Road Noise Assessment

Arcadia East Residential Development
Burgmanns Lane
Tamworth, NSW

Prepared for: CSO Engineers Pty Ltd
December 2022
MAC221663-01RP1V2

Muller Acoustic Consulting

Document Information

Road Noise Assessment

Arcadia East Residential Development

Burgmanns Lane

Tamworth, NSW

Prepared for: CSO Engineers Pty Ltd

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1 Introduction

Muller Acoustic Consulting Pty Ltd (MAC) has been engaged by CSO Engineers Pty Ltd (CSO) to prepare a Road Noise Assessment (RNA) for the Arcadia Estate Residential Development project (the 'project'), to be located at Burgmanns Lane, Tamworth, NSW. The RNA has been completed to assess road traffic noise from the Burgmanns Lane (see **Figure 1**) within the footprint of the project. The RNA also includes the assessment of future traffic flows associated with the potential upgrade of Burgmanns Lane to be part of the Western Freight Link connecting Oxley Highway to the New England Highway.

The assessment has been undertaken in general accordance with the following policies and guidelines:

- NSW Environment Protection Authority (EPA), Noise Policy for Industry (NPI), 2017;
- Department of Planning (DPI) 2008, Development Near Rail Corridors and Busy Roads – Interim Guideline;
- NSW Environment Protection Authority (EPA's), Approved methods for the measurement and analysis of environmental noise in NSW, 2022; and
- Australian Standard AS 2107:2016 – Acoustics – Recommended design sound levels and reverberation times for building interiors.

A glossary of terms, definitions and abbreviations used in this report is provided in **Appendix A.**

1.1 Western Freight Link - Burgmanns Lane Upgrade

The Western Freight Link (WFL) is part of the Tamworth City Wide Transport Model (TCWTM) and is the proposed link aiming to connect the New England Highway with the Oxley Highway via Burgmanns Lane and Country Road. The WFL will divert traffic including freight heavy vehicles around Tamworth City Centre, elevating traffic congestion.

In addition to assessing existing traffic flows for Burgmanns Lane, this RNA has assessed the predicted "2030-PC05" traffic flows for the WFL, which is representative of a population of up to 100,000 living in the Tamworth Region.

FIGURE 1

Site Layout

MAC221663-01

Arcadia Estate

KEY

L1 - Logger Location

Site Boundary

0 70 140 210 280 350 420 m

N

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2 Noise Policy and Guidelines

2.1 Noise Intrusion – Road Traffic Noise

Guidance for the specification of internal noise levels of habitable rooms from road traffic noise is prescribed in Department of Planning's (DoP) Development near Rail Corridors and Busy Roads – Interim Guidelines (2008) ('the guideline').

The guideline outlines internal criterion levels for Clause 102 (Road) of the State Environmental Planning Policy (SEPP) for Infrastructure (Infrastructure SEPP):

"If the development is for the purpose of a building for residential use, the consent authority must be satisfied that appropriate measures will be taken to ensure that the following LAeq levels are not exceeded:

- *in any bedroom in the building: 35 dBA at any time 10pm–7am; and*
- *anywhere else in the building (other than a garage, kitchen, bathroom or hallway): 40dBA at any time."*

Table 3.1 of the guideline clarifies that the above noise criteria are to be determined as an $LA_{eq(15hr)}$ for the day and $LA_{eq(9hr)}$ for the night period.

The guideline assists in the planning, design and assessment of development in, or adjacent to, rail corridors and busy roads and supports the Infrastructure SEPP. The guidelines are mandatory for residential developments proposed adjacent to busy roads with an Annual Average Daily Traffic (AADT) of greater than 40,000 vehicles or for projects where traffic noise impacts are anticipated.

2.1.1 Road Noise Screening Test

Section 5.3.2 of the guideline provides screening tests for single and dual occupancy dwellings. The screening tests provide varying categories of noise control treatments for dwellings taking into consideration distance to the road and amount of traffic. The guideline presents two screen tests for a 60/70 km/hr zone and 100/110 km/hr zone that are reproduced in **Figure 2** and **Figure 3** respectively. The screening tests have been adopted in this assessment to provide guidance on building categories for the project.

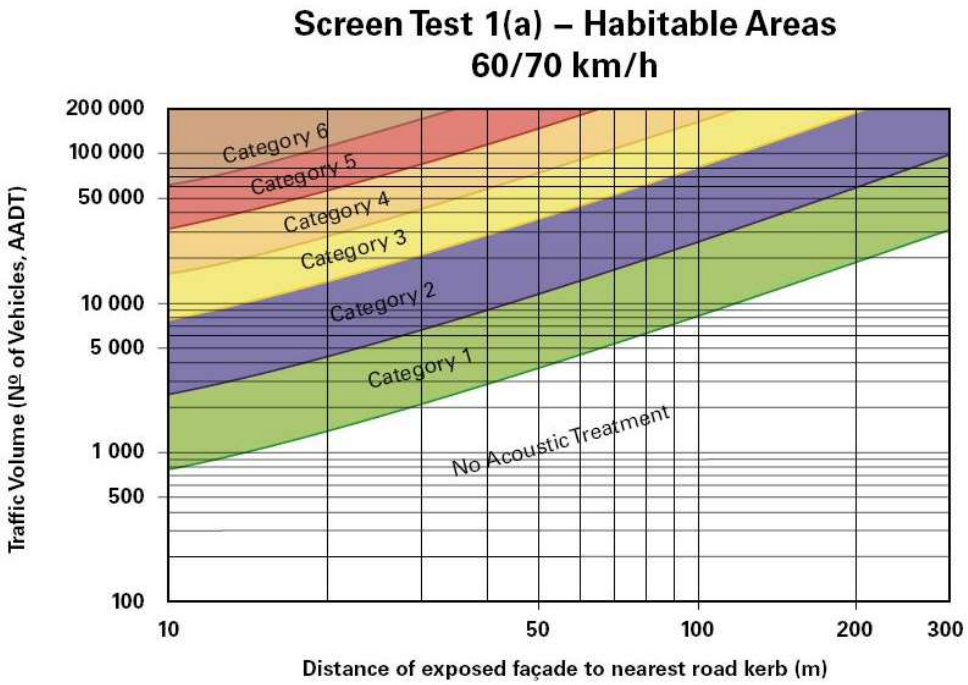

Figure 2 Screen test for habitable areas of single/dual occupancy dwellings adjacent to 60/70 km/hr zones.

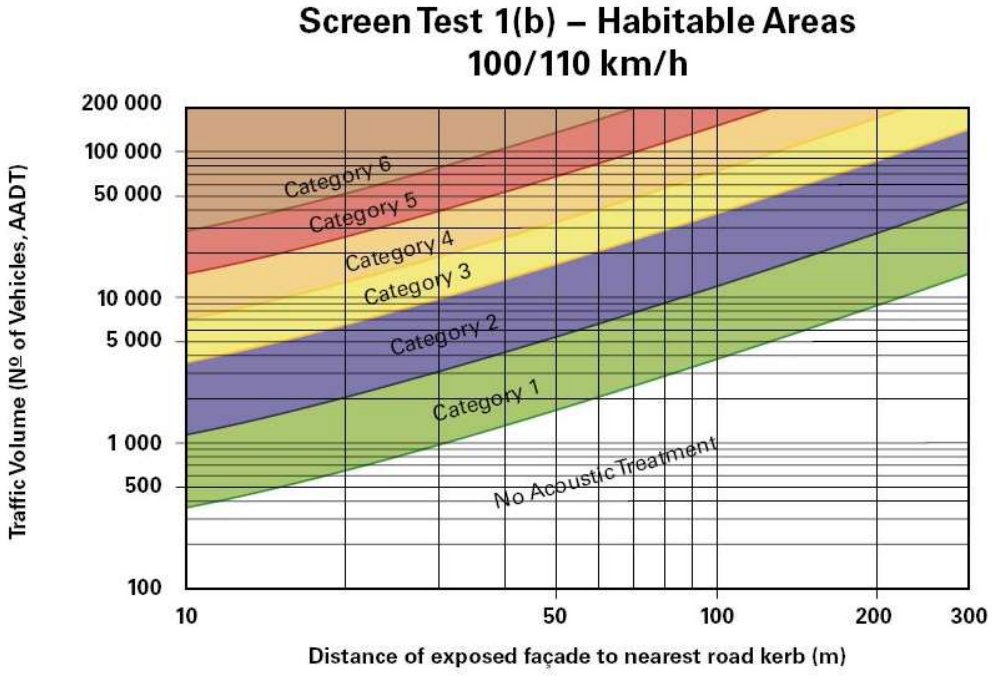

Figure 3 Screen test for habitable areas of single/dual occupancy dwellings adjacent to 100/110 km/hr zones.

2.1.2 Indicative Attenuation Levels

The Environmental Noise Management Manual (ENMM) (2001) provides a summary of indicative attenuation from standard building types. The indicative attenuation levels are summarised in **Table 1**, which provides typical performance of buildings with respect to noise reduction. A light frame residence with single glazing would be expected to provide a reduction of 20dBA from external to internal with windows closed. Where windows are closed, the fresh air requirements outlined in the Building Code of Australia are to be satisfied.

Table 1 Indicative Building Noise Attenuation

Building Type	Windows	Internal noise reduction, dBA
All	Open	10
Light frame	Single glazed (closed)	20
Masonry	Single glazed (closed)	25
	Double glazed (closed)	30

Note: Sourced from ENMM, 2001.

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3 Unattended Noise Monitoring

Background unattended noise logging was completed to quantify existing road noise levels at the project site. One unattended noise monitor was installed adjacent to the southern boundary of the project site from Monday 10 October 2022 to Wednesday 18 October 2022. Data from the logger was used to calibrate the noise model. The noise logger location is presented in **Figure 1**.

Instrumentation used was a SVANTEK 977 Type 1 octave sound analyser, programmed to collect samples at 15 minute intervals with 'Fast' time weighting and 'A' frequency weighting. The analyser was calibrated before and after the monitoring period with no drift in calibration noted. Monitoring was conducted in general accordance with the procedures described in Australian Standard AS 1055:2018 Acoustics - Description and Measurement of Environmental Noise. Data affected by adverse meteorological conditions has been excluded from the results in accordance with methodologies provided in the NPI. All equipment carries appropriate and current NATA (or manufacturer) calibration certificates with records of all calibrations maintained by MAC as per Approved methods for the measurement and analysis of environmental noise in NSW (EPA, 2022).

The results of long-term unattended monitoring are provided in **Table 2**. Appendix C presents the noise monitoring charts for the assessment period.

Table 2 Unattended Noise Monitoring Results

ID	Measured Ambient Noise dB L_{Aeq}	
	Day Period (7am to 10pm)	Night Period (10pm to 7am)
L1	54.7	51.8

Note: Rail noise is assessed over two periods, Day 7am to 10pm and Night 10pm to 7am (ie no evening).

Road noise predictions for Burgmanns Lane were compared to measured levels at monitoring location (L1). This is considered a good practice technique to validate the assumptions made in the assessment. Results of the validation are presented in **Table 3**. Noise predictions demonstrate a consistent correlation (±<2dB tolerance) when compared against measured levels.

Table 3 Noise Assessment Validation Results[1]

Measurement Location	Predicted level, dB L_{Aeq}		Measured dB L_{Aeq}		Difference, dB	
	Day	Night	Day	Night	Day	Night
Burgmanns Lane	55.5	51.2	54.7	51.8	+0.8	-0.6

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4 Noise Assessment Review

4.1 Calculation of Road Traffic Noise

A theoretical assessment of road traffic noise was carried out to predict levels at the future lots within the project site using the Calculation of Road Traffic Noise (CRTN) algorithm, as developed by the UK Department of Transport. This method incorporates consideration of traffic flow volume, average speed, percentage of heavy vehicles, and road gradient and includes attenuation via spherical spreading (or cylindrical in the case of a line source such as a road), soft ground, atmospheric absorption and screening from buildings or barriers.

4.2 Assessed Traffic Flows

Existing Hourly AADT distributions utilised in predictive modelling, were sourced from Traffic Counts conducted at site 2209 on Burgmanns Lane from Friday 10 June 2022 to Thursday 23 June 2022 by Tamworth Regional Council (TRC). In addition to assessing existing traffic flows for Burgmanns Lane, this RNA has assessed the predicted "2030-PC05" traffic flows for the WFL with traffic flows calculated from the two-hour AM peak of 800 vehicles sourced from the Arcadia Traffic Modelling Update (report Ref: N156252/301401261 Issue C, Stantec February 2022). The day and night splits as well as the heavy vehicle percentages from the existing traffic flows were also adopted for the 2030-PC05 flows. **Table 4** summarises the calculation parameters adopted for both traffic scenarios included in this assessment.

Table 4 Calculation Parameters – Hennessey Drive

Assessment Period	AADT Volume[2]	% Heavy Vehicles	Speed Limit (km/hr)
Existing Traffic Flows, Site 2209			
Day	1146[1]	10	60
Night	163[1]	23	60
2030-PC05 Predicted Traffic Flows			
Day	4182[2]	10	60
Night	494[2]	23	60

Note 1: Tamworth Regional Council, 2022.

Note 2: Calculated 2030-PC05 flows.

4.2.1 Road Noise Prediction Results – Existing Traffic Flows

The subdivision plans (**Appendix B**) for the proposed project have been reviewed and incorporated into the assessment. The initial calculation scenario for this assessment includes 'free field' predictions for day and night road noise levels. **Figure 4** and **Figure 5** presents the 'free field' noise contours for each modelled day $LA_{eq(15hr)}$ and night $LA_{eq(9hr)}$ assessment periods.

Figure 4 - Existing Day, LAeq(15hr)

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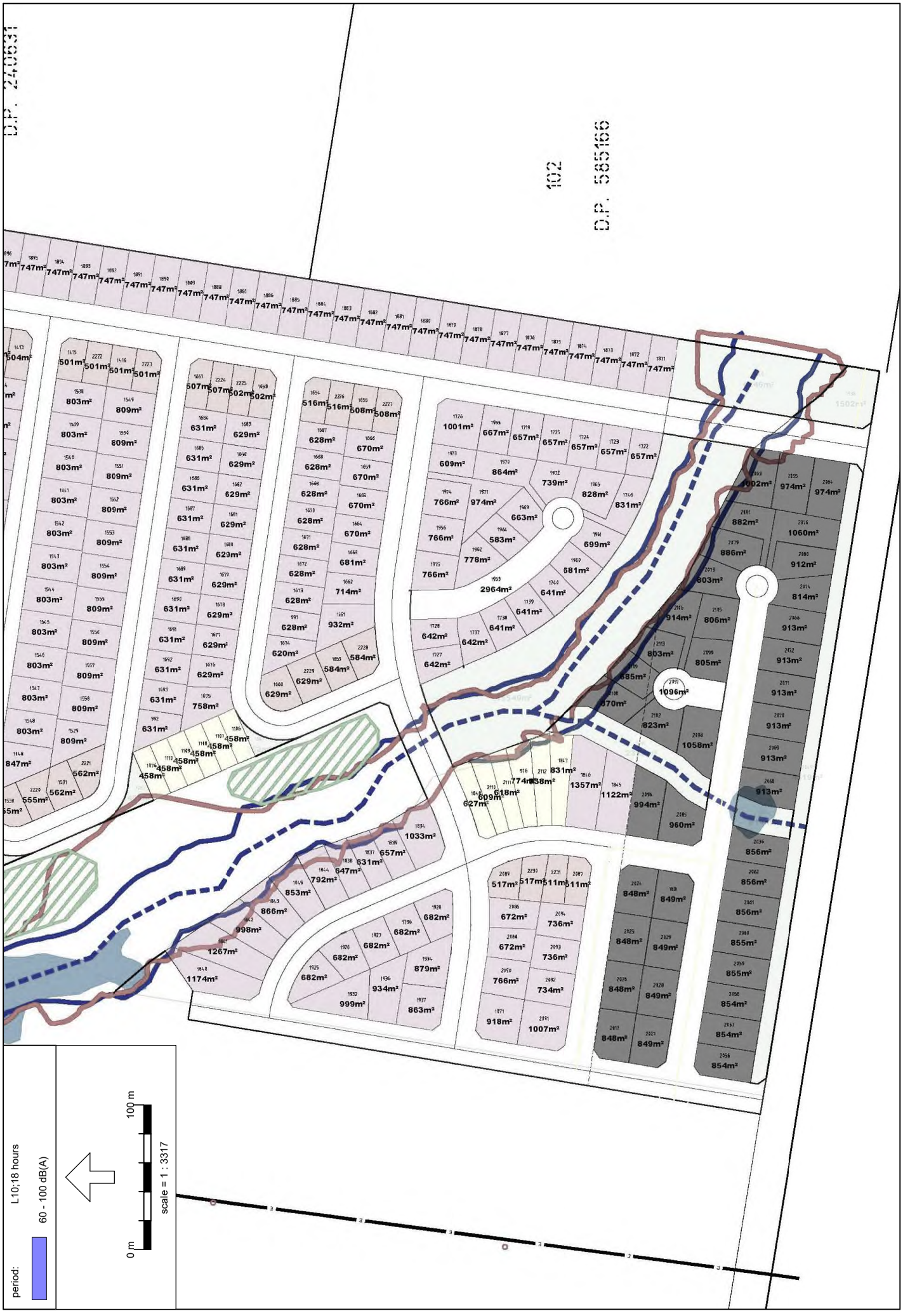
Figure 5 - Existing Night, LAeq(9hr)

A review of modelling results presented in **Figure 4** and **Figure 5** identifies that existing traffic levels on Burgmanns Lane is predicted to be a significant contributor to noise levels within the project site, with external noise levels up to 55dB $LA_{eq(period)}$ likely to be experienced at the nearest residential allotments.

Further assessment was undertaken to identify areas within the project site where internal noise levels may exceed the design sound levels, hence requiring at-property treatments or source to receiver mitigation measures. The assessment applied a 20dB reduction across the façade for a light framed building with windows closed. The noise management zone for the day period (7am to 10pm) is based on a design sound level of 40dB $LA_{eq(15hr)}$ for habitable rooms, while the noise management zone for the night period (10pm to 7am) is based on a design sound level of 35dB $LA_{eq(9hr)}$ for sleeping areas. The noise management zones are presented in **Figure 6** and **Figure 7**.

