustic fence heights are consistent with those indicated on the PODs for each Stage.

3.1 Methodology – Road

The SoundPLAN noise prediction model for the Flagstone Precinct 1 Stage 2-5 Development was based on the following datasets which were made available to SLR by PEET.

- Detailed designs for the Lot configurations, road network and civil earthworks at the Flagstone City Development. The ground contours were supplied by Meinhardt (20191204 Flagstone Stg 2-5 Conts.dwg dated 4 December 2019). The initial acoustic fence alignments were supplied in AutoCAD and PDF format by RPS (Precinct 1 Stage 2-5 Combined_RevG, dated 24 July 2019 and 29 July 2019, respectively). The Lot plan boundaries and numbers were supplied in PDF format by PEET (Precinct 1 Stage 2-5 Rev L, dated 25 November 2020).
- All road surfaces were assumed to be dense grade asphalt (DGA).
- Road traffic volumes for the Year 2036, which are adopted as a 10-year planning horizon from the anticipated year of construction (refer **Appendix C**).

The MP4.4 Noise Categories are based on transport noise levels calculated 1 m from the facade of a building. There are no buildings in the noise prediction model, the calculated road traffic noise levels were adjusted by +2.5 dBA to account for the reflected sound at 1 m from a building facade.

The noise prediction model calculated road traffic noise levels using the Calculation of Road Traffic Noise[1] methodology and the Code of Practice published by Transport and Main Roads[2]. Ground was modelled as soft (grass). The model included ground contours as provided by Meinhardt.

3.2 Methodology – Rail

A transport noise prediction model for the Sydney to Brisbane rail line has been developed utilising the SoundPLAN noise prediction software. The SoundPLAN software is widely used in Australia and internationally to calculate rail traffic noise levels in accordance with recognised transport noise assessment methodologies.

[1] UK Department of Transport (1988). Calculation of Road Traffic Noise (CoRTN 88).
[2] Department of Transport and Main Roads. Transport Noise Management Code of Practice, November 2013.

The rail component of this assessment considered existing daily rail operations on the Sydney to Brisbane rail corridor, adjacent to the Flagstone Development.

The KILDE 130 rail noise prediction methodology[3] was applied to calculate railway noise levels. The methodology calculates L_{Aeq} and single event maximum (SEM) rail noise levels for daily rail traffic and referenced noise emissions specific for Queensland's rolling stock. The noise modelling also referenced guidelines on the prediction of railway noise and the KILDE 130 methodology from guidelines issued by Queensland Rail (QR) and Department of Transport and Main Roads (TMR).

In January 2018, railway noise levels were measured over seven days at 48 m from the Sydney to Brisbane rail corridor within a green-field area of the Flagstone City Development. The measured noise levels were referenced to verify the accuracy of the rail noise prediction model.

The daily passenger trains include two XPT services which operate at a track speed of approximately 130 km/h which result in a relatively short duration noise event of approximately 11-seconds. Due to the insect noise during the daylight hours, the noise levels from passenger train events were not always clearly measurable.

The freight train passby events were 1 to 2 minutes in duration with a typical passby noise level at least 10 to 15 dBA higher than the passenger trains that were clearly measured. The freight train passbys were the main contribution to the L_{Aeq} and SEM rail noise levels during each 24-hour period.

For these reasons only the freight train events were used to verify the noise model. The daily rail movements used in the assessment are detailed in **Table 2**.

Table 2 Daily Rail Movements

Train Type	Noise Emission	Modelled Speed	Train per 24-hour 2028
XPT	91 dBA SEL, 86 dBA L_{Amax} at 15 m	120 km/h	2
Freight (notch 8)	83 dBA SEL, 90 dBA L_{Amax} at 25m	80 km/h	5
Freight wagons	100 dBA SEL, 90 dBA L_{Amax} at 15m	80 km/h	5

The noise model verification is detailed in **Table 3**, which shows the model verified the rail freight noise levels to within 1 dBA of the measured rail freight noise levels.

Table 3 Verification of Rail Noise Model

Measured Rail Noise Levels		Predicted Rail Noise Levels		Verification of Predicted Levels	
LAeq(24hour)	SEM	LAeq(24hour)	SEM	LAeq(24hour)	SEM
44	77	44	79	0	+1

Notes Single Event Maximum (SEM)

Rail noise levels were measured in the free-field at 48 m from a straight section of track with no signals, cross overs etc. The measured noise levels are for the daily rail freight train movements only.

Rail noise levels were calculated using the Kilde 130[4] railway noise prediction methodology.

[3] Ringheim, M, KILDE Report 130, 1984.

[4] Nordic Rail Traffic Noise Prediction Method Kilde Report 130 (1984).

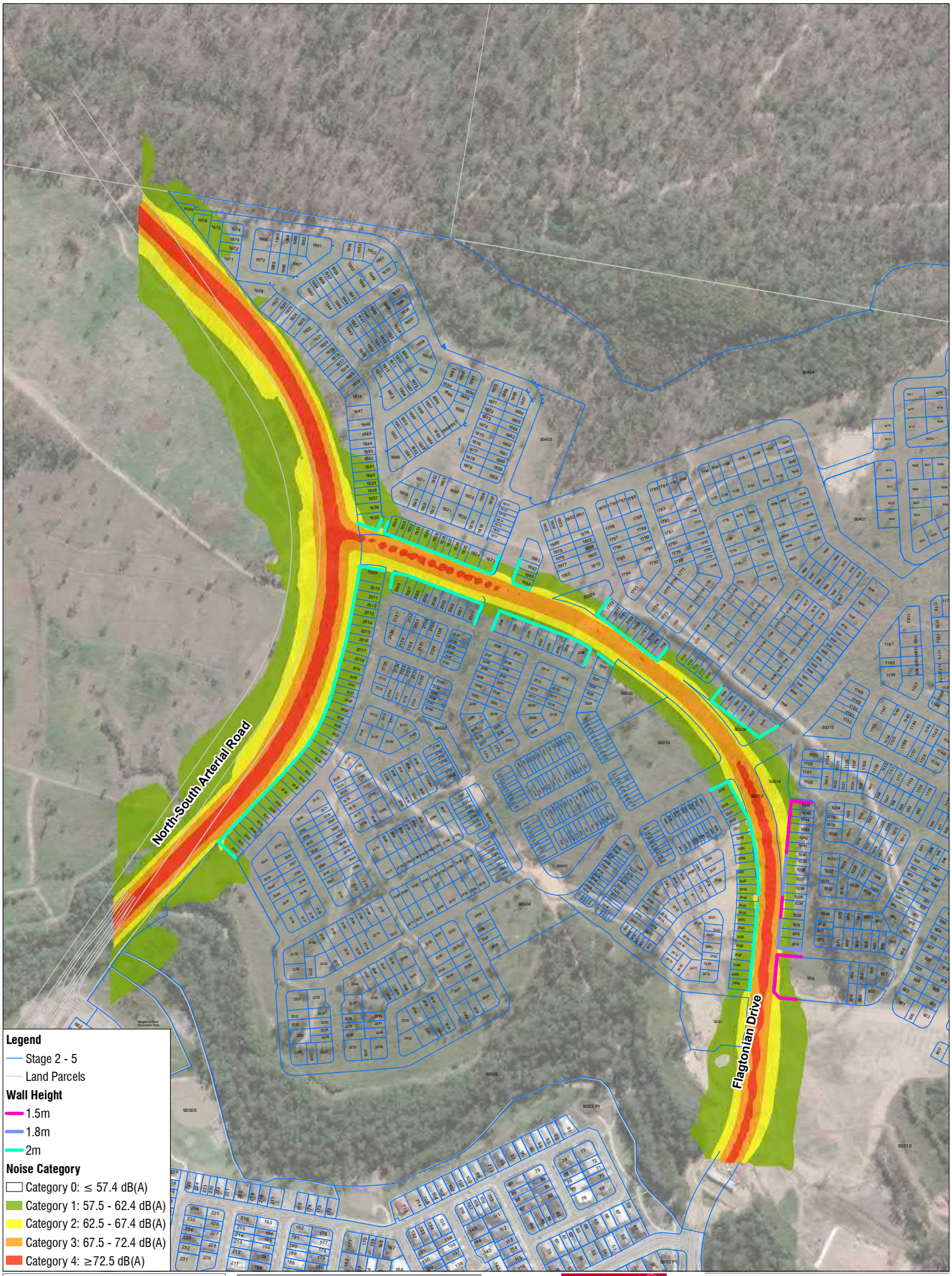
The MP4.4 Noise Categories are based on transport noise levels calculated at 1 m from the facade of a building. There are no buildings in the noise prediction model, the calculated railway noise levels were adjusted by +2.5 dBA to account for the reflected sound at 1 m from a building facade.

Acoustic fencing has been modelled along the property boundaries of the Stage 2 and Stage 3 Lots directly adjacent the rail line. The acoustic fencing has a height of 2 m and has been designed to mitigate the noise levels, and in-turn Noise Category, for single storey dwellings in the vicinity of the rail line.

3.3 Transport Noise Assessment

Road and rail noise levels have been predicted at Stages 2-5 and have been presented consistent with the MP4.4 Noise Categories. The contours of the MP4.4 Noise Categories across each residential Lot of Stages 2-5 are detailed in the following figures.

- **Figure 1** and **Figure 2** present the road traffic Noise Categories calculated at 1.8 m for a single storey (low set) dwelling and at 4.6 m for a two storey (high set) dwelling, including noise fences. These fences were included as they were specified in the approved plan of the development.
- **Figure 3** and **Figure 4** present the rail Noise Categories calculated at 1.8 m for a single storey (low set) dwelling and at 4.6 m for a two storey (high set) dwelling, without any noise fences, as no fences were specified in the approved plan of the development.
- **Figure 5** and **Figure 6** present the rail Noise Categories calculated at 1.8 m for a single storey (low set) dwelling and at 4.6 m for a two storey (high set) dwelling, including the 2 m noise fences. These fences show the impact of including noise fences along the rail corridor.



