RENZO TONIN & ASSOCIATES
inspired to achieve

Acoustics
Vibration
Structural Dynamics

ED PARK PRECINCT 3

Acoustic Assessment

17 January 2023

Landcom

TM996-01F02 Acoustic Assessment (r2)

35 1982-2017 ACOUSTIC ENGINEERING EXCELLENCE

Sydney Melbourne Brisbane Gold Coast Kuwait Singapore
Renzo Tonin & Associates ABN 29 117 462 861
Level 1/418A Elizabeth St SURRY HILLS NSW 2010 | PO Box 877 STRAWBERRY HILLS NSW 2012
P (02) 8218 0500 F (02) 8218 0501 sydney@renzotonin.com.au www.renzotonin.com.au

aaac Association of Australian Acoustical Consultants

Document details

Detail	Reference
Doc reference:	TM996-01F02 Acoustic Assessment (r2)
Prepared for:	Landcom
Address:	Level 14, 60 Station Street Parramatta NSW 2150
Attention:	Thomas Gianatti

Document control

Date	Revision history	Non-issued revision	Issued revision	Prepared	Instructed	Reviewed / Authorised
15.11.2022	Draft	-	0	H. Pearce		
13.01.2023	Updated report to address Client's comments.	-	1	H. Pearce/S. Khan		H.Pearce
17.01.2023	Minor amendments		2	H. Pearce/S. Khan		H.Pearce

File Path: \\SYD-SERVER\RTAGroupSyd\AssocSydProjects\TM951-TN000\TM996 TT Ed Park Precinct 3\1 Docs\2. Report\TM996-01F02 Acoustic Assessment (r2).docx

Contents

List of tables

List of figures

1 Introduction

A residential subdivision is proposed known as Precinct 3 at Edmondson Park. The site is on the Northern side of Campbelltown Road, extending from Zouch Road in the West to Macdonald Road in the East. The extent to the North is approximately in line with General Boulevard. Renzo Tonin & Associates was engaged to undertake an acoustic assessment for the proposed residential subdivision to accompany the Development Application ('DA') to Liverpool Council ('Council') to show that it is practicable to construct homes on the noise affected lots.

Edmondson Park is a developing area and traffic volumes on Campbelltown Road are not yet at capacity. Renzo Tonin & Associates have used a combination of site measurements and a review of previous acoustic reporting for Campbelltown Road upgrade to forecast traffic noise levels at the site and assessed the impact of traffic noise on the residential lots to determine typical building treatment requirements.

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.

2 Site Description

Land zoning from Liverpool Council's Local Environment Plan ('LEP') indicates that the land within the proposed site is zoned as SSP - SEPP (State Significant Precincts) 2005. The location of the subdivision is presented in Figure 1.

The subdivision is mainly influenced by road traffic along Campbelltown Road to the south and to a lesser extent by Macdonald Road to the East. It is anticipated that a total of 250 residential lots will be created on the site. 26 residential lots will have a southern facade directly facing towards Campbelltown Road. Additional sites will be affected by road traffic noise from Campbelltown Road (11 additional sites separated from Campbelltown Road by a secondary road) and others by Macdonald Road.

The proposed lot layout for the subdivision as of 21 December 2022 is shown in Figure 2.

Figure 1 Subdivision location - approximate extent marked in yellow

Figure 2 Proposed lot layout

Precinct 3 Subdivision Plan
Lots 2, 3 & 5 (DP1272931), Cnr Campbelltown Road and MacDonald Road, Edmondson Park

Client: Landcom

0 20 40m
scale: 1:1000@A1 | 1:2000@A3
plan: 021.EP.015
date: 21/12/2022
aerial: June 2022
revision: 08
proj: MGA94 56
drawn: BR

urbanco

3 On site noise monitoring

Long term unattended noise monitoring was conducted on the site from the 25th of October 2022 to the 3rd of November 2022, inclusive. There were some periods of inclement weather however, the affected data has been omitted from the assessment.

Monitoring was conducted at 2 locations, one on Campbelltown Road and the other on Macdonald Road, each approximately 10m from the near side of kerb. Refer Figure 3 below.

Figure 3 - Aerial view of site showing long term unattended noise monitoring locations

3.1 Equipment used

The equipment used for noise measurements was two RTA Technology RTA07 noise loggers which are based on an NTi Audio Type XL2 precision sound level analyser which is a class 1 instrument having accuracy suitable for field and laboratory use. The instrument was calibrated prior and subsequent to measurements using a Bruel & Kjaer Type 4231 calibrator. No significant drift in calibration was observed. All instrumentation complies with IEC 61672 (parts 1-3) '*Electroacoustics - Sound Level Meters*' and IEC 60942 '*Electroacoustics - Sound calibrators*' and carries current NATA certification (or if less than 2 years old, manufacturers certification).

3.2 Results of unattended noise monitoring

The following table presents the results of long-term unattended noise monitoring undertaken on site.

Table 1 - Site measured traffic noise levels October-November 2022

Location	Measured Level Day (7am to 10pm)	Measured Level Night (10pm to 7am)
Campbelltown Road - appx 10m to kerb	66	62
Macdonald Road - appx 10m to kerb	61	56

Notes: Presented noise levels are period average and include façade correction

4 Road traffic noise criteria

4.1 Edmondson Park South DCP 2012

The proposed residential subdivision is within the area applicable to the Edmondson Park South Development Control Plan 2012 ("EPS DCP"). Given the site is within the Liverpool local government area portion of the Precinct, the Development Application shall be determined by Liverpool Council.

Section 4.3 of the EPS DCP defines controls for noise and vibration, excerpt as follows:

Controls

1. Development in proximity to the rail corridor is to demonstrate consistency with the Infrastructure SEPP 2007 and 'Development Near Rail Corridors and Busy Roads - Interim Guideline'.

2. Development in close proximity to Campbelltown and Macdonald Roads is to demonstrate consistency with the NSW Road Noise Policy (DECCW 2011).