The results of the assessment of residential allotments where internal noise levels may exceed the design sound levels, identifies that there are no allotments located within the project site which are within the noise management zones for the day period or the night period for the existing traffic flows on Burgmanns Lane with the windows closed.

Where windows are closed, alternative means of internal ventilation (eg air conditioning or wall ventilators) must be considered to allow windows to remain fully closed (refer to BCA requirements).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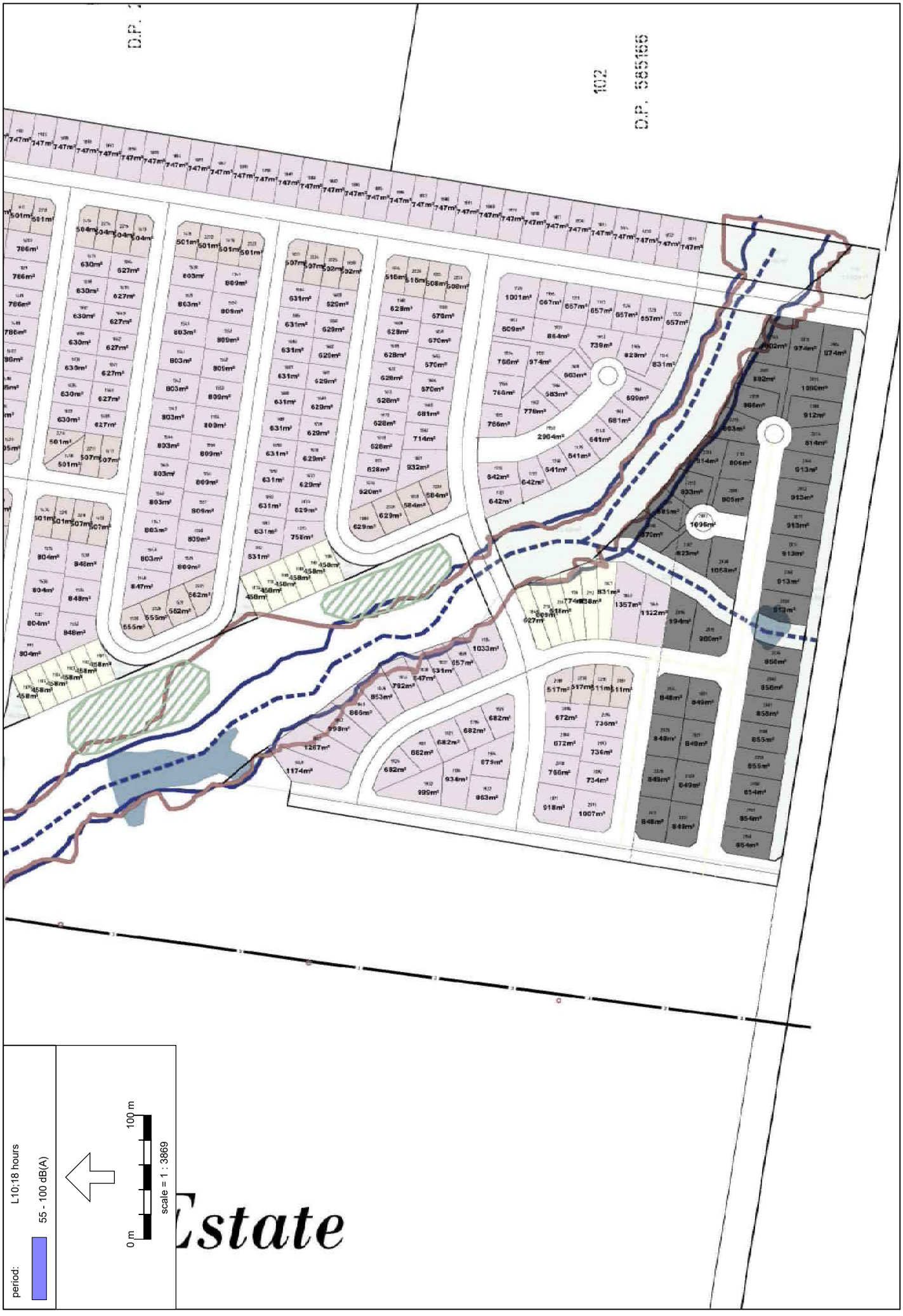
100 m
0 m



Road traffic noise - LimA - CRTN, [MAC221663-01RP1 - October 2022 - Night Cal - Existing Traffic Levels] , Predictor V11.10

4.2.2 Road Noise Prediction Results – 2030-PC05 traffic Flows

The future calculation scenario for this assessment includes 'free field' predictions for day and night road noise levels with the inclusion of the 2030-PC05 traffic flows. The assessment also included the proposed amenity bund or acoustic barrier indicated in the subdivision plans. The barrier has been assumed to be a nominal 2m above the final floor level of Burgmanns Lane. **Figure 8** and **Figure 9** presents the 'free field' noise contours for each modelled day $LA_{eq(15hr)}$ and night $LA_{eq(9hr)}$ assessment periods including the 2030-PC05 traffic flows.

Figure 8 - 2030-PC05 Flows - Day LAeq(15hr)

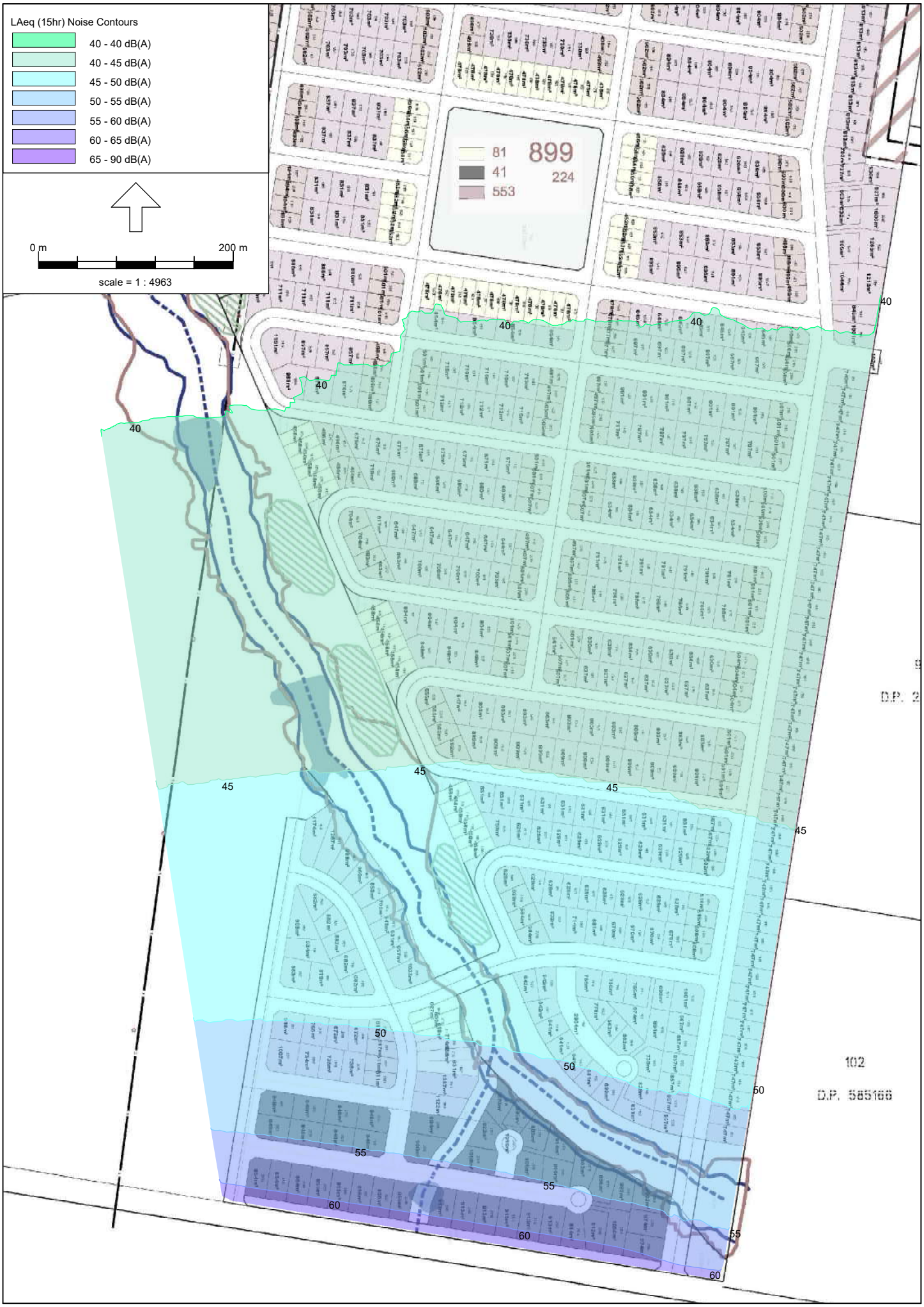
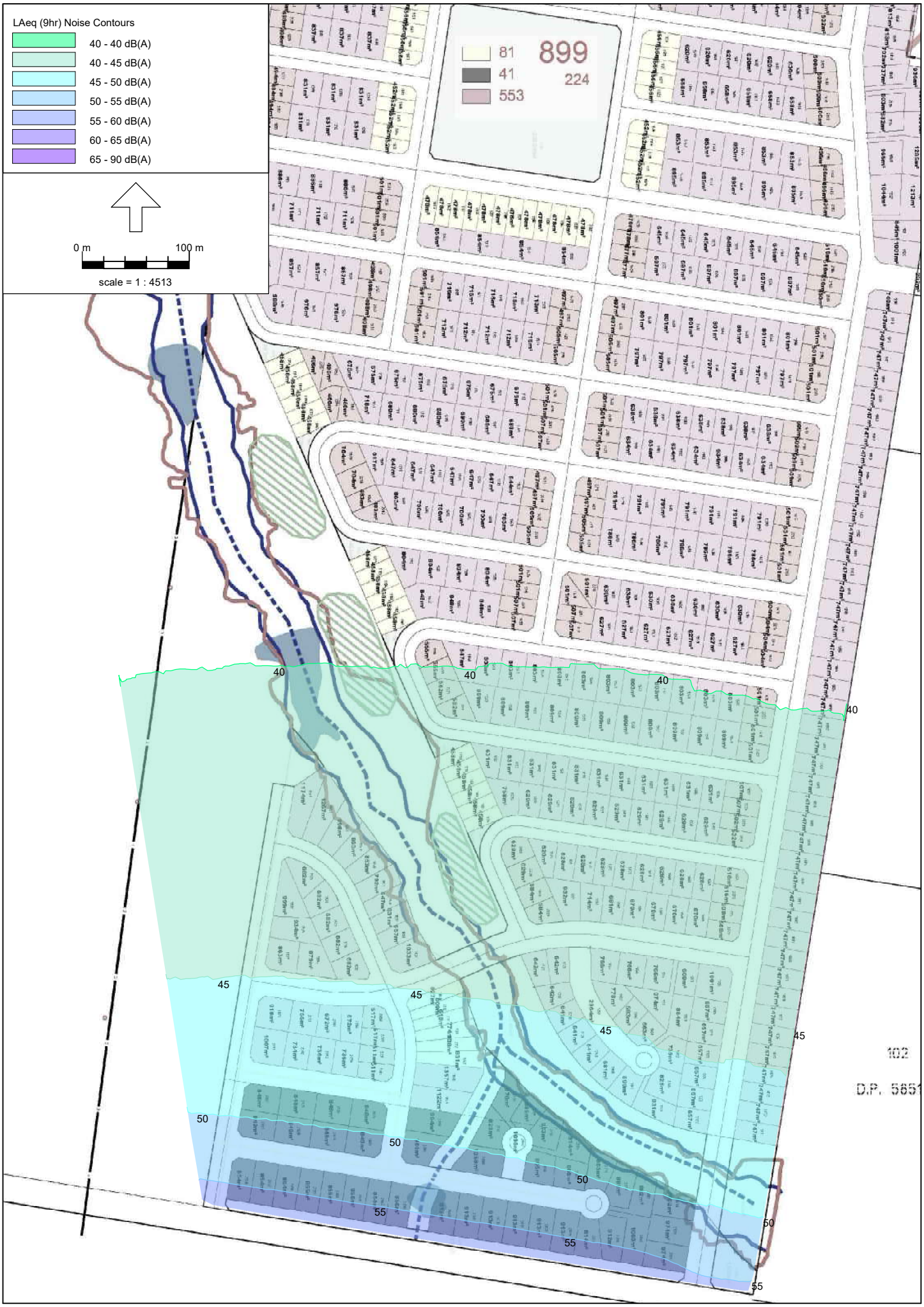


Figure 9 - 2030-PC05 Flows - Night, LAeq(9hr)



A review of modelling results presented in **Figure 8** and **Figure 9** identifies that the future 2030-PC05 traffic levels on Burgmanns Lane have the potential to generate external traffic noise levels up to 60dB $L_{Aeq(period)}$ likely to be experienced at the nearest residential allotments.

Further assessment was undertaken to identify areas within the project site where internal noise levels may exceed the design sound levels, hence requiring at-property treatments or source to receiver mitigation measures. The assessment applied the 20dB reduction across the façade for a light framed building with windows closed. The noise management zone for the day period (7am to 10pm) is based on a design sound level of 40dB $L_{Aeq(15hr)}$ for habitable rooms, while the noise management zone for the night period (10pm to 7am) is based on a design sound level of 35dB $L_{Aeq(9hr)}$ for sleeping areas. The noise management zones are presented in **Figure 10** and **Figure 11**.

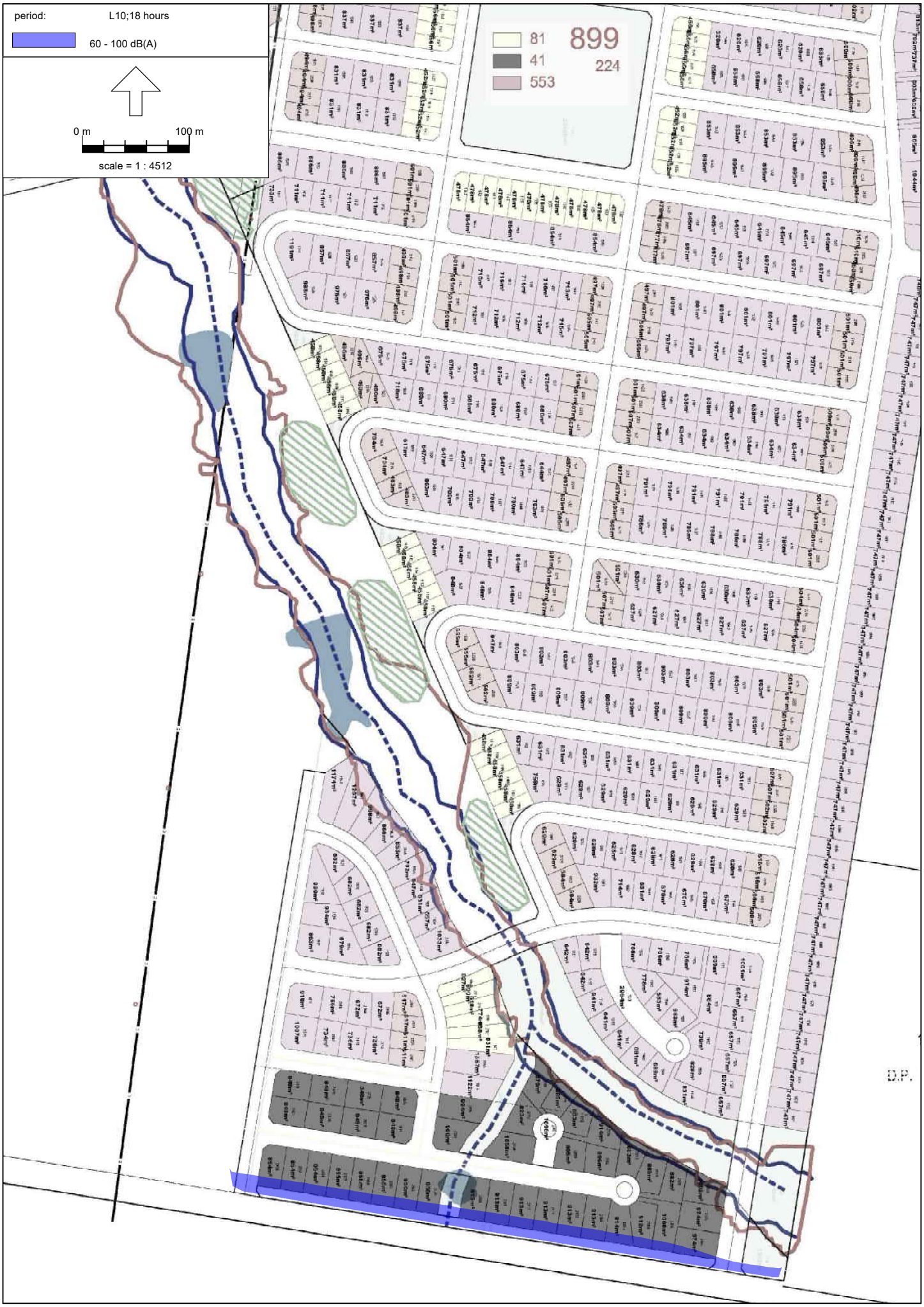
The results of the assessment of residential allotments where internal noise levels may exceed the design sound levels, identifies that the allotments located along the south boundary of the project site which are within the noise management zones for the day period or the night period for the future 2030-PC05 traffic flows on Burgmanns Lane. For these allotments additional mitigation measures such as category 2 treatments or boundary fences should be considered.

Generally, standard domestic glass is usually acoustically inadequate and can reduce the attenuation performance of the overall building façade, in many cases the glazing element may be the only element that requires upgrading. Notwithstanding, dwellings constructed in the noise management zones presented in **Figure 10** and **Figure 11** should have their construction materials reviewed against the Category 2 construction materials outlined in Appendix C of the guideline (reproduced in **Appendix D** of this document).