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N W E S

0 50 100 150 200 m

Flagstone
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Flagstone Noise Assessment

Calculated MP4.4 Road Noise Categories for Stages 2 - 5 Single Storey 1.8m Facade corrected LA10 (18hour)

FIGURE 1

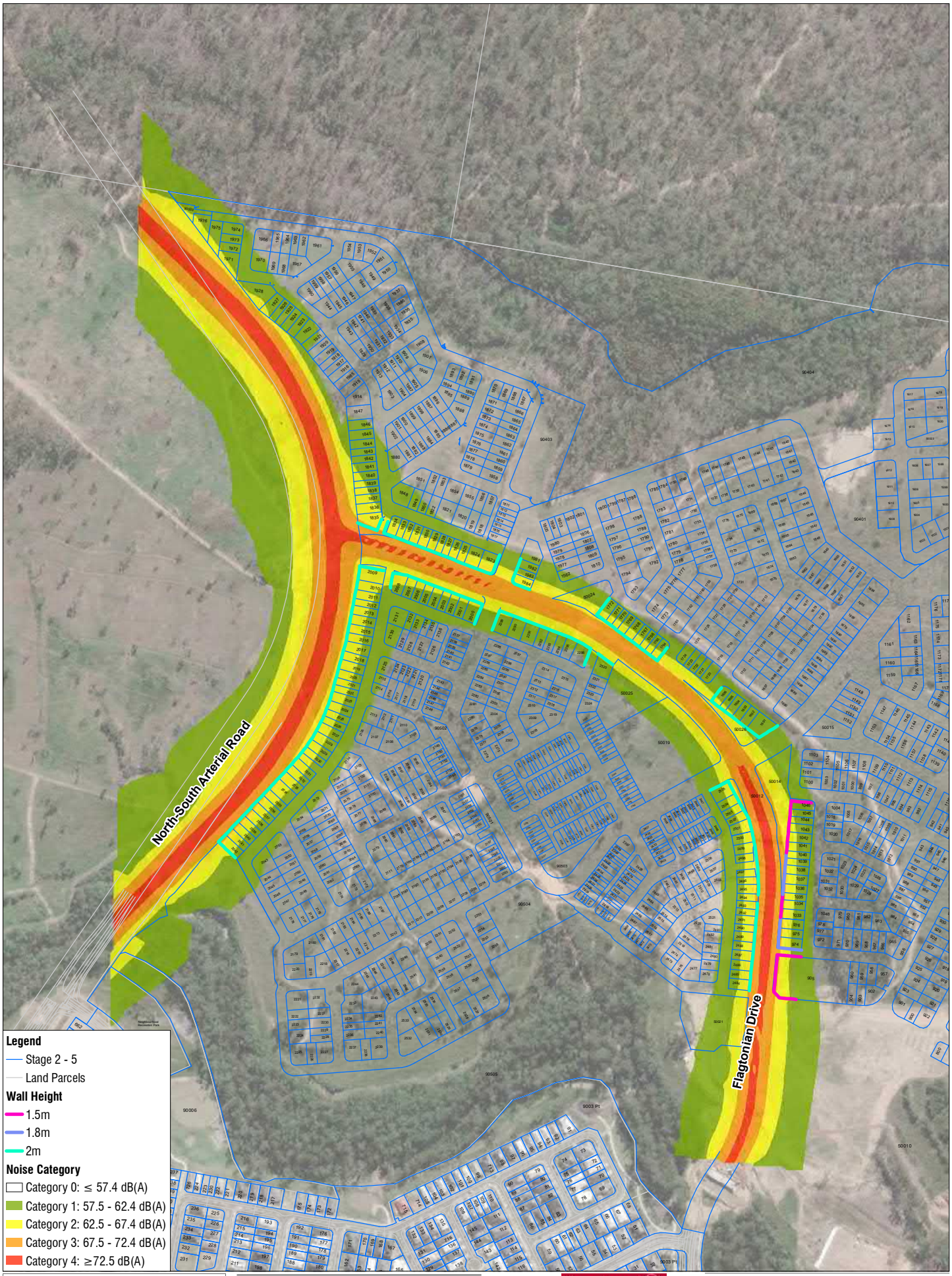

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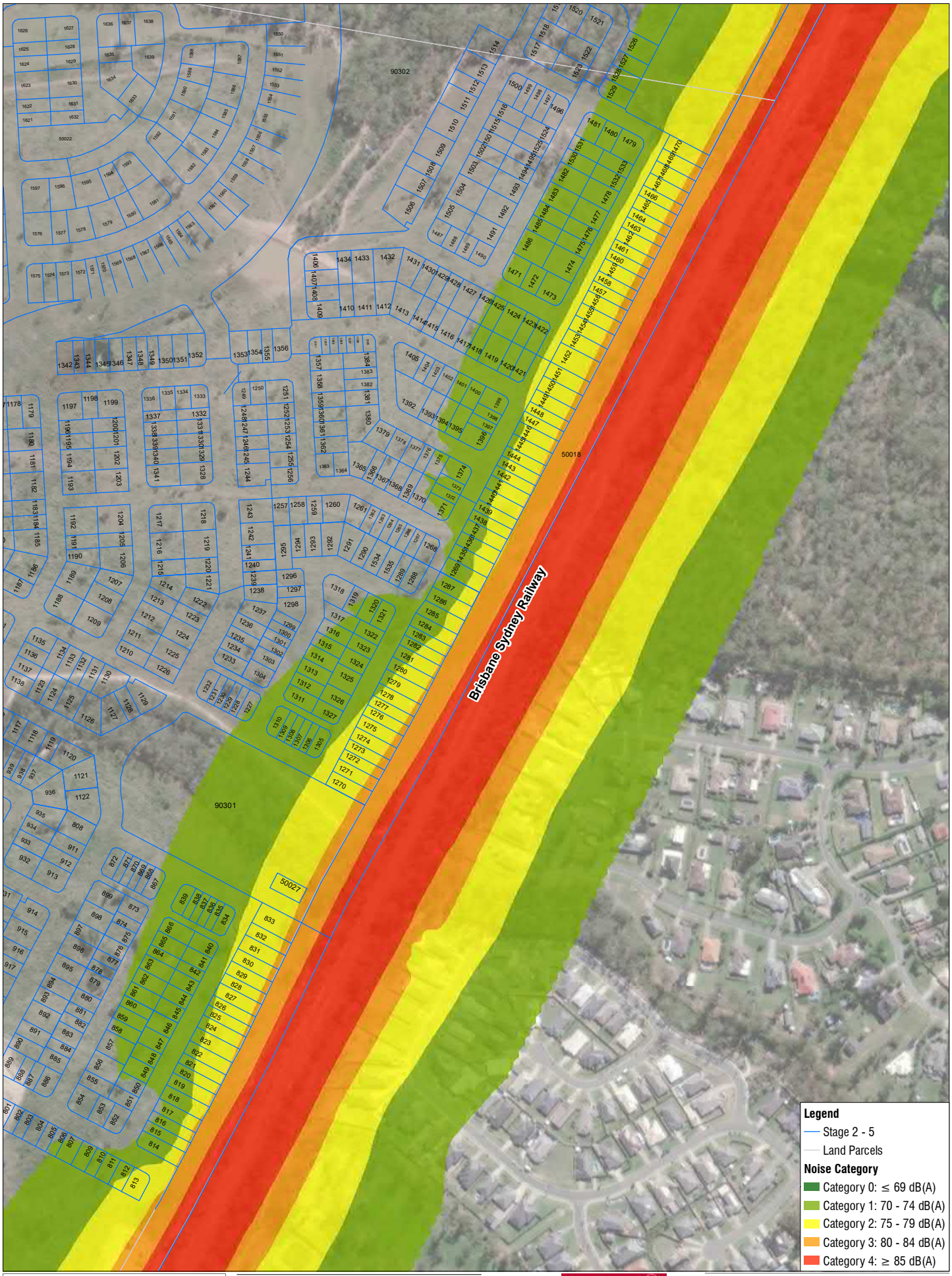
FIGURE 2



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Flagstone
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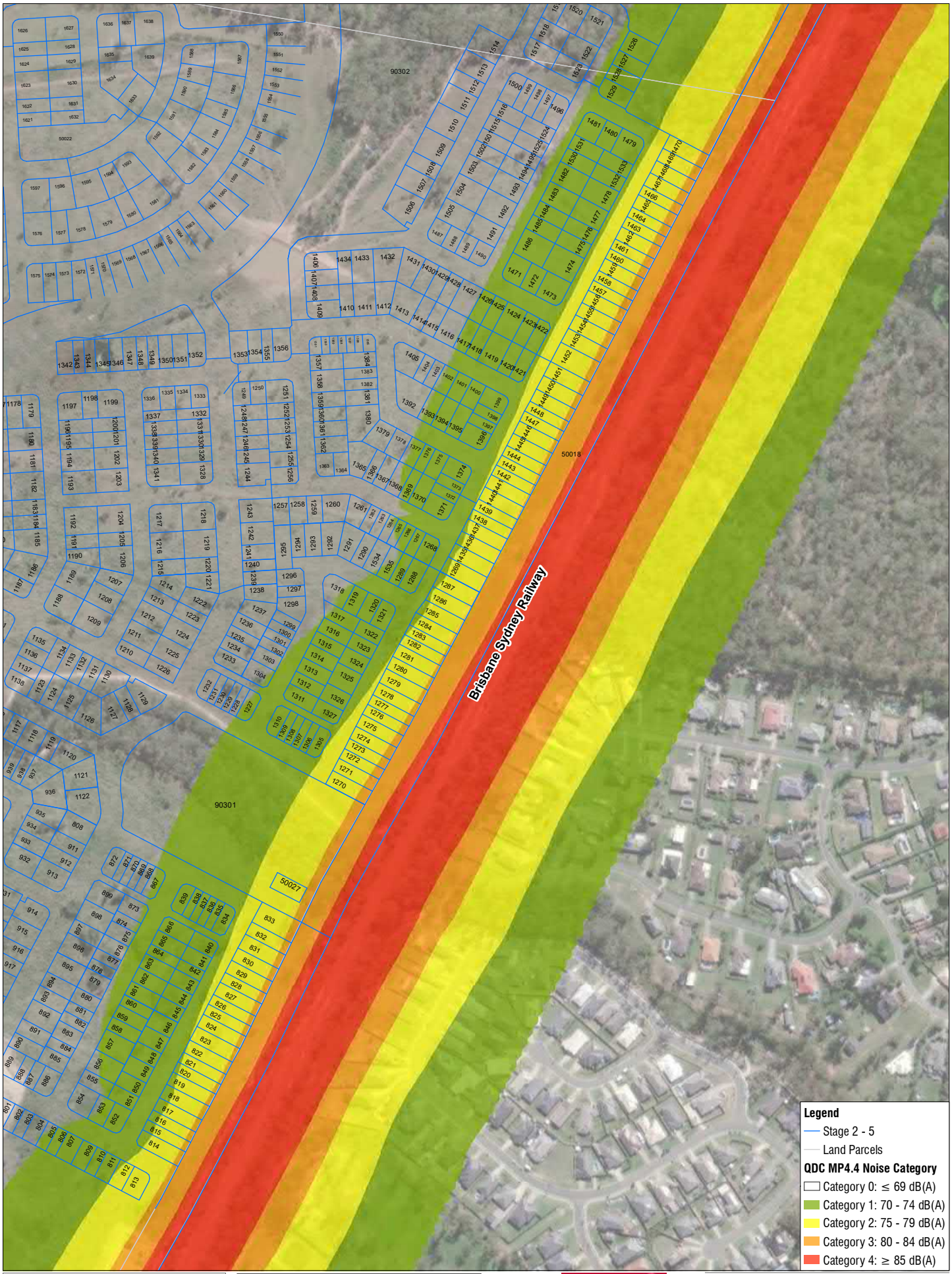
Flagstone Noise Assessment

