

FLAGSTONE DEVELOPMENT

Acoustic Report - Stage 1 West

Prepared for: Peet Flagstone City Pty Ltd

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PREPARED BY

SLR Consulting Australia Pty Ltd
ABN 29 001 584 612
Level 2, 15 Astor Terrace
Spring Hill QLD 4000 Australia
(PO Box 26 Spring Hill QLD 4004)
+61 7 3858 4800 +61 7 3858 4801
brisbane@slrconsulting.com www.slrconsulting.com

BASIS OF REPORT

This report has been prepared by SLR Consulting Australia Pty Ltd with all reasonable skill, care and diligence, and taking account of the timescale and resources allocated to it by agreement with 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.

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DOCUMENT CONTROL

Reference	Date	Prepared	Checked	Authorised
620.10512-R05-v2.0	9 March 2018	S Walker	R Grant [RPEQ 12407]	S Walker
620.10512-R05-v1.0	22 February 2018	S Walker	R Grant [RPEQ 12407]	S Walker

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. The development at Flagstone City is to be undertaken in accordance with condition 31 of the Development Approval which relates to acoustic requirements. The condition requires an acoustic compliance assessment for all lots within 100 m of Road01, the North-South Arterial road and the rail corridor. With respect to complying with Condition 31, the Economic Development of Queensland (EDQ) requires the design and construction of applicable residential developed 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. For the purpose of determining the noise reduction requirements for residential property at the Flagstone City Development, the EDQ has defined Road01, the North-South Arterial road and the rail corridor as Transport Noise Corridors.

The noise reduction is dependent upon the highest MP4.4 Noise Category which all or each part of the building sits. The required noise reduction can be achieved through incorporating appropriate building materials to the building envelope (e.g. 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 Ltd (SLR), on behalf of Peet Flagstone City Ltd (PEET), to provide an assessment of the future transport noise levels from the Transport Noise Corridors 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 Stage 1L, Stage 1O, Stage 1P, Stage 1Q, Stage 1T, Stage 1X due to their proximity to the North-South Arterial road. Stage 1W has been previously assessed by SLR¹. Noise Categories have been presented for the other stages in Stage 1 West for information only.

It is to be noted that lots which are within Noise Category 0 would not require acoustic treatment and lots are within Noise Category 1, the noise reduction requirements of which can often be readily achieved with standard building constructions (with relatively minor improvements to glazing requirements).

It is noteworthy that the shape and form of individual buildings were not known at time of the assessment. As such these buildings, which could screen road traffic noise, are not included in the calculated transport noise levels and for this reason, the Noise Categories are considered a conservative assessment of transport noise.

In this regard, there is potential for the Noise Categories to change once the building design for properties becomes known and buildings are constructed at the Flagstone City Development and thus reduce the QDC requirements. It is recommended that, to confirm the MP4.4 construction requirements, further assessment is considered for lots assessed to be in Category 2 and above once the building design is known and where road traffic volumes have increased from those assessed in this report.

Information presented in this report is based on the interpretation of data collected, 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. Further information on transport noise corridors and the requirements of QDC can be obtained from the Queensland Government Department of Housing and Public Works.

¹ SLR Consulting Australia, 2018. Flagstone Development Acoustic Report – Stage 1W, ref: 620.10512-R01.V2.0, dated 25 January 2018

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- Appendix D Road Traffic Noise Categories – Stage 1 West

1 Introduction

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. Where applicable, residential buildings in the Flagstone City Development are required to be designed and constructed in accordance with the Queensland Development Code (QDC), specifically *Mandatory Part 4.4 Buildings in a Transport Corridor* (MP4.4) of the QDC.

This report provides calculated transport noise levels at the lot configurations for Stage 1L, Stage 1O, Stage 1P, Stage 1Q, Stage 1T and Stage 1X in Stage 1 West as these lots are adjacent to the North-South Arterial road and require an acoustic assessment (refer **Appendix A**). A separate acoustic report for Stage 1W was prepared by SLR (refer report 620.10512-R01.v2.0, 25 January 2018).

The transport noise levels have been applied to identify the MP4.4 Noise Categories, which are referenced when determining the potential building construction requirements to mitigate transport noise intrusion within residential property.

2 Requirements of the Queensland development code

Condition 31 of the Development Approval for the Flagstone City Development requires a compliance assessment for transport noise management at residential lots. Condition 31 is reproduced below.

Compliance Assessment – Noise Management

Submit to EDQ Development Assessment DSDIP for compliance assessment a Noise Mitigation Report, certified by a RPEQ, for all lots within 100 m from Road01, the future North-South Arterial road and the railway corridor achieving a ≤ 35 dBA for 1 hour max, over a 24-hour period for all habitable rooms.

Where a ≤ 35 dBA 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.

SLR has been advised that Economic Development Queensland (EDQ) consider the acceptable forms of building construction in MP4.4 as appropriate noise mitigation measures referenced in Condition 31. MP4.4 does not provide internal noise criteria but 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. SLR was advised that EDQ consider, for the purpose of assessing transport noise, the roads currently called 'Roads 01' and the 'North-South arterial road' and the Sydney to Brisbane rail line to be Transport Noise Corridors applicable to the Flagstone City Development. The land at Stage 1 West is set back more than 1 km from the Sydney to Brisbane rail line and at this distance rail noise levels would not trigger the consideration of noise mitigation under MP4.4.

Accordingly, MP4.4 applies at Stage 1 West at the lot configurations at Stage 1L, Stage 1O, Stage 1P, Stage 1Q, Stage 1T and Stage 1X which are within 100 m of the North-South Arterial road. The Noise Categories for the other stages in Stage 1 West are provided for information only as compliance to MP4.4 is not required.

When building in a Transport Noise Corridor, the residential buildings need to achieve certain levels of noise reduction, which is dependent on the highest MP4.4 Noise Category 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 at habitable rooms. MP4.4 provides acceptable forms of construction to assist in achieving a building design and construction which meets the required noise reduction for each Noise Category (refer **Appendix B** of this report). The Noise Categories, transport noise reductions for habitable rooms and minimum sound reductions (R_w) for building components are shown in **Table 1**.

Table 1 QDC MP4.4 Noise categories for road traffic noise and railway noise

Noise Category	Transport Noise Level ¹	Minimum Transport noise reduction for habitable rooms ²	Building external envelope component	Minimum R_w required for each component
4	Road traffic noise ≥73 dBA LA10(18hour) Railway noise ≥85 dBA LAmax	40 dBA	Glazing	43
			External Walls	52
			Roof	45
			Floors	51
			Entry doors	35
3	Road traffic noise 68 – 72 dBA LA10(18hour) Railway noise 80 – 84 dBA LAmax	35 dBA	Glazing	38
				35
			External walls	47
			Roof	41
			Floors	45
2	Road traffic noise 63 – 67 dBA LA10(18hour) Railway noise 75 – 79 dBA LAmax	30 dBA	Glazing	35
				32
			External walls	41
			Roof	38
			Floors	45
1	Road traffic noise 58 – 62 dBA LA10(18hour) Railway noise 70 – 74 dBA LAmax	25 dBA	Glazing	27
				24
			External walls	35
			Roof	35
			Entry doors	28
0	Road traffic noise ≤57 dBA LA10(18hour) Railway noise ≤69 dBA LAmax	No additional acoustic treatment required – standard building assessment provisions apply.		

Note 1 dBA is an abbreviation for decibels on the A-weighted scale.

Note 2 A habitable room is defined by the Building Code of Australia to be a room used for normal domestic activities, including; bedrooms, living rooms, lounge rooms, music rooms, television rooms, kitchens, dining rooms, sewing rooms, studies, playrooms, family rooms, home theatres and sunrooms.

Note 3 The R_w is a measure of the sound insulation properties of a specific building material element.

3 Assessment of Transport Noise

3.1 Methodology

A transport noise prediction model for the road network at Flagstone has been developed utilising the SoundPLAN noise prediction software. The SoundPLAN software is widely used in Australia and internationally to calculate road traffic noise levels in accordance with recognised transport noise assessment methodologies. The SoundPLAN noise prediction model for the Flagstone City Development incorporated 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.
- Road traffic volumes for the year 2028 which are adopted as a 10 year planning horizon from the anticipated year of construction (refer **Appendix C**).
- 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 94% of the total traffic volume for the 24-hour period. The 94% ratio was referenced from existing traffic volumes for similar roads in south-east Queensland.
- All road surfaces were assumed to be dense grade asphalt (DGA).

The noise prediction model calculated road traffic noise levels using the Calculation of Road Traffic Noise² methodology and the Code of Practice published by Transport and Main Roads³.

The MP4.4 Noise Categories are based on transport noise levels calculated at 1 m from the facade of a building and, as 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 façade.

3.2 Transport noise assessment

Road traffic noise levels for the year 2027/28 have been predicted at Stage 1 West and presented consistent with the MP4.4 Noise Categories. The calculated transport noise contours for the MP4.4 Noise Categories across each residential lots are detailed in the contours presented in **Appendix D**.

The contours assume the potential residential building can be constructed at any location within the lot. The adopted 1.8 m and 4.6 m contour heights have been referenced from the Code of Practice which nominates standard building heights in lieu of the known building design.

3.3 QDC MP4.4 Noise Categories

The assessed Noise Categories for each lot at Stage 1 West are detailed in the following tables. The Noise Category for each lot has been determined as the highest Noise Category for road traffic noise that has been predicted at part or all of the lot. Noise Categories have been presented for either a single storey (low set) or two storey (high set) dwelling.

² UK Department of Transport (1988). Calculation of Road Traffic Noise (CoRTN 88).

³ Department of Transport and Main Roads. Transport Noise Management Code of Practice, Volume 1 Road Traffic Noise, dated November 2013.

Table 2 MP4.4 Noise Categories for Stage 1K

Lot	Predicted QDC MP4.4 Noise Category	
	Low set dwelling	High set dwelling
318	1	2
319	0	1
320	0	0
321	0	0
322	0	0
323	0	0
324	0	0
325	0	0
725	0	0
326	0	0
327	0	0
328	0	0
329	0	0
519	0	0
520	0	0
521	0	0
522	0	0
523	0	0
534	0	0
535	0	0
536	0	0
537	0	0
538	0	0
539	0	0
553	0	0
554	0	0
555	0	0
556	0	0
557	0	0
558	0	1
559	1	1

Table 3 MP4.4 Noise Categories for Stage 1L

Lot	Predicted QDC MP4.4 Noise Category	
	Low set dwelling	High set dwelling
540	0	0
541	0	0
542	0	0
543	0	0
544	0	0
545	0	0
546	0	0
547	0	0
548	0	0
549	0	0
550	0	0
551	0	0
552	0	0
688	0	0
689	0	0
690	0	0
691	0	0
692	0	0
693	0	0
694	0	0

Table 4 MP4.4 Noise Categories for Stage 1M

Lot	Predicted QDC MP4.4 Noise Category	
	Low set dwelling	High set dwelling
330	0	0
331	0	0
332	0	0
333	0	0
334	0	0
389	0	0
390	0	0
391	0	0
392	0	0
393	0	0

Lot	Predicted QDC MP4.4 Noise Category	
	Low set dwelling	High set dwelling
394	0	0
395	0	0
396	0	0
397	0	0
398	0	0
399	0	0
400	0	0
401	0	0
402	0	0
516	0	0
517	0	0
518	0	0

Table 5 MP4.4 Noise Categories for Stage 1N

Lot	Predicted QDC MP4.4 Noise Category	
	Low set dwelling	High set dwelling
403	0	0
404	0	0
405	0	0
406	0	0
407	0	0
408	0	0
409	0	0
410	0	0
411	0	0
412	0	0
413	0	0
414	0	0
415	0	0
416	0	0
417	0	0
418	0	0
419	0	0
420	0	0
421	0	0

Lot	Predicted QDC MP4.4 Noise Category	
	Low set dwelling	High set dwelling
422	0	0
497	0	0
498	0	0
499	0	0
500	0	0
501	0	0
502	0	0
503	0	0
90002	0	0

Table 6 MP4.4 Noise Categories for Stage 1O

Lot	Predicted QDC MP4.4 Noise Category	
	Low set dwelling	High set dwelling
524	0	0
525	0	0
526	0	0
527	0	0
528	0	0
529	0	0
530	0	0
531	0	0
532	0	0
533	0	0
695	0	0
696	0	0
697	0	0

Table 7 MP4.4 Noise Categories for Stage 1P

Lot	Predicted QDC MP4.4 Noise Category	
	Low set dwelling	High set dwelling
427	0	0
428	0	0
429	0	0
430	0	0
431	0	0

Lot	Predicted QDC MP4.4 Noise Category	
	Low set dwelling	High set dwelling
635	0	0
432	0	0
433	0	0
434	0	0
435	0	0
436	0	0
437	0	0
438	0	0
439	0	0
440	0	0
441	0	0
442	0	0
443	0	0
444	0	0
445	0	0
446	0	0
447	0	0
448	0	0
449	0	0
450	0	0
451	0	0
452	0	0
729	0	1
730	0	1
731	0	1
732	0	1
733	0	1
734	0	0
735	0	0
736	0	0
737	0	0
738	0	0
739	0	0
740	0	0
741	0	0

Lot	Predicted QDC MP4.4 Noise Category	
	Low set dwelling	High set dwelling
742	0	0
743	0	0
744	0	0

Table 8 MP4.4 Noise Categories for Stage 1Q

Lot	Predicted QDC MP4.4 Noise Category	
	Low set dwelling	High set dwelling
488	0	0
489	0	0
490	0	0
491	0	0
492	0	0
493	0	0
494	0	0
495	0	0
496	0	0
504	0	0
505	0	0
506	0	0
507	0	0
508	0	0
509	0	0
510	0	0
511	0	0
512	0	0
513	0	0
514	0	0
515	0	0
698	0	0
699	0	1
700	0	1
701	0	1
702	0	0
703	0	0
704	0	0

Lot	Predicted QDC MP4.4 Noise Category	
	Low set dwelling	High set dwelling
705	0	0
706	0	0
707	0	0
708	0	0

Table 9 MP4.4 Noise Categories for Stage 1R

Lot	Predicted QDC MP4.4 Noise Category	
	Low set dwelling	High set dwelling
347	2	2
348	2	2
349	2	2
350	2	2
351	2	2
352	2	2
353	1	1
354	0	0
355	0	0
356	0	0
357	0	0
358	0	0
359	0	0
360	0	0
361	0	0
362	0	0
363	0	0
364	0	0
365	0	0
366	0	0
367	0	0
368	0	0
376	0	0
377	0	0
378	0	0
379	0	0
382	0	0