3. Noise walls are not permitted on Campbelltown and MacDonald Roads. A combination of the following measures is to be used to mitigate the impacts of traffic noise on these busy roads:

a) setbacks and service roads,

b) internal dwelling layouts that are designed to minimise noise in living and sleeping areas,

c) changes in topography,

d) using attached dwellings,

e) using higher than standard fencing between separate buildings constructed with a suitably solid mass, and / or

f) site layouts that locate principal private open space areas away from the noise source.

4. Development immediately adjoining the South Western Freeway (M5) is to demonstrate consistency with the Environmental Criteria for Road Traffic Noise (EPA 1999). A combination of the following measures may be used to meet the criteria:

a) acoustic glazing,

b) a barrier / acoustics fence (typically 4-5m high) with reduced glazing,

c) the adoption of the 'Quiet House' design, and /or

d) a combination of roadside barriers and perimeter buildings.

5. Where development is proposed that is affected by 1-4 above, an acoustic report is required to be submitted as part of a subdivision application demonstrating that the proposed subdivision design and any required acoustic attenuation can comply with the relevant criteria. An acoustic report is also required for any non-residential use to be undertaken within a residential area.

Subsequent to the publication of the EPS DCP, the SEPP (Infrastructure) 2007 has been amended and in respect of noise impacts from busy roads onto residential dwellings, the SEPP (Transport and Infrastructure) 2021 ("TISEPP") is now the relevant instrument.

Under the TISEPP, roads carrying in excess of 20,000 vehicles per day (AADT) should be constructed in order to comply with its objective internal noise goals. At the time of writing, the *'Development Near Rail Corridors and Busy Roads - Interim Guideline'* has not been amended to consider the change of SEPP, however, we assume that the recommendations/control measures of that document still apply, other than elements superseded by the TISEPP.

The NSW EPA Road Noise Policy 2011 (RNP) does not define objective criteria for new residential developments on busy roads. That policy refers to the SEPP (Infrastructure) 2007 (ISEPP) in respect of internal noise levels for new residential developments affected by noise from existing roads. As stated above, the ISEPP 2007 has been superseded and for road traffic noise impacts from busy roads (for roads carrying in excess of 20,000 vehicles per day) the relevant instrument is the TISEPP.

Based on predictions included in the Campbelltown Road Upgrade acoustic assessment (Report No. 11313, Version D, dated March 2013, prepared by J. Peng of Wilkinson Murray), Campbelltown Road in the region of the site is predicted to carry in excess of 20,000 vehicles per day before the year 2026. As such, the TISEPP shall apply to noise from Campbelltown Road.

Based on site measured levels, the existing traffic volumes on Campbelltown Road are 3-4 times those on Macdonald Road meaning that the TISEPP would not be strictly applicable to dwellings affected by noise from Macdonald Road (unless they are also affected by Campbelltown Road). However, for consistency, the TISEPP criteria have been applied as the project internal noise goals for Macdonald Road receivers.

As noise modelling is undertaken for external locations, the ISEPP criteria and guidelines have been used to establish equivalent external noise criteria. This external noise criterion is used to determine which building facades may require specific acoustic treatment to meet the requirements of the TISEPP.

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

To support the Infrastructure SEPP 2007, the NSW Department of Planning released the *Development in Rail Corridors and Busy Roads – Interim Guideline* (December 2008). Whilst the ISEPP 2007 has been superseded by the TISEPP 2021, in the absence of an updated policy, the *Development in Rail Corridors and Busy Roads – Interim Guideline* (December 2008) is assumed to remain valid (except where contradicted by the TISEPP in which case the TISEPP position is taken) The Guideline assists in the planning, design, and assessment of developments in, or adjacent to, major transport corridors in terms of noise, vibration and air quality. While the TISEPP applies only to roads with an AADT greater than 20,000 vehicles, the guideline is also recommended for other road traffic noise affected sites.

4.3 Clarification of TISEPP noise limits

The Guideline clarifies the time period of measurement and assessment. Section 3.4 '*What Noise and Vibration Concepts are Relevant*' and Table 3.1 of Section 3.6.1 confirms that noise assessment is based over the following time periods:

Daytime	7:00am - 10:00pm	$L_{Aeq(15hr)}$
Night-time	10:00pm - 7:00am	$L_{Aeq(9hr)}$

The noise criteria nominated in the TISEPP apply to internal noise levels with windows and doors closed. However, as the preliminary noise assessment is based on measurements/predictions at external locations, equivalent external noise criteria has been established. The equivalent external noise criterion is used to determine which areas of the development may require acoustic treatment to meet the internal noise requirements of the TISEPP. The equivalent external goals have been determined on the following basis:

- The Interim Guideline states: "*If internal noise levels with windows or doors open exceed the criteria by more than 10dBA, the design of the ventilation for these rooms should be such that occupants can leave windows closed, if they so desire, and also to meet the ventilation requirements of the Building Code of Australia*." The internal criteria with windows open is therefore 10dB(A) above the criteria explicitly outlined in the TISEPP.
- The generally accepted noise reduction through an open window from a free-field external position is 10dB(A). Windows/doors are assumed to be open no more than 5% of room floor area, in accordance with the Building Code of Australia (BCA) ventilation requirements.

Table 2 presents the TISEPP internal noise criteria along with the equivalent external noise criteria for residential premises.

Table 2 ISEPP noise criteria for new residential development

Room	Location	$L_{Aeq,\ 15hr}$ Day 7am – 10pm	$L_{Aeq\ 9hr}$ Night 10pm – 7am
Living rooms	Internal, windows closed*	40	40
	Internal, windows open^	50	50
	External free field (allowing windows to remain open)^	60	60
Bedrooms	Internal, windows closed*		35
	Internal, windows open^		45
	External free field (allowing windows to remain open)^		55

Notes: * Requisite for 20,000AADT Roads only under TISEPP 2021.

^ ISEPP Guideline states that where internal noise criteria are exceeded by more than 10dB(A) with windows open mechanical ventilation is required. External goals have been calculated based on nominal 10dB(A) reduction through an open window to a free-field position. Windows open to 5% of floor area in accordance with the BCA 2011 requirements.