Calculated MP4.4 Rail Noise Categories for Stages 2 - 5 Single Storey 1.8m Single event maximum noise (LAmax)

FIGURE 3



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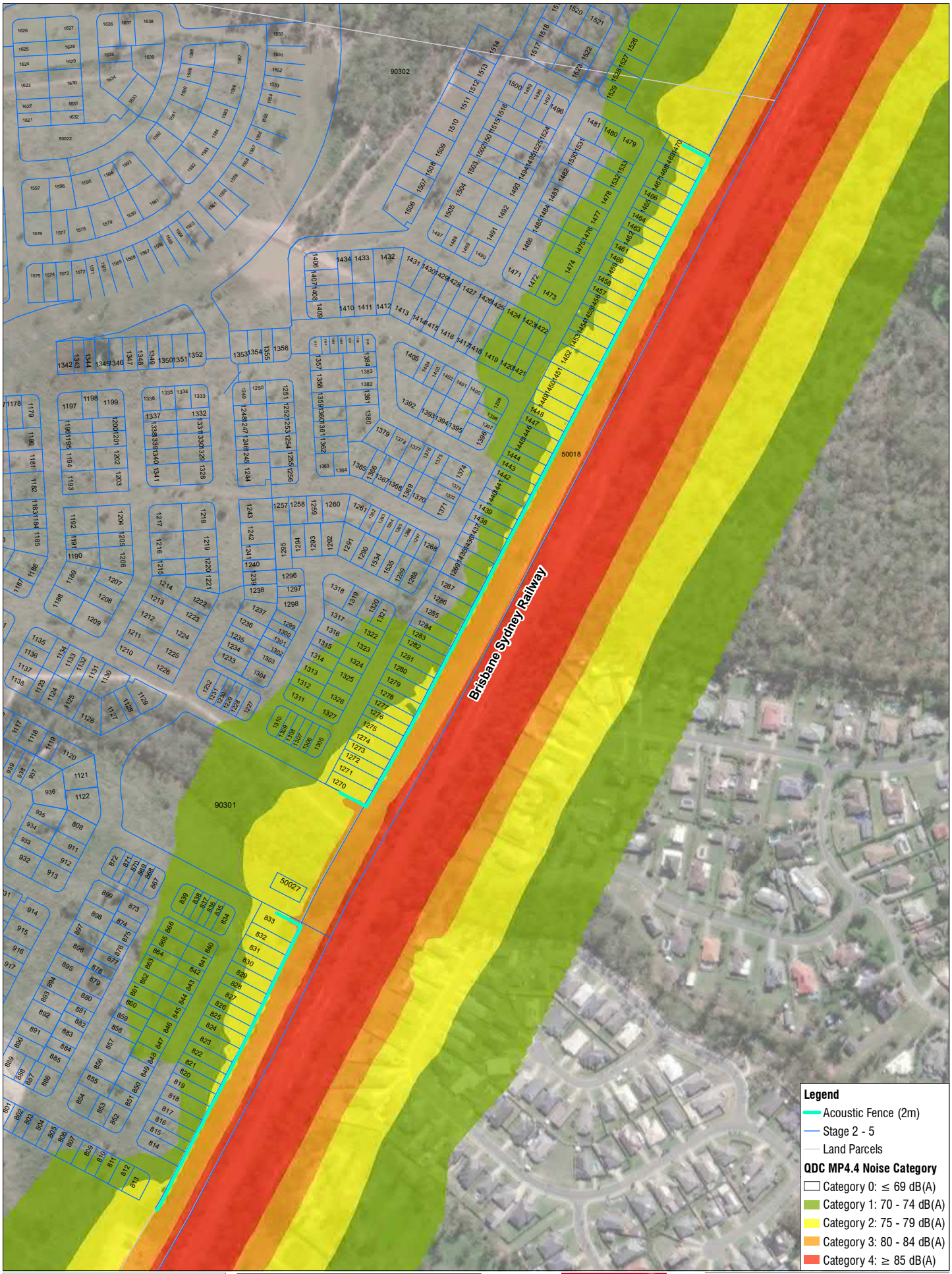
Calculated MP4.4 Rail Noise Categories for Stages 2 - 5 Double Storey 4.6m Single event maximum noise (LAmax)

FIGURE 4



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Flagstone Noise Assessment

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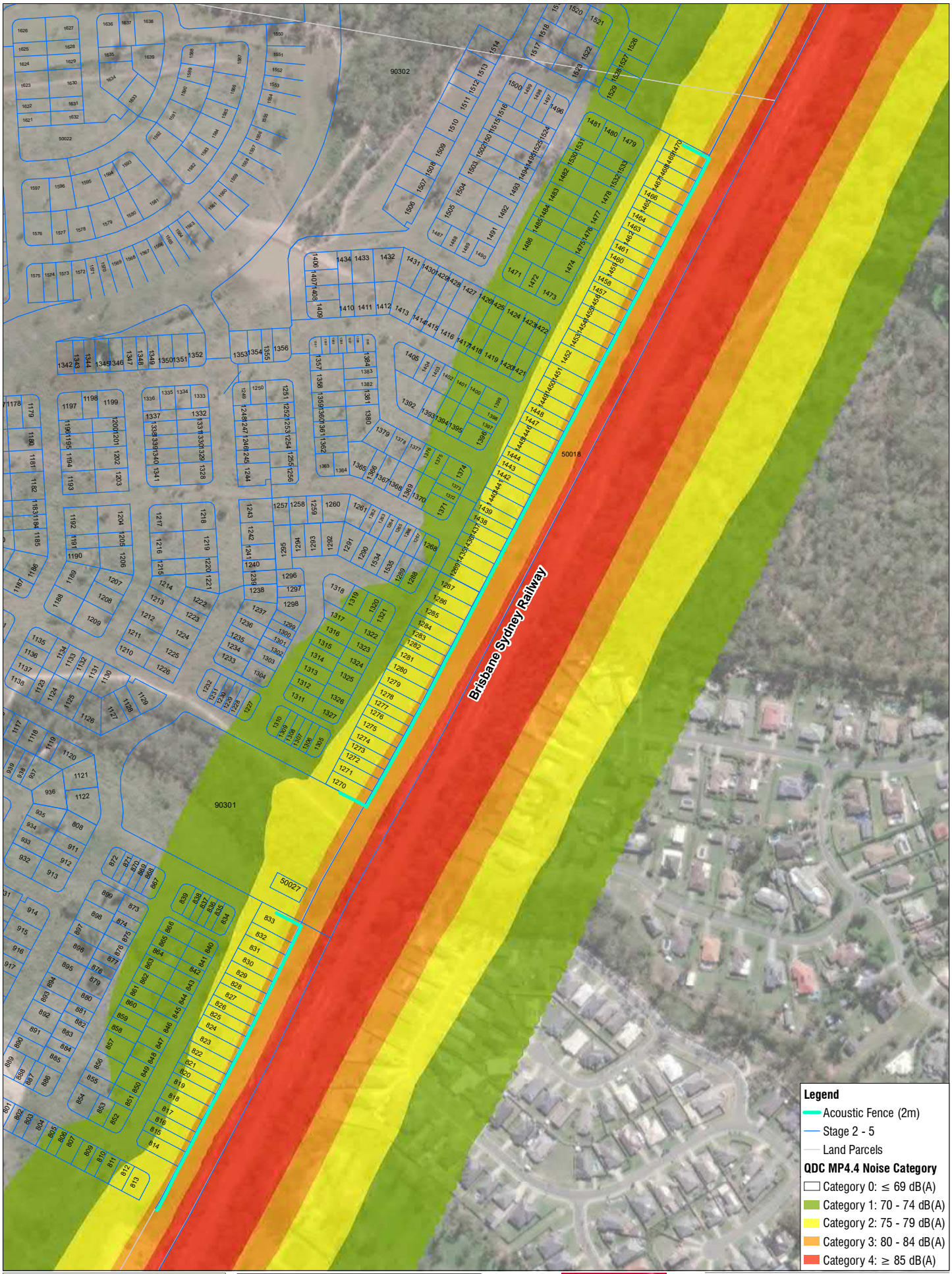
FIGURE 5



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Flagstone Noise Assessment

Calculated MP4.4 Rail Noise Categories for Stages 2 - 5 Double Storey 4.6m Single event maximum noise (LAmax)

FIGURE 6

3.4 QDC MP4.4 Noise Categories

The assessed Noise Categories for each Lot at Stages 2-5 (including attenuation from designed acoustic fencing) are detailed in **Table 4** to **Table 7**. The Noise Category for each Lot has been determined as the highest Noise Category noise that has been predicted at part or all of the Lot, considering both road and railway noise.

The noise contours in **Figure 1** to **Figure 6** show an approximation of the proportion of each Lot in which the highest Noise Category has been determined. Noise Categories have been presented for both a single storey (low set) and two storey (high set) dwelling. It should be noted that these figures provide a representation of the predicted noise environment and determination of the applicable Category for each Lot is to be based on the results in **Table 4** to **Table 7** only.

The minimum acceptable forms of building construction for each Noise Category are detailed in **Appendix D**.

