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Lots 103 and 105 West Wallsend, NSW

Noise Impact Assessment

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0	18/07/2011	Initial issue
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EXECUTIVE SUMMARY

This report provides the results, findings and recommendations arising from a Noise Impact Assessment of the proposed subdivision of Lots 103 & 105 DP 1000408 West Wallsend, NSW as per the latest layout plans of the development and the updated traffic conditions.

The assessment highlights that future traffic movements have the potential to cause elevated noise levels at 46 of the proposed lots at the ground floor and 47 lots at the first floor.

Building design and landscaping measures, as detailed in **Section 5.2**, will assist in minimising the noise impact on the most affected lots.

In this context, we believe that residential development on those affected lots is acceptable without noise barriers, provided that satisfactory internal noise levels are achieved within the exposed dwellings. This implies façade treatments (i.e. glazing, ceiling, wall insulation etc) are required, which are normally determined from the requirements and procedures of *AS2107: 2000 Recommended sound levels and reverberation times for building interiors* and *AS3671: 1989 Road traffic noise intrusion – Building siting and construction*.

The required extent of façade treatments will depend on the glazing/floor area ratio in each room of any proposed dwelling, which has not been provided at this early stage. However, given the traffic noise levels outlined in this report, we do not believe these treatments will be unrealistic or cost prohibitive. Pending on design details, it is our expectation that, in the worst-case, glazing would be 6.38mm to 10.38mm laminated glass and sound rated plasterboard in roofs, which are commonly used in residential estates.

The predicted increases in noise on existing roads due to the development are expected to be a maximum of 2.1dB(A). This complies with and is well below the traffic noise criteria for existing residences of 12dB(A).

It is VIPAC's opinion that development of housing on the subject land is acceptable provided the recommendations outlined in this report are implemented. This consists of façade treatment of the dwellings most affected by traffic noise, to be constructed to the requirements of AS2107 and AS3671.

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1 INTRODUCTION

Vipac Engineers and Scientists Ltd (VIPAC) was commissioned by ADW Johnson on behalf of Roche Group Pty Limited to update the noise impact assessment for the proposed residential development of Lots 103 & 105 DP 1000408, West Wallsend, NSW as per the latest layout plans for the development and the updated traffic conditions. This report is referenced from an earlier report 29N-07-0079-TRP-214577-1 provided by VIPAC on the noise impact assessment of the proposed residential development mentioned above.

The purpose of this feasibility investigation was to determine the updated traffic noise impact from Carrington Street, George Booth Drive, and Withers Street on the latest allotment layout of the proposed development. The impact is shown by generating traffic noise contour maps to show the cumulative contributions from the specified road systems.

This assessment is carried out according to the criteria and guidelines of the Office of Environment and Heritage (OEH) document *"NSW Road Noise Policy"* and the Noise Guide for Local Councils, where applicable.

2 NOISE MONITORING

Three (3) environmental noise loggers were installed on site to measure the traffic noise levels associated with the proposed development, West Wallsend. The monitoring locations are detailed in **Table 1** and are shown on **Figure 1.**

Table 1: Monitoring Locations

Location ID	Location Description	Instrument	Serial No.
1	Carrington Street, 2 metres to the road (Nov 2007)	ARL	194657
2	George Booth Drive, 15 metres to the road (Nov 2007)	ARL	194696
	George Booth Drive, 8.5 metres to the road (April 2012)	LD 870	1159
3	Withers Street, 5 metres to the road (Nov 2007)	ARL	194691

As detailed above a second round of noise monitoring was conducted on George Booth Drive (April/May 2012) utilising a LD 870 Noise Logger. The reason for the additional monitoring was to assess the current traffic noise impact along the arterial road to coincide with the revised assessment. Updating the noise monitoring on Carrington Street and Withers Street was not deemed necessary, as the current traffic volumes were similar to those in November 2007.

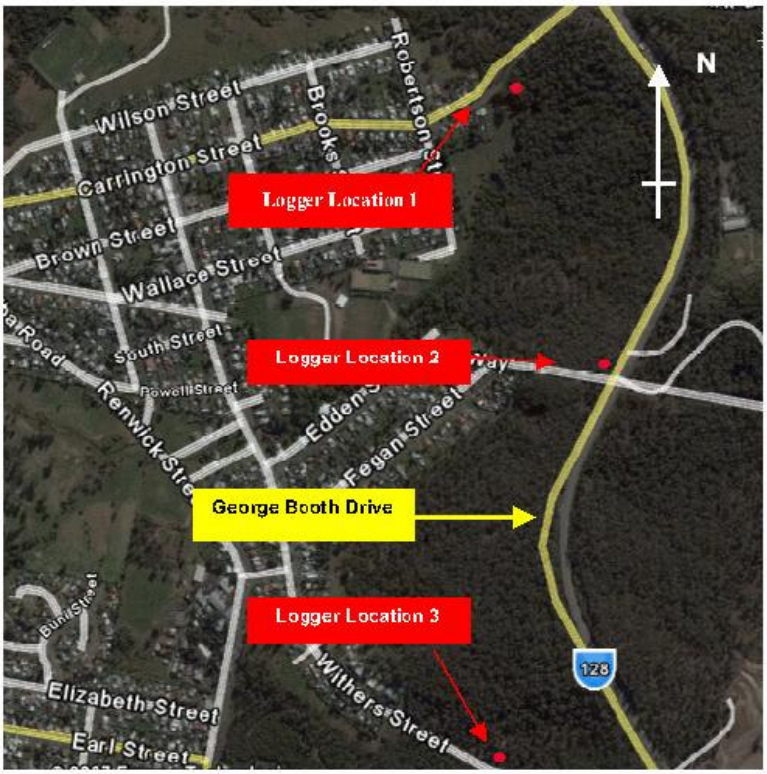

Figure 1: Monitoring Locations

Noise logging was conducted between the 2nd and 15th November 2007 at all monitoring locations. Additionally, noise logging was conducted on George Booth Drive during a period from 26th April to 3rd May 2012.

The instruments were programmed to accumulate noise data continuously over sampling periods of 15-minutes for the entire monitoring period. Internal software then calculated and stored the L_n percentile noise levels for each sampling period, which were later retrieved for detailed analysis.

The instrument was calibrated using a Rion NC-73 calibrator immediately before and after monitoring and showed a maximum error of 0.5dB.

Analysis of the George Booth Drive noise monitor results for April 2012 showed unusually high traffic noise impact, which was influenced by the construction of the Hunter Expressway, which requires temporary re-direction of traffic flows along this arterial road from the Newcastle Link Road. This was the case for the entire monitoring period.

VIPAC therefore determined it inappropriate to include this data, as it did not provide a true indication of the traffic noise impact on the revised development layout. We further note that the Planning report prepared by Moody and Doyle (May 2012) stated that the Hunter Expressway is expected to reduce traffic volumes on George Booth Drive by 25%, which supports our approach to utilise the 2007 noise monitoring results as part of this assessment. Data affected by adverse weather conditions has been excluded where necessary.

A summary of traffic noise data used to calibrate the noise model is shown in **Table 2.**

Table 2: Summary of measured traffic noise levels – dB(A)

Noise Parameter	Location #1 (Carrington Street)	Location #2 (George Booth Drive)	Location #3 (Withers Street)
$L_{A10,18hr}$	67.0	67.8	68.9
$L_{Aeq(15hr)}$	64.1	66.1	65.3
$L_{Aeq(9hr)}$	56.8	62.5	56.1

3 CRITERIA

3.1 TRAFFIC NOISE

Relevant criteria are set out in the NSW Road Noise Policy. The following criteria has been applied for the development:

Table 3: Road traffic noise criteria for sensitive land uses

Day (7am-10pm)	Night (10pm-7am)	Applied to:
$L_{Aeq\ (15h)}$ 55dB(A)	$L_{Aeq\ (9hr)}$ 50dB(A)	Residential areas in the proposed development affected by noise from an arterial road (George Booth Drive)
$L_{Aeq\ (15h)}$ 60dB(A)	$L_{Aeq\ (9hr)}$ 55dB(A)	Residential areas in the proposed development affected by noise from sub-arteria roads (Carrington Road and Withers Street)
Increase in noise: 12dB(A)		Increase in noise on existing roads from traffic associated with the development
$L_{Aeq\ (15hr)}$ 55dB(A)		Open space areas - applied to private open space on lots

Where criteria are already exceeded, the NSW Road Noise Policy further advises that (where feasible and reasonable) existing noise levels should be reduced to meet the noise criteria via judicious design and construction of the development. Location, internal layouts, building materials and construction should be chosen so as to minimize noise impacts.

4 TRAFFIC NOISE MODELLING

4.1 MODELLING SOFTWARE

Traffic noise single point calculations and colour noise contour maps were produced using the Office of Environment and Heritage (OEH) approved SoundPLAN computer modelling software.

Braunstein & Berndt International a leading firm of transportation and environmental engineers in Germany developed the SoundPLAN computer modelling software. The software is used worldwide by over 600 companies and is one of the leading software products available for road, rail and industry noise prediction. Version 7.0 was used in this assessment.

4.2 GEOGRAPHICAL DATA

ADW Johnson supplied topographical details of the area in 3-dimensional DXF format. The proposed allotment layout is shown in Appendix A of this report.

4.3 TRAFFIC DATA

Traffic volumes used to predict traffic noise were obtained from the Brown Consulting Development Assessment Report dated January 2011 and the Brown Consulting Addendum Letter prepared in support of the current proposal for 397 lots dated 8 May 2012.

AADT traffic flows were assumed to be 9 times the peak hour traffic, and a factor of 94% was used to convert AADT's to 18-hour traffic flows. Future (2022) traffic flows have been derived using a growth rate of 2.5%. Traffic volumes were extrapolated to the **Year 2022** resulting in the traffic volumes shown in **Table 4.**

Table 4: 18 Hour Traffic Volumes used for the Noise Assessment

Road	Scenario	Peak Hour Traffic Flow	Source	18 hour Traffic Flow*	Scenario	Growth Rate	18 hour Traffic Flow
Carrington St	2007	559	Brown Jan 2011 Report	4729	2012 Prior to Development	2.5%	5351
George Booth Drive		1038		8781			9935
Withers St	2010	378		3198			3360
Carrington St	2012/2013 Development Commenced	577	Brown 8/5/2012 Report	4881	2022	2.5%	6249
George Booth Drive		1174	Brown Jan 2011 Report	9935			12718
Withers Street		503	Brown 8/5/2012 Report	4255			5447

**18 hr traffic flows were calculated using a factor of 9 to convert from Peak Hr to AADT and a factor of 94% to convert AADTs to 18hr flows*

4.4 ALLOTMENT/RECEIVER POSITIONS

Allotment/receiver positions were based on the proposed development plan and topographical maps.