As the windows are to be closed, alternative means of internal ventilation (eg air conditioning or wall ventilators) must be considered to allow windows to remain fully closed (refer to BCA requirements).

It is also noted that for this assessment the location of the future alignment of Burgmanns Lane is indicative only as the final position and alignment is still being finalised. Furthermore, the model has assumed Burgmanns Lane will be situated at the existing ground level. Therefore, results of the modelling should be considered indicative only.

As this assessment has relied on preliminary information, the precise number of exceedances, if any, may be quantified in more detail assessment at a later stage of the development and noise control measures may be specifically tailored to the project. This may include any potential barriers (including rear boundary residential fences and other buildings), specifying location and optimal height. Additionally, the assessment could take into consideration the final position and elevation of Burgmanns Lane along with potential future traffic flows.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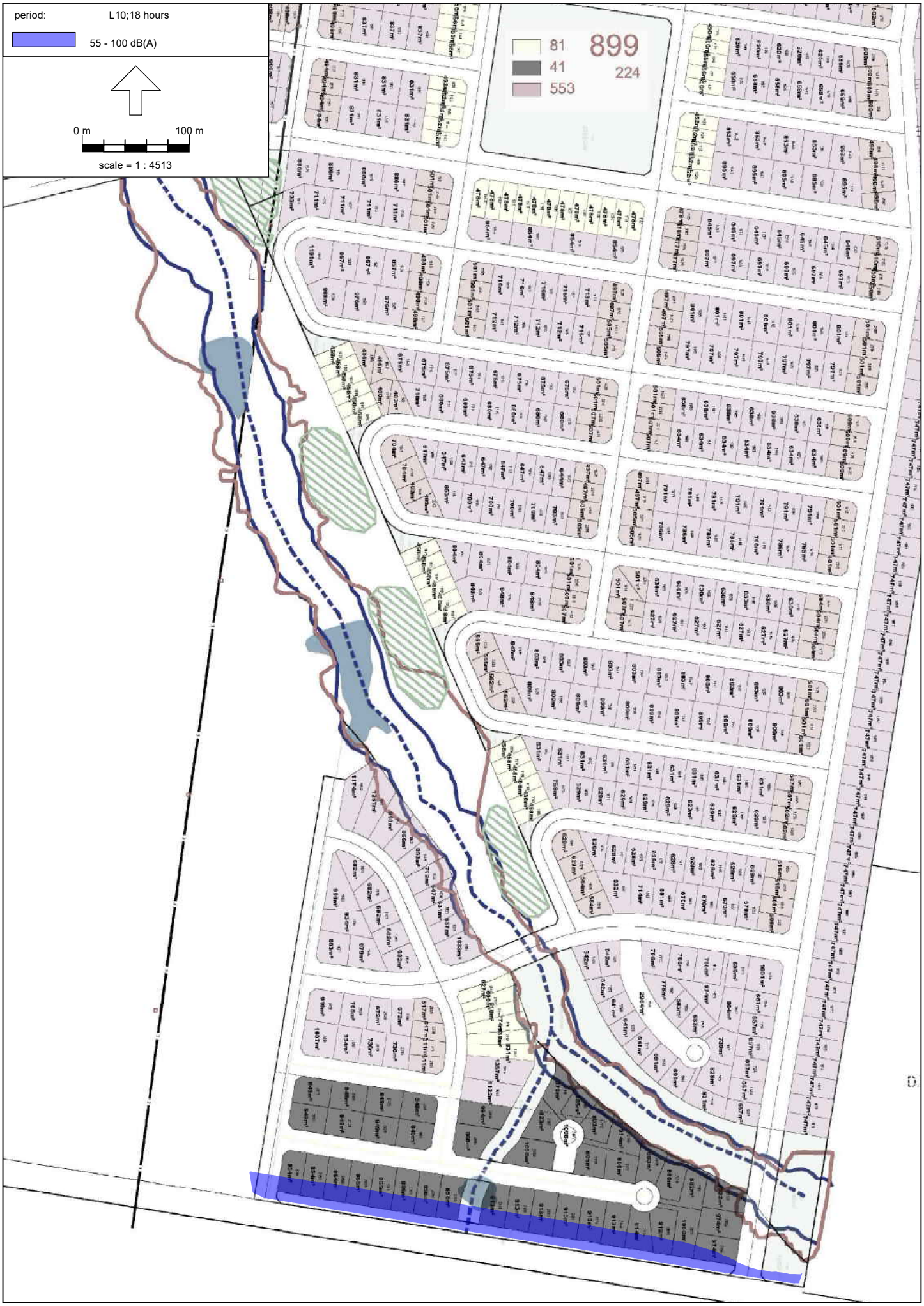
553
899
224


period: L10;18 hours
55 - 100 dB(A)
0 m
100 m
scale = 1 : 4513
81
41
553
899
224

5 Conclusion

Muller Acoustic Consulting Pty Ltd (MAC) has completed a Road Noise Assessment for the proposed Arcadia Estate Residential Development to be located at Burgmanns Lane, Tamworth, NSW. The assessment has been completed to assess road traffic noise to future residential allotments from Burgmanns Lane.

Road traffic noise predictions identified that internal noise levels are predicted to meet the design sound levels at each of the proposed residential allotments for dwellings constructed of standard building elements for all assessed scenarios with the exception of the south boundary allotments during the worst case 2030-PC05 future traffic flows. Standard construction materials are anticipated to attenuate road noise levels to meet in ternal criteria based on the worst case future traffic flows with windows closed at all other allotments. Where windows are closed, alternative means of internal ventilation (eg air conditioning or wall ventilators) must be considered to allow windows to remain fully closed (refer to BCA requirements).

For the southern most allotments during 2030-PC05 future traffic flows additional mitigation measures such as Category 2 treatments (see **Appendix D**) or boundary fences should be considered. It is reiterated that as this assessment has relied on preliminary information, the precise number of exceedances, if any, may be quantified in more detail assessment at a later stage of the development and noise control measures may be specifically tailored to the project

It is recommended that a more detailed assessment be completed when more detailed data for the western freight link project is available, including alignment, elevations and traffic flows. Notwithstanding, the demonstrations that the development of the Arcadia Estate is a feasible option with respect to traffic noise emissions.

Accordingly, the Noise Assessment supports the Development Application for the project incorporating the recommendations and controls outlined in this report.

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Appendix A – Glossary of Terms

A number of technical terms have been used in this report and are explained in **Table A1**.

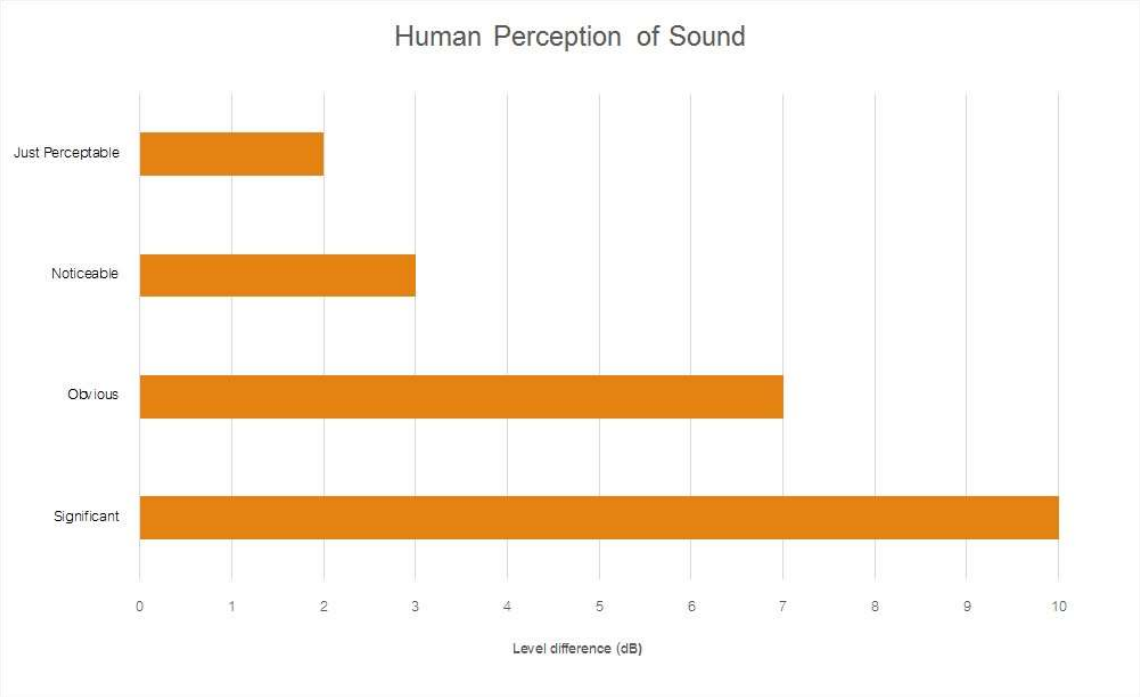
Table A1 Glossary of Acoustical Terms

Term	Description
1/3 Octave	Single octave bands divided into three parts
Octave	A division of the frequency range into bands, the upper frequency limit of each band being twice the lower frequency limit.
ABL	Assessment Background Level (ABL) is defined in the NPI as a single figure background level for each assessment period (day, evening and night). It is the tenth percentile of the measured L90 statistical noise levels.
Ambient Noise	The total noise associated with a given environment. Typically, a composite of sounds from all sources located both near and far where no particular sound is dominant.
A Weighting	A standard weighting of the audible frequencies designed to reflect the response of the human ear to sound.
Background Noise	The underlying level of noise present in the ambient noise, excluding the noise source under investigation, when extraneous noise is removed. This is usually represented by the LA90 descriptor
dBA	Noise is measured in units called decibels (dB). There are several scales for describing noise, the most common being the 'A-weighted' scale. This attempts to closely approximate the frequency response of the human ear.
dB(Z), dB(L)	Decibels Z-weighted or decibels Linear (unweighted).
Extraneous Noise	Sound resulting from activities that are not typical of the area.
Hertz (Hz)	The measure of frequency of sound wave oscillations per second - 1 oscillation per second equals 1 hertz.
LA10	A sound level which is exceeded 10% of the time.
LA90	Commonly referred to as the background noise, this is the level exceeded 90% of the time.
LAeq	Represents the average noise energy or equivalent sound pressure level over a given period.
LAmax	The maximum sound pressure level received at the microphone during a measuring interval.
Masking	The phenomenon of one sound interfering with the perception of another sound. For example, the interference of traffic noise with use of a public telephone on a busy street.
RBL	The Rating Background Level (RBL) as defined in the NPI, is an overall single figure representing the background level for each assessment period over the whole monitoring period. The RBL, as defined is the median of ABL values over the whole monitoring period.
Sound power level (Lw or SWL)	This is a measure of the total power radiated by a source in the form of sound and is given by 10.log10 (W/Wo). Where W is the sound power in watts to the reference level of 10^{-12} watts.
Sound pressure level (Lp or SPL)	the level of sound pressure; as measured at a distance by a standard sound level meter. This differs from Lw in that it is the sound level at a receiver position as opposed to the sound 'intensity' of the source.

Table A2 provides a list of common noise sources and their typical sound level.

Table A2 Common Noise Sources and Their Typical Sound Pressure Levels (SPL), dBA	
Source	Typical Sound Pressure Level
Threshold of pain	140
Jet engine	130
Hydraulic hammer	120
Chainsaw	110
Industrial workshop	100
Lawn-mower (operator position)	90
Heavy traffic (footpath)	80
Elevated speech	70
Typical conversation	60
Ambient suburban environment	40
Ambient rural environment	30
Bedroom (night with windows closed)	20
Threshold of hearing	0

Figure A1 – Human Perception of Sound



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Appendix B – Subdivision Plan

Arcadia Estate

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PROJECT:	----
LOCATION:	----

DESCRIPTION:	----
CLIENT:	----
DRAWN BY:	JB
CHECKED BY:	CT
SCALE:	As Shown
DOCUMENT STAGE:	PRELIMINARY ISSUE

JOB NUMBER	SHEET	TITLE	Dwg. No.	REV.	Size
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Issue Date	Description	By

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Plot Date: 03/06/2022 3:41 PM JB

ARCADIA RESIDENTIAL LAND RELEASE

Job No. 6255 FEBRUARY 2022

STRUCTURE PLAN

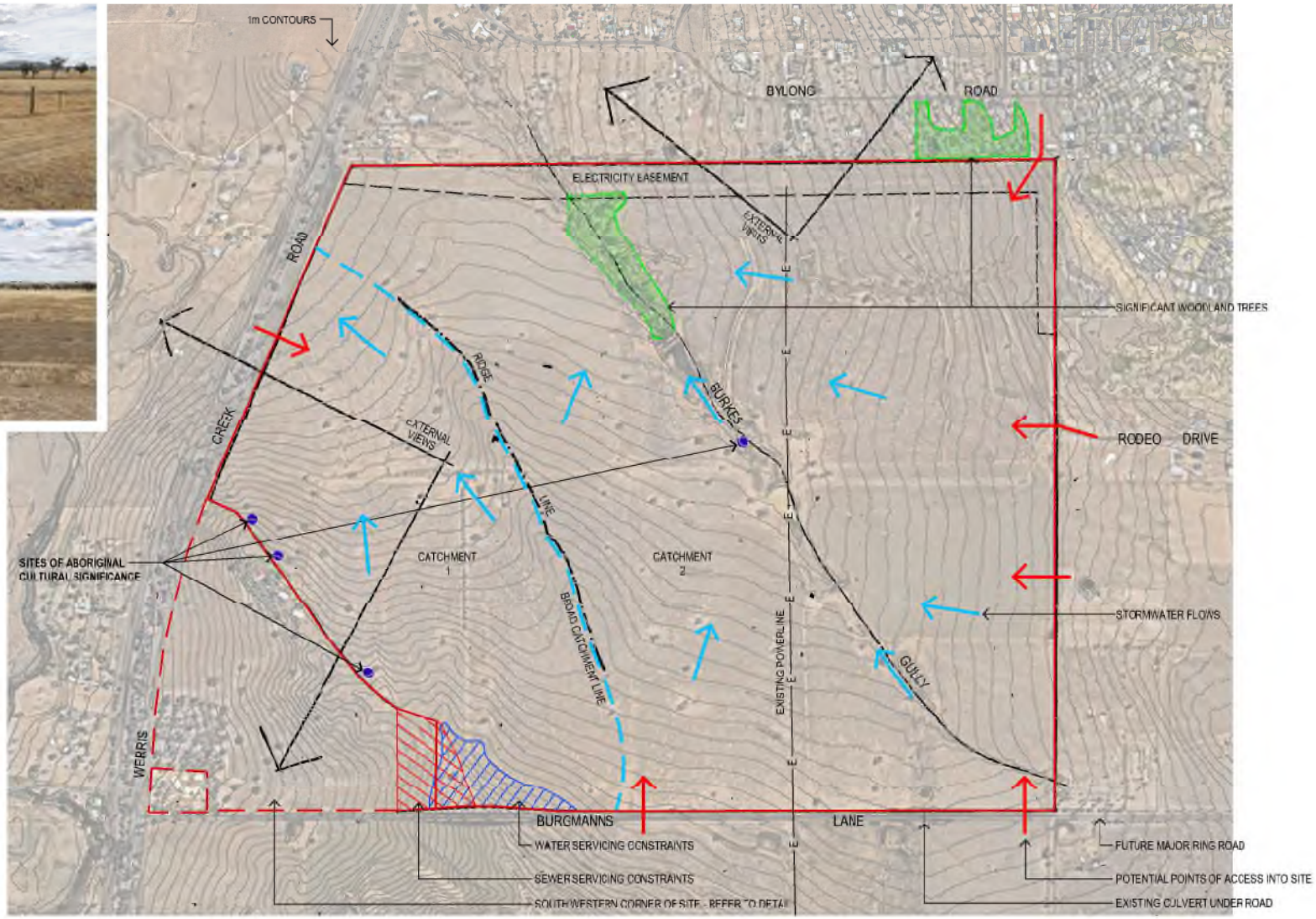
DRAWING SCHEDULE

prepared for

TAMWORTH REGIONAL COUNCIL

KING + CAMPBELL

EXTERNAL VIEWS



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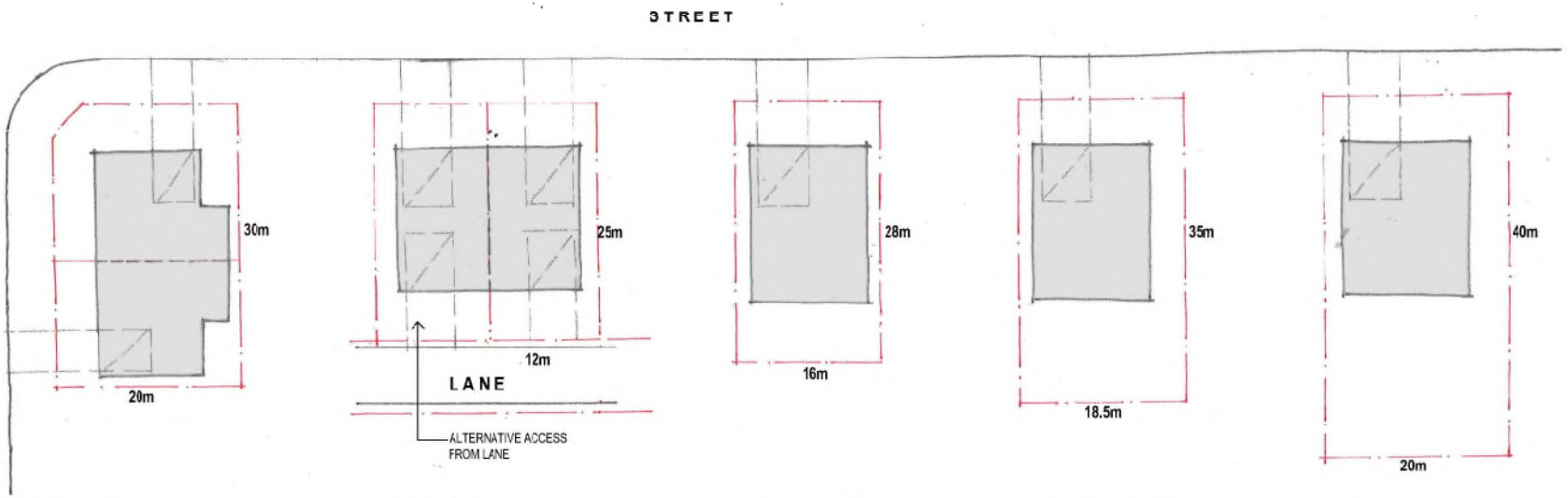
SITE ANALYSIS