Table 4 MP4.4 Noise Categories for Stage 2

Lot Number	Predicted QDC MP4.4 Noise Category	
	Low Set Dwelling	High Set Dwelling
800	0	0
801	0	0
802	0	0
803	0	1
804	1	1
805	1	1
806	1	1
807	1	1
808	1	1
809	1	1
810	1	1
811	2	2
812	2	2
813	2	3
814	1	2**
815	1	2**
816	1	2**
817	1	2**
818	1**	2**
819	1**	2**
820	1**	2**
821	1**	2**
822	1**	2**

Lot Number	Predicted QDC MP4.4 Noise Category	
	Low Set Dwelling	High Set Dwelling
823	2	2**
824	2	2**
825	2	2**
826	2	2**
827	2	2**
828	2	2**
829	2	2**
830	2	2**
831	2	2**
832	2	2**
833	2^^	2**
834	2	2
835	1	1
836	1	1
837	1	1
838	1	1
839	1	1
840	1	2
841	1	2
842	1	2
843	1	2
844	1	1
845	1	1
846	1	1
847	1	1
848	1	1
849	1	1
850	0	1
851	0	1
852	0	1
853	0	1
854	0	1
855	0	1
856	1	1
857	1	1

Lot Number	Predicted QDC MP4.4 Noise Category	
	Low Set Dwelling	High Set Dwelling
858	1	1
859	1	1
860	1	1
861	1	1
862	1	1
863	1	1
864	1	1
865	1	1
866	1	1
867	1	1
868	1	1
869	1	1
870	0	1
871	0	0
872	0	0
873	1	1
874	1	1
875	1	1
876	1	1
877	1	1
878	1	1
879	0	1
880	0	1
881	0	1
882	0	1
883	0	1
884	0	0
885	0	0
886	0	0
887	0	0
888	0	0
889	0	0
890	0	0
891	0	0
892	0	0

Lot Number	Predicted QDC MP4.4 Noise Category	
	Low Set Dwelling	High Set Dwelling
893	0	0
894	0	0
895	0	0
896	0	0
897	0	0
898	0	1
899	0	1
900	0	0
901	0	0
902	0	0
903	0	0
904	0	0
905	2	2††
911	0	0
912	0	0
913	0	0
914	0	0
915	0	0
916	0	0
917	0	0
918	0	0
919	0	0
920	0	0
921	0	0
922	0	0
923	0	0
924	0	0
925	0	0
926	0	0
927	0	0
928	0	0
929	0	0
930	0	0
931	0	0
932	0	0

Lot Number	Predicted QDC MP4.4 Noise Category	
	Low Set Dwelling	High Set Dwelling
933	0	0
934	0	0
935	0	0
936	0	0
937	0	0
938	0	0
939	0	0
940	0	0
941	0	0
942	0	0
943	0	0
944	0	0
945	0	0
946	0	0
947	0	0
948	0	0
949	0	0
950	0	0
951	0	0
952	0	0
953	0	0
954	0	0
955	0	0
956	0	0
957	0	0
958	0	0
959	0	0
960	0	0
965	0	0
966	0	0
967	0	0
968	0	0
969	0	0
970	0	0
971	0	0

Lot Number	Predicted QDC MP4.4 Noise Category	
	Low Set Dwelling	High Set Dwelling
972	0	0
974	1‡‡	2‡‡
975	1‡‡	2‡‡
976	1‡‡	2‡‡
977	0	0
978	0	0
979	0	0
980	0	0
981	0	0
982	0	0
983	0	0
984	0	0
985	0	0
986	0	0
987	0	0
988	0	0
989	0	0
990	0	0
991	0	0
992	0	0
993	0	0
994	0	0
995	0	0
996	0	0
997	0	0
999	0	0
1000	0	0
1001	0	0
1002	0	0
1003	0	0
1004	0	0
1005	0	0
1006	0	0
1007	0	0
1008	0	0

Lot Number	Predicted QDC MP4.4 Noise Category	
	Low Set Dwelling	High Set Dwelling
1009	0	0
1010	0	0
1011	0	0
1012	0	0
1013	0	0
1014	0	0
1015	0	0
1016	0	0
1017	0	0
1018	0	0
1019	0	0
1020	0	0
1021	0	0
1022	0	0
1023	0	0
1024	0	0
1025	0	0
1026	0	0
1027	0	0
1028	0	0
1029	0	0
1030	0	0
1031	0	0
1032	0	0
1033	1‡‡	2‡‡
1034	1‡‡	2‡‡
1035	1‡‡	2‡‡
1036	1‡‡	2‡‡
1037	1‡‡	2‡‡
1038	1‡‡	2‡‡
1039	1‡‡	2‡‡
1040	1‡‡	2
1041	1‡‡	2
1042	1‡‡	2
1043	1‡‡	2

Lot Number	Predicted QDC MP4.4 Noise Category	
	Low Set Dwelling	High Set Dwelling
1044	1	2
1045	1	2
1046	1	2
1047	0	0
1048	0	0

** Lots 814-833 – The building facades are to be set back at least 10 m from the acoustic fence in order for Category 1 to apply to the ground floor of Lots 818-822 and Category 2 to apply to the upper floor of all these Lots. If setback distances are not implemented, then Category 2 applies to the ground floor of Lots 818-822 and Category 3 applies to the upper floor for all of these Lots.

^^ Lot 833 – The building facades are to be set back at least at least 10 m from the acoustic fence (south-east) and at least 2 m from the acoustic fence return (north-east) in order for Category 2 to apply to the ground floor. If setback distances are not implemented, then Category 3 applies to the ground floor on this Lot.

†† Lot 905 – The building facades are to be at least 3.6 m from the acoustic fence on the western boundary and 25 m from the acoustic fence on the northern boundary in order for Category 2 to apply to the upper floor. If setback distances are not implemented, then Category 3 applies to the upper floor on this Lot.

‡‡ Lots 974-976 and Lots 1033-1043 – The western building facades are to be set back at least 5 m from the acoustic fence in order for Category 1 to apply to the ground floor and Category 2 to apply to the upper floor. If setback distances are not implemented, then Category 2 applies to the ground floor for all of these Lots and Category 3 applies to the upper floor for Lots 974-976 and Lots 1033-1039.

Table 5 MP4.4 Noise Categories for Stage 3

Lot Number	Predicted QDC MP4.4 Noise Category	
	Low Set Dwelling	High Set Dwelling
1100	0	1
1101	0	1
1102	0	1
1103	0	0
1104	0	0
1105	0	0
1106	0	0
1107	0	0
1108	0	0
1109	0	0
1110	0	0
1111	0	0
1112	0	0
1113	0	0
1114	0	0
1115	0	0
1116	0	0
1117	0	0
1118	0	0

Lot Number	Predicted QDC MP4.4 Noise Category	
	Low Set Dwelling	High Set Dwelling
1119	0	0
1120	0	0
1121	0	0
1122	0	0
1123	0	0
1124	0	0
1125	0	0
1126	0	0
1127	0	0
1128	0	0
1129	0	0
1130	0	0
1131	0	0
1132	0	0
1133	0	0
1134	0	0
1135	0	0
1136	0	0
1137	0	0
1138	0	0
1139	0	0
1140	0	0
1141	0	0
1142	0	0
1143	0	0
1144	0	0
1145	0	0
1146	0	0
1147	0	0
1148	0	0
1149	0	0
1150	0	0
1151	0	0
1152	0	0
1153	0	0

Lot Number	Predicted QDC MP4.4 Noise Category	
	Low Set Dwelling	High Set Dwelling
1154	0	0
1155	0	0
1156	0	0
1157	0	0
1158	0	0
1159	0	0
1160	0	0
1161	0	0
1162	0	0
1163	0	0
1164	0	0
1165	0	0
1166	0	0
1167	0	0
1168	0	0
1169	0	0
1170	0	0
1171	0	0
1172	0	0
1173	0	0
1174	0	0
1175	0	0
1176	0	0
1177	0	0
1178	0	0
1179	0	0
1180	0	0
1181	0	0
1182	0	0
1183	0	0
1184	0	0
1185	0	0
1186	0	0
1187	0	0
1188	0	0

Lot Number	Predicted QDC MP4.4 Noise Category	
	Low Set Dwelling	High Set Dwelling
1189	0	0
1190	0	0
1191	0	0
1192	0	0
1193	0	0
1194	0	0
1195	0	0
1196	0	0
1197	0	0
1198	0	0
1199	0	0
1200	0	0
1201	0	0
1202	0	0
1203	0	0
1204	0	0
1205	0	0
1206	0	0
1207	0	0
1208	0	0
1209	0	0
1210	0	0
1211	0	0
1212	0	0
1213	0	0
1214	0	0
1215	0	0
1216	0	0
1217	0	0
1218	0	0
1219	0	0
1220	0	0
1221	0	0
1222	0	0
1223	0	0

Lot Number	Predicted QDC MP4.4 Noise Category	
	Low Set Dwelling	High Set Dwelling
1224	0	0
1225	0	0
1226	0	0
1227	1	1
1228	1	1
1229	1	1
1230	1	1
1231	0	0
1232	0	0
1233	0	1
1234	0	0
1235	0	0
1236	0	0
1237	0	0
1238	0	0
1239	0	0
1240	0	0
1241	0	0
1242	0	0
1243	0	0
1244	0	0
1245	0	0
1246	0	0
1247	0	0
1248	0	0
1249	0	0
1250	0	0
1251	0	0
1254	0	0
1254	0	0
1254	0	0
1254	0	0
1256	0	0
1257	0	0
1258	0	0

Lot Number	Predicted QDC MP4.4 Noise Category	
	Low Set Dwelling	High Set Dwelling
1259	0	0
1260	0	0
1261	0	0
1262	0	0
1263	0	1
1264	0	1
1265	0	1
1266	0	1
1267	0	1
1268	0	1
1269	2	3
1270	2**	3
1271	2	3
1272	2	3
1273	2	3
1274	2	3
1275	2	3
1276	2	3
1277	2	3
1278	2	3
1279	2	3
1280	2	3
1281	2	3
1282	2	3
1283	2	3
1284	2	3
1285	2	3
1286	2	3
1287	2	3
1288	0	1
1289	0	1
1290	0	1
1291	0	0
1292	0	0
1293	0	0

Lot Number	Predicted QDC MP4.4 Noise Category	
	Low Set Dwelling	High Set Dwelling
1294	0	0
1295	0	0
1296	0	0
1297	0	0
1298	0	1
1299	0	1
1300	0	1
1301	1	1
1302	1	1
1303	1	1
1304	1	1
1305	2	2
1306	1	2
1307	1	1
1308	1	1
1309	1	1
1310	1	1
1311	1	1
1312	1	1
1313	1	1
1314	1	1
1315	1	1
1316	1	1
1317	1	1
1318	1	1
1319	1	1
1320	1	1
1321	1	1
1322	1	1
1323	1	1
1324	1	1
1325	1	1
1326	1	2
1327	1	2
1328	0	0

Lot Number	Predicted QDC MP4.4 Noise Category	
	Low Set Dwelling	High Set Dwelling
1329	0	0
1330	0	0
1331	0	0
1332	0	0
1333	0	0
1334	0	0
1335	0	0
1336	0	0
1337	0	0
1338	0	0
1339	0	0
1340	0	0
1341	0	0
1342	0	0
1343	0	0
1344	0	0
1345	0	0
1346	0	0
1347	0	0
1348	0	0
1349	0	0
1350	0	0
1351	0	0
1352	0	0
1353	0	0
1354	0	0
1355	0	0
1356	0	0
1357	0	0
1358	0	0
1359	0	0
1360	0	0
1361	0	0
1362	0	0
1363	0	0

Lot Number	Predicted QDC MP4.4 Noise Category	
	Low Set Dwelling	High Set Dwelling
1364	0	0
1365	0	0
1366	0	0
1367	0	1
1368	1	1
1369	0	1
1370	0	1
1371	0	1
1372	0	1
1373	0	1
1374	0	1
1375	0	1
1376	0	1
1377	0	1
1378	0	1
1379	0	0
1380	0	0
1381	0	0
1382	0	0
1383	0	0
1384	0	0
1385	0	0
1386	0	0
1387	0	0
1388	0	0
1389	0	0
1390	0	0
1391	0	0
1392	0	1
1393	0	1
1394	0	1
1395	0	1
1396	0	1
1397	0	1
1398	0	1

