HERRING STORER ACOUSTICS

PROPOSED RESIDENTIAL DEVELOPMENT

LOTS 7, 89, 90 ANKETELL ROAD ANKETELL

STATE PLANNING POLICY 5.4
NOISE MANAGEMENT PLAN

APRIL 2024

OUR REFERENCE: 32618-2-24122

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NOISE MANAGEMENT PLAN

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FOR

TERRANOVIS

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Revision	Description	Date	Author	Checked
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2	Updated for Lot 7	01/05/24	GH	PLD

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C Lots requiring “Quiet House” Design and / or Notifications

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EXECUTIVE SUMMARY

Herring Storer Acoustics was commissioned by Terranovis to undertake an acoustical assessment of noise that would be received at the proposed residential development located at Lots 7, 89 and 90 Anketell Road, Anketell from road traffic noise associated with the future Anketell Road.

Under the Western Australian Planning Commission (WAPC) Planning Policy 5.4 "Road and Rail Transport Noise and Freight Considerations in Land Use Planning" (SPP 5.4), the appropriate criteria for assessment for this development are:

EXTERNAL

$L_{Aeq(Day)}$ of 60 dB(A);
$L_{Aeq(Night)}$ of 55 dB(A).

INTERNAL

$L_{Aeq(Day)}$ of 40 dB(A) in living and work areas; and
$L_{Aeq(Night)}$ of 35 dB(A) in bedrooms.

Additional to the above, noise received at an outdoor area should also be reduced as far as practicable, with an aim of achieving an L_{Aeq} of 50 dB(A) during the night period.

The modification to Anketell Road would be considered as major upgrade and hence the infrastructure provided is obliged to achieve compliance with the "Noise Target" of $L_{AEq(Day)}$ 60 dB at the ground floor. This normally requires the infrastructure provider to construct the barrier walls. However, in this case as, as outlined in the policy under Section 5.3.2 where a major road project is to be constructed in the vicinity of a future noise sensitive land use, the infrastructure provider and developer are both responsible for ensuring that the objectives of this policy are achieved. Similarly, for an upgrade to Anketell Road, the infrastructure provider would be responsible for achieving compliance with the "Noise Target", which in this case would be the use of a dense graded asphalt road surface. However, once again, discussions should take place between the infrastructure provider and the developer to ensure that a mutually beneficial noise management plan is developed and implemented.

The results of the acoustic assessment indicate that due to the set back of the lots in relation to Anketell Road, noise received at the residences in the future would not exceed the "Noise Limits" as outlined in the Western Australian Planning Commission (WAPC) Planning Policy 5.4 "Road and Rail Transport Noise and Freight Considerations in Land Use Planning".

1. INTRODUCTION

Herring Storer Acoustics were commissioned by Terranovis to carry out an acoustical assessment of noise received at the subdivisional stage of the residential development located at Lots 7, 89 and 90 Anketell Road, Anketell.

As part of the study, the following was carried out:

- Determine by noise modelling the noise that would be received at proposed residences within this stage of the scheme amendment from vehicles travelling on the roadway (Anketell Road) for the future road alignment.
- Assess the predicted noise levels for compliance with the appropriate criteria.
- Provide detailed information as to noise control requirements such as quiet house design, noise walls and notification on titles.

For information, the subdivision plan and road alignment (sourced from MRWA) is attached in Appendix A.

2. SUMMARY

Under the WAPC State Planning Policy 5.4, for this development, the appropriate "Noise Targets" to be achieved under SPP 5.4, external to a residence are:

External

Day	Maximum of 55 dB(A) L_{Aeq}
Night	Maximum of 50 dB(A) L_{Aeq}

The policy states that the "outdoor targets are to be met at all outdoor areas as far as reasonable and practical to do so using the various noise mitigation measures outlined in the guidelines". The Policy also states, under Section 6 – Policy Measures that "a reasonable degree of acoustic amenity for living areas on each residential lot". The policy recognises that "it may not be practicable to meet the outdoor noise targets".

The Policy states the following acceptable internal noise levels:

Internal

Living and Work Areas	$L_{Aeq(Day)}$ of 40 dB(A)
Bedrooms	$L_{Aeq(Night)}$ of 35 dB(A)

For this development, compliance with the requirements of SPP 5.4, noise modelling and assessment are based on the day period for residence located adjacent to Anketell Road, as compliance with the day period would yield compliance with the night period. Only Lot 7, sublots 5 and 6 within the development is in exceedance of 55 dB L_{AeqDay}, with these lots requiring "Quiet House Design" Package A and Notifications on the Title. Other lots would not require any "Quiet House Design" nor Notifications on the Title.

Noise contours from vehicles travelling along Anketell Road are provided in Appendix B.

3. CRITERIA

3.1 NOISE

The Western Australian Planning Commission (WAPC) released on 6th September 2019 State Planning Policy 5.4 *"Road and Rail Noise".* The requirements of State Planning Policy 5.4 are outlined below.

