Harley Dykstra

SURVEYING | TOWN PLANNING | PROJECT MANAGEMENT

STRUCTURE PLAN

Lots 37-40 Rockingham Road, Lake Coogee



Prepared for
Terranovis
August 2026

DOCUMENT CONTROL

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Prepared for: Terranovis
Prepared by: JS
Reviewed by: CP

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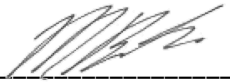
RECORD OF ENDORSEMENT

This amended Structure Plan is prepared under the provisions of the City of Cockburn Town Planning Scheme No. 3.

IT IS CERTIFIED THAT THIS STRUCTURE PLAN WAS APPROVED BY RESOLUTION OF THE WESTERN AUSTRALIAN PLANNING COMMISSION ON:

19 OCTOBER 2026

Signed for and on behalf of the Western Australian Planning Commission:



an officer of the Commission duly authorised by the Commission pursuant to section 24 of the Planning and Development Act 2005 for that purpose, in the presence of:

Witness: Anne Woodin

Date: **21 OCTOBER 2026**

Date of Expiry: **21 OCTOBER 2036**

TABLE OF AMENDMENTS

Amend No:	Summary	Date approved by the WAPC

EXECUTIVE SUMMARY

This Structure Plan has been prepared to guide the subdivision and development of the area bounded by (but not inclusive of) Lot 41 to the north, Stock Road to the east, Lots 1-10 to the south and Rockingham Road to the west. The site is located approximately 800m south of the Lake Coogee town centre and 3.5km north west of the Beeliar town site.

The Structure Plan area is 1.9384 ha and comprises Lots 37, 38, 39 & 40 Rockingham Road, Lake Coogee. The Structure Plan will enable the creation of 38 residential lots. The road layout largely promotes the development of regular shaped lots of different sizes to accommodate a variety of community needs. Extensive consultation with the City of Cockburn has been undertaken to ensure a positive design outcome.

The Structure Plan will deliver the following key planning outcomes:

- Provide for appropriate residential development that responds to its surrounds, notably the R40 development adjacent to the south;
- Foster a strong sense of community and identity;
- Ensure active street interfaces to maximise surveillance opportunities;
- Provide for safe and convenient access to the transport network; and
- Build on an existing inter-connected footpath network.

A summary of the key statistics are provided in **Table 1.**

Item	**Data**	**Structure Plan Ref (section no.)**
Total area covered by the Structure Plan	1.9384ha	1.1
Area of each land use proposed: • Residential	1.3182ha	4.2
Total estimated lot yield	38 lots	4.2
Estimated number of dwellings	38	4.2
Estimated residential site density	19.6 dwelling per ha	4.2
Estimated population	95 persons	4.2

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PART ONE: IMPLEMENTATION

1 STRUCTURE PLAN AREA AND OPERATION

1.1 Structure Plan Area

This Structure Plan shall apply to Lots 37, 38, 39 & 40 Rockingham Road, Lake Coogee being the land contained within the inner edge of the line denoting the Structure Plan Map (**Plan 1**). Details of the lots included in the Structure Plan area are included in **Table 3** below.

Stock Road defines the eastern boundary of the Structure Plan area with Lot 41 to the north, Lots 1-10 to the south and Rockingham Road to the west.

The Structure Plan (refer to **Plan 1**, **Table 1**) incorporates 1.3182ha of Residential land, 1,101m^2 for road widening and 5,101m^2 of road reserves.

Once developed, the Structure Plan is estimated to be capable of supporting approximately 38 dwellings and an overall estimated population of 95 people.

Lot	Street No.	Plan No.	Area (ha)	Proprietor
37	586	3562	0.4641	Julie Radonich
38	584	3562	0.4775	Leigha Tahte, Ryan Joseph Radonich & Wayne Radonich
39	582	3562	0.4914	Wayne Radonich
40	580	3562	0.5054	George Radonich

Table 2 Lot Details

1.2 Operation

This Structure Plan is in effect from the date stated on the cover, and for a period of 10 years (or any other period approved by the WAPC), from that date.

2 PURPOSE

The purpose of the Structure Plan is to facilitate development and subdivision of the site for residential purposes.

The Structure Plan has been prepared in accordance with City of Cockburn Town Planning Scheme No.3, the Planning and Development (Local Planning Schemes) Regulations 2015 (the Regulations) and Western Australian Planning Commission (WAPC) Liveable Neighbourhoods operational policy.

3 STAGING

The development staging shall follow an orderly sequence and provide a manageable level of service of essential infrastructure for roads, drains and utility services. Specifically, the intention is to progress a subdivision over Lot 37 first, which is reflective of the proposed road design. This will then unlock subdivision of Lot 38 and subsequently Lots 39 and 40.

Cooperation between landowners will be necessary, in some instances, to facilitate development and stage development appropriately according to landowner timeframes, market demand and infrastructure implementation.

4 SUBDIVISION AND DEVELOPMENT REQUIREMENTS

4.1 Land Use Zones and Reserves

Plan 1 designates the 'Residential' (R40) zoning across the Structure Plan area, with a portion of road widening adjacent to Stock Road. Land use permissibility within the Structure Plan area shall be in accordance with the corresponding zone or reserve under TPS 3, or as otherwise outlined in this Structure Plan.

4.1.1 Road Reserves

The road reserve widths of the proposed internal road network are 15m wide, consistent with the Liveable Neighbourhoods (WAPC 2009) requirements.

The applicant/owner shall make provision for footpaths through the Structure Plan area as identified on **Plan 1**. The final location and width of footpaths are to be determined at subdivision stage and shall be in accordance with the requirements of Liveable Neighbourhoods.

4.1.2 Public Open Space

In order to meet the 10% POS requirement of the WAPC's Liveable Neighbourhoods policy, the Structure Plan proposes a cash in lieu contribution instead of land provision. A gross subdividable area of 18,283m^2 requires a POS contribution of 1,828.3m^2.

4.2 Density and Development

Plan 1 designates the R-Codes applicable to subdivision and development in the Structure Plan area.

4.2.1 Density and R-Codes

Residential densities applicable to the Structure Plan area are depicted at **Plan 1**. Subdivision and development within the Structure Plan is to generally achieve a minimum dwelling density target of 19.6 dwellings per site hectare.

4.2.2 Local Development Plans (LDP)

Local Development Plans (LDP) are required to be prepared and implemented for lots subject to a 'Quiet House Design' package, as identified in the Noise Management Plan.

4.2.3 Interface with Adjoining Areas

The Structure Plan provides for orderly connection of local roads to adjoining areas and to the wider road network, via the connections shown on the Structure Plan Map at **Plan 1.**

Future development of the lots to the north have been considered in the design by facilitating opportunities for future road connections. This has been indicatively shown on the Lot Yield plan, enabling a logical extension of residential development.

The boundary interface between the Structure Plan area and adjoining Stock Road to the east will be addressed through the subdivision process and will incorporate fencing as detailed in the technical appendices, particularly with regards to noise attenuation.

4.2.4 Heritage

A review of the Department of Planning, Lands and Heritage Aboriginal Cultural Heritage Inquiry System confirms there are no registered sites in the Structure Plan Area.

4.3 Other Requirements

4.3.1 Bushfire Protection

A portion of the land within the Structure Plan area is mapped as being bushfire prone under the Department of Fire and Emergency Services Bushfire Prone Mapping.

This Structure Plan is supported by a Bushfire Management Plan, prepared in accordance with *State Planning Policy 3.7 – Planning in Bushfire Prone Areas (SPP3.7)*. Any development on land within the Structure Plan area shall be constructed in accordance with the recommendations made by the Bushfire Management Plan and shall comply with the requirements of *Australian Standard 3959 – Construction of Buildings in Bushfire Prone Areas*.

Bushfire management requirements will ultimately be considered as part of future applications to subdivide or develop land within the Structure Plan area. A site-specific Bushfire Management Plan, where applicable, may be required at that time. As a minimum, a Bushfire Attack Level Contour Plan, prepared in accordance with an approved Bushfire Management Plan, will be required to be submitted at the time of lodgment of an application for subdivision and/or development approval.

4.3.2 Infrastructure Arrangements

All proposed lots are to be connected to reticulated water, sewer, power, gas as well as being connected to a comprehensive drainage system in accordance with the Local Government and Service Agency requirements.

All proposed lots are to be serviced by internal subdivision roads, with no direct access being proposed to Stock Road as identified on the Structure Plan map at **Plan 1**. The Transport Impact Statement prepared as part of this report details the capability of existing and proposed roads.

Detailed design and implementation of subdivisional roads, intersections and the delivery of services will occur as part of the subdivisional works.

Where subdivision occurs which results in the retention of any existing dwellings, the lots containing the retained dwellings are to be connected to a reticulated sewer and any existing septics/leach drains decommissioned.

4.3.3 Retained Dwellings

Where it is proposed to subdivide land and, in doing so, retain an existing dwelling, that subdivision:

- is to ensure the full area of local roads, as shown on the approved structure plan, are capable of being constructed and ceded;
- the lot containing the retained dwelling will, or will be capable, of obtaining vehicular access to one of this Structure Plan's local roads; and
- is to ensure dwellings comply with the deemed-to-comply requirements of the Planning Codes – Residential Design Codes (Volume 1)."

4.3.4 Development Contributions

The Structure Plan is located within two Development Contribution Areas (DCA) under Town Planning Scheme No.3, being DCA 6 and DCA 13. Contributions may be imposed through a condition of subdivision and/or development approval.

4.3.5 Sewerage

Where subdivision occurs which results in the retention of any existing dwellings, the lots containing the retained dwellings are to be connected to a reticulated sewer and any existing septic/leach drains decommissioned.

4.3.6 Water Resource Management

A Stormwater Drainage Management Plan has been prepared and will be implemented as part of development within the Structure Plan area. An Urban Water Management Plan will be prepared as a condition of subdivision approval.

5 ADDITIONAL DETAILS

5.1 Information to be Submitted with an Application

Once approved, the Structure Plan forms the statutory framework to guide subdivision and development within the Structure Plan area.

Various detailed investigations may need to be undertaken in order to support the eventual subdivision of the site. The details of additional information required to be submitted and the stage which it is to be submitted, are summarised in **Table 3**.

Additional Information/Purpose	**Approval Stage**	**Responsible Agency (Consultation Required)**
Bushfire Management Plan	Subdivision Application	City of Cockburn (in conjunction with DFES)
Transport Noise Assessment/Noise Management Plan	Subdivision Application	City of Cockburn

Table 3 Additional Information

The responsibility for formulation of these plans will rest with the landowner/developers at the appropriate time of development.

As the development progresses it may be necessary to vary aspects of the Structure Plan and as such the plan is intended to be adaptable subject to suitable justification. Modifications to the adopted Structure Plan area to be undertaken in accordance with Schedule 2, Clause 29 of the Planning and Development (Local Planning Schemes) Regulations (2015).

5.1.1 Notifications on Title

A notification on the title at subdivision stage will be required in order to address lots subject to a Bushfire Management Plan and lots within close proximity to a transport noise source (i.e. Beeliar Drive and Stock Road). In providing its advice on subdivision applications, the City of Cockburn may recommend the WAPC require a notification be put on the certificate(s) of title, advising that the land may be affected by midge from nearby lakes and/or wetlands.

5.1.2 Road Widening

A portion of Lots 37, 38, 39 and 40, abutting Stock Road is reserved for Primary Regional Roads purposes in the Metropolitan Region Scheme and is required for the planned future widening of Stock Road. The land required for road widening is to be ceded at the time of subdivision.

5.1.3 School Contributions

A pro-rate contribution towards the acquisition of a primary school site will be required as a condition of subdivision approval, in accordance with WAPC Operational Policy 2.4 – Planning for School Sites.

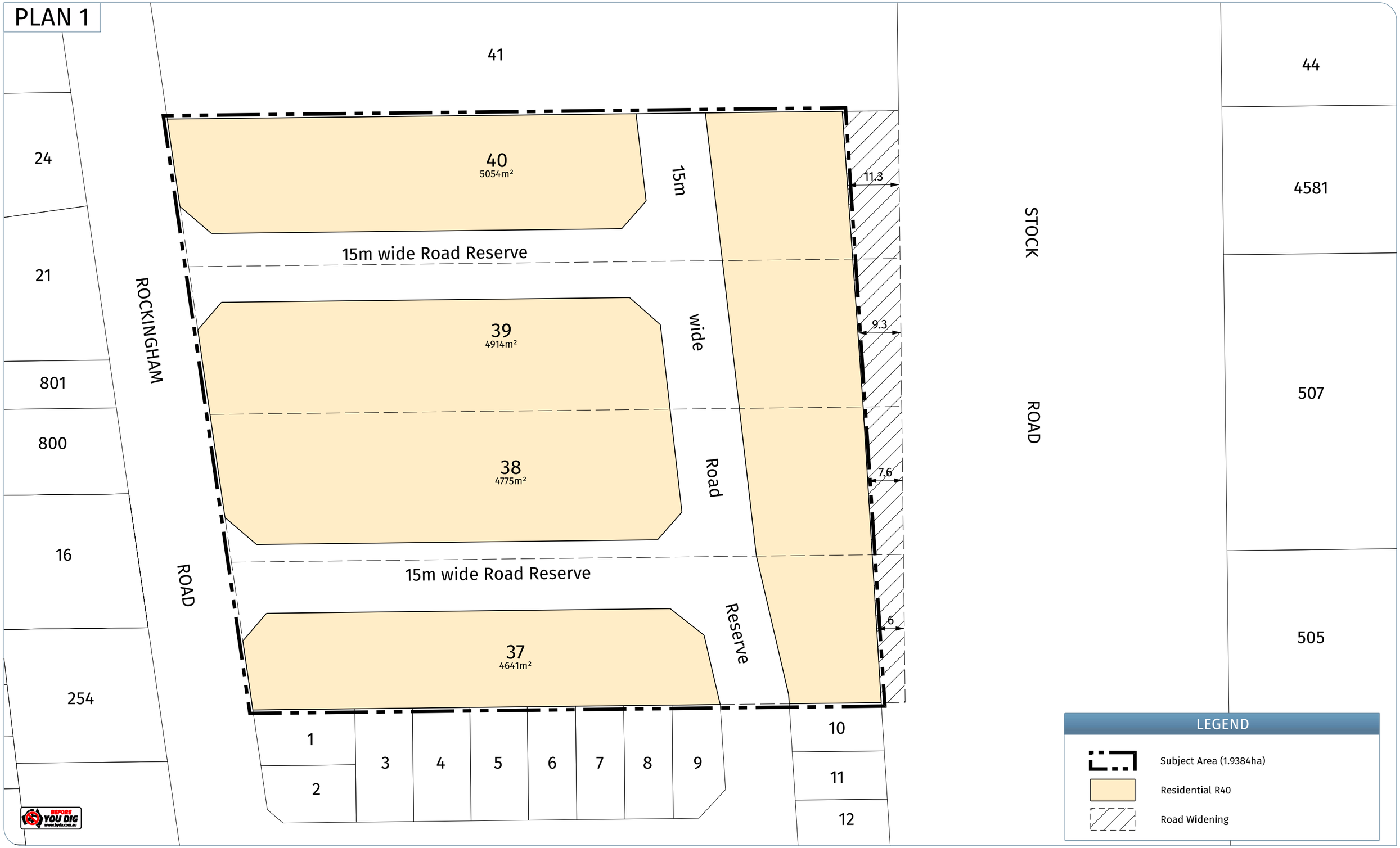
5.2 Studies to be Required Under Condition of Subdivision/Development Approval

Conditions of subdivision approval	**Responsible Agency (Consultation Required)**
Urban Water Management Plan	City of Cockburn (in conjunction with DWER)
Local Development Plan	City of Cockburn

Table 4 Studies Required as a Condition

Structure Plan Map

PLAN 1



LEGEND

- Subject Area (1.9384ha)
- Residential R40
- Road Widening

STRUCTURE PLAN

Lot 37-40 (No. 586, 584, 582 & 580) Rockingham Road, LAKE COOGEE

Plan No.	24222-02	
Date	05/08/26	
Drawn	TJ	
Checked	JS	
Revision	C	
Scale	1:750@A3	0 10m 20m

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

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PART TWO: EXPLANATORY SECTION

1 INTRODUCTION AND PURPOSE

The purpose of the Structure Plan is to provide for the orderly and proper planning of the Structure Plan area in accordance with the State Planning Framework and the City of Cockburn Local Planning Policy Framework.

The intent of this Structure Plan is to guide the subdivision, development and infrastructure servicing of the Structure Plan area as a residential neighbourhood that is integrated with the surrounding local areas.

The proposal is accompanied by a Structure Plan Map (**Plan 1**) prepared in accordance with the *Planning and Development (Local Planning Schemes) Regulations, 2015*. It is included in Part 1 of this report.

The Explanatory Section of this Structure Plan Report includes a detailed description of the proposal, provides an evaluation of the relevant town planning, bushfire management, local water management, and traffic considerations applicable to the land, and details the rationale supporting the proposed Structure Plan.

This Structure Plan has been formulated by Harley Dykstra in collaboration with specialist consultants who have provided input in relation to matters as follows:

Development Engineering Consultants	- Servicing Report & Stormwater Drainage Plan
Herring Storer Acoustics	- Noise Management Plan
Urbii	- Transport Impact Statement
Smith Consulting	- Bushfire Management Plan

Copies of the relevant consultant reports and drawings are appended to this submission and key findings incorporated within the body of the report.

2 SITE AND CONTEXT ANALYSIS

2.1 Physical Context

2.1.1 Location

The Structure Plan area is located approximately 1.5km south of the Stargatre Spearwood centre on Rockingham Road and 1km west of Beeliar Local Centre. The Structure Plan area is generally bounded by Stock Road to the east, Rockingham Road to the west, Lot 41 Rockingham Road to the north and Lots 1-10 Keeper Vista to the south. A locational plan is included at **Figure 1**.

2.1.2 Area & Land Use

The Structure Plan area incorporates 4 lots as detailed in **Table 2** in conjunction with **Figure 2** overleaf. The Structure Plan area comprises a total of 1.9384 hectares and has historically supported rural residential land use activities. The subject land has been cleared of vegetation and currently accommodates a residential dwelling and associated structures on each of Lots 37, 38 and 39. Lot 40 is vacant.

2.1.3 Ownership and Title Details

The Structure Plan comprises 4 separate titles, with 5 different landowners, with the legal description of this land set out in **Table 2** of Part One of this report. A copy of the Certificates of Title are included at **Appendix A**.

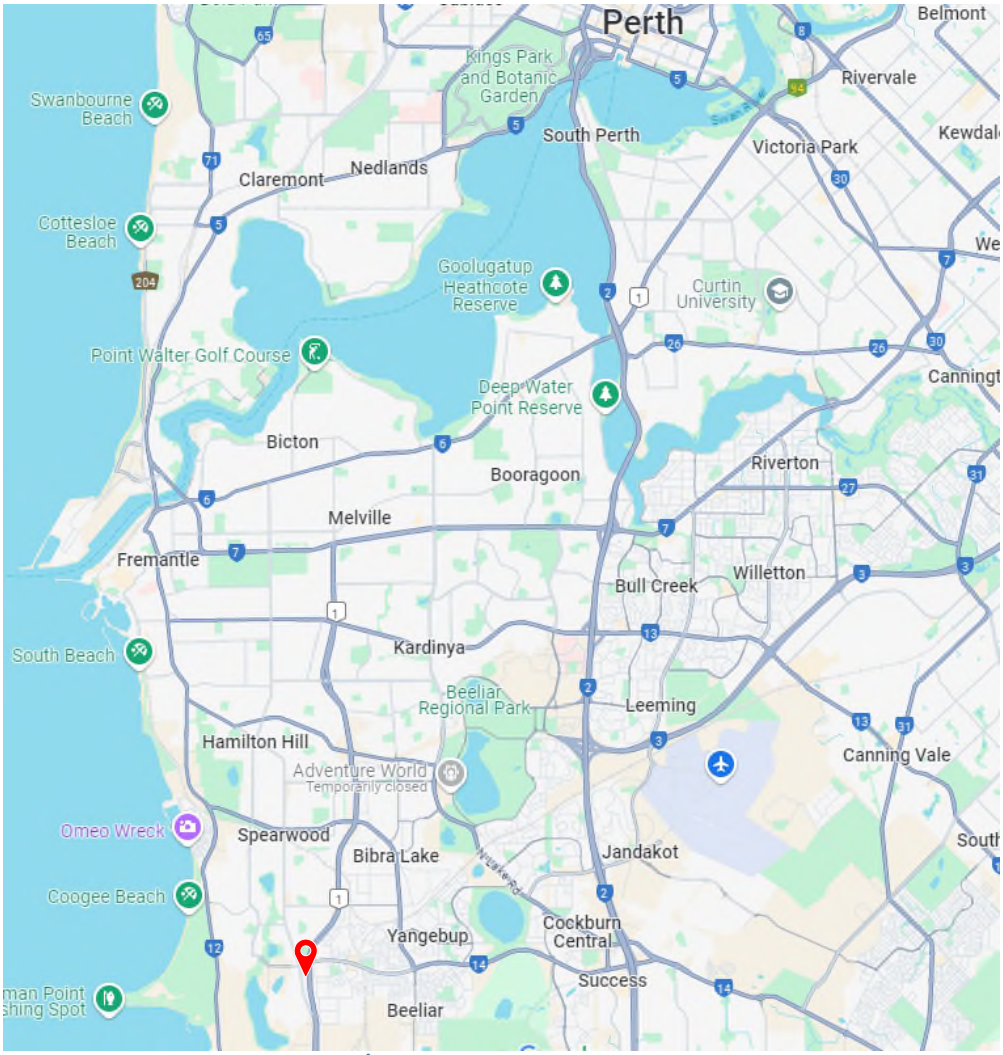


Figure 1 Context Plan



Figure 2 Aerial Photograph (subject land outlined in red)

2.2 Community Context

The Structure Plan area is located within the City of Cockburn, in the locality of Lake Coogee and is approximately 1.5m south of the Stargate Spearwood centre and 1km west of Beeliar Local Centre.