ARCADIA RESIDENTIAL LAND RELEASE
FEBRUARY 2022

SHEET 01 OF 15

Tamworth REGIONAL COUNCIL

K+C REF: O-9283_Tamworth Council - Urba Design Advisory\01_Planning\02SP_Site Analysis.dwg A0/L-Site Analysis, 24-Feb-2022, angelac



DUPLEX LOT
600m² MINIMUM
(APPROVAL FOR BUILDINGS REQUIRED)

COMPACT LOTS
300 - 450m² MINIMUM
(APPROVAL FOR BUILDINGS REQUIRED)

MINIMUM LOT SIZE
450m² MINIMUM
(FOR SUBDIVISION APPROVAL ONLY)

AVERAGE LOT SIZE
650m²

LARGE LOT
GREATER THAN 700m²

DUPLEX HOUSING

INTEGRATED HOUSING
ACCESS FROM LANE

INTEGRATED / MEDIUM DENSITY HOUSING
ACCESS FROM STREET

MEDIUM DENSITY HOUSING

CONVENTIONAL HOUSING

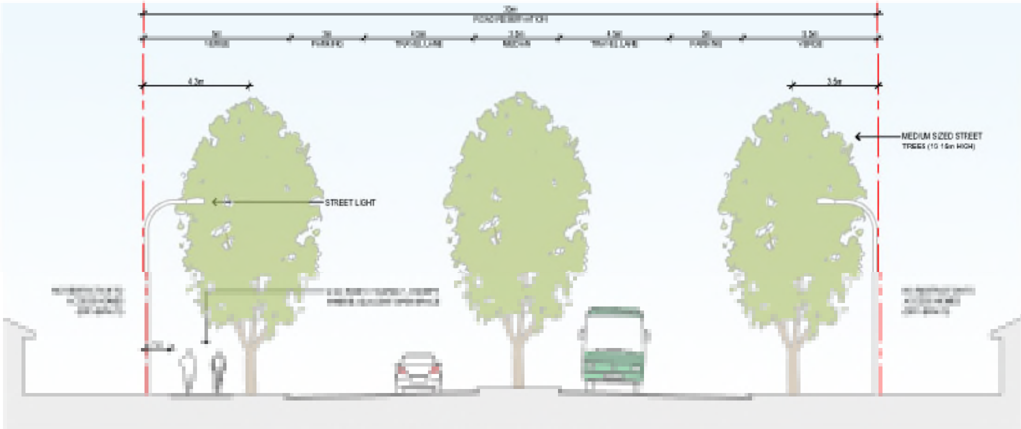
KING + CAMPBELL

LOT AND HOUSING DIVERSITY

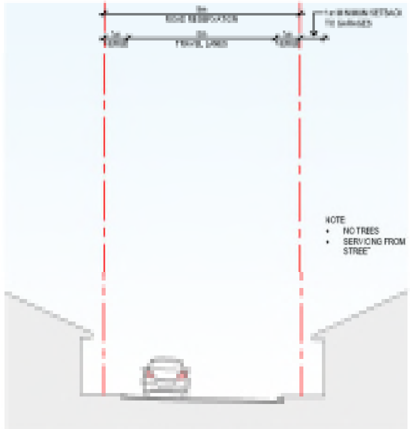
ARCADIA RESIDENTIAL LAND RELEASE
FEBRUARY 2022

Tamworth REGIONAL COUNCIL

K+C REF: O:\9265_Tamworth Council - Urba Design Advisory\01_Planning\02SP_Lot+HousingDiversity.dwg - A3_Lot+Housing Diversity, 24-Feb-2022, angelac



TYPICAL SECTION - ENTRY ROAD/BOULEVARD



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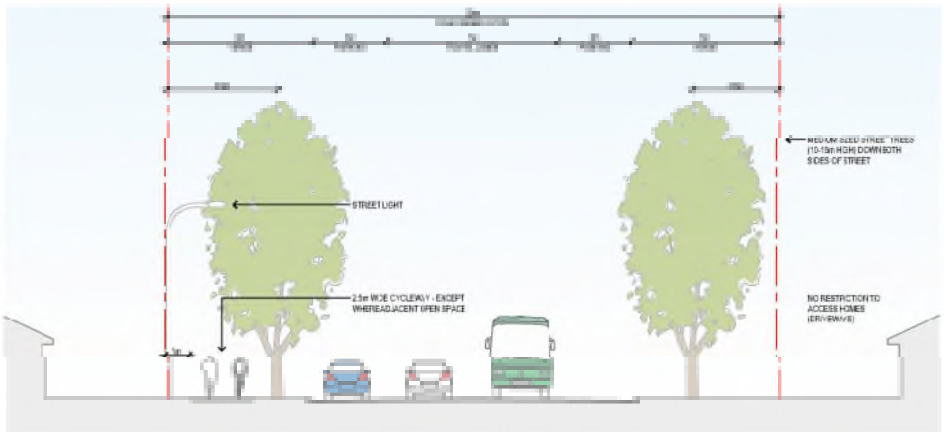

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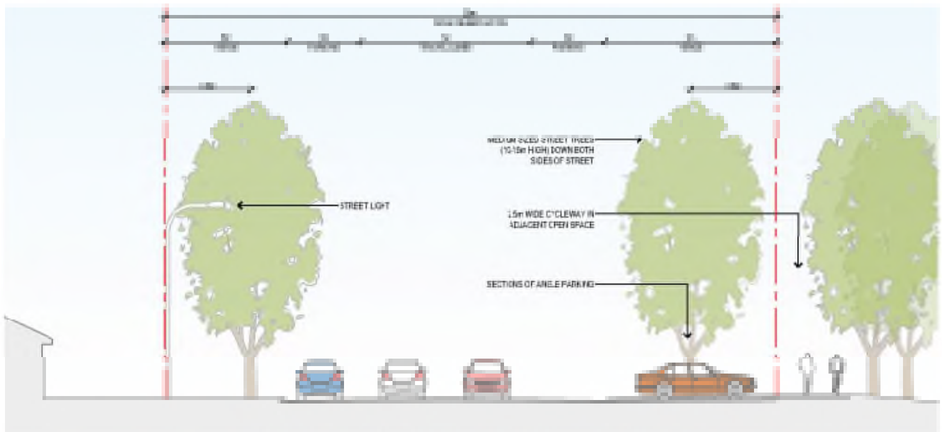

TYPICAL SECTION - BURKES GULLY EDGE STREET

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TYPICAL STREET SECTIONS

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FEBRUARY 2022

SHEET 03 OF 15

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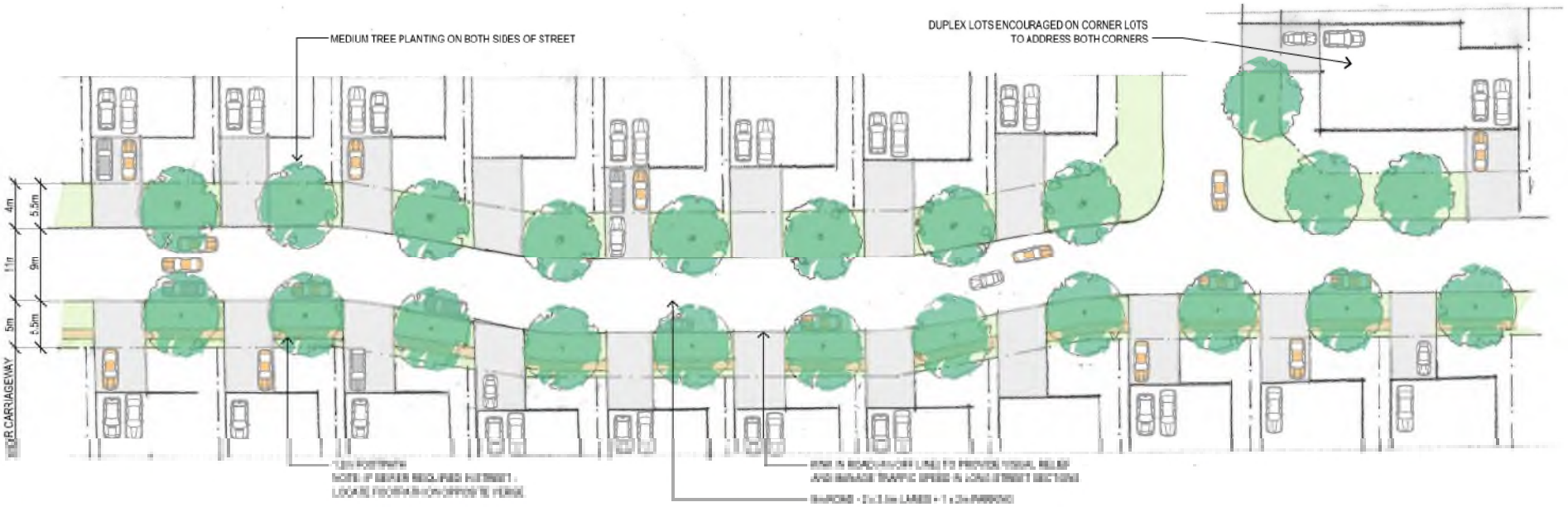
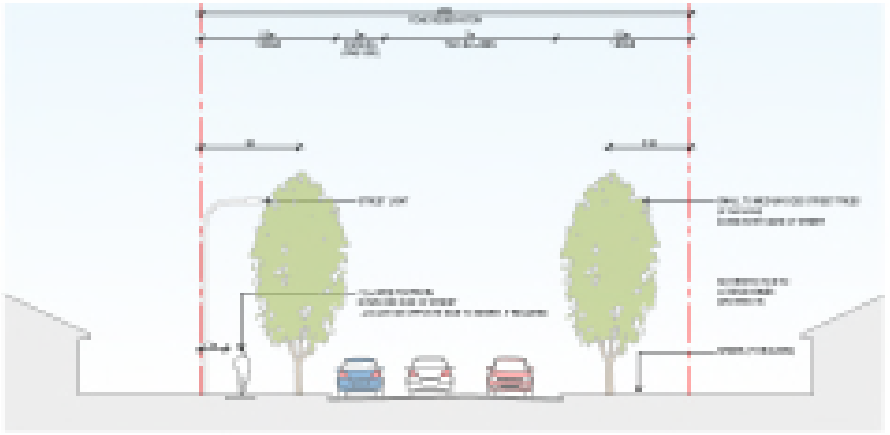
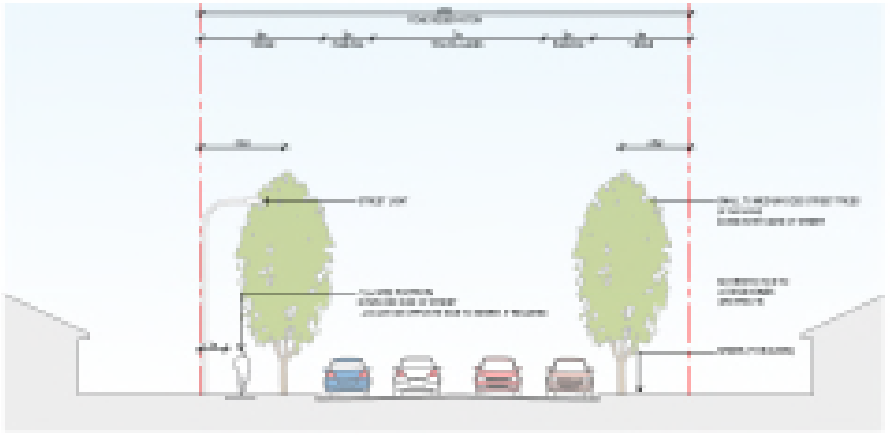




TYPICAL SECTION - LOCAL ACCESS STREET - 9m CARRIAGEWAY



TYPICAL SECTION - LOCAL ACCESS STREET - 11m CARRIAGEWAY

LOCAL STREET - TYPICAL PLAN AND SECTION

ARCADIA RESIDENTIAL LAND RELEASE
FEBRUARY 2022

SHEET 04 OF 15

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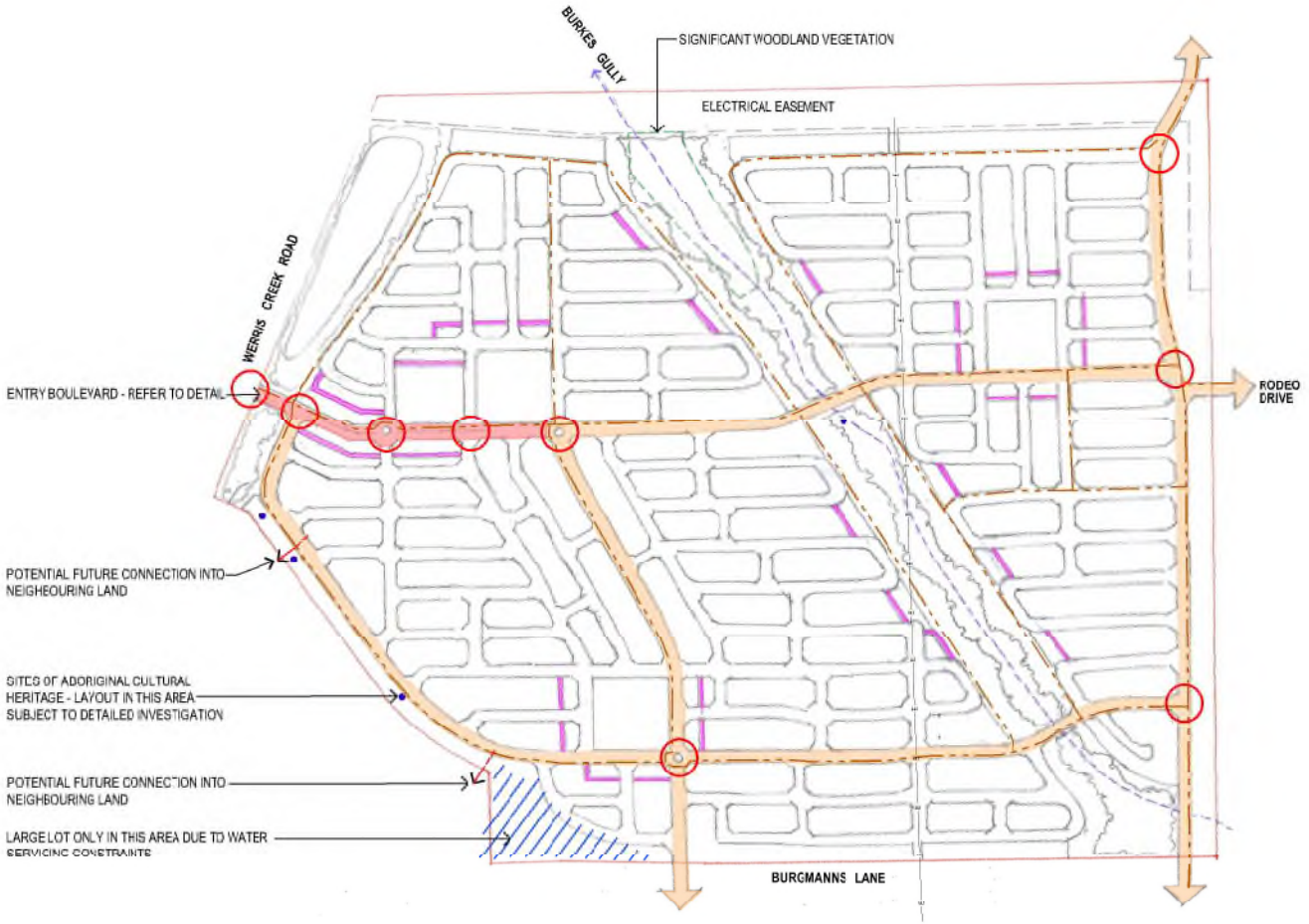

LEGEND

- SITE
- SITE OF ABORIGINAL CULTURAL HERITAGE
- EXISTING OVERHEAD ELECTRICITY

STREETS

- ENTRY BOULEVARD
- COLLECTOR / BUS STREET
- LOCAL ACCESS STREET
- LANE (POTENTIAL)
- SHAREWAY (2.5m WIDE)
- KEY INTERSECTIONS