POLICY APPLICATION (Section 4)

When and where it applies (Section 4.1)

SPP 5.4 applies to the preparation and assessment of planning instruments, including region and local planning schemes; planning strategies, structure plans; subdivision and development proposals in Western Australia, where there is proposed:

a) *noise-sensitive land-use within the policy's trigger distance of a transport corridor as specified in* ***Table 1****.*

b) *New or major upgrades of roads as specified in* ***Table 1*** *and maps* ***(Schedule 1,2 and 3);*** *or*

c) *New railways or major upgrades of railways as specified in maps (****Schedule 1, 2 and 3);*** *or any other works that increase capacity for rail vehicle storage or movement and will result in an increased level of noise.*

Policy trigger distances (Section 4.1.2)

Table 1 *identifies the State's transport corridors and the trigger distances to which the policy applies.*

The designation of land within the trigger distances outlined in ***Table 1*** *should not be interpreted to imply that land is affected by noise and/or that areas outside the trigger distances are un-affected by noise.*

*Where any part of the lot is within the specified trigger distance, an assessment against the policy is required to determine the likely level of transport noise and management/ mitigation required. An initial screening assessment (****guidelines: Table 2: noise exposure forecast****) will determine if the lot is affected and to what extent."*

TABLE 1: TRANSPORT CORRIDOR CLASSIFICATION AND TRIGGER DISTANCES

Transport corridor classification	***Trigger distance***	***Distance measured from***
Roads		
Strategic freight and major traffic routes *Roads as defined by Perth and Peel Planning Frameworks and/or roads with either 500 or more Class 7 to 12 Austroads vehicles per day, and/or 50,000 per day traffic volume*	*300 metres*	*Road carriageway edge*
Other significant freight/traffic routes *These are generally any State administered road and/or local government road identified as being a future State administered road (red road) and other roads that meet the criteria of either >=23,000 daily traffic count (averaged equivalent to 25,000 vehicles passenger car units under region schemes)*	*200 metres*	*Road carriageway edge*
Passenger railways		
	100 metres	*Centreline of the closest track*
Freight railways		
	200 metres	*Centreline of the closest track*

Proponents are advised to consult with the decision making authority as site specific conditions (significant differences in ground levels, extreme noise levels) may influence the noise mitigation measures required, that may extend beyond the trigger distance.

POLICY MEASURES (Section 6)

The policy applies a performance-based approach to the management and mitigation of transport noise. The policy measures and resultant noise mitigation will be influenced by the function of the transport corridor and the type and intensity of the land-use proposed. Where there is risk of future land-use conflict in close proximity to strategic freight routes, a precautionary approach should be applied. Planning should also consider other broader planning policies. This is to ensure a balanced approach takes into consideration reasonable and practical considerations.

Noise Targets (Section 6.1)

***Table 2** sets out noise targets that are to be achieved by proposals under which the policy applies. Where exceeded, an assessment is required to determine the likely level of transport noise and management/mitigation required.*

In the application of the noise targets the objective is to achieve:

- *indoor noise levels as specified in **Table 2** in noise sensitive areas (for example, bedrooms and living rooms of houses, and school classrooms); and*
- *a reasonable degree of acoustic amenity for outdoor living areas on each residential lot. For non-residential noise-sensitive developments, for example schools and child care centres the design of outdoor areas should take into consideration the noise target.*

It is recognised that in some instances, it may not be reasonable and/or practicable to meet the outdoor noise targets. Where transport noise is above the noise targets, measures are expected to be implemented that balance reasonable and practicable considerations with the need to achieve acceptable noise protection outcomes.

TABLE 2: NOISE TARGETS

Proposals	***New/Upgrade***	***Noise Targets***		
		Outdoor		***Indoor***
		Day (L_{Aeq}(Day) dB) (6 am-10 pm)	***Night (L_{Aeq}(Night)dB) (10 pm-6 am)***	***(L_{Aeq} dB)***
Noise-sensitive land-use and/or development	*New noise sensitive land use and/or development within the trigger distance of an existing/proposed transport corridor*	*55*	*50*	*L_{Aeq} (Day) 40(Living and work areas)* *L_{Aeq} (Night) 35 (bedrooms)*
Roads	*New*	*55*	*50*	*N/A*
	Upgrade	*60*	*55*	*N/A*
Railways	*New*	*55*	*50*	*N/A*
	Upgrade	*60*	*55*	*N/A*

Notes:

- *The noise target is to be measured at one metre from the most exposed, habitable façade of the proposed building, which has the greatest exposure to the noise-source. A habitable room has the same meaning as defined in State Planning Policy 3.1 Residential Design Codes.*
- *For all noise-sensitive land-use and/or development, indoor noise targets for other room usages may be reasonably drawn from Table 1 of Australian Standard/New Zealand Standard AS/NZS 2107:2016 Acoustics – Recommended design sound levels and reverberation times for building interiors (as amended) for each relevant time period.*
- *The 5dB difference in the criteria between new and upgrade infrastructure proposals acknowledges the challenges in achieving noise level reduction where existing infrastructure is surrounded by existing noise-sensitive development.*
- *Outdoor targets are to be met at all outdoor areas as far as is reasonable and practical to do so using the various noise mitigation measures outlined in the guidelines. For example, it is likely unreasonable for a transport infrastructure provider to achieve the outdoor targets at more than 1 or 2 floors of an adjacent development with direct line of sight to the traffic.*