The surrounding land uses mainly consist of new residential estates, with sporadic portions of larger lots still containing single dwellings. Land to the north consists of established residential areas. The area is also supported by a range of community facilities within close proximity to the site including:

- South Metropolitan Tafe Munster Campus;
- Santich Park and Basketball Courts;
- South Coogee Junior Football Club;
- St Jerome's Primary School & OSH Club;
- Hagan Park;
- Lake Coogee;
- Lollipops Childcare Centre;
- Montessori Early Years Learning and Care Centre; and
- Troode Gardens (retirement village).

The Structure Plan site is situated on Rockingham Road, providing excellent connectivity to surrounding residential areas, the Kwinana Freeway, Indian Ocean and the Perth Central Business District. The major roads surrounding the site include Stock Road, being a Primary Distributor, and Rockingham Road, being a Distributor B and Beeliar Drive which is a Distributor A.

There are no existing internal roads, pedestrian or cycle networks within the Structure Plan area, however there is a footpath located on both sides of Rockingham Road. A bus stop is located directly opposite Lot 39 on Rockingham Road, with a bus stop offering different routes located approximately 300m north on Beeliar Road.

Figure 3 provides a context and site analysis identifying the existing neighbourhood form in the immediate area, and the surrounding road and community infrastructure. The Structure Plan area is generally devoid of significant topographic features.

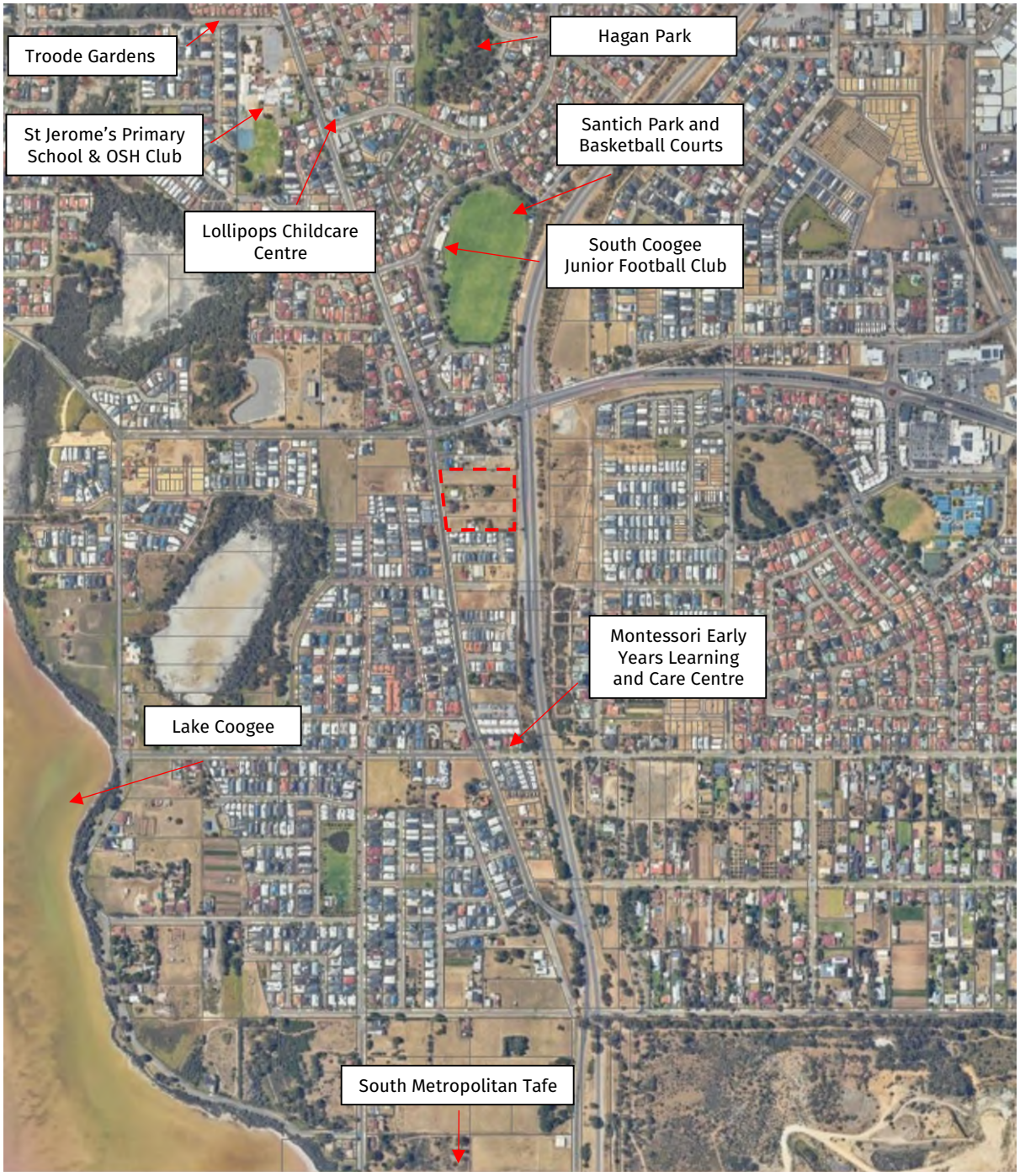


Figure 3 Immediate Context and Site Analysis

2.3 Planning Context

The following section outlines the designations under the relevant state and local planning framework.

2.3.1 Metropolitan Region Scheme (MRS)

The MRS is the statutory land use planning scheme for the Perth Metropolitan Area. The primary purpose of the MRS is to reserve and zone land and control development on reserved and zoned land at the Regional level. The subject land is primarily zoned 'Urban', with a strip of land on the eastern portion reserved as 'Primary Regional Roads' as identified in **Figure 4**.

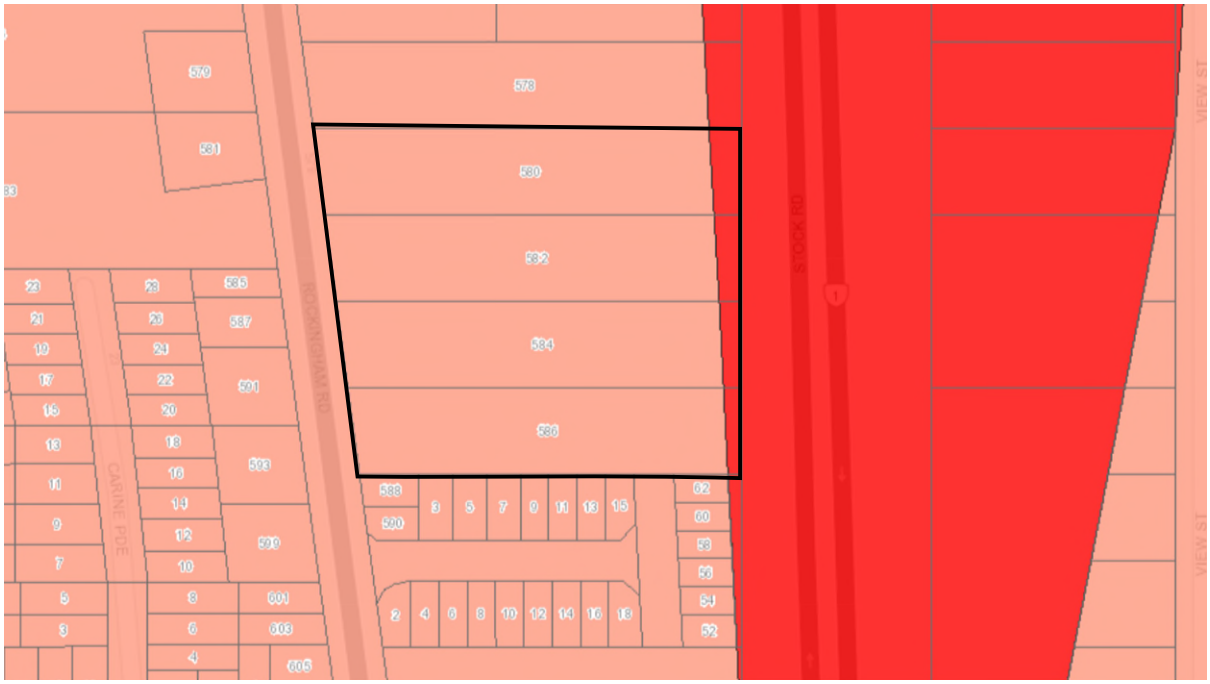


Figure 4 Metropolitan Region Scheme (Subject Site in Black)

2.3.2 Perth and Peel @ 3.5 Million

Perth and Peel @ 3.5 million is a high-level spatial framework and strategic plan that provides a vision for the future growth of the Perth metropolitan region towards a population of 3.5 million residents.

Consistent with the MRS, the land subject to this Structure Plan is identified as 'Urban' in the South Metropolitan Peel Sub-Regional Planning Framework while the strip of land fronting Stock Road is reserved as 'Primary Regional Road (**Figure 5**).

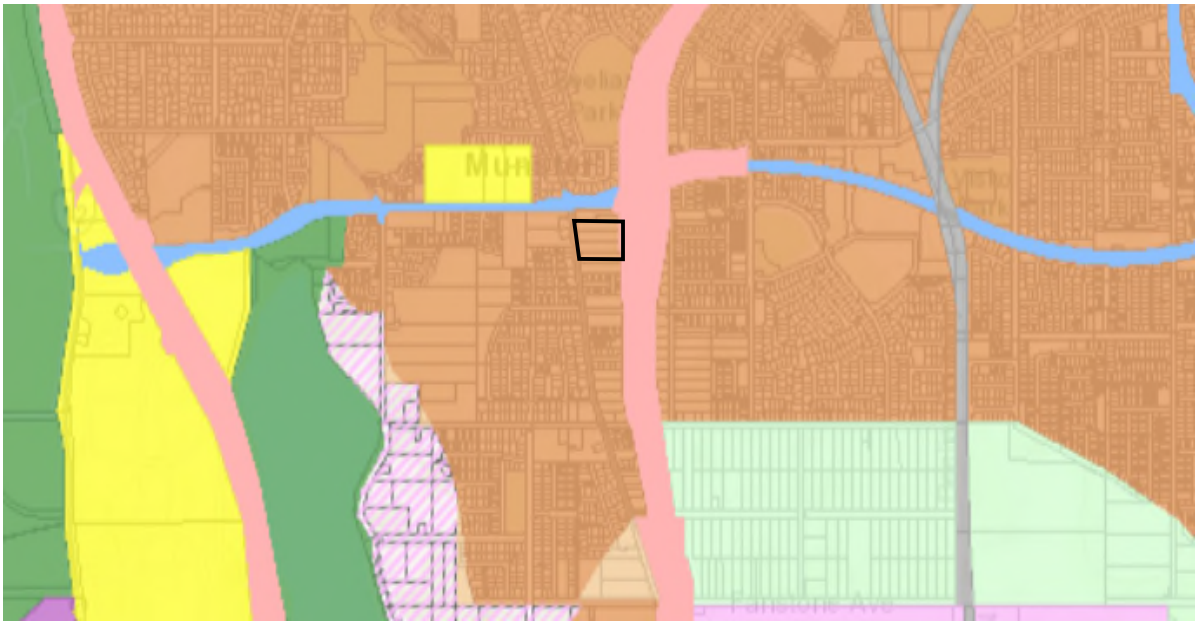


Figure 5 Sub Regional Framework (Subject Site in Black)

2.3.3 City of Cockburn Local Planning Strategy

The City of Cockburn Local Planning Strategy (Local Planning Strategy) was adopted by Council in 1996 and was prepared to provide a strategic plan that will plan for the future of the City in a responsible manner and reflect the aspirations of the City and its community, accommodate future needs, and create opportunities to enhance local attributes.

A new Local Planning Strategy has recently been endorsed by the Western Australian Planning Commission (WAPC) on the 28th of October 2024. The Structure Plan area is identified as 'structure planning areas for future rationalisation' with the eastern portion along Stock Road identified as 'Primary Regional Road' (refer **Figure 6** below).

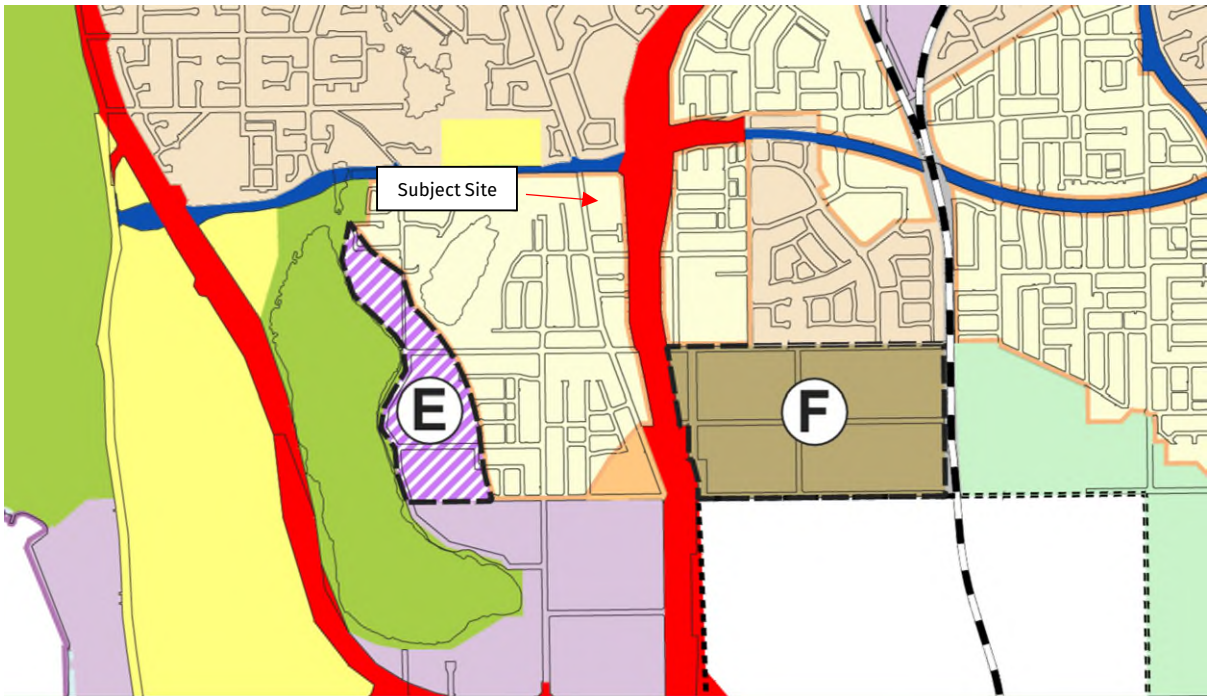


Figure 6 Local Planning Strategy (2024)

2.3.4 City of Cockburn Town Planning Scheme No. 3

The Structure Plan area is predominantly zoned 'Development' within the City of Cockburn Town Planning Scheme No.3 (TPS 3) with a strip of the eastern portion reserved as 'Primary Regional Roads' (refer **Figure 7**).

A Structure Plan is required to be endorsed for land included in the 'Development' zone prior to subdivision and/or development in accordance with *Part 5, Table 9* of TPS 3. The subject site is identified as 'Development Area 5 – Munster'. The provisions of this are as follows:

1. An approved Structure Plan together with all approved amendments shall be given due regard in the assessment of applications for subdivision and development in accordance with clause 27(1) of the Deemed Provisions.
2. To provide for residential development except within the buffers to the Woodman Point WWTP, Munster Pump Station and Cockburn Cement.
3. The local government will not recommend subdivision approval or approve land use and development for residential purposes contrary to Western Australian Planning Commission and Environmental Protection Authority Policy on land within the Cockburn Cement buffer zone

This report has been prepared in accordance with this requirement.

TPS 3 also identifies the subject land as being within the Development Contribution Area 6 (DCA6). The contribution scheme requires that all landowners make a proportional contribution to 23.4% of the cost of widening and upgrading of Beeliar Drive (Mayor Road) between stock Road and Cockburn Road, Munster. It is expected that a condition of subdivision approval would require a contribution. Subdivision within the Structure Plan shall also be subject to a requirement to contribute to DCA 13, which funds various regional, sub-regional and local recreational infrastructure.

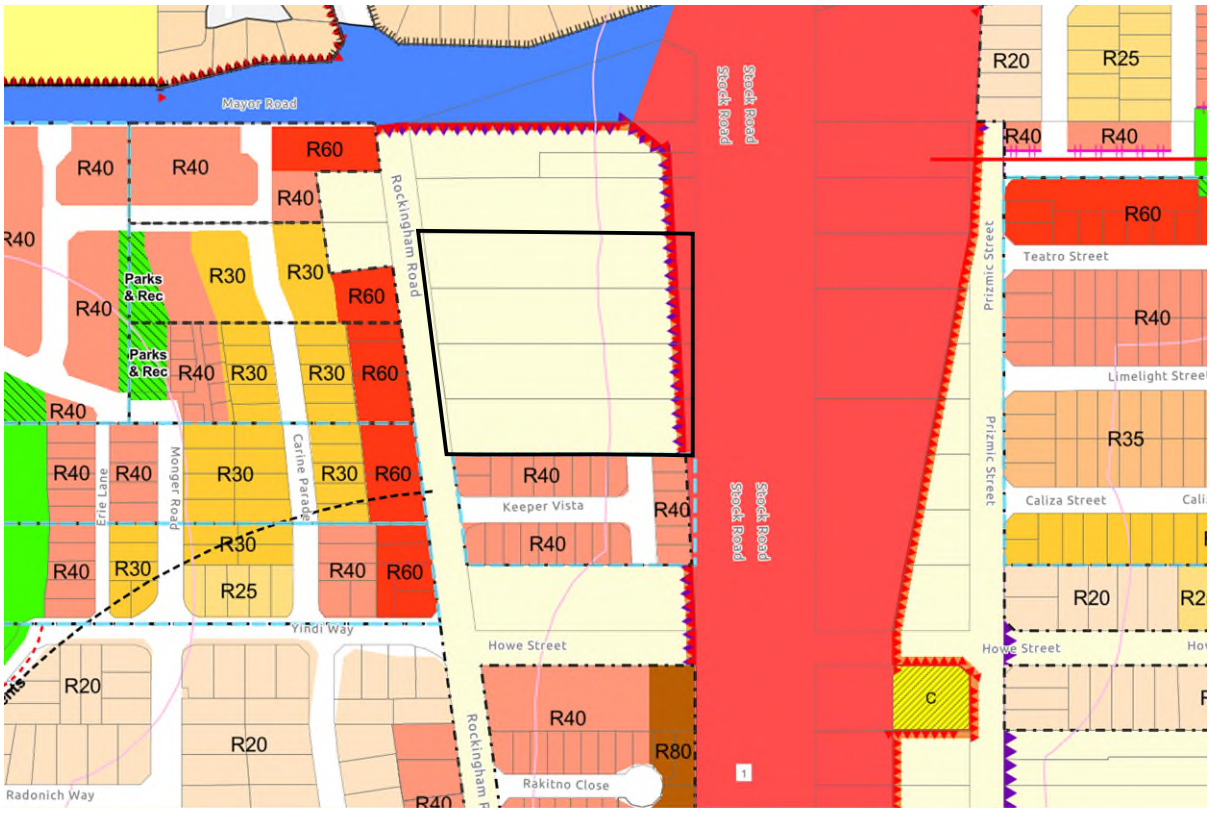


Figure 7 Town Planning Scheme No.3 (Subject Site in Black)

2.3.5 Liveable Neighbourhoods

The WAPC's *Liveable Neighbourhoods* is an operational policy that guides the design and assessment of Structure Plans (regional, district and local) and subdivision for new urban areas in the metropolitan area and regional centres, on greenfield and large urban infill sites. Liveable Neighbourhoods outlines a number of aspects that Structure Plans should address. Of note is the creation of an efficient and legible lot layout and road network and the provision of 10% Public Open Space (POS).