N

0 500

SCALE 1: 10,000 @ A3

KING + CAMPBELL

STRUCTURE PLAN - STREETS

ARCADIA RESIDENTIAL LAND RELEASE
FEBRUARY 2022

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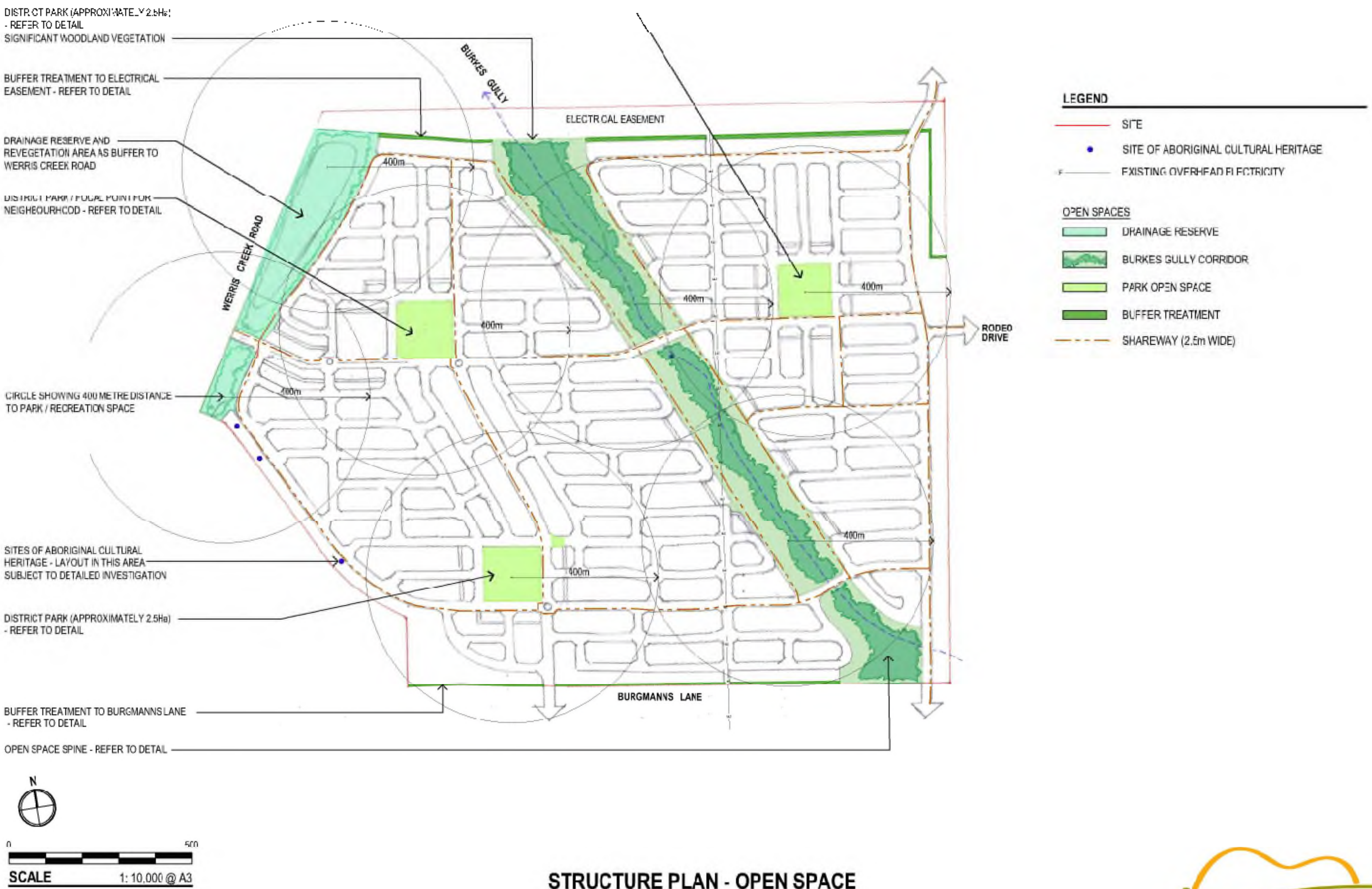
K+C REF: 0/8283_Tamworth Council - Urba Design Advisory\01_Planning\02SP_Structure Plan.dw - ASIL-Streets, 24- Feb- 2022, angelac



STRUCTURE PLAN - OPEN SPACE

ARCADIA RESIDENTIAL LAND RELEASE
FEBRUARY 2022

SHEET 06 OF 15

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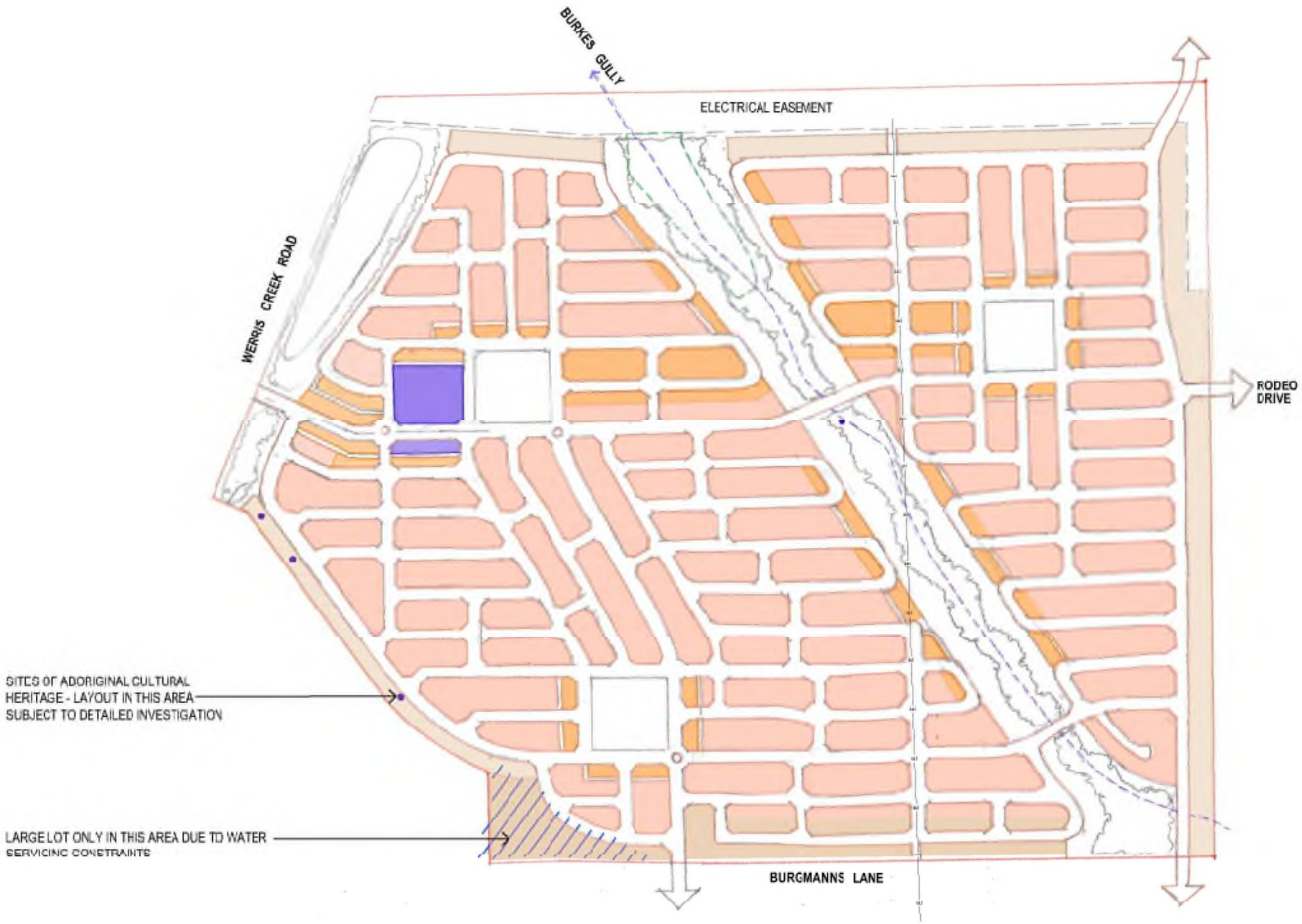


LEGEND

SITE

SITE OF ABORIGINAL CULTURAL HERITAGE

EXISTING OVERHEAD ELECTRICITY

LANDUSE

TOTAL LAND AREA = 286Ha

TOTAL AREA OF OPEN SPACES AND EASEMENTS = 59Ha

COMMERCIAL - NEIGHBOURHOOD SHOPPING CENTRE = 2.11Ha

COMPACT LOTS (300 - 450m2) = 13.73Ha

SMALL LOTS (450 - 700m2) = 97.35Ha

LARGE LOTS - (700 - 800m2) = 15.44Ha

LARGE LOTS - (800m2 MINIMUM) = 8.02Ha

AREAS ARE APPROXIMATE MEASURED FROM STRUCTURE PLAN

N

0 500

SCALE 1: 10,000 @ A3

KING + CAMPBELL

STRUCTURE PLAN - LANDUSE

ARCADIA RESIDENTIAL LAND RELEASE

FEBRUARY 2022

SHEET 07 OF 15

REGIONAL COUNCIL Tamworth

K+C REF: O:\6255_Tamworth Council - Urban Design Advisory\21_Planning\6255P_Structure Plan.dw - A3(L)-Landuse, 24-Feb-2022, angelac

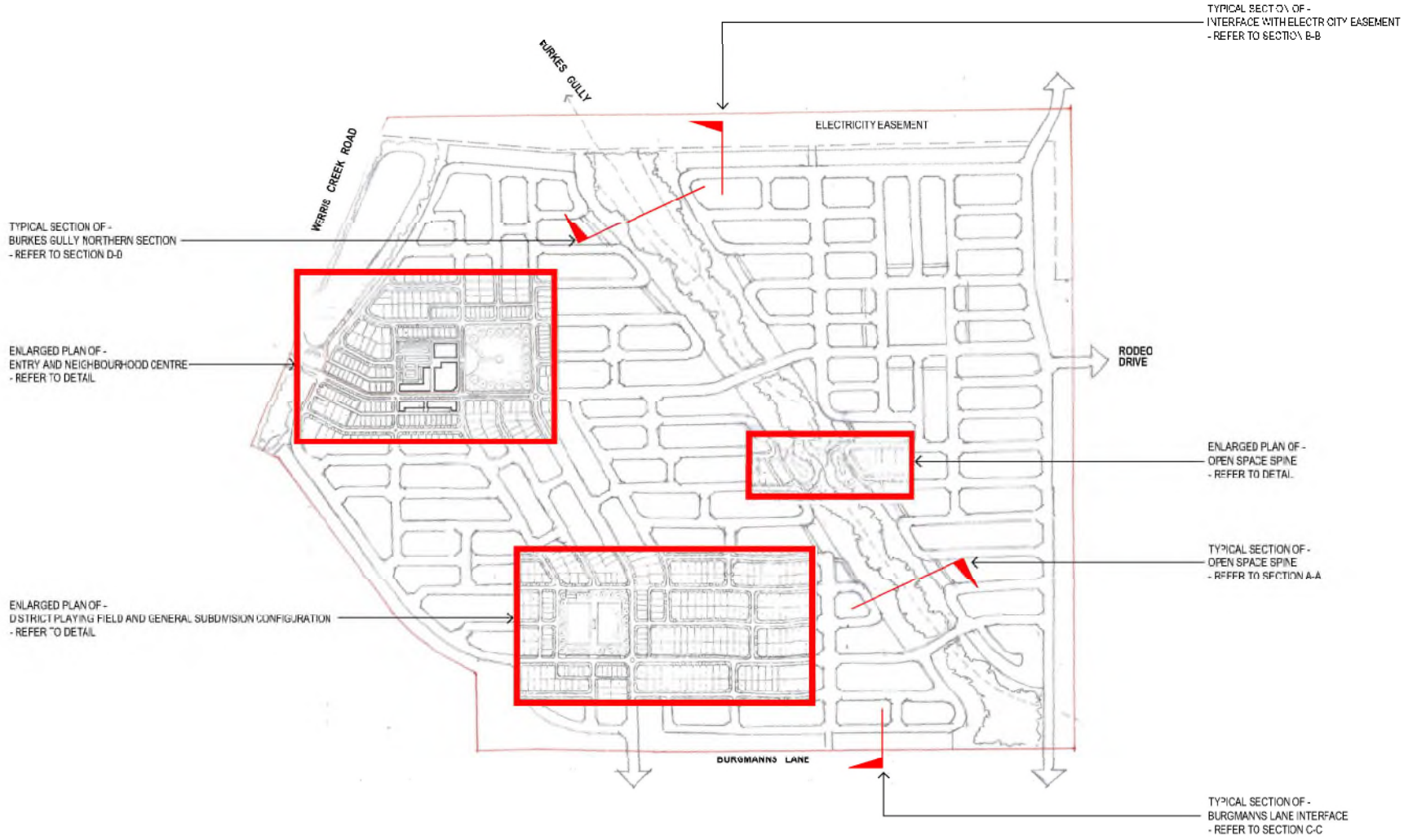
KING + CAMPBELL

STRUCTURE PLAN

ARCADIA RESIDENTIAL LAND RELEASE
FEBRUARY 2022

SHEET 08 OF 15

Tamworth Regional Council



N

0 500

SCALE 1: 10,000 @ A3

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PLAN AND SECTION REFERENCING

ARCADIA RESIDENTIAL LAND RELEASE
FEBRUARY 2022

SHEET 09 OF 15

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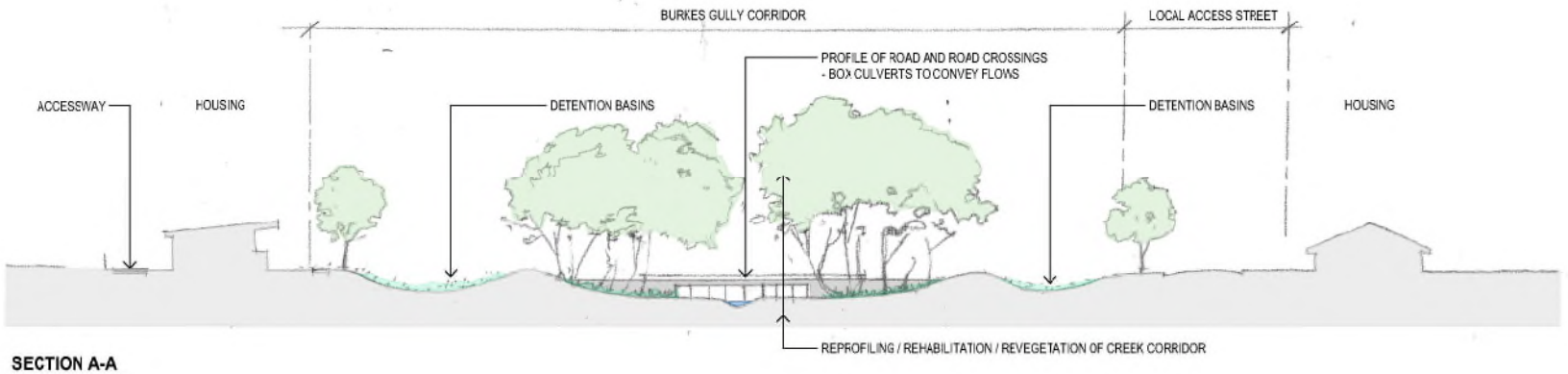
K+C REF: 0/4283_Tamworth Council - Urba Design Advisory\01_Planning\02SP_Site Analysis.dwg A0(L)-Plan Plots: 24-Feb-2022 algetic

PLAN
NOT TO SCALE



SECTION A-A
NOT TO SCALE

OPEN SPACE SPINE

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FEBRUARY 2022

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K+C REF: 0/4203_Tamworth Council - Ultra Design Advisory/21_Planning/02SP_Site Analysis.dwg A3(L)-Open Space Spine, 24- Feb- 2022, angelac

N

0 125

SCALE 1: 2500 @ A3

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ENTRY AND NEIGHBOURHOOD CENTRE PLAN

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SHEET 11 OF 15

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K+C REF: 0/0283_Tamworth Council - Ultra Design Advisory\01_Planning\02SP_Neighbourhood pln.dwg - AXIL-Neighbourhood Plan_24-Feb-2022_angelac

N

0 125

SCALE 1: 2500 @ A3

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DISTRICT PLAYING FIELD AND SUBDIVISION CONFIGURATION

ARCADIA RESIDENTIAL LAND RELEASE
FEBRUARY 2022

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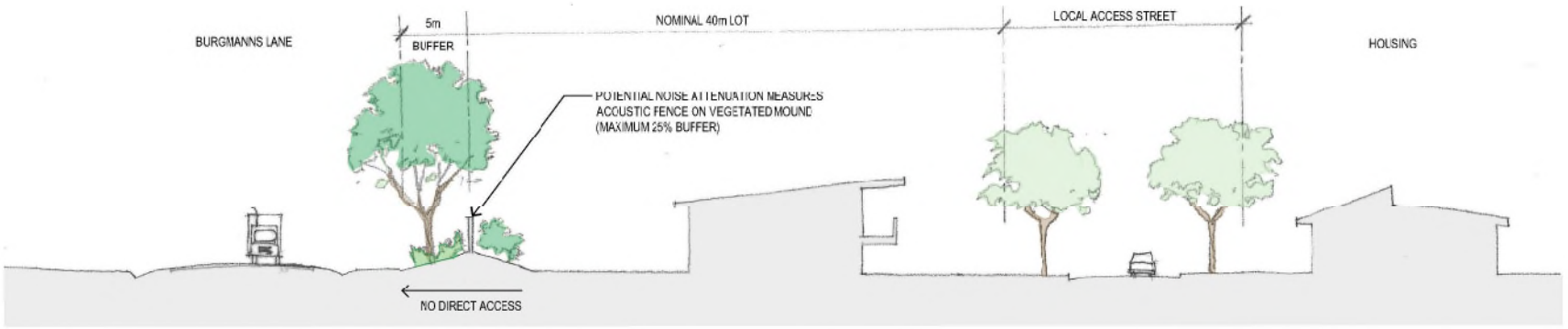
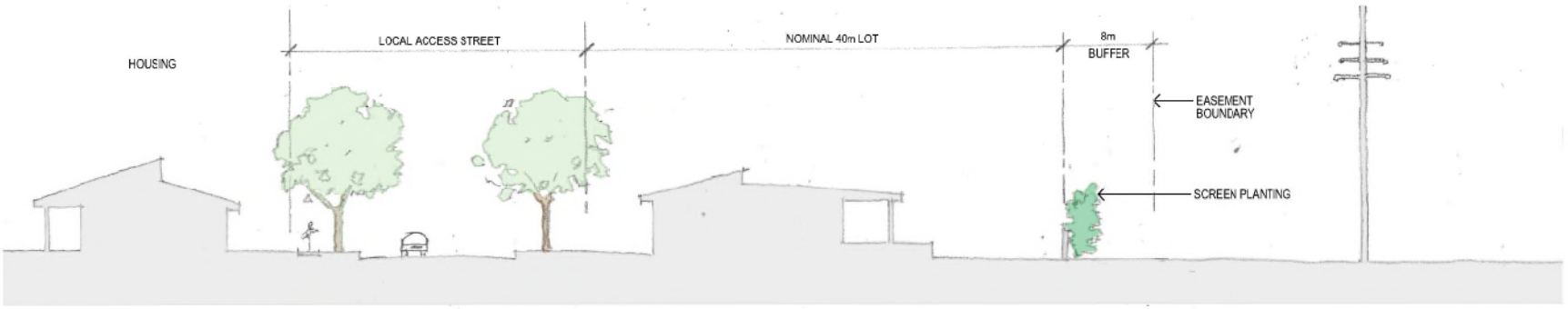
KC REF: 0/9283_Tamworth Council - Ultra Design Advisory\01_Planning\02SP_Playing field plan.vwx - A3(L)-Playing Field Plan, 24-Feb-2022 angelac



