

PLEASURE POINT DEVELOPMENT

Subdivision DA Acoustic Assessment

28 August 2024

Hodge Developments Pty Ltd

TN797-02F02 DA Acoustic Assessment Report (r2)

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We have prepared this report in accordance with the usual care and thoroughness of the consulting profession, for the sole purpose described above and by reference to applicable standards, guidelines, procedures, and practices at the date of issue of this report. For the reasons outlined above, however, no other warranty or guarantee, whether expressed or implied, is made as to the data, observations and findings expressed in this report, to the extent permitted by law.

The information contained herein is for the purpose of acoustics only. No claims are made, and no liability is accepted in respect of design and construction issues falling outside of the specialist field of acoustics engineering including and not limited to structural integrity, fire rating, architectural buildability, and fit-for-purpose, waterproofing and the like. Supplementary professional advice should be sought in respect of these issues.

Contents

1	Introduction	5
1.1	References	5
2	Project Overview	6
3	Assessment methodology	8
4	Noise criteria	9
4.1	City of Liverpool Council DCP 2008	9
4.2	City of Liverpool Council Pre-DA Meeting	9
4.3	SEPP (Transport and Infrastructure) 2021	10
4.4	Department of Planning Publication 'Development near rail corridors and busy roads - Interim guideline'	10
4.5	Supplementary ventilation	11
5	Traffic Noise Measurements	12
6	Noise Modelling and Predictions	13
6.1	Prediction methodology	13
6.2	Results	14
7	Noise control treatment recommendations	15
7.1	Building Façade Upgrades	15
7.2	External Walls	16
7.3	Roof	17
7.4	External doors	17
7.5	Acoustic Barriers	17
7.6	Mechanical ventilation	18
8	Conclusion	19
APPENDIX A	Glossary of terminology	20
APPENDIX B	Noise modelling results	22
APPENDIX C	Acoustic treatments categories	23
APPENDIX D	Noise monitoring data	24

List of tables

Table 4-1:	DoP Guideline Internal Noise Levels	10
Table 4-2:	DoP Guideline – Trigger for Provision of Supplementary Ventilation	11
Table 5-1:	Representative Day and Night Traffic Noise Levels, $L_{eq, period}$	12
Table 6-1:	Summary of modelling inputs	13
Table 7-1:	Category 1 – Marked Red in APPENDIX C	15
Table 7-2:	Category 2 – Marked Dark Blue in APPENDIX C	15
Table 7-3:	Category 3 – Marked Light Blue in APPENDIX C	16

Table 7-4: Category 4 – Marked Yellow in APPENDIX C

1 Introduction

Renzo Tonin & Associates was engaged to undertake a noise impact assessment of the proposed residential sub-division (approximately 500 lots) at Lot 1 DP875804 and Lot 2 DP817692 at Pleasure Point.

This report has been prepared to address the acoustic requirements of *SEPP (Transport and Infrastructure) 2021* and *Development Near Rail Corridors and Busy Roads – Interim Guideline*.

The purpose of this assessment is to determine existing road traffic, rail and surrounding noise levels at site, to demonstrate that the proposed subdivision development is capable of meeting acoustic requirements with respect to internal noise levels and determine appropriate building control treatments to ensure an acceptable level of internal acoustic amenity is achieved, in accordance with *SEPP (Transport & Infrastructure) 2021*.

The work documented in this report was carried out in accordance with the Renzo Tonin & Associates Quality Assurance System, which is based on Australian Standard / NZS ISO 9001.

APPENDIX A contains a glossary of acoustic terms used in this report.

1.1 References

- Pre-DA Council meeting minutes.
- NSW Government State Environmental Planning Policy (Transport and Infrastructure), 2021.
- NSW Department of Planning, Industry and Environment (DPIE). '*Development Near Rail Corridors and Busy Roads – Interim Guideline*', 2008.
- Final Master Plan sent by Sera Developments Pty Ltd, dated May 2024.

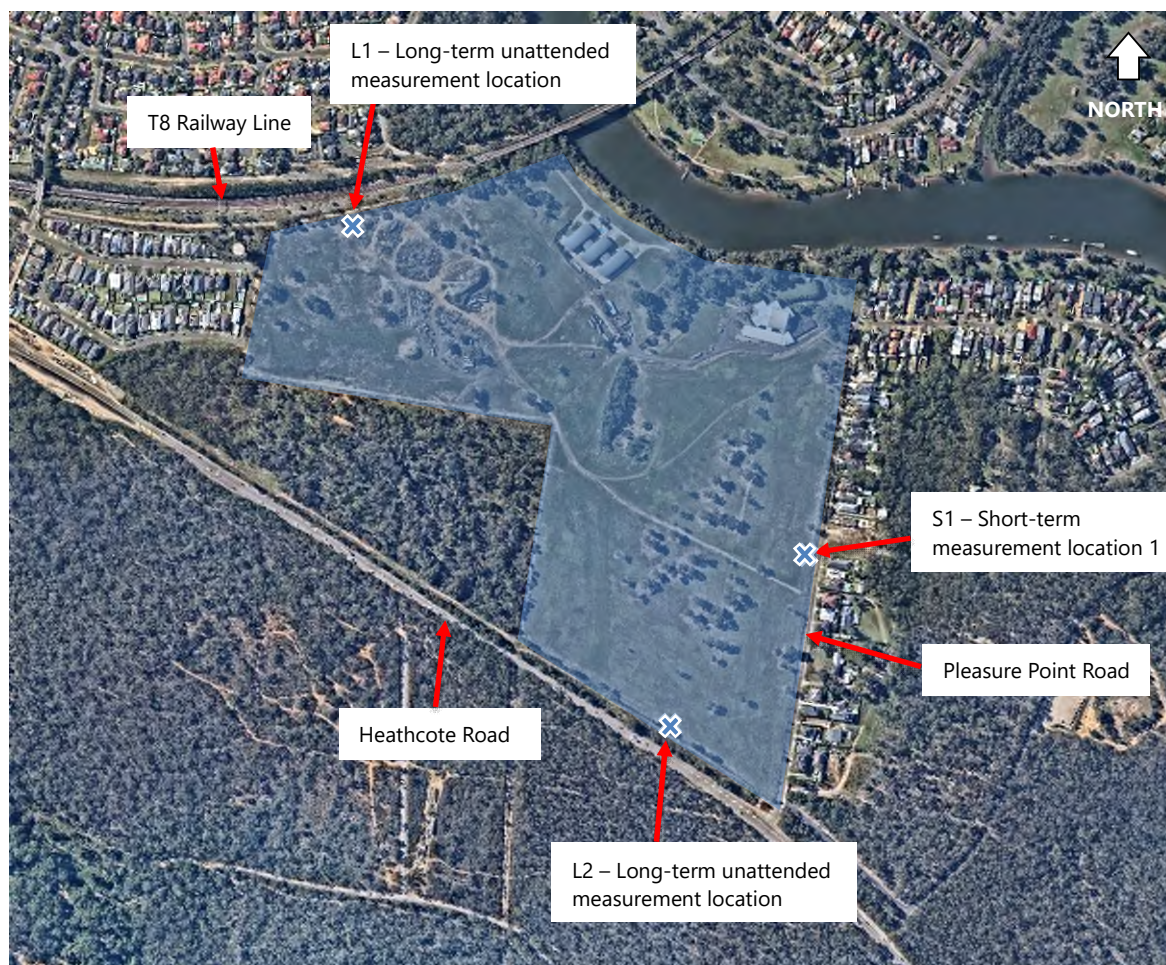
2 Project Overview

The DA seeks consent for construction of a subdivision with approximately 500 residential dwellings at Pleasure Point.