Whilst the Structure Plan ensures the creation of a street block design that is legible and provides good access and connection to the existing residential developments, no POS has been provided. This will be discussed further in Section 5.1 of this report.

2.3.6 State Planning Policy 3.7 –Bushfire

State Planning Policy 3.7 (SPP 3.7) seeks to guide the implementation of effective risk-based land use planning and development to preserve life and reduce the impact of bushfire on property and infrastructure. SPP 3.7 applies to strategic planning proposals, including Structure Plans, over land designated as bushfire prone by the Department of Fire and Emergency Services (DFES). Given the Structure Plan area is partially designated as Bushfire Prone, SPP 3.7 is applicable to the LSP area. The requirements of SPP 3.7 are addressed by a Bushfire Management Plan prepared by Bushfire Logic (**Appendix B**). Further details are provided in Section 3.5 of this report.

2.3.7 State Planning Policy 3.6 Infrastructure Contributions

SPP 3.6 provides the mechanism for local governments or service providers to collect contributions towards the cost of infrastructure necessary to accommodate urban growth.

Contributions are levied directly through the subdivision and development process, or where there are multiple landowners, through Development Contribution Plans (DCP's). The development contributions may include common infrastructure works such as roads, drainage and sewer as well as the equitable apportionment of public open space.

Section 5.6 details the two DCA's applicable to the Structure Plan area.

2.3.8 State Planning Policy 5.4 Road and Rail Noise

The purpose of SPP 5.4 is to minimize the adverse impact of road and rail noise on noise-sensitive land use and/or development within the specified trigger distance of strategic freight and major traffic routes and other significant freight and traffic routes. It indicates that where any part of the lot is within the specific trigger distance an assessment against the policy is required to determine the likely level of transport noise and management/mitigation required.

The entirety of the subject site is located within the trigger distance associated with the Stock Road, with the eastern portion of Lots 39 & 40 located within the trigger distance associated with Beeliar Drive (refer **Figure 8**).

Any noise-sensitive land-use and/or development within the trigger distance of a transport corridor is required to meet specific indoor and outdoor noise targets. A Noise Management Plan has been prepared as part of the Structure Plan (refer **Appendix C**), which identifies the need for the inclusion of 'Quiet House Design' packages.



Figure 8 SPP 5.4 Trigger Distance Buffer

2.3.9 Government Sewerage Policy (2019)

The Government Sewerage Policy (GSP) is a whole of Government Policy, intent on establishing the governmental position on the provision of sewer services within Western Australia through the progressive planning and development of land.

The subject site is located within a sewer sensitive area in accordance with DPLH WA mapping. Connection to reticulated sewer is proposed as part of the development of the Structure Plan area, which is further detailed in Section 3.63 of this report and within the Servicing Report at **Appendix D**.

2.3.10 Better Urban Water Management Policy

Better Urban Water Management Policy (BUWMP) was designed to guide water management at the regional, district, local and subdivision stages of the planning process by ensuring consideration is given to the total water cycle at each stage of planning and development.

The Stormwater Drainage Management Plan (**Appendix E**) and the Servicing Report (**Appendix D**) address the requirements of the BUWMP. Further information is provided in section 3.3.

2.3.11 Residential Design Codes of Western Australia

The Residential Design Codes of Western Australia (R-Codes) provide a comprehensive basis for local governments to control residential development. They generally apply to residential development throughout Western Australia, except as otherwise prescribed by the provisions of Town Planning Scheme No.3 or as varied by City of Cockburn Policies. An R-Code of R40 has been identified on the Structure Plan map (**Plan 1**) that will guide the detailed design and lot layout and subsequent subdivision applications that are lodged in accordance with the approved Structure Plan.

3 OPPORTUNITIES AND CONSTRAINTS ANALYSIS

In support of the proposed Structure Plan, the following reports have been prepared:

- Bushfire Management Plan
- Noise Management Plan
- Servicing Report
- Stormwater Drainage Management Plan
- Traffic Impact Assessment

The findings of these reports will be provided in the following sections with the full reports attached as appendices.

3.1 Biodiversity & Natural Area Assets

It should be noted that the full suite of environmental assessments has not been undertaken as the subject site does not contain any environmental features that warrant assessment.

3.1.1 Flora & Fauna

The subject land has mostly been cleared, with only a few mature trees remaining. A review of Locate Mapping confirms there is no native vegetation or Carnaby Cockatoo roosting or breeding sites.

3.2 Landform & Soils

3.2.1 Soil Type

Perth Environmental Geology mapping indicates that the Structure Plan area consists of Tamala limestone for the majority of the site with a small portion of sand abutting Rockingham Road in the north western portion of the site.

3.2.2 Topography

The site has a gentle slope, with elevations between 18m AHD in the east and 12m AHD in the west.

3.2.3 Acid Sulfate Soils (ASS)

The Department of Water and Environmental Regulation (DWER) has compiled a series of maps indicating ASS risk areas. There are no ASS located within the Structure Plan area.

3.3 Water Management

A Stormwater Drainage Management Plan has been prepared by Development Engineering Consultants and is attached as **Appendix E**. Details with regards to the report are discussed below.

3.3.1 Surface Water

The subject area is quite pervious, with no visual or anecdotal evidence of water ponding occurring.

Stormwater management for the Structure Plan has been designed by taking into account the following water sensitive design criteria:

<u>Water Quantity Management:</u>

- Principle: to ensure that post development discharge peak flow rates match required pre-development rates.
- Objective: all finished floors to be a minimum of 0.3m above the 1% AEP floor level of the urban drainage system and at least 0.5m above the 1% AEP level of waterways and major drainage systems.
- Objective: detention storage to be provided to ensure that relevant storm outflows do not exceed pre-development flow rates.

<u>Water Quality Management:</u>

- Principle: to improve the overall surface water quality of the water leaving the development.
- Objective: ensure that surface water is contained on site and infiltrated up to and including the 10% AEP storm.
- Objective: all water for the 63.2% - 1 hour storm (15mm) to be contained on site prior to outflow.

In accordance with Water Sensitive Urban Design (WSUD) principles, stormwater management principles for the Structure Plan area will include 2 by 1.2m diameter by 1.2m deep soak wells to dispose of stormwater on site. Roads will be provided with capture pits and soak wells to capture road runoff and excess runoff from lots up to and including the 1% AEP storm.

Further information is contained in the Stormwater Drainage Management Plan at **Appendix E**.

3.3.2 Groundwater

Groundwater generally flows in an east to west direction given it is at 2.0mAHD 750m east of the site and falls to 1.0mAHD around 2.1km west of the site. Whilst no recent ground water testing has been undertaken on site, it can be interpolated that the peak ground water level is at approximately 1.7mAHD. Therefore, given the site's lowest point sits at 9.8m AHD, sufficient clearance, without the need to fill, is achieved.

3.4 Wetlands

A review of the *Geomorphic Wetlands on the Swan Coastal Plain* dataset (DBCA 2020) indicates that there are no geomorphic wetlands present in the Structure Plan area.

3.5 Bushfire Hazard

A Bushfire Management Plan (BMP) has been prepared by Bushfire Logic to address requirements under Policy Measures 6.2 and 6.3 of *State Planning Policy 3.7 - Bushfire (SPP 3.7)* in accordance with *Guidelines for Planning in Bushfire Prone Areas Version 1.4* (the Guidelines). The report provides an assessment of the proposed development, bushfire risk context and required bushfire mitigation measures.

A full copy of the Bushfire Management Plan is included at **Appendix B** of this report.

3.6 Earthworks

Retaining walls of around 0.74m will be required to terrace the lots between the eastern and western boundaries. Given that outcropping limestone is likely to be within 600mm of the surface levels, it is anticipated that additional earthworks will be required to ensure that there is a minimum clearance of 600mm between the outcropping rock and the final surface levels.

3.7 Drainage

Drainage from the Structure Plan area, up to the 20% AEP event, will be contained within each lot via self-contained soak wells. The soil characteristics of the site, coupled with the depth to groundwater (0.8m) will enable sufficient site soakage.

Internal road stormwater will be directed to a proposed underground storage area located within the road reserve abutting Rockingham Road. Further details, demonstrating a comprehensive drainage strategy are included in the Stormwater Drainage Management Plan at **Appendix E**.

3.8 Servicing

A Servicing Report has been prepared by Development Engineering Consultants to investigate and report on servicing of the proposed Structure Plan area and to provide a servicing strategy to allow efficient delivery of the estate.

A full copy of the report is included as **Appendix D** with a summary of the servicing requirements included below.

3.8.1 Roads and Paths

All new roads will be constructed to City of Cockburn standards, including kerbing and piped drainage plus the provision of footpaths, as required.

3.8.2 Water Supply

A 100mm reticulation water main is located along the western verge of Rockingham Road. It is anticipated that this service can be extended to service the Structure Plan area.

3.8.3 Reticulated Sewer

Whilst there is no sewer connection within the Structure Plan area, there is the opportunity to connect to a sewer main along the western verge of Rockingham. Sewer connection will be provided by drilling a 150mm reticulation sewer under Rockingham Road to the existing main on the western side. This will enable each new lot to be serviced by sewer.

3.8.4 Power

A high and low voltage aerial power line is located along the western verge of Rockingham Road in addition to underground cables. The proposed Structure Plan area is able to be supplied with an overhead power connection via the existing network.

3.8.5 NBN/Telstra

All new lots will be required to connect to NBN as outlined under Commonwealth legislation. Telstra underground infrastructure services are located adjacent to the site along Rockingham Road, with an Optus cable located along the eastern verge of Rockingham Road. These telecommunications facilities can be supplied to the proposed development, subject to the developer paying connection fees.

3.8.6 Gas

A 155mm medium pressure gas main is located along the western verge of Rockingham Road. It is expected that reticulated gas services will be extended to the proposed Structure Plan area.

3.8.7 Mobile Telecommunications Infrastructure

The City of Cockburns Local Planning Policy 5.19 – Structure Plans & Mobile Telecommunications Infrastructure recommends early consultation with infrastructure providers to determine whether the existing telecommunications are able to accommodate the proposed development.

Although consultation with an infrastructure provider has not been undertaken at this stage, data available online indicates that the area is able to connect to mobile telecommunications. Notwithstanding this, the proposed structure plan is located in an existing residential area, which reinforces the notion that telecommunications are readily available.

3.9 Heritage

A review of the Department of Planning, Lands and Heritage Aboriginal Cultural Heritage Inquiry System confirms there are no registered sites in the Structure Plan Area

4 STAKEHOLDER AND COMMUNITY ENGAGEMENT

A pre-lodgement meeting was held with Planning Officers from the City of Cockburn on the 20th of June 2024 to discuss the proposed Structure Plan and seek preliminary advice on matters to consider. Feedback from Officers at the City of Cockburn has been positive and supportive with regards to the proposal, with the following summarising the advice received:

- It is noted that the default position is to provide 10% POS, however, a cash-in-lieu provision of POS can be considered, provided that clear justification is provided.
- The City is willing to consider a higher than typical R30 base coding given the links to high frequency bus routes.
- A design that that proposes minimal crossovers to Rockingham Road is preferred, with a left in left out onto Rockingham Road in the northern portion.
- Consideration needs to be given to future development of the lots to the north. Therefore, the design should demonstrate how the proposed Structure Plan does not compromise further Structure Planning.

Accordingly, all of the City's comments have been addressed in the Structure Plan Map provided at **Plan 1** and within the following section.

5 DESIGN RESPONSE

The Structure Plan design has been developed having regard to the evolving strategic planning objectives for the locality, providing a continuation of residential development which has occurred in new estates to the east, south and west. Specifically, the Structure Plan has been formulated to inter-connect with the adjoining residential area to the south and ensure a logical extension for future residential development to the north.

The Structure Plan will facilitate the subdivision of the site into a contemporary residential development of approximately 38 lots which will conform to the provisions of the Residential Design Codes. The density allocation for all lots has been identified as R40 within the Structure Plan area.

The Structure Plan is deemed consistent with the goals and aspirations of the State and relevant City of Cockburn planning framework, as well as proper and orderly planning.

5.1 Public Open Space (POS)

The Structure Plan proposes a cash in lieu contribution of POS instead of the provision of land. This has been informed through discussions with officers at the City of Cockburn who indicated that cash in lieu could be considered if adequately justified. Specifically, the City advised that there may be the opportunity to financially contribute towards the establishment of Glamuzina Park, which is located approximately 150m west of the subject site.

In order to justify a cash in lieu of land POS contribution we note that there are numerous existing recreational parks located within close proximity to the Structure Plan area (refer to **Figure 9**). The map details the distance to these via pedestrian means. It should be worth noting that these parks boast a wide range of facilities, enabling for a broad range of activities. Of note are the following parks and their facilities:

- Firbank Park: BBQ facilities, park benches, playground equipment (including an inclusive swing) and kick about space.
- Radonich Park: basketball ring, exercise equipment, park benches, BBQs, AFL goals, kick about space.
- Kevin Bowman Reserve: basketball ring, exercise equipment, shade sails, playground equipment, BBQs and extensive walking tracks.
- Santich Park: basketball ring, AFL goals, playground equipment, BBQs, kick about space, soccer clubrooms.

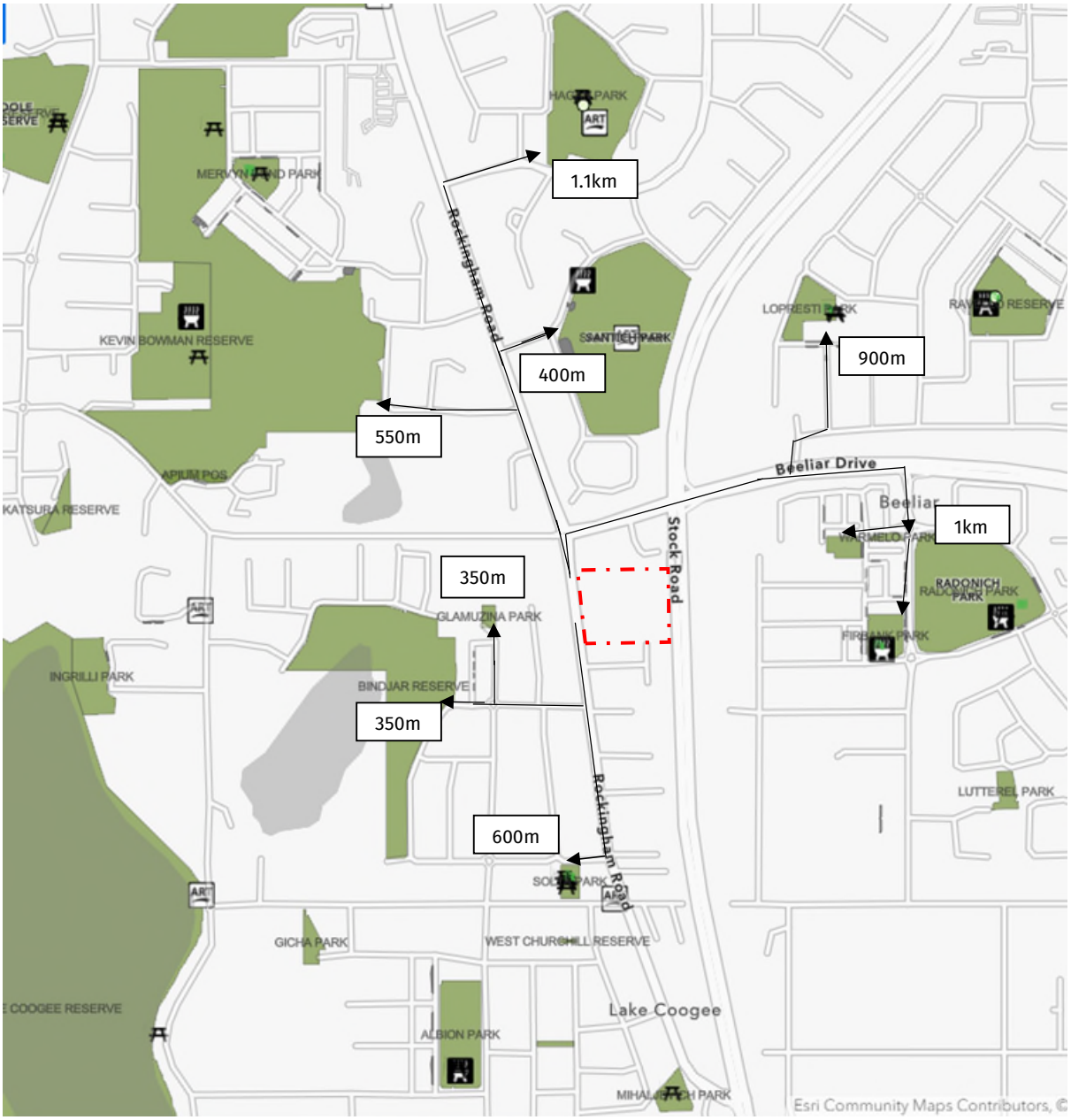


Figure 9 POS Map Detailing Distance via Pedestrian Means

Therefore, due to an abundance of well established and emerging recreational parks in close proximity to the Structure Plan area, a cash in lieu contribution towards POS is considered appropriate.

5.2 Residential

The road network has been designed to facilitate the creation of regular shaped lots, capable of accommodating standard residential dwellings, with direct access to a public street. A suitable mix of lot types are proposed, with the design allowing a response to the current market demand in regard to lot depths and widths. An indicative Lot Yield Plan has been attached at **Appendix G.**

Based on the indicative Lot Yield Plan, the proposed Structure Plan is likely to achieve a density of 19.6 dwellings per gross urban hectare. Based on the indicative maximum dwelling yield of 38 dwellings, the Structure Plan area is likely to accommodate 95 persons based upon 2.8 persons per household (2021 Census, Greater Perth).

Lot layout and size has been designed by taking into consideration the existing road network and surrounding residential estates. The Structure Plan seeks to maximise its proximity to high frequency bus routes by providing residential development at a density coding of R40.

The proposed residential density of R40 can be considered consistent with the strategic direction of the Sub-Regional Planning Framework as it promotes higher densities in undeveloped areas zoned for urban use, particularly in areas close to transit corridors and high amenity. Further, the proposed density reflects development located directly to the south, ensuring a seamless integration.

The Structure Plan has been formulated to meet the requirements of Liveable Neighbourhoods. The Residential Design Codes (R-Codes), administered by the City, will provide a comprehensive basis for the control of residential development within the Structure Plan area. The R-Codes will outline the provisions which apply to residential development.

5.3 Bushfire Management

The Structure Plan design takes into account bushfire protection requirements and includes specific bushfire protection measures including vehicle egress to at least two different destinations, provision of fire hydrants and appropriate separation distances to bushfire hazards.

A full copy of the Bushfire Management Plan is located in **Appendix B** of this report.

5.4 Noise Impacts

Noise impacting the Structure Plan area can be considered to originate from Stock Road and Beeliar Drive.

A Noise Management Plan has been prepared to support the Structure Plan (**Appendix C**), which takes into account current and future traffic volumes on Stock Road. The Assessment concludes that noise received at the development from future traffic on Stock Road, exceed external noise level criteria. Therefore, 'Quiet House Design' packages are required for certain proposed lots. A map is included within the Noise Management Plan detailing the required packages.

Any noise mitigation measures that are required to be implemented will be undertaken as part of the subdivisional works as relevant, through the requirements of a Local Development Plan.

5.5 Movement Networks

5.5.1 Regional Road Network

The subject site is well connected to the metropolitan and wider regional road network, given its frontage to Rockingham Road and close proximity to Stock Road and Beeliar Drive. The regional road network provides efficient access to the wider Perth Metropolitan Region including commercial and employment centres. Stock Road is considered to be a Primary Distributor Road, whilst Rockingham Road functions as a Distributor Road B.

The ceding of the Primary Regional Road widening in the eastern portion of the subject site will occur at subdivision stage.

5.5.2 Proposed Internal Roads

A series of three 15m wide local road reserves are proposed which will provide access from Rockingham Road to the new lots. A Transport Impact Statement has been prepared by Urbii in support of the Structure Plan, providing detail on the proposed road network and the impact of potential traffic volumes on the local road network. The Transport Impact Statement is attached at **Appendix F.**

The proposed road widths are consistent with the range stated in Liveable Neighbourhoods (WAPC 2009).

5.5.3 Proposed Movement Capacity

In calculating trip generation and distribution within the Structure Plan area, the Transport Impact Statement examines the trip generation rates for the proposed residential development. Based on these rates, the proposed Structure Plan will generate approximately 304 vehicles per day. Trips generated by the proposed development are primarily anticipated to be daily commute trips as the proposed Structure Plan incorporates residential development.

The traffic report concludes that the traffic generation of the proposed Structure Plan is minimal and as such would have a negligible impact on the surrounding road network.