4.5 TRAFFIC NOISE MODEL CALIBRATION

The Calculation of Road Traffic Noise (CoRTN) method of traffic noise prediction was used which the OEH approves. The CoRTN method accommodates the following factors affecting traffic noise.

- Posted Speed (90km/h for George Booth Drive, 60km/h for Withers Street, and 50km/h for Carrington Street);
- Heavy vehicle traffic (input as percentage heavy vehicles);
- Pavement surface;
- Gradient of roadway;
- Topographic features;
- Receiver/source distance and heights;
- Intervening ground cover;
- Reflections from buildings, including multiple reflections;

The model was calibrated with the noise data from each monitoring locations – the predicted $L_{10,18hrs}$ was compared with the $L_{10,18hrs}$ calculated from logging data, and a calibration constant was determined. **Table 5** shows the measured and predicted $L_{10\ (18hr)}$ values used to calculate the calibration constants.

Table 5: Model Calibration – dB(A)

	Logging location 1 Carrington Street	Logging location 2 George Booth Drive	Logging location 3 Withers Street
Predicted $L_{A10\ (18hr)}$	67.2	66.2	67.6
Logging (measured) $L_{A10\ (18hr)}$	67	67.8	68.9
Difference	**0.2**	**-1.6**	**-1.3**

Normally the acceptable difference between measured and predicted values is ±2dB(A). In this case the model calibration satisfies the QEH road traffic noise criteria

4.6 NOISE PARAMETER CONVERSION

The CoRTN method predicts the $L_{A10,18hrs}$ statistics. To determine the other required noise parameters logging data was used to calculate differences between noise parameters. Correction factors are presented in **Table 6** below.

Table 6: Parameters Calibration – dB(A)

	Noise Parameter	Measured	Difference with L_{A10}
Carrington Street	$L_{eq\ (18hr)}$	64.4	-2.6
	$L_{eq\ (9hr)}$	56.8	-10.2
George Booth Drive	$L_{eq\ (18hr)}$	66.4	-1.4
	$L_{eq\ (9hr)}$	62.5	-5.3
Withers Street	$L_{eq\ (18hr)}$	65.3	3.6
	$L_{eq\ (9hr)}$	56.1	-12.8

The total noise source adjustment in the model to predict noise parameters, which include the model calibration and the noise parameter conversion, are shown in **Table 7** below.

Table 7: Summary of Model Adjustments – dB(A)

	Noise Parameter	Model Cal	Parameter Cal	Total
Carrington Street	$L_{Aeq\ (15hr)}$	0.2	-2.6	-2.4
	$L_{Aeq\ (9hr)}$	0.2	-10.2	-10.0
George Booth Drive	$L_{Aeq\ (15hr)}$	-1.6	-1.4	-3.0
	$L_{Aeq\ (9hr)}$	-1.6	-5.3	-6.9
Withers Street	$L_{Aeq\ (15hr)}$	-1.3	-3.6	-4.9
	$L_{Aeq\ (9hr)}$	-1.3	-12.8	-14.1

5 RESULTS & DISCUSSIONS

5.1 NOISE CONTOUR MAPS

The following traffic noise contour maps are presented in **Appendix B:**

- Year 2022 $L_{Aeq\ (15hr)}$ – Noise impact to ground floor receivers;
- Year 2022 $L_{Aeq\ (9hr)}$ – Noise impact to ground floor receivers.
- Year 2022 $L_{Aeq\ (15hr)}$ – Noise impact to first floor receivers; and
- Year 2022 $L_{Aeq\ (9hr)}$ – Noise impact to first floor receivers.

5.2 TRAFFIC NOISE IMPACT

The noise model has predicted the traffic noise impacts on the proposed allotment layout without the use of noise controls. The following number of lots exceeds the traffic noise criteria at the ground floor:

- 1 lot, Carrington Street.
- 45 lots, Withers Street

The following number of lots exceeds the traffic noise criteria at the first floor:

- 1 lot, Carrington Street.
- 46 lots, Withers Street

Lots exceeding the noise limits at the ground floor and first floor are presented in **Appendix C.**

Noise impact to the lots on Withers and Carrington Street exceed the noise criteria. As such, measures should be taken to provide suitable noise environments for any dwelling proposed for the affected lots. Some of these measures include building setbacks; façade treatments and landscaping which would be implemented as part of a covenant on the proposed subdivision.

Houses located beyond the first row of lots will be subject to traffic noise levels in compliance with the criteria, with a preference to single storey dwellings. Two-storey homes will typically require additional façade treatments. It should also be noted that the first row of houses would provide some additional shielding to any located further within the subdivision.

Note that vehicular movements on the subdivision internal roads are expected to produce only short term and intermittent noise sources.

Typical noise events in the internal roads will include:

- Car door slams
- Engine revving
- Engine starts
- Vehicle movement (tyre scuff, braking, etc)

Traffic noise from vehicular movements on the subdivision internal roads is not expected to be significant when compared to that of the Carrington Street, Withers Street, and George Booth Drive.

5.3 EXISTING RESIDENCES

The existing (2012) traffic volumes on Carrington Street and Withers Street are 5351 and 3360, as presented in Table 4. The future traffic volumes on Carrington Street and Withers Street have conservatively been estimated at 6249 and 5447. This results in a maximum increase in traffic noise of 0.7dB(A) on Carrington Street and 2.1dB(A) on Withers Street. Therefore, the traffic on existing roads is expected to comply with and be well below the traffic noise criteria of 12dB(A).

5.4 PRIVATE OPEN SPACE AREAS

Traffic noise contour maps of the predicted free field $L_{Aeq(1hr)}$ noise levels have been included in Appendix B. It can be seen that most lots have areas that are below the $55dBL_{Aeq(15hr)}$ open space area noise limit.

All lots have significant areas with traffic noise levels less than or equal to $60dBL_{Aeq(15hr)}$. It is expected that when the buildings are constructed traffic noise levels will be at least 8dB(A) lower in the space shielded by the buildings. Therefore, all lots will have areas that comply with the $55dBL_{Aeq(15hr)}$ open space noise limit.

6 CONCLUSION & RECOMMENDATIONS

This assessment highlights that future traffic movements have the potential to cause elevated noise levels at 46 of the proposed lots at the ground floor and 47 lots at the first floor.

In this context, we believe that residential development on those affected lots is acceptable without noise barriers, provided that satisfactory internal noise levels are achieved within the exposed dwellings. This implies façade treatments (i.e. glazing, ceiling, wall insulation etc) are required, which are normally determined from the requirements and procedures of *AS2107: 2000 Recommended sound levels and reverberation times for building interiors* and *AS3671: 1989 Road traffic noise intrusion – Building siting and construction*.

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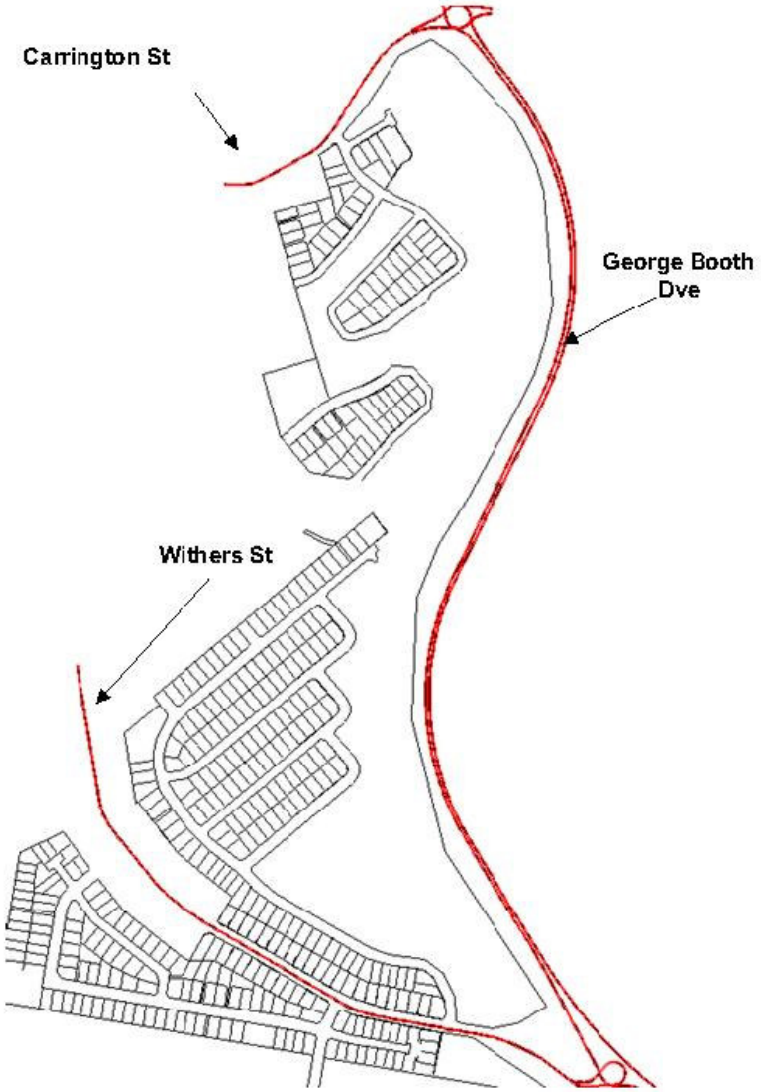
Building setbacks, façade treatments and landscaping as detailed in Section 5.2, will further assist in minimising the noise impact on the most affected lots.