SECTION C-C - BURGMANNS LANE INTERFACE

NOT TO SCALE



SECTION B-B - INTERFACE WITH ELECTRICITY EASEMENTS

NOT TO SCALE

K+C REF: 0/4253_Tamworth Council - Ultra Design Advisory\01_Planning\02SP_Site Analysis.dwg A3(L)-Interface Sections, 24-Feb-2022, angelac

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INTERFACE SECTIONS B AND C

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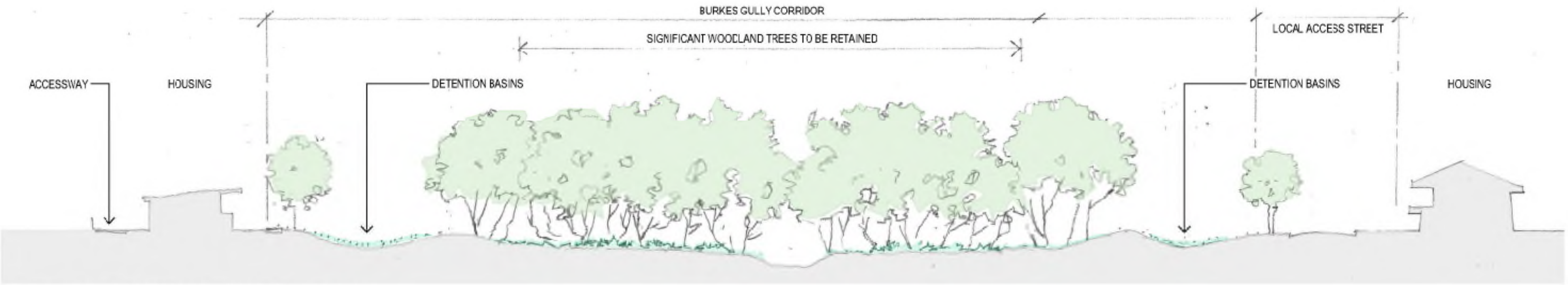

SECTION D-D - BURKES GULLY NORTHERN SECTION

NOT TO SCALE

INTERFACE SECTION D

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FEBRUARY 2022

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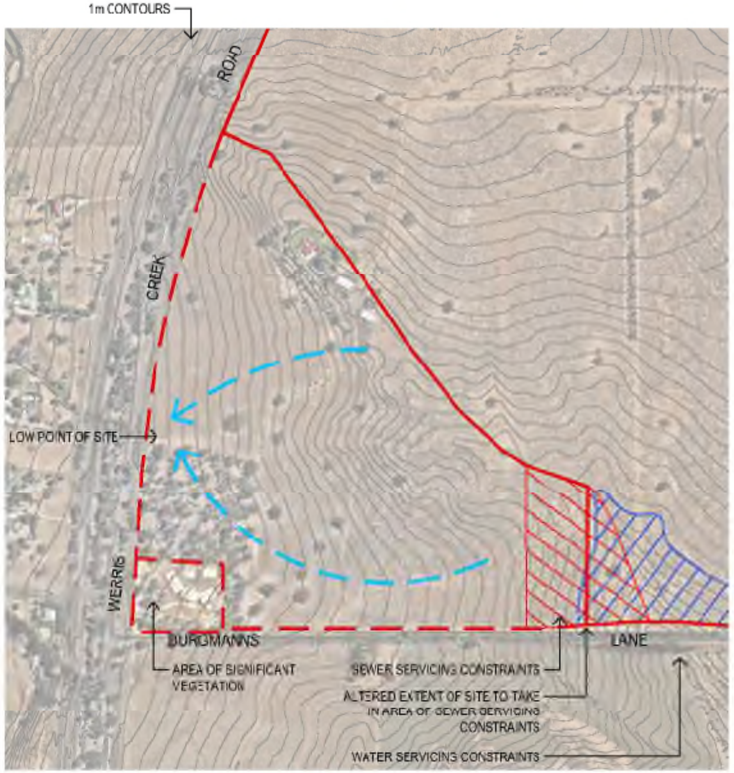

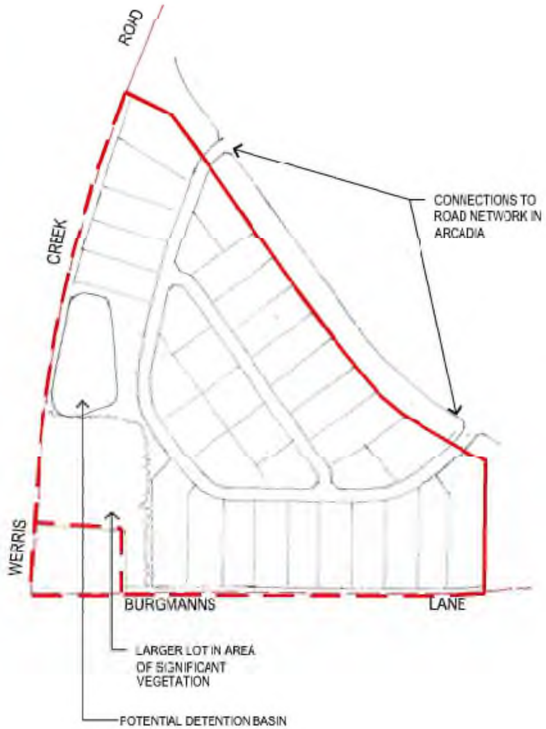

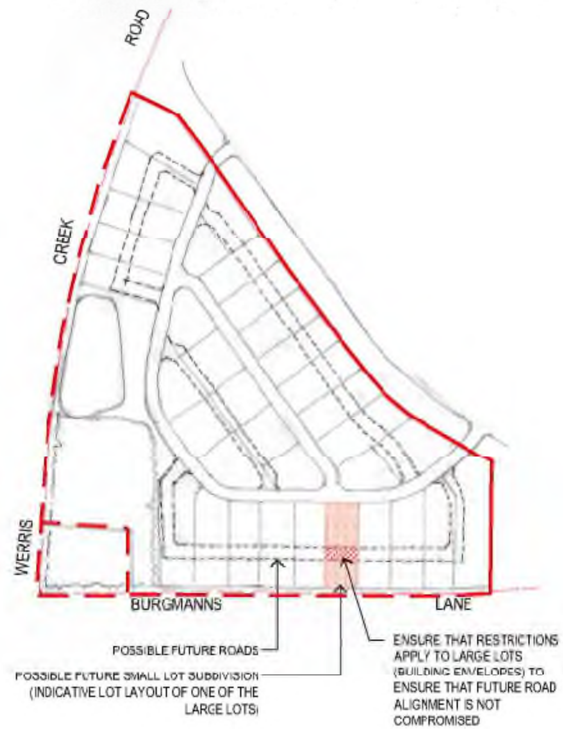

N

0 375

SCALE 1 : 7,500 @ A3

POSSIBLE LARGE LOT SUBDIVISION

LOTS GREATER THAN $4000m^2$

POSSIBLE FUTURE SMALL LOT SUBDIVISION

WHEN SEWER INFRASTRUCTURE IS AVAILABLE TO SITE

POTENTIAL DEVELOPMENT OF SOUTH WESTERN CORNER

ARCADIA RESIDENTIAL LAND RELEASE
FEBRUARY 2022

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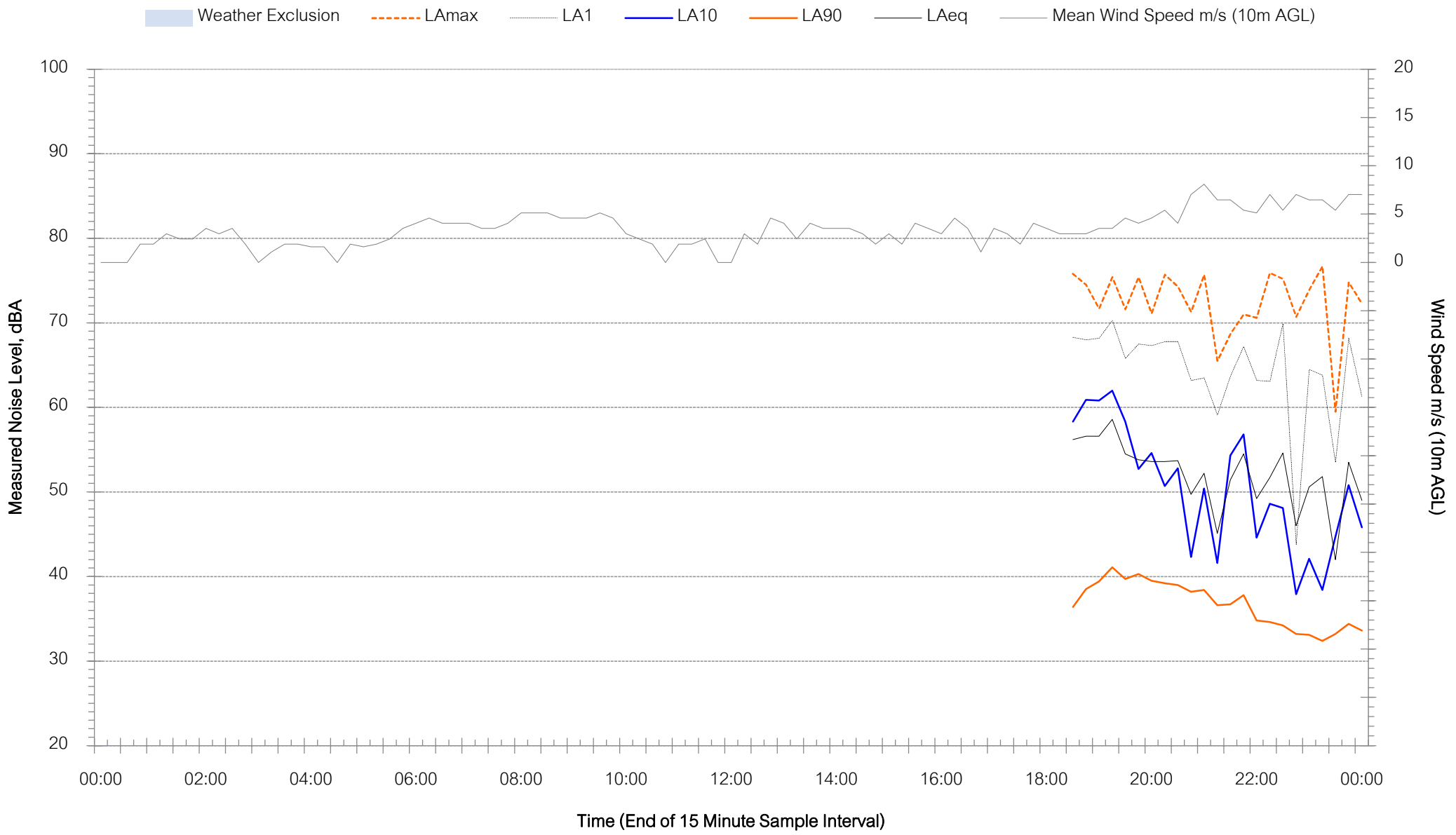
Tamworth Regional Council