Lot	Predicted QDC MP4.4 Noise Category	
	Low set dwelling	High set dwelling
383	0	0
384	0	0
385	0	0
386	0	0
387	0	0
388	0	0
745	0	0
746	0	0

Table 10 MP4.4 Noise Categories for Stage 1S

Lot	Predicted QDC MP4.4 Noise Category	
	Low set dwelling	High set dwelling
335	0	0
336	0	0
337	0	0
338	0	0
339	0	0
340	0	0
341	0	0
342	0	0
343	0	1
344	2	2
345	2	2
346	2	2
369	0	0
370	0	0
371	0	0
372	0	0
373	0	0
374	0	0
375	0	0
380	0	0
381	0	0

Table 11 MP4.4 Noise Categories for Stage 1T

Lot	Predicted QDC MP4.4 Noise Category	
	Low set dwelling	High set dwelling
423	0	0
424	0	0
425	0	0
426	0	0
453	0	0
454	0	0
455	0	0
456	0	0
457	0	0
458	0	0
459	0	0
460	0	0
461	0	0
462	0	0
463	0	0
464	0	0
465	0	0
466	0	0
467	0	0
468	0	0
469	0	0
470	0	0
471	0	0
472	0	0
473	0	0
474	0	0
475	0	0
476	0	0
477	0	0
478	0	0
479	0	0
480	0	0
481	0	0
482	0	0

Lot	Predicted QDC MP4.4 Noise Category	
	Low set dwelling	High set dwelling
483	0	0
484	0	0
90003	0	0
709	0	0
710	0	0
711	0	0
712	0	0
727	0	1
728	0	1

Table 12 MP4.4 Noise Categories for Stage 1U

Lot	Predicted QDC MP4.4 Noise Category	
	Low set dwelling	High set dwelling
560	1	1
561	1	1
612	0	0
613	0	0
90005	0	0
617	0	0
618	0	0
632	1	2
633	1	2
634	1	2
636	2	2
637	2	2
638	2	2
639	2	2
640	2	2
641	2	2
642	2	2
643	2	2
644	2	2
645	2	2
646	2	2
647	2	2

Table 13 MP4.4 Noise Categories for Stage 1X

Lot	Predicted QDC MP4.4 Noise Category	
	Low set dwelling	High set dwelling
583	0	0
584	0	0
585	0	0
586	0	0
587	0	0
588	0	0
589	0	0
590	0	0
652	1	2
653	0	1
654	0	0
655	0	0
656	0	0
657	0	0
658	0	0
659	0	0
660	0	0
661	0	0
662	1	2
663	1	1
664	1	1
665	0	1
666	0	1
667	0	1
668	0	1
669	0	1
670	0	1
671	0	1
672	0	1
673	0	1
674	0	1
675	0	1

4 Discussion and recommendations

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 these buildings, which could screen road noise, are not included in the calculated transport noise levels. For this reason the Noise Categories are considered a conservative assessment of transport noise for the year 2028.

Noise Category 1 is deemed to be a standard building construction (other than for some relatively minor improvement to glazing requirements), and further detailed assessment of transport noise at lots currently assessed as Noise Category 1 is unlikely to result in significant changes to the building construction.

The assessed lots in Stage 1K, Stage 1M, Stage 1N, Stage 1R, Stage 1S and Stage 1U do not require compliance to MP4.4. Notwithstanding, the design and construction of homes at the lots identified Noise Category 2 in Stage 1R, Stage 1S and Stage 1U are worthy of consideration of acoustic mitigation.

In Stage 1 West where adherence to MP4.4 is required, there are two lots (652 and 662) in Stage 1X where noise levels were predicted to be in Noise Category 2 or above for 2028 road traffic noise levels. Once future development occurs these lots may experience screening of road traffic noise from the building on the lot and adjacent buildings. It is recommended these lots undergo further assessment to confirm if a lower Noise Category is applicable and a reduction in the MP4.4 construction requirements can be adopted. This can only be done during the building certification stage where the specific design of the dwelling and neighbouring properties is known.

When considering the individual building components it is noteworthy the building design and construction can apply materials other than those presented in MP4.4; as long as the materials, in combination, achieve the minimum R_w value applicable to the individual building components and the Noise Category.

Furthermore, it may be possible to 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).

5 Conclusion

This report provides calculated MP4.4 Noise Categories for the proposed residential lots in Stage 1 West, excluding Stage 1W which has been assessed separately. The calculated Noise Categories for either single storey or double storey buildings at each stage are provided in the tables in **Section 3** and noise contours in **Appendix D**.

The Noise Categories can be referenced when considering acceptable forms of building construction to control the intrusion of transport noise within habitable rooms. Examples of acceptable forms of construction for the building components as described in MP4.4 are shown in **Appendix B**.

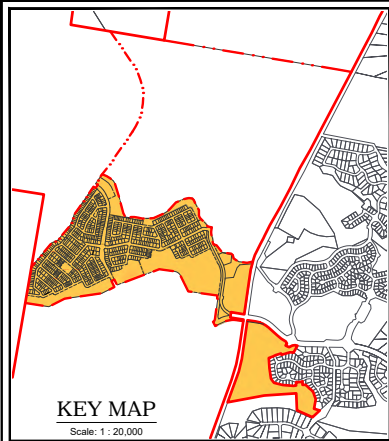
The majority of lots have been assessed to be in Noise Category 0 (no mitigation required) or Noise Category 1. Noise Category 1 is deemed to be a standard building construction, and for this reason further detailed assessment of transport noise at lots currently assessed as Noise Category 1 is unlikely to result in significant changes to the building construction (noise mitigation requirements).

It is recommended that dwellings proposed to be built on lots located behind or adjacent to developed lots, and have been assessed in this report at Noise Category 2 or above, undergo further detailed assessment of transport noise to potentially refine the potential decisions on the building design and construction.

It is important to note the Noise Categories have been predicted with reference to forecast future road traffic and without the inclusion of building structures in the noise model. On this basis the Noise Categories are a conservative assessment of road noise for the forecast traffic volumes in 2028. Further assessment is also recommended where the forecast road traffic volumes are increased from the traffic data applied in this assessment.

APPENDIX A

Lot Configurations for Stage 1 West



General

- Site Boundary
- - - Proposed Precinct Boundary
- - - Proposed Super Stage Boundary
- - - Proposed Sub Stage Boundary
- ▨ Entry Statements - Lease
- Existing Q5
- Existing Q100
- - - Alternative Road Alignment
- 400m Catchment Area
- Maximum Potential Residential Dwellings
- Indicative In-line Bus Stop
- Indicative Bus Stop Location
- Padmount Transformer

Open Space

- Regional Recreation Park
- Corridor Park
- Neighbourhood Recreation Park
- Local Recreation Park
- Local Linear Recreation Park
- Stormwater Detention
- Linear Connections
- Entry Statements
- Retained Vegetation - Flagstone & Sandy Creek (updated as per Saunders Havill email 10/11/14)
- Retained Vegetation - Other Areas (updated as per Saunders Havill email 10/11/14)

Legend

25m Deep Allotments

- Villa Allotment
- Courtyard Allotment
- Premium Courtyard Allotment
- Premium Traditional Allotment
- Possible Multiple Residential Allotment

28m Deep Allotments

- 7.5m Terrace Allotment
- 9.5m End Terrace Allotment

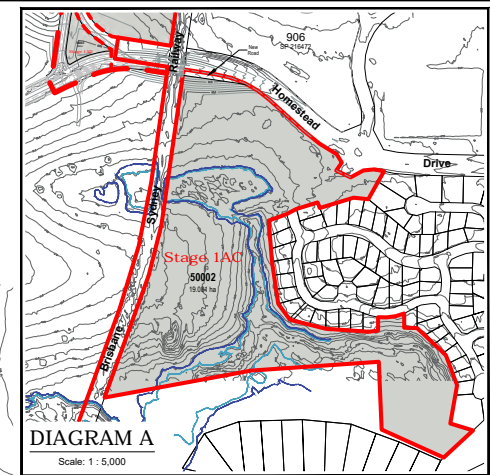
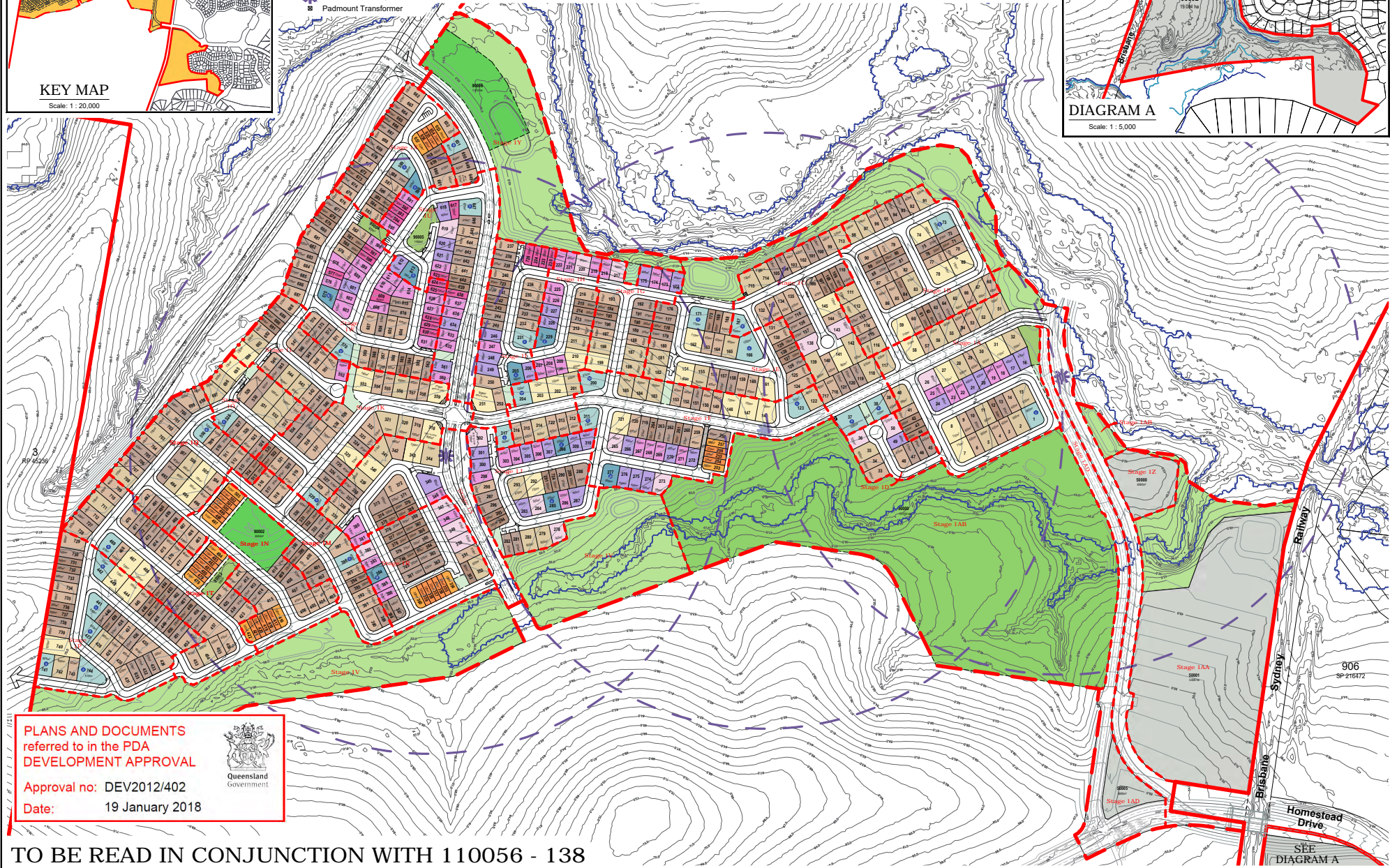
Allotments

30m Deep Allotments

- Villa Allotment
- Premium Villa Allotment
- Courtyard Allotment
- Traditional Allotment
- Premium Traditional Allotment
- Possible Multiple Residential Allotment

Super Allotments

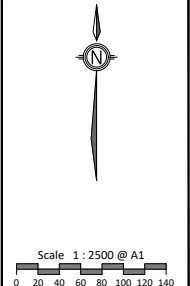
- Super Allotment



REVISION	DATE	BY	DESCRIPTION
1	12/06/17	Multiple Residential Separation	
2	27/07/17	Amend Stage 1K - 1Y	
3	28/07/17	Amend Stage 1K & 1Y	
4	13/08/17	Amend Stage 1K & 1Y	
5	18/08/17	Amend Stage 1K & 1Y	
6	05/10/17	Amend Stage 1K & 1Y	
7	13/10/17	Amend Stage 1M & 1N	
8	18/10/17	Amend Stage 1K, 1M, 1N, 1O & 1U	
9	23/11/17	Amend Stage 1M, 1Q, 1R & 1Y	
10	30/11/17	Amend Stage 1M, 1N, 1Q & 1Y	
11	14/12/17	Amend PDD Stage 1K, 1N, 1P & 1S	

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.