<u>Noise Exposure Forecast (Section 6.2)</u>

*When it is determined that SPP 5.4 applies to a planning proposal as outlined in Section 4, proponents and/or decision makers are required to undertake a preliminary assessment using **Table 2**: noise exposure forecast in the guidelines. This will provide an estimate of the potential noise impacts on noise-sensitive land-use and/ or development within the trigger distance of a specified transport corridor. The outcomes of the initial assessment will determine whether:*

- *no further measures are required.*
- *noise-sensitive land-use and/or development is acceptable subject to deemed-to- comply mitigation measures; or*
- *noise-sensitive land-use and/or development is not recommended. Any noise-sensitive land-use and/ or development is subject to mitigation measures outlined in a noise management plan."*

3.2 APPROPRIATE CRITERIA

Based on the above, the following criteria are proposed for this development:

External

Day	55 dB(A) L_{Aeq}
Night	50 dB(A) L_{Aeq}

Internal

Sleeping Areas	35 dB(A) $L_{Aeq(night)}$
Living Areas	40 dB(A) $L_{Aeq(day)}$

Additional to these criteria, noise received at an outdoor area, where practicable, should also achieve an L_{Aeq} of 50 dB(A) during the night period.

4. MEASUREMENTS AND OBSERVATIONS

As Anketell Road has a new alignment proposed by West Port, no noise measurements of the existing road were undertaken as they would not be representative of the future road.

However, the site was attended to observe the current state of development and there is no present noise amelioration.

5. MODELLING

To determine the noise levels from traffic from the Anketell Road, acoustic modelling was carried out using SoundPlan, using the Calculation of Road Traffic Noise (CoRTN)[1] algorithms.

The input data for the model included:

- Topographical data, with the ground level within the development based on natural ground levels as per Google Earth.
- Cadastral subdivisional layout as supplied by client (Shown in Appendix A).
- Road Traffic data as per Table 5.1 and the road alignment (Shown in Appendix A)
- Adjustments as listed in Table 5.2.

TABLE 5.1 - NOISE MODELLING INPUT DATA

Parameter	Anketell Road (Future) 2044*
Traffic Volumes	43,900 vpd
Percentage traffic 0600 – 2400 hours (Assumed)	94%
Heavy Vehicles (%) (Assumed)	6% (Assumed)
Speed (km/hr)	70km/hr
Road Surface	Dense Grade Asphalt

*As supplied by MRWA, attached in Appendix D.

1 *Calculation of Road Traffic Noise* UK Department of Transport 1987

TABLE 5.3 – ADJUSTMENTS FOR NOISE MODELLING

Description	Value
Façade Reflection Adjustment	+2.5 dB
Conversion from $L_{A10\ (18\ hour)}$ to $L_{Aeq\ (16\ hour)}$ (Day)	-2.5 dB*
Adjustment for Future Modelled Noise	-1.7 dB

* Based on DEFRA Calculation.

Based on the DEFRA Calculation, the difference between the $L_{Aeq,(8hr)}$ and $L_{Aeq,(16hr)}$ would be greater than 5 dB(A), hence, the day period is the critical period for compliance and, achieving compliance with the day period criteria would also result in compliance with the night period criteria.

6. DISCUSSION / RECOMMENDATION

WAPC State Planning Policy 5.4, for this development, the appropriate "Noise Targets" to be achieved under SPP 5.4, external to a residence are:

External

Day	Maximum of 55 dB(A) L_{Aeq}
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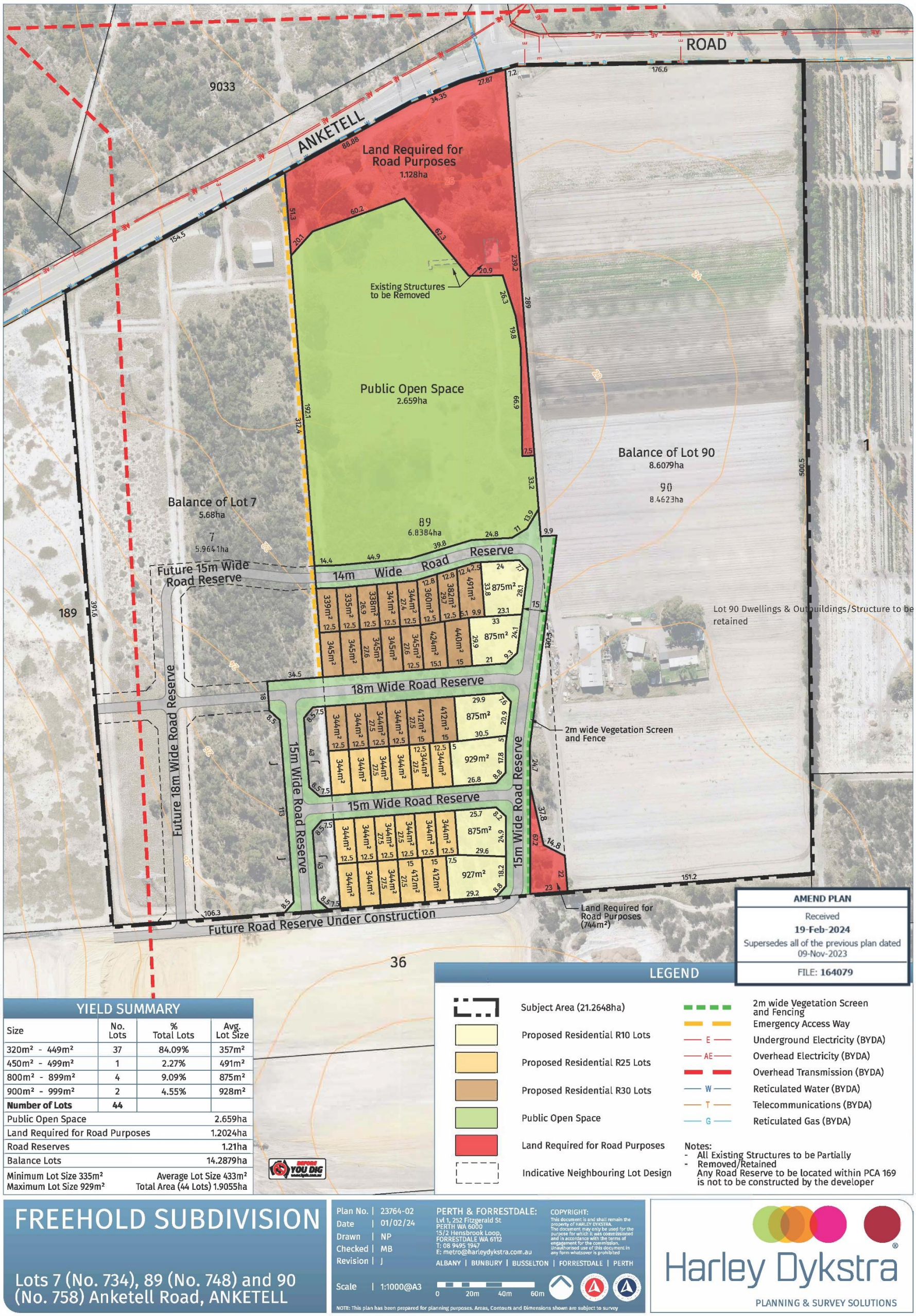
Noise contours from vehicles travelling along Anketell Road are provided in Appendix B.

APPENDIX A

SUBDIVISION PLAN & ROAD ALIGNMENT



YIELD SUMMARY

Size	No. Lots	% Total Lots	Avg. Lot Size
320m² - 449m²	37	84.09%	357m²
450m² - 499m²	1	2.27%	491m²
800m² - 899m²	4	9.09%	875m²
900m² - 999m²	2	4.55%	928m²
Number of Lots	**44**		
Public Open Space			2.659ha
Land Required for Road Purposes			1.2024ha
Road Reserves			1.21ha
Balance Lots			14.2879ha
Minimum Lot Size 335m²		Average Lot Size 433m²	
Maximum Lot Size 929m²		Total Area (44 Lots) 1.9055ha	

AMEND PLAN
Received
19-Feb-2024
Supersedes all of the previous plan dated 09-Nov-2023
FILE: **164079**

LEGEND

- Subject Area (21.2648ha)
- Proposed Residential R10 Lots
- Proposed Residential R25 Lots
- Proposed Residential R30 Lots
- Public Open Space
- Land Required for Road Purposes
- Indicative Neighbouring Lot Design
- 2m wide Vegetation Screen and Fencing
- Emergency Access Way
- E — Underground Electricity (BYDA)
- AE — Overhead Electricity (BYDA)
- Overhead Transmission (BYDA)
- W — Reticulated Water (BYDA)
- T — Telecommunications (BYDA)
- G — Reticulated Gas (BYDA)

Notes:
- All Existing Structures to be Partially Removed/Retained
- Any Road Reserve to be located within PCA 169 is not to be constructed by the developer

FREEHOLD SUBDIVISION

Lots 7 (No. 734), 89 (No. 748) and 90 (No. 758) Anketell Road, ANKETELL

Plan No. | 23764-02
Date | 01/02/24
Drawn | NP
Checked | MB
Revision | J

Scale | 1:1000@A3

0 20m 40m 60m

PERTH & FORRESTDALE:
Lvl 1, 252 Fitzgerald St
PERTH WA 6000
15/2 Hensbrook Loop,
FORRESTDALE WA 6112
T: 08 9495 1947
E: metro@harleydykstra.com.au
ALBANY | BUNBURY | BUSSELTON | FORRESTDALE | PERTH

NOTE: This plan has been prepared for planning purposes. Areas, Contours and Dimensions shown are subject to survey