Lot Number	Predicted QDC MP4.4 Noise Category	
	Low Set Dwelling	High Set Dwelling
1399	1	1
1400	0	1
1401	0	1
1402	0	1
1403	0	1
1404	0	1
1405	0	0
1406	0	0
1407	0	0
1408	0	0
1409	0	0
1410	0	0
1411	0	0
1412	0	0
1413	0	0
1414	0	0
1415	0	0
1416	0	1
1417	0	1
1418	0	1
1419	1	1
1420	1	1
1421	1	2
1422	1	2
1423	1	1
1424	1	1
1425	1	1
1426	0	1
1427	1	1
1428	0	0
1429	0	0
1430	0	0
1431	0	0
1432	0	0
1433	0	0

Lot Number	Predicted QDC MP4.4 Noise Category	
	Low Set Dwelling	High Set Dwelling
1434	0	0
1435	2	3
1436	2	3
1437	2	3
1438	2	3
1439	2	3
1440	1	3
1441	1	3
1442	1	3
1443	1	3
1444	1	3
1445	1	3
1446	1	3
1447	1	3
1448	1	3
1449	1	3
1450	1	3
1451	1	3
1452	2	3
1453	2	3
1454	2	3
1455	2	3
1456	2	3
1457	2	3
1458	2	3
1459	2	3
1460	2	3
1461	2	3
1462	2	3
1463	2	3
1464	2	3
1465	2	3
1466	2	3
1467	2	3
1468	2	3

Lot Number	Predicted QDC MP4.4 Noise Category	
	Low Set Dwelling	High Set Dwelling
1469	2	3
1470	2	3
1471	1	1
1472	1	1
1473	1	2
1474	1	2
1475	1	2
1476	1	2
1477	1	2
1478	1	2
1479	1	2
1480	1	1
1481	1	1
1482	1	1
1483	1	1
1484	1	1
1485	1	1
1486	1	1
1487	0	0
1488	0	0
1489	0	0
1490	0	1
1491	0	1
1492	0	1
1493	0	1
1494	0	1
1495	0	1
1496	0	1
1497	0	0
1498	0	0
1499	0	0
1500	0	0
1501	0	0
1502	0	0
1503	0	0

Lot Number	Predicted QDC MP4.4 Noise Category	
	Low Set Dwelling	High Set Dwelling
1504	0	0
1505	0	0
1506	0	0
1507	0	0
1508	0	0
1509	0	0
1510	0	0
1511	0	0
1512	0	0
1513	0	0
1514	0	0
1515	0	0
1516	0	0
1517	0	0
1518	0	0
1519	0	0
1520	0	0
1521	0	1
1522	0	1
1523	0	1
1524	0	1
1525	0	1
1526	1	1
1527	1	1
1528	1	1
1529	1	1
1530	1	1
1531	1	1
1532	1	2
1533	1	2
1534	0	1
1535	0	1

** Lot 1270 – The building facades are to be set back at least 2m away from the acoustic fence in order for Category 2 to apply. If setback distances are not implemented, then Category 3 applies to this Lot.

Table 6 MP4.4 Noise Categories for Stage 4

Lot Number	Predicted QDC MP4.4 Noise Category	
	Low Set Dwelling	High Set Dwelling
1550	0	0
1551	0	0
1552	0	0
1553	0	0
1554	0	0
1555	0	0
1556	0	0
1557	0	0
1558	0	0
1559	0	0
1560	0	0
1561	0	0
1562	1	1
1563	0	0
1564	0	0
1565	0	0
1566	0	0
1567	0	0
1568	0	0
1569	0	0
1570	0	0
1571	0	0
1572	0	0
1573	0	0
1574	0	0
1575	0	0
1576	0	0
1577	0	0
1578	0	0
1579	0	0
1580	0	0
1581	0	0
1582	0	0
1583	0	0

Lot Number	Predicted QDC MP4.4 Noise Category	
	Low Set Dwelling	High Set Dwelling
1584	0	0
1585	0	0
1586	0	0
1587	0	0
1588	0	0
1589	0	0
1590	0	0
1591	0	0
1592	0	0
1593	0	0
1594	0	0
1595	0	0
1596	0	0
1597	0	0
1598	0	0
1599	0	0
1600	0	0
1601	0	0
1602	0	0
1603	0	0
1604	0	0
1605	0	0
1606	0	0
1607	0	0
1608	0	0
1609	0	0
1610	0	0
1611	0	0
1612	0	0
1613	0	0
1614	0	0
1615	0	0
1616	0	0
1617	0	0
1618	0	0

Lot Number	Predicted QDC MP4.4 Noise Category	
	Low Set Dwelling	High Set Dwelling
1619	0	0
1620	0	0
1621	0	0
1622	0	0
1623	0	0
1624	0	0
1625	0	0
1626	0	0
1627	0	0
1628	0	0
1629	0	0
1630	0	0
1631	0	0
1632	0	0
1633	0	0
1634	0	0
1635	0	0
1636	0	0
1637	0	0
1638	0	0
1639	0	0
1640	0	0
1641	0	0
1642	0	0
1643	0	0
1644	0	0
1645	0	0
1646	0	0
1647	0	0
1648	0	0
1649	0	0
1650	0	0
1651	0	0
1652	0	0
1653	0	0

Lot Number	Predicted QDC MP4.4 Noise Category	
	Low Set Dwelling	High Set Dwelling
1654	0	0
1655	0	0
1656	0	0
1657	0	0
1658	0	0
1659	0	0
1660	0	0
1661	0	0
1662	0	0
1663	0	0
1664	0	0
1665	0	0
1666	0	0
1667	0	0
1668	0	0
1669	0	0
1670	0	0
1671	0	0
1672	0	0
1673	0	0
1674	0	0
1675	0	0
1676	0	0
1677	0	0
1678	0	0
1679	0	0
1680	0	0
1681	0	0
1682	0	0
1683	0	0
1684	0	0
1685	0	0
1686	0	0
1687	0	0
1688	0	0

Lot Number	Predicted QDC MP4.4 Noise Category	
	Low Set Dwelling	High Set Dwelling
1689	0	0
1690	0	0
1691	1	1
1692	1	1
1693	1	2
1694	1	2
1695	1	2
1696	1	2
1697	0	0
1698	0	0
1699	0	0
1700	0	0
1701	0	0
1702	0	0
1703	0	0
1704	0	0
1705	0	0
1706	0	0
1707	0	0
1708	0	0
1709	0	0
1710	0	0
1711	0	0
1712	0	0
1713	0	0
1714	0	0
1715	0	0
1716	0	0
1717	0	0
1718	0	0
1719	0	0
1720	1	1
1721	1	1
1722	1	1
1723	1	1

Lot Number	Predicted QDC MP4.4 Noise Category	
	Low Set Dwelling	High Set Dwelling
1724	1	1
1725	0	0
1726	0	0
1727	0	0
1728	0	0
1729	0	0
1730	0	0
1731	0	0
1732	0	0
1733	0	0
1734	0	0
1735	0	0
1736	0	0
1737	0	0
1738	0	0
1739	0	0
1740	0	0
1741	0	0
1742	0	0
1743	0	0
1744	0	0
1745	0	0
1746	0	0
1747	0	0
1748	0	0
1749	0	0
1750	0	0
1751	0	0
1752	0	0
1753	0	0
1754	0	0
1755	0	0
1756	0	0
1757	0	0
1758	0	0

Lot Number	Predicted QDC MP4.4 Noise Category	
	Low Set Dwelling	High Set Dwelling
1759	0	0
1760	0	0
1761	0	0
1762	0	0
1763	0	0
1764	2	2
1765	2	2
1766	1	2
1767	1	2
1768	1	2
1769	2	2
1770	2	2
1771	1	2
1772	1	2
1773	0	0
1774	0	0
1775	0	0
1776	0	0
1777	0	0
1778	0	0
1779	0	0
1780	0	0
1781	0	0
1782	0	0
1783	0	0
1784	0	0
1785	0	0
1786	0	0
1787	0	0
1788	0	0
1789	0	0
1790	0	0
1791	0	0
1792	0	0
1793	0	0

Lot Number	Predicted QDC MP4.4 Noise Category	
	Low Set Dwelling	High Set Dwelling
1794	0	0
1795	0	0
1796	0	0
1797	0	0
1798	0	0
1799	0	0
1800	0	0
1801	0	0
1802	0	0
1803	0	0
1804	0	0
1805	0	0
1806	0	0
1807	0	0
1808	0	0
1809	0	0
1810	0	0
1811	0	0
1812	0	0
1813	0	0
1814	0	0
1815	0	0
1816	0	0
1817	0	0
1818	0	0
1819	0	0
1820	0	1
1821	0	1
1822	0	1
1823	2	3
1824	2	3
1825	2	3
1826	2	3
1827	2	3
1828	2	3

Lot Number	Predicted QDC MP4.4 Noise Category	
	Low Set Dwelling	High Set Dwelling
1829	2	3
1830	2	3
1831	2	3
1832	2	3
1833	2	3
1834	2	3
1835	2	3
1836	2	2
1837	1	2
1838	1	2
1839	1	2
1840	1	2
1841	1	2
1842	1	2
1843	1	1
1844	1	1
1845	0	1
1846	0	1
1847	0	1
1848	1	1
1849	0	1
1850	0	1
1851	0	1
1852	0	0
1853	0	0
1854	0	0
1855	0	0
1856	0	0
1857	0	0
1858	0	0
1859	0	0
1860	0	0
1861	0	0
1862	0	0
1863	0	0

Lot Number	Predicted QDC MP4.4 Noise Category	
	Low Set Dwelling	High Set Dwelling
1864	0	0
1865	0	0
1866	0	0
1867	0	0
1868	0	0
1869	0	0
1870	0	0
1871	0	0
1872	0	0
1873	0	0
1874	0	0
1875	0	0
1876	0	0
1877	0	0
1878	0	0
1879	0	0
1880	0	1
1881	0	0
1882	0	0
1883	0	0
1884	0	0
1885	0	0
1886	0	0
1888	0	0
1889	0	0
1890	0	0
1891	0	0
1892	0	0
1893	0	0
1894	0	0
1895	0	0
1896	0	0
1897	0	0
1898	0	0
1899	0	0

Lot Number	Predicted QDC MP4.4 Noise Category	
	Low Set Dwelling	High Set Dwelling
1900	0	0
1901	0	0
1902	0	1
1903	0	0
1904	0	0
1905	0	0
1906	0	0
1907	0	0
1908	0	0
1909	0	0
1910	0	0
1911	0	0
1912	0	0
1913	0	0
1914	0	0
1915	0	0
1916	0	0
1917	0	0
1918	0	0
1919	0	0
1920	0	1
1921	0	1
1922	0	1
1923	0	1
1924	0	1
1925	0	1
1926	0	2
1927	0	2
1928	1	2
1929	0	0
1930	0	0
1931	0	0
1932	0	0
1933	0	0
1934	0	0