5.5.4 Pedestrian and Cycle Network

Pedestrian and cycling facilities are available along both sides of Rockingham Road. Data collected by the City of Cockburn from Strava reveals that Rockingham Road and Beeliar Drive are relatively popular cycling routes in the area. This will be further confirmed through the use of these facilities generated by development at the subject site.

5.5.5 Public Transport

The subject site is easily accessible to public transport, with two bus stops located within close proximity. A bus stop is located directly opposite Lot 39 on Rockingham Road, with a bus stop offering different routes located approximately 300m north on Beeliar Road. The bus network provides connection to the nearby rail network.

5.6 Developer Contributions

As outlined in preceding sections, the Structure Plan area is subject to Development Contribution Plans 6 and 13, administered by the City of Cockburn.

DCP 6 requires that all landowners make a proportional contribution to 23.4% of the cost of widening and upgrading of Beeliar Drive (Mayor Road) between stock Road and Cockburn Road, Munster. It is expected that a condition of subdivision approval would require a contribution.

DCP 13 requires a contribution at the time of development or subdivision which funds various regional, sub-regional and local recreational infrastructure.

5.7 Implementation

The proposed Structure Plan has been prepared in accordance with the requirements of the *Planning and Development (Local Planning Schemes) Regulations 2015*. Further, the Structure Plan Amendment complies with the applicable State and Local Planning Policy Framework as set out in Section 2.3 of this Report.

The *Planning and Development (Local Planning Schemes) Regulations 2015* stipulates the manner by which the Structure Plan will be processed by the City of Cockburn and thereafter, the Western Australian Planning Commission to enable final approval.

Once the Structure Plan is sufficiently progressed and the TPS 3 zoning is amended, development and/or subdivision applications can be considered and approved where they comply with the Structure Plan.

Appendix A Certificates of Title

WESTERN AUSTRALIA

TITLE NUMBER	
Volume	Folio
1190	**792**

RECORD OF CERTIFICATE OF TITLE

UNDER THE TRANSFER OF LAND ACT 1893

The person described in the first schedule is the registered proprietor of an estate in fee simple in the land described below subject to the reservations, conditions and depth limit contained in the original grant (if a grant issued) and to the limitations, interests, encumbrances and notifications shown in the second schedule.

BGRoberts
REGISTRAR OF TITLES

REGISTRAR OF TITLES WESTERN AUSTRALIA

LAND DESCRIPTION:

LOT 40 ON PLAN 3562

REGISTERED PROPRIETOR:
(FIRST SCHEDULE)

GEORGE RADONICH OF ROCKINGHAM ROAD, SPEARWOOD

(XE A000001A) REGISTERED 1/1/0001

LIMITATIONS, INTERESTS, ENCUMBRANCES AND NOTIFICATIONS:
(SECOND SCHEDULE)

1. THE LAND THE SUBJECT OF THIS CERTIFICATE OF TITLE EXCLUDES ALL PORTIONS OF THE LOT DESCRIBED ABOVE EXCEPT THAT PORTION SHOWN IN THE SKETCH OF THE SUPERSEDED PAPER VERSION OF THIS TITLE. VOL 1190 FOL 792.

Warning: A current search of the sketch of the land should be obtained where detail of position, dimensions or area of the lot is required. Lot as described in the land description may be a lot or location.

----------END OF CERTIFICATE OF TITLE----------

STATEMENTS:

The statements set out below are not intended to be nor should they be relied on as substitutes for inspection of the land and the relevant documents or for local government, legal, surveying or other professional advice.

SKETCH OF LAND:	1190-792 (40/P3562)
PREVIOUS TITLE:	632-102
PROPERTY STREET ADDRESS:	580 ROCKINGHAM RD, LAKE COOGEE.
LOCAL GOVERNMENT AUTHORITY:	CITY OF COCKBURN

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Landgate
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WESTERN AUSTRALIA

TITLE NUMBER	
Volume	Folio
1207	**691**

RECORD OF CERTIFICATE OF TITLE

UNDER THE TRANSFER OF LAND ACT 1893

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BGRoberts

REGISTRAR OF TITLES

REGISTRAR OF TITLES WESTERN AUSTRALIA

LAND DESCRIPTION:

LOT 39 ON PLAN 3562

REGISTERED PROPRIETOR:
(FIRST SCHEDULE)

WAYNE RADONICH OF 592 ROCKINGHAM ROAD, MUNSTER

(T F597648) REGISTERED 30/6/1994

LIMITATIONS, INTERESTS, ENCUMBRANCES AND NOTIFICATIONS:
(SECOND SCHEDULE)

1. THE LAND THE SUBJECT OF THIS CERTIFICATE OF TITLE EXCLUDES ALL PORTIONS OF THE LOT DESCRIBED ABOVE EXCEPT THAT PORTION SHOWN IN THE SKETCH OF THE SUPERSEDED PAPER VERSION OF THIS TITLE. VOL 1207 FOL 691.
2. F597649 MORTGAGE TO AUSTRALIA & NEW ZEALAND BANKING GROUP LTD REGISTERED 30/6/1994.

Warning: A current search of the sketch of the land should be obtained where detail of position, dimensions or area of the lot is required. Lot as described in the land description may be a lot or location.

----------END OF CERTIFICATE OF TITLE----------

STATEMENTS:

The statements set out below are not intended to be nor should they be relied on as substitutes for inspection of the land and the relevant documents or for local government, legal, surveying or other professional advice.

SKETCH OF LAND:	1207-691 (39/P3562)
PREVIOUS TITLE:	1061-897
PROPERTY STREET ADDRESS:	582 ROCKINGHAM RD, LAKE COOGEE.
LOCAL GOVERNMENT AUTHORITY:	CITY OF COCKBURN

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WESTERN AUSTRALIA

TITLE NUMBER	
Volume	Folio
2058	**108**

RECORD OF CERTIFICATE OF TITLE

UNDER THE TRANSFER OF LAND ACT 1893

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BGRoberts
REGISTRAR OF TITLES

REGISTRAR OF TITLES WESTERN AUSTRALIA

LAND DESCRIPTION:

LOT 38 ON PLAN 3562

REGISTERED PROPRIETOR:
(FIRST SCHEDULE)

WAYNE RADONICH
IN 96/100 SHARE
LEIGHA TAHTE ERCEG
IN 2/100 SHARE
RYAN JOSEPH RADONICH
IN 2/100 SHARE
ALL OF 592 ROCKINGHAM ROAD LAKE COOGEE WA 6166
AS TENANTS IN COMMON

(T O967014) REGISTERED 6/12/2021

LIMITATIONS, INTERESTS, ENCUMBRANCES AND NOTIFICATIONS:
(SECOND SCHEDULE)

1. THE LAND THE SUBJECT OF THIS CERTIFICATE OF TITLE EXCLUDES ALL PORTIONS OF THE LOT DESCRIBED ABOVE EXCEPT THAT PORTION SHOWN IN THE SKETCH OF THE SUPERSEDED PAPER VERSION OF THIS TITLE. VOL 2058 FOL 108.

Warning: A current search of the sketch of the land should be obtained where detail of position, dimensions or area of the lot is required. Lot as described in the land description may be a lot or location.

----------END OF CERTIFICATE OF TITLE----------

STATEMENTS:

The statements set out below are not intended to be nor should they be relied on as substitutes for inspection of the land and the relevant documents or for local government, legal, surveying or other professional advice.

SKETCH OF LAND:	2058-108 (38/P3562)
PREVIOUS TITLE:	1197-513
PROPERTY STREET ADDRESS:	584 ROCKINGHAM RD, LAKE COOGEE.
LOCAL GOVERNMENT AUTHORITY:	CITY OF COCKBURN

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WESTERN AUSTRALIA

TITLE NUMBER	
Volume	Folio
2058	**109**

RECORD OF CERTIFICATE OF TITLE

UNDER THE TRANSFER OF LAND ACT 1893

The person described in the first schedule is the registered proprietor of an estate in fee simple in the land described below subject to the reservations, conditions and depth limit contained in the original grant (if a grant issued) and to the limitations, interests, encumbrances and notifications shown in the second schedule.

BGRoberts

REGISTRAR OF TITLES

REGISTRAR OF TITLES WESTERN AUSTRALIA

LAND DESCRIPTION:

LOT 37 ON PLAN 3562

REGISTERED PROPRIETOR:
(FIRST SCHEDULE)

JULIE RADONICH OF 582 ROCKINGHAM ROAD LAKE COOGEE WA 6166

(T P285248) REGISTERED 13/9/2022

LIMITATIONS, INTERESTS, ENCUMBRANCES AND NOTIFICATIONS:
(SECOND SCHEDULE)

1. THE LAND THE SUBJECT OF THIS CERTIFICATE OF TITLE EXCLUDES ALL PORTIONS OF THE LOT DESCRIBED ABOVE EXCEPT THAT PORTION SHOWN IN THE SKETCH OF THE SUPERSEDED PAPER VERSION OF THIS TITLE. VOL 2058 FOL 109.

Warning: A current search of the sketch of the land should be obtained where detail of position, dimensions or area of the lot is required. Lot as described in the land description may be a lot or location.

----------END OF CERTIFICATE OF TITLE----------

STATEMENTS:

The statements set out below are not intended to be nor should they be relied on as substitutes for inspection of the land and the relevant documents or for local government, legal, surveying or other professional advice.

SKETCH OF LAND:	2058-109 (37/P3562)
PREVIOUS TITLE:	1197-513
PROPERTY STREET ADDRESS:	586 ROCKINGHAM RD, LAKE COOGEE.
LOCAL GOVERNMENT AUTHORITY:	CITY OF COCKBURN

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Appendix B Bushfire Management Plan

Bushfire Management Plan Coversheet

This Coversheet and accompanying Bushfire Management Plan has been prepared and issued by a person accredited by Fire Protection Association Australia under the Bushfire Planning and Design (BPAD) Accreditation Scheme.

Bushfire Management Plan and Site Details					
Site address / Plan reference:	Lots 37-40 (No.580-586) Rockingham Road				
Suburb:	Lake Coogee	State:	WA	Postcode:	N/A
Local government area:	City of Cockburn				
Description of the planning proposal:	Local Structure Plan				
BMP / Reference number:	N/A	Version:	V1.3	Date of issue:	4/10/2026
Client / Business name:	J. Radonich c/ Terranovis				

Reason for referral to DFES[1]	Yes	No
Has the BAL been calculated by a method other than Method 1 as outlined in AS3959? (Tick *No* if AS3959 Method 1 has been used to calculate the BAL)	☐	✔
Have any of the bushfire protection criteria elements been addressed through the use of an outcomes-based approach?	☐	✔
Strategic planning proposal (including rezoning applications)	☐	✔
Local planning scheme amendment containing supplementary provisions, additional to the deemed provisions for bushfire risk management	☐	✔
Where a bushfire local planning policy, or variation to the acceptable solutions or the APZ is proposed	☐	✔
Where there is a conflict of opinion between the decision maker and proponent	☐	✔
Expert technical advice on bushfire behaviour, emergency management, or other occasions where bushfire technical advice is required to support planning decision-making	☐	✔
Expert technical advice on bushfire matters referred to State Administrative Tribunal (SAT) or Development Assessment Panel (DAP)	☐	✔
Comments on future buildings' compliance with FES Commissioner's operational requirement guidelines	☐	✔
Decision maker discretionary referral, (e.g. renewable energy, hazardous materials, vulnerable land use)	☐	✔

If the development is a special development type as listed above, explain why the proposal is considered to be one of the above listed classifications (E.g. considered vulnerable land-use as the development is for accommodation of the elderly, etc.)?

N/A

Note: The decision maker (e.g. local government or the WAPC) should only refer the proposal to DFES for comment if one (or more) of the above answers are ticked "Yes".

BPAD Accredited Practitioner Details and Declaration

Name	Accreditation Level	Accreditation No.	Accreditation Expiry
Jemma Douglas	Level 2	38400	February 2027
Company		**Contact No.**	
Bushfire Logic		0410621291	

I declare that the information provided within this bushfire management plan is to the best of my knowledge true and correct.

Signature of Practitioner  Date 4 October 2026

[1] For more information please refer to DFES Referral to DFES Checklist

Bushfire Management Plan

Lots 37-40 (No.580-586) Rockingham Road, Lake Coogee

City of Cockburn

Date: 4 October 2026

Bushfire Logic

ABN: 926 121 79165

LIMITATIONS STATEMENT

This report has been prepared in accordance with the Agreement between Bushfire Logic and the Client. This Bushfire Management Plan has been prepared for the sole purpose of supporting a development application for a new residential development at Lots 37-40 (No.580-586) Rockingham Road, Lake Coogee (the Site).

In undertaking this work the author(s) have made every effort to ensure the accuracy of the information used. Unless otherwise stated in the report, Bushfire Logic has not independently verified such information and cannot guarantee its accuracy or completeness. Within the limitations imposed by the scope of work, preparation of this report has been undertaken and performed in a professional manner, in accordance with generally accepted practices and using a degree of skill and care ordinarily exercised by reputable bushfire consultants under similar circumstances. No other warranty, expressed or implied, is made.

The measures contained in this Bushfire Management Plan, are considered to be minimum requirements and they do not guarantee that a building will not be damaged in a bushfire, persons injured, or fatalities occur either on the subject site or off the site while evacuating. This is substantially due to the unpredictable nature and behaviour of fire and fire weather conditions. Additionally, the correct implementation of the required bushfire protection measures will depend upon, among other things, the ongoing actions of the landowners and/or operators over which Bushfire Logic has no control. The growth, planting or removal of vegetation, poor maintenance of any fire prevention/mitigation measures, addition of structures not included in this report, or other activity can and will change the bushfire threat to all properties detailed in this report.

Should changes be made to the Site, a new Bushfire Management Plan will be required. All surveys, forecasts, projections and recommendations made in this report associated with the proposed development are made in good faith based on information available to Bushfire Logic at the time. All maps included herein are indicative in nature and are not to be used for accurate calculations. Notwithstanding anything contained therein, Bushfire Logic accepts no Liability, including Liability for Loss in connection with:

- A Claim, damage, or injury to property, or persons caused by fire;
- Further growth, planting or removal of vegetation on the Site;
- Poor maintenance of any fire protection measures;
- Additional structures not included in this assessment; or
- Any other activity that may change the bushfire threat level.

The Client and owner of the site acknowledge that they have been made aware of the exclusions above and that such exclusion of Liability is reasonable in all the circumstances.

This report is valid for a period of two years only from the date of its issue. All BAL ratings identified within this report are indicative only and are required to be verified at the time of construction of individual buildings to ensure appropriate setbacks have been achieve.

Document Control: Report Details		
Report version	**Report Date**	**Version Details**
V1.1	8 December 2025	Original
V1.2	16 August 2026	Updates to address WAPC modifications including removal of Radiant Heat Barrier Calculator and classification of road reserve as Class G Grassland.
V1.3	4 October 2026	Updates to reflect WAPC comments regarding modification schedule.
BPAD Practitioner	Jemma Douglas (Level 2)	BPAD-38400

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Appendix 1: Vegetation Assessment and Classification

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1. INTRODUCTION

Bushfire Logic has been engaged to prepare a Bushfire Management Plan (BMP) to support a development application for a Local Structure Plan at Lots 37-40 (No.580-586) Rockingham Road, Lake Coogee.

The site is partially within a declared Bush Fire Prone Area 2 (BFP2) and the portions of the subject land that is within this mapped area are required to be assessed for its compliance with State Planning Policy 3.7 – Bushfire (SPP 3.7) (WAPC, 2024) and the bushfire protection criteria contained within the Planning for Bushfire Guidelines (September 2024) (the Guidelines).

The intent of SPP 3.7 is: "to preserve life and reduce the impact of bushfire on property and infrastructure". This report will undertake an assessment using AS3959:2018 and against the applicable Elements set out within the Guidelines.

1.1 LOCATION

The subject land is zoned 'Urban' under the Metropolitan Region Scheme with the most eastern portion of the site adjoining Stock Road being reserved for 'Primary Regional Road' consistent with road widening requirements. The subject land is zoned 'Development' under City of Cockburn Local Planning Scheme No.3 (LPS 3) which triggers the requirement for a Local Structure Plan to be prepared prior to subdivision progressing.

<table>
<tr><td rowspan="2">Address Details</td><td>Street no.
No.580-586</td><td>Lot no.
37-40</td><td>Street name
Rockingham Road</td></tr>
<tr><td colspan="3">Suburb & State

Lake Coogee, Western Australia</td></tr>
<tr><td>Local government area</td><td colspan="3">City of Cockburn</td></tr>
<tr><td>Main BCA class of the building</td><td>N/A</td><td>Use(s) of the existing building</td><td>N/A</td></tr>
<tr><td>Description of the building or works</td><td colspan="3">Local Structure Plan</td></tr>
</table>



Figure 1: Location Map for Subject Site

1.2 DEVELOPMENT PROPOSAL

The proposal is for the approval of a Local Structure Plan (the LSP) which will facilitate future subdivision of residential lots. The LSP proposes a Residential zone with a density of R40 and 15-metre-wide road reserves. The site currently contains two existing single houses and outbuildings which will be demolished to facilitate future redevelopment.

Existing land use	Single House
Proposed land use:	N/A
Region Planning Scheme:	Urban & Primary Regional Road Reserve
Local Planning Scheme	Development
Local Planning Policies:	N/A
State Planning Policy 3.7	SPP 3.7 – Section 7.1 – General measures Planning for Bushfire Guidelines – Part 5 Structure Plans and Subdivision Applications

The 2023-2024 review of the Bushfire Prone Area Mapping introduced two distinct bush fire contexts. Area 1 comprises selected suburbs located on the Swan Coastal Plain within the Perth, Peel and Greater Bunbury Region Schemes. These are areas where the intensity of development and non-contiguous nature of vegetation reduces the risk of landscape scale bush fire. Area 2 comprises the remainder of the Western Australia. The publicly released Bushfire Prone Area Mapping (OBRM-023) shows that the eastern portions of the subject lots are located within Bush Fire Prone Area 2 and as such are subject to a planning assessment of the bushfire risks. The Bushfire Prone Area Mapping is shown in Figure 2.

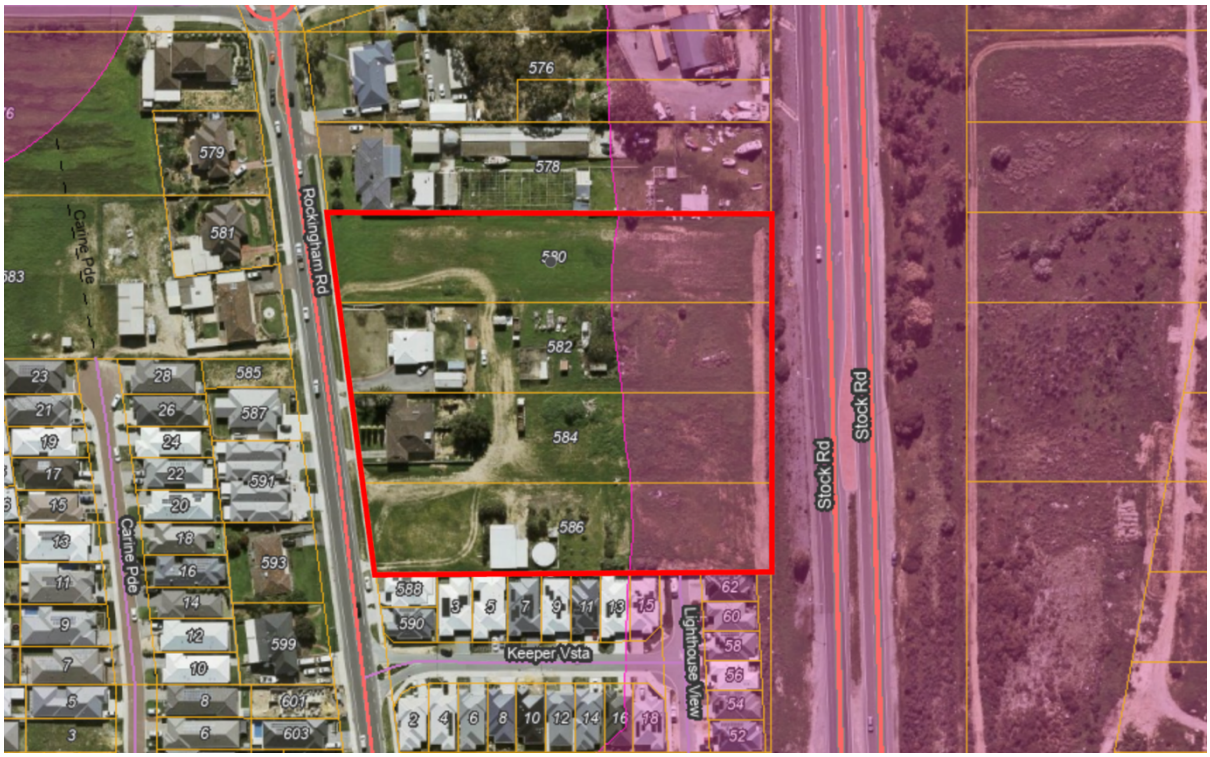


Figure 2: Map of Bushfire Prone Areas and relevance to subject site (OBRM, 2024)

1.3 STATUTORY FRAMEWORK

This document and the recommendations contained within are aligned to the following policy and guidelines:

- *Planning and Development Act 2005;*
- *Planning and Development (Local Planning Scheme) Regulations 2015*;
- State Planning Policy (SPP) 3.7 Planning in Bushfire Prone Areas 2015
- Guidelines for Planning in Bushfire Prone Areas (1.4)
- *Building Act 2011*;
- *Building Regulations 2012*;
- Building code of Australia (National Construction Code);
- *Fire and Emergency Services Act 1998*;
- AS3959-2018 “Construction of buildings in bushfire-prone areas”; and
- *Bushfires Act 1954*.