Harley Dykstra®
PLANNING & SURVEY SOLUTIONS

LEGEND

- Application Area
- Existing Boundary
- Existing Contours / Survey
- Existing Easement
- Existing Water Infrastructure
- Existing Power Infrastructure
- MRS Regional Road Reservation
- Proposed Boundary
- Indicative Future Block Layout
- Proposed Easement

LOT SUMMARY

Existing	
Lot 7	5.9641ha
Proposed	
Single Residential Lots (24)	1.0455ha
Balance Lot (1) (Lot 9000)	0.3506ha
Public Open Space Reserves (3)	2.9226ha
Road Widening (1)(Lot 9001)	0.6916ha

NOTES

1. Minimum 6m wide interim laneway constructed to the satisfaction of the City of Kwinana for temporary vehicular access (including bushfire management). Laneways to be removed once alternative road access is provided from neighbouring land.
2. Minimum 6m wide trafficable secondary (emergency) accessway constructed to the satisfaction of the City of Kwinana for temporary vehicular access (including bushfire management). Accessway to be removed once alternative road access is provided from neighbouring land.

AMEND PLAN

Received
16-Mar-2021
Supersedes all of the previous plan dated 19-Jun-2020

FILE: **159387 (DR217/2020)**

Subdivision Plan

Lot 7 Anketell Road, Anketell

Date: 4 Mar 2021 Scale: 1:1500 @ A3 1:750 @ A1 File: **19-332 SU02A** Staff: JP GW Checked: JP

element.