Lot Number	Predicted QDC MP4.4 Noise Category	
	Low Set Dwelling	High Set Dwelling
1935	0	0
1936	0	0
1937	0	0
1938	0	0
1939	0	0
1940	0	0
1941	0	0
1942	0	0
1943	0	0
1944	0	0
1945	0	0
1946	0	0
1947	0	0
1948	0	0
1949	0	0
1950	0	0
1951	0	0
1951	0	0
1952	0	0
1953	0	0
1954	0	0
1955	0	0
1956	0	0
1957	0	0
1958	0	0
1959	0	0
1960	0	0
1961	0	0
1962	0	0
1963	0	0
1964	0	0
1965	0	0
1966	0	0
1967	0	0
1968	0	0

Lot Number	Predicted QDC MP4.4 Noise Category	
	Low Set Dwelling	High Set Dwelling
1969	0	1
1970	0	1
1971	1	2
1972	1	2
1973	1	1
1974	1	1
1975	1	2
1976	1	2
1977	0	1
1978	0	0
1979	0	0
1980	0	0
1981	0	1
1982	1	1
1983	1	2
1984	2	2
1985	0	0
1986	0	0
1987	0	0

Table 7 MP4.4 Noise Categories for Stage 5

Lot Number	Predicted QDC MP4.4 Noise Category	
	Low Set Dwelling	High Set Dwelling
2000	1	2
2001	1	2
2002	1	2
2003	1	2
2004	1	2
2005	1	2
2006	1	2
2007	1	2
2008	2	2
2009	2	2
2010	2	2

Lot Number	Predicted QDC MP4.4 Noise Category	
	Low Set Dwelling	High Set Dwelling
2011	2	2
2012	2	2
2013	2	2
2014	2	2
2015	2	2
2016	2	2
2017	2	2
2018	2	2
2019	2	2
2020	1	2
2021	2	2
2022	1	2
2023	1	2
2024	1	2
2025	1	2
2026	1	2
2027	1	2
2028	2	2
2029	2	2
2030	2	2
2031	1	2
2032	2	2
2033	2	2
2034	2	3
2035	2	3
2036	2	3
2037	2	3
2038	1	3
2039	1	3
2040	2	3
2041	2	3
2042	2	3
2043	0	1
2044	0	1
2045	0	0

Lot Number	Predicted QDC MP4.4 Noise Category	
	Low Set Dwelling	High Set Dwelling
2046	0	0
2047	0	0
2048	0	0
2049	0	0
2050	0	0
2051	0	0
2052	0	0
2053	0	1
2054	0	1
2055	0	0
2056	0	0
2057	0	0
2058	0	0
2059	0	0
2060	0	0
2061	0	0
2062	0	0
2063	0	0
2064	0	0
2065	0	0
2066	0	0
2067	0	0
2068	0	0
2069	0	0
2070	0	0
2071	0	0
2072	0	1
2073	0	0
2074	0	0
2075	0	0
2076	0	0
2077	0	0
2078	0	0
2079	0	0
2080	0	0

Lot Number	Predicted QDC MP4.4 Noise Category	
	Low Set Dwelling	High Set Dwelling
2081	0	0
2082	0	0
2083	0	0
2084	0	0
2085	0	0
2086	0	0
2087	0	0
2088	0	0
2089	0	0
2090	0	0
2091	0	0
2092	0	0
2093	0	0
2094	0	0
2095	0	0
2096	0	0
2097	0	0
2098	0	0
2099	0	0
2100	0	0
2101	0	0
2102	0	0
2103	0	0
2104	0	1
2105	0	1
2106	0	1
2107	0	0
2108	0	0
2109	0	0
2110	0	0
2111	0	0
2112	0	0
2113	0	1
2114	0	1
2115	0	1

Lot Number	Predicted QDC MP4.4 Noise Category	
	Low Set Dwelling	High Set Dwelling
2116	0	0
2117	0	0
2118	0	0
2119	0	0
2120	0	0
2121	0	0
2122	0	0
2123	0	0
2124	0	0
2125	0	1
2126	0	0
2127	0	0
2128	0	0
2129	0	1
2130	0	1
2131	0	1
2132	0	1
2133	0	1
2134	0	1
2135	0	1
2136	0	1
2137	0	0
2138	0	0
2139	0	0
2140	0	0
2141	0	0
2142	0	0
2143	0	0
2144	0	0
2145	0	0
2146	0	0
2147	0	0
2148	0	0
2149	0	0
2150	0	0

Lot Number	Predicted QDC MP4.4 Noise Category	
	Low Set Dwelling	High Set Dwelling
2151	0	0
2152	0	0
2153	0	0
2154	0	0
2155	0	0
2156	0	0
2157	0	0
2158	0	0
2159	0	0
2160	0	0
2161	0	0
2162	0	0
2163	0	0
2164	0	0
2165	0	0
2166	0	0
2167	0	0
2168	0	0
2169	0	0
2170	0	0
2171	0	0
2172	0	0
2173	0	0
2174	0	0
2175	0	0
2176	0	0
2177	0	0
2178	0	0
2179	0	0
2180	0	0
2181	0	0
2182	0	0
2183	0	0
2184	0	0
2185	0	0

Lot Number	Predicted QDC MP4.4 Noise Category	
	Low Set Dwelling	High Set Dwelling
2186	0	0
2187	0	0
2188	0	0
2189	0	0
2190	0	0
2191	0	0
2192	0	0
2193	0	0
2194	0	0
2195	0	0
2196	0	0
2197	0	0
2198	0	0
2199	0	0
2200	0	0
2201	0	0
2202	0	0
2203	0	0
2204	0	0
2205	0	0
2206	0	0
2207	0	0
2208	0	0
2209	0	0
2210	0	0
2211	0	0
2212	0	0
2213	0	0
2214	0	0
2215	0	0
2216	0	0
2217	0	0
2218	0	0
2219	0	0
2220	0	0

Lot Number	Predicted QDC MP4.4 Noise Category	
	Low Set Dwelling	High Set Dwelling
2221	0	0
2222	0	0
2223	0	0
2224	0	0
2225	0	0
2226	0	0
2227	0	0
2228	0	0
2229	0	0
2230	0	0
2231	0	0
2232	0	0
2233	0	0
2234	0	0
2235	0	0
2236	0	0
2237	0	0
2238	0	0
2239	0	0
2240	0	0
2241	0	0
2242	0	0
2243	0	0
2244	0	0
2245	0	0
2246	0	0
2247	0	0
2248	0	0
2249	0	0
2250	0	0
2251	0	0
2252	0	0
2253	0	0
2254	0	0
2255	0	0

Lot Number	Predicted QDC MP4.4 Noise Category	
	Low Set Dwelling	High Set Dwelling
2256	0	0
2257	0	0
2258	0	0
2259	0	0
2260	0	0
2261	0	0
2262	0	0
2263	0	0
2264	0	0
2265	0	0
2266	0	0
2267	0	0
2268	0	0
2269	0	0
2270	0	0
2271	0	0
2272	0	0
2273	0	0
2274	0	0
2275	0	0
2276	0	0
2277	0	0
2278	0	0
2279	0	0
2280	0	0
2281	0	0
2282	0	0
2283	0	0
2284	0	0
2285	0	0
2286	0	0
2287	0	0
2288	0	0
2289	1	2
2290	1	2

Lot Number	Predicted QDC MP4.4 Noise Category	
	Low Set Dwelling	High Set Dwelling
2291	1	2
2292	1	2
2293	1	2
2294	0	2
2295	1	2
2296	1	2
2297	0	0
2298	0	0
2299	0	0
2300	0	0
2301	0	0
2302	0	0
2303	0	0
2304	0	0
2305	0	0
2306	0	0
2307	0	0
2308	0	0
2309	0	0
2310	0	0
2311	0	0
2312	0	0
2313	0	0
2314	0	0
2315	0	0
2316	0	0
2317	0	0
2318	0	0
2319	0	0
2320	1	2
2321	0	1
2322	0	0
2323	0	0
2324	0	0
2325	0	0

Lot Number	Predicted QDC MP4.4 Noise Category	
	Low Set Dwelling	High Set Dwelling
2326	0	0
2327	0	0
2328	0	0
2329	0	0
2330	0	0
2331	0	0
2332	0	0
2333	0	0
2334	0	0
2335	0	0
2336	0	0
2337	0	0
2338	0	0
2339	0	0
2340	0	0
2341	0	0
2342	0	0
2343	0	0
2344	0	0
2345	0	0
2346	0	0
2347	0	0
2348	0	0
2349	0	0
2350	0	0
2351	0	0
2352	0	0
2353	0	0
2354	0	0
2355	0	0
2356	0	0
2357	0	0
2358	0	0
2359	0	0
2360	0	0

Lot Number	Predicted QDC MP4.4 Noise Category	
	Low Set Dwelling	High Set Dwelling
2361	0	0
2362	0	0
2363	0	0
2364	0	0
2365	0	0
2366	0	0
2367	0	0
2368	0	0
2369	0	0
2370	0	0
2371	0	0
2372	0	0
2373	0	0
2374	0	0
2375	0	0
2376	0	0
2377	0	0
2378	0	0
2379	0	0
2380	0	0
2381	0	0
2382	0	0
2383	0	0
2384	0	0
2385	0	0
2386	0	0
2387	0	0
2388	0	0
2389	0	0
2390	0	0
2391	0	0
2392	0	0
2393	0	0
2394	0	0
2395	0	0

Lot Number	Predicted QDC MP4.4 Noise Category	
	Low Set Dwelling	High Set Dwelling
2396	0	0
2397	0	0
2398	0	0
2399	0	0
2400	0	0
2401	0	0
2402	0	0
2403	0	0
2404	0	0
2405	0	0
2406	0	0
2407	0	0
2408	0	0
2409	0	0
2410	0	0
2411	0	0
2412	0	0
2413	0	0
2414	0	0
2415	0	0
2416	0	0
2417	0	0
2418	0	0
2419	0	0
2420	0	0
2421	0	0
2422	0	0
2423	0	0
2424	0	0
2425	0	0
2426	0	0
2427	0	0
2428	0	0
2429	0	0
2430	0	0