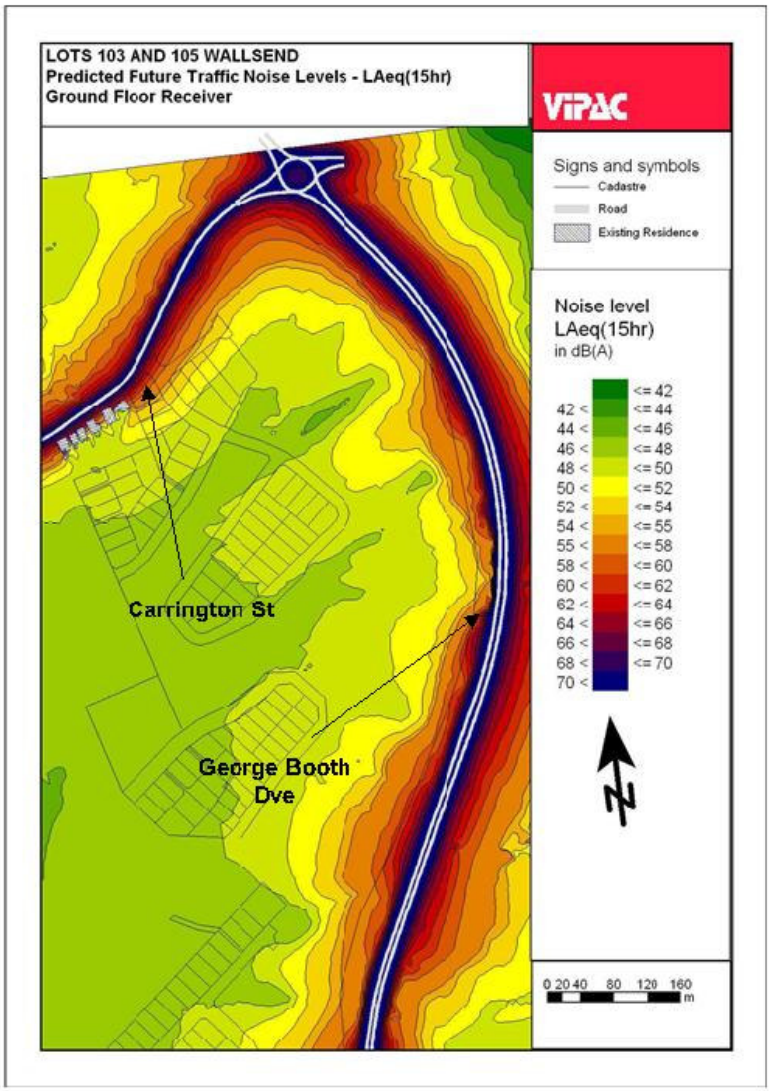
The predicted increases in noise on existing roads due to the development are expected to be a maximum of 2.1dB(A). This complies with and is well below the traffic noise criteria for existing residences of 12dB(A).

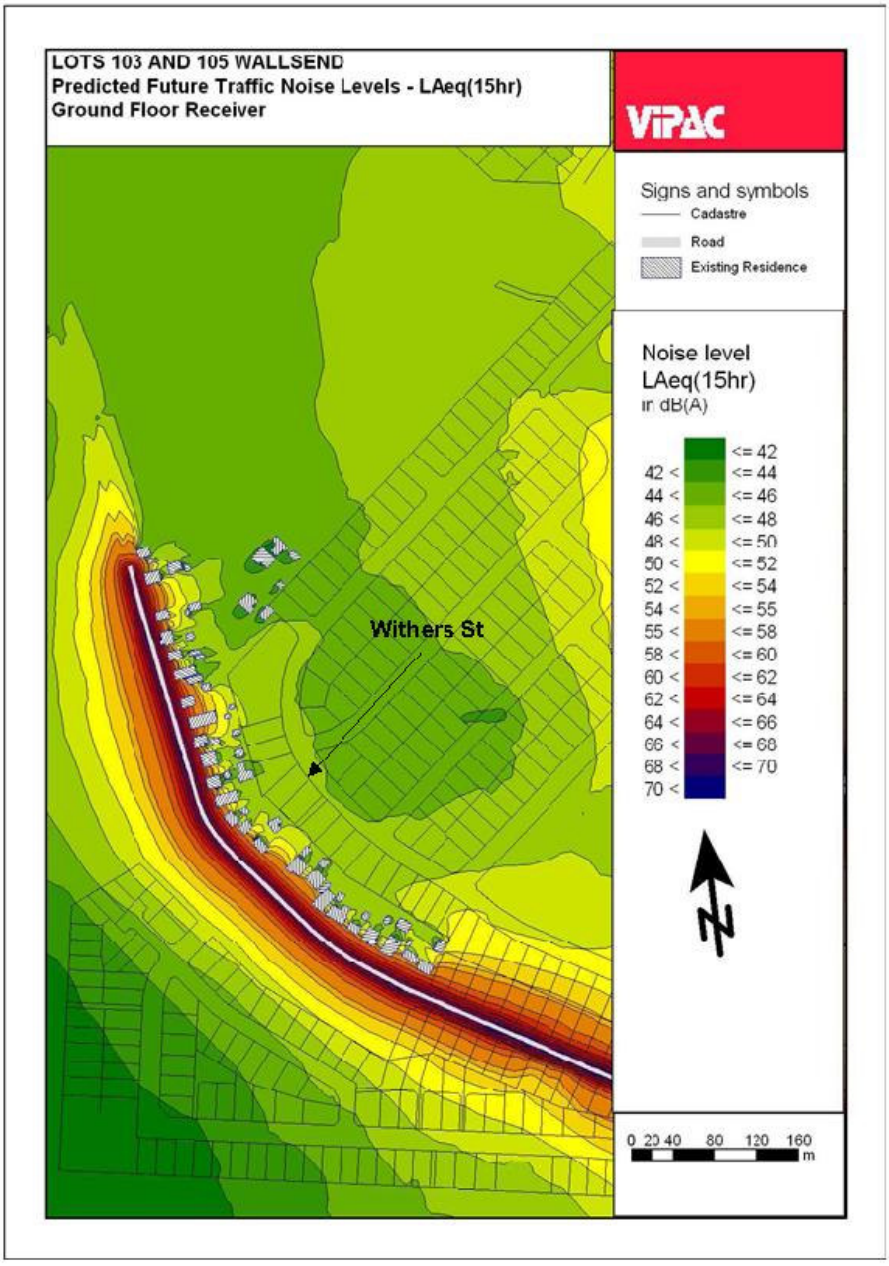
It is VIPAC's opinion that development of housing on the subject land is acceptable provided the recommendations outlined in this report are implemented. This consists of façade treatment of the dwellings most affected by traffic noise, to be constructed to the requirements of AS2107 and AS3671.