2. ENVIRONMENTAL CONSIDERATIONS

2.1 NATIVE VEGETATION –MODIFICATION AND/OR CLEARING

A review into the environmental data sets as identified in the Department of Planning Lands and Heritage (DPLH) BMP Template has been undertaken and has not identified any regulated (restricted) vegetation or attributes that may be affected by the proposal, see Table 1 Environment Dataset Review. The subject land is vacant and does not contain any existing native vegetation.

2.2 REVIEW OF THE ENVIRONMENTAL DATA SETS

Table 1: Environmental Dataset Review

Vegetation Modification and/or Clearing Assessment		
Is modification and/or management of vegetation within the subject lot required?	No. The application does not propose any vegetation modification or clearing works.	
Environmental Value	**Mapped as occurring within or adjacent to the project area**	**Description**
Wetlands	No	The site does not contain any listed wetlands.
Waterway Control Area	No	The development site is not located within the Swan-Canning Water Catchment Area.
Commonwealth Threatened Ecological Communities listed under the *Environment Protection and Biodiversity Conservation Act 1999* (the EPBC Act)	No	The subject land is not listed as containing any threatened ecological communities or listed fauna or flora species.
Fauna habitat listed under the EPBC Act	Yes	The subject land is within a 6km buffer for a confirmed Carnabys Cockatoo roost.
Bush Forever Site	No	The development site is not adjacent to any Bush Forever sites.
DBCA managed lands and waters	No	The site is not impacted by DBCA managed land or waters.
Conservation covenants	No	There are no existing conservation covenants in place for the development site.

2.3 REVEGETATION/LANDSCAPE PLANS

The Structure Plan and concept subdivision plan do not propose the creation of any new public open space (POS) reserves that will require revegetation or landscaping. Any landscaping proposed as part of future development and dwellings and will be the subject of compliance with the City's Firebreak Notice. In this regard, it is not expected that landscaping will result in changes to the bushfire attack level ratings.

3. BUSHFIRE ASSESSMENT RESULTS

The bushfire assessment for this site has followed the Bushfire Attack Level (BAL) Assessment and WAPC Planning for Bushfire Guidelines.

3.1 ASSESSMENT INPUTS

Bushfire Assessment inputs for the proposed LSP have been calculated using the Method 1 BAL Assessment procedures as outlined in AS3959:2018. This incorporates the following factors:

- WA adopted Fire Danger Index (FDI), being FDI 80;
- Vegetation Classes;
- Effective Slope under classified vegetation; and
- Distance between proposed development site and classified vegetation

3.1.1 Relevant Fire Danger Index (FDI)

The fire danger index for this site has been determined in accordance with Table 2.1 or otherwise determined in accordance with a jurisdictional variation applicable to the site.

Fire Danger Index			
FDI 40 ☐	FDI 50 ☐	FDI 80 ☒	FDI 100 ☐
Table 2.7	*Table 2.6*	*Table 2.5*	*Table 2.4*

3.1.2 Vegetation Classification

A site assessment was undertaken on 10 September 2025. Figure 3: *Vegetation Assessment and Photo Points Map* provides an assessment of all vegetation within the designated bushfire prone area mapping and within 150m of the subject site. Vegetation within these areas has been assessed and classified in accordance with Clause 2.2.3 of AS 3959-2018.

A summary of the plot data assessed as per Clause 2.2.3 of AS 3959-2018 is provided below in Table 2 below, detailed plot data is provided in Appendix 2.

Table 2: Vegetation Classification Table (as per AS3959:2018)

Plot	Vegetation Classification	Effective Slope
1	Class G Grassland	Flat/Upslope
2	Class G Grassland	Downslope >0-5 degrees
3	Class D Scrub	Flat/Upslope
4	Class B Woodland	Flat/Upslope
5	Excluded 2.2.3.2(e) & (f) – Non-vegetated areas and low threat vegetation	N/A



LEGEND

- Photopoint
- 100m Assessment Boundary
- 150m Assessment Boundary
- Structure Plan Boundary

VEGETATION CLASSIFICATION

- Excluded 2.2.3.2 (e)
- Excluded 2.2.3.2 (f)
- Class B Woodland
- Class D Scrub
- Class G Grassland

Bushfire Logic

FIGURE 3: VEGETATION ASSESSMENT AND PHOTOPOINTS MAP

LOTS 37-40 (NO.580-586) ROCKINGHAM ROAD, LAKE COOGEE

Client: J. RADONICH C/ TERRANOVIS

Date: 4 OCTOBER 2026

N

V1.3

3.2 ASSESSMENT OUTPUT

3.2.1 Bushfire Attack Level Result

Figure 4: *Bushfire Attack Level Contour Map* illustrates the indicative radiant heat impacts and associated indicative BAL ratings for the portions of the LSP that are located within the bushfire prone area mapping. Figures 3 and 4 have been completed in accordance with the SPP3.7, the Guidelines, Method 1 methodology of AS3959-2018. Despite the author of the BMP certifying that the portion of Stock Road immediately adjacent to the subject lot does not contain any classifiable vegetation, in accordance with instructions by the Western Australian Planning Commission, this land has been classified as Class G Grassland.

Table 3 provides summary of each of the indicative vegetation plots that will remain following implementation of the subdivision.

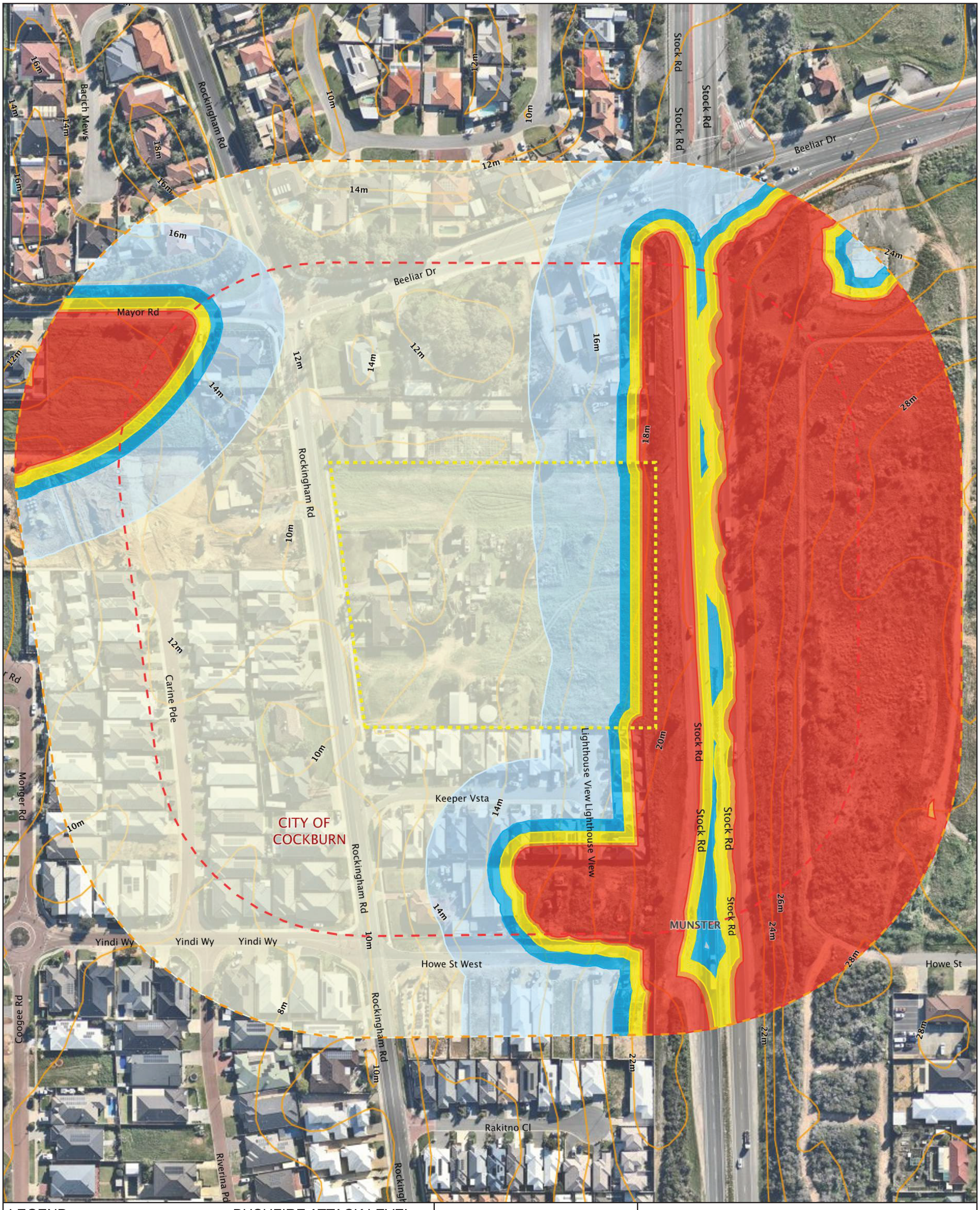
Table 3: Post Development Vegetation Classification Table (as per AS3959:2018)

Plot	Vegetation Classification	Effective Slope	Comment
1	Class G Grassland	Flat/Upslope	Plot 1 is characterised by areas grassland within land to the east of the LSP area that is not subject to ongoing management arrangements. This vegetation is outside of the LSP and is not expected to be altered. Plot 1 includes portions of the current Stock Road reserve which MRWA does not agree to managing in a low threat state in perpetuity. While observed to be maintained to a low-threat state and treated with mulch, this vegetation has been mapped as Class G Grassland in accordance with directions from the Department of Planning, Lands and Heritage (DPLH) received as part of their assessment process.
2	Class G Grassland	Downslope >0-5 degrees	Plot 2 is characterised by grassland within a privately owned lot south of the LSP area. This vegetation is outside of the LSP and is not expected to be altered.
3	Class D Scrub	Flat/Upslope	Plot 3 is characterised by areas of scrub approximately 2-4 metres tall with tall grass understory. Plot 4 is to the south and east of the LSP area and is not expected to the altered.
4	Class B Woodland	Flat/Upslope	Plot 4 is characterised by eucalypt trees approximately 5-10 metres tall with a prominent grass understory. Plot 4 is outside the LSP area and is not expected to the altered.
5	Excluded 2.2.3.2(e) & (f) – Non-vegetated areas and low threat vegetation	N/A	Plot 5 includes areas permanently clear of vegetation such as developed residential lots, driveways and public road reserves. Plot 5 also includes land managed to a low-threat fuel state.

Table 4 provides an indication of the level of bushfire attack (i.e. the radiant heat flux) that may be received by the proposed lots and the separation distances that will be required for new buildings from each of the vegetation plots.

Table 4: AS3959:2018 Vegetation Separation Distances to Corresponding Radiant Heat Impact

Plot	Vegetation Classification	Effective Slope	Separation distances required (m)				
			BAL-FZ	BAL-40	BAL-29	BAL-19	BAL-12.5
1	Class G Grassland	Flat/Upslope	<6	6-<8	8-<12	12-<17	17-<50
2	Class G Grassland	Downslope >0-5 degrees	<7	7-<9	9-<14	14-<20	20-<50
3	Class D Scrub	Flat/Upslope	<10	10-<13	13-<19	19-<27	27-<100
4	Class B Woodland	Flat/Upslope	<10	10-<14	14-<20	20-<29	29-<100
5	Excluded 2.2.3.2(e) Non-vegetated areas and (f) – Low threat vegetation	N/A	N/A				



LEGEND

- Photopoint
- 100m Assessment Boundary
- 150m Assessment Boundary
- Structure Plan Boundary

BUSHFIRE ATTACK LEVEL

- BAL-FZ
- BAL-40
- BAL-29
- BAL-19
- BAL-12.5
- BAL-LOW

Bushfire Logic

FIGURE 4: BUSHFIRE ATTACK LEVEL CONTOUR MAP

LOTS 37-40 (NO.580-586) ROCKINGHAM ROAD, LAKE COOGEE

Client: J. RADONICH C/ TERRANOVIS

Date: 4 OCTOBER 2026

N

V1.2

4. IDENTIFICATION OF BUSHFIRE HAZARD ISSUES

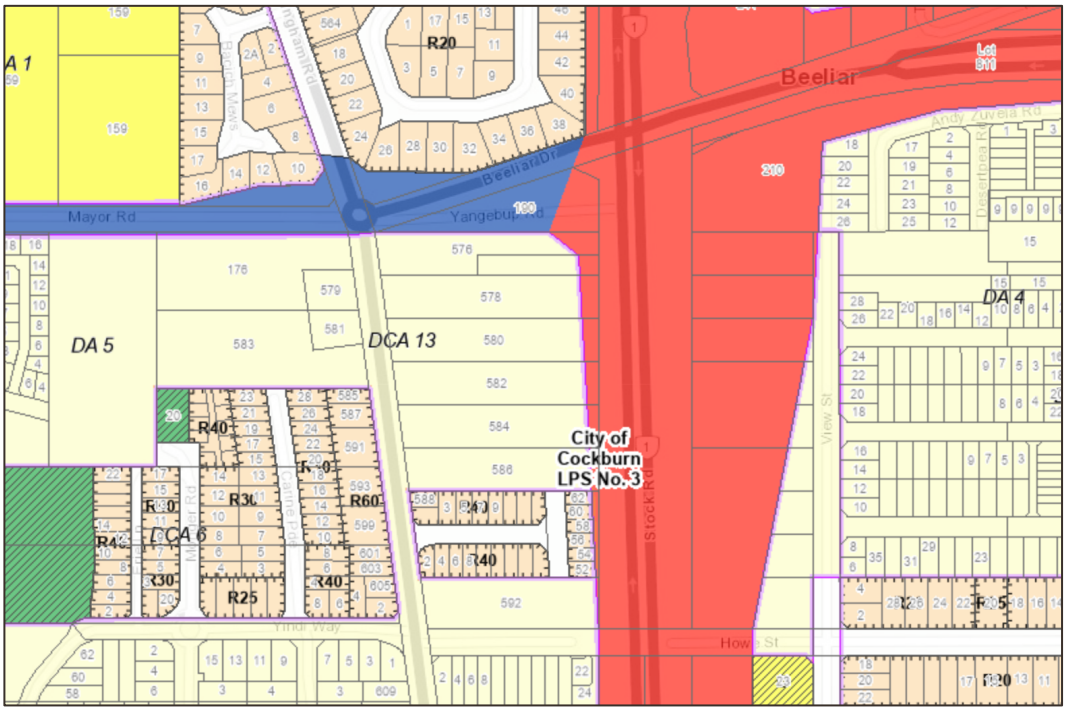
The purpose of this section is to identify any bushfire hazard issues through an examination of environmental considerations in addition to the bushfire risk assessment. Considerations can include vehicle access constraints both within and adjacent to the site, the location of significant bushfire hazards such as regional reserves or national parks and other relevant bushfire hazards. This is particularly relevant to strategic proposals where consideration of these sorts of factors can assist in determining the suitability of area for development and subdivision or identifying issues that may need to be considered in further detail as part of subsequent planning stages.

4.1 BUSHFIRE CONTEXT

The subject lot is located within the Perth Metropolitan Region and forms part of an establishing urban zone. Surrounding land contains a mixture of developing residential estates and remnant rural-residential properties. Consideration of the risk of bushfire and compliance with SPP3.7 and the Guidelines has been undertaken as part of the progression of the regional and local planning frameworks for the site.

The subject site is currently cleared of native vegetation and is bordered by residential development to the south and west. To the east, the land directly adjoins the Stock Road reserve, which is a Primary Regional Road reserve identified for future widening. Grassland and scrub vegetation occur along the eastern side of Stock Road; while these areas present a potential bushfire risk, the LSP area is separated from them by the width of the road reserve.

It is expected that a barrier along the boundary of the Structure Plan running parallel with the Stock Road reserve will be required as part of future subdivision applications for the Structure Plan. This barrier is expected to comprise a retaining wall and a noise wall with a total height of approximately 3.5 metres and will follow the boundary of the land required to be ceded for road widening. The barrier is expected to be masonry construction and will therefore be non-combustible. In this respect, future applications for subdivision may be accompanied by a bushfire assessment which considers the impact of the noise barrier and retaining wall on the radiant heat that the proposed lots will be exposed to. Any such assessment is to be prepared by a suitably qualified bushfire practitioner with appropriate technical documentation being provided to support the assessment.


A 1
159
R20
Beeliar
Beeliar Dr
Mayor Rd
Yangebup Rd
DA 5
DCA 13
DA 4
City of
Cockburn
LPS No. 3
Stock Rd
View St
R40
R30
R25
R60
DCA 6
Howe St

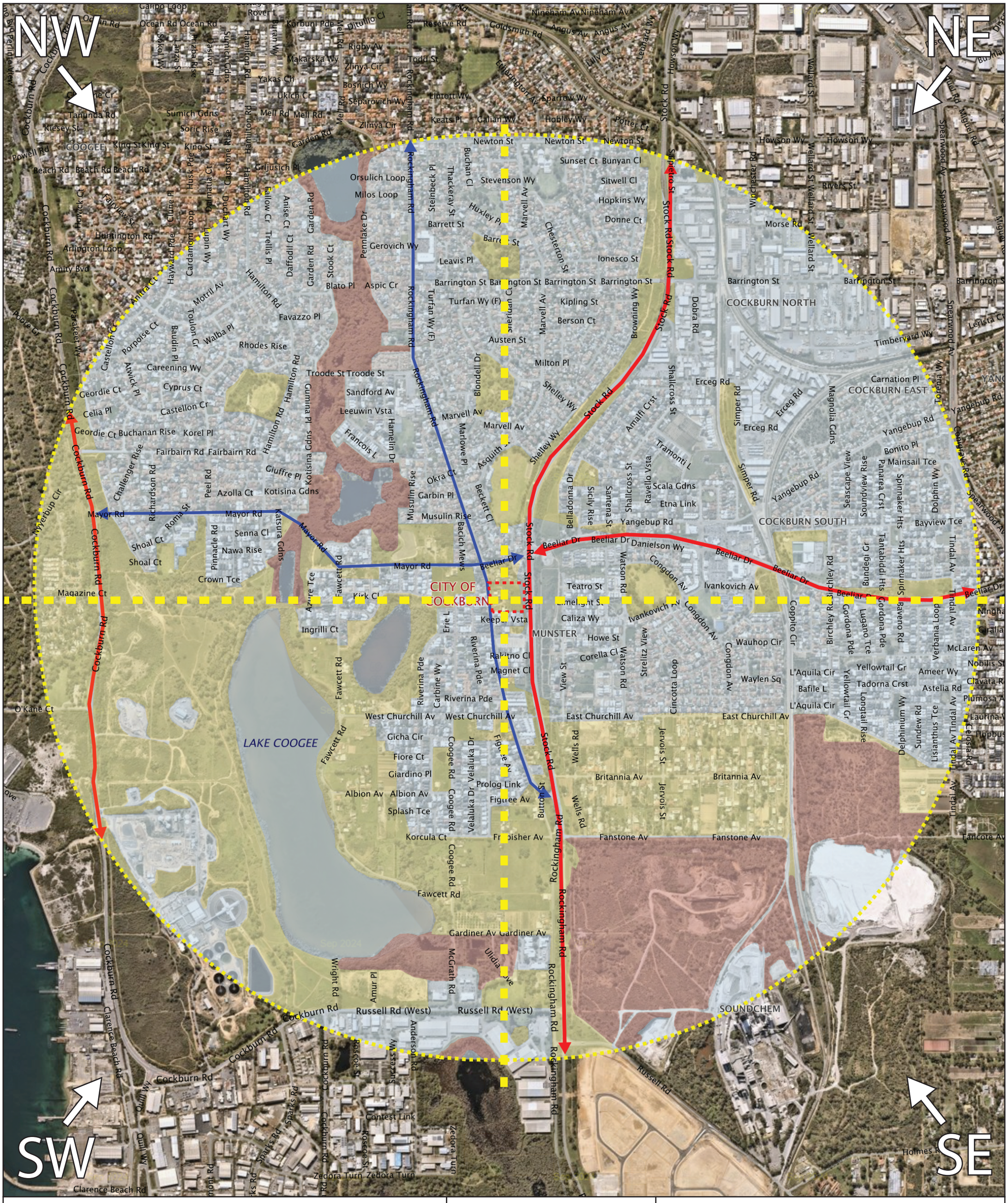
5. ASSESSMENT AGAINST THE BUSHFIRE PROTECTION CRITERIA

5.1 COMPLIANCE TABLE

The Guidelines outline different bushfire protection criteria for which structure plans, subdivision applications and development proposals are to be assessed against for compliance. The bushfire protection criteria are performance-based criteria utilised to assess bushfire risk management measures, and they outline four elements relevant subject site as follows:

- Element 1 – Location – Broader Landscape;
- Element 2 – Siting and Design;
- Element 3 – Vehicular Access; and
- Element 4 – Water.