Source Information:
Site boundaries: Registered Survey Plans.
Adjoining information: DCCB.
Contours: Cardno Bulk Earthworks



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PROJECT
FLAGSTONE PRECINCT 1

PLAN OF SUBDIVISION
STAGE 1
ALLOTMENT LAYOUT

Date	14 December 2017
Comp By	WNW
Checked By	MD / DG
DWG Name	Precinct 1 Stage 1
Job Reference	110056
Local Authority	ECONOMIC DEVELOPMENT QUEENSLAND
Locality	JIMBOOMBA
Scale	1 : 2500
Sheet	A1
Plan Ref	110056 - 121
Rev	Y

RPS

RPS Australia East Pty Ltd
ACN 140 292 762
ABN 44 140 292 762

Urban Design
Brisbane Design Studio
455 Brunswick Street
Fortitude Valley QLD 4006
T +61 7 3124 9300
F +61 7 3124 9399
W rpsgroup.com.au

PLANS AND DOCUMENTS referred to in the PDA DEVELOPMENT APPROVAL

Approval no: DEV2012/402
Date: 19 January 2018



TO BE READ IN CONJUNCTION WITH 110056 - 138

APPENDIX B

QDC MP4.4 Acceptable Forms of Construction

Schedule 2

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

Component of building's external envelope	Minimum R_w	Acceptable forms of construction
External walls	52	Two leaves of clay brick masonry, at least 270mm in total, with subfloor vents fitted with noise attenuators.
	47	<p>Two leaves of clay brick masonry at least 110mm thick with:</p> <ul style="list-style-type: none"> (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. <p>OR</p> <p>Two leaves of clay brick masonry at least 110mm thick with:</p> <ul style="list-style-type: none"> (i) cavity not less than 50mm between leaves; and (ii) at least 13mm thick cement render on each face <p>OR</p> <p>Single leaf of clay brick masonry at least 110mm thick with:</p> <ul style="list-style-type: none"> (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. <p>OR</p> <p>Single leaf of minimum 150mm thick masonry of hollow, dense concrete blocks, with mortar joints laid to prevent moisture bridging.</p>

Component of building's external envelope	Minimum R_w	Acceptable forms of construction
	41	<p>Two leaves of clay brick masonry at least 110mm thick with cavity not less than 50mm between leaves</p> <p>OR</p> <p>Single leaf of clay brick masonry at least 110mm thick with:</p> <ul style="list-style-type: none"> (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 <p>OR</p> <p>Single leaf of brick masonry at least 110mm thick with at least 13mm thick render on each face</p> <p>OR</p> <p>Concrete brickwork at least 110mm thick</p> <p>OR</p> <p>In-situ concrete at least 100mm thick</p> <p>OR</p> <p>Precast concrete at least 100mm thick and without joints.</p>

Component of building's external envelope	Minimum R_w	Acceptable forms of construction
	35	<p>Single leaf of clay brick masonry at least 110mm thick with:</p> <ul style="list-style-type: none"> (i) a row of at least 70mm x 35mm timber studs or 64mm steel studs at 600mm centres, spaced at least 20mm from the masonry wall; and (ii) One layer of plasterboard at least 10mm thick fixed to outside face of studs <p>OR</p> <p>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.</p>
Roof	45	<p>Concrete or terracotta tile or sheet metal roof with sarking, <i>acoustically rated plasterboard</i> ceiling at least 13mm thick fixed to ceiling joists, cellulose fibre insulation at least 100mm thick with a density of at least 45kg/m³ in the cavity.</p> <p>OR</p> <p>Concrete or terracotta tile or sheet metal roof with sarking, 2 layers of <i>acoustically rated plasterboard</i> at least 16mm thick fixed to ceiling joists, glass wool insulation at least 50mm thick with a density of at least 11kg/m³ or polyester insulation at least 50mm thick with a density of at least 20kg/m³ in the cavity.</p>
	41	<p>Concrete or terracotta tile or metal sheet roof with sarking, plasterboard ceiling at least 10mm thick fixed to ceiling joists, glass wool insulation at least 50mm thick with a density of at least 11kg/m³ or polyester insulation at least 50mm thick with a density of at least 20kg/m³ in the cavity.</p> <p>OR</p> <p>Concrete suspended slab at least 100mm thick.</p>
	38	<p>Concrete or terracotta tile or metal sheet roof with sarking, plasterboard ceiling at least 10mm thick fixed to ceiling cavity, mineral insulation or glass wool insulation at least 50mm thick with a density of at least 11 kg/m³.</p>

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

Component of building's external envelope	Minimum R_w	Acceptable forms of construction
	28	<p>Fixed so as to overlap the frame or rebate of the frame, constructed of -</p> <ul style="list-style-type: none"> (i) Wood, particleboard or blockboard not less than 33mm thick; or (ii) Compressed fibre reinforced sheeting not less than 9mm thick; or (iii) Other suitable material with a mass per unit area not less than 24.4kg/m²; or (iv) Solid core timber door not less than 35mm thick fitted with full perimeter <i>acoustically rated seals</i>.

Schedule 3

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

Table 1 – Noise category levels

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

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

APPENDIX C

Road Transport Noise Modelling Data

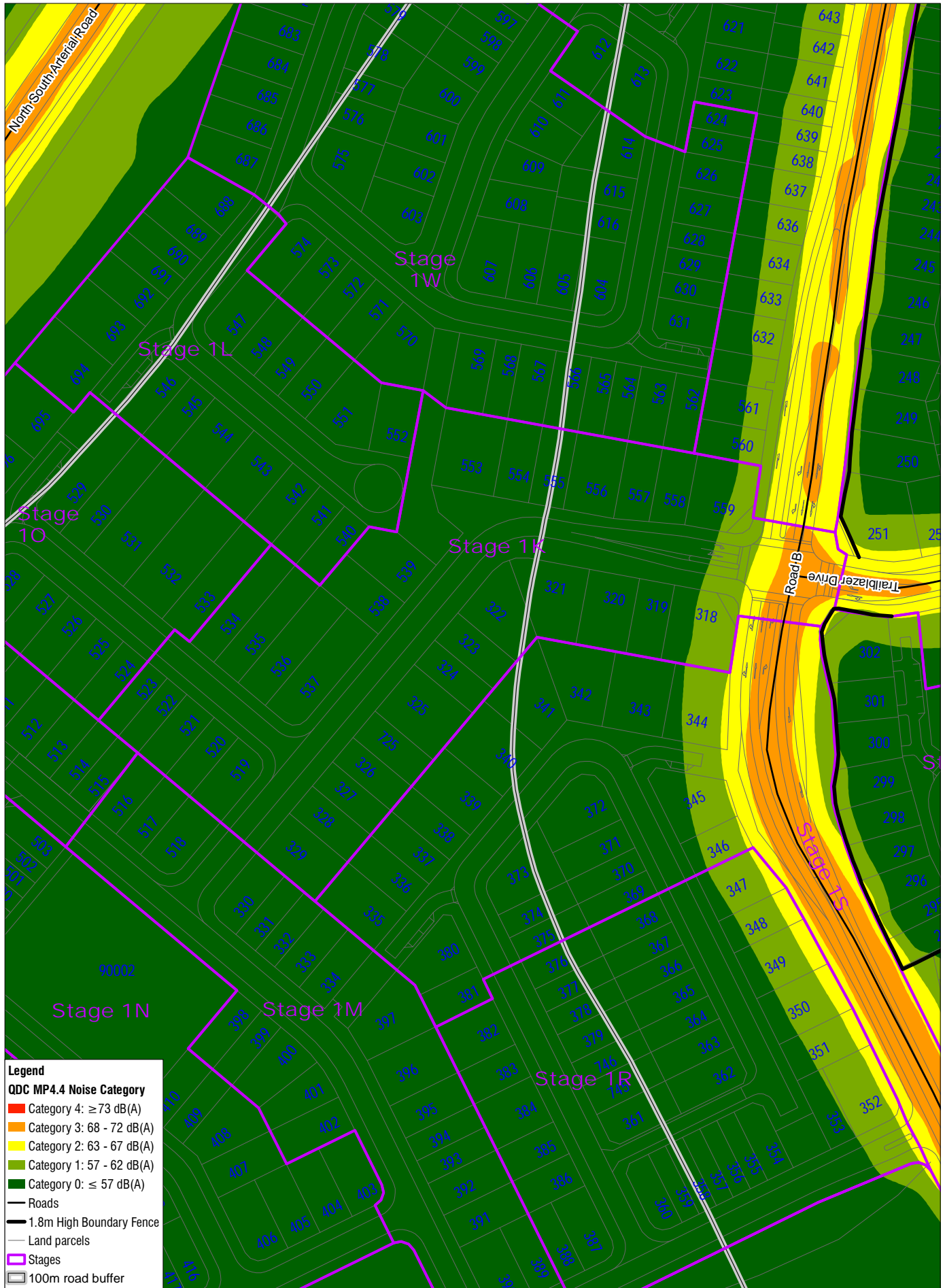
Road	24-hour traffic volume	18-hour traffic volume	3% heavy vehicles	Traffic speed
North-South Arterial Road	2,740	2,576	77	80 kmh
Road B north of Trailblazer Drive	2,740	2,576	77	60 kmh
Road B south of Trailblazer Drive	5,686	5,345	160	60 kmh
Road01 north of Trailblazer Drive	16,971	15,953	479	60 kmh
Road01 south of Trailblazer Drive	21,316	20,037	601	60 kmh
Trailblazer Drive	4,572	4,298	129	40 kmh

Note Trailblazer Drive was modelled for a comprehensive assessment consistent with previous acoustic reports, however specific traffic noise levels from this road are not deemed to apply to QDC MP4.4.

All noise predictions include a -1.7 dBA correction for Australia road conditions as per the Code of Practice. A Dense Grade Asphalt road pavement surface was modelled which is the default road pavement type in CoRTN and no corrections for pavement type were included.

APPENDIX D

Road Traffic Noise Categories – Stage 1 West



Legend

QDC MP4.4 Noise Category

- Category 4: ≥ 73 dB(A)
- Category 3: 68 - 72 dB(A)
- Category 2: 63 - 67 dB(A)
- Category 1: 57 - 62 dB(A)
- Category 0: ≤ 57 dB(A)

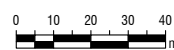
- Roads
- 1.8m High Boundary Fence
- Land parcels
- Stages
- 100m road buffer

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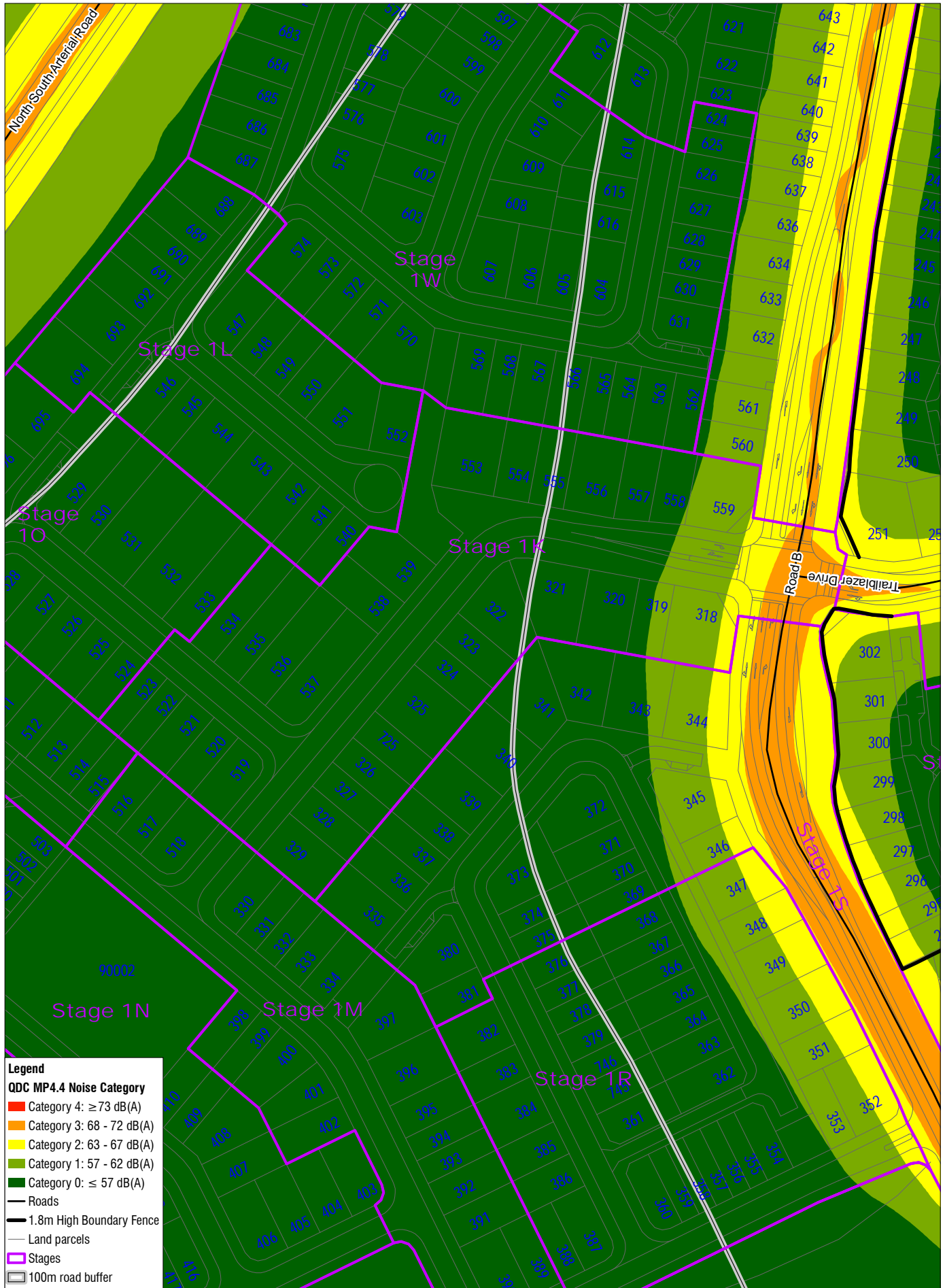
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Projection:	GDA 1994 MGA Zone 56



PEET

Flagstone Noise Assessment - Stage 1K

Calculated MP4.4 Noise Categories for Stage 1K Single Storey 1.8m



Legend

QDC MP4.4 Noise Category

- Category 4: ≥ 73 dB(A)
- Category 3: 68 - 72 dB(A)
- Category 2: 63 - 67 dB(A)
- Category 1: 57 - 62 dB(A)
- Category 0: ≤ 57 dB(A)