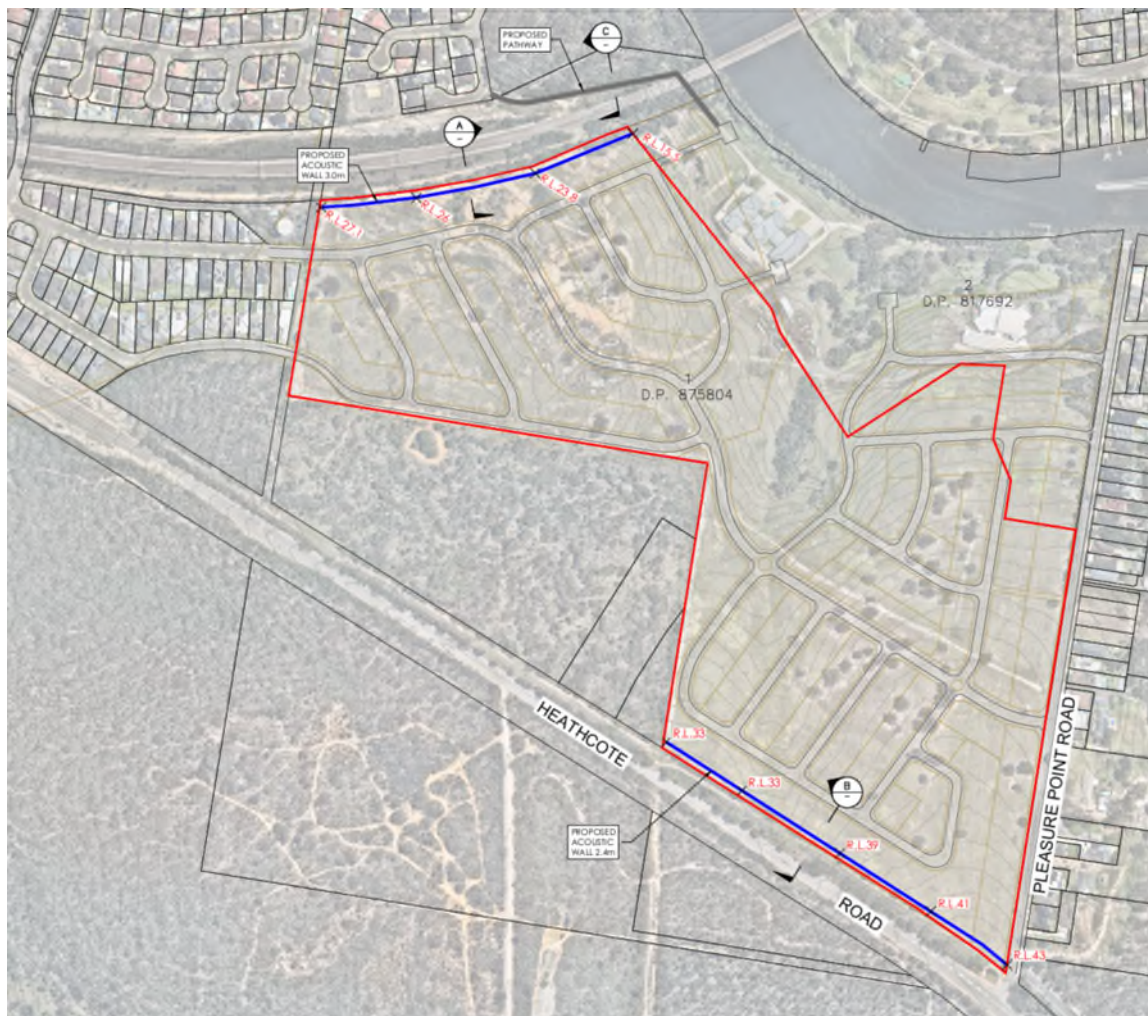
The subject site is located within the City of Liverpool Council local government area (LGA) in Pleasure Point. It will be bounded by a major road (Heathcote Road) to the South, a local road (Pleasure Point Road) to the East, a T8 railway line to the North and existing residential dwellings to the West.

Heathcote Road runs along the southern edge of the subdivision and the T8 railway line runs along the northern edge of the subdivision being the primary noise sources impacting the site.

Figure 2-1: Site Context



The DA also seeks to propose a 3m high acoustic barrier along the T8 railway line and a 2.4m high acoustic barrier along the Heathcote Road as shown in the Figure 2-2 below.

Figure 2-2: Proposed Acoustic Barrier Location

3 Assessment methodology

To assess the potential noise impact onto the proposed residential subdivision, the following methodology was used:

- A survey of the site was conducted and existing road traffic, rail and surrounding noise levels at the site measured using long and short-term noise logging.
- Using predictive noise modelling to determine the extent of noise impact from the surrounding road traffic and rail network at residential facades and areas designated as principal private open space.
- Determine acoustic treatment to ensure that suitable noise levels are achieved (both in internal areas and in private outdoor space).

4 Noise criteria

4.1 City of Liverpool Council DCP 2008

The City of Liverpool Council DCP 2008 does not set any numerical noise emission criteria relating to rail or traffic noise impact on a subdivision. Hence, to establish noise criteria for the site, The City of Liverpool Council Pre-DA meeting minutes has been utilised in this report.

4.2 City of Liverpool Council Pre-DA Meeting

Regarding the developments affected by noise from existing or possible future rail or traffic noise, Pre-DA meeting minutes on Road/Rail noise states:

Acoustics – Road/Rail

Council's records indicate that the proposed residential accommodation is located on land in or adjacent to a road corridor for a freeway, tollway, transitway or any other road with an annual average daily traffic (AADT) volume of more than 20,000 vehicles.

Consequently, the proposed development may be adversely impacted by noise or vibration. To address Division 17, Subdivision 2 of State Environmental Planning Policy (Transport and Infrastructure) 2021, the Development Application shall be supported by an acoustic report prepared by a suitably qualified acoustic consultant for the noise sensitive development.

Additionally, the proposed residential accommodation is located on land in or adjacent to a rail corridor that may be adversely impacted by noise or vibration. Division 15, Subdivision 2 of the SEPP infrastructure should also be addressed via the below mentioned acoustic report.

The acoustic report shall take into consideration any guidelines issued by the Director-General including the NSW Department of Planning document titled 'Development Near Rail Corridors and Busy Roads- Interim Guideline' dated December 2008. The development may generate additional traffic and affect existing residential or other noise-sensitive land uses. If required, road traffic noise impacts must be assessed in accordance with the 'NSW Road Noise Policy' prepared by the Department of Environment, Climate Change and Water NSW (DECCW NSW) dated March 2011.

Additionally, The acoustic report shall also take into consideration any guidelines issued by the Director-General including the NSW Department of Planning document titled 'Development Near Rail Corridors and Busy Roads- Interim Guideline' dated December 2008. The proposed development may generate additional traffic and affect existing residential or other noise-sensitive land uses. Therefore, road traffic noise impacts may need to be assessed in accordance with the 'NSW Road Noise Policy' prepared by the Department of Environment, Climate Change and Water NSW (DECCW NSW) dated March 2011.

Note: 'Suitably qualified acoustic consultant' means a consultant who possesses Australian Acoustical Society membership or are employed by an Association of Australasian Acoustical Consultants (AAAC) member firm.

The report's cover or title page must confirm membership details or include a watermark for the relevant certification body.

Council is unable to recommend specific consultants or auditors.

4.3 SEPP (Transport and Infrastructure) 2021

Section 2.119 of the SEPP states:

(1) This section applies to development for any of the following purposes that is on land in or adjacent to the road corridor for a freeway, a tollway or a transitway or any other road with an annual average daily traffic volume of more than 20,000 vehicles (based on the traffic volume data published on the website of TfNSW) and that the consent authority considers is likely to be adversely affected by road noise or vibration—

- (a) residential accommodation,*
- (b) a place of public worship,*
- (c) a hospital,*
- (d) an educational establishment or centre-based childcare facility.*

(2) Before determining a development application for development to which this section applies, the consent authority must take into consideration any guidelines that are issued by the Secretary for the purposes of this section and published in the Gazette.

(3) If the development is for the purposes of residential accommodation, the consent authority must not grant consent to the development unless it is satisfied that appropriate measures will be taken to ensure that the following LAeq levels are not exceeded—

- (a) in any bedroom in the residential accommodation—35 dB(A) at any time between 10 pm and 7 am,*
- (b) anywhere else in the residential accommodation (other than a garage, kitchen, bathroom, or hallway)—40 dB(A) at any time.*

4.4 Department of Planning Publication 'Development near rail corridors and busy roads - Interim guideline'

The Guideline provides direction for developments that may be impacted by rail corridors and/or busy roads and consideration for the Guideline is a requirement for development specified under the SEPP.

The Guideline recommends an acoustic traffic assessment be undertaken for roads having an AADT of greater than 20,000 and less than 40,000 vehicles per day and states an assessment is mandatory for roads having an AADT of greater than 40,000 vehicles per day.

The internal noise goals determined in the Guideline are presented below.

Table 4-1: DoP Guideline Internal Noise Levels

Condition	Occupancy	Design Internal Noise Level
Windows closed	Bedroom (10pm – 7am)	35 dB(A) Leq 9hr
	Living / Dining /Kitchen (24 hours)	40 dB(A) Leq 15hr

4.5 Supplementary ventilation

The Department of Planning guideline refers to acoustic criteria with “window open”, and in the event the windows open criteria are not complied with, this serves as a trigger for whether supplementary ventilation (fresh air) must be supplied to the dwellings.

Table 4-2: DoP Guideline – Trigger for Provision of Supplementary Ventilation

Condition	Occupancy	Trigger level for Supplementary Ventilation
Internal Spaces - Windows open	Bedroom (10pm – 7am)	45 dB(A) L_{eq} 9hr
	Living / Dining /Kitchen (24 hours)	50 dB(A) L_{eq} 15hr

5 Traffic Noise Measurements

Renzo Tonin & Associates conducted unattended noise monitoring at the site from 21/03/2024 to 27/03/2024.

Measurements were conducted using an XL2 type one sound analyser and RTA Technology Environmental Noise Loggers. The calibration was checked at the beginning and end of the measurement period.

Also, a simultaneous attended measurement was taken 7m from the middle of the Pleasure Point Road on 13/03/2024 with the microphone 1.5m above the ground to determine noise levels of the road.

Measurement locations are shown in Section 2.

The measured traffic noise levels for the daytime (7am to 10pm) and night-time (10pm-7am) periods are presented in the below.