The proposed development has been assessed against Elements 1 to 4 of the bushfire protection criteria and found to be compliant, refer to Table 6.



LEGEND

- Subject Lot
- 2km Assessment Boundary

ROAD HIERARCHY

- Primary Distributor Road
- Regional Distributor Road
- Local Distributor Road

BLA PATTERN

- Large Tracts of Classified Veg.
- Mosaic Pattern (Inc. Rural Living)
- Cleared Vegetation

Bushfire Logic

FIGURE 5: SIMPLIFIED BROADER LANDSCAPE AREA ASSESSMENT

LOTS 37-40 (NO.580-586) ROCKINGHAM ROAD, LAKE COOGEE

Client: J. RADONICH C/ TERRANOVIS

Date: 4 OCTOBER 2026

V1.3

Table 5: Bushfire Protection Criteria Applicable to Subject Site

<table>
<tr><th>ELEMENT</th><th>ACCEPTABLE SOLUTION</th><th>APPLICABLE OR NOT YES/NO</th><th colspan="3">PROPOSAL MEETS ACCEPTABLE SOLUTION</th></tr>
<tr><td colspan="6">Element 1 - Location (Area 2)</td></tr>
<tr><td>A1.1a Broader Landscape Type A</td><td>The subject site is located in an area that is a Broader Landscape Type A. This location satisfies the policy outcome for

Element 1: Location and no additional consideration is required.</td><td>Yes</td><td colspan="3">Compliant

Figure 6: Simplified Broader Landscape Assessment demonstrates that the proposed subdivision has been assessed in accordance with Appendix A.1.4.2: Broader Landscape Assessment Methodology requirements of the Guidelines. The following details responses to the requirements of A.1.4.2:</td></tr>
<tr><td></td><td></td><td></td><td>Criteria</td><td>Response</td><td>Points</td></tr>
<tr><td></td><td></td><td></td><td>Proximity of the planning proposal to a suitable destination is:</td><td>The subject site is located immediately adjacent to the existing Urban zone and is approximately 700 metres west of the Beelier Local Centre.</td><td>1 point</td></tr>
<tr><td></td><td></td><td></td><td>The road pattern from the planning proposal to a suitable destination is:</td><td>The road patterns within the surrounding locality are simple with a consistent grid pattern, bitumen construction and traverse a flat landscape allowing for clear sight lines and good visibility.</td><td>1 point</td></tr>
<tr><td></td><td></td><td></td><td>The predominant vegetation pattern is:</td><td>Large portions of the 2km wide broader landscape assessment area have been cleared of vegetation in accordance with applicable zoning under the planning framework.</td><td>2 points</td></tr>
<tr><td></td><td></td><td></td><td>Exposure of the planning proposal to an identified external bushfire</td><td>The subject site is exposed to external bushfire hazards from vegetation within south-east and north-west aspects. These external hazards are</td><td>2 points</td></tr>
</table>

			hazard (excluding Class G Grassland) is from:	associated with Bush Forever reserves and connect to adjoining reserves north and south.	
			Total Points		
			Total points Broader Landscape Type	**Total points Broader Landscape Area Type**	
			0-11 points Broader landscape area type A	0-11 points Broader landscape area type A	
			12-20 points Broader landscape type area B	12-20 points Broader landscape area type B	
			Determined Broader Landscape Type:	**6 points – BLA Type A**	
A1.1b Broader Landscape Type B	*The subject site is located in an area that is a Broader Landscape Type B which presents an unacceptable bushfire risk of a landscape-scale bushfire resulting in impacts to people, property and infrastructure.*	No	N/A – Site is within Broader Landscape Type A as demonstrated above.		
Element 2 – Siting and Design (Area 2)					
A2.1 Siting and design	*Proposed and existing lot(s) contains a sufficient development site(s) that can achieve a radiant heat impact not exceeding 29 kW/mÇ (BAL-29).*	Yes	Compliant Refer to discussion under Section 4.1 of this report. Figure 3: *Vegetation Assessment and Photo Points* provides an assessment of vegetation within a 150-metre radius of the subject land that is within the bushfire prone area mapping and is being retained within the assessment area.		

			Figures 4 demonstrates that the LSP area will contain sufficient developable areas within the BAL-29 contour or lower to be subdivided, consistent with the requirements of SPP3.7 and the Guidelines. Proposal meets Acceptable Solution A2.1.
A2.2 Asset Protection Zone (APZ)	*An indicative APZ is to be provided ensuring BAL-29 is achieved, the APZ is to be contained solely within the boundaries of the lot, and the APZ is maintained in perpetuity.*	No	N/A Given the proposed LSP area is capable of being located within an area of BAL-29 or below, APZs are not required. Proposal not required to be assessed to Acceptable Solution A2.2.
A2.3 Clearing of native vegetation	*Subdivision avoids, or where unavoidable, minimises the clearing of native vegetation*	Yes	Compliant The subject land is clear of native vegetation and therefore will not require clearing works. Proposal meets Acceptable Solution A2.3.
Element 3 – Vehicular Access			
A3.1 Public Roads	*Meet technical requirements of Appendix B.3 Table 10.*	Yes	Compliant The subject site takes direct access from Rockingham Road to the west which is an existing bitumen constructed public road network in accordance with the IPWEA Subdivision Guidelines and Appendix B.3 Table 10 of the Guidelines. A new network of public roads will be constructed through the future subdivision and will comply with IPWEA requirements. Proposal meets Acceptable Solution A3.1.
A3.2 Access Routes	*Area 2: Public road access should be provided in two different directions to two different suitable destinations, with an all-weather surface.*	Yes	Compliant The subject site is well connected to the public road network with access from the LSP area proposed via Rockingham Road to the west. Rockingham Road is a Regional Distributor Road network under the Main Roads WA road hierarchy map and provides connection north to Beelier Drive and south to West Churchill Avenue. The site also

			directly adjoining Stock Road to the east which is a Primary Regional Road reserve, however direct access to this road is not proposed. Proposal meets Acceptable Solution A3.2.
A3.3a No-through roads OR A3.3b No-through road requirements	*Area 2: If the public road access to the subject site is via a no-through road which cannot be avoided due to demonstrated site constraints, the public road access is to be a maximum of 200 metres from the proposed lot(s) boundary to an intersection where two-way access is provided.*	No	N/A The proposed subdivision does not propose the creation of any new cul-de-sac or no-through road reserves. Proposal not required to be assessed to Acceptable Solution A3.3a and A3.3b.
A3.4 Emergency access way	Where A3.2 and A3.3 cannot be achieved.	No	N/A Refer to Section A3.2 and A3.3 above. Proposal not required to be assessed to Acceptable Solution A3.4.
A3.5a Perimeter roads OR A3.5b Fire service access route	*A perimeter road is a public road and is to be provided for greenfield or infill development where 10 or more lots are proposed* *OR* *A fire service access route is to be provided to provide firefighter access, where access is not available to the classified vegetation.*	Yes	Compliant The proposed development does not adjoin any classified vegetation and therefore is not required to provide a perimeter road or fire service access road. Proposal not required to be assessed against A3.5a or A3.5b.
A3.6 Battle-axe access legs	*For battle-axe access legs greater than 50m in length*	No	N/A Battle-axe legs are not proposed as part of the subdivision application.

			Proposal not required to be assessed against A3.6.
Element 4 – Water Supply			
A4.1 Water supply for structure plans	*Evidence that a reticulated or sufficient and sustainable non-reticulated water supply for bushfire firefighting can be provided*	Yes	Compliant The proposed LSP area is serviced by a reticulated water supply with hydrants located within the adjoining subdivision to the south and within the Rockingham Road reserve. This network will be extended through the subject land as part of future subdivision applications. Proposal not required to be assessed against A4.1.
A4.2 Water supply for subdivision applications	*Where a reticulated water supply is existing or proposed, a hydrant connection(s) should be provided in accordance with the specifications of the relevant water supply authority.*	No	N/A The proposal is for consideration of a LSP and assessment against A4.3 is not required. Proposal not required to be assessed against A4.2.
A4.3 Water supply for existing habitable building(s)	*Where subdivision includes an existing habitable building(s) that is to be retained, a hydrant connection(s) should be provided in accordance with the specifications of the relevant water supply authority.*	No	N/A The proposal is for consideration of a LSP and assessment against A4.3 is not required. Proposal not required to be assessed against A4.3.

6. RESPONSIBILITIES FOR IMPLEMENTATION AND MANAGEMENT OF BUSHFIRE MEASURES

Table 6: Implementation Requirements

NO.	IMPLEMENTATION ACTIONS
1	Future subdivision applications are to be supported by a subdivision specific Bushfire Management Plan. The BMP is to include management arrangements for the portion of the subject land identified for the widening of Stock Road.

7. CERTIFICATION

I hereby certify that I have undertaken the assessment of the above site and determined the Bushfire Attack Level (s) stated in this document have been prepared in accordance with the requirements of AS3959:2018 and the Guidelines for Planning in Bushfire Prone Areas.

SIGNED, ASSESSOR: ……  …….. DATE 16/8/2025

Jemma Douglas, Bushfire Logic

Accredited Level 2 Bushfire Practitioner (Accreditation No: 38400)

8. REFERENCES

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APPENDIX 1: VEGETATION ASSESSMENT AND CLASSIFICATION

Site Details	
Address:	Lots 37-40 (No.580-586) Rockingham Road
Suburb:	Lake Coogee
Local Government Area:	City of Cockburn
Description of works:	Local Structure Plan

Report Details		
Report Version	**Assessment Date**	**Report Date**
V1.1	10 September 2025	4 October 2026

Vegetation Classification

All vegetation within 150m of the site / proposed development was classified in accordance with Clause 2.2.3 of AS 3959-2018. Each distinguishable vegetation plot with the potential to determine the Bushfire Attack Level is identified below.

Vegetation Plot 1				
Classification	Class G Grassland			
Exclusion Clause (if applicable)	N/A			
Effective Slope	Measured	Upslope	Applied Range (Method 1)	Upslope or flat 0 degrees
Description/Justification:	Plot 1 is characterised by areas of grassland within privately owned land that is not subject to ongoing management arrangements. This vegetation is outside of the structure plan area and is not expected to be altered.			
Post Development Assumptions:	Nil.			



Photo ID: **P1**



Photo ID: **P2**



Photo ID: **P3**



Photo ID: **P4**

Vegetation Plot 2				
Classification	Class G Grassland			
Exclusion Clause (if applicable)	N/A			
Effective Slope	Measured	Downslope 2/3 degrees	Applied Range (Method 1)	Downslope >0-5 degrees
Description/Justification:	Plot 2 is characterised by areas of grassland within privately owned land that is not subject to ongoing management arrangements. This vegetation is outside of the structure plan area and is not expected to be altered.			
Post Development Assumptions:	Nil.			



Photo ID: **P5**



Photo ID: **P6**

Vegetation Plot 3				
Classification	Class D Scrub			
Exclusion Clause (if applicable)	N/A			
Effective Slope	Measured	Upslope	Applied Range (Method 1)	Upslope or flat 0 degrees
Description/Justification:	Areas of scrub ranging in height from 2 metres to 5 metres with tall grasses and occasional small trees. This vegetation is within the Railway Reserve			
Post Development Assumptions:	Nil.			



Photo ID: **P7**



Photo ID: **P8**

Vegetation Plot 4				
Classification	Class B Woodland			
Exclusion Clause (if applicable)	N/A			
Effective Slope	Measured	Upslope	Applied Range (Method 1)	Upslope or flat 0 degrees
Description/Justification:	Plot 4 is characterised by tall eucalypt trees approximately 5-10 metres tall with a prominent grassy understory. Plot 4 is outside the structure plan area and is not expected to the altered.			
Post Development Assumptions:	Nil.			



Photo ID: **P9**

Vegetation Plot 5				
Classification	N/A			
Exclusion Clause (if applicable)	2.2.3.2 (e) Non-vegetated areas 2.2.3.2 (f) Low threat vegetation			
Effective Slope	Measured	N/A	Applied Range (Method 1)	N/A
Description/Justification:	Plot 5 includes areas permanently clear of vegetation such as developed residential lots, driveways and public road reserves. Plot 5 also includes Stock Road reserve which is maintained to a low threat fuel state in perpetuity through mowing and/or mulch. Written confirmation from Main Roads WA is included at Appendix 3 confirming ongoing management activities will be continued in perpetuity allowing for exclusion of the road reserve under AS3959:2018.			
Post Development Assumptions:	Nil.			



Photo ID: **P10**



Photo ID: **P11**



Photo ID: **P12**



Photo ID: **P13**



Photo ID: **P14**

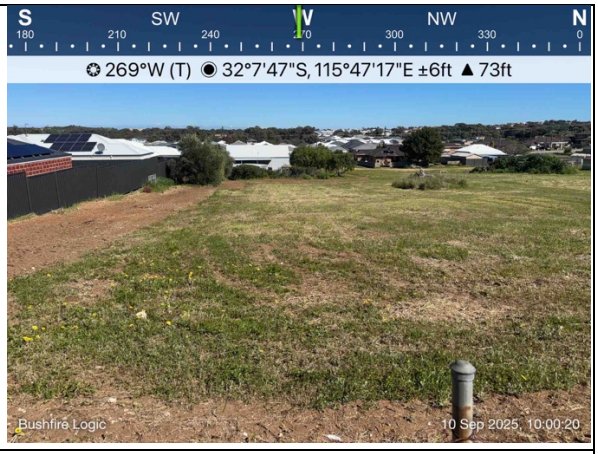


Photo ID: **P15**



Photo ID: **P16**

Appendix C Noise Management Plan

HERRING STORER ACOUSTICS

TERRANOVIS

RESIDENTIAL DEVELOPMENT
580, 582, 584 & 586 ROCKINGHAM ROAD
MUNSTER

SPP 5.4 NOISE MANAGEMENT PLAN

JULY 2026

OUR REFERENCE: 33242-6-24275

Rochdale Holdings Pty Ltd A.B.N. 85 009 049 067 trading as:
HERRING STORER ACOUSTICS
P.O. Box 219, Como, W.A. 6952
(08) 9367 6200
hsa@hsacoustics.com.au

DOCUMENT CONTROL PAGE

SPP 5.4 NOISE MANAGEMENT PLAN
580, 582, 584 & 586 ROCKINGHAM RAOD
MUNSTER

Job No: 24275

Document Reference: 33242-6-24275

DOCUMENT INFORMATION			
Author:	Geoff Harris	**Checked By:**	George Watts
Date of Issue:	23 August 2024		

REVISION HISTORY

Revision	Description	Date	Author	Checked
2	Updates re: City of Cockburn Queries	12/11/24	GH	GW
3	Updates re: MRWA Comments	10/03/25	GH	GW
4	Updates re: DPLH Comments	15/12/25	GH	GW
5	Updates re: DPLH Comments	23/07/26	GH	GW
6	Updates re: wording	30/09/26	GH	GW

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APPENDICES

A Site Layout

B Future Day Time Noise Conoturs

C Lots Requiring "Quiet House Design" Packages

D MRWA Traffic Flows

1. INTRODUCTION

Herring Storer Acoustics were commissioned by Terranovis to carry out an acoustic study with regards to traffic related noise for the proposed residential development located at 580, 582, 584 & 586 Rockingham Road, Munster.

The purpose of the study was to:

- Assess the noise that would be received within the development area from vehicles travelling on Stock Road and Beeliar Drive for future traffic volumes.
- Compare the results with accepted criteria and if exceedances exist, develop the framework for the management of noise.

A plan is attached in Appendix A.

2. ACOUSTIC CRITERIA

2.1 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 is 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. MEASUREMENTS

The noise measurements were conducted on 12 June 2023 for a short term period during peak hour at approximately 4:00PM to determine the L_{A10} noise level. Measurements were taken 4 metre from the road edge at the location shown in Figure 3.1



FIGURE 3.1 : MEASUREMENT LOCATION

Utilising this measurement, reference to the DEFRA publication (*Method for Converting the UK Road Traffic Noise $L_{A10,18h}$ to the EU Noise Indices for Road Noise Mapping, ref: st/05/91/AGG04442)* has been sought and the difference between the $L_{A10,18hr}$ and the $L_{Aeq,8hr}$ and the $L_{Aeq,16hr}$ has been calculated. The results of the measurement and the determination of the $L_{Aeq(Day)}$ and $L_{Aeq(Night)}$ are shown in Table 3.1.

Noise measurements were conducted with a Larson Davis 831 Sound Level Meter. The Sound Level Meter was calibrated prior to and after use with a Bruel and Kjaer 4230 Calibrator. All equipment used is currently NATA laboratory calibrated. Calibration certificates are available on request.

TABLE 3.1 : SUMMARY OF MEASURED NOISE LEVELS

Measurement Location	Measured/Calculated Noise Level, dB(A)		
	L_{A10}	$L_{Aeq,\ day\ (6am\ to\ 10pm)}$	$L_{Aeq,\ night\ (10pm\ to\ 6am)}$
Stock Road	73.8	71.2	62.6

During site measurements it was noted that noise on the site was dominated by vehicles travelling on Stock Road and vehicles from Beeliar Drive (Mayor Road) were inaudible, however for thoroughness was still included in the noise model.

4. MODELLING

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

The input data for the model included:

- Plans supplied by client (Shown in Appendix A).
- Traffic data as per Table 4.1 and Table 4.2 (And Sourced in Appendix D from Clare Yu of MRWA, Ref #42616).
- Adjustments as listed in Table 4.3.
- 1800mm Boundary Barrier (see further details below).

TABLE 4.1 - NOISE MODELLING INPUT DATA

Parameter	Stock Road 2021	Stock Road 2024	Stock Road 2041	Stock Road 2046
Traffic Volumes	22,000 vpd	24,900 vpd	50,700 vpd	62,500 vpd
Percentage traffic 0600 – 2400 hours (Assumed)	94%			
Heavy Vehicles (%) (Assumed)	11.6%			
Speed (km/hr)	80 km/hr			
Road Surface	Dense Graded Asphalt			

TABLE 4.2 - NOISE MODELLING INPUT DATA

Parameter	Beelier Drive 2021	Beelier Drive 2024	Beelier Drive 2041	Beelier Drive 2046
Traffic Volumes	11,900 vpd	13,500 vpd	14,900 vpd	18,400 vpd
Percentage traffic 0600 – 2400 hours (Assumed)	94%			
Heavy Vehicles (%) (Assumed)	9.2%			
Speed (km/hr)	60 km/hr			
Road Surface	Dense Graded Asphalt			

TABLE 4.3 – ADJUSTMENTS FOR NOISE MODELLING

Description	Value
Façade Reflection Adjustment	+2.5 dB
Conversion from $L_{A10\,(18\ hour)}$ to $L_{Aeq\,(16\ hour)}$ (Day)	-2.6 dB*

* Based on measured results listed in Table 3.1.

The 1800mm boundary barrier listed above would traditionally required to be a "solid and continuous" as well as meeting the MRWA surface density requirement of 15kg/m^2. However, it is noted that the adjacent developments have colourbond barriers, as would likely be required to be similar to meet aesthetic requirements of council. If a higher density that a typical colourbond barrier would be required, a 'double-skin' colourbond barrier can be implemented, consisting of two sheets of steel with an air gap separating them.

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

5. TRAFFIC NOISE ASSESSMENT

Using the data contained in Tables 4.1, 4.2 and 4.3, noise modelling was conducted for the future planning window, with ground and first floor lots that required Quiet House Design Packages (and notification on title) are shown in Appendix C and noise contours are shown in Appendix B. Additionally, Appendix A contains a site plan for reference.

It is noted that all requirements pertain to only acoustic advice in regard to *State Planning Policy 5.4* and may be superseded by other requirements (BAL, Thermal, etc).

6. CONCLUSION

In accordance with the WAPC Planning Policy 5.4, an assessment of the noise that would be received within the development located at 580, 582, 584 & 586 Rockingham Road, Munster from vehicles travelling on Stock Road has been undertaken.