Lot Number	Predicted QDC MP4.4 Noise Category	
	Low Set Dwelling	High Set Dwelling
2431	0	0
2432	0	0
2433	0	0
2434	0	0
2435	0	0
2436	0	0
2437	0	0
2438	0	0
2439	0	0
2440	0	0
2441	0	0
2442	0	0
2443	0	0
2444	0	0
2445	0	0
2446	0	0
2447	0	1
2448	0	1
2449	0	1
2450	0	0
2451	0	0
2452	0	0
2453	0	0
2454	0	0
2455	0	0
2456	0	0
2457	0	0
2458	0	0
2459	0	0
2460	0	0
2461	0	0
2462	0	0
2463	0	0
2464	0	0
2465	0	0

Lot Number	Predicted QDC MP4.4 Noise Category	
	Low Set Dwelling	High Set Dwelling
2466	0	0
2467	0	0
2468	0	0
2469	0	0
2470	0	0
2471	0	0
2472	0	0
2473	0	0
2474	0	0
2475	0	0
2476	0	0
2477	0	0
2478	0	1
2479	0	1
2480	0	1
2481	0	1
2482	0	1
2483	0	1
2484	2	3
2485	2	3
2486	1	3
2487	2	3
2488	2	3
2489	2	3
2490	2	3
2491	2	3
2492	2	3
2493	2	3
2494	2	3
2495	2	3
2496	2	3
2497	2	2
2498	2	2
2499	2	2
2500	2	3

Lot Number	Predicted QDC MP4.4 Noise Category	
	Low Set Dwelling	High Set Dwelling
2501	2	3
2502	1	3
2503	1	2
2504	2	2
2505	2	2
2506	0	1
2507	0	1
2508	0	1
2509	0	0
2510	0	0
2511	0	0
2512	0	0
2513	0	0
2514	0	0
2515	0	0
2516	0	0
2517	0	0
2518	0	0
2519	0	0
2520	0	0
2521	0	1
2522	0	0
2523	0	0
2524	0	0
2525	0	0
2526	0	0
2527	0	0
2528	0	0
2529	0	0
2530	0	0
2531	0	0
2532	0	0
2533	0	0
2534	0	0
2535	0	0

Lot Number	Predicted QDC MP4.4 Noise Category	
	Low Set Dwelling	High Set Dwelling
2536	0	0
2537	0	0
2538	0	0
2539	0	0
2540	0	0
2541	0	0
2542	0	0
2543	0	0
2544	0	0

4 Discussion and Recommendations

4.1 Road Noise

For single-storey dwellings in Stages 2-5, there are no Lots which fall within Noise Category 3 and 64 Lots which fall within Noise Category 2 due to road traffic noise. Noise area categories for the upper floor on two storey dwellings may be higher.

Acoustic fence heights have been specified in the planning conditions, and therefore SLR was unable to afford further noise attenuation in the form of noise barriers. Building sites that fall within a Noise Category will be subject to minimum building envelope performance requirements as per QDC MP4.4.

It should be noted that for Lot 905, the building facades are to be set back at least 3.6 m from the acoustic fence on the western boundary and 25 m from the northern boundary in order for Category 2 to apply to the upper floor. If the setback distances are not implemented, then Category 3 will apply to the upper floor of this Lot.

Similarly, for Lots 974-976 and Lots 1033-1043, the building facades are to be set back at least 5 m from the acoustic fence in order for Category 1 to apply at the ground floor and Category 2 to apply at the upper floor. If the setback distances are not implemented, then Category 2 will apply to the ground floor of these Lots and Category 3 will apply to the upper floor of Lots 974-976 and Lots 1033-1039.

4.2 Rail Noise

For single-storey dwellings in Stages 2-5, there are 49 Lots which fall within Noise Category 3 and 34 Lots which fall within Noise Category 2 due to rail noise without attenuation from acoustic fences. Noise area categories for the upper floor on two storey dwellings may be higher.

The 2 m high acoustic fence is sufficient to mitigate rail noise to a Category 2 or below at all Lots (with single storey dwellings). Building sites that fall within a Noise Category will be subject to minimum building envelope performance requirements as per QDC MP4.4.

It should be noted that for Lot 833 and Lot 1270, the building facades are to be set back at least 2 m from the acoustic fence in order for Category 2 to apply. If the setback distances are not implemented, then Category 3 will apply to these Lots.

4.3 General

The predicted Noise Categories presented in this report provide advice on the application of MP4.4 at individual Lots. The shape and form of individual buildings was not known at time of the assessment and are not included in the calculated transport noise levels.

As detailed in **Section 3.3**, the results tables represent the highest Noise Category for any part of the Lot (rather than only the building envelope). A lower Noise Category may be applicable depending on the layout of the building on the Lot. Buildings may also screen road and rail noise. For these reasons, the Noise Categories are considered a conservative assessment of transport noise.

The building design and construction can apply materials other than those presented in MP4.4, only if the materials, in combination, achieve the minimum R_W value for the relevant building component and applicable Noise Category.

Furthermore, it may be possible to further refine the MP4.4 accepted forms of constructions based on the actual building dimensions, preferred construction materials, and the predicted noise levels based on the methodology contained within Australian Standard 3671:1989 *Acoustics – Road traffic noise intrusion – Building siting and construction* (AS 3671).

Category 1 is deemed to be a standard building construction, and for this reason, further assessment on Lots currently assessed as Category 1 is unlikely to result in significant changes to the building construction.

However, it is likely that, where a dwelling is situated within Noise Category 2 or higher, a detailed noise assessment and an alternative solution (to adopting the specific MP4.4 Noise Category constructions) can result in a reduced R_W requirement and potential reduced construction costs to the applicant/developer.

It should be noted that the predicted Noise Categories presented in this report are based on the datasets which were made available to SLR by PEET as detailed in **Section 3**. Consequently, any changes to these datasets would invalidate the noise prediction results and corresponding Noise Categories presented in this report.

5 Conclusion

This report describes the results of a transport noise assessment undertaken for Stages 2-5 of the Flagstone City Development and provides calculated MP4.4 Noise Categories for the proposed residential Lots. In accordance with QDC and specifically MP4.4, the Noise Categories can be referenced when considering acceptable forms of building construction to control the intrusion of transport noise.

Examples of acceptable forms of construction for the building components as described in QDC MP4.4 are shown in **Appendix D**. It is important to note the Noise Categories have been predicted with reference to forecast future road and existing rail traffic and without the inclusion of building structures in the noise model.

APPENDIX A

Glossary of terminology

Noise and Sound The terms 'sound' and 'noise' are almost interchangeable, except that 'noise' commonly refers to unwanted sound. Sound (or noise) consists of minute fluctuations in atmospheric pressure capable of evoking the sense of hearing.

A-weighted sound pressure Human hearing responds to changes in sound pressure over a wide range and the range of sound pressure is not sensed equally. To account for the sensitivity of human hearing the A-weighted filter is applied to the sound frequencies so the loudness of the sound (expressed as decibels) corresponds to human hearing.

dBA Sound energy is expressed as a measure of decibels on the A-weighted scale. A change of 1 dBA or 2 dBA in the level of sound is difficult for most people to detect. A change in sound of 10 dBA corresponds to an approximate doubling or halving of loudness.

Sound power level This is a measure of the rate at which a source emits acoustic energy. The sound power level is expressed in decibels and is the overall acoustic energy of the source.

Low frequency noise Commonly referenced as the sound energy at the frequency range 20 Hz to 160 Hz, low frequency sound can be a source of disturbance as it is potentially perceptible as a low rumble. Low frequency sound waves can travel relatively long distances without much attention.

Tonality Tonal sound contains prominent tones (distinct frequency components) and is normally regarding as more offensive than broad band sound.

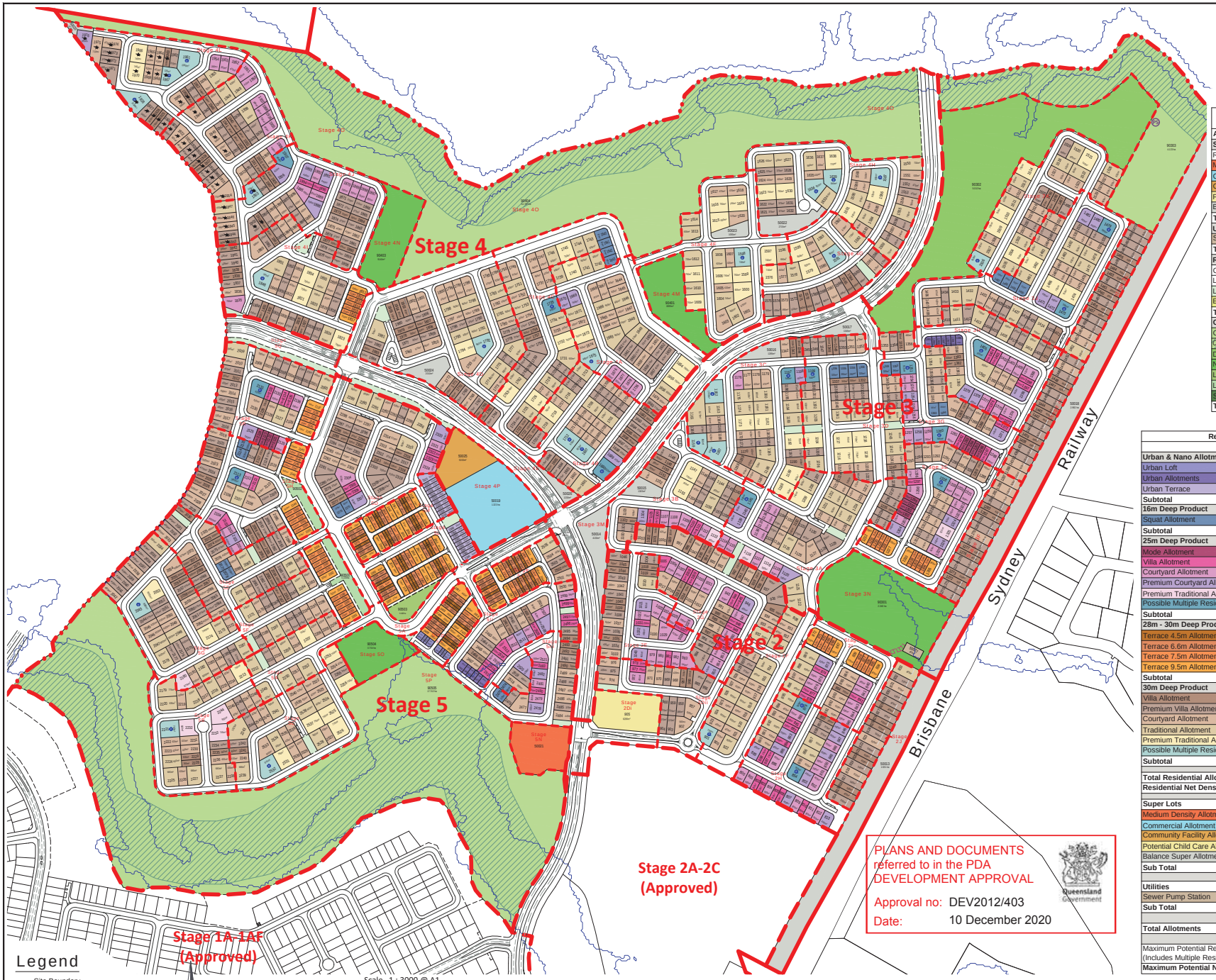
Impulsive sound Typically experienced as a sudden, almost instantaneous, peak sound level event or sequence of peak sound level events. The acute change in sound level, along with the high sound level, can be a potential source of disturbance.