Table 5-1: Representative Day and Night Traffic Noise Levels, $L_{eq, period}$

Address	Logger Location	Measured Traffic Noise Level (dB(A) $L_{eq, period}$)	
		Day ¹	Night ¹
Pleasure Point	L1 – approximately 20m from the corridor of T8 Railway Line, 1.5m above ground.	51	47
	L2 – approximately 32m from the middle of Heathcote Road, 1.5m above ground.	64	61
	S2 – approximately 7m from the middle of Pleasure Point Road, 1.5m above ground.	63	59

Note: 1. Day is defined as 7am to 10pm; Night is defined as 10pm to 7am

6 Noise Modelling and Predictions

6.1 Prediction methodology

Noise predictions are based on a method developed by the United Kingdom Department of Environment entitled '*Calculation of Road Traffic Noise (1988)*' known as the CoRTN (1988) method. The method has been adapted to Australian conditions and extensively tested by the Australian Road Research Board. As a result, it is recognised and accepted by the NSW Environment Protection Authority (EPA). The model predicts noise levels for steady flowing traffic and adjustments have been made to account for the higher source locations associated with heavy vehicle engines and exhausts.

Noise modelling for the project was carried out using CadnaA software, which applies the CoRTN algorithms. The noise level calculations consist of a source model and a propagation calculation. The software generates noise contours by performing point receiver calculations on a grid of points across the assessment area. The noise prediction model considers the following:

Table 6-1: Summary of modelling inputs

Input parameters	Input used
Source height	0.5m for car engines, exhaust, and car & truck tyres, 1.5m for truck engines and 3.6m for truck exhaust as detailed within CoRTN
Ground topography at receiver and road	From elevation and depth cloud-based system - ELVIS
Angles of view from receiver	Calculated within CadnaA
Reflections from existing barriers, structures, and cuttings on opposite side of road	Calculated within CadnaA
Air and ground absorption – Values vary between 0 (hard surface) to 1 (100% absorptive)	0.3 has been used in this study <i>It is noted that where screening is calculated CoRTN uses hard surface correction.</i>
Receiver heights	1.5m above ground level for ground floor and 4.5m above ground level for 1 st floor
Building setbacks	This report assumes all dwellings are constructed a minimum of 1 metre from both side boundaries 4m setback from the back and 5m setback from the front.
Acoustic barriers	A 3m high acoustic wall along the T8 railway line and a 2.4m high acoustic wall along the Heathcote Road as shown in the Figure 2-2 has been utilised in the noise model

6.2 Results

The noise prediction results are showing noise contours in Appendix B of this report.

Noise contours across the subdivision were determined for both the day and night-time periods.

When reading the contour charts:

- The noise level at any given dwelling façade is affected because of façade reflection (the noise level immediately in front of the façade is inflated because the prediction model considers the noise directly coming from the road traffic, rail, surrounding, and noise reflecting off the building façade itself). When examining the noise level incident on a given façade, 2dB(A) is removed from the noise level presented in the contours in Appendix B.

Recommended building treatments to ensure that suitable internal noise levels are achieved are detailed in Section 7.

7 Noise control treatment recommendations

The following provides noise control recommendations to reduce road traffic, rail and surrounding noise intrusion into residential dwellings.

As detailed dwelling designs are not available, the recommendations are based on a number of assumptions relating to the built form.

The advice provided here is in respect of acoustics only. Supplementary professional advice should be sought in respect of fire ratings, structural design, buildability, fitness for purpose and the like.

7.1 Building Façade Upgrades

Refer to Appendix C for designation of acoustic treatment categories for dwellings.

Recommended glazing systems for each acoustic treatment category is identified below.

Table 7-1: Category 1 – Marked Red in APPENDIX C

Room	Glazed Element Area (Windows/Doors)	Recommended Glazing
Bedrooms	<2m ²	4mm glass (Rw 27)
	2m ² to 5m ²	6mm glass (Rw 29)
	5m ² to 10m ²	6.38mm Laminated glass (Rw 31)
	> 10m ²	10.38mm Laminated glass (Rw 36)
Living Room	<5m ²	4mm glass (Rw 27)
	5m ² to 10m ²	6mm glass (Rw 29)
	> 10m ²	6.38mm Laminated glass (Rw 31)

Table 7-2: Category 2 – Marked Dark Blue in APPENDIX C

Room	Glazed Element Area (Windows/Doors)	Recommended Glazing
Bedrooms	<3m ²	4mm glass (Rw 27)
	3m ² to 10m ²	6mm glass (Rw 29)
	> 10m ²	6.38mm Laminated glass (Rw 31)
Living Room	<5m ²	4mm glass (Rw 27)
	5m ² to 12m ²	6mm glass (Rw 29)
	> 12m ²	6.38mm Laminated glass (Rw 31)

Table 7-3: Category 3 – Marked **Light Blue** in APPENDIX C

Room	Glazed Element Area (Windows/Doors)	Recommended Glazing
Bedrooms	<5m ²	4mm glass (Rw 27)
	5m ² to 15m ²	6mm glass (Rw 29)
	>15m ²	6.38mm Laminated glass (Rw 31)
Living Room	<5m ²	4mm glass (Rw 27)
	5m ² to 15m ²	6mm glass (Rw 29)
	>15m ²	6.38mm Laminated glass (Rw 31)

Table 7-4: Category 4 – Marked **Yellow** in APPENDIX C

Room	Glazed Element Area (Windows/Doors)	Recommended Glazing
Bedrooms	<5m ²	4mm glass (Rw 27)
	5m ² to 18m ²	6mm glass (Rw 29)
	>18m ²	6.38mm Laminated glass (Rw 31)
Living Room	<5m ²	4mm glass (Rw 27)
	5m ² to 20m ²	6mm glass (Rw 29)
	>20m ²	6.38mm Laminated glass (Rw 31)

All R_w ratings listed above are for window in frame (and not just glass alone).

All operable windows/doors are to incorporate seals equal to Schlegel Q-Ion.

7.2 External Walls

External walls constructed of double brick or brick veneer and will not require upgrade for acoustics.

If a lightweight external wall is used:

- External wall system is to include 1x13mm thick plasterboard sheeting for internal wall lining (in 6mm fc sheet or equivalent external lining).
- 75mm thick 14kg/m³ insulation is required in the external wall cavity.

7.3 Roof

Generally:

- Roofs can be sheet metal or tile.
- Roof ceiling cavity to have minimum 75mm thick 14kg/m³ insulation to cavity.
- Ceiling to be minimum 10mm thick.

7.4 External doors

Category 1 and 2 Areas - External non-glazed doors are to be minimum 35mm solid core timber or glazed, fitted with acoustic seals around the perimeter (Raven RP 10 to top and sides, Raven RP 36 drop seal to base).

7.5 Acoustic Barriers

A 3m high acoustic barrier along the T8 Railway Line and a 2.4m high acoustic barrier along the Heathcote Road (as shown in Figure 2-2) is to be constructed of solid material with a minimum sound reduction index of Rw 21 such as Colourbond, fibre cement, Hebel or masonry.

7.6 Mechanical ventilation

The NSW Department of Planning document *Development Near Rail Corridors and Busy Roads* provides guidance on the provision of supplementary ventilation in noise impacted areas.

Supplementary ventilation should be provided in the event that when windows/doors are left open, the noise level within the room exceeds the following:

- For Bedrooms, internal noise levels are not to exceed 45dB(A)Leq(9hr) between 10pm and 7am.
- For other habitable areas, internal noise levels are not to exceed 50dB(A)Leq(15hr) between 7am and 10pm

Recommendation:

Suitable internal noise levels with windows left open will not be achieved at the following locations:

- Bedrooms with Category 1 glazing system.

Note - this does not mean that windows to the bedrooms in these locations must be fixed shut. However, for these rooms, supplementary ventilation is to be supplied. This could consist of:

- An open window on another façade or
- Borrowed ventilation from space directly connected to a façade not facing the street or
- ventilation fans.

It is recommended that a mechanical engineer is consulted to ensure the ventilation requirements of the Building Code of Australia and Australian Standard 1668 '*The use of ventilation and air-conditioning in buildings*' are achieved.

Where alternative forms of ventilation are to be provided, it must be ensured that the solution does not provide a new noise leakage path into the dwelling and does not create a noise nuisance to neighbouring premises.

8 Conclusion

Renzo Tonin & Associates has completed a road traffic, rail and surrounding noise impact assessment for the proposed approximately 500 lots subdivision at Pleasure Point.

Provided that the recommendations at Section 7 in this report are adopted, internal noise levels in dwellings and in outdoor areas will comply with relevant Council and NSW Planning acoustic requirements, with respect to residences impacted by road traffic and rail noise.

APPENDIX A Glossary of terminology

The following is a brief description of the technical terms used to describe noise to assist in understanding the technical issues presented.