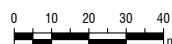
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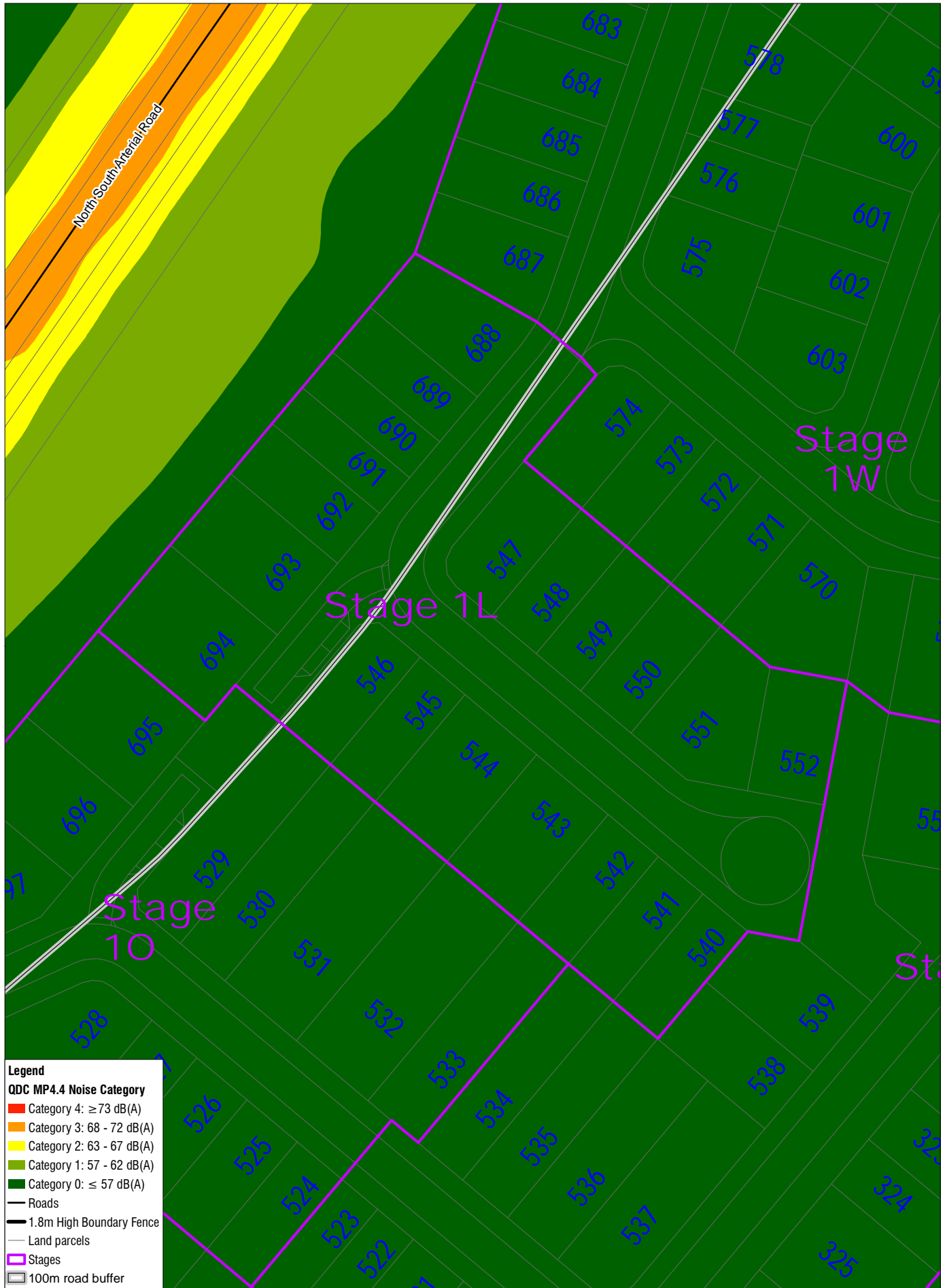
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Projection: GDA 1994 MGA Zone 56



PEET

Flagstone Noise Assessment - Stage 1K

Calculated MP4.4 Noise Categories
for Stage 1K Double Storey 4.6m



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Legend

QDC MP4.4 Noise Category

- Category 4: ≥ 73 dB(A)
- Category 3: 68 - 72 dB(A)
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- Category 1: 57 - 62 dB(A)
- Category 0: ≤ 57 dB(A)

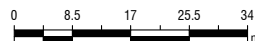
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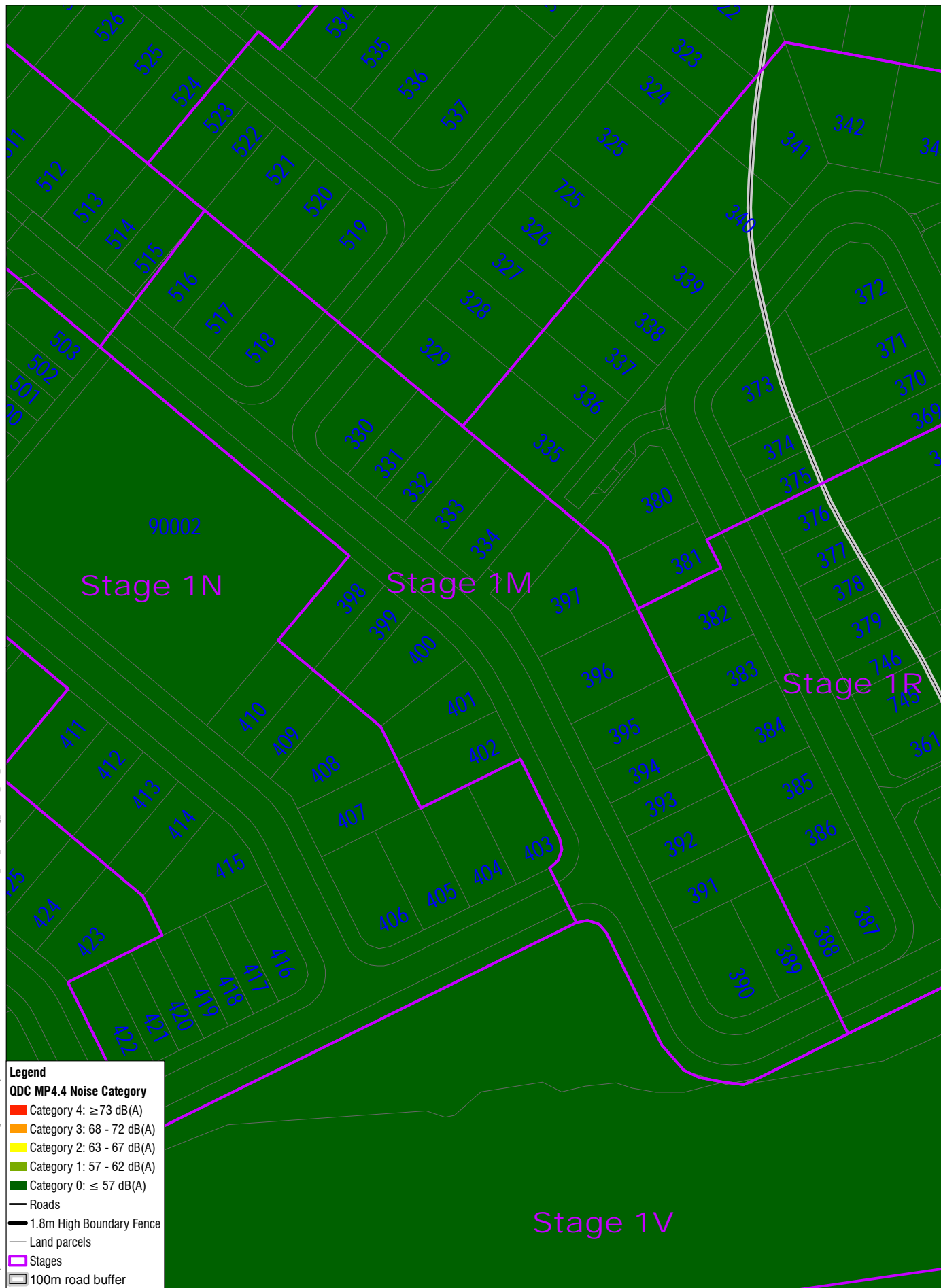


PEET

Flagstone Noise Assessment - Stage 1L

Calculated MP4.4 Noise Categories
for Stage 1L Single Storey 1.8m

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Legend

QDC MP4.4 Noise Category

- Category 4: ≥ 73 dB(A)
- Category 3: 68 - 72 dB(A)
- Category 2: 63 - 67 dB(A)
- Category 1: 57 - 62 dB(A)
- Category 0: ≤ 57 dB(A)

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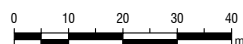
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Sheet Size: A4

Projection: GDA 1994 MGA Zone 56



PEET

Flagstone Noise Assessment - Stage 1M

Calculated MP4.4 Noise Categories
for Stage 1M Single Storey 1.8m

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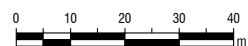


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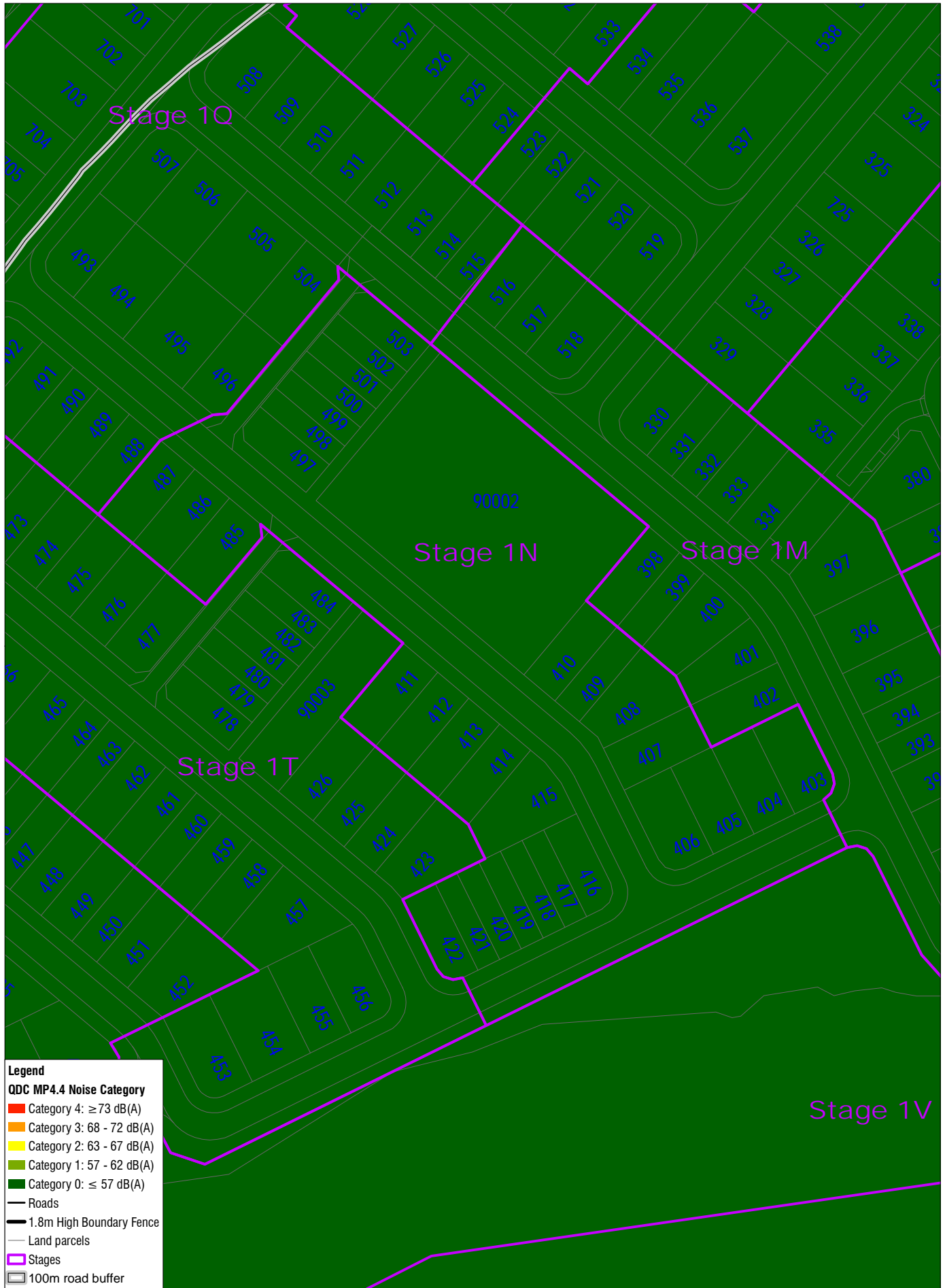


PEET

Flagstone Noise Assessment - Stage 1M

**Calculated MP4.4 Noise Categories
for Stage 1M Double Storey 4.6m**

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Legend

QDC MP4.4 Noise Category

- Category 4: ≥ 73 dB(A)
- Category 3: 68 - 72 dB(A)
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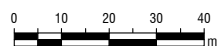
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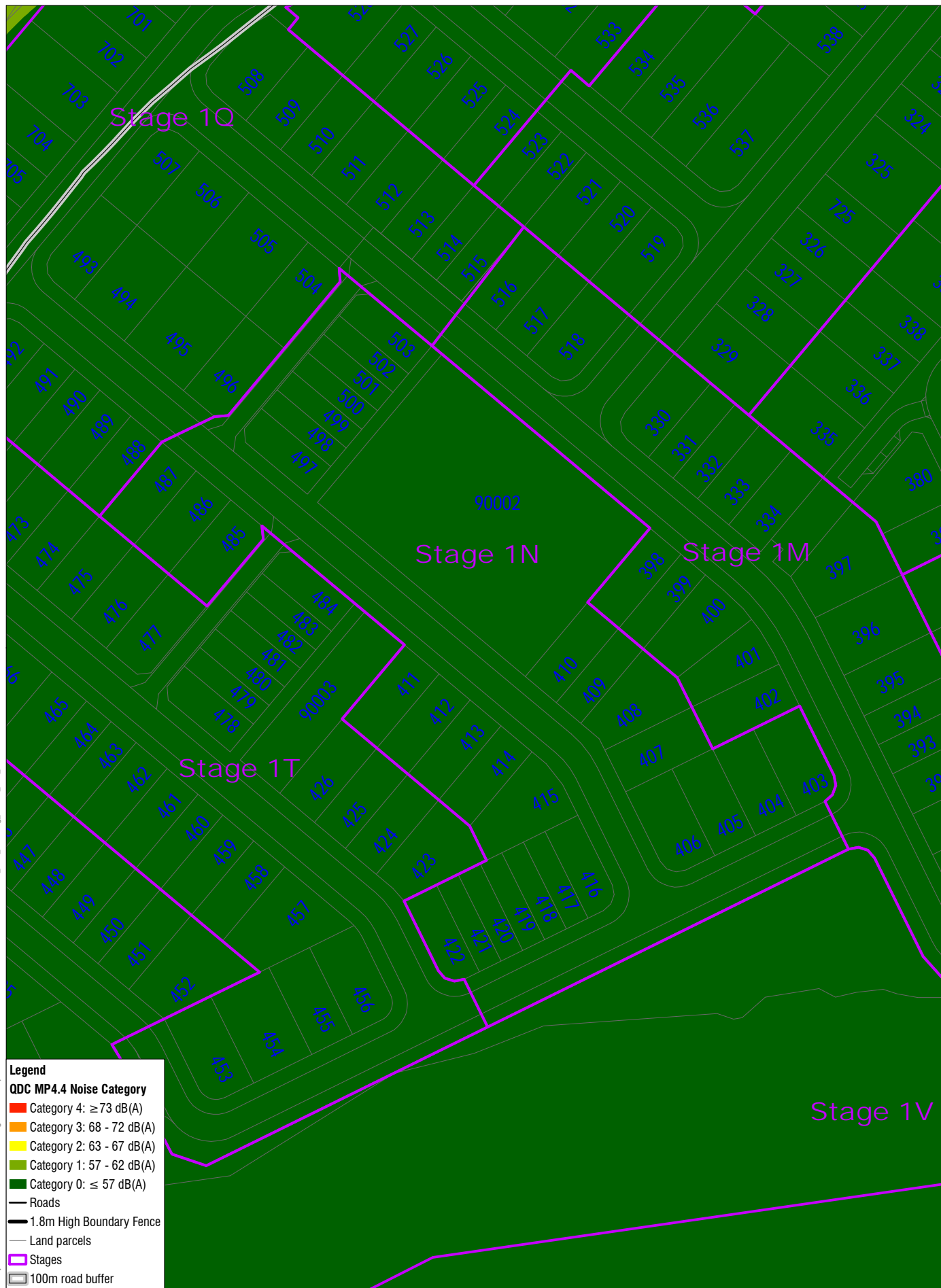