Appendix C – Noise Monitoring Charts

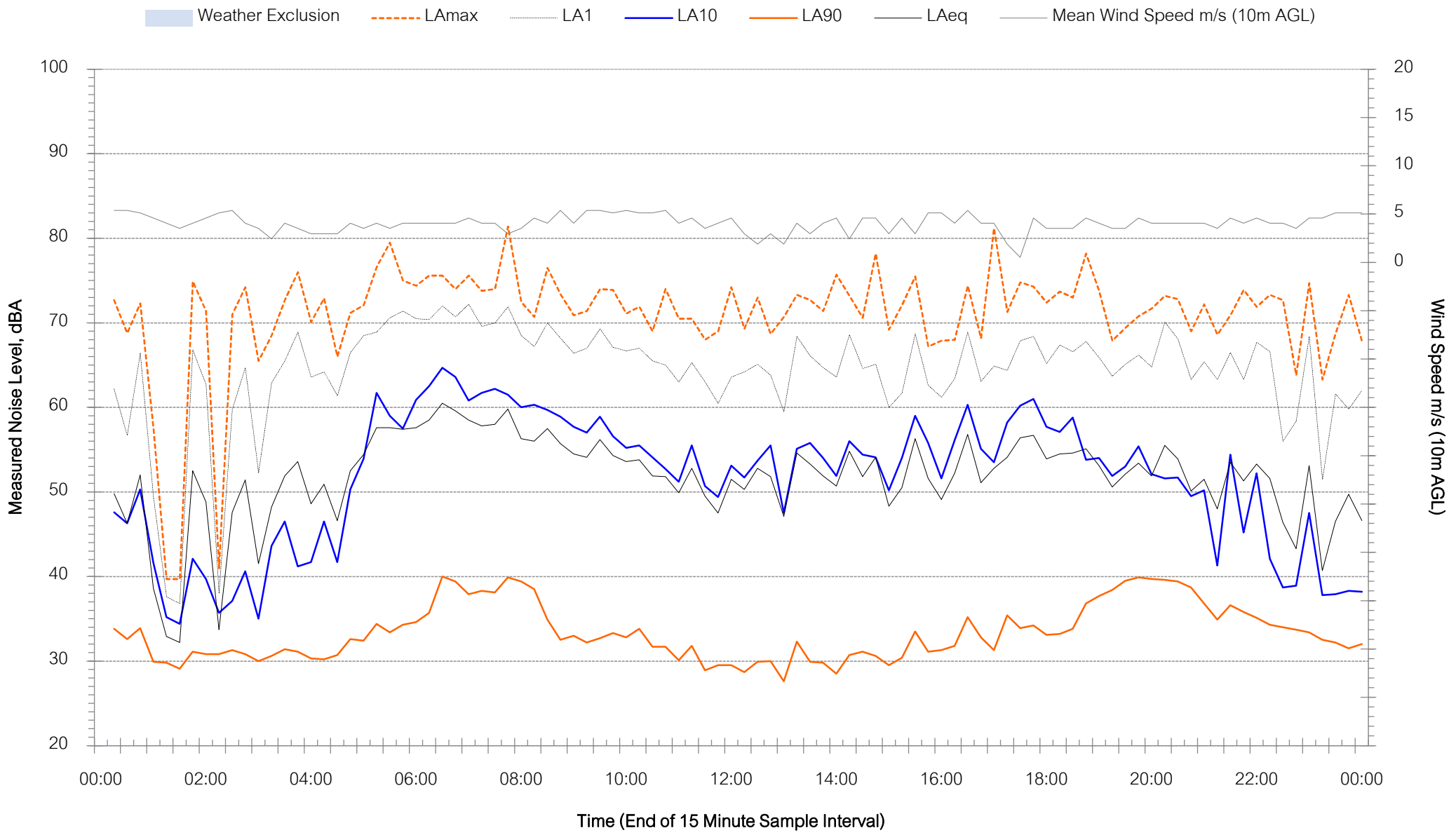
Background Noise Levels

Burgmanns Lane, Tamworth - Monday 10 October 2022



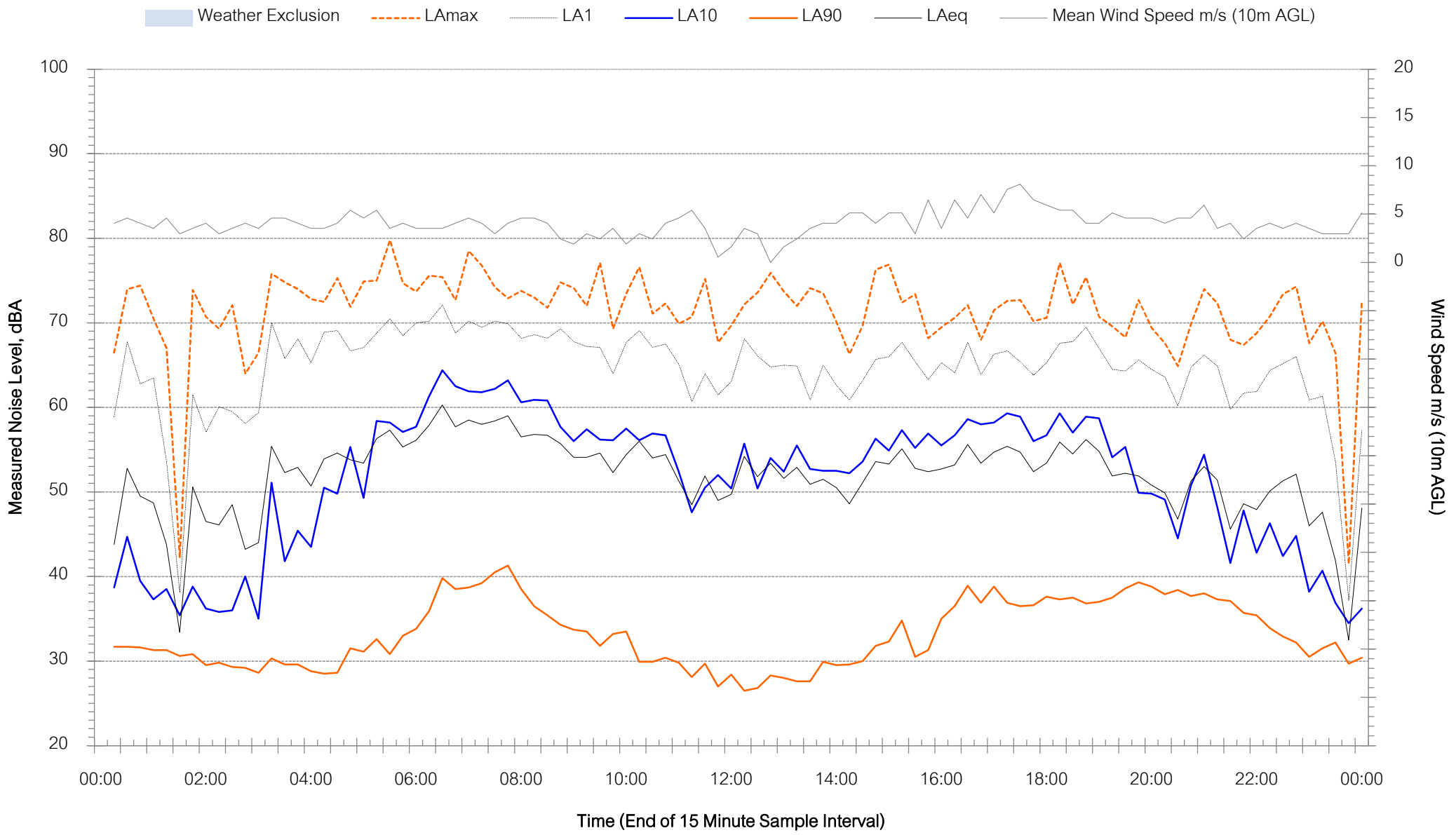
Background Noise Levels

Burgmanns Lane, Tamworth - Tuesday 11 October 2022



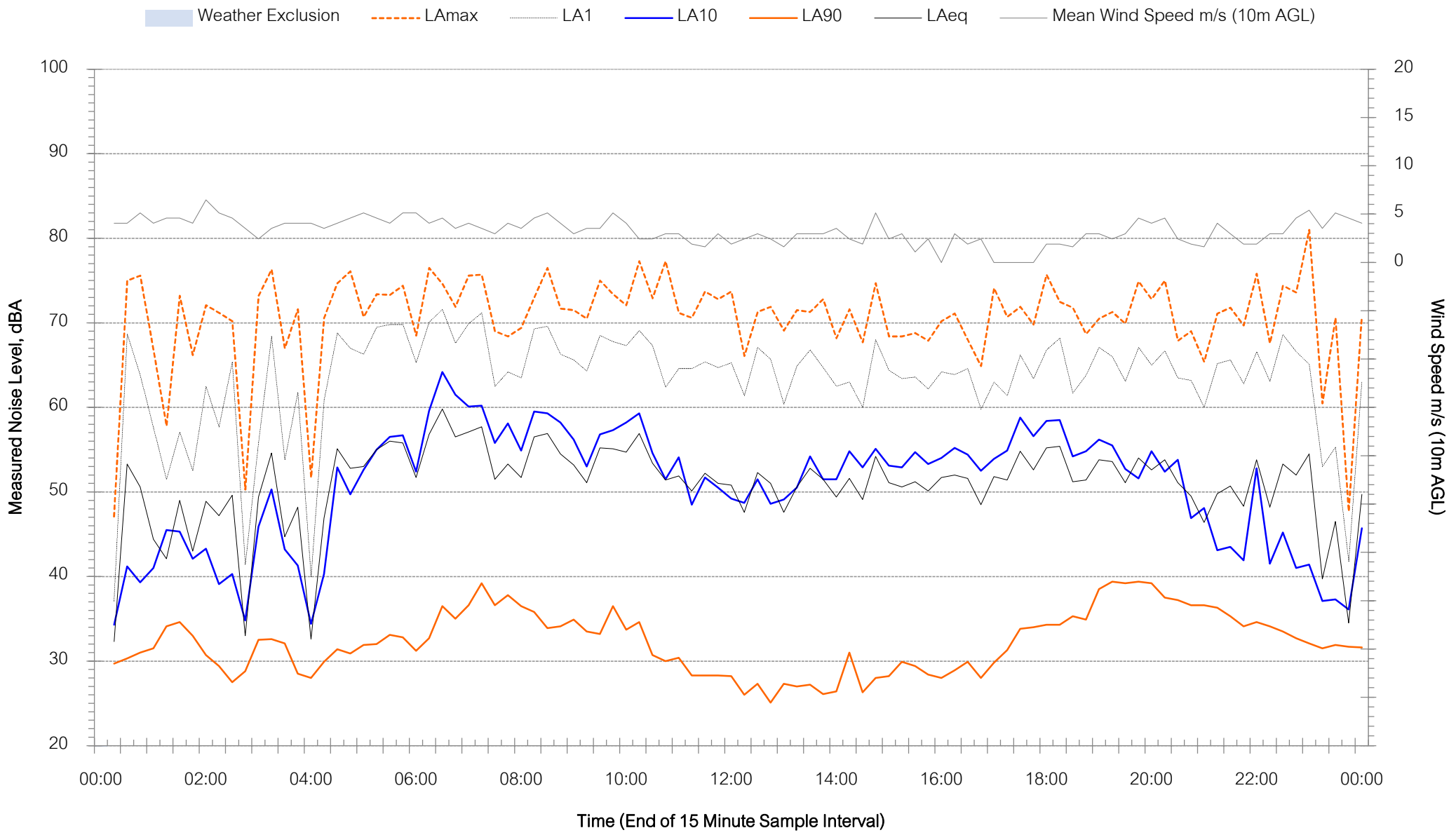
Background Noise Levels

Burgmanns Lane, Tamworth - Wednesday 12 October 2022



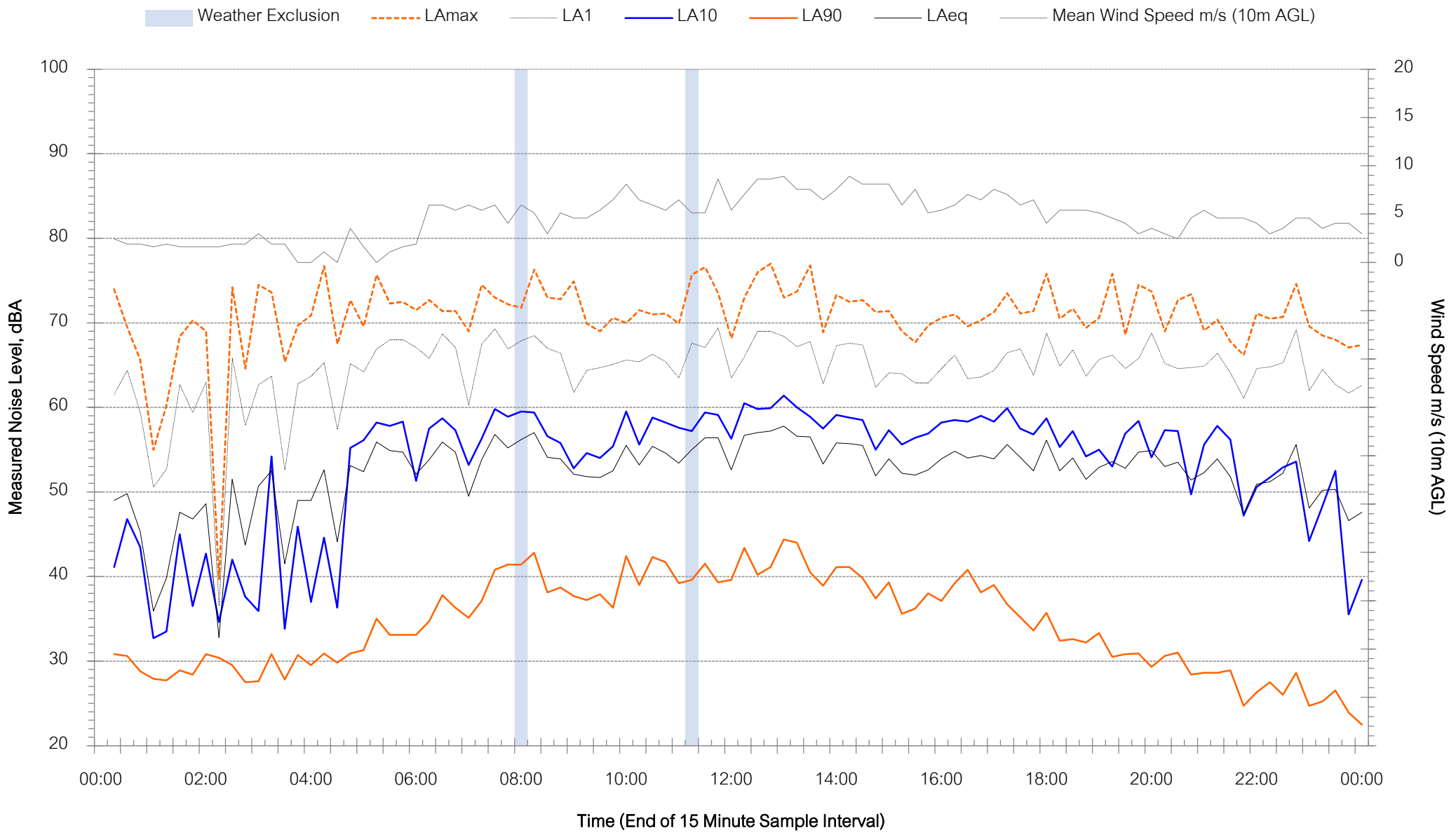
Background Noise Levels

Burgmanns Lane, Tamworth - Thursday 13 October 2022



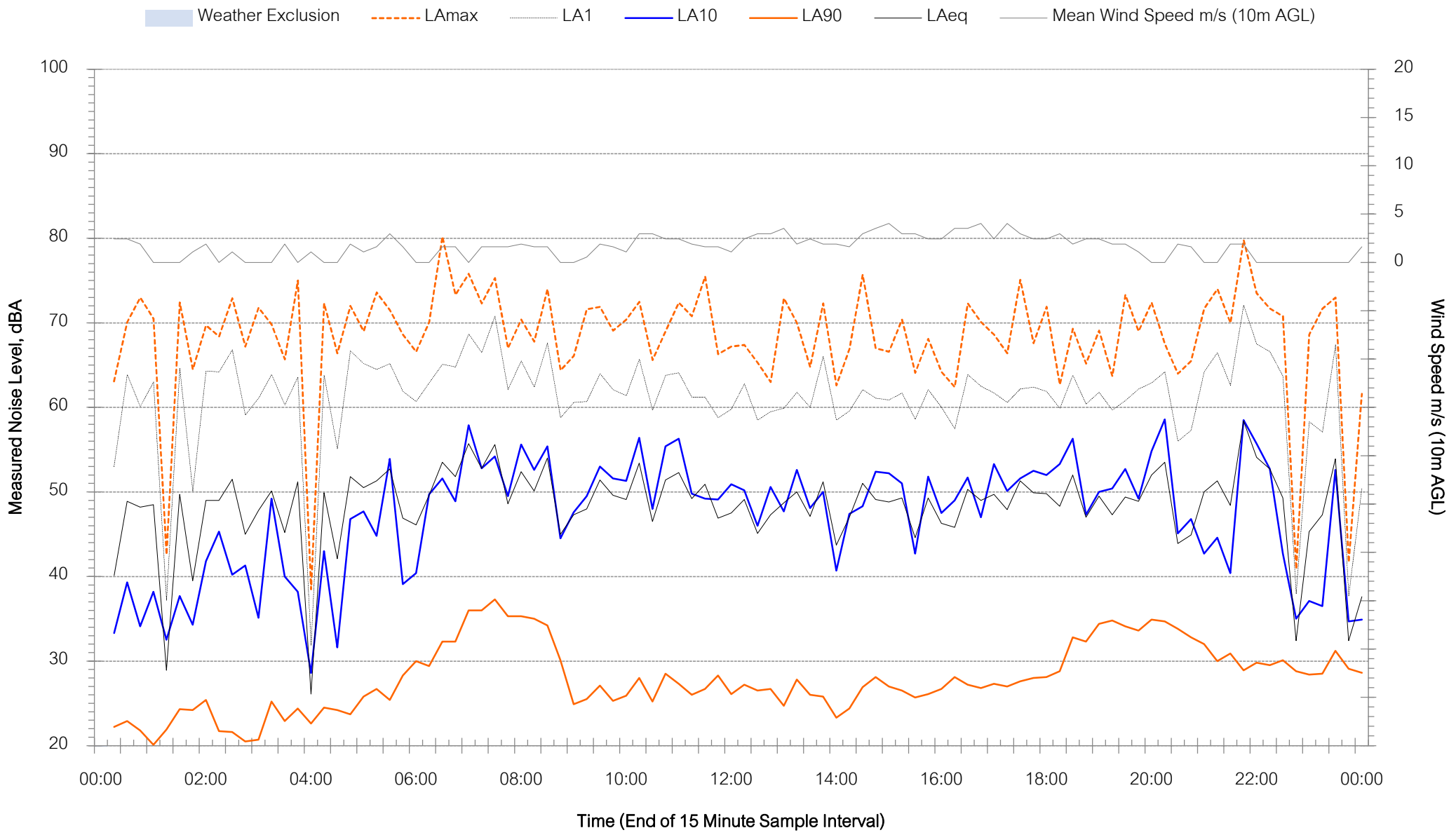
Background Noise Levels

Burgmanns Lane, Tamworth - Friday 14 October 2022



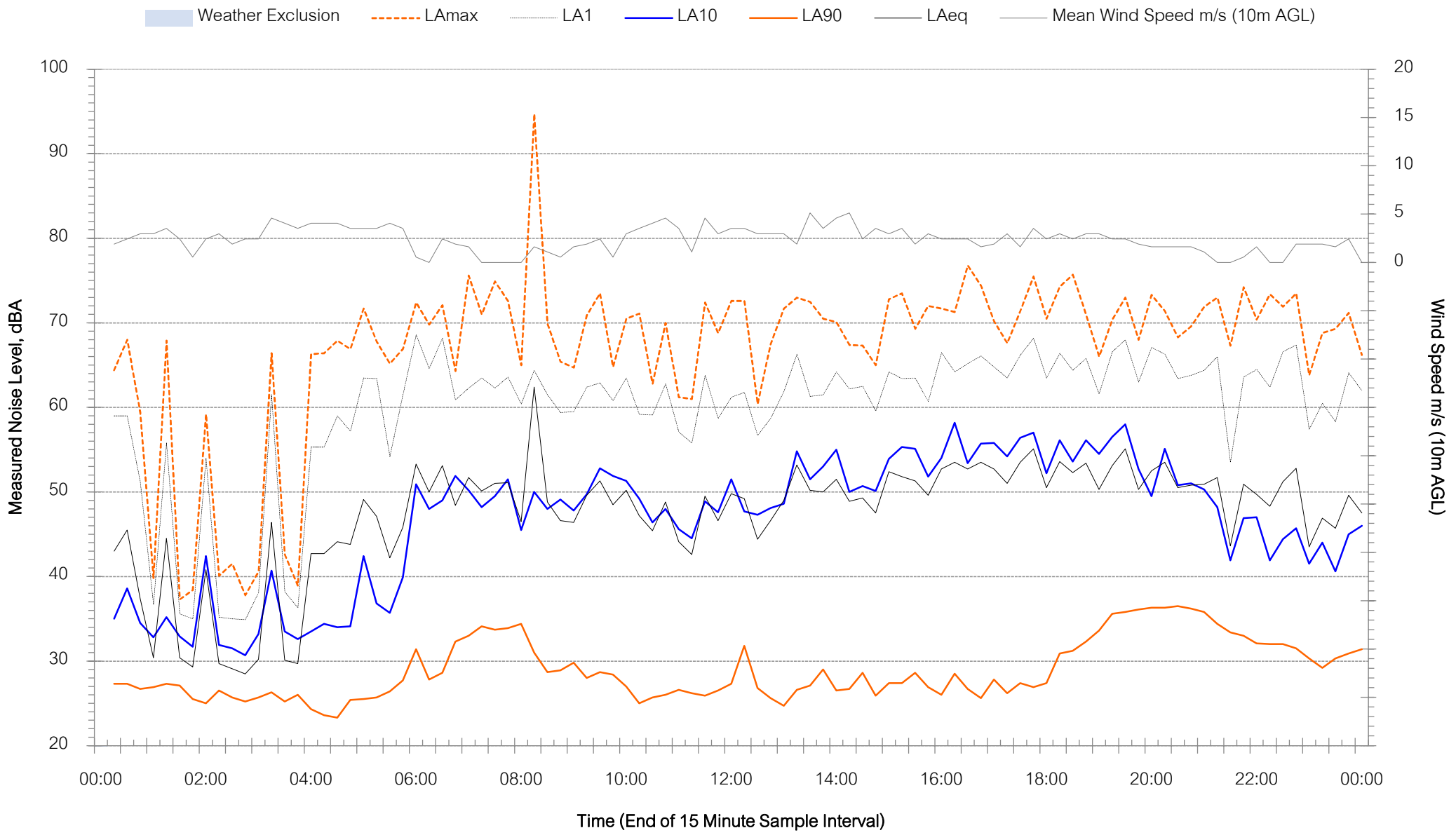
Background Noise Levels

Burgmanns Lane, Tamworth - Saturday 15 October 2022



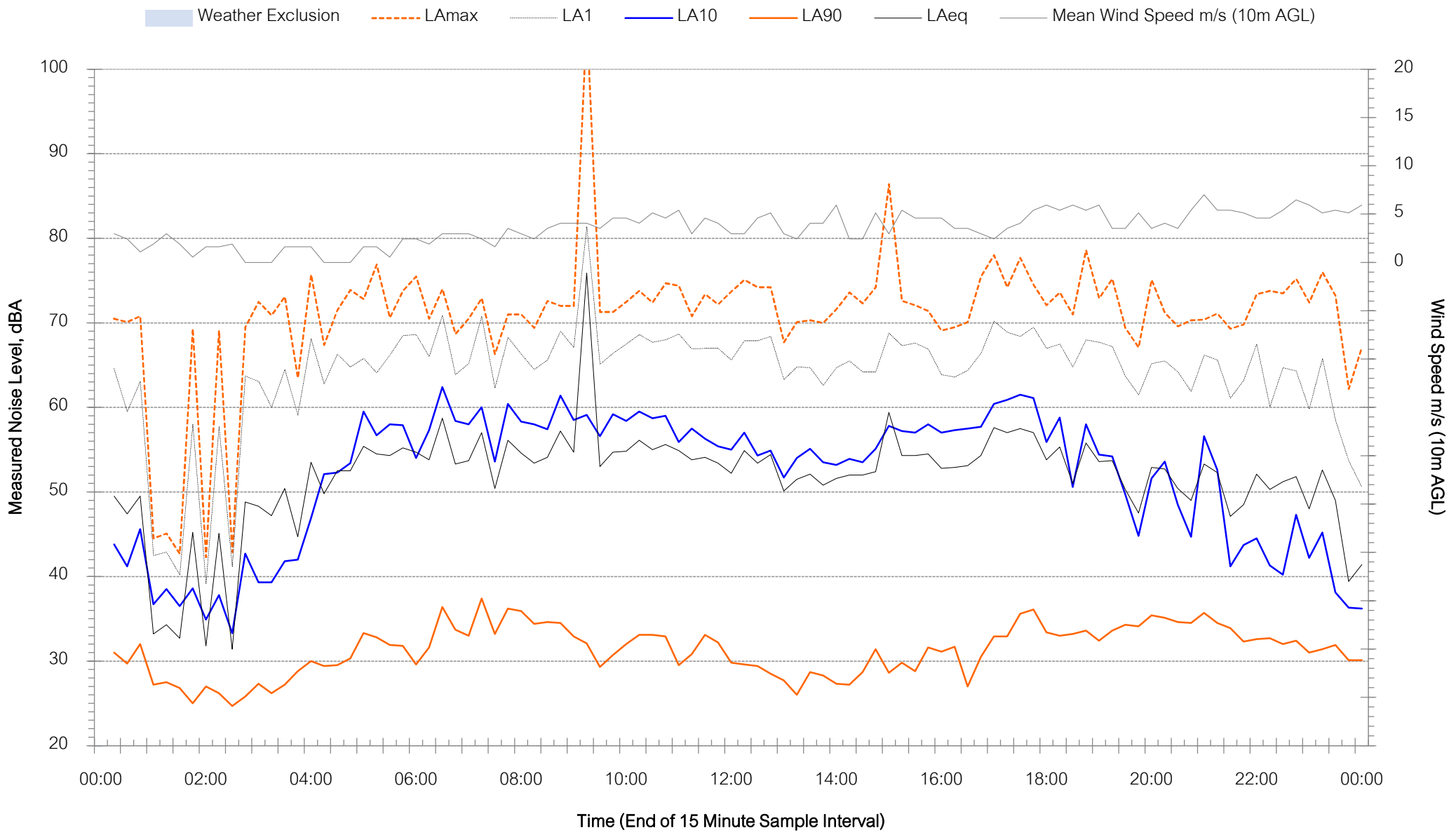
Background Noise Levels

Burgmanns Lane, Tamworth - Sunday 16 October 2022



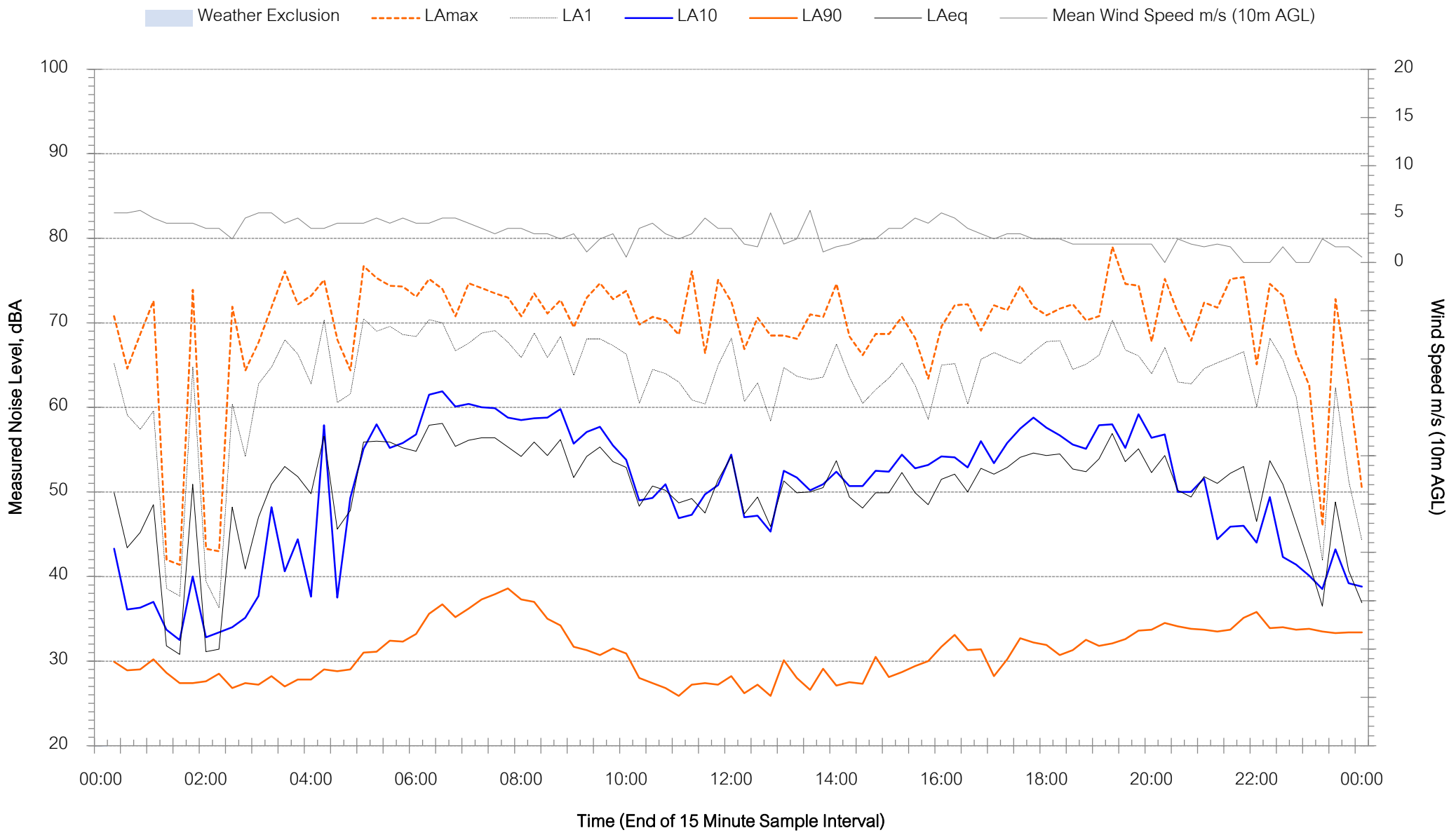
Background Noise Levels

Burgmanns Lane, Tamworth - Monday 17 October 2022



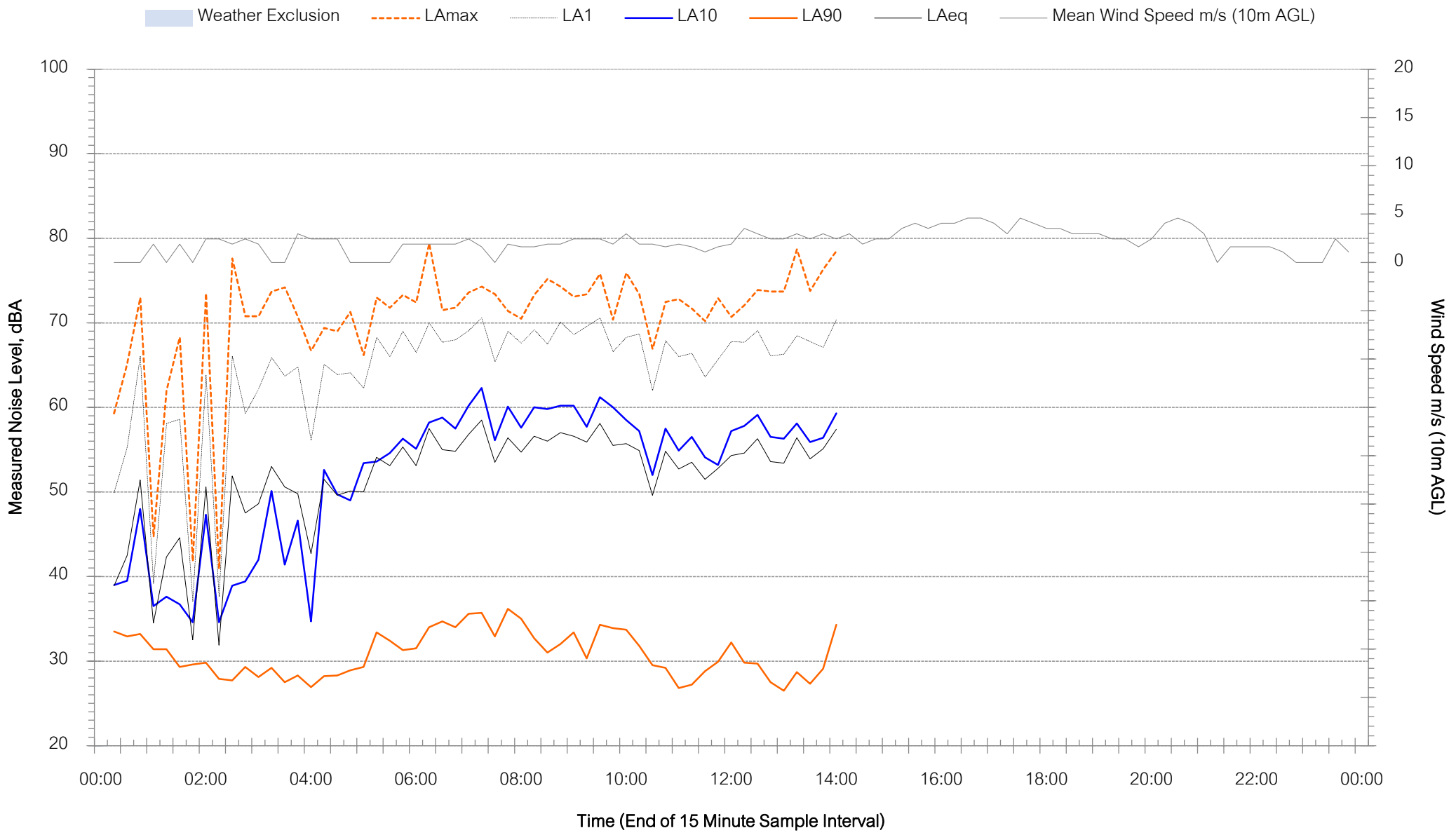
Background Noise Levels

Burgmanns Lane, Tamworth - Tuesday 18 October 2022



Background Noise Levels

Burgmanns Lane, Tamworth - Wednesday 19 October 2022



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Appendix D – Acoustic Treatments

Appendix C – Acoustic Treatment of Residences

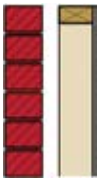
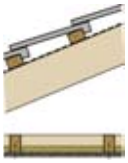
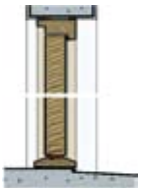
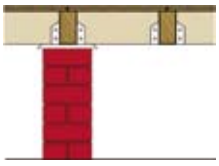
The following table sets out standard (or deemed-to-satisfy) constructions for each category of noise control treatment for the sleeping areas and other habitable areas of single / dual occupancy residential developments only. The assumptions made in the noise modelling are as follows:

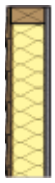
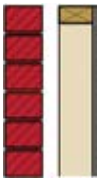
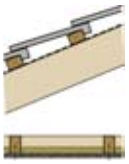
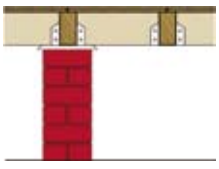
- Typical layout of a modern dwelling taken from a recent large residential development in an outer Sydney suburb
- Bedrooms and other habitable rooms are exposed to road noise

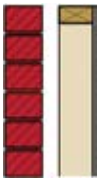
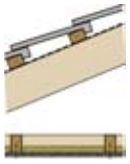
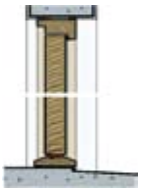
ACOUSTIC PERFORMANCE OF BUILDING ELEMENTS

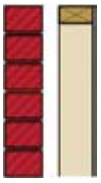
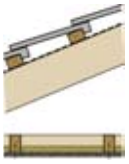
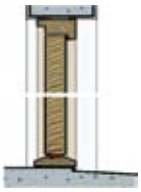
The acoustic performances assumed of each building element in deriving the Standard Constructions for each category of noise control treatment presented in the preceding Table, are presented below in terms of Weighted Sound Reduction Index (Rw) values, which can be used to find alternatives to the standard constructions presented in this Appendix:

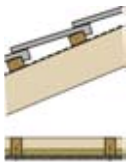
Category of Noise Control Treatment	R_w of Building Elements (minimum assumed)				
	Windows/Sliding Doors	Frontage Facade	Roof	Entry Door	Floor
Category 1	24	38	40	28	29
Category 2	27	45	43	30	29
Category 3	32	52	48	33	50
Category 4	35	55	52	33	50
Category 5	43	55	55	40	50

Category No.	Building Element	Standard Constructions	sample
1	**Windows/Sliding Doors**	Openable with minimum 4mm monolithic glass and standard weather seals	
	Frontage Facade	**Timber Frame or Cladding:** 6mm fibre cement sheeting or weatherboards or plank cladding externally, 90mm deep timber stud or 92mm metal stud, 13mm standard plasterboard internally	
		Brick Veneer: 110mm brick, 90mm timber stud or 92mm metal stud, minimum 50mm clearance between masonry and stud frame, 10mm standard plasterboard internally	
		Double Brick Cavity: 2 leaves of 110mm brickwork separated by 50mm gap	
	Roof	Pitched concrete or terracotta tile or metal sheet roof with sarking, 10mm plasterboard ceiling fixed to ceiling joists, R1.5 insulation batts in roof cavity.	