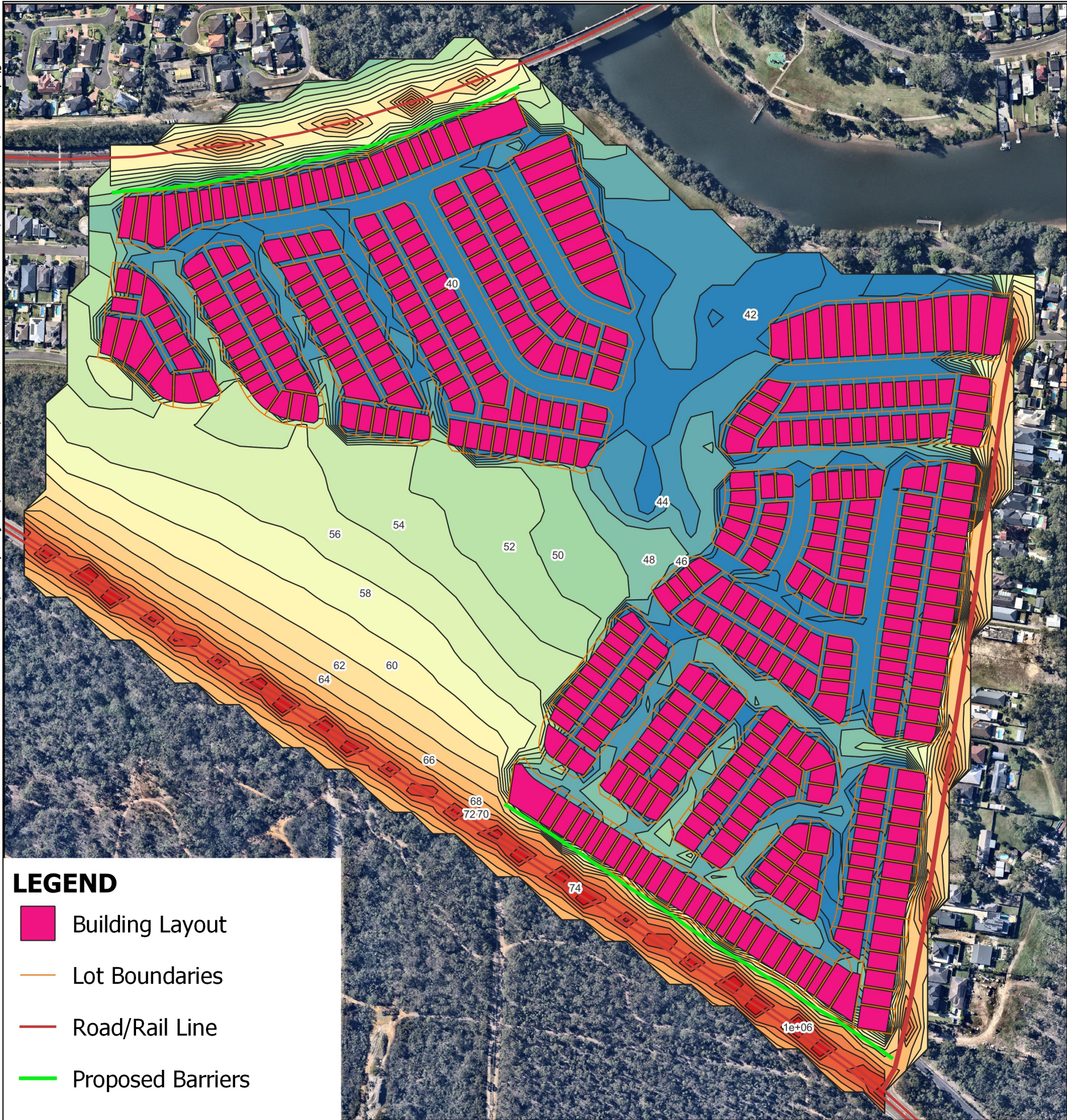
Adverse weather	Weather effects that enhance noise (that is, wind and temperature inversions) that occur at a site for a significant period of time (that is, wind occurring more than 30% of the time in any assessment period in any season and/or temperature inversions occurring more than 30% of the nights in winter).
Ambient noise	The all-encompassing noise associated within a given environment at a given time, usually composed of sound from all sources near and far.
Assessment period	The period in a day over which assessments are made.
Assessment point	A point at which noise measurements are taken or estimated. A point at which noise measurements are taken or estimated.
Background noise	Background noise is the term used to describe the underlying level of noise present in the ambient noise, measured in the absence of the noise under investigation, when extraneous noise is removed. It is described as the average of the minimum noise levels measured on a sound level meter and is measured statistically as the A-weighted noise level exceeded for ninety percent of a sample period. This is represented as the L_{90} noise level (see below).
Decibel [dB]	The units that sound is measured in. The following are examples of the decibel readings of everyday sounds: 0dB The faintest sound we can hear 30dB A quiet library or in a quiet location in the country 45dB Typical office space. Ambience in the city at night 60dB CBD mall at lunch time 70dB The sound of a car passing on the street 80dB Loud music played at home 90dB The sound of a truck passing on the street 100dB The sound of a rock band 115dB Limit of sound permitted in industry 120dB Deafening
dB(A)	A-weighted decibels. The ear is not as effective in hearing low frequency sounds as it is hearing high frequency sounds. That is, low frequency sounds of the same dB level are not heard as loud as high frequency sounds. The sound level meter replicates the human response of the ear by using an electronic filter which is called the "A" filter. A sound level measured with this filter switched on is denoted as dB(A). Practically all noise is measured using the A filter.
Frequency	Frequency is synonymous to pitch. Sounds have a pitch which is peculiar to the nature of the sound generator. For example, the sound of a tiny bell has a high pitch, and the sound of a bass drum has a low pitch. Frequency or pitch can be measured on a scale in units of Hertz or Hz.
Impulsive noise	Having a high peak of short duration or a sequence of such peaks. A sequence of impulses in rapid succession is termed repetitive impulsive noise.
Intermittent noise	The level suddenly drops to that of the background noise several times during the period of observation. The time during which the noise remains at levels different from that of the ambient is one second or more.
L_{Max}	The maximum sound pressure level measured over a given period.
L_{Min}	The minimum sound pressure level measured over a given period.
L_1	The sound pressure level that is exceeded for 1% of the time for which the given sound is measured.
L_{10}	The sound pressure level that is exceeded for 10% of the time for which the given sound is measured.

L ₉₀	The level of noise exceeded for 90% of the time. The bottom 10% of the sample is the L ₉₀ noise level expressed in units of dB(A).
L _{eq}	The "equivalent noise level" is the summation of noise events and integrated over a selected period of time.
Reflection	Sound wave changed in direction of propagation due to a solid object obscuring its path.
SEL	Sound Exposure Level (SEL) is the constant sound level which, if maintained for a period of 1 second would have the same acoustic energy as the measured noise event. SEL noise measurements are useful as they can be converted to obtain L _{eq} sound levels over any period of time and can be used for predicting noise at various locations.
Sound	A fluctuation of air pressure which is propagated as a wave through air.
Sound absorption	The ability of a material to absorb sound energy through its conversion into thermal energy.
Sound level meter	An instrument consisting of a microphone, amplifier and indicating device, having a declared performance, and designed to measure sound pressure levels.
Sound pressure level	The level of noise, usually expressed in decibels, as measured by a standard sound level meter with a microphone.
Sound power level	Ten times the logarithm to the base 10 of the ratio of the sound power of the source to the reference sound power.
Tonal noise	Containing a prominent frequency and characterised by a definite pitch.

APPENDIX B Noise modelling results

Plot Date: 31/05/24

GIS File: R:\AssocSydProjects\TN751-TN800\TN797 msk Pleasure Point subdivision\5 Calcs\Cadnaa\Noise Map.qgz



LEGEND

- Building Layout
- Lot Boundaries
- Road/Rail Line
- Proposed Barriers

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CLIENT

Sera Developments Pty Ltd

ACOUSTIC CONSULTANT

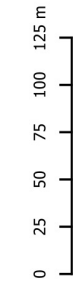
RENZO TONIN
& ASSOCIATES
inspired to achieve

Figure 1: Noise level predictions for Day time Receivers at 1.5m high above ground level

Location: Pleasure Point

Plot Date: 31/05/24

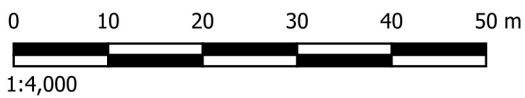
GIS File: R:\AssocSydProjects\TN751-TN800\TN797 msk Pleasure Point subdivision\5 Calcs\Cadnaa\Noise Map.qgz



LEGEND

- Building Layout
- Lot Boundaries
- Road/Rail Line
- Proposed Barriers

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r0	MSK	29/04/24	Prepare figure	TT	..
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A3	Original		Co-ordinate System: MGA Zone 56		