5 Road traffic noise assessment

5.1 Road design and traffic flow

Average daily traffic flows for the Year 2026 were presented in the Campbelltown Road Upgrade acoustic assessment (Report No. 11313, Version D, dated March 2013, prepared by J. Peng of Wilkinson Murray Peak). Renzo Tonin & Associates have assumed that the growth rate applicable in the 2016 to 2026 period would persist through to 2032 (10 years from now). It is also assumed that growth rate would apply to Macdonald Road.

The following calculations and assumptions were used for the road traffic noise modelling:

- Existing light/heavy vehicle mix would persist into the future.
- Growth Rate 4.6% for both Day and Night (based on 2016 to 2026 growth rate from Peng report).
- A Growth Rate of 4.6% for 10 years results in a 2dB increase in noise from 2022 (measured) to 2032 (predicted).

The traffic noise levels used for the acoustic assessment are presented in Table 3.

Table 3 Existing and future traffic noise levels at appx 10m from kerb

Road	Measured, 2022		Predicted 2032	
	Day (7am – 10pm)	Night (10pm – 7am)	Day (7am – 10pm)	Night (10pm – 7am)
Campbelltown between Macdonald and Zouch	66	62	68	64
Macdonald between Campbelltown and General Boulevard	61	56	63	59

Note: Levels are period average and include façade reflection.

5.2 Road noise prediction model

Noise modelling for the project was carried out using CadnaA software, by calibrating traffic strings to the site measured logger locations. 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 4 Summary of modelling inputs

Input parameters	Input used
Traffic volumes and mix	As described in Section 5.1
Vehicle speed	Campbelltown Road - 80km/h, Macdonald Road - 60km/h
Gradient of roadways	Topographic data from NSW Department of Spatial Services (Elvis).

Input parameters	Input used
Source height	1.5m
Ground topography at receiver and road	Topographic data from NearMaps
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)	0.5 has been used in this study *It is noted that where screening is calculated CoRTN uses hard surface correction.*
Receiver heights	1.5m above ground level for ground floor and 4.5m above ground level for 1st floor
Facade correction	Free field noise levels are used in this assessment as it is directly relevant to assessment against TISEPP criteria
Australian conditions correction	-0.7dB(A) free field (daytime only)
Acoustic properties of road surfaces	Based on site measured data from the existing roads
Roadside mounds / barriers	None were considered in this assessment

5.3 Noise modelling assumptions

The following assumptions were adopted for noise modelling:

- Indicative building envelopes on each lot as per the subdivision layout in Figure 2. Front and rear property setbacks for each building envelope are generally in accordance with Section 6.4 of the Edmondson Park South DCP 2012.
- Terrace houses are assumed to be two-storey dwellings with a total height of 6m above ground level.
- Remaining dwellings are assumed to be single storey with a total height of 4m above ground.
- Residential floor areas and window sizes are assumed to not exceed those outlined in Appendix B of the Department of Planning "Development near Rail Corridors and Busy Roads - Interim Guideline".
- No boundary fences are included in the existing model.

5.4 Road traffic noise results

Noise modelling was conducted for both ground and first floor receivers at day and night-time periods. It was calculated that greater facade treatment would be required for the night-time period for Campbelltown Road whereas Macdonald Road was approximately the same Day/Night. Noise contours from Campbelltown Road and Macdonald Road are presented in Figure 4 and Figure 6 in APPENDIX C.

Building treatment recommendations are derived from the noise model results and are shown in Figure 8 and Figure 9 in APPENDIX C. Each category and its required facade sound reduction performance and construction details are summarised in APPENDIX B.

The noise model results show that for lots 53, 66-75 and 236-250 with facades facing Campbelltown Road, up to Category 4 treatment is required for the ground and first floor. As these lots are terrace houses, there is no side façade as such. It is assumed that the front façade is continuous over the two-storey height. Any windows on the side façade where there is another terrace adjacent are well shielded from road traffic noise and there are no particular requirements for the walls/windows. At the end of the row Category 3 treatment applies at both ground and first floor side facades.

The noise model results show that for Lots 42-52 with facades facing Macdonald Road, up to Category 3 treatment is required for the ground and first floor.

To achieve the ISEPP Guideline ventilation requirements, any room on a facade with treatment Category 2 or higher would require ventilation that allows windows and doors to remain closed and the room provided with ventilation from another façade which is either Category 1 or uncategorised. If the room doesn't have access to such a location, the room should be provided with alternative ventilation.

6 Conclusion

Potential noise impacts have been identified and assessed for the proposed residential subdivision at Edmondson Park South Precinct 3. Road traffic noise from Campbelltown Road and Macdonald Road has been considered.

Based on the noise modelling and indicative building envelopes, future dwellings will require facade treatment to control road traffic noise ingress in accordance with the Department of Planning "*Development in Rail Corridors and Busy Roads – Interim Guideline*". The recommended treatments have been specified and can be achieved using standard building materials and techniques.

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 L90 noise level (see below).
Decibel [dB]	The units that sound is measured in. The following are examples of the decibel readings of common sounds in our daytime environment:

threshold of hearing	0 dB	The faintest sound we can hear
	10 dB	Human breathing
almost silent	20 dB	
	30 dB	Quiet bedroom or in a quiet national park location
generally quiet	40 dB	Library
	50 dB	Typical office space or ambience in the city at night
moderately loud	60 dB	CBD mall at lunch time
	70 dB	The sound of a car passing on the street
loud	80 dB	Loud music played at home
	90 dB	The sound of a truck passing on the street
very loud	100 dB	Indoor rock band concert
	110 dB	Operating a chainsaw or jackhammer
extremely loud	120 dB	Jet plane take-off at 100m away
threshold of pain	130 dB	
	140 dB	Military jet take-off at 25m away

dB(A)	A-weighted decibels. The A- weighting noise filter simulates the response of the human ear at relatively low levels, where the ear is not as effective in hearing low frequency sounds as it is in 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.
dB(C)	C-weighted decibels. The C-weighting noise filter simulates the response of the human ear at relatively high levels, where the human ear is nearly equally effective at hearing from mid-low frequency (63Hz) to mid-high frequency (4kHz) but is less effective outside these frequencies.