In accordance with the Policy, the following would be the acoustic criteria applicable to this project:

External

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

Internal

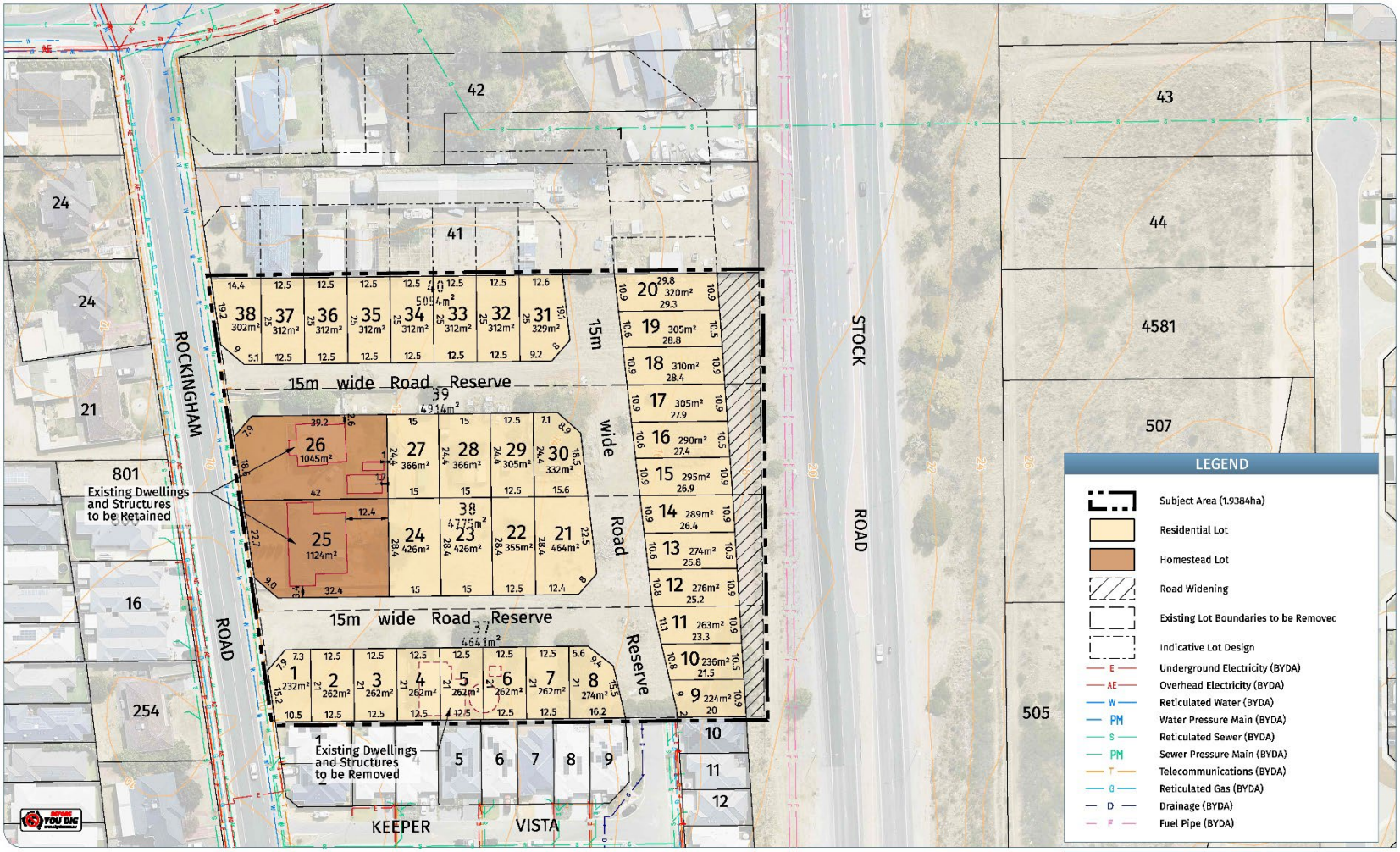
Sleeping Areas	35 dB(A) $L_{Aeq(night)}$
Living Areas	40 dB(A) $L_{Aeq(day)}$

The results of the acoustic assessment indicate that noise received at the development from future traffic on Stock Road, exceed external noise level criteria. Therefore, “Quiet House Design” Packages are required for shown in Appendix C and notifications advising of traffic noise being placed on certificates of titles of these lots.

.

APPENDIX A

Site Layout



CONCEPT SUBDIVISION PLAN

Lot 37 (No. 580) Rockingham Road,
LAKE COOGEE

Plan No.	24222-01
Date	18/07/24
Drawn	JW
Checked	CP
Revision	C
Scale	1:1000@A3

PERTH & FORRESTDALE:
Lvl 1, 252 Fitzgerald St
PERTH WA 6000
15/7 Henstrook Loop,
FORRESTDALE WA 6112
T: 08 9495 1943
E: metro@harleydykstra.com.au
ALBANY | BUNBURY | BUSSELTON | FORRESTDALE | PERTH

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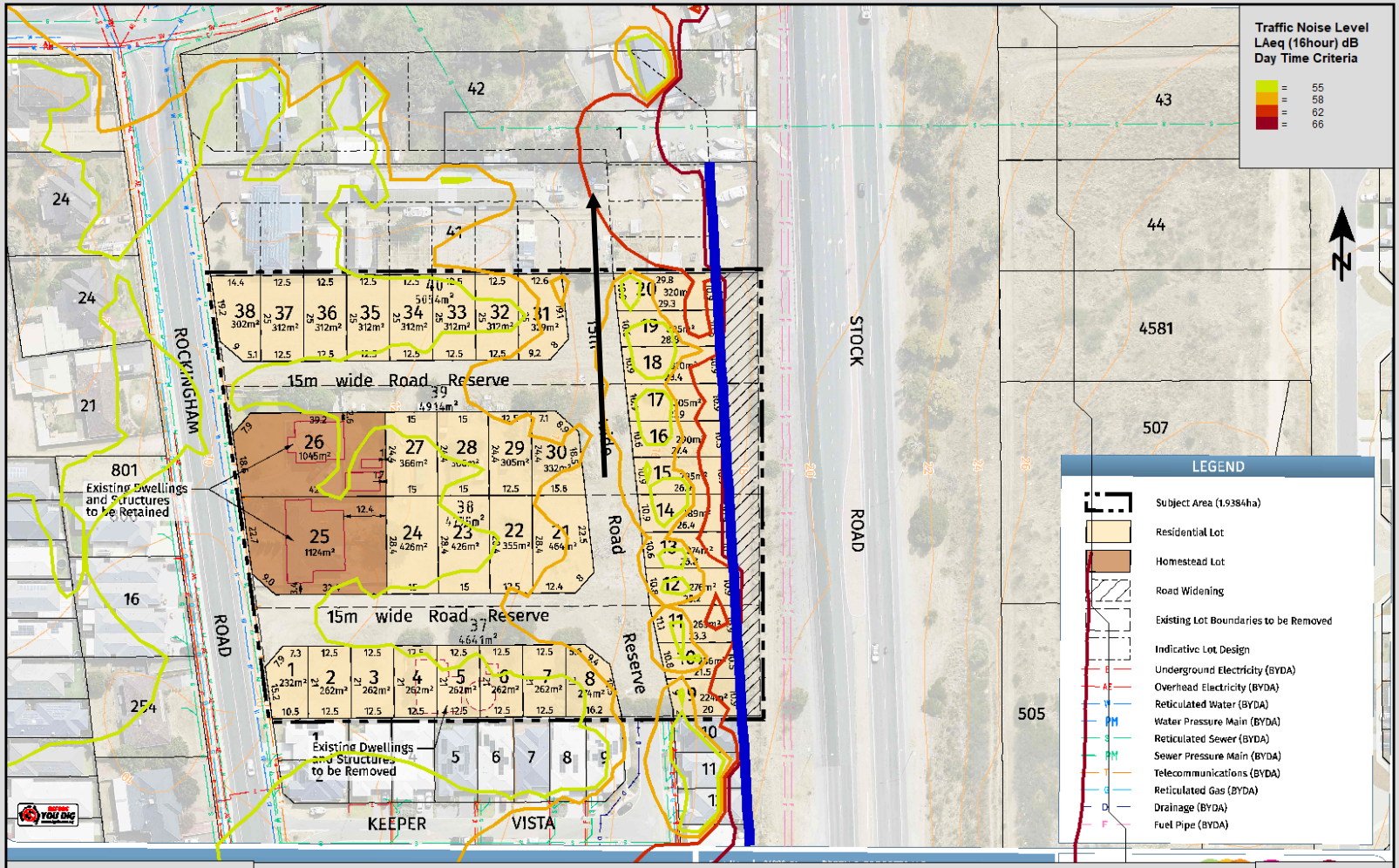
0 10m 20m 30m

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

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APPENDIX B

Future Day Time Noise Contours

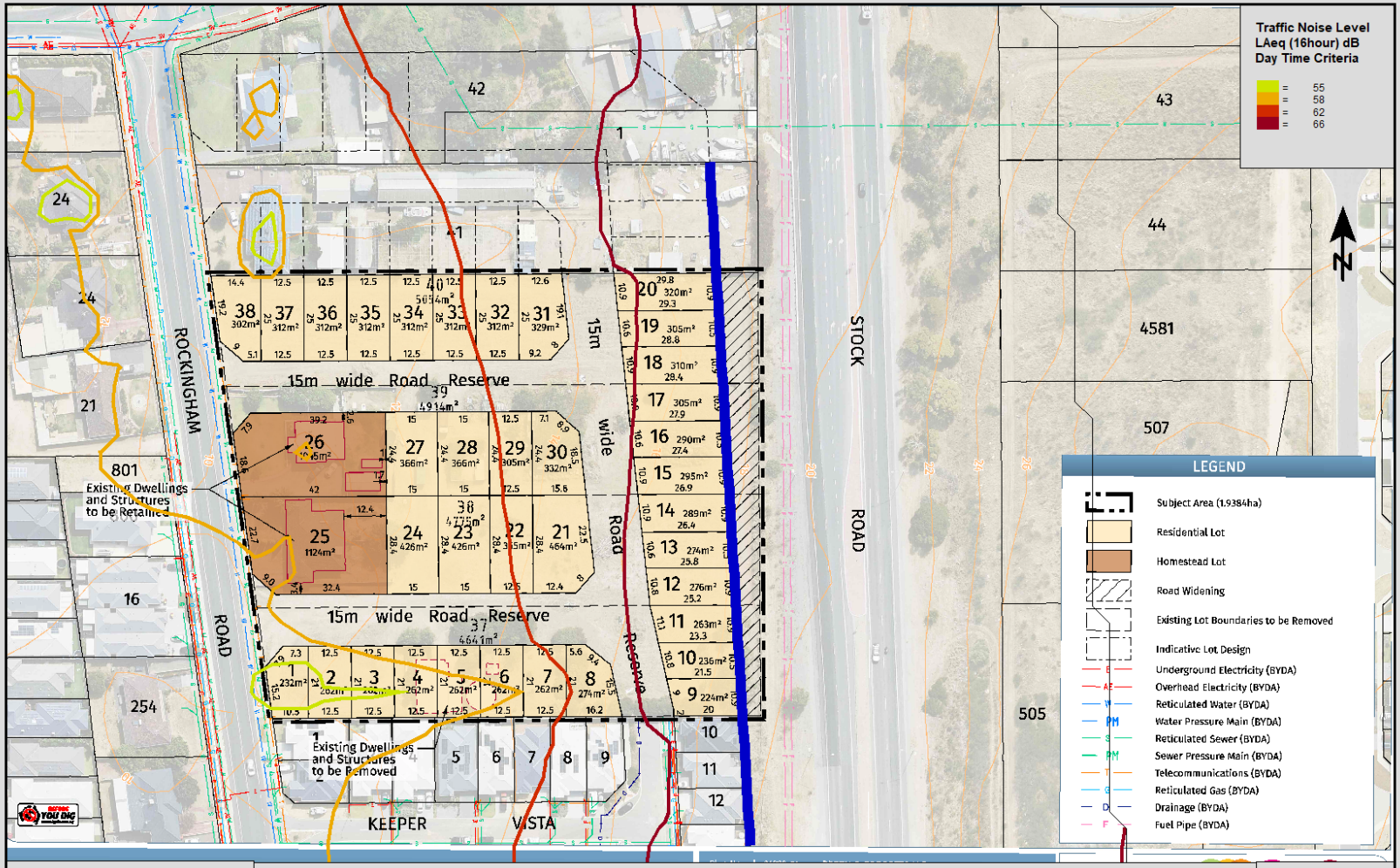


Herring Storer Acoustics

580 Rockingham Road – Stock Road, 1800mm Boundary Barrier

Ground Floor
Future Traffic Volumes
LAeq (16hour) Day Noise Level Contour

Figure 01
Ref # 001



Herring Storer Acoustics

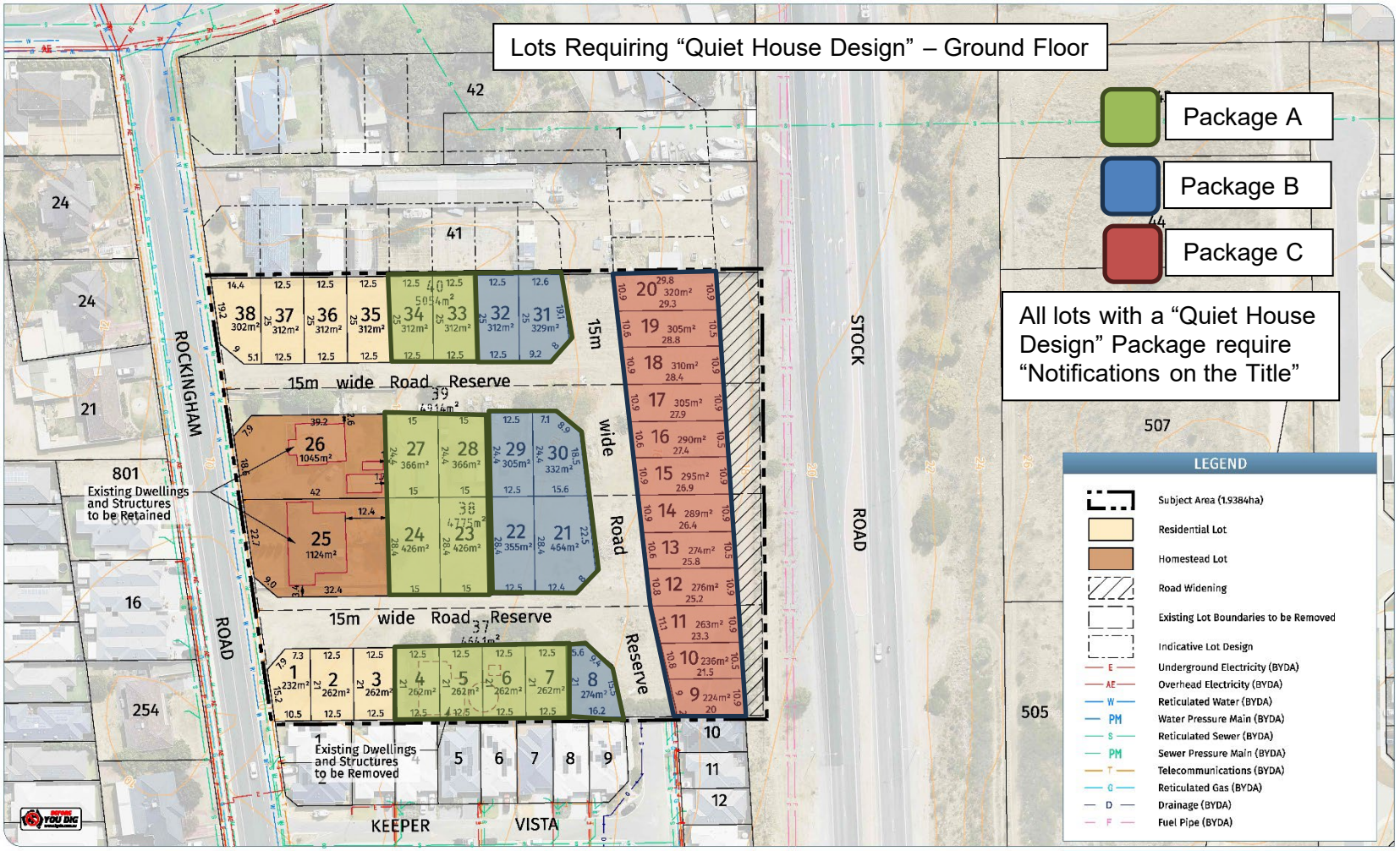
580 Rockingham Road – Stock Road, 1800mm Boundary Barrier

First Floor
Future Traffic Volumes
LAeq (16hour) Day Noise Level Contour

Figure 02
Ref # 001

APPENDIX C

Lots Requiring “Quiet House Design” Packages



CONCEPT SUBDIVISION PLAN

Lot 37 (No. 580) Rockingham Road,
LAKE COOGEE

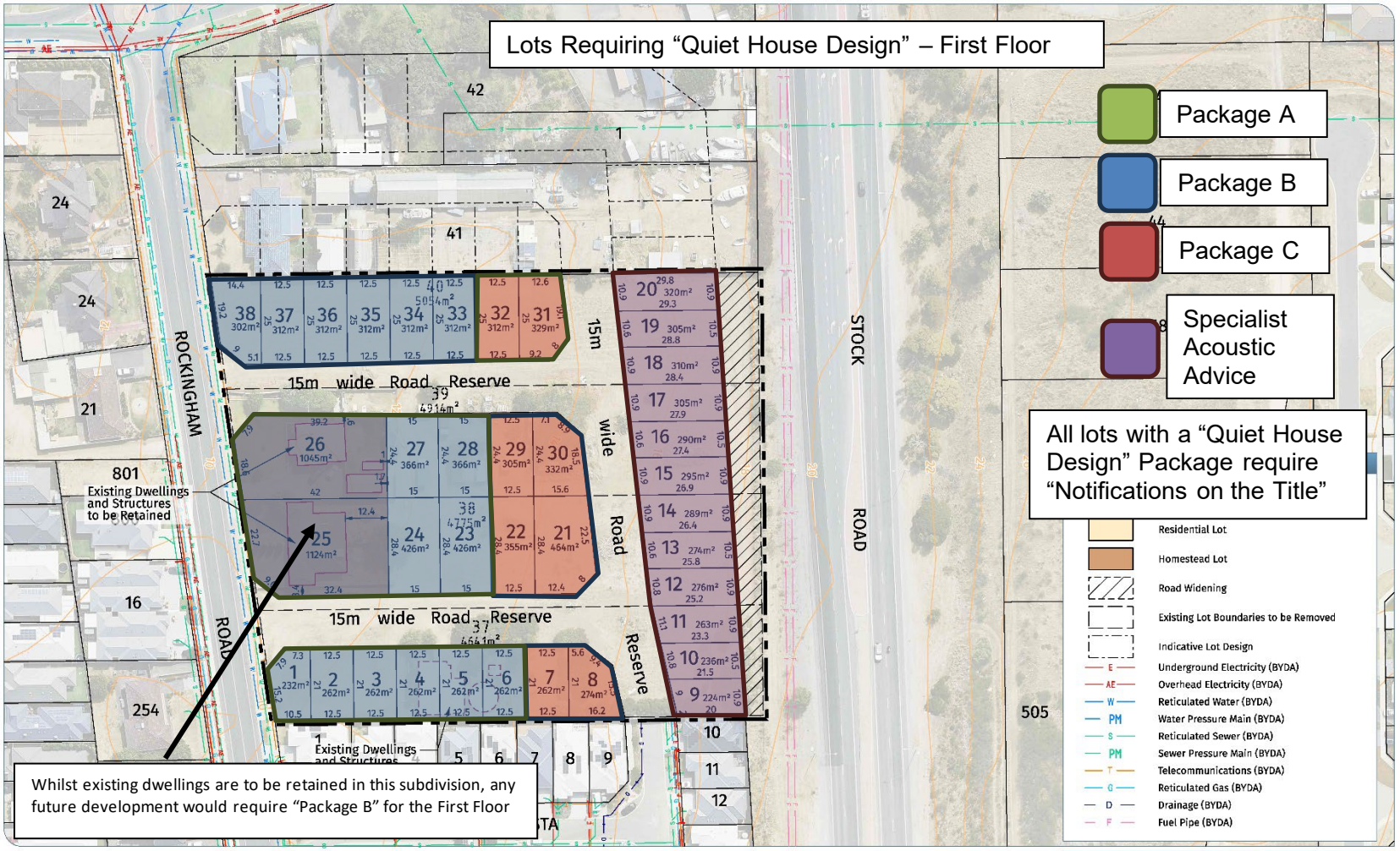
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Date	18/07/24
Drawn	JW
Checked	CP
Revision	C
Scale	1:1000@A3

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Lvl 1, 252 Fitzgerald St
PERTH WA 6000
15/2 Hennsbrook Loop,
FORRESTDALE WA 6112
T: 08 9495 1047
E: metro@harleydykstra.com.au
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CONCEPT SUBDIVISION PLAN