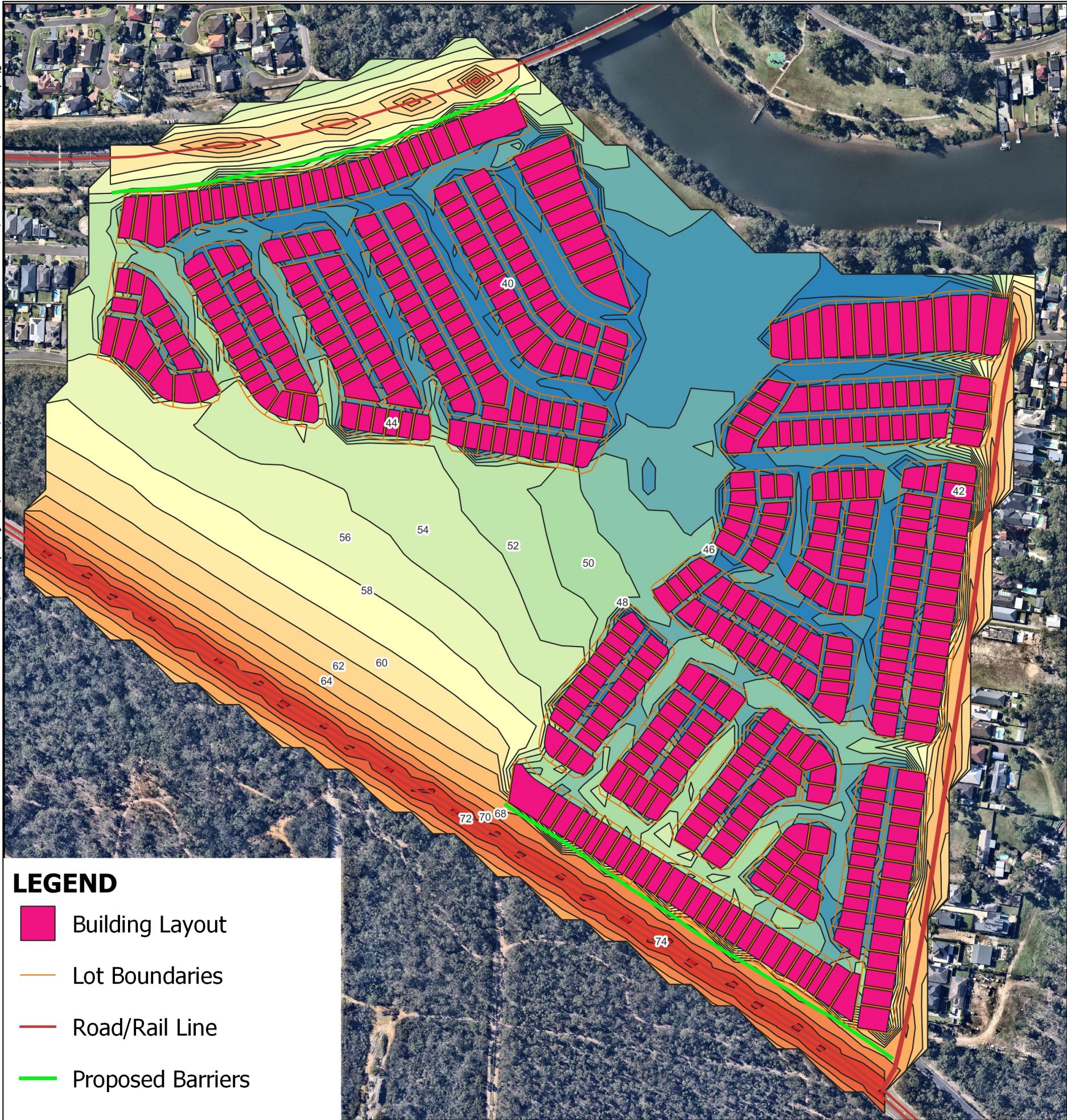


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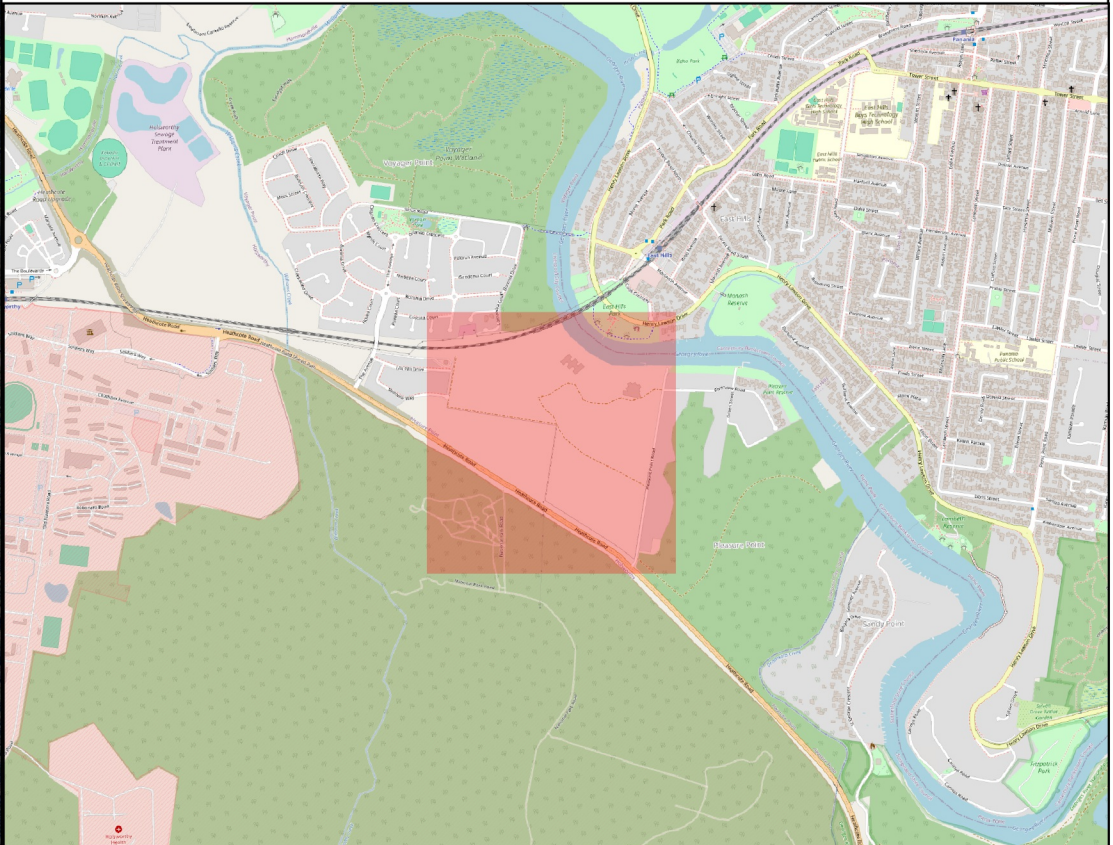
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Figure 2: Noise level predictions for Day time Receivers at 4.5m high above ground level
Location: Pleasure Point



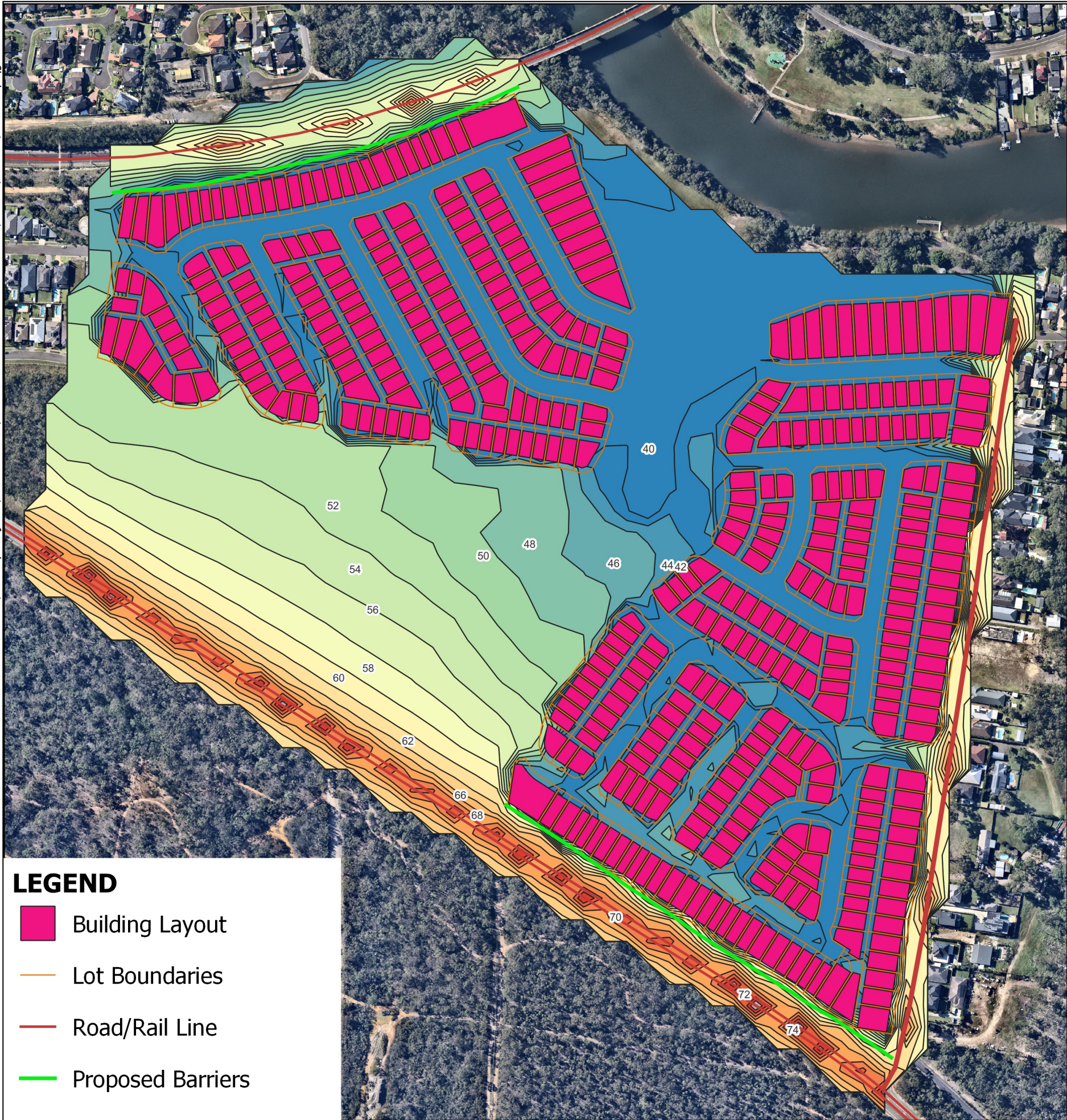
Day Time
First Floor
Noise Levels - LAeq 15-hour