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 L90 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 Leq 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 Building treatment categories

The dwellings in the proposed development will require facade treatment to achieve suitable internal noise levels. The facade treatment recommendations are shown in Figure 5 and Figure 6. The recommendations are for both ground and first floor and are applicable to bedrooms and living rooms.

Table 5 details the facade treatment categories and recommended constructions. The facade recommendations assume room volumes and areas as per Table B1 of the ISEPP Guideline.

Table 5 Treatment categories

Category No.	Building Element	Required Acoustic Rating of Building Element, Rw	Construction Recommendation		
1	Windows / Sliding Doors	24+	Openable with minimum 4mm monolithic glass and standard weather seals		
	Facade	38+	Cladding Construction: 9mm fibre cement sheeting or weatherboards or plank cladding externally, 90mm timber stud, R2 insulation batts in wall cavity, 10mm standard plasterboard internally.	Brick Veneer Construction: 110mm brick, 90mm timber stud, minimum 40mm clearance between masonry and stud frame, R2 insulation batts in wall cavity, 10mm standard plasterboard internally.	Cavity Brick Construction: 2 leaves of 110mm brickwork separated by 50mm gap.
	Roof	40+	Pitched concrete or terracotta tile or metal sheet roof, 10mm plasterboard ceiling fixed to ceiling joists, bulk insulation in roof cavity.		
	Door	28+	35mm solid core timber door fitted with full perimeter acoustic seals		
2	Windows / Sliding Doors	27+	Openable with minimum 6mm monolithic glass and full perimeter acoustic seals		
	Facade	45+	Cladding Construction: 9mm fibre cement sheeting or weatherboards or plank cladding externally, 90mm timber stud, R2 insulation batts in wall cavity, 10mm standard plasterboard internally.	Brick Veneer Construction: 110mm brick, 90mm timber stud, minimum 40mm clearance between masonry and stud frame, R2 insulation batts in wall cavity, 10mm standard plasterboard internally.	Cavity Brick Construction: 2 leaves of 110mm brickwork separated by 50mm gap.
	Roof	43+	Pitched concrete or terracotta tile or metal sheet roof, 10mm plasterboard ceiling fixed to ceiling joists, bulk insulation in roof cavity.		
	Door	30+	40mm solid core timber door fitted with full perimeter acoustic seals		
3	Windows / Sliding Doors	32+	Openable with minimum 6.38mm laminated glass and full perimeter acoustic seals		
	Facade	52+	Brick Veneer Construction: 110mm brick, 90mm timber stud, minimum 40mm clearance between masonry and stud frame, R2 insulation batts in wall cavity, 10mm standard plasterboard internally.		Cavity Brick Construction: 2 leaves of 110mm brickwork separated by 50mm gap.

Category No.	Building Element	Required Acoustic Rating of Building Element, Rw	Construction Recommendation
	Roof	48+	Pitched concrete or terracotta tile or sheet metal roof, 1 layer of 13mm sound-rated plasterboard fixed to ceiling joists, bulk insulation in roof cavity.
	Door	33+	45mm solid core timber door fitted with full perimeter acoustic seals
4	Windows / Sliding Doors	35+	Openable with minimum 10.38mm laminated glass and full perimeter acoustic seals
	Facade	55+	Brick Veneer Construction: 110mm brick, 90mm timber stud, minimum 40mm clearance between masonry and stud frame, R2 insulation batts in wall cavity, 10mm standard plasterboard internally. Cavity Brick Construction: 2 leaves of 110mm brickwork separated by 50mm gap.
	Roof	52+	Pitched concrete or terracotta tile or sheet metal, 2 layers of 13mm sound-rated plasterboard fixed to ceiling joists, bulk insulation in roof cavity.
	Door	33+	45mm solid core timber door fitted with full perimeter acoustic seals. Door is to open into a corridor. If a door opens directly into a room, the glass is to be upgraded to 12.38mm laminated or 10.5 vlam Hush with a rating of Rw37.

Notes:

- Where a room has different category recommendations on two or more facades, the roof recommendation for the highest category applies.
- Where a room is adjacent to the road and has different category recommendations on two or more facades, both the roof and the glazing recommendation for the highest category applies.
- Any wall, roof or ceiling penetrations shall be acoustically sealed so as not to reduce the acoustic performance of the element.
- The acoustic performance of glazed doors should be in accordance with the window glazing requirement of the applicable category.
- Development Near Rail Corridors and Busy Roads – Interim Guideline recommends solid core timber doors of 45mm thickness for treatment categories 3 and 4. To align with current industry construction methods, solid core door recommendations have been limited to no more than 40mm thickness.

The required acoustic rating is for the entire system. For example, for windows this includes the glass, frame and seals including the perimeter seal at the wall junction.

By way of explanation, the Sound Insulation Rating Rw is a measure of the noise reduction property of the glazing assembly, a higher rating implying a higher sound reduction performance.

Note that the Rw rating of systems measured as built on site (R'w Field Test) may be up to 5 points lower than the laboratory result.

The client is advised not to commence detailing or otherwise commit to systems which have not been tested in an approved laboratory or for which an opinion only is available. Testing of systems and assemblies is a component of the quality control of the design process and should be viewed as a priority because there is no guarantee the forecast results will be achieved. No responsibility is taken for use of or reliance upon untested systems, estimates or opinions. The advice provided here is in respect of acoustics only.

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

NOTES FOR GLAZING CONSTRUCTIONS:

All openable glass windows and doors shall incorporate full perimeter acoustic seals equivalent to Q-Lon, which enable the Rw rating performance of the glazing to not be reduced.