PEET

Flagstone Noise Assessment - Stage 1N

Calculated MP4.4 Noise Categories
for Stage 1N Single Storey 1.8m

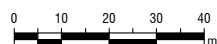
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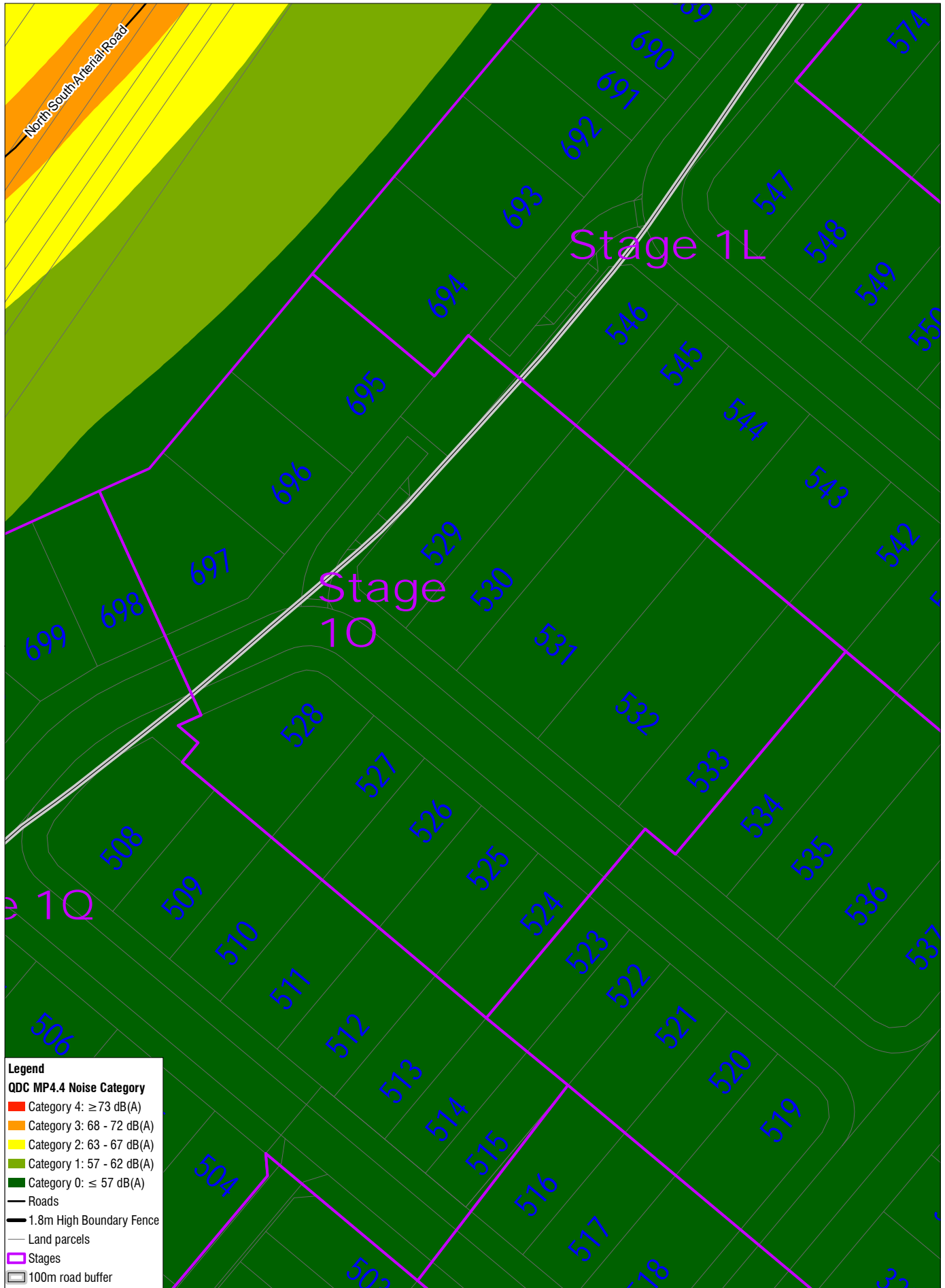
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Flagstone Noise Assessment - Stage 1N

**Calculated MP4.4 Noise Categories
for Stage 1N Double Storey 4.6m**



Legend

QDC MP4.4 Noise Category

- Category 4: ≥ 73 dB(A)
- Category 3: 68 - 72 dB(A)
- Category 2: 63 - 67 dB(A)
- Category 1: 57 - 62 dB(A)
- Category 0: ≤ 57 dB(A)

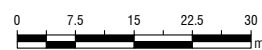
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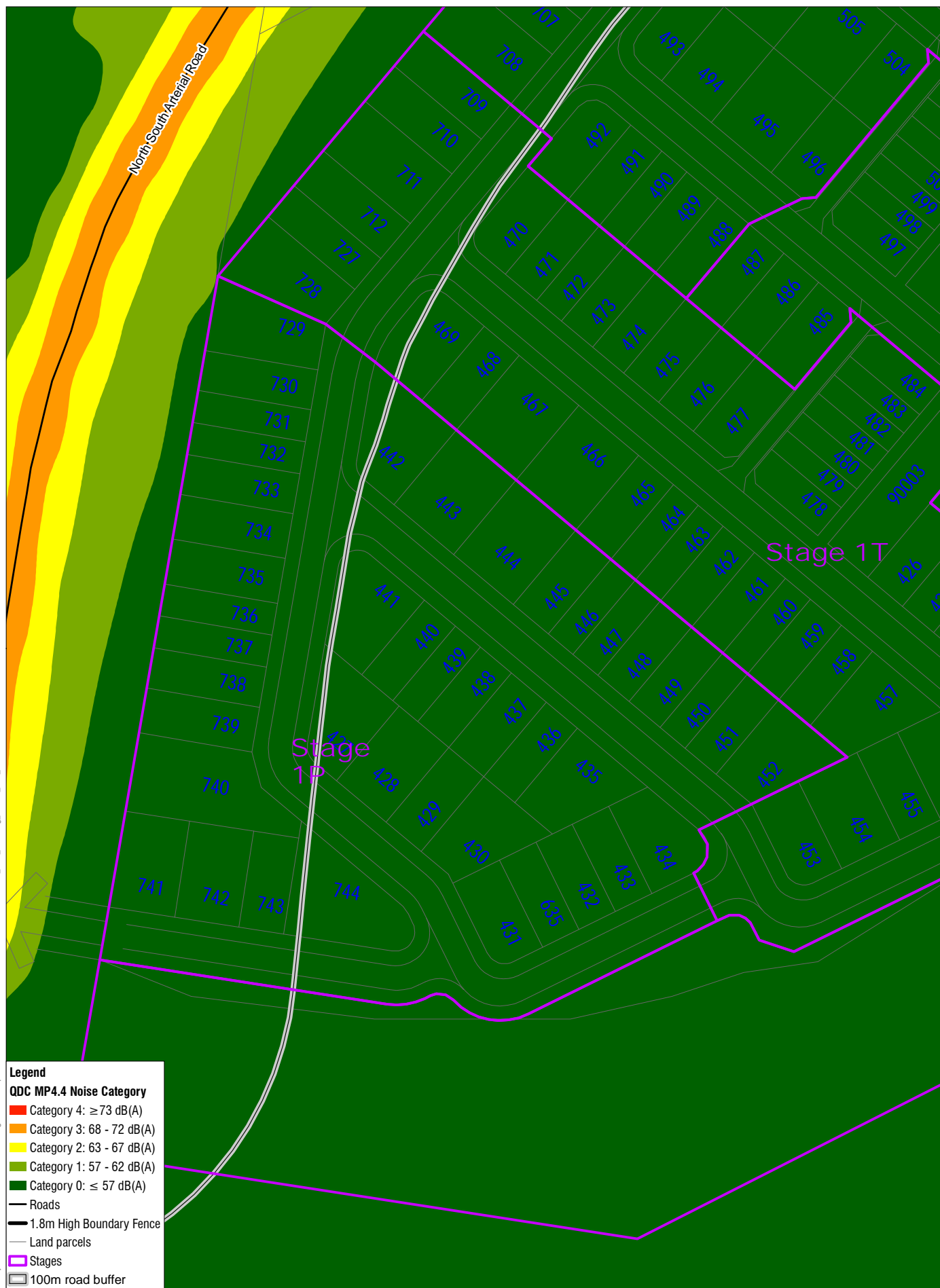


PEET

Flagstone Noise Assessment - Stage 10

Calculated MP4.4 Noise Categories for Stage 10 Double Storey 4.6m

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Legend

QDC MP4.4 Noise Category

- Category 4: ≥ 73 dB(A)
- Category 3: 68 - 72 dB(A)
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- Category 1: 57 - 62 dB(A)
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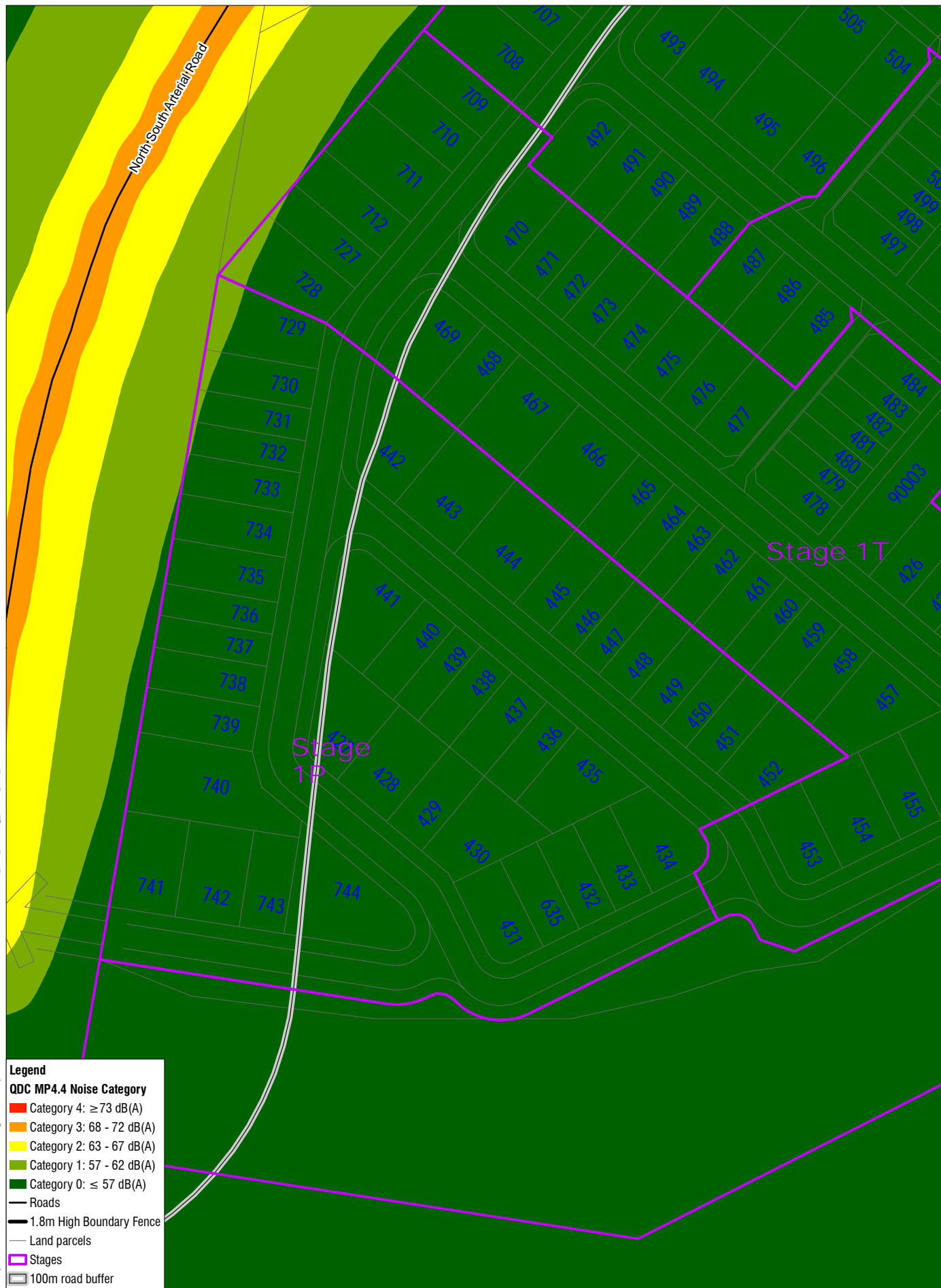


PEET

Flagstone Noise Assessment - Stage 1P

Calculated MP4.4 Noise Categories
for Stage 1P Single Storey 1.8m

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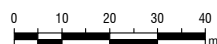