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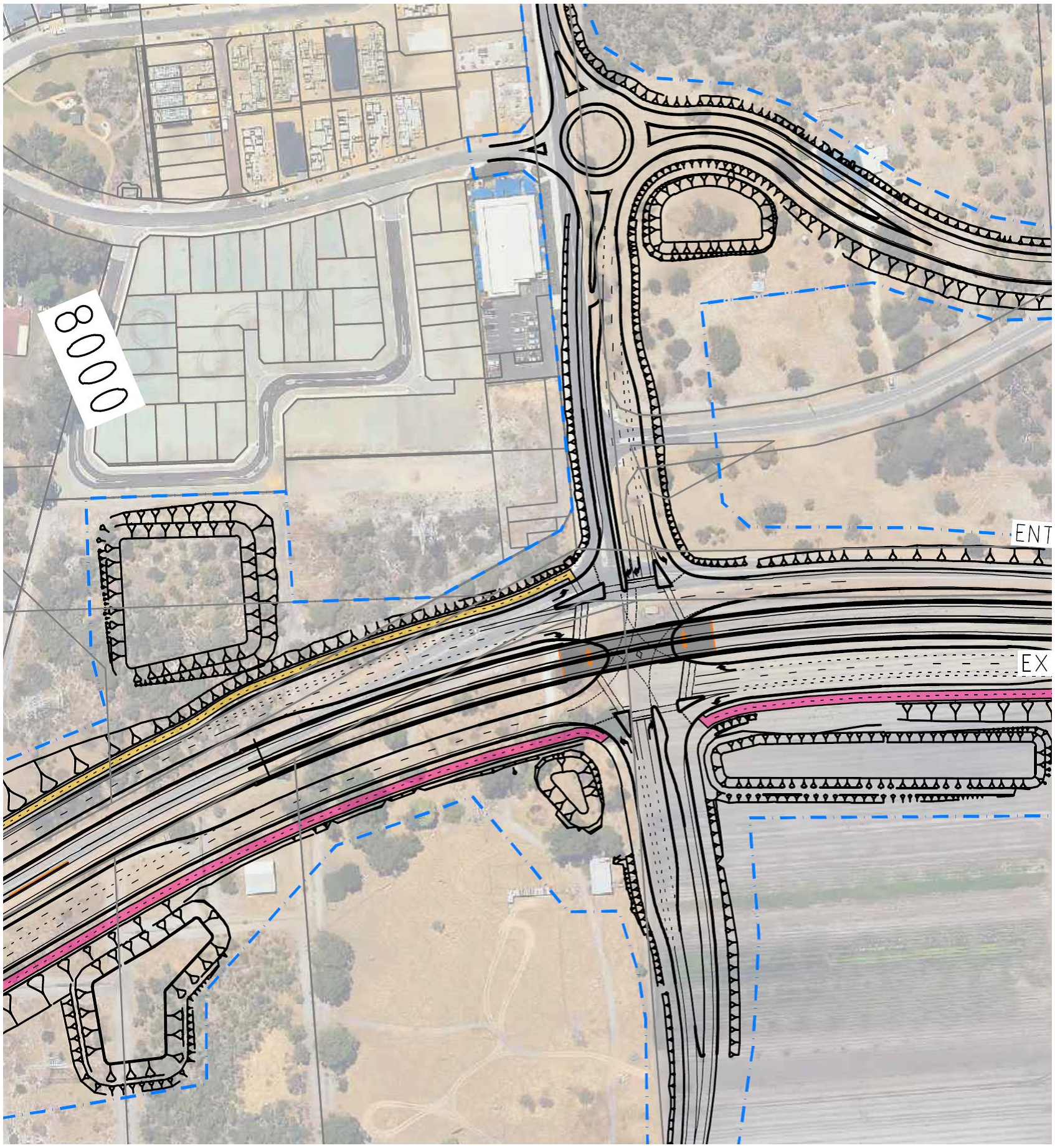
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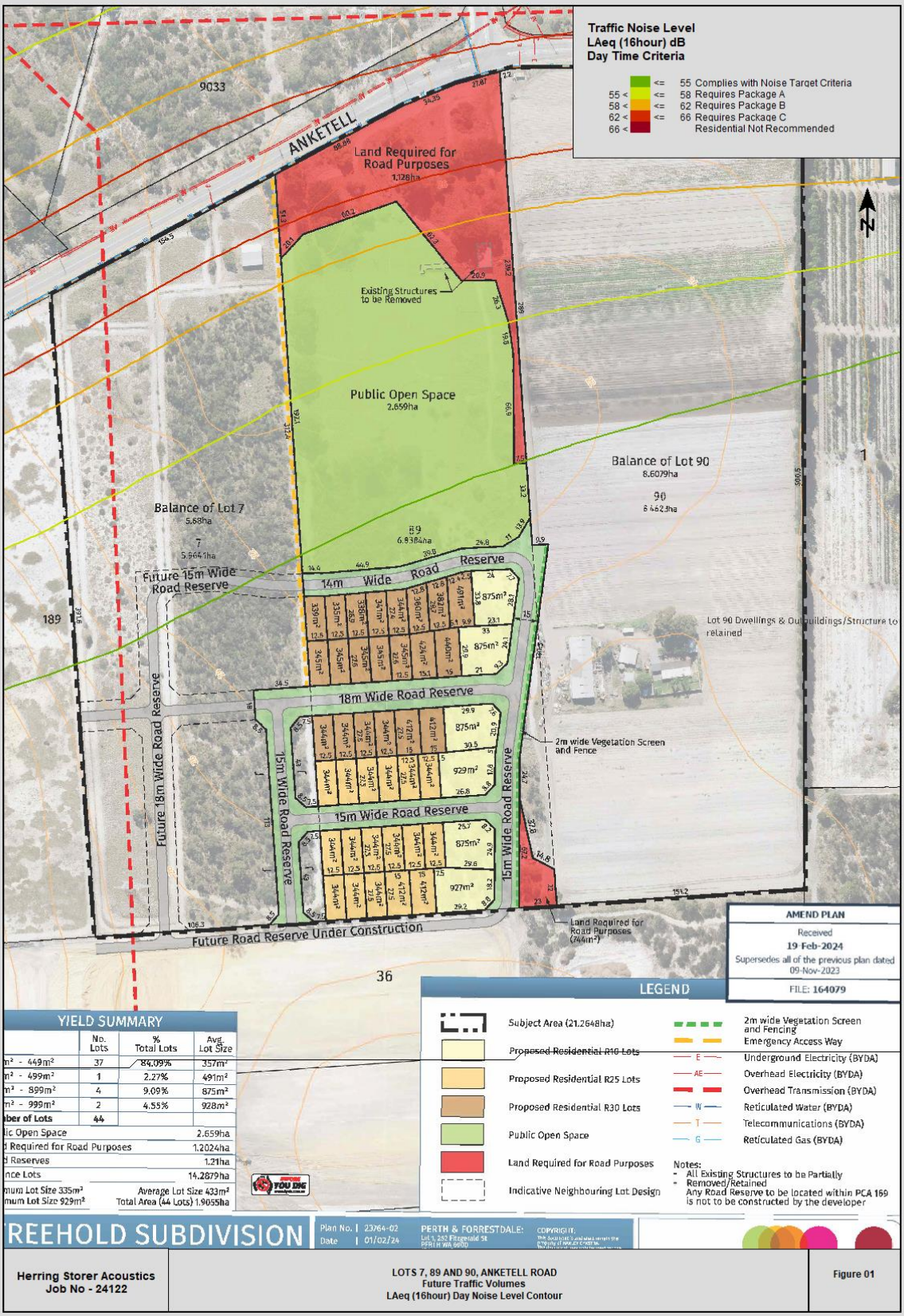
APPENDIX B