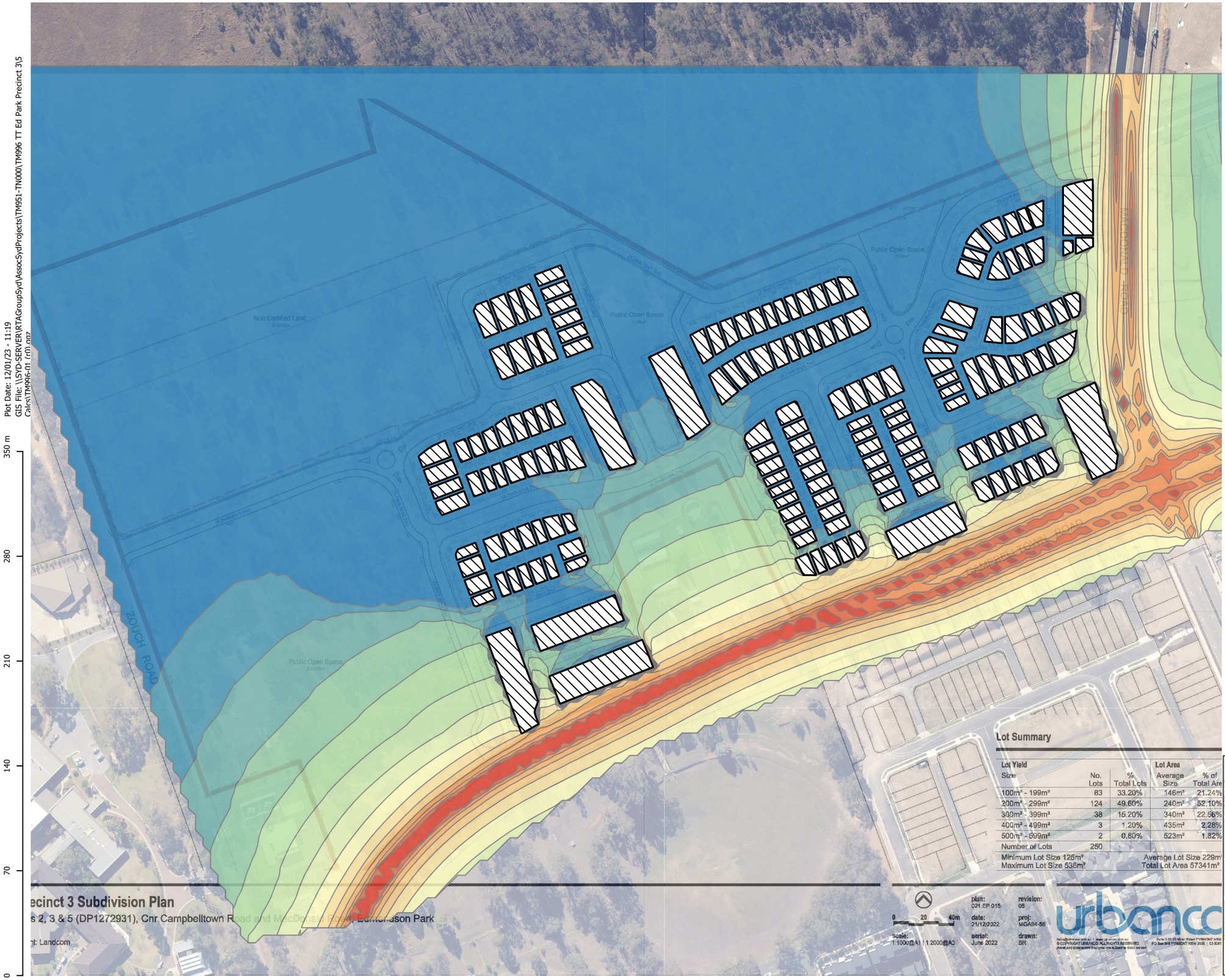
The above glazing thicknesses should be considered the minimum thicknesses to achieve acoustical ratings. Greater glazing thicknesses may be required for structural loading, wind loading etc.

Category No.	Building Element	Required Acoustic Rating of Building Element, Rw	Construction Recommendation
GENERAL			
The sealing of all gaps in acoustic rated glazing assemblies and facades is critical in a sound rated construction. Use only sealer approved by the acoustic consultant.			
Check design of all junction details with acoustic consultant prior to construction.			
Check the necessity for HOLD POINTS with the acoustic consultant to ensure that all building details have been correctly interpreted and constructed.			
The information provided in this table is subject to modification and review without notice.			
The advice provided here is in respect of acoustics only. Supplementary professional advice may need to be sought in respect of fire ratings, structural design, buildability, fitness for purpose and the like.			

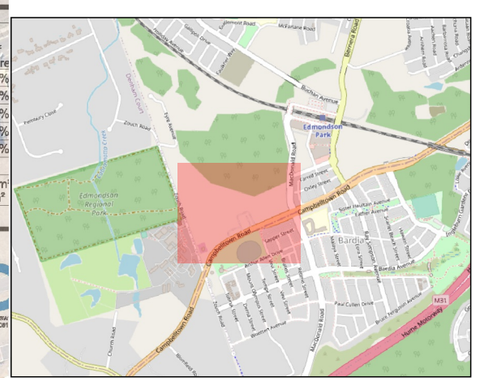
APPENDIX C Noise contours and building treatment recommendations

Figure 4 Predicted road traffic noise levels at ground floor facades, Day

Plot Date: 12/01/23 - 11:19
GIS File: \\SYD-SERVER\RTAGroupSyd\AssocSydProjects\TM951-TN000\TM996 TT Ed Park Precinct 3\5 Calcs\TM996-01 (r0).qgz



FOR INFORMATION



Edmonson Park Precint 3

Figure 4: Noise level predictions for 2032 during Day period (1.5m high residential reciever height)

r1	MSK	12.01.2023	Updated figure to address client's comments	HPe
r0	MSK	14.11.2022	Prepare figure	HPe