	40 - 42		52 - 54		64 - 66
	42 - 44		54 - 56		66 - 68
	44 - 46		56 - 58		68 - 70
	46 - 48		58 - 60		70 - 72
	48 - 50		60 - 62		72 - 74
	50 - 52		62 - 64		>74



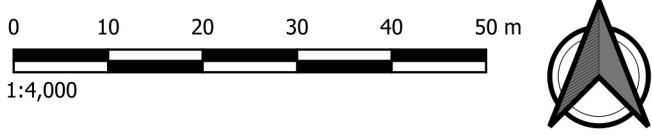
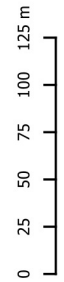
Plot Date: 31/05/24

GIS File: R:\AssocSydProjects\TN751-TN800\TN797 msk Pleasure Point subdivision\5 Calcs\Cadnaa\Noise Map.qgz



LEGEND

- Building Layout
- Lot Boundaries
- Road/Rail Line
- Proposed Barriers



..	..	..	..	..	..
..	..	..	..	..	..
..	..	..	..	..	..
r1	MSK	31/05/24	Updated building as per new drawings	TT	..
r0	MSK	29/04/24	Prepare figure	TT	..
REV	BY	DATE	DESCRIPTION	APPROVER	
A3	Original		Co-ordinate System: MGA Zone 56		

NOTE: Do not scale from this drawing.

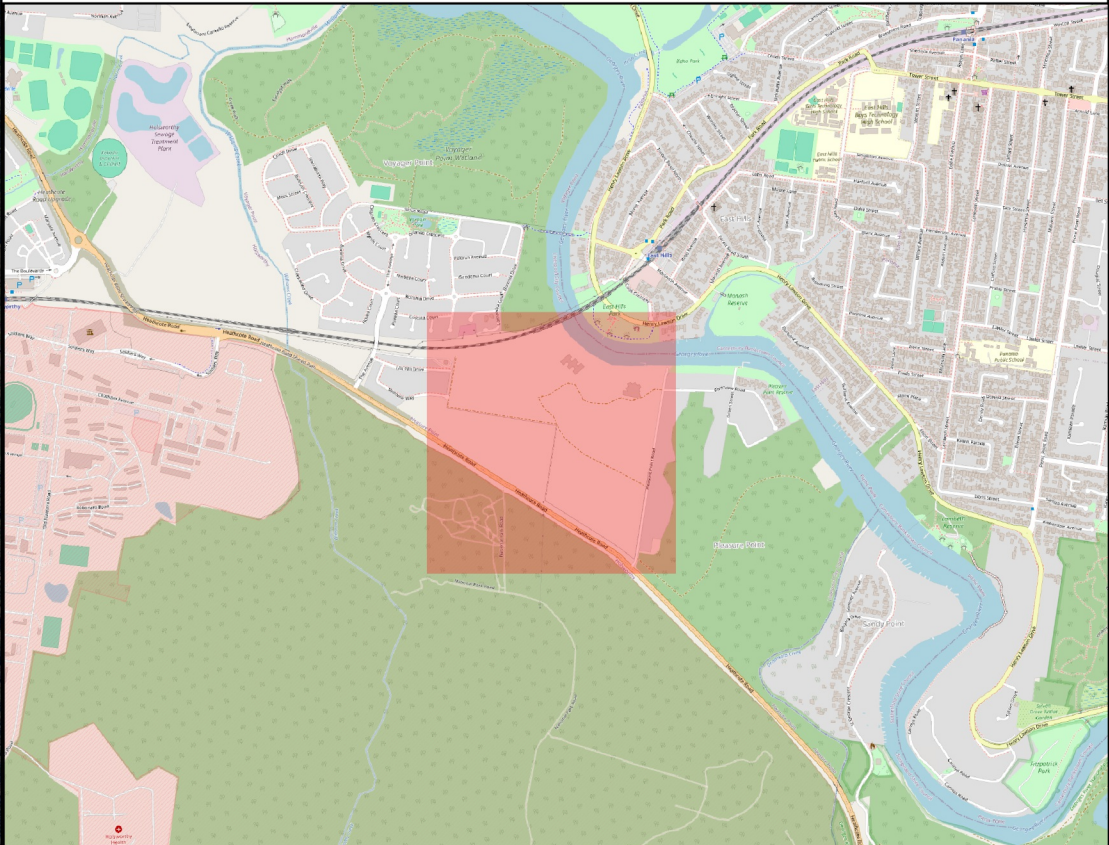
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Figure 3: Noise level predictions for Night time Receivers at 1.5m high above ground level
Location: Pleasure Point

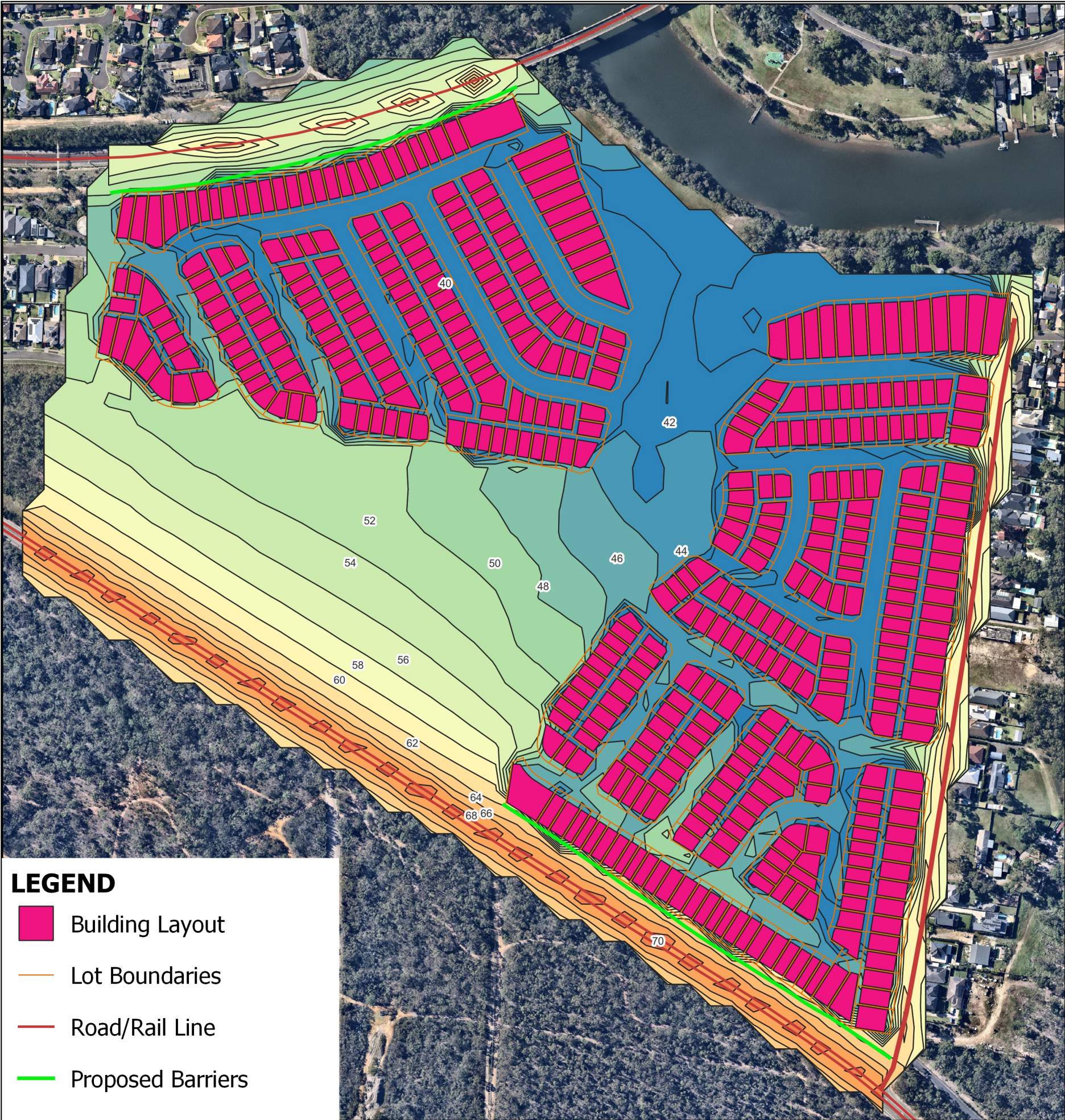
Night Time Ground Floor Noise Levels - LAeq 9-hour

 40 - 42	 52 - 54	 64 - 66
 42 - 44	 54 - 56	 66 - 68
 44 - 46	 56 - 58	 68 - 70
 46 - 48	 58 - 60	 70 - 72
 48 - 50	 60 - 62	 72 - 74
 50 - 52	 62 - 64	 >74



Plot Date: 31/05/24

GIS File: R:\AssocSydProjects\TN751-TN800\TN797 msk Pleasure Point subdivision\5 Calcs\Cadnaa\Noise Map.qgz