APPENDIX A PROPOSED DEVELOPMENT LAYOUT



APPENDIX B NOISE CONTOUR MAPS

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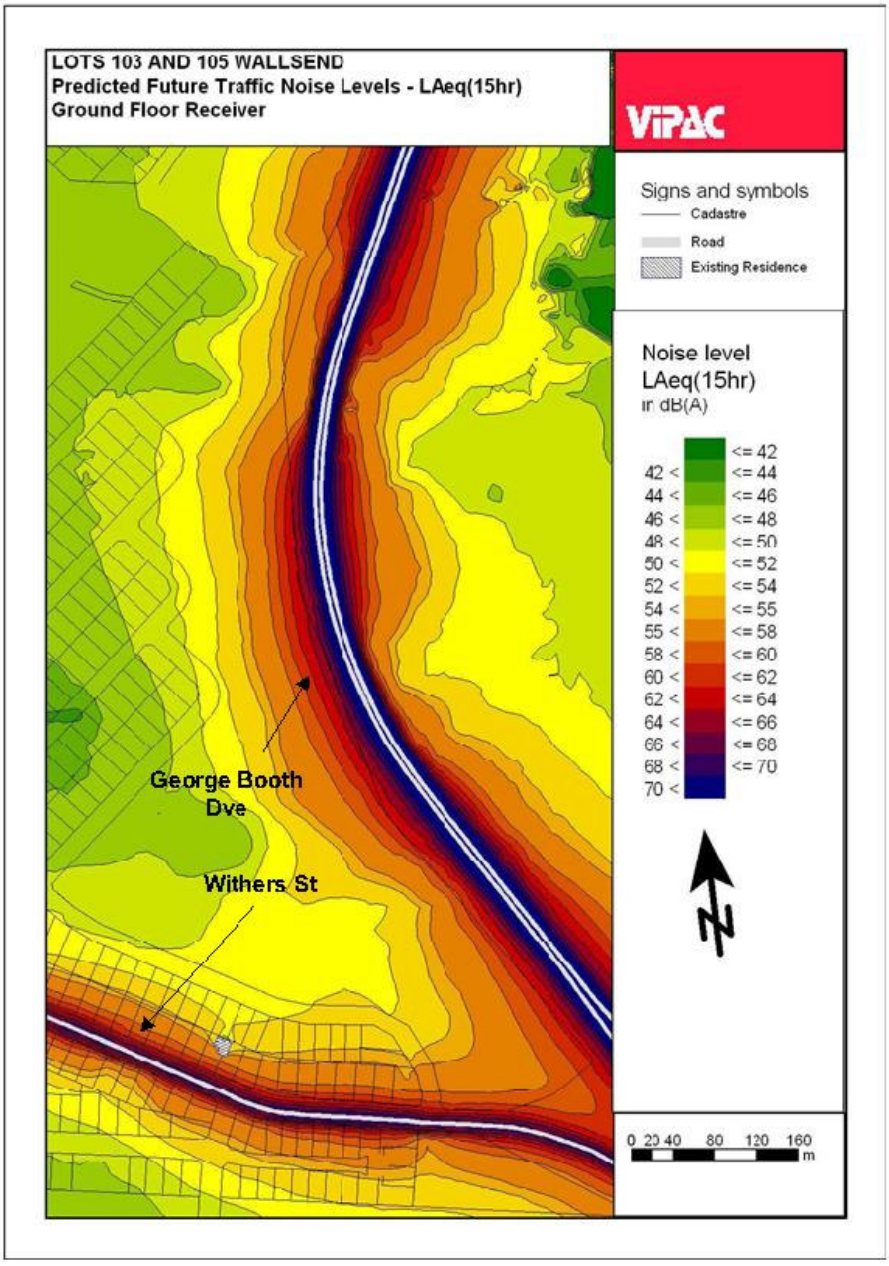
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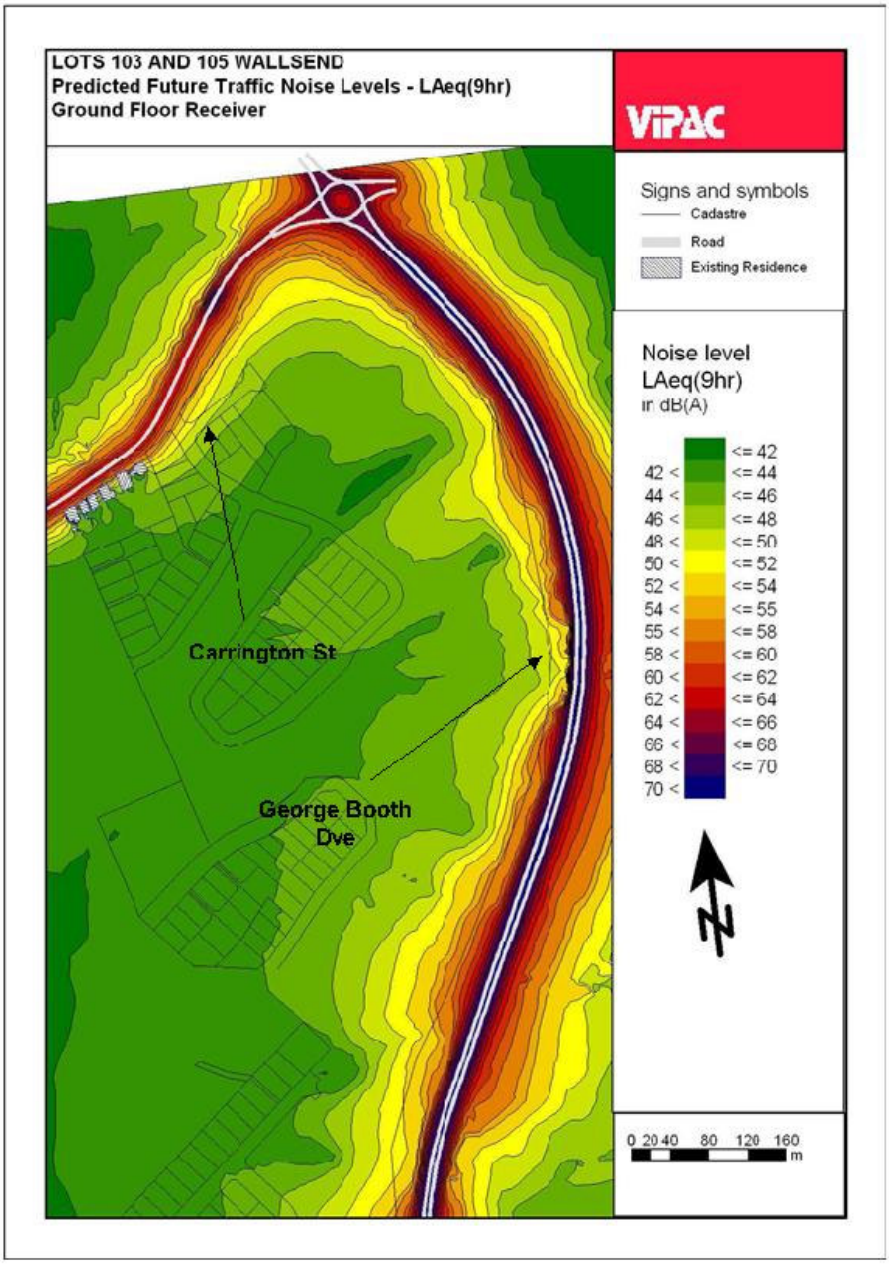