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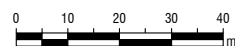
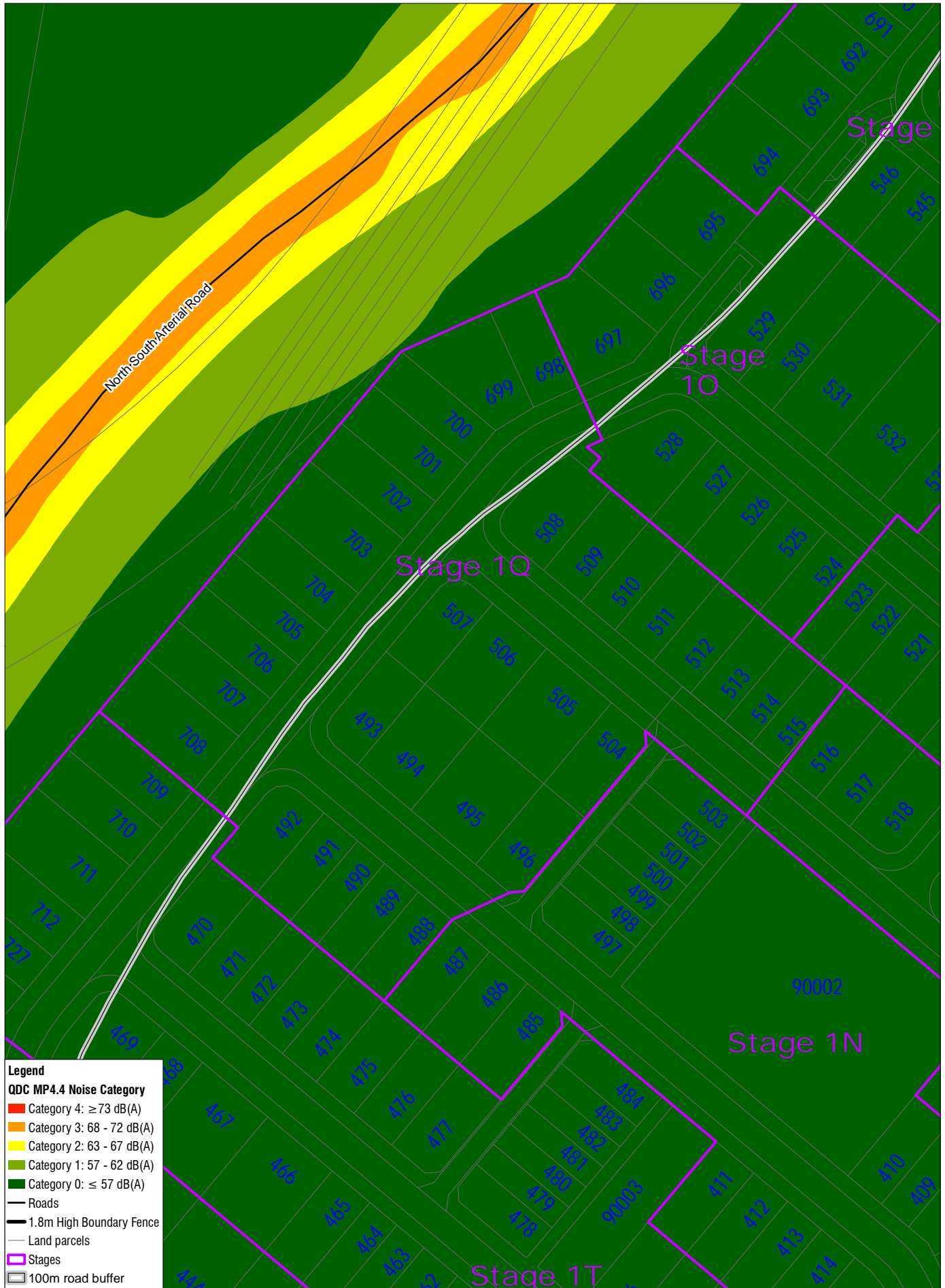
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Projection: GDA 1994 MGA Zone 56



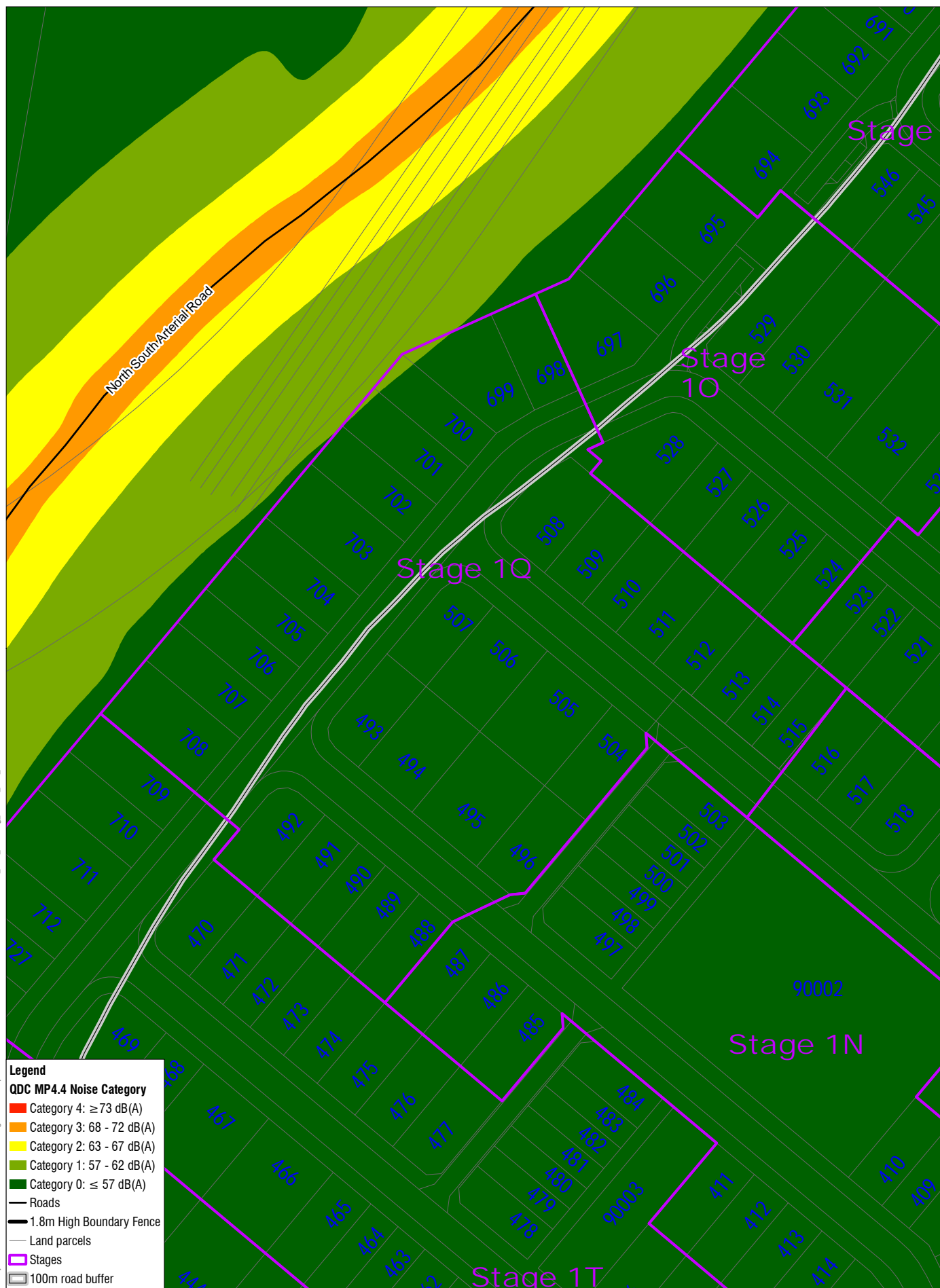
PEET

Flagstone Noise Assessment - Stage 1P

**Calculated MP4.4 Noise Categories
for Stage 1P Double Storey 4.6m**



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QUEENSLAND 4000
AUSTRALIA
T: 61 7 3858 4800
F: 61 7 3858 4801
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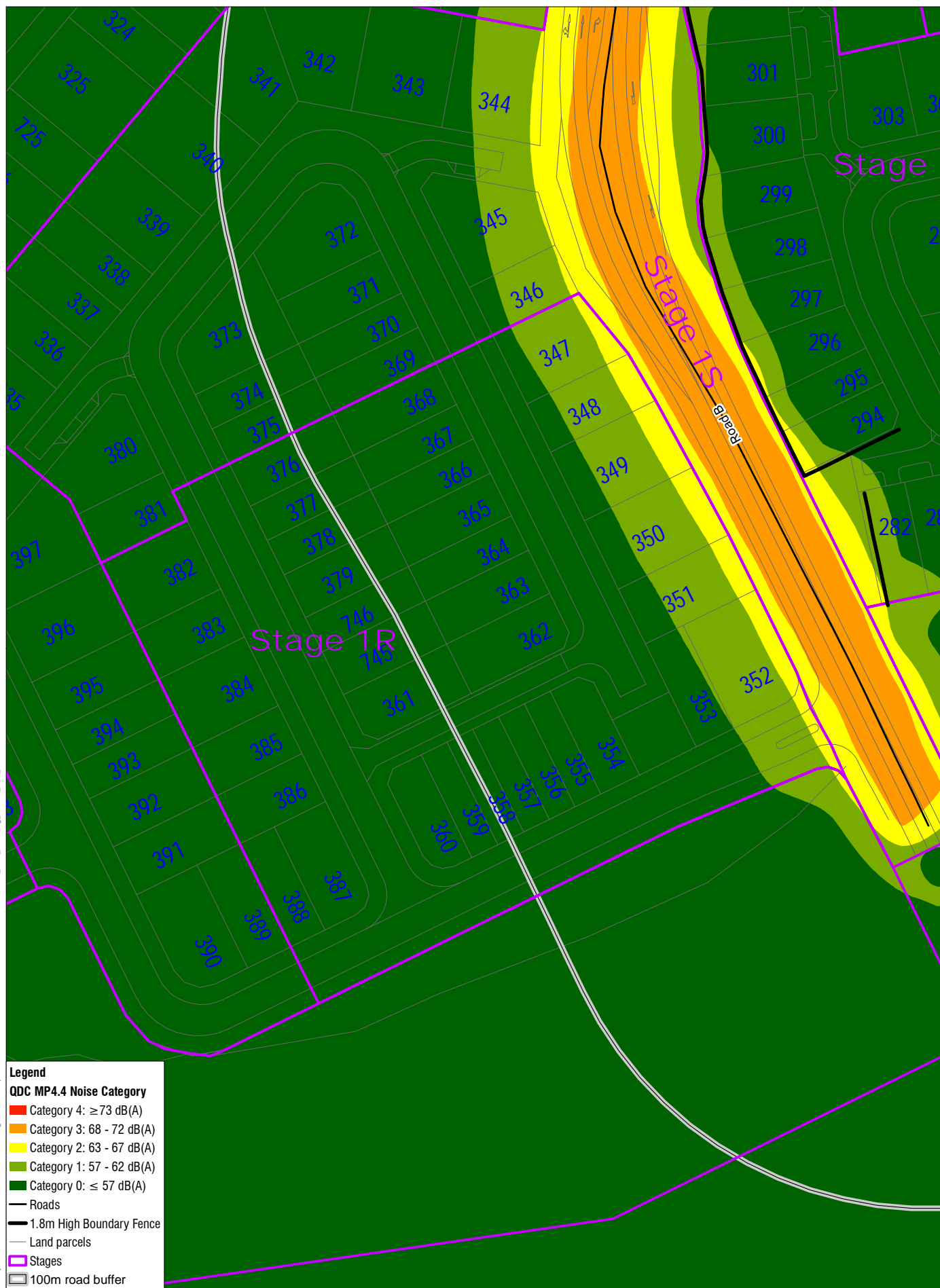


PEET

Flagstone Noise Assessment - Stage 1Q

**Calculated MP4.4 Noise Categories
for Stage 1Q Double Storey 4.6m**

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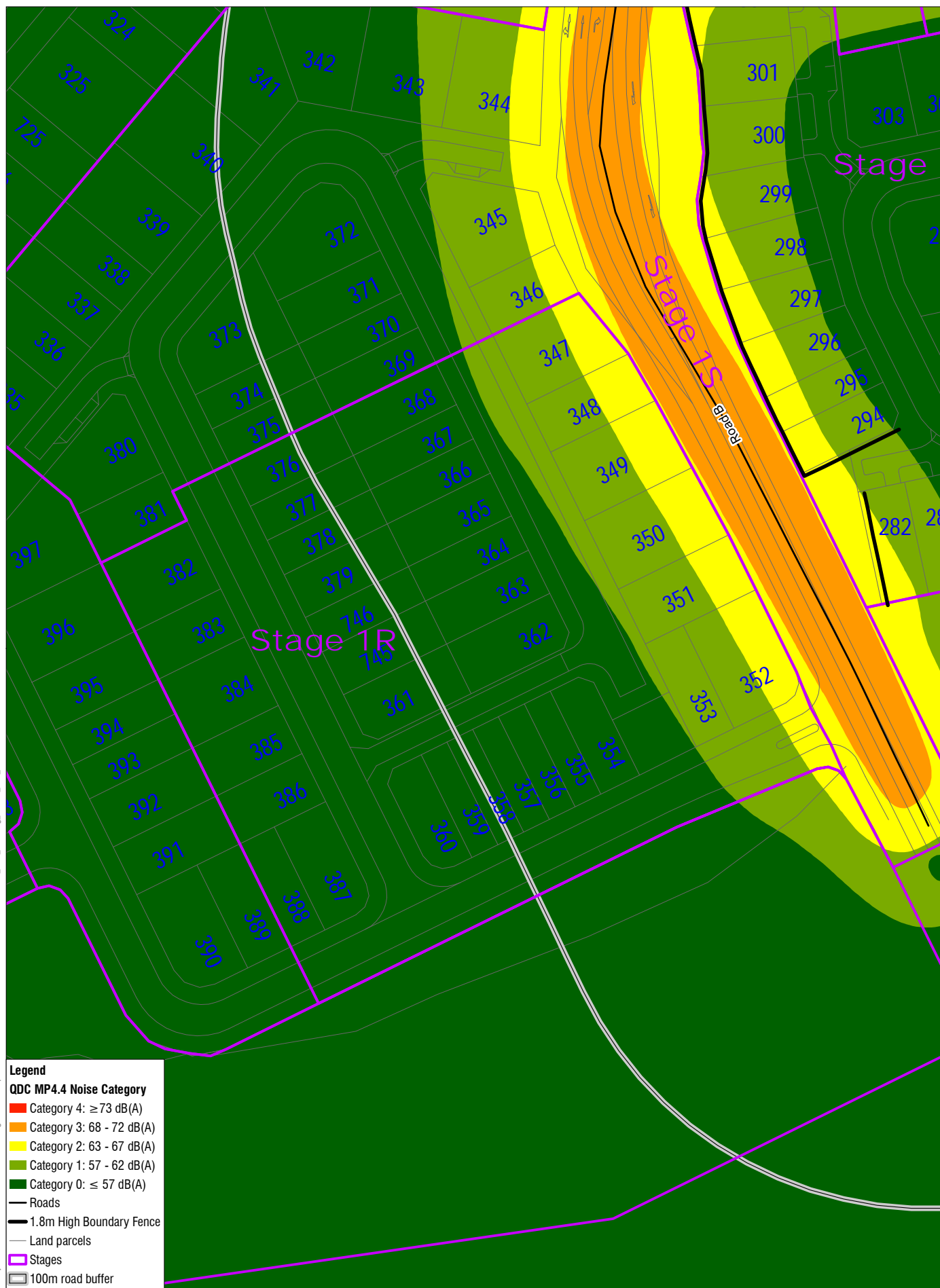