	Entry Door	35mm solid core timber door fitted with full perimeter acoustic seals	
	Floor	1 layer of 19mm structural floor boards, timber joist on piers	
		Concrete slab floor on ground	

Category No.	Building Element	Standard Constructions	sample
2	**Windows/Sliding Doors**	Openable with minimum 6mm monolithic glass and full perimeter acoustic seals	
	Frontage Facade	**Timber Frame or Cladding Construction:** 6mm fibre cement sheeting or weatherboards or plank cladding externally, 90mm deep timber stud or 92mm metal stud, 13mm standard plasterboard internally with R2 insulation in wall cavity.	
		Brick Veneer Construction: 110mm brick, 90mm timber stud frame or 92mm metal stud, minimum 50mm clearance between masonry and stud frame, 10mm standard plasterboard internally.	
		Double Brick Cavity Construction: 2 leaves of 110mm brickwork separated by 50mm gap	
	Roof	Pitched concrete or terracotta tile or metal sheet roof with sarking, 10mm plasterboard ceiling fixed to ceiling joists, R2 insulation batts in roof cavity.	
	Entry Door	40mm solid core timber door fitted with full perimeter acoustic seals	
	Floor	1 layer of 19mm structural floor boards, timber joist on piers	
		Concrete slab floor on ground	

Category No.	Building Element	Standard Constructions	sample
3	**Windows/Sliding Doors**	Openable with minimum 6.38mm laminated glass and full perimeter acoustic seals	
	Frontage Facade	**Brick Veneer Construction:** 110mm brick, 90mm timber stud or 92mm metal stud, minimum 50mm clearance between masonry and stud frame, 10mm standard plasterboard internally.	
		Double Brick Cavity Construction: 2 leaves of 110mm brickwork separated by 50mm gap	
	Roof	Pitched concrete or terracotta tile or sheet metal roof with sarking, 1 layer of 13mm sound-rated plasterboard fixed to ceiling joists, R2 insulation batts in roof cavity.	
	Entry Door	45mm solid core timber door fitted with full perimeter acoustic seals	
	Floor	Concrete slab floor on ground	

Category No.	Building Element	Standard Constructions	sample
4	**Windows/Sliding Doors**	Openable with minimum 10.38mm laminated glass and full perimeter acoustic seals	
	Frontage Facade	**Brick Veneer Construction:** 110mm brick, 90mm timber stud or 92mm metal stud, minimum 50mm clearance between masonry and stud frame, R2 insulation batts in wall cavity, 10mm standard plasterboard internally.	
		Double Brick Cavity Construction: 2 leaves of 110mm brickwork separated by 50mm gap	
	Roof	Pitched concrete or terracotta tile or sheet metal roof with sarking, 2 layers of 10mm sound-rated plasterboard fixed to ceiling joists, R2 insulation batts in roof cavity.	
	Entry Door	45mm solid core timber door fitted with full perimeter acoustic seals	
	Floor	Concrete slab floor on ground	

Category No.	Building Element	Standard Constructions	sample
5	**Windows/Sliding Doors**	Openable Double Glazing with separate panes: 5mm monolithic glass, 100mm air gap, 5mm monolithic glass with full perimeter acoustic seals.	
	Frontage Facade	**Double Brick Cavity Construction:** 2 leaves of 110mm brickwork separated by 50mm gap with cement render to the external face of the wall and cement render or 13mm plasterboard direct fixed to internal faces of the wall.	
	Roof	Pitched concrete or terracotta tile or sheet metal roof with sarking, 2 layers of 10mm sound-rated plasterboard fixed to ceiling joist using resilient mounts, R2 insulation batts in roof cavity	
	Entry Door	Special high performance acoustic door required - Consult an Acoustic Engineer	*Door to acoustic consultant's specifications*
	Floor	Concrete slab floor on ground	
6	**All**	Consult an Acoustic Engineer	

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