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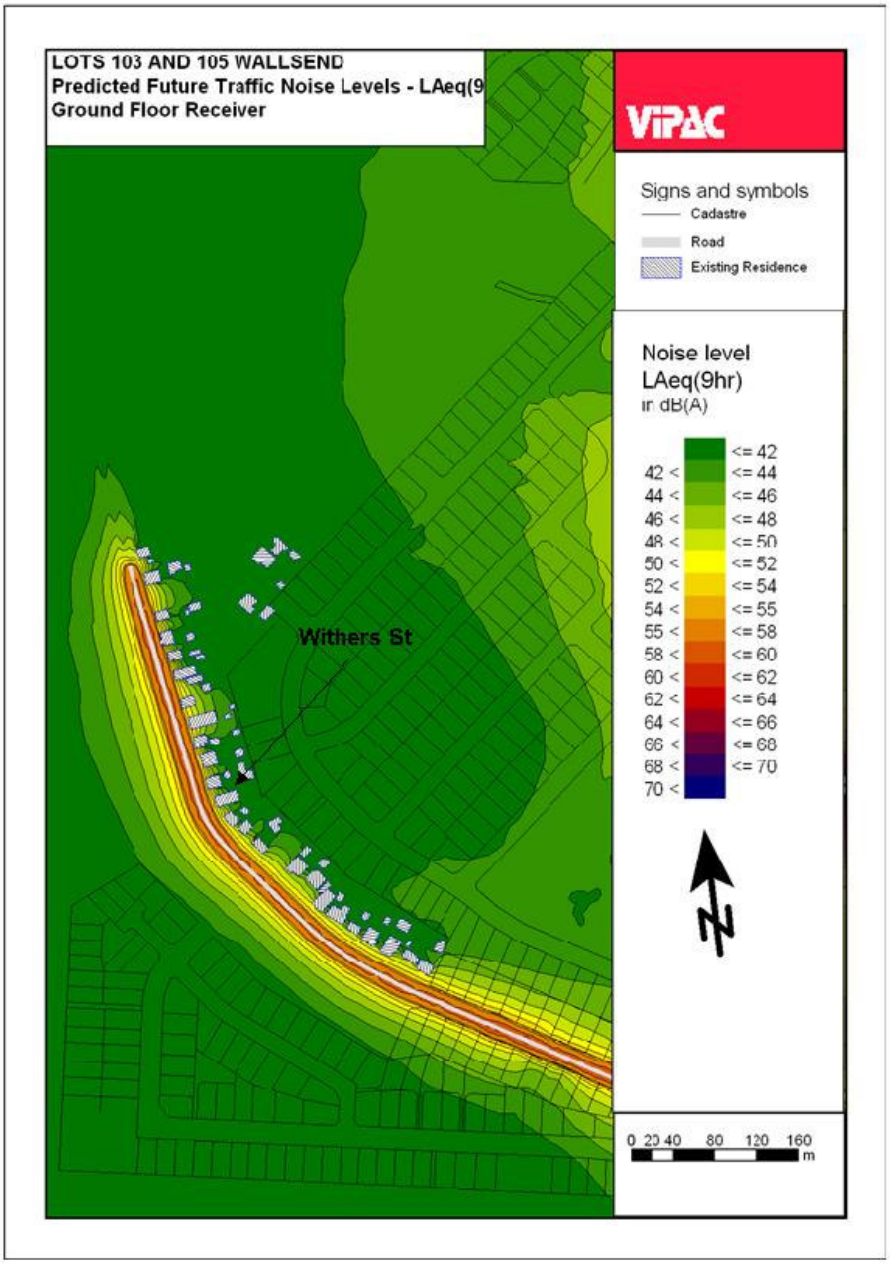
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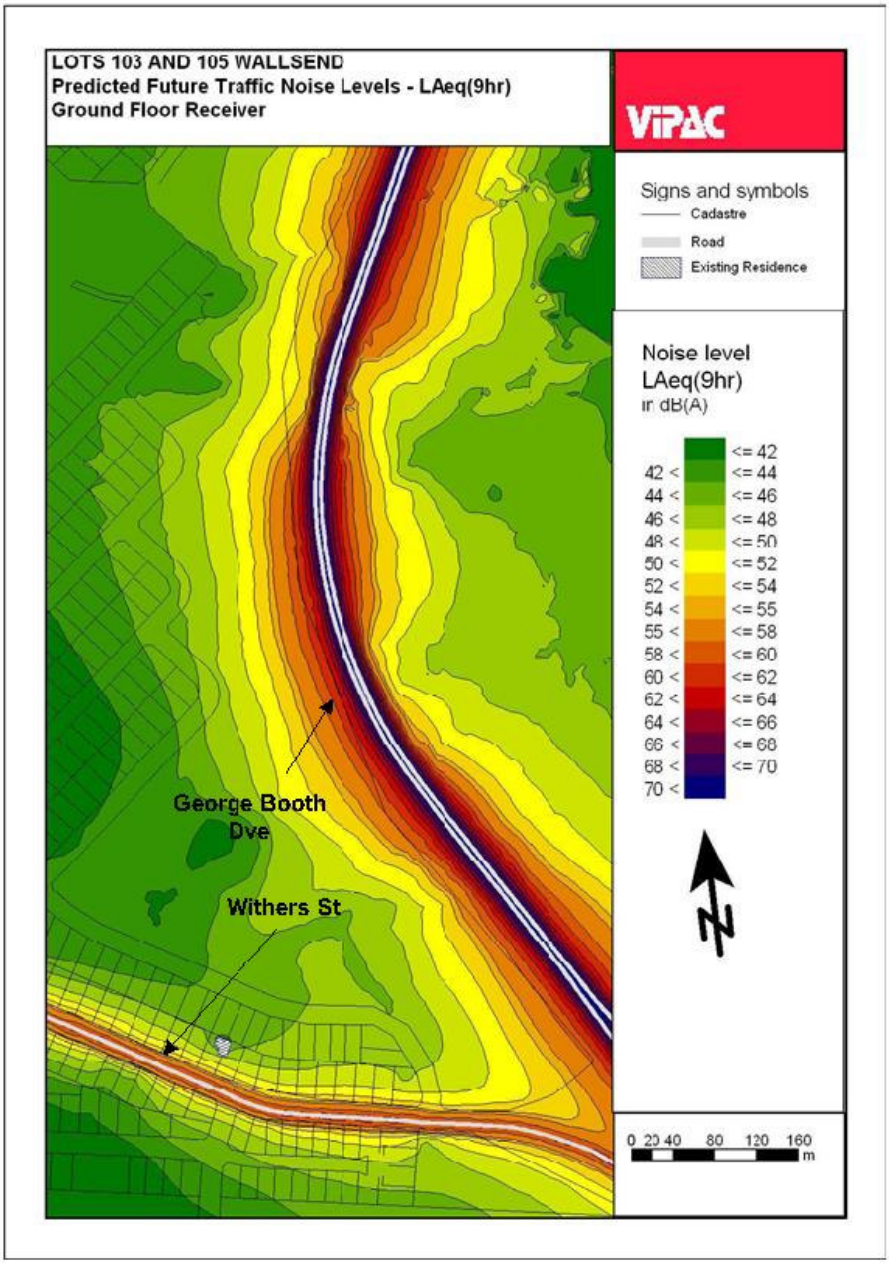
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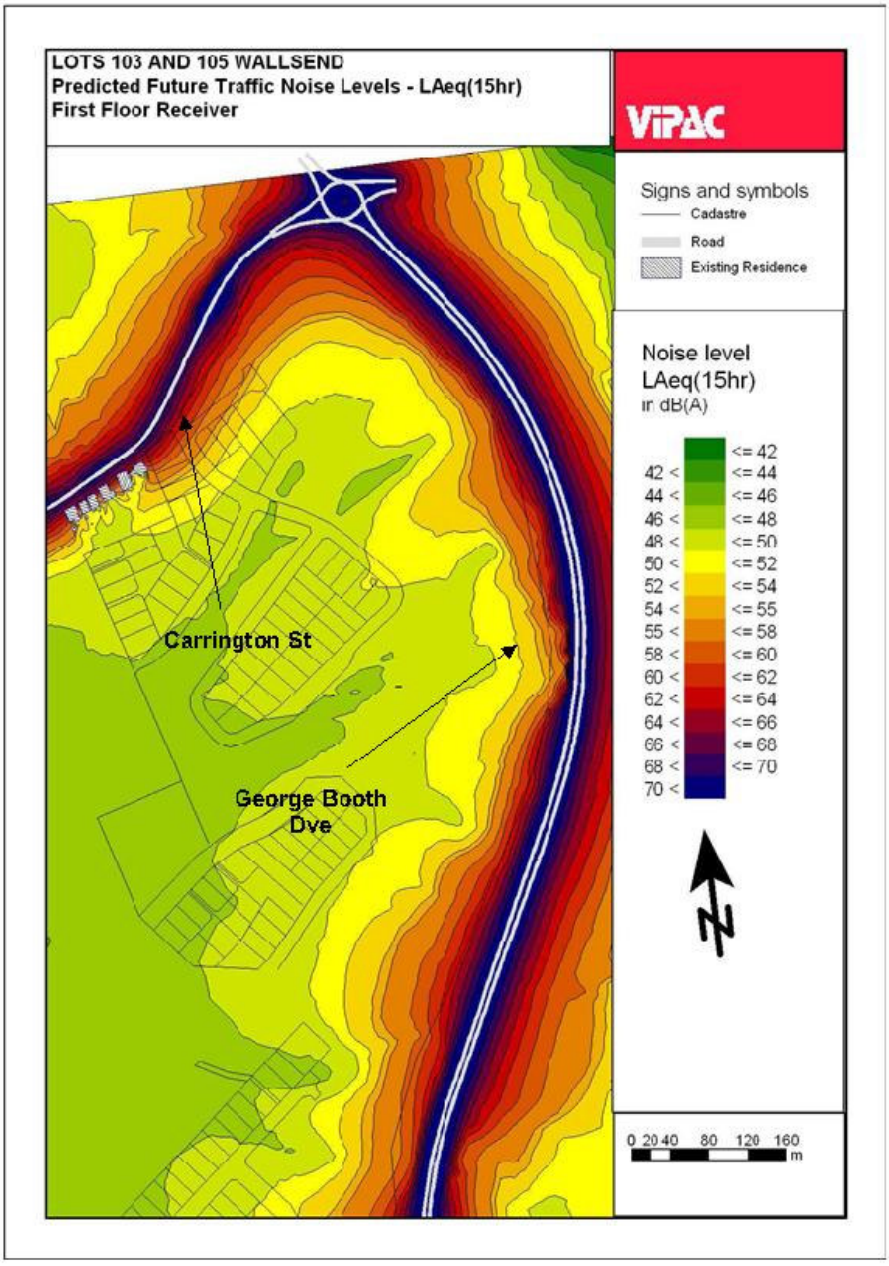