0 60 120 180 m

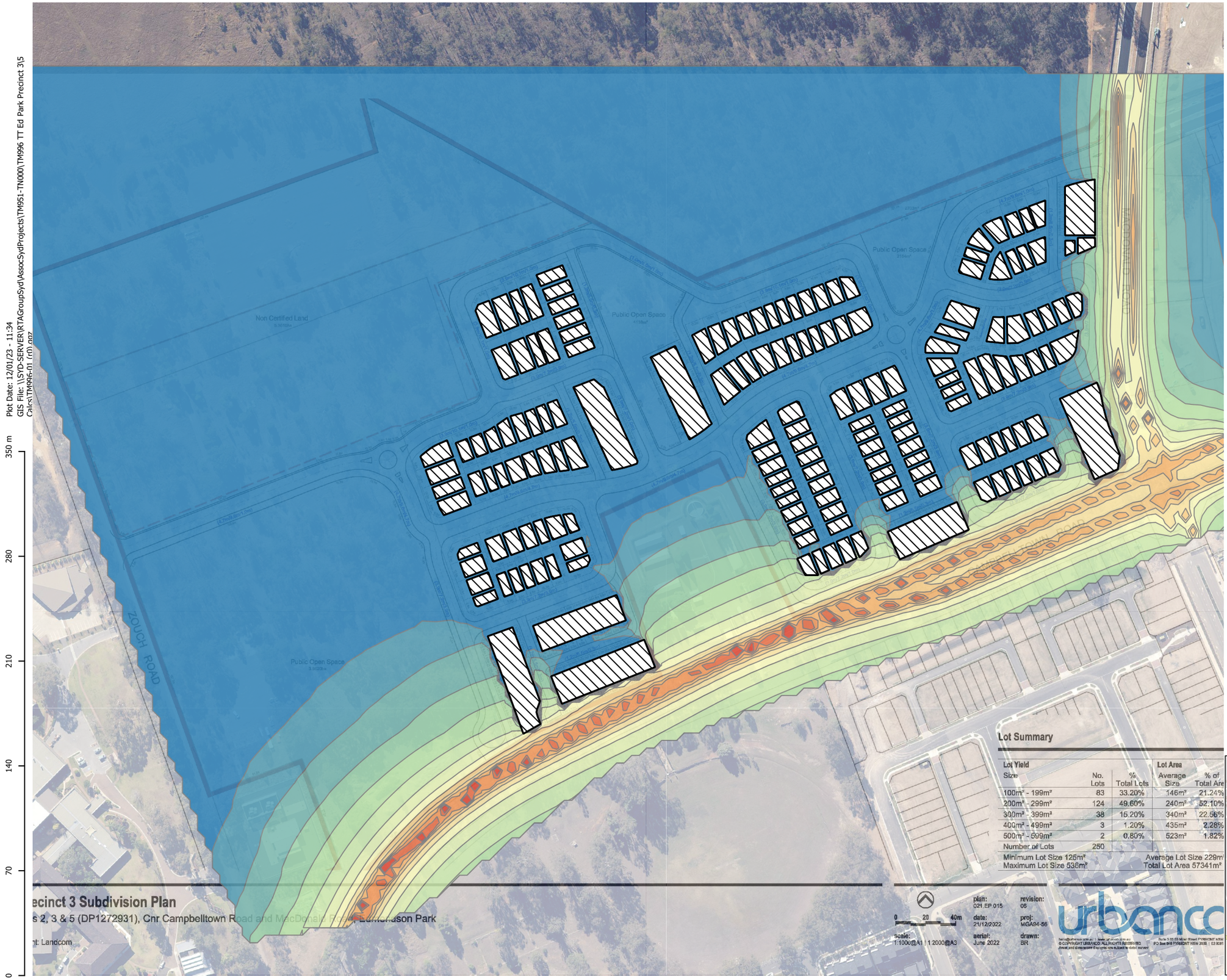
1:2,500

N

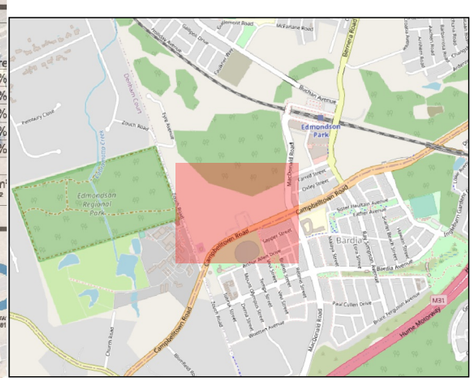
RENZO TONIN & ASSOCIATES

inspired to achieve

Figure 5 Predicted road traffic noise levels at ground floor facades, Night



FOR INFORMATION



Edmonson Park Precint 3

Figure 5: Noise level predictions for 2032 during Night period (1.5m high residential reciever height)