PEET

Flagstone Noise Assessment - Stage 1R

Calculated MP4.4 Noise Categories
for Stage 1R Single Storey 1.8m

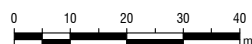
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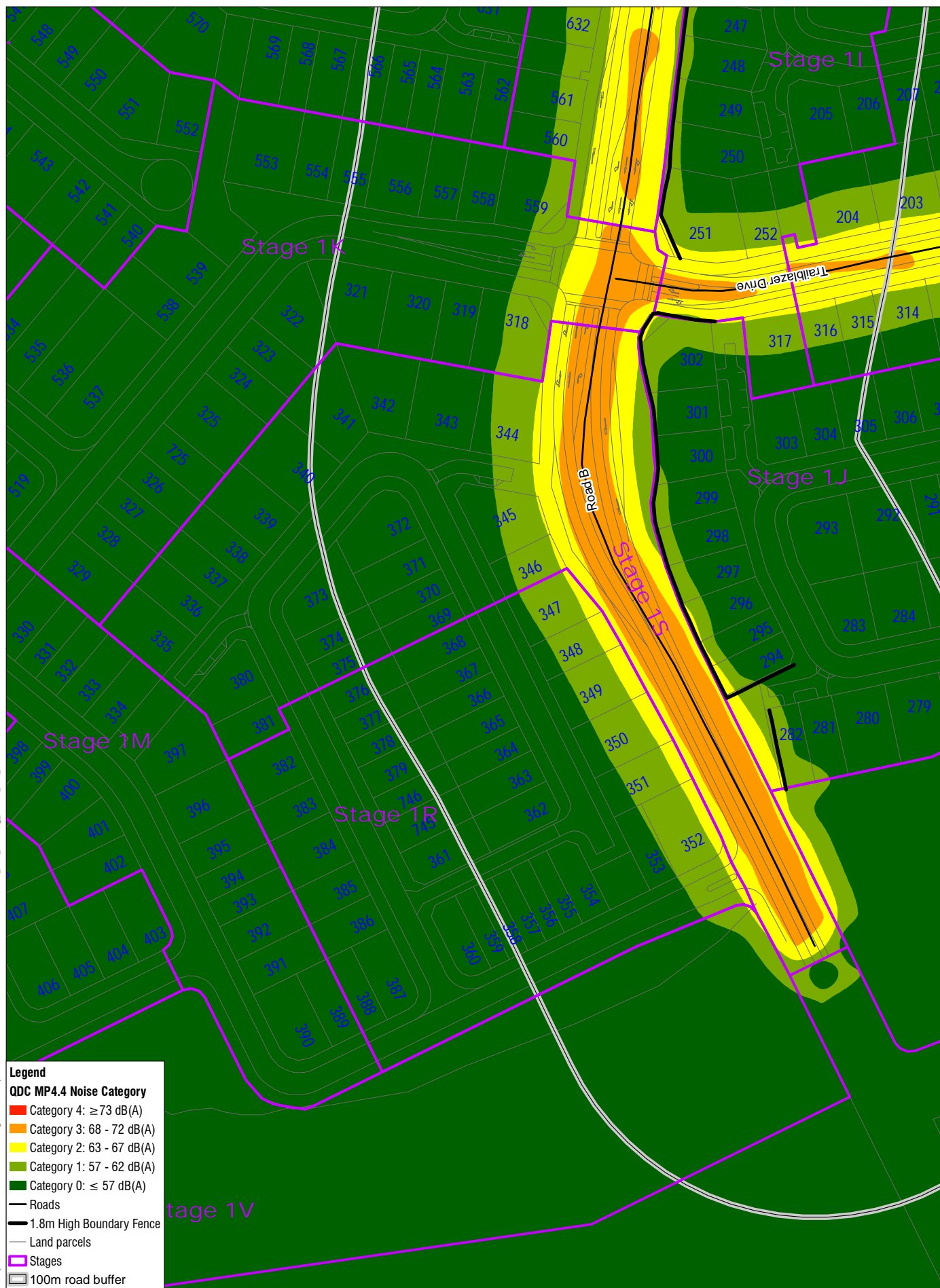


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Flagstone Noise Assessment - Stage 1R

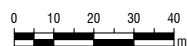
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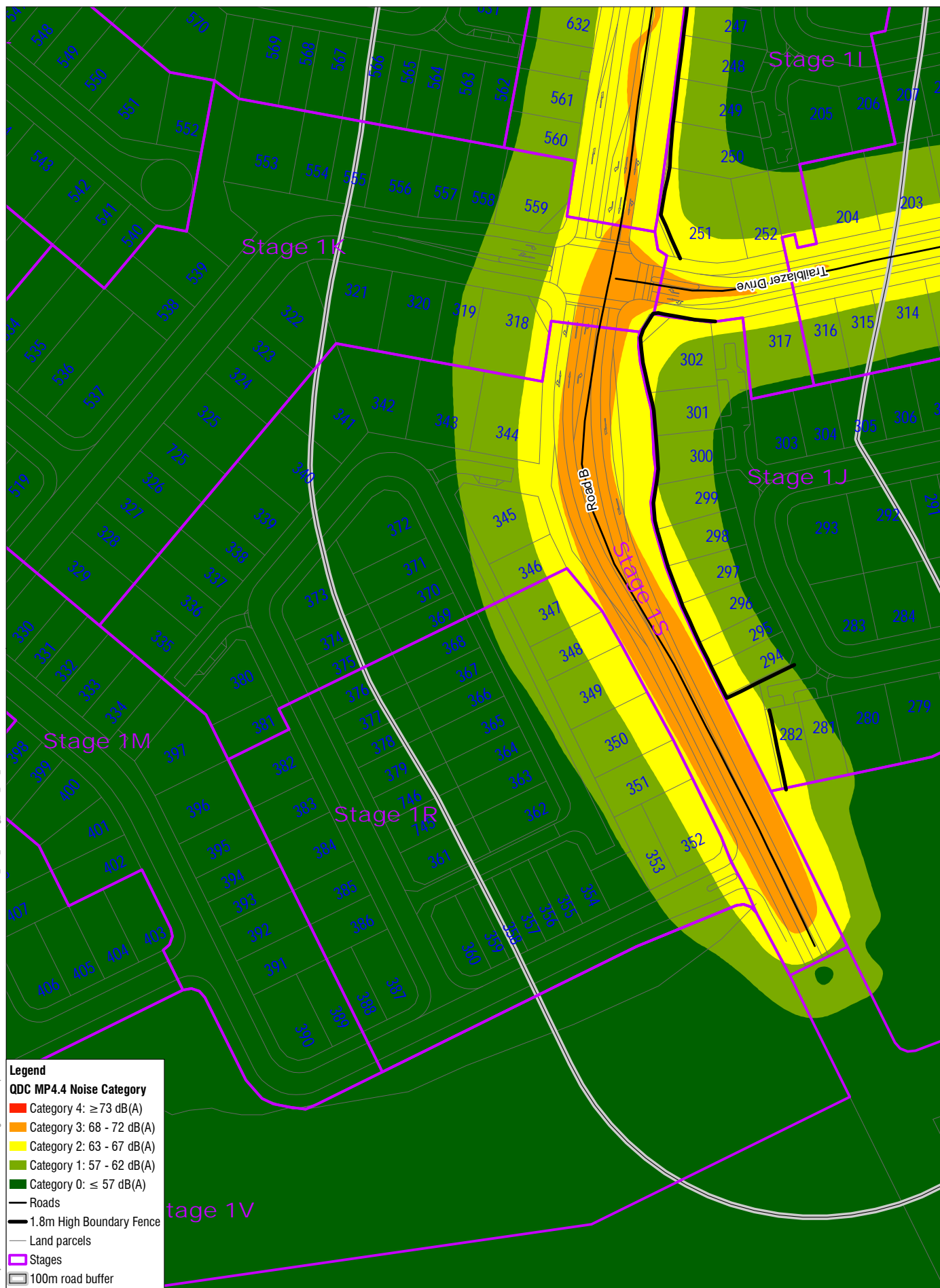


PEET

Flagstone Noise Assessment - Stage 1S

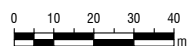
**Calculated MP4.4 Noise Categories
for Stage 1S Single Storey 1.8m**

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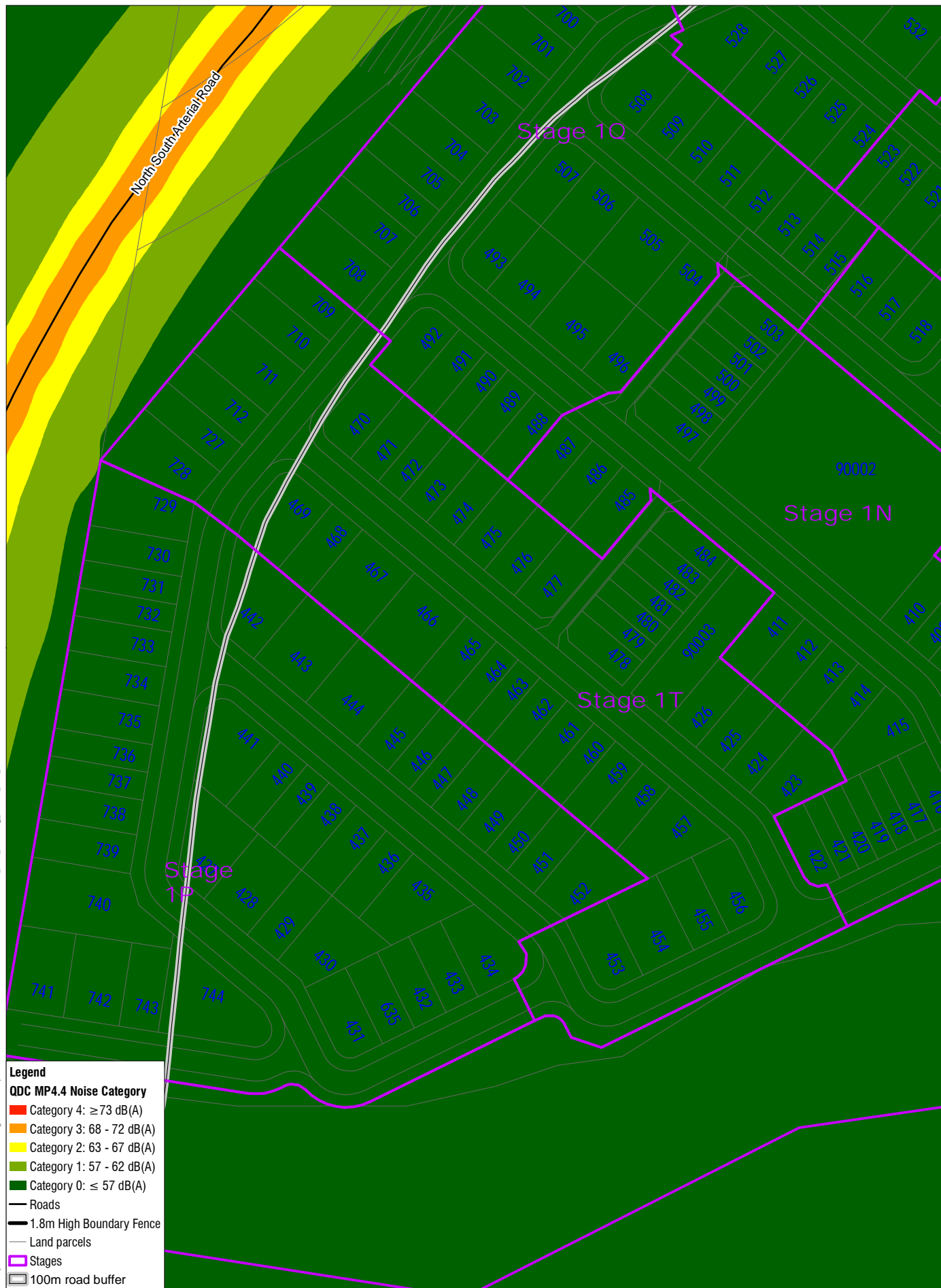


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Flagstone Noise Assessment - Stage 1S

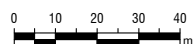
**Calculated MP4.4 Noise Categories
for Stage 1S Double Storey 4.6m**