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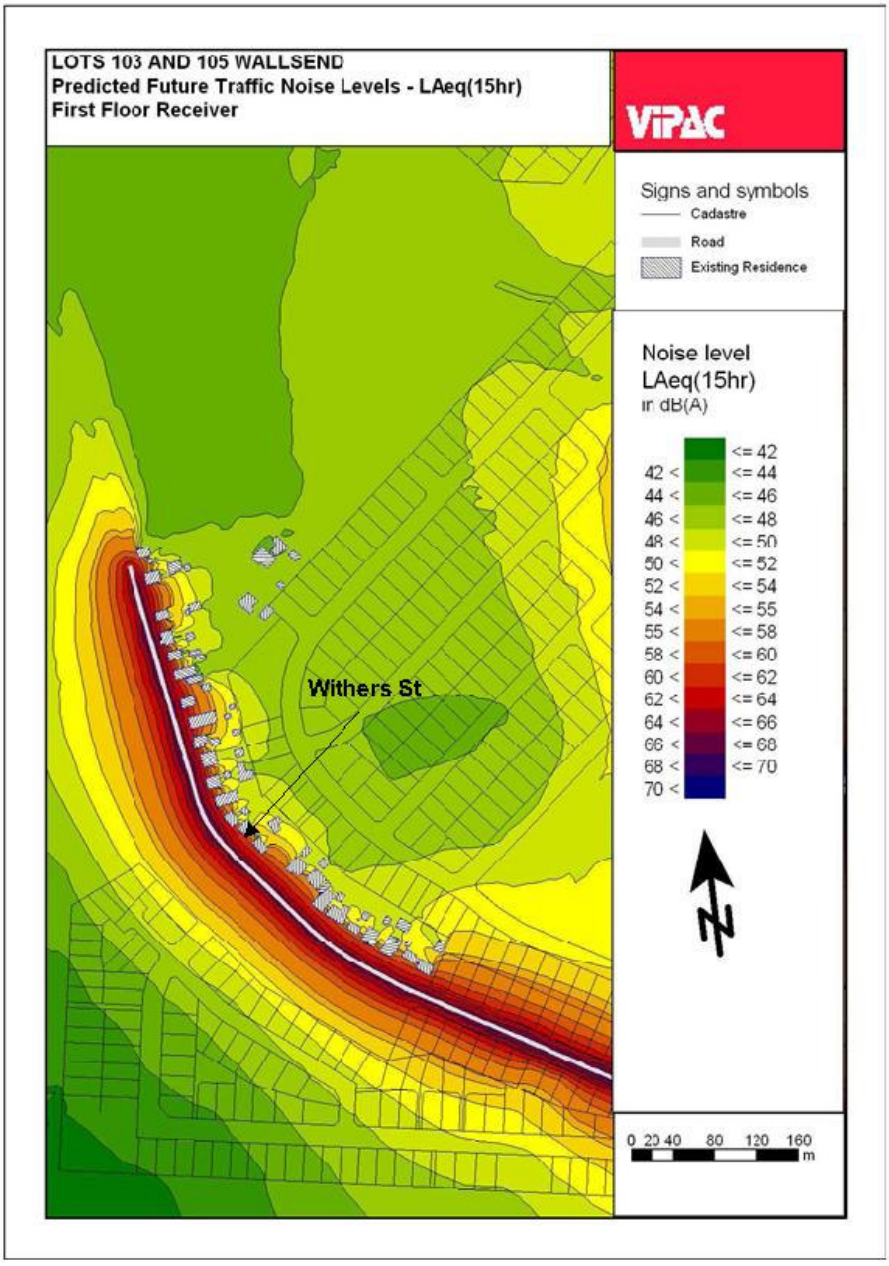
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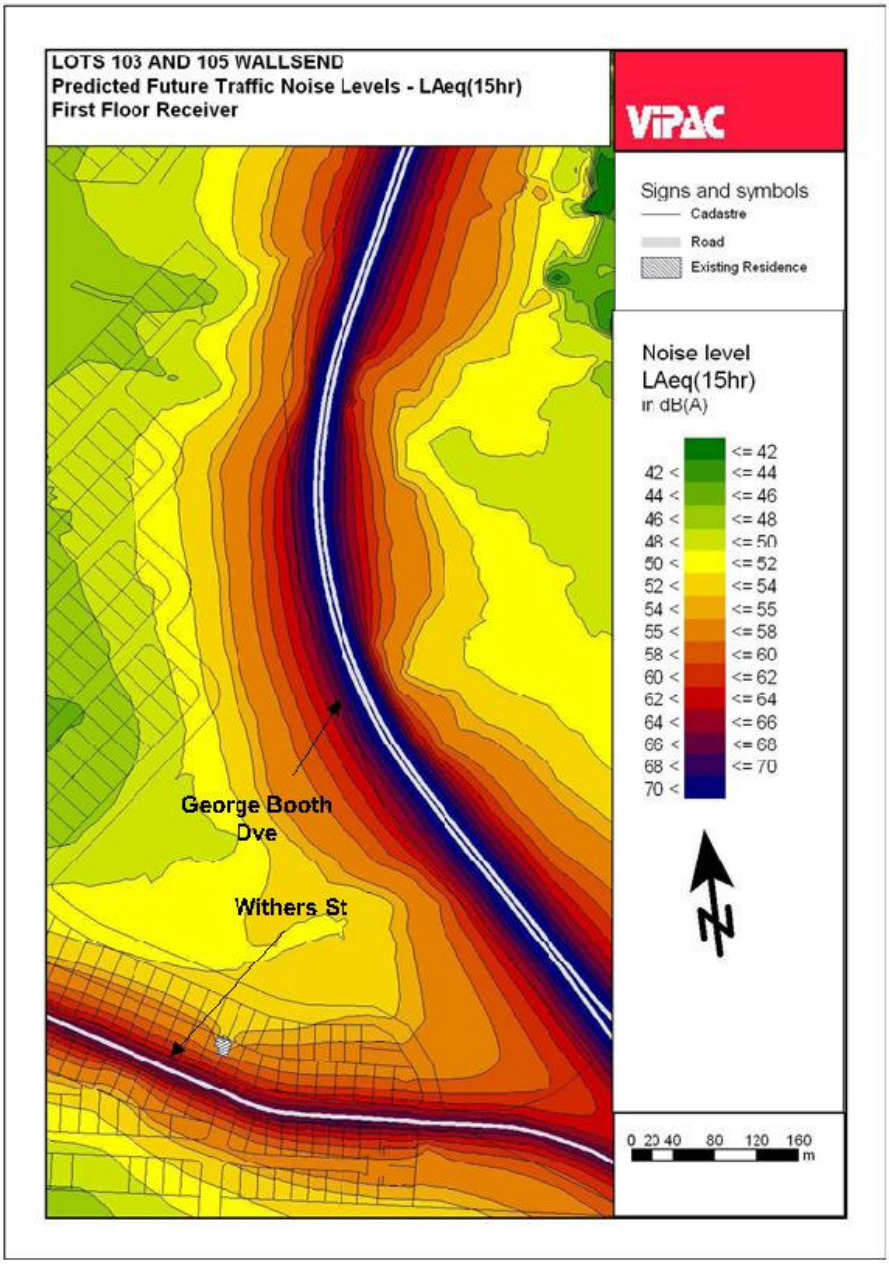
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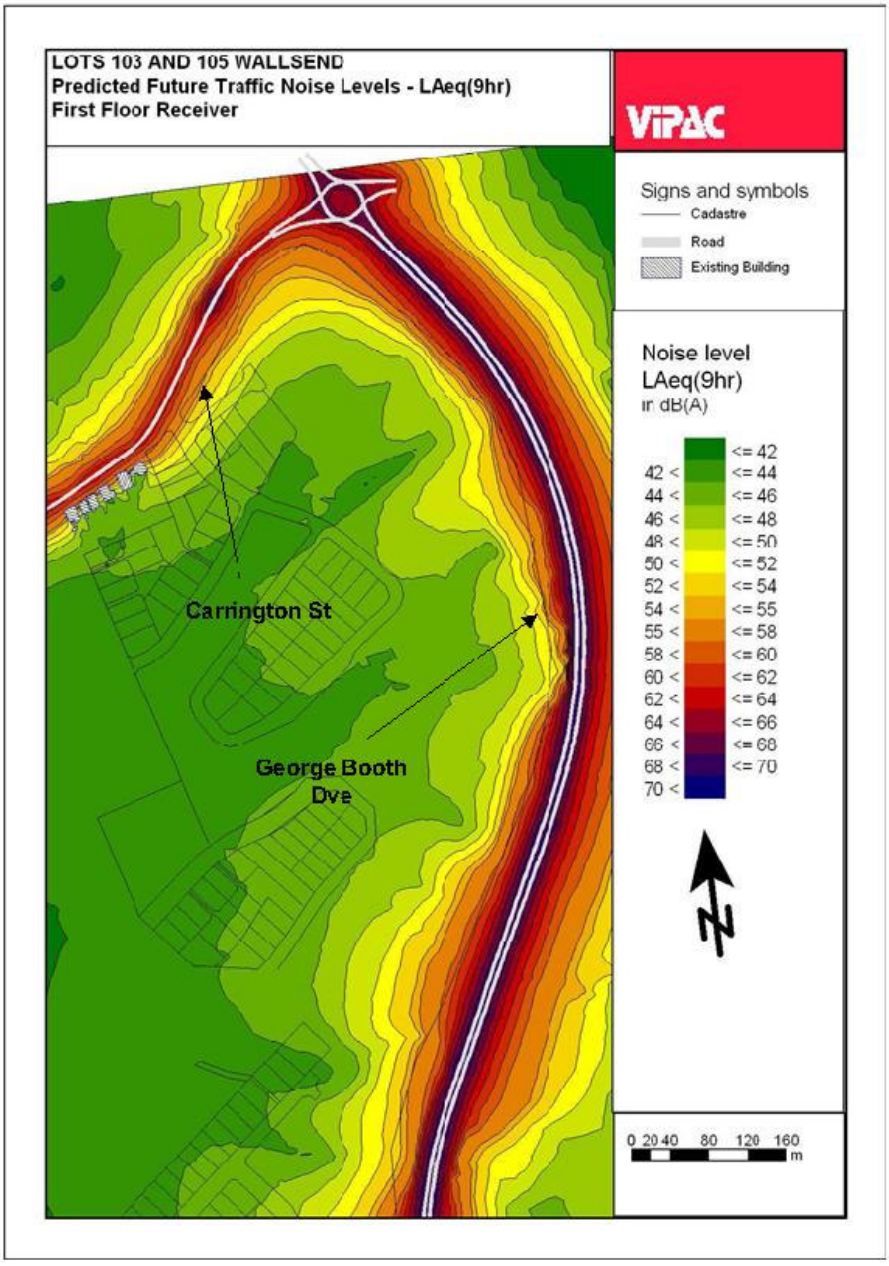