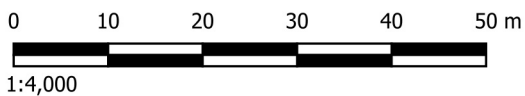


LEGEND

- Building Layout
- Lot Boundaries
- Road/Rail Line
- Proposed Barriers

0 25 50 75 100 125 m

...	...	...	...	...	...
r1	MSK	31/05/24	Updated building as per new drawings	TT	...
r0	MSK	29/04/24	Prepare figure	TT	...
REV	BY	DATE	DESCRIPTION	APPROVER	
A3	Original		Co-ordinate System: MGA Zone 56		



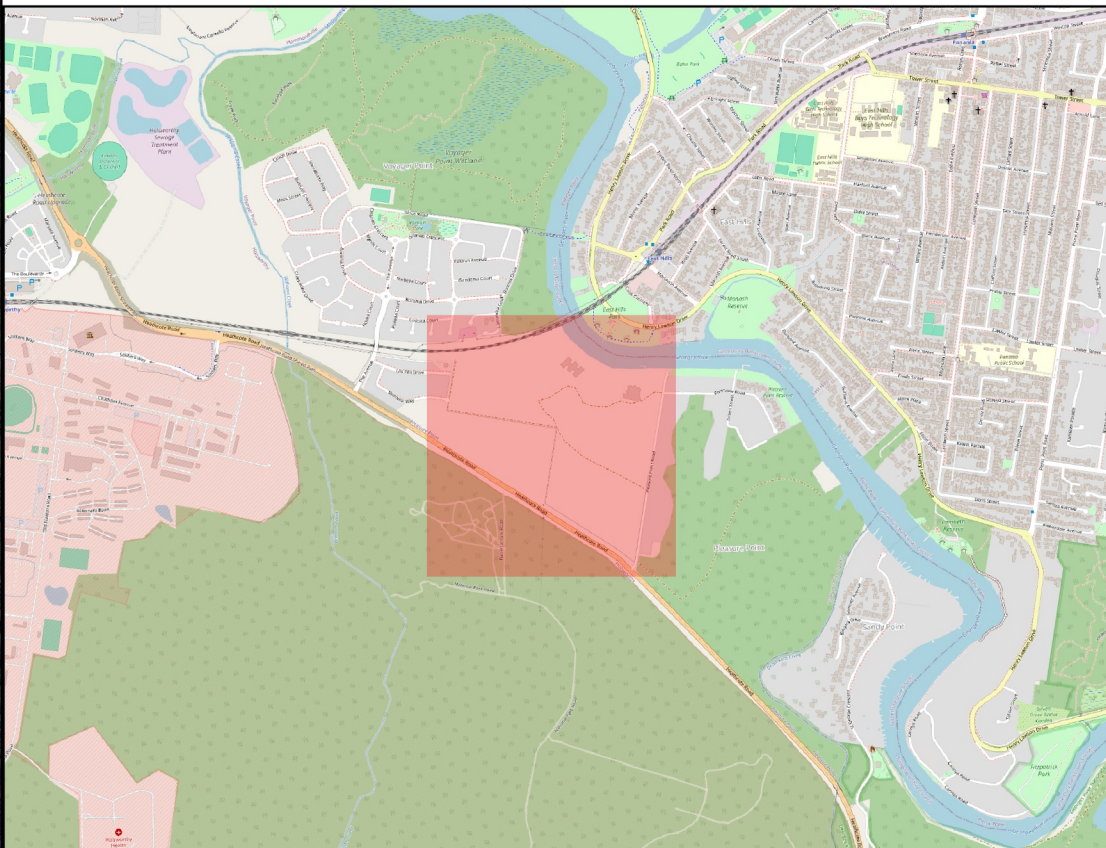
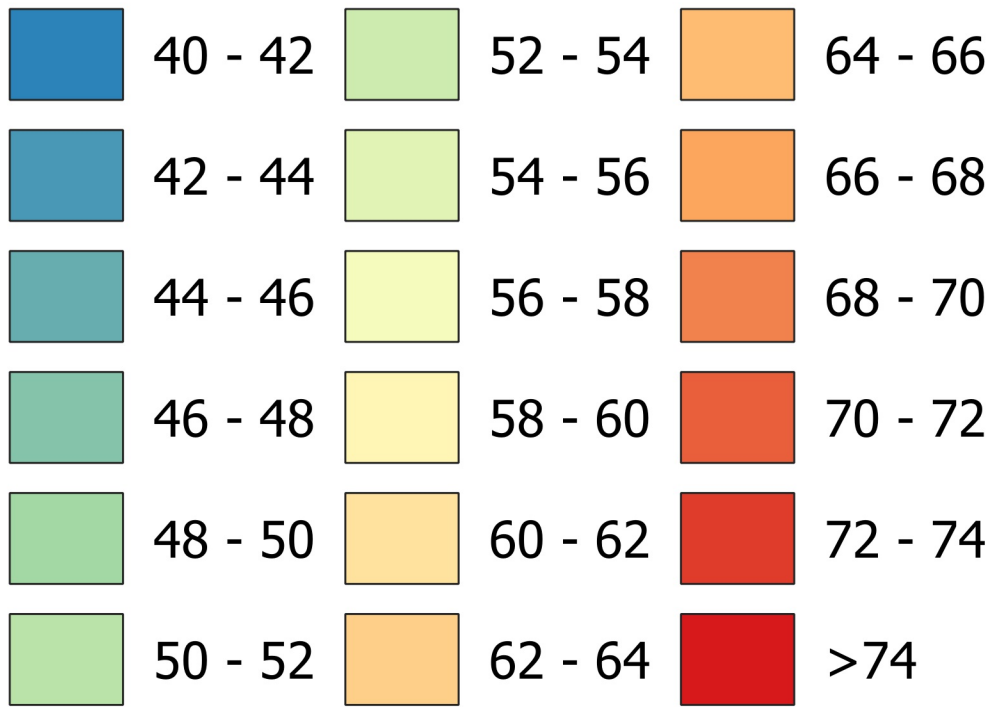
NOTE: Do not scale from this drawing.

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Figure 4: Noise level predictions for Night time Receivers at 4.5m high above ground level
Location: Pleasure Point

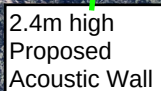
Night Time
First Floor
Noise Levels - LAeq 9-hour



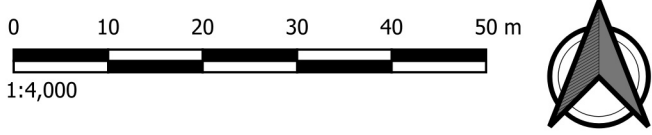
APPENDIX C Acoustic treatments categories

Acoustic treatment for the dwellings has been classified as follows:

GIS File: R:\AssocSydProjects\TN751-TN800\TN797 msk Pleasure Point subdivision\5 Calcs\CadnaA\Noise Map.qgz



- Building Layout
- Lot Boundaries
- Road/Rail Line
- Proposed Barriers



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- Category 1
- Category 2
- Category 3
- Category 4

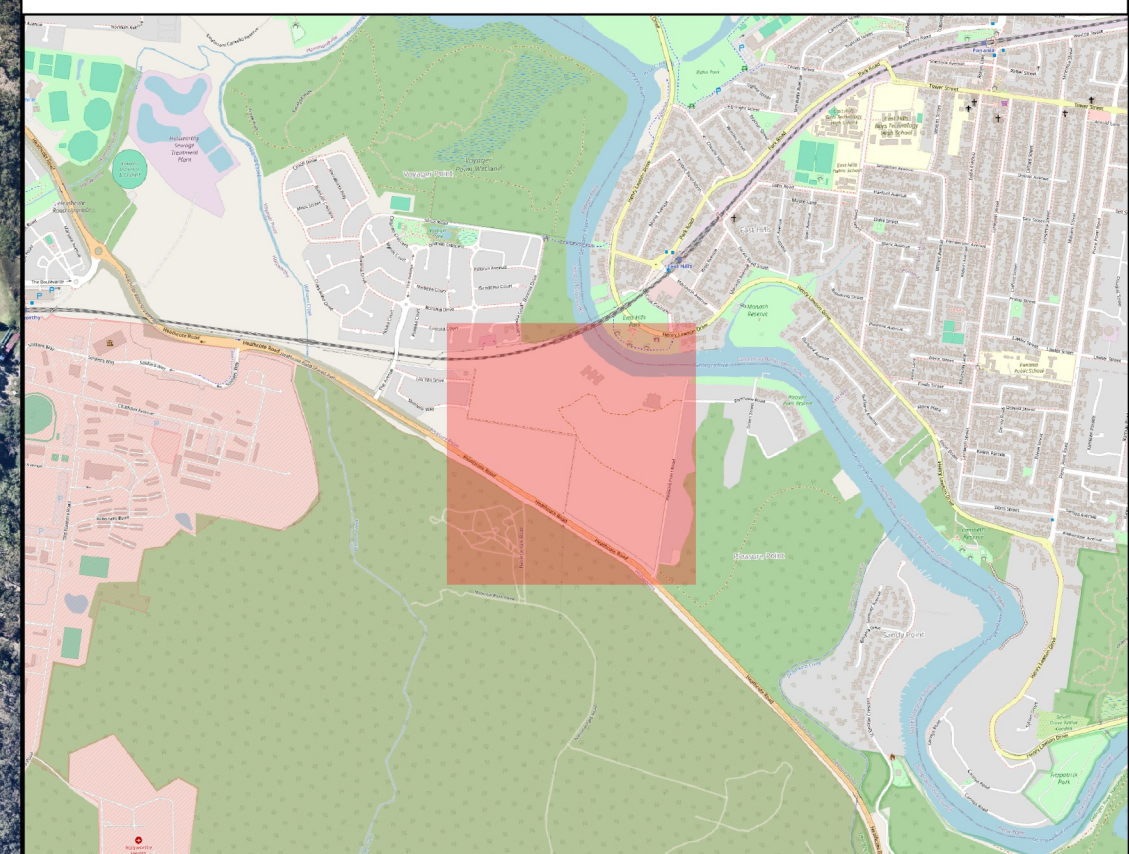
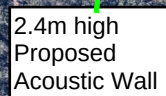