LAeq The sound level (sound energy) can fluctuate over the time (duration) of an event or activity. The L_{Aeq} is used as a measure of the total sound energy of the time varying event, whereby the L_{Aeq} represents a steady sound level for the event. The L_{Aeq} level has the same acoustic energy as the time-varying sound event and can be considered as an average noise level which accounts for all the fluctuations in sound level during the event.

LAMax Maximum instantaneous sound level for an event and is commonly used in the assessment of potential sleep disturbance impacts during the night-time.

APPENDIX B

Lot Configuration for Stages 2-5



Land Budget Stages 2 – 5

Land Use	Stage 2 Area	Stage 3 Area	Stage 4 Area	Stage 5 Area	Overall Area	Overall %
Area of Subject Site	**16.883 ha**	**47.116 ha**	**54.976 ha**	**50.968 ha**	**169.943 ha**	**100.0%**
Saleable Area						
Residential Allotments	9.636 ha	19.742 ha	21.369 ha	19.663 ha	70.410 ha	41.4%
Medium Density Allotment	—	—	—	0.665 ha	0.665 ha	0.4%
Commercial Allotment	—	—	1.324 ha	—	1.324 ha	0.8%
Community Facility Allotment	—	—	0.500 ha	—	0.500 ha	0.3%
Potential Child Care Allotment	0.628 ha	—	—	—	0.628 ha	0.4%
Balance Super Allotments	1.581 ha	3.822 ha	0.747 ha	—	6.150 ha	3.6%
Total Area of Allotments	**11.845 ha**	**23.564 ha**	**23.940 ha**	**20.328 ha**	**79.677 ha**	**46.9%**
Utilities						
Sewer Pump Station	—	0.045 ha	—	—	0.045 ha	0.0%
Total Area of Utilities	**—**	**0.045 ha**	**—**	**—**	**0.045 ha**	**0.0%**
Road						
Collector Road	1.502 ha	4.238 ha	4.559 ha	2.432 ha	12.731 ha	7.5%
Local Road	3.465 ha	7.612 ha	9.528 ha	8.745 ha	29.350 ha	17.3%
Linear Connections	0.071 ha	0.178 ha	0.359 ha	0.459 ha	1.067 ha	0.6%
Entry Statements	—	—	—	—	—	0.0%
Total Area of New Road	**5.038 ha**	**12.028 ha**	**14.446 ha**	**11.636 ha**	**43.148 ha**	**25.4%**
Open Space						
Corridor Park	—	4.123 ha	14.787 ha	17.742 ha	36.652 ha	21.6%
Conservation Park (Within Corridor Park)	—	*2.650 ha*	*6.357 ha*	*10.710 ha*	*19.717 ha*	
District Recreation Park	—	5.010 ha	—	—	5.010 ha	2.9%
Neighbourhood Recreation Park	—	2.346 ha	1.803 ha	0.704 ha	4.853 ha	2.9%
Local Recreation Park	—	—	—	0.188 ha	0.188 ha	0.1%
Local Linear Recreation Park	—	—	—	0.370 ha	0.370 ha	0.2%
Stormwater Detention	—	—	—	—	—	0.0%
Total Open Space	**—**	**11.479 ha**	**16.590 ha**	**19.004 ha**	**47.073 ha**	**27.7%**

Yield Breakdown Stages 2 – 5

Residential Allotments	Typical Size	Typical Area	Stage 2	Stage 3	Stage 4	Stage 5	Overall	
Urban & Nano Allotments Product								
Urban Loft	4.7 x 11.5m	50m²	—	—	—	8	8	0%
Urban Allotments	7.5 x 16m	120m²	—	7	—	6	13	1%
Urban Terrace	6.2 x 27.5m	170m²	—	—	—	20	20	1%
Subtotal			**—**	**7**	**—**	**34**	**41**	**2%**
16m Deep Product								
Squat Allotment	14 x 16m	220m²	—	12	4	8	24	1%
Subtotal			**—**	**12**	**4**	**8**	**24**	**1%**
25m Deep Product								
Mode Allotment	8.5 x 25m	213m²	—	8	—	4	12	1%
Villa Allotment	10 x 25m	250m²	29	14	2	19	64	4%
Courtyard Allotment	14 x 25m	350m²	41	37	22	18	118	7%
Premium Courtyard Allotment	16 x 25m	400m²	17	18	8	9	52	3%
Premium Traditional Allotment	20 x 25m	500m²	—	4	—	4	8	0%
Possible Multiple Residential Allotment	—	—	2	9	3	2	16	1%
Subtotal			**89**	**90**	**35**	**56**	**270**	**16%**
28m - 30m Deep Product								
Terrace 4.5m Allotment	4.5 x 28m	126m²	—	—	—	34	34	2%
Terrace 6.6m Allotment	6.6 x 28m	185m²	—	—	—	35	35	2%
Terrace 7.5m Allotment	7.5 x 28m	210m²	8	8	5	43	64	4%
Terrace 9.5m Allotment	9.5 x 28m	265m²	4	4	2	44	54	3%
Subtotal			**12**	**12**	**7**	**156**	**187**	**11%**
30m Deep Product								
Villa Allotment	10 x 30m	300m²	32	49	56	45	182	11%
Premium Villa Allotment	12.5 x 30m	375m²	33	92	113	81	319	19%
Courtyard Allotment	14 x 30m	420m²	51	94	113	109	367	22%
Traditional Allotment	20 x 30m	600m²	19	55	64	43	181	11%
Premium Traditional Allotment	25 x 30m	720m²	—	21	32	10	63	4%
Possible Multiple Residential Allotment	—	—	1	4	14	3	22	1%
Subtotal			**136**	**315**	**392**	**291**	**1134**	**68%**
Total Residential Allotments			**237**	**436**	**438**	**545**	**1656**	**100%**
Residential Net Density			18.0 dw/ha	14.6 dw/ha	13.2 dw/ha	18.1 dw/ha	**15.6 dw/ha**	
Super Lots			**Lots**	**Lots**	**Lots**	**Lots**	**Lots**	
Medium Density Allotment			—	—	—	1	1	
Commercial Allotment			—	—	1	—	1	
Community Facility Allotment			—	—	1	—	1	
Potential Child Care Allotment			1	—	—	—	1	
Balance Super Allotments			1	6	5	—	12	
Sub Total			**2**	**6**	**7**	**1**	**16**	
Utilities								
Sewer Pump Station			—	1	—	—	**1**	
Sub Total			**—**	**1**	**—**	**—**	**1**	
Total Allotments			**239**	**443**	**445**	**546**	**1673**	
Maximum Potential Residential Dwellings (Includes Multiple Residential Allotments)			**240**	**455**	**466**	**554**	**1715**	
Maximum Potential Net Residential Density			18.2 dw/ha	15.2 dw/ha	14.1 dw/ha	18.4 dw/ha	**16.1 dw/ha**	

PLANS AND DOCUMENTS referred to in the PDA DEVELOPMENT APPROVAL

Approval no: DEV2012/403

Date: 10 December 2020

Queensland Government

Legend

- Site Boundary
- Proposed Stage Boundary
- Proposed Sub Stage Boundary
- Existing Q100
- (1) Residential Allotment (Max. no. of dwellings)
- (PS) Indicative Pump Station Location
- 10m Wide EMT (Railway)
- 6m Wide SPS Access EMT

Note:
All dimensions and areas are approximate only, and are subject to survey and Council approval.

Dimensions have been rounded to the nearest 0.1 metres.

Areas have been rounded down to the nearest 5m².

The boundaries shown on this plan should not be used for final detailed engineers design.

Scale 1 : 3000 @ A1

0 15 30 60 90 120 150 180

Road linemarkings and turn slots are indicative only and subject to detailed design.

Source Information:
Site boundaries: Registered Survey Plans / Vers.
Adjoining information: DCDB.
Contours: Bradlees.

REVISION
A: 17/07/18 Amend District Recreation Park
B: 31/07/18 Amend Sub-Staging & Open Space
C: 22/11/2018 Further Issues Amendments
D: 22/02/2019 Further Issues Amendments
E: 07/03/2019 Further Issues Amendments
F: 15/07/2019 Stage 2-5 Layout Amendments
G: 24/07/2019 Incorporate EDQ Feedback
H: 23/09/2019 Stage 2 & 3 Layout Amendments
I: 11/03/2020 Road and Bus Stops Updates
J: 07/10/2020 Stage 2 & 5 Layout Amendments
K: 19/11/2020 Stage 2 Layout Amendments
L: 25/11/2020 Stage 2 Layout Amendments

PROJECT: Flagstone Precinct 1

Job Ref.	110056	Date.	25 November 2020
Comp By.	WW / JC / MD	DWG Name.	Precinct 1 Stages 2-5
Chk'd By.	DG / MD	Locality.	Flagstone
Local Authority.	Economic Development Queensland		

CLIENT: PEET

Plan of Subdivision
Stages 2 – 5
Overall Allotment Layout - Sub - Staging

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Scale	Sheet	Plan Ref	Rev
1 : 3000	A1	110056 – 481	L

APPENDIX C

Road Noise Modelling Input Data

Road Noise Model Year 2036 Traffic Parameters

Road	Segment	18-hour Volume	%Heavy Vehicles	Posted Speed Limit
Flagstonian Drive	Northern End	9,282	2.5%	60 km/h
	Middle Section	6,760	2.6%	60 km/h
	Southern End	11,169	2.6%	60 km/h
North-South Arterial Road	North of Flagstonian Drive	14,046	2.7%	70 km/h
	South of Flagstonian Drive	13,146	2.5%	70 km/h

Note All road traffic forecasts and signposted speeds were provided to SLR by Bitzios Consulting via email, dated 25 November 2020.

Additional Road Noise Model Input Information

Noise Model Element	Input Data/Assumptions
CoRTN correction for Australian road traffic conditions	-1.7 dB
CoRTN Dense grade asphalt road surface correction	0 dB

To calculate the required road traffic noise levels over the 18-hour period between 6.00 am and midnight, the 18-hour traffic volume was assumed to be 95% of the total traffic volume for the 24-hour period. The 95% ratio was referenced from existing traffic volumes for Teviot Road and Homestead Drive at the Flagstone City Development.

APPENDIX D

QDC MP4.4 Acceptable Forms of Building Construction

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.

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