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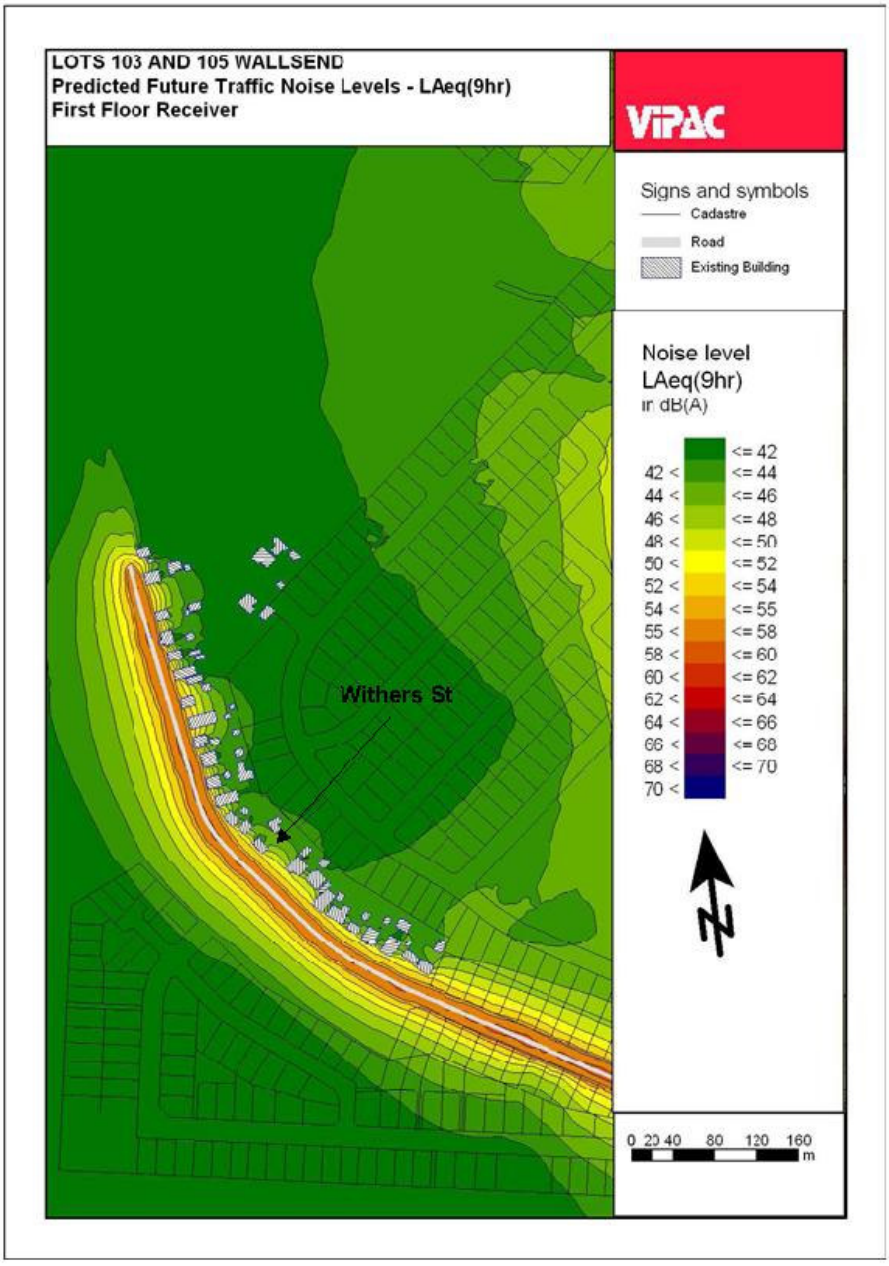
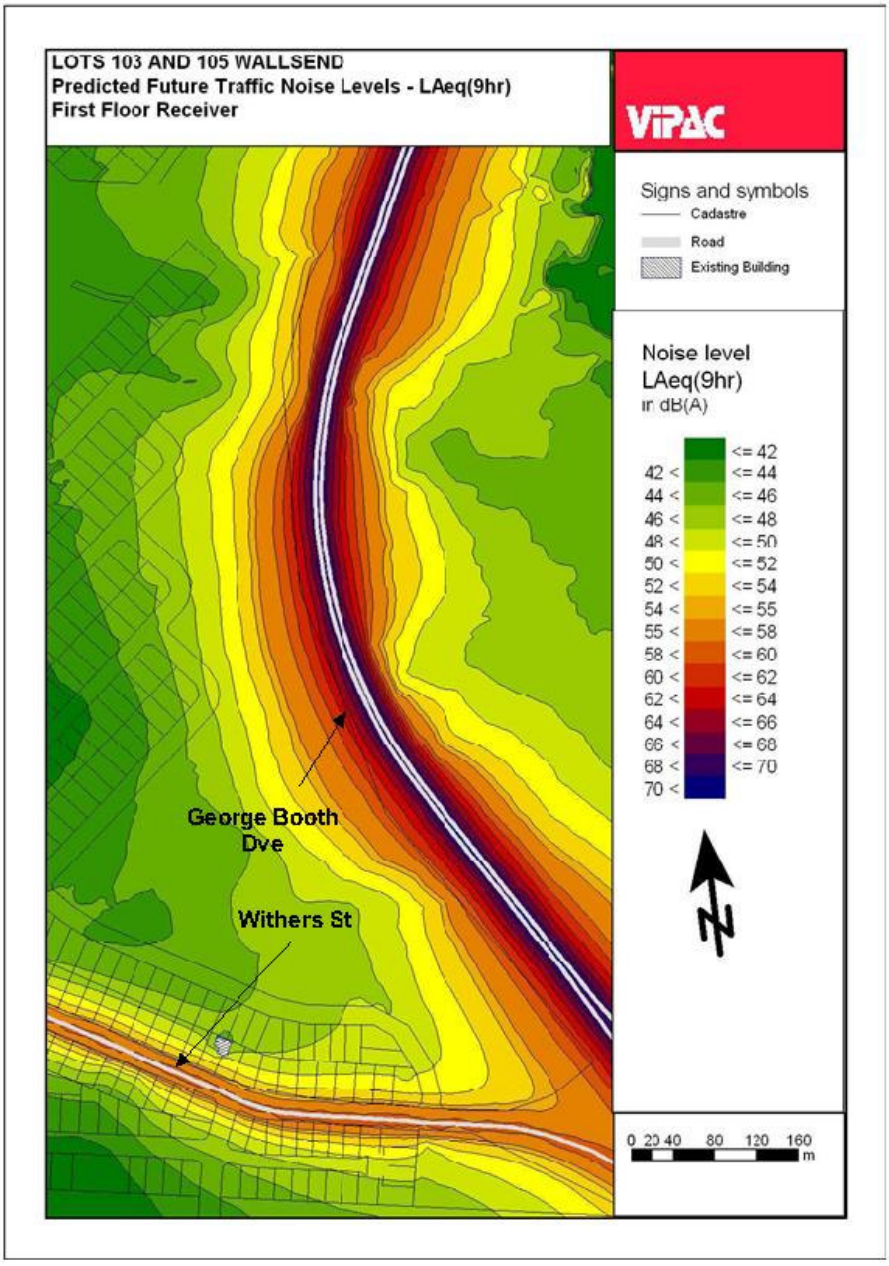
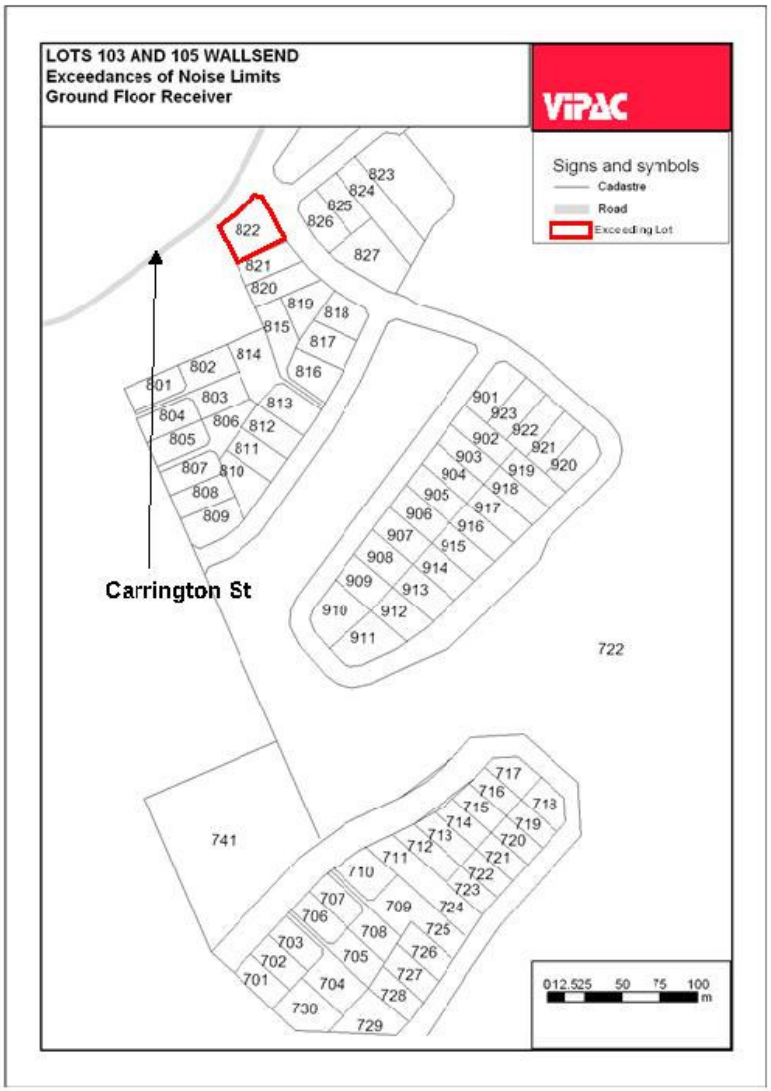
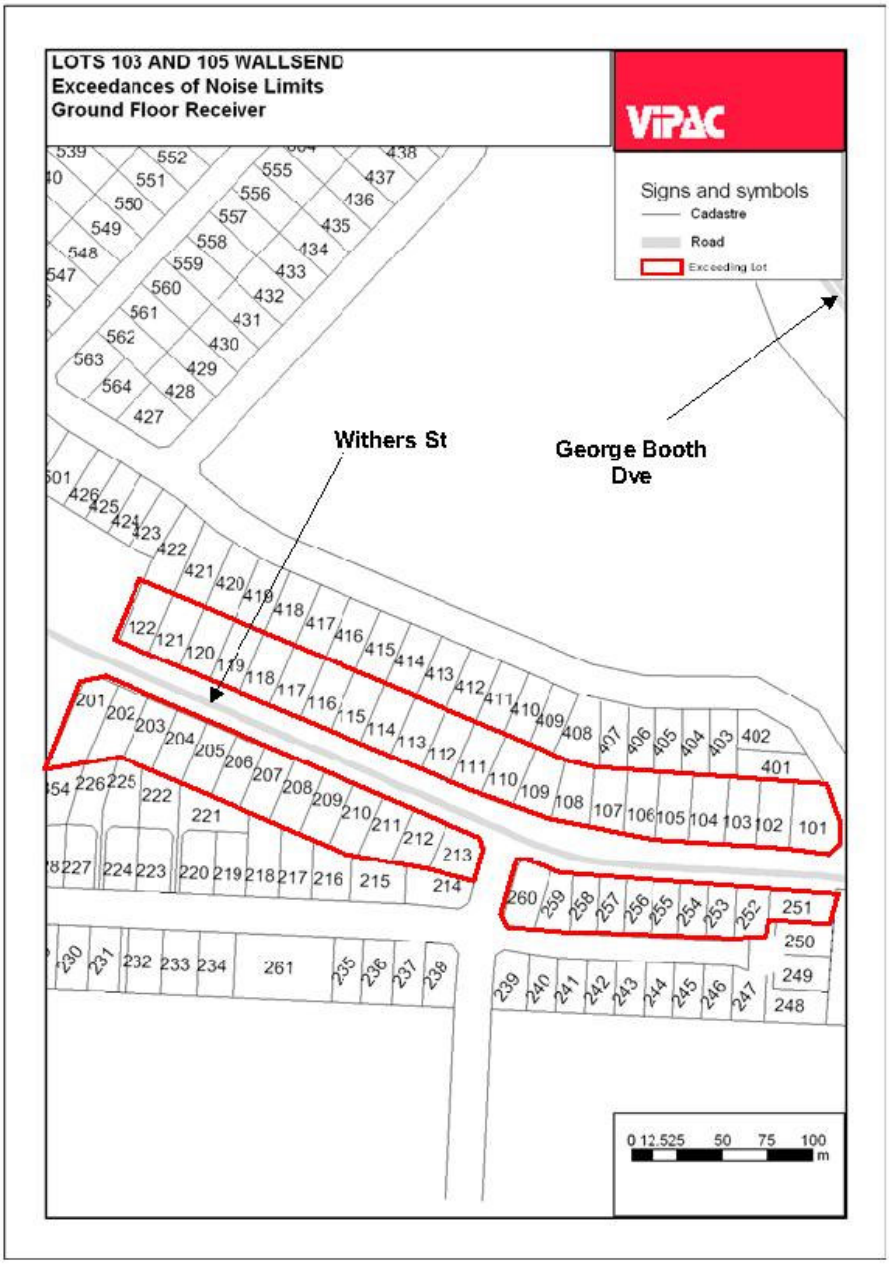
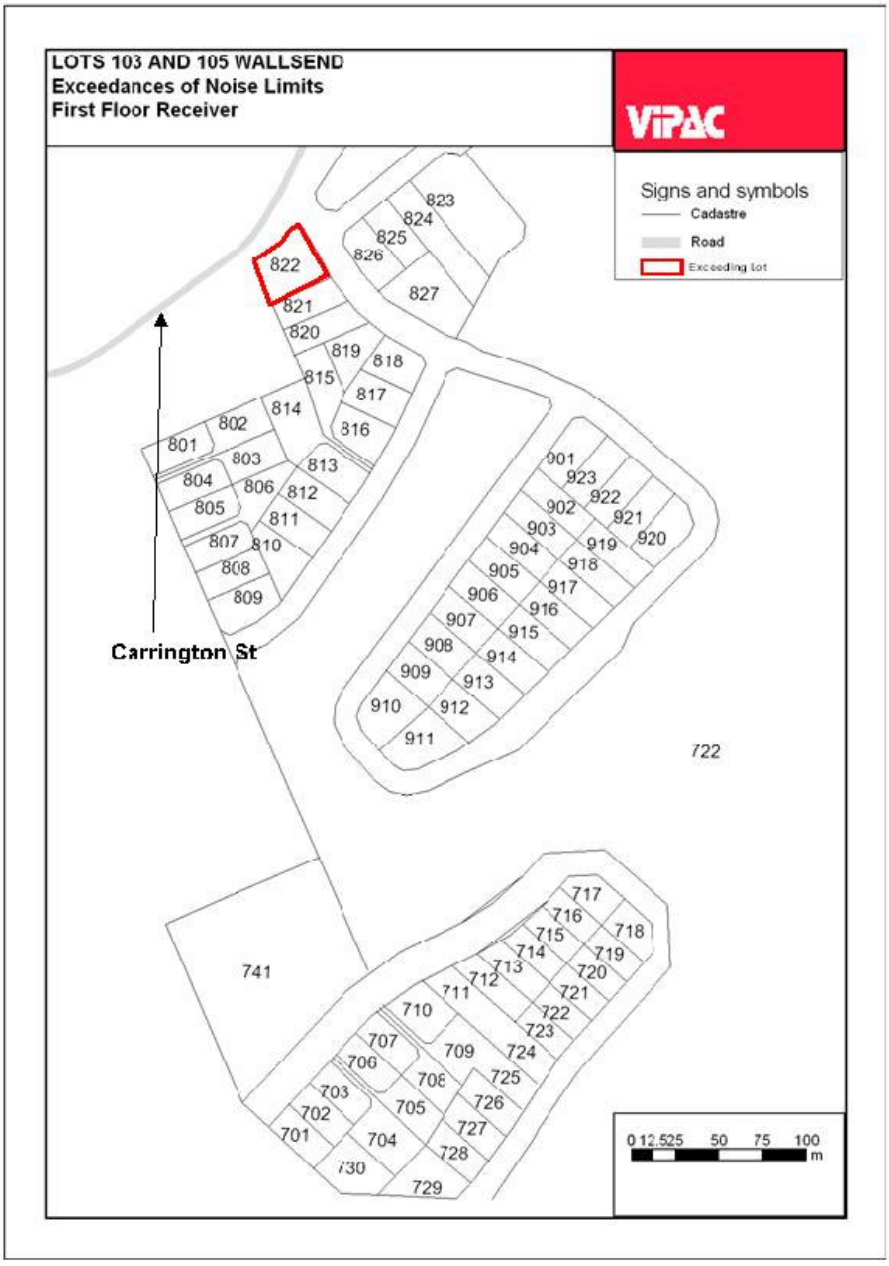