$L_{Aeq(16hr)}$ DAY NOISE CONTOURS


Traffic Noise Level
LAeq (16hour) dB
Day Time Criteria
<= 55 Complies with Noise Target Criteria
55 < <= 58 Requires Package A
58 < <= 62 Requires Package B
62 < <= 66 Requires Package C
66 < Residential Not Recommended
ANKETELL
Land Required for Road Purposes 1.128ha
Existing Structures to be Removed
Public Open Space 2.659ha
Balance of Lot 90 8.6079ha
Balance of Lot 7 5.68ha
Future 15m Wide Road Reserve
14m Wide Road Reserve
18m Wide Road Reserve
15m Wide Road Reserve
Future 18m Wide Road Reserve
15m Wide Road Reserve
Future Road Reserve Under Construction
Lot 90 Dwellings & Outbuildings/Structure to retained
2m wide Vegetation Screen and Fence
Land Required for Road Purposes (744m²)
AMEND PLAN
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No. Lots
% Total Lots
Avg. Lot Size
LEGEND
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Proposed Residential R30 Lots
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Land Required for Road Purposes
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2m wide Vegetation Screen and Fencing
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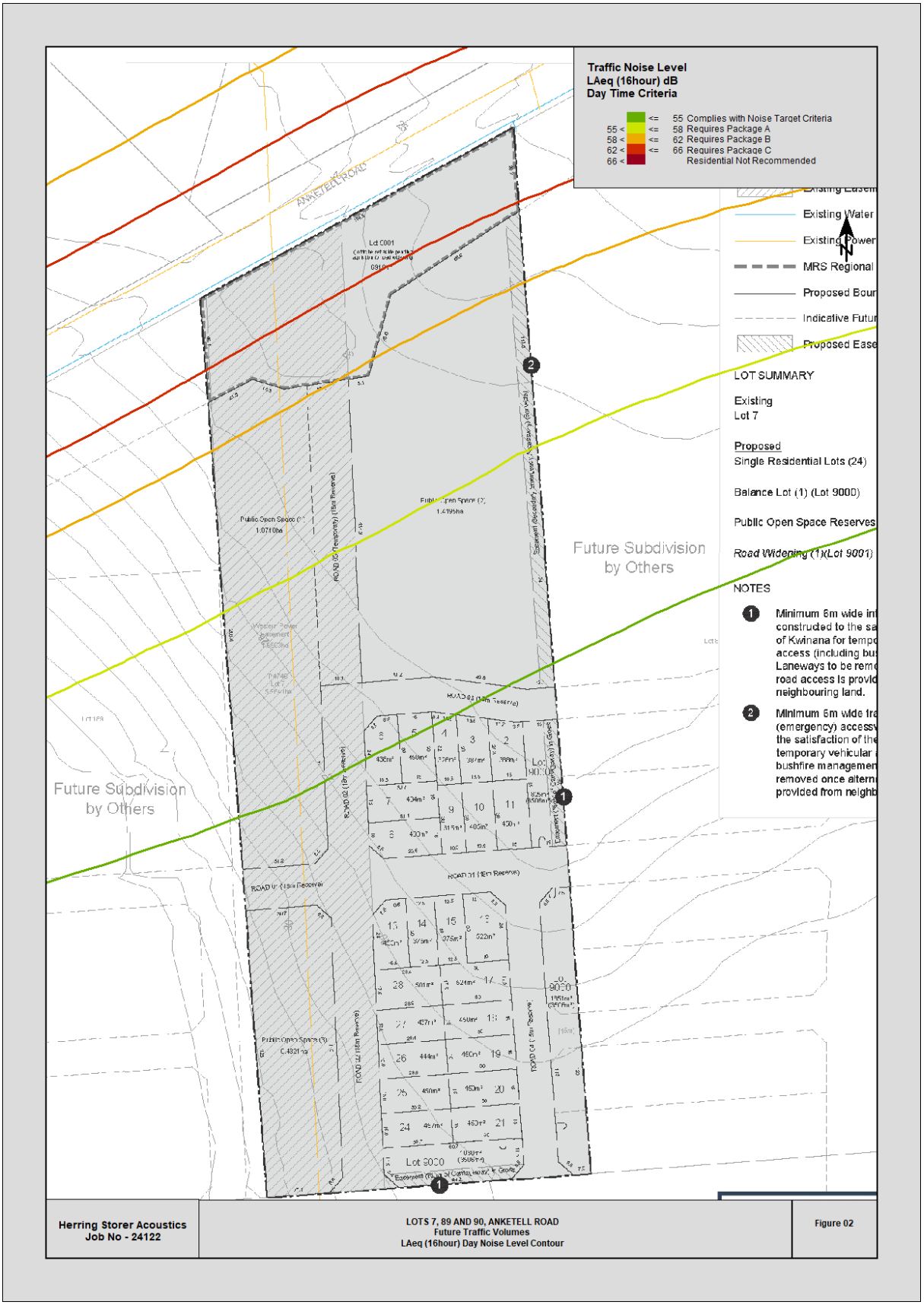
REEHOLD SUBDIVISION
Plan No. | 23764-02
Date | 01/02/24
PERTH & FORRESTDALE:
Herring Storer Acoustics
Job No - 24122
LOTS 7, 89 AND 90, ANKETELL ROAD
Future Traffic Volumes
LAeq (16hour) Day Noise Level Contour
Figure 01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LAeq (16hour) dB