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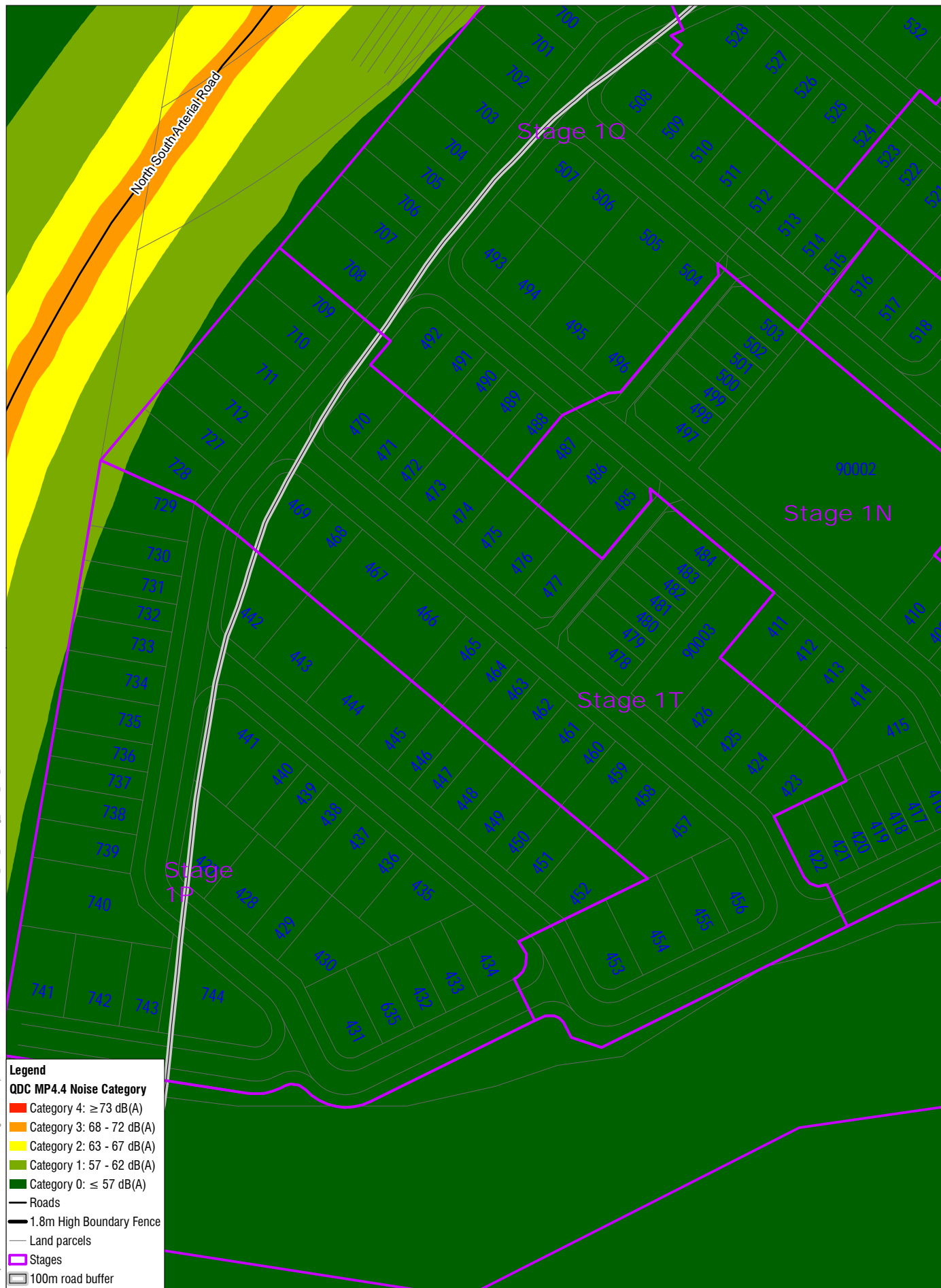


PEET

Flagstone Noise Assessment - Stage 1T

Calculated MP4.4 Noise Categories
for Stage 1T Single Storey 1.8m

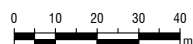
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SPRING HILL
QUEENSLAND 4000
AUSTRALIA
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Flagstone Noise Assessment - Stage 1T

**Calculated MP4.4 Noise Categories
for Stage 1T Double Storey 4.6m**

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SPRING HILL
QUEENSLAND 4000
AUSTRALIA
T: 61 7 3858 4800
F: 61 7 3858 4801
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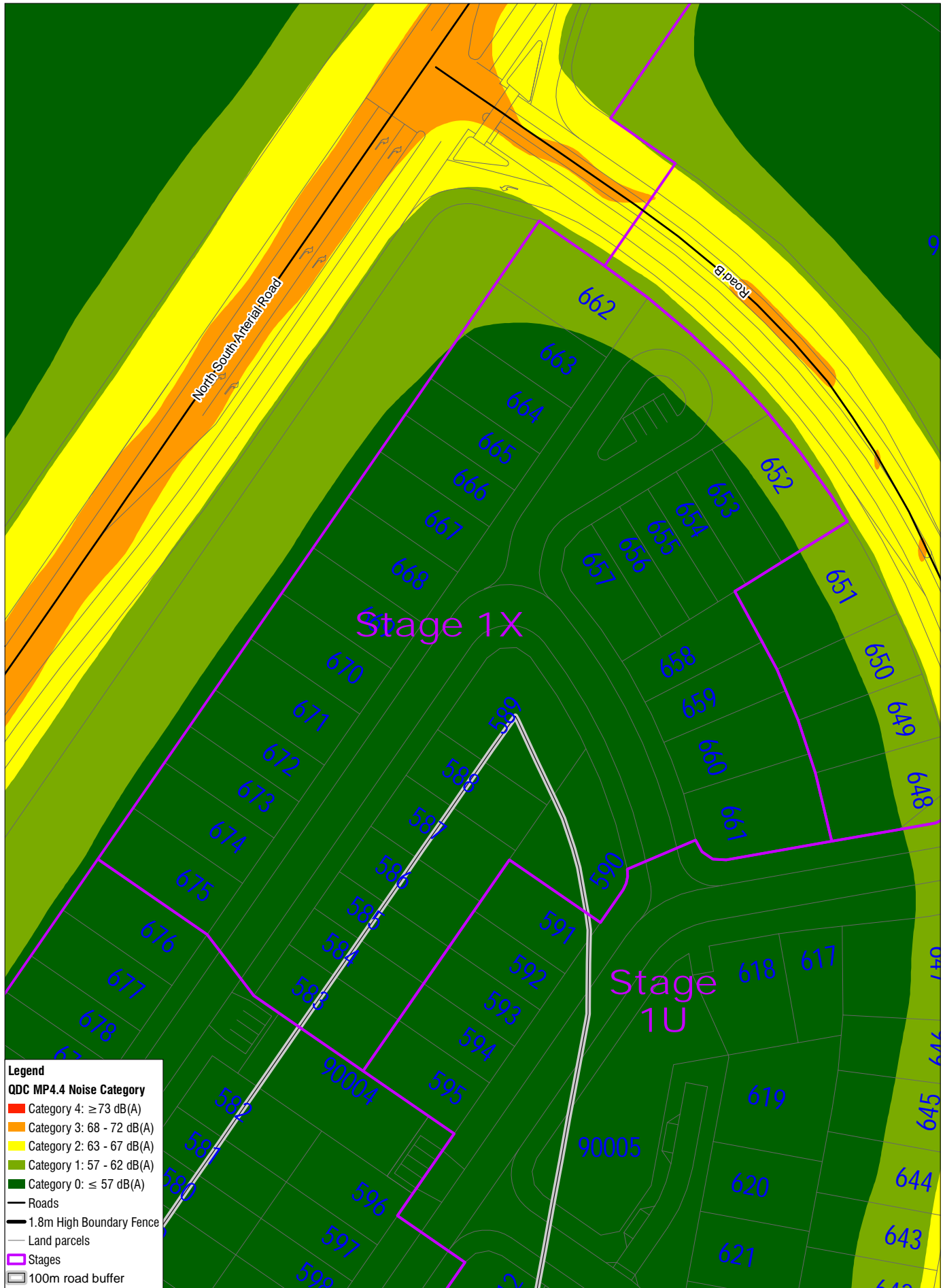
PEET

Flagstone Noise Assessment - Stage 1U

**Calculated MP4.4 Noise Categories
for Stage 1U Single Storey 1.8m**

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Legend

QDC MP4.4 Noise Category

- Category 4: ≥ 73 dB(A)
- Category 3: 68 - 72 dB(A)
- Category 2: 63 - 67 dB(A)
- Category 1: 57 - 62 dB(A)
- Category 0: ≤ 57 dB(A)

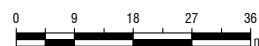
- Roads
- 1.8m High Boundary Fence
- Land parcels
- Stages
- 100m road buffer

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AUSTRALIA
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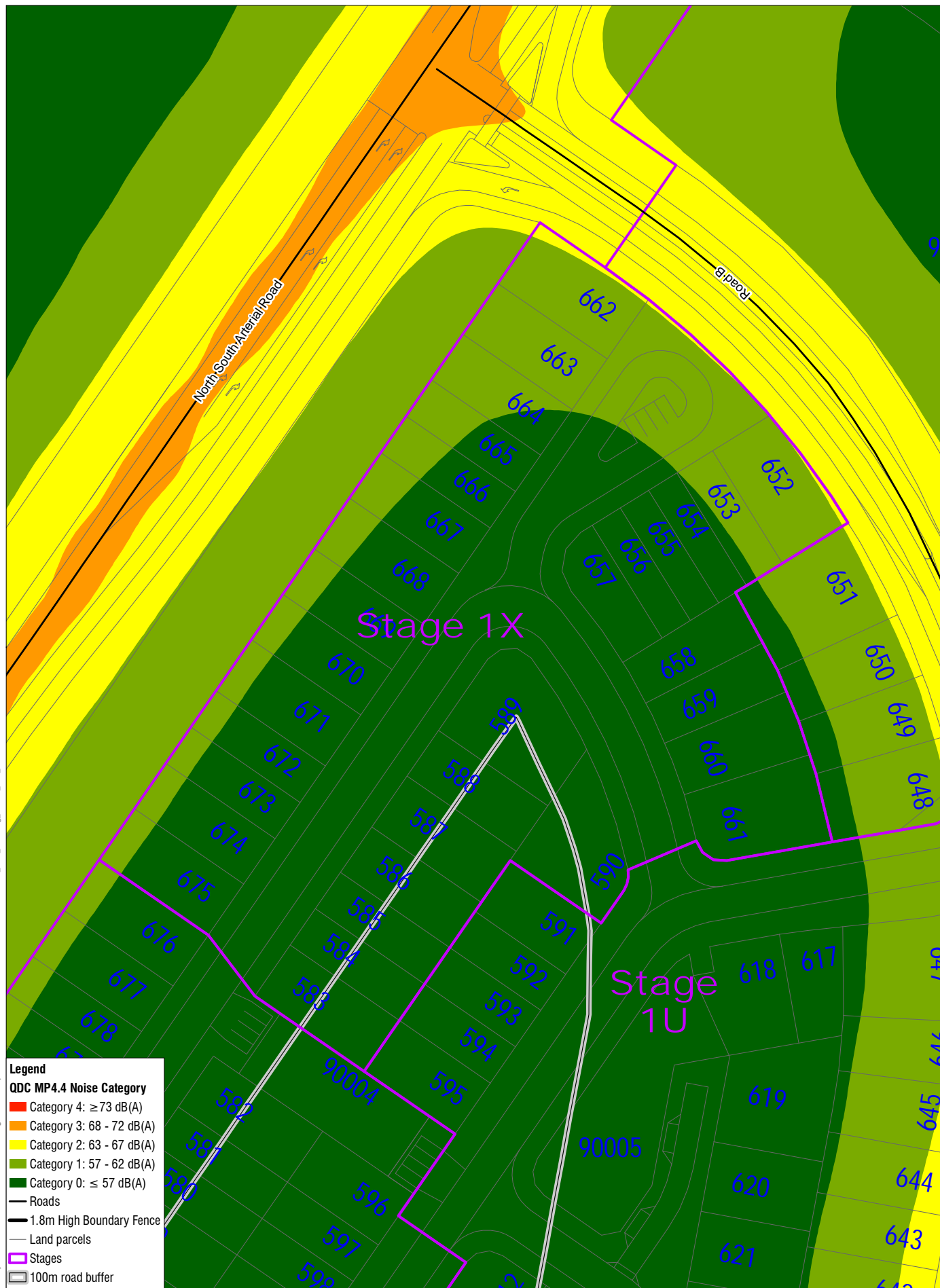


PEET

Flagstone Noise Assessment - Stage 1X

Calculated MP4.4 Noise Categories for Stage 1X Single Storey 1.8m

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Legend

QDC MP4.4 Noise Category

- Category 4: ≥ 73 dB(A)
- Category 3: 68 - 72 dB(A)
- Category 2: 63 - 67 dB(A)
- Category 1: 57 - 62 dB(A)
- Category 0: ≤ 57 dB(A)

- Roads
- 1.8m High Boundary Fence
- Land parcels
- Stages
- 100m road buffer



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SPRING HILL
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Flagstone Noise Assessment - Stage 1X

Calculated MP4.4 Noise Categories
for Stage 1X Double Storey 4.6m

ASIA PACIFIC OFFICES

BRISBANE

Level 2, 15 Astor Terrace
Spring Hill QLD 4000
Australia
T: +61 7 3858 4800
F: +61 7 3858 4801

MELBOURNE

Suite 2, 2 Domville Avenue
Hawthorn VIC 3122
Australia
T: +61 3 9249 9400
F: +61 3 9249 9499

SYDNEY

2 Lincoln Street
Lane Cove NSW 2066
Australia
T: +61 2 9427 8100
F: +61 2 9427 8200

AUCKLAND

68 Beach Road
Auckland 1010
New Zealand
T: +64 27 441 7849

CANBERRA

GPO 410
Canberra ACT 2600
Australia
T: +61 2 6287 0800
F: +61 2 9427 8200

NEWCASTLE

10 Kings Road
New Lambton NSW 2305
Australia
T: +61 2 4037 3200
F: +61 2 4037 3201

TAMWORTH

PO Box 11034
Tamworth NSW 2340
Australia
M: +61 408 474 248
F: +61 2 9427 8200

NELSON

5 Duncan Street
Port Nelson 7010
New Zealand
T: +64 274 898 628

DARWIN

5 Foelsche Street
Darwin NT 0800
Australia
T: +61 8 8998 0100
F: +61 2 9427 8200

PERTH

589 Hay Street
Jolimont WA 6014
Australia
T: +61 8 9422 5900
F: +61 8 9422 5901

TOWNSVILLE

Level 1, 514 Sturt Street
Townsville QLD 4810
Australia
T: +61 7 4722 8000
F: +61 7 4722 8001

NEW PLYMOUTH

Level 2, 10 Devon Street East
New Plymouth 4310
New Zealand
T: +64 0800 757 695

MACKAY

21 River Street
Mackay QLD 4740
Australia
T: +61 7 3181 3300

ROCKHAMPTON

rockhampton@slrconsulting.com
M: +61 407 810 417