LOTS 103 AND 105 WALLSEND
Predicted Future Traffic Noise Levels - LAeq(9hr)
First Floor Receiver
VIPAC
Signs and symbols
Cadastre
Road
Existing Building
Noise level
LAeq(9hr)
in dB(A)
<= 42
42 < <= 44
44 < <= 46
46 < <= 48
48 < <= 50
50 < <= 52
52 < <= 54
54 < <= 55
55 < <= 58
58 < <= 60
60 < <= 62
62 < <= 64
64 < <= 66
66 < <= 68
68 < <= 70
70 <
Withers St
N
0 20 40 80 120 160
m

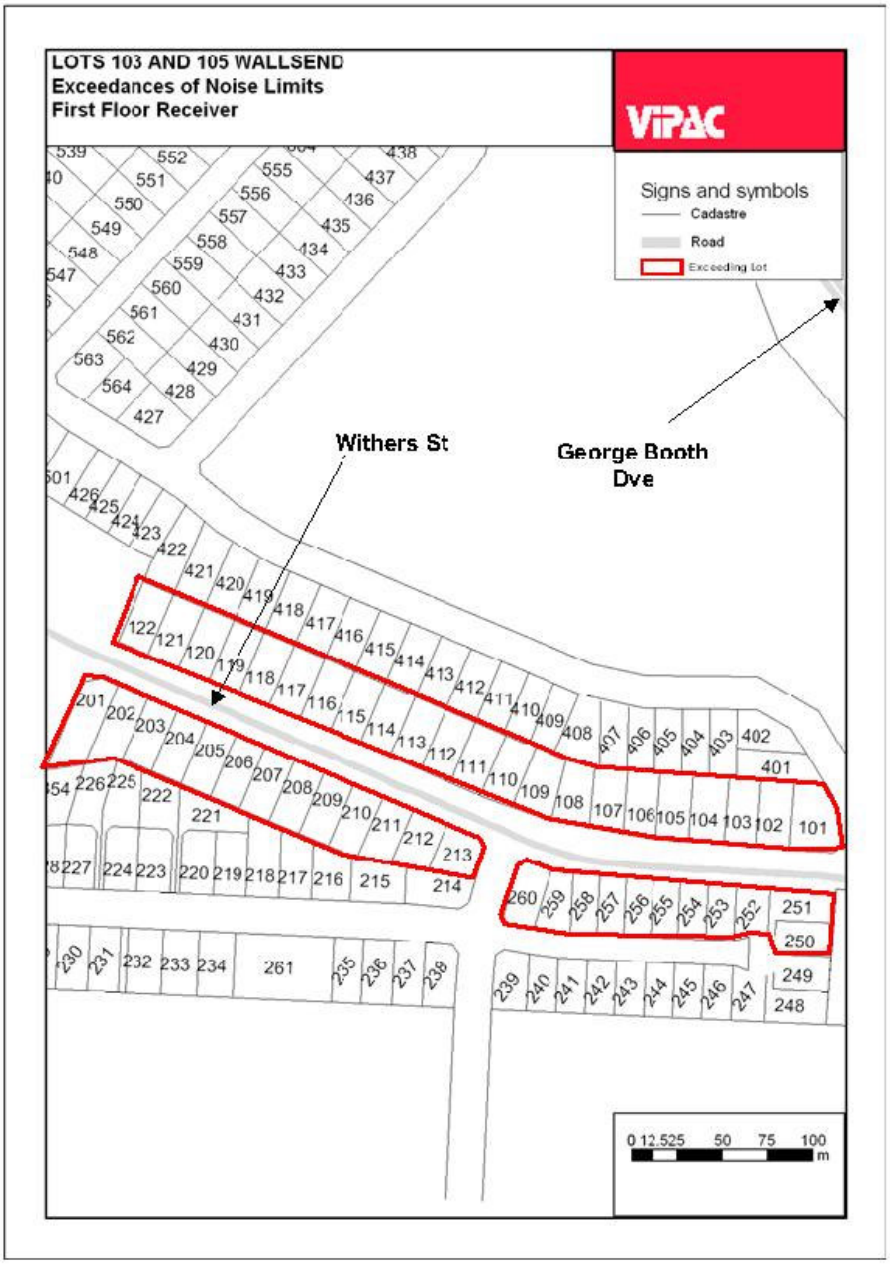

LOTS 103 AND 105 WALLSEND
Predicted Future Traffic Noise Levels - LAeq(9hr)
First Floor Receiver
VIPAC
Signs and symbols
Cadastre
Road
Existing Building
Noise level
LAeq(9hr)
in dB(A)
42 < <= 42
44 < <= 44
46 < <= 46
48 < <= 48
50 < <= 50
52 < <= 52
54 < <= 54
55 < <= 55
58 < <= 58
60 < <= 60
62 < <= 62
64 < <= 64
66 < <= 66
68 < <= 68
70 < <= 70
George Booth Dve
Withers St
N
0 20 40 80 120 160
m

APPENDIX C EXCEEDANCES OF NOISE LIMITS




LOTS 103 AND 105 WALLSEND
Exceedances of Noise Limits
Ground Floor Receiver
Signs and symbols
Cadastre
Road
Exceeding lot
Withers St
George Booth Dve
0 12.525 50 75 100 m


LOTS 103 AND 105 WALLSEND
Exceedances of Noise Limits
First Floor Receiver
Signs and symbols
Cadastre
Road
Exceeding lot
Carrington St
0 12.525 50 75 100
m


LOTS 103 AND 105 WALLSEND
Exceedances of Noise Limits
First Floor Receiver
VIPAC
Signs and symbols
Cadastre
Road
Exceeding lot
Withers St
George Booth Dve
0 12.525 50 75 100
m

APPENDIX D GLOSSARY OF TERMS

Table 8 below contains the definitions of commonly used acoustical terms and is presented as an aid to understanding the Report.

Table 8: Definition of Acoustical Terms

Term	Definition
L_{Aeq}	Equivalent Continuous Noise Level - which, lasting for as long as a given noise event has the same amount of acoustic energy as the given event.
L_{A10}	The noise level, which is equalled or exceeded for 10% of the measurement period.
L_{A90}	The noise level, which is equalled or exceeded for 90% of the measurement period. An indicator of the mean minimum noise level, and is used in Australia as the descriptor for background or ambient noise.
$L_{Aeq\ 15hrs}$	The L_{eq} noise level for the period 7am to 10pm
$L_{Aeq\ 9hrs}$	The L_{eq} noise level for the period 10pm to 7am
$L_{Aeq,1hr}$	The highest tenth percentile hourly A-weighted L_{eq} during the period 7am to 10pm or the period 10pm to 7am (whichever is relevant).
$L_{A10,18hrs}$	The L_{10} noise level for the period 6am to midnight.

Attachment E

JBA PLANNING – RESPONSE TO SMALL LOT HOUSING (SEPP 1 OBJECTION)

11793
23 May 2012

Wes van der Gardner
General Manager - Development
Roche Group Pty Ltd
365 New South Head Road
DOUBLE BAY NSW 360

Dear Wes,

RESPONSE TO PLANNING REPORT
WEST WALLSEND RESIDENTIAL SUBDIVISION (DA 113/2011)

As requested, we have reviewed the Planning Report prepared by Maddy and Doyle and make the following observations specifically in regard to section 5 – Small Lot Housing of the Report:

- The Report fails to adequately consider the broader objectives for small lot housing, and how they may apply to small lot housing within Lake Macquarie. The reference to Canterbury City Council's Development Control Plan 47 is obscure and irrelevant in that:
  - The DCP defines small lot housing as allotments that have a frontage of less than 10 metres; and,
  - The intention of the DCP is to ensure quality design outcomes for housing on narrow lots within an existing urban area, being a defined geographic location known as Richmond Grove Estate, Eastwood.

  There are a number of like controls across Sydney whose principles and objectives cannot be conveyed to a green field subdivision in Lake Macquarie.

- The Report suggests that the SEPP 1 objection does not refer to the objective of the standard. There is no nominated objective in the LEP and objectives from other LEPs in NSW cannot simply be imported into the LEP. Accordingly the SEPP 1 objection refers to and addresses the inferred objective (page 11). This is a valid and acceptable approach.

- There are clear objectives within Lake Macquarie, and other regional LGAs, to provide a greater diversity in housing types, however the assumption that this will correlate to improving affordability is not a simple matter. The applicant has provided evidence that building dwellings on smaller allotments does not automatically result in a more affordable outcome, nor does it necessarily result in greater housing diversity. To dismiss this evidence is unreasonable, particularly where no contrary professional review by an economist or real estate specialist is provided.

- SEPP 1 requires an applicant to address whether strict compliance would hinder the achievement of certain aims of the EP&A Act, namely:

  (ii) the promotion and co-ordination of the orderly and economic use and development of land…

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The Report states that market and economic viability is not a valid ground for consideration in a SEPP 1. We disagree and submit that strict compliance with a development standard which promotes an uneconomic and unviable landuse will tend to work against the promotion of the orderly and economic use and development of land. On this basis, the market and economic feasibility of a certain type of housing and landuse cannot and should not be discounted.

- The Report does not acknowledge the amount of smaller conventional lots (between 450 -550 m²) that are being provided (~ 3% of lots) and the fact that owners of each of these lots can simply obtain dwelling approvals by way of NSW wide Housing Code. This will add to certainty of outcome and the reduction of cost in the provision of housing.

Should you have any queries about this matter, please do not hesitate to contact me on 9409 4946 or aduggan@jbaplanning.com.au.

Yours faithfully

Andrew Duggan
Director