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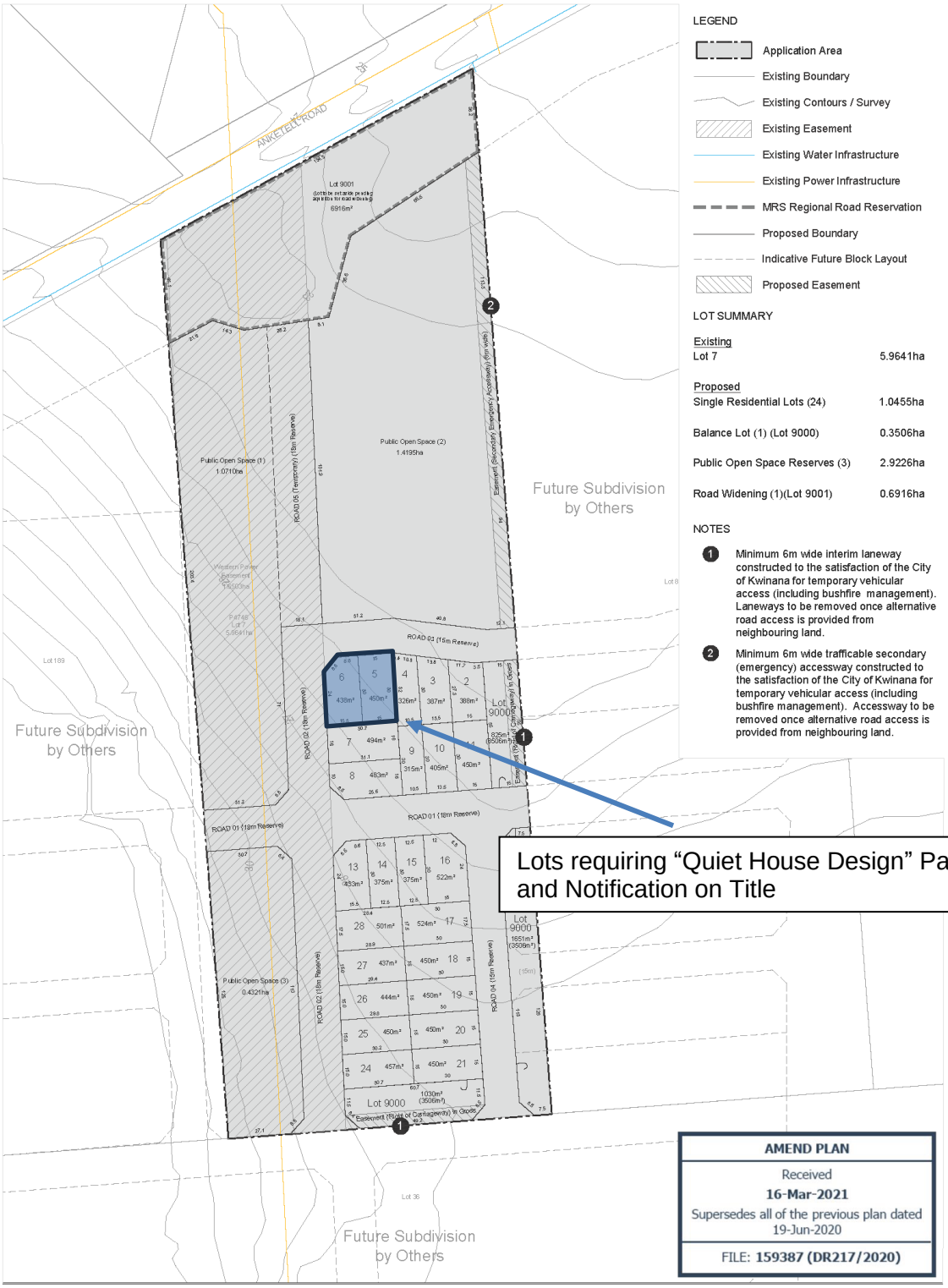
<= 55 Complies with Noise Target Criteria
55 < <= 58 Requires Package A
58 < <= 62 Requires Package B
62 < <= 66 Requires Package C
66 < Residential Not Recommended
ANKETELL ROAD
Future Subdivision by Others
Future Subdivision by Others
Existing Water
Existing Power
MRS Regional
Proposed Bour
Indicative Futur
Proposed Ease
LOT SUMMARY
Existing
Lot 7
Proposed
Single Residential Lots (24)
Balance Lot (1) (Lot 9000)
Public Open Space Reserves
Road Widening (1)(Lot 9001)
NOTES
1 Minimum 6m wide int
construcded to the sa
of Kwinana for tempo
access (including bu
Laneways to be rem
road access is provid
neighbouring land.
2 Minimum 6m wide tra
(emergency) accessv
the satisfaction of the
temporary vehicular
bushfire management
removed once alterna
provided from neighb
Lot 9000
Herring Storer Acoustics
Job No - 24122
LOTS 7, 89 AND 90, ANKETELL ROAD
Future Traffic Volumes
LAeq (16hour) Day Noise Level Contour
Figure 02

APPENDIX C

LOTS REQUIRING QUIET HOUSE DESIGN



LEGEND

- Application Area
- Existing Boundary
- Existing Contours / Survey
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Subdivision Plan

Lot 7 Anketell Road, Anketell

Date: 4 Mar 2021 Scale: 1:1500 @ A3 1:750 @ A1 File: 19-332 SU02A Staff: JP GW Checked: JP

element.

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APPENDIX D

MRWA FUTURE TRAFFIC DATA

2041 ROM24 Scenario - Link Volume Plot for Anketell Rd, Wandi Noise Assessment
All Day
Westport - FRCAH Modelling Project