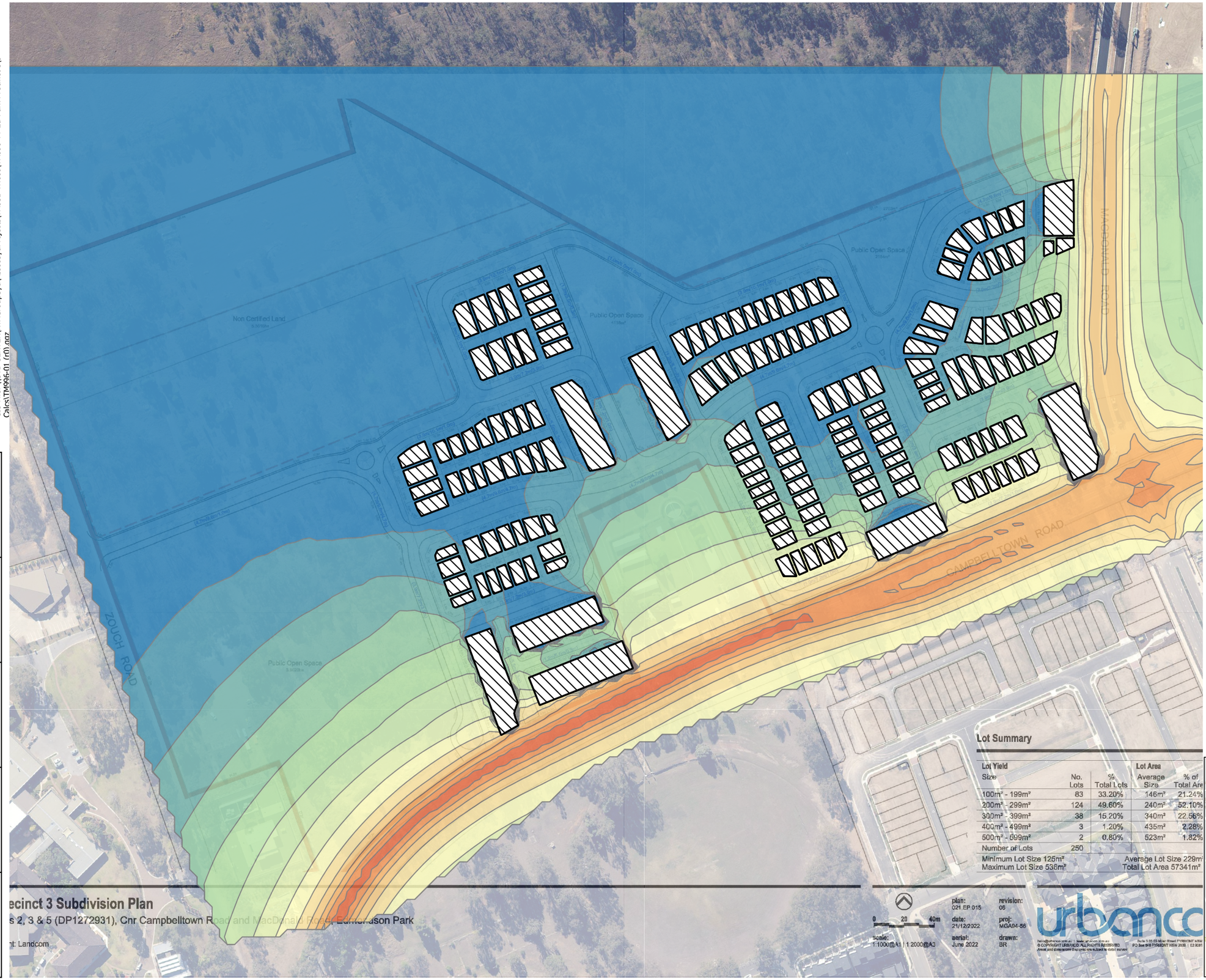
r1	MSK	12.01.2023	Updated figure to address client's comments	HPe
r0	MSK	14.11.2022	Prepare figure	HPe

RENZO TONIN & ASSOCIATES
inspired to achieve

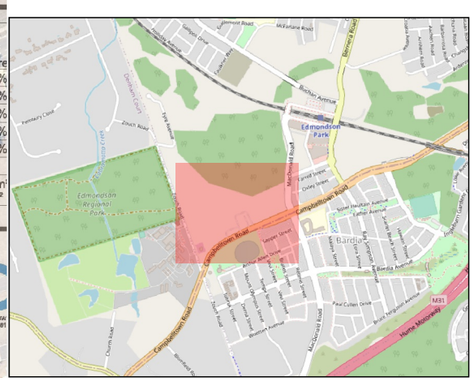
Figure 6 Predicted road traffic noise levels at first floor facades, Day

Plot Date: 12/01/23 - 11:31
GIS File: \\SYD-SERVER\RTAGroupSyd\AssocSydProjects\TM951-TN000\TM996 TT Ed Park Precinct 3\5 Calcs\TM996-01 (r0).qgz

350 m
280
210
140
70
0



FOR INFORMATION



Edmonson Park Precint 3

Figure 6: Noise level predictions for 2032 during Day period (4.5m high residential reciever height)

r1	MSK	12.01.2023	Updated figure to address client's comments	HPe
r0	MSK	14.11.2022	Prepare figure	HPe