Figure 5: Facade glazing treatments for Ground Floor

Location: Pleasure Point

GIS File: R:\AssocSydProjects\TN751-TN800\TN797 msk Pleasure Point subdivision\5 Calcs\CadnaA\Noise Map.qgz



- Building Layout
- Lot Boundaries
- Road/Rail Line
- Proposed Barriers



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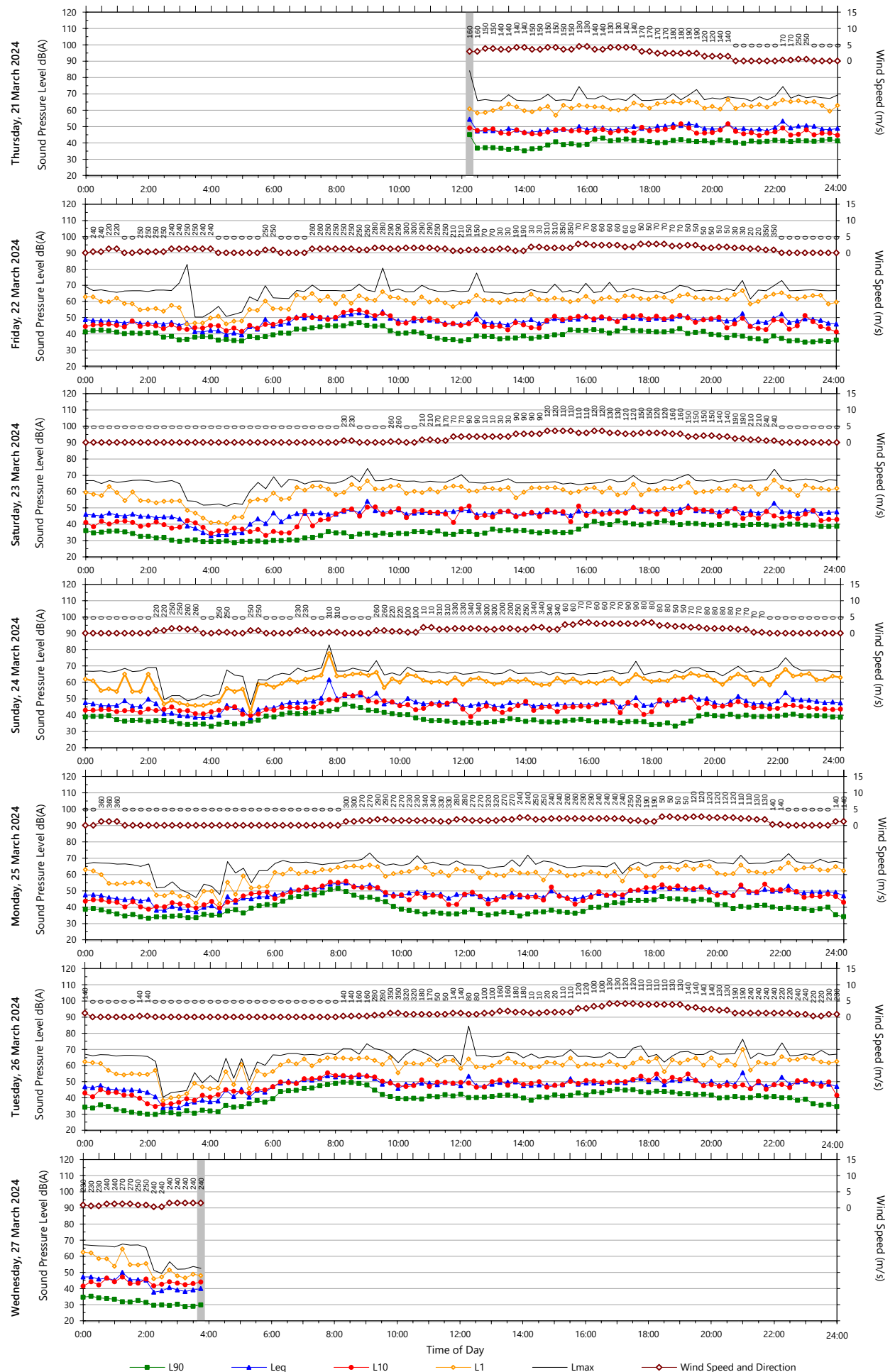
Figure 6: Facade glazing treatments for First Floor

Location: Pleasure Point

APPENDIX D Noise monitoring data

Unattended Monitoring Results

Location: Pleasure Point Reserve - North Boundary

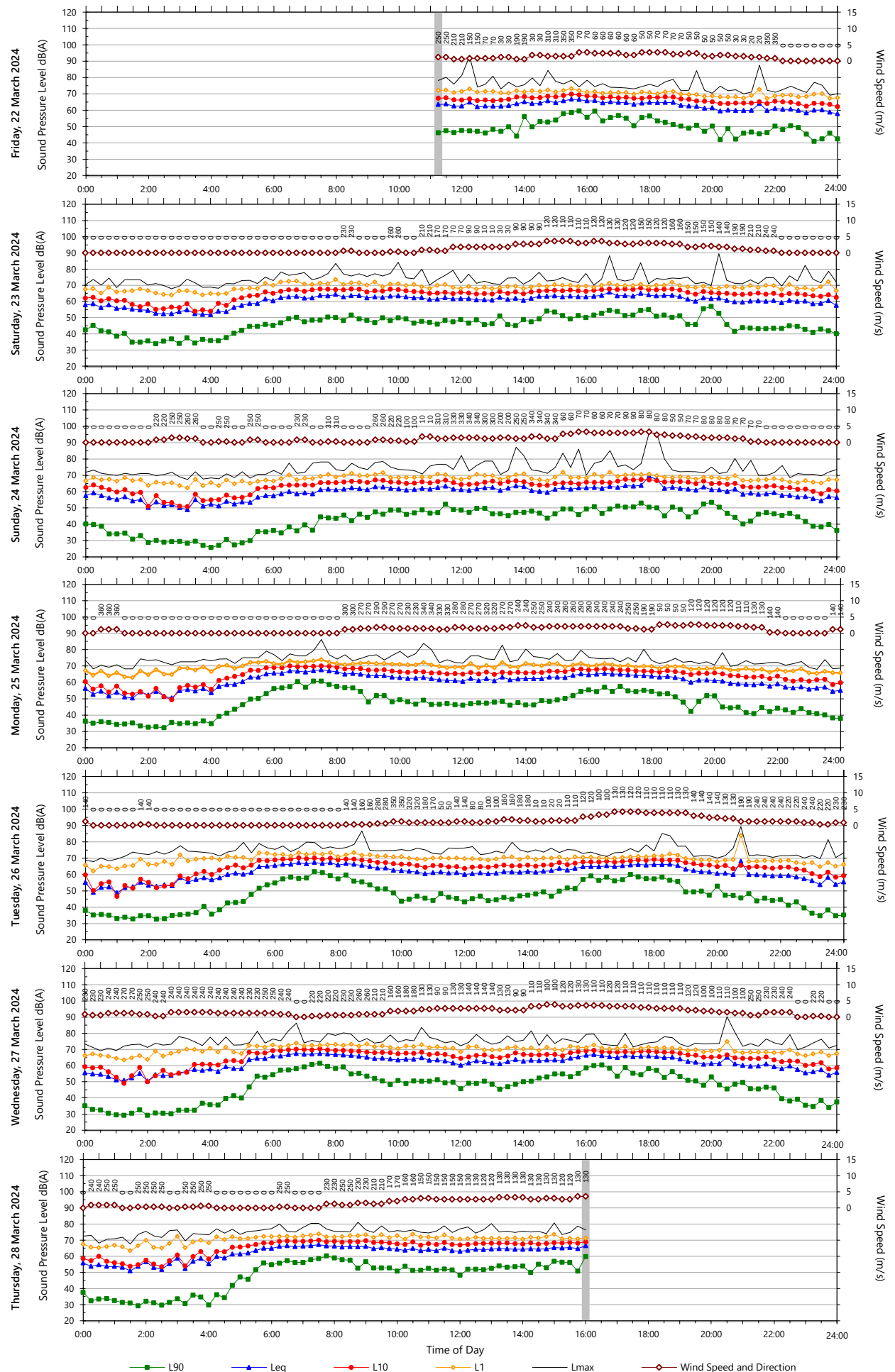


Data File: 2024-03-21_SLM_000_123_Rpt_Report.txt

Template: QTE-26 Logger Graphs Program (r42)

Unattended Monitoring Results

Location: Pleasure Point Reserve - South Boundary



Data File: 2024-03-22_SLM_000_123_Rpt_Report.txt

Template: QTE-26 Logger Graphs Program (r42)