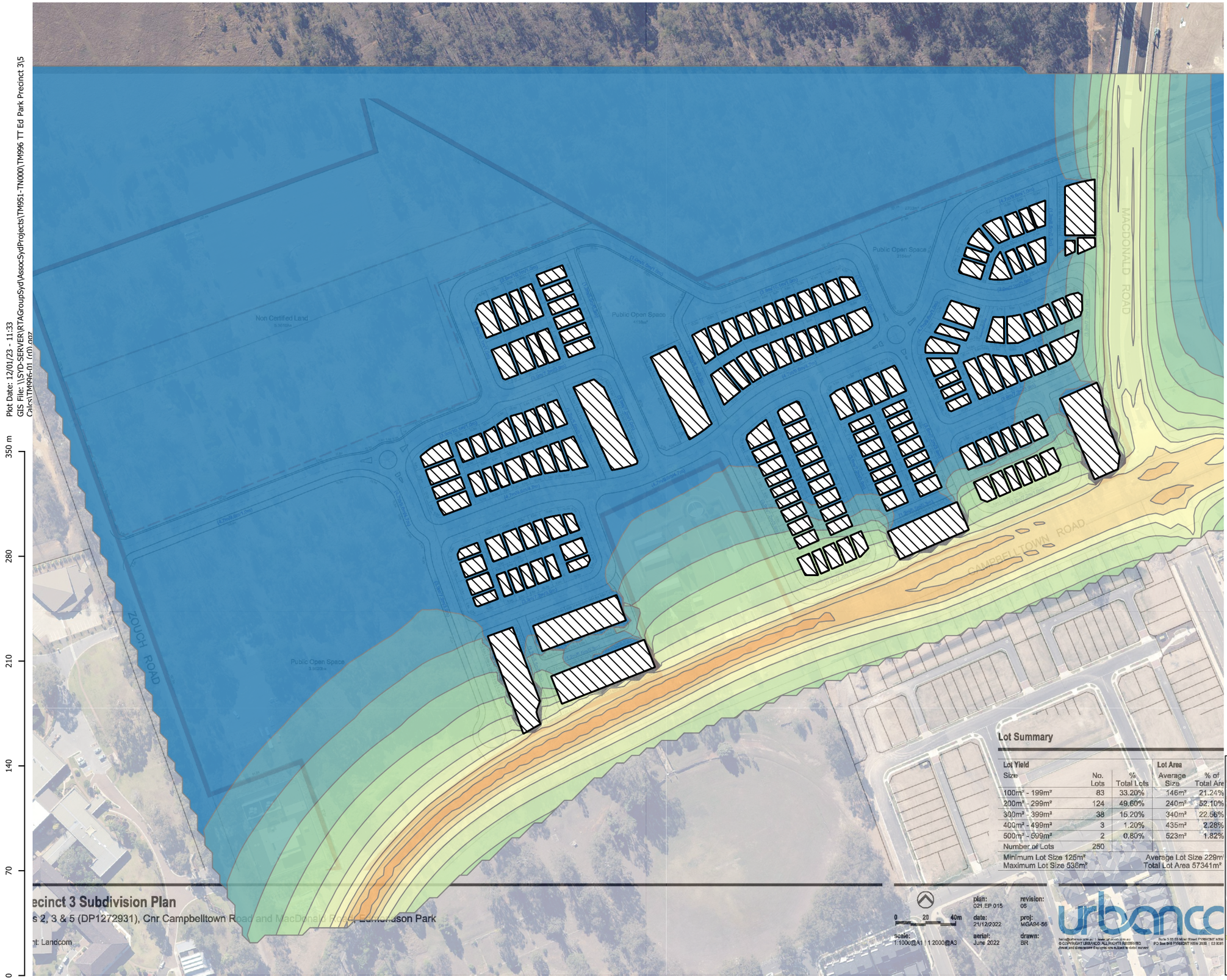
0 60 120 180 m
1:2,500

N

RENZO TONIN & ASSOCIATES
inspired to achieve

Figure 7 Predicted road traffic noise levels at first floor facades, Night

Plot Date: 12/01/23 - 11:33
GIS File: \\SYD-SERVER\RTAGroupSyd\AssocSydProjects\TM951-TN000\TM996 TT Ed Park Precinct 3\5 Calcs\TM996-01 (r0).qgz



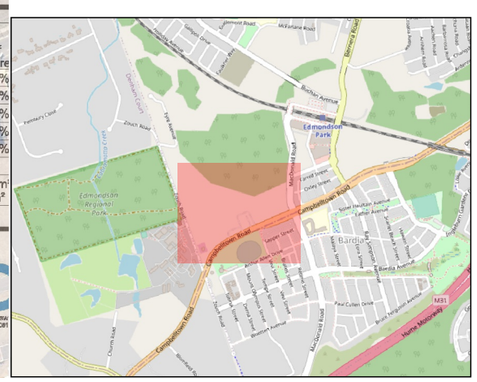
r1	MSK	12.01.2023	Updated figure to address client's comments	HPe
r0	MSK	14.11.2022	Prepare figure	HPe

0 60 120 180 m
1:2,500

N

RENZO TONIN & ASSOCIATES
inspired to achieve

FOR INFORMATION



Edmonson Park Precint 3

Figure 7: Noise level predictions for 2032 during Night period (4.5m high residential reciever height)

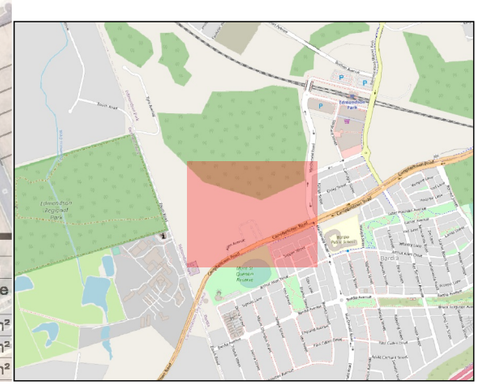
Figure 8 Treatment categories at ground floor facades

300mm
Date: 12/01/23 - 12:27
File: \\SYD-SERVER\RTAGroupSyd\AssocSydProjects\TM951-TN000\TM996 TT Ed Park Precinct 3\5 Calcs\TM996-01 (r0) - Conv.qgz

r1	MSK	12.01.2023	Updated figure to address client's comments	HPe
r0	MSK	14.11.2022	Prepare figure	HPe

RENZO TONIN & ASSOCIATES
inspired to achieve

FOR INFORMATION



Edmonson Park Precint 3

Figure 8: Treatment catogories at ground floor facades

Figure 9 Treatment categories at first floor facades

Date: 12/01/23 - 12:28
File: \\SYD-SERVER\RTAGroupSydAssocSydProjects\TM951-TN000\TM996 TT Ed Park Precinct 3\5 Calcs\TM996-01 (r0) - Copy.qgz

0 60 120 180 240 300m

r1	MSK	12.01.2023	Updated figure to address client's comments	HPe
r0	MSK	14.11.2022	Prepare figure	HPe

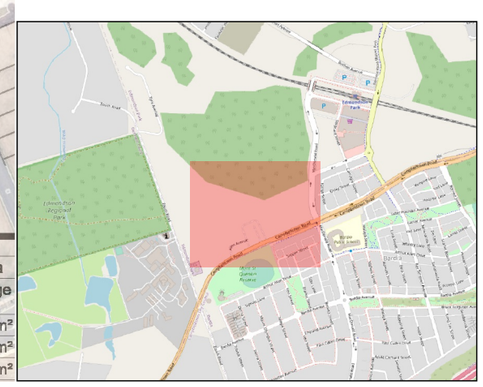
0 50 100 150 m

1:2,000

N

RENZO TONIN & ASSOCIATES
inspired to achieve

FOR INFORMATION



Edmonson Park Precint 3

Figure 9: Treatment catogories at first floor facades

THIS PAGE IS INTENTIONALLY BLANK