Lot 37 (No. 580) Rockingham Road,
LAKE COOGEE

Plan No. | 24222-01
Date | 18/07/24
Drawn | JW
Checked | CP
Revision | C
Scale | 1:1000@A3

PERTH & FORRESTDALE:
Lvl 1, 252 Fitzgerald St
PERTH WA 6000
15/2 Hennstock Loop,
FORRESTDALE WA 6112
T: 08 9495 1047
E: metro@harleydykstra.com.au
ALBANY | BUNBURY | BUSSELTON | FORRESTDALE | PERTH

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APPENDIX D

MRWA Traffic Flows

2021 ROM24 Scenario - Link Volume Plot for Mayor Rd, Coogee Noise Assessment
All Day
Land Use Scenario: DAEDS Version 3.1



mainroads WESTERN AUSTRALIA

Transport Modelling Section
Enquiries Clare Yu 9323 4967
MRWA Reference Job #42616
Thu 01 Jun 2023
T:\VOYAGER\JOBS_V2023\42616\Reports\LVP\42616_All Day_LVP_Y21 DAEDS V31_Mayor Rd_Coogee VPR

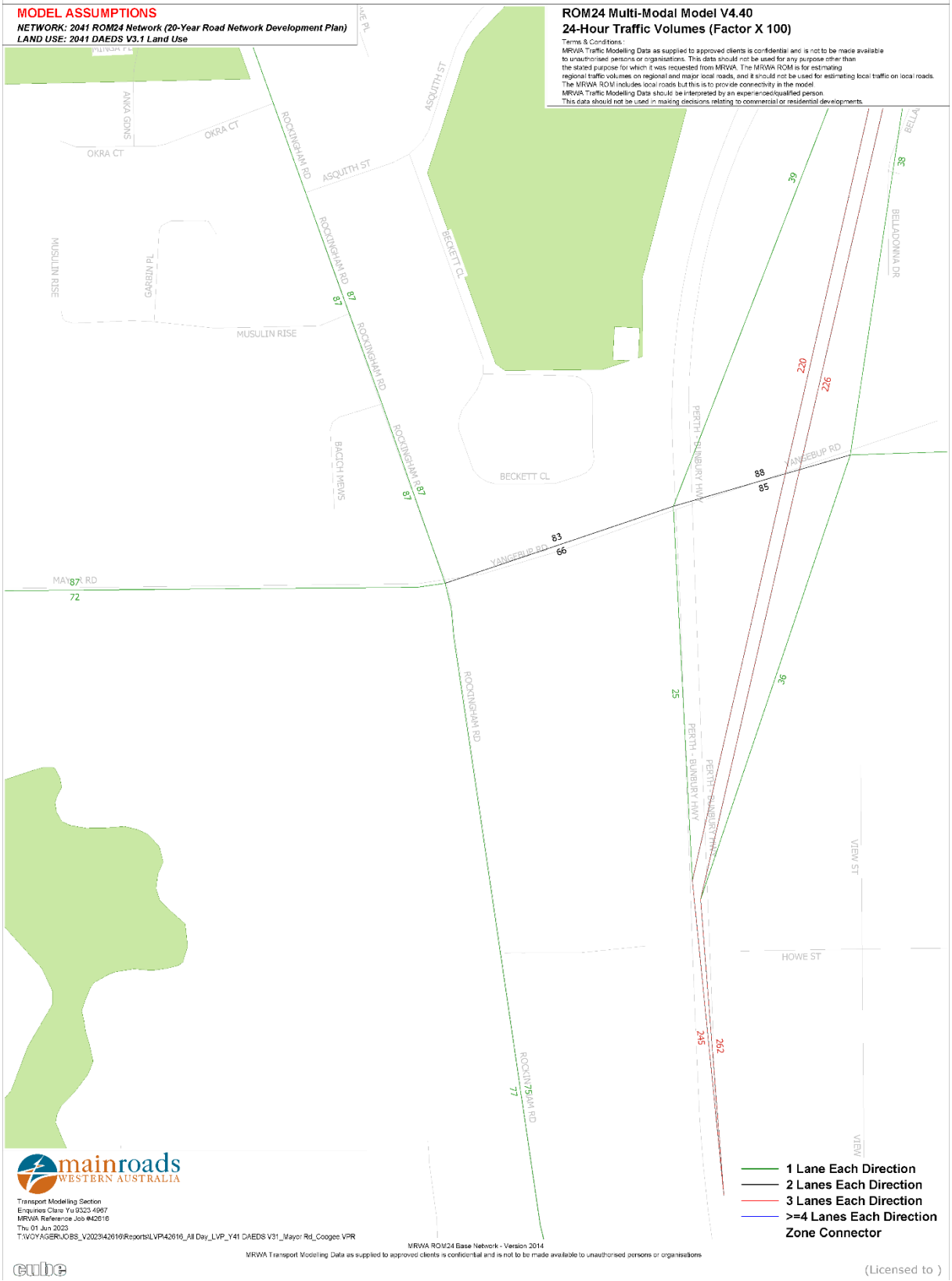
MRWA ROM24 Base Network - Version 2014

MRWA Transport Modelling Data as supplied to approved clients is confidential and is not to be made available to unauthorised persons or organisations

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2041 ROM24 Scenario - Link Volume Plot for Mayor Rd, Coogee Noise Assessment
All Day
Land Use Scenario: DAEDS Version 3.1



mainroads WESTERN AUSTRALIA

Transport Modelling Section
Enquiries Clare Yu 9323 4967
MRWA Reference Job #42616
Thu 01 Jun 2023
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MRWA ROM24 Base Network - Version 2014

MRWA Transport Modelling Data as supplied to approved clients is confidential and is not to be made available to unauthorised persons or organisations

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Appendix D Servicing Report

DEVELOPMENT
ENGINEERING
CONSULTANTS

Telephone: (08) 9481 1900
Facsimile: (08) 9481 1700
Ground Floor "The Atrium"
Suite 3/123A Colin Street
West Perth WA 6005
Our Ref:
LcoTer01ServRep211124.doc

JULIE RADONICH
LOTS 37-40 ROCKINGHAM ROAD, LAKE COOGEE
ENGINEERING SERVICES REPORT

1. General:

The subject site is approximately 1.94 hectares in size and is located on the eastern side of Rockingham Road, some 80m south of the intersection between Beeliar Drive and Rockingham Road.

It is to be ultimately developed into around 38 residential lots including 2 homestead lots of some 2200 square metres.

This report covers existing and proposed services, plus proposals for earthworks, retaining walls, roads, drainage, groundwater, water supply, sewerage, power supply, gas, telecommunication as required for current urban development standards.

2. Executive Summary

The land the subject of this report is located between Stock Road and Rockingham Road in Lake Coogee. It can be easily developed immediately by extending all required services from the existing Rockingham Road.

The land consists of four separate titles in different ownership. Lot 37 contains a small shed and Lots 38 and 39 contain existing houses at the front with vacant land at the rear of Lot 38 and various outbuildings and stockpiles at the rear of Lot 39. Lot 40 is vacant.

Rockingham road is a kerbed, urban style roadway and will not require further upgrading. Stock Road is significantly higher than the site and is a main road – no access is available to Stock Road.

The basic land form is Tamala Limestone. The Perth Environmental Geology mapping indicates that the site area consists of Tamala limestone for the majority of the site with a thin sliver of sand abutting Rockingham Road in the north western portion of the site.

Maximum groundwater levels are a minimum of 8.0m below natural ground levels.

No visual or anecdotal evidence of water ponding has occurred in this area.

The land can be connected to all services, either by extension and upgrading from existing infrastructure, or by provision of new infrastructure as set out below. Power, telephone, gas, sewer and water services already pass along the site frontage.

It is proposed that all road stormwater from the development up to and including the 1% AEP (1 in 100yr) event will be retained on site. Houses will discharge roof stormwater into on site soakwells.

Because of the steep falls of the site, lots will be terraced with medium height retaining walls in order to provide level building blocks.

3. Site

The land is currently partially developed and is mostly cleared. Given that the land consists of four separate titles in different ownership, each has been managed differently. Lot 37 contains a small shed and Lots 38 and 39 contain existing houses at the front with vacant land at the rear of Lot 38 and various outbuildings and stockpiles at the rear of Lot 39. Lot 40 is vacant.

The land falls steeply from east to west and gently from north to south. The eastern boundary of the site is at around RL18.0mAHD and falls west where the western boundary grades from RL11.0mAHD on the northern boundary to around RL9.8mAHD on the southern boundary.

The basic land form is Tamala Limestone. The Perth Environmental Geology mapping indicates that the site area consists of Tamala limestone for the majority of the site with a thin sliver of sand abutting Rockingham Road in the north western portion of the site.

Existing Water Corporation sewer and scheme water are located in Rockingham Road with the gravity sewer located in the Western verge. Rockingham Road is a major conduit for services with the following services located abutting the site:

- Eastern Verge abutting the site:
    - 760mm Steel water main.
    - 150mm PVC Pressure main.
    - Optus Optical Fibre.
    - Telstra cable and conduit.
- Western Verge:
    - 250mm AC Pressure Main
    - 100mm CI Water Main
    - 150mm Gravity Sewer (Located in an easement if front of lots)
    - Overhead power.
    - Telstra Cable and conduit
    - 155 Medium Pressure Gas main

As a result, there is no issue in accessing services but it will be difficult to establish a clear line to connect the site.

Access is from the existing Rockingham Road. Each lot has access off the road although Lot 40 does not have a formally constructed cross over.

4. Development Proposal

It is proposed to develop the land to around 38 residential lots.

Access to the proposed subdivision will be by way of two new subdivisional roads off Rockingham Road. The development is proposed to be constructed in two stages as per the attached staging plan.

The development will be provided with all normal services, with links to abutting developments for sewer, water, power, roads, gas and telephone services, with all drainage to be disposed on site via underground soakage located in the road reserve.

Water Corporation reticulated sewer and water services will be connected to the existing in Rockingham Road. Sewer reticulation will be extended from the western side of Rockingham Road ideally by trenchless technology although the ultimate decision will be dependent on the relative separation of the other services in the area.

Aerial power lines are located on the opposite verge of Rockingham Road, so following normal protocol, these will remain, with underground connections to be made as approved and extended within the development.

The development will entail earthworks largely via a cut to fill balance to provide level, free draining building blocks with medium height retaining walls.

All residential lot storm runoff will be directed to individual site soakage. Internal road stormwater will be directed to a proposed underground storage located within the road reserve abutting Rockingham Road. Based on regional mapping and from experience in the area, the site is Tamala limestone which is porous and suitable for disposal of water by soakage. The GWL at this proposed basin position is some 8.0m below natural surface level which will be well below the base of any below ground storage.

5. Earthworks & Retaining Walls

Earthworks will be required to be carried out over the site to terrace the lots between the stock road boundary and Rockingham Road. Given that outcropping limestone is likely to be within 600mm of the surface levels, it is likely that additional earthworks will be required to ensure that there is a minimum clearance of 600mm between the outcropping rock and the final surface levels. On the assumption that sufficient sand can be found on the site to fill the top 600mm of the site it is unlikely that any imported fill will be required.

No fill is required to provide clearance to the MGL, which is at a maximum of around RL1.7m AHD beneath the site in comparison to the lowest surface level at RL10.0mAHD.

Some medium height retaining walls (Circa 0.74m) will be required to terrace the lots between the eastern and western boundaries. All retaining walls will be subject to Council building approval.

6. Roads

All new subdivisional roads will be constructed to City of Cockburn standards and approval, including kerbing and piped drainage plus provision of footpaths as required.

The existing Rockingham Road is a 10.0m wide urban roadway kerbed on both sides and is in good condition. It is not proposed that any upgrading of this road is required other than to accommodate the new intersections.

There are concrete paths on either side of Rockingham Road which are also in good condition although some of these will need to be replaced to accommodate service connections.

Based on standard residential trip generation of 10 vehicle movements per day per lot, the development is likely to result in an additional 320 vehicles per day. Rockingham Road is constructed with 2 by 3.5m lanes with 1.5 cycle lanes and has an existing traffic volume of around 7,000 vehicles per day. The additional traffic movements are unlikely to have a significant affect on the existing level of service for Rockingham Road.

Bus routes are close to the site which run at 10 minute intervals at peak times and 60 minutes at off peak times.

Pedestrian access is available via the existing paths along Rockingham Road and Cycle lanes are in place along Rockingham Road.

7. Drainage

Drainage from the whole site is wholly contained within an underground storage system located within the road reserve on the southern side of the site. The underground storage will be via soakwells distributed throughout the site or by underground storage cells.

Lot drainage will be self-contained in soakwells. The soil characteristics of the site in conjunction with the depth to groundwater will allow site soakage.

Stormwater design will be done to the standards of the City of Cockburn and in accord with the Local Water Management Strategy (LWMS) submitted with the structure plan documentation.

8. Groundwater

The maximum groundwater level generally flows from east to west and is RL2.0mAHD some 750m east of the site and falls to RL1.0m AHD around 2.1km west of the site. By interpolation, the peak groundwater level is around 1.7mAHD.

The underground storage will be installed at a depth of around 2.4m to the base meaning that there will be a clearance to groundwater of some 5.7m, which is well clear of the peak groundwater levels.

9. Power

Sufficient power supply exists in the area to supply the development. A high and low voltage aerial power line is located along the western verge of Rockingham Road in addition to some underground cable. Extension to this development will be from the existing overhead system.

All subdivisional power reticulation lines and transformer installations will be constructed at the cost of the developer. Transformer sites will be determined at the detailed subdivision design stage.

10. Water Supply

Sufficient water supply exists in the area to service this development.

At present there is a 100mm reticulation water main located along the western verge of Rockingham Road, to which the development will be connected.

A 760mm steel trunk water main is located in the verge abutting the development and this main is known as a distribution main and as such is unavailable for reticulation connection.

11. Sewer

The site is not currently connected to sewer, although a reticulation sewer main is located along the western verge of Rockingham Road, to which it is proposed to connect.

The site sewer connection will be made by drilling a 150mm reticulation sewer under Rockingham Road to the existing main on the western side. This connection will need to connect under the Fibre Optic cable, medium pressure gas main, the 760mm trunk water main and two sewer pressure mains - all of which are located along Rockingham Road.

Internal sewers will allow for future extensions to abutting properties as required.

12. Telephone & NBN

Telstra underground infrastructure services exist adjacent to the site along the frontage to the site on both sides of Rockingham Road. These are most likely to be able to be extended or upgraded to service this proposed development.

Fibre Optic cables are located in this area. An Optus cable is located along the eastern verge of Rockingham Road abutting the development. Caution will need to be taken with subdivisional services connections and road construction where crossings are required.

In accordance with recent requirements, the developer is required to install NBN "pipe and pit" to allow for future installation of cables for the NBN. The design of the "pipe & pit" is the responsibility of the developer and will be designed in conjunction with the underground power network and installed during the construction phase of the development.

Although written consultation with NBN has not been undertaken, the NBN website indicates that NBN is available in this area for connection.

13. Gas

Gas mains are installed in this area, with a 155mm medium pressure main located along the western verge of Rockingham Road opposite the development. It is expected that reticulated gas services will be extended into this development by ATCO in the normal way, with trenching done by the developer.

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THIS REPORT IS DATED 21ST NOVEMBER 2024.

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ATTACHMENT 1 – LSP WITH STAGING PLAN

CONCEPT SUBDIVISION PLAN

Lots 37-40 (No. 580, 582, 854 & 586) Rockingham Road, LAKE COOGEE

Plan No.	24222-01	
Date	30/10/24	
Drawn	NP	
Checked	JS	
Revision	D	
Scale	1:1000@A3	0 10m 20m 30m

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

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LEGEND

- Subject Area (1.9384ha)
- Residential Lot
- Road Widening
- Existing Lot Boundaries to be Removed
- Indicative Lot Design
- E — Underground Electricity (BYDA)
- AE — Overhead Electricity (BYDA)
- W — Reticulated Water (BYDA)
- PM — Water Pressure Main (BYDA)
- S — Reticulated Sewer (BYDA)
- PM — Sewer Pressure Main (BYDA)
- T — Telecommunications (BYDA)
- G — Reticulated Gas (BYDA)
- D — Drainage (BYDA)
- F — Fuel Pipe (BYDA)

Appendix E Stormwater Management Plan

REPORT

JULIE RADONICH

LOTS 37-40 ROCKINGHAM ROAD, LAKE COOGEE

STORMWATER DRAINAGE MANAGEMENT PLAN

NOVEMBER 2024

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Revision History:

Revision	Description	Checked	Approved	Date
0	Original Issue	SRA	SRA	16th August 2024
1	Updated to reflect City of Cockburn Comments	SRA	SRA	22nd November 2024

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- 1.2 Drainage / Water Management Principles and Design Objectives 5
- 1.3 Planning Background 5

2 Proposed Development 5
- 2.1 Key Elements of the Development 5
- 2.2 Previous Land Use 6
- 2.3 Finished Lot Level 6

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- 4.2 Soil Characteristics/Geotechnical 7
- 4.3 Groundwater Aspects 7
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Appendix A – Locality Plans
- Locality Plan (L01)
- Aerial Photo (L02)

Appendix B – Drainage Catchment Plans
- Pre Development Catchment Plan (L03)
- Post Development Catchment Plan (L04)

Appendix C – Drainage Calculations
- Drainage Basin Calculations (10% and 1% AEP Calcs)
- At Lot Calculations to correlate run-off coefficient with peak allowable flow

Executive Summary

- The stormwater management plan is prepared to provide sufficient information to support the structure plan across the subject land.
- The site consists of Tamala Limestone and sand derived from Talama Limestone meaning that the soil has sufficient permeability to provide for disposal of stormwater by soakage.
- Peak groundwater levels are some 7.0m below proposed development levels which are similar to existing surface levels.
- Lots will provide 2 by 1.2 by 1.2 soakwells to dispose of stormwater on site. Roads will be provided with capture pits and soakwells to capture road runoff and excess runoff from lots up to and including the 1%AEP storm.

1 Introduction

1.1 General

The subject site is approximately 1.94 hectares in size and is located on the eastern side of Rockingham Road, some 80m south of the intersection between Beeliar Drive and Rockingham Road as outlined in the Locality Plan (DrawingL-01) in Appendix A and the land area with Drawing L-02 showing the site with the aerial photo also shown.

It is to be ultimately developed into around 38 residential lots including 2 homestead lots of some 2200 square metres.

The land is proposed to be developed for urban residential purposes and a structure plan and development concept plan has been prepared as shown in the attached plans in Appendix A.

The purpose of this document is to provide the drainage concept for the development of the land to support the structure plan documentation.

1.2 Drainage / Water Management Principles and Design Objectives

The following water sensitive design criteria, principles and objectives are to be pursued and/or implemented as part of the proposed development:

- *Water Quantity Management*

  Principle: To ensure that post development discharge peak flow rates match required pre-development rates.

  Objective: All finished floors to be a minimum of 0.3m above the 1% AEP flood level of the urban drainage system and at least 0.5m above the 1% AEP level of waterways and majors drainage systems.

  Objective: Detention storage to be provided to ensure that relevant storm outflows do not exceed predevelopment flow rates.

- *Water Quality Management*

  Principle: To improve the overall surface water quality of the water leaving the development.

  Objective: Ensure that surface water is contained on site and infiltrated up to and including the 10% AEP storm.

  Objective: All water for the 63.2% – 1 hour storm (15mm) to be contained on-site prior to outflow.

1.3 Planning Background

This site is currently zoned urban under the relevant town planning schemes and the structure plan is proposed to ensure the development of the land can occur in a logical manner.

2 Proposed Development

2.1 Key Elements of the Development

The development proposal consists of an internal roadway linking to the existing development to the south and the potential development to the north with two further

links through to Rockingham Road. The development will result in the creation of around 38 residential allotments including two large homestead lots to retain the existing houses on Lots 38 and 39.

2.2 Previous Land Use

The land is currently partially developed and is mostly cleared. Given that the land consists of four separate titles in different ownership, each has been managed differently. Lot 37 contains a small shed and Lots 38 and 39 contain existing houses at the front with vacant land at the rear of Lot 38 and various outbuildings and stockpiles at the rear of Lot 39. Lot 40 is vacant.

The land has historically been used for rural residential purposes with small garden areas and houses on Lots 37 to 39 with the house on lot 37 being demolished in 2011.

2.3 Finished Lot Level

The land falls steeply from east to west and gently from north to south. The eastern boundary of the site is at around RL18.0mAHD and falls west where the western boundary grades from RL11.0mAHD on the northern boundary to around RL9.8mAHD on the southern boundary.

No fill is required to provide clearance to the MGL which is well below the existing surface, however the site will need to be shaped to terrace the lots between the stock road boundary and Rockingham Road.

3 Design Criteria

The drainage requirements for developments within this area are controlled by the general requirements of the Council and geotechnical parameter of the soil.

Item	Description	Requirement	Source/Comment
1	Water quality	1EY – 1 hour storm (15mm) to be retained on-site	DWER Policy
2	Detention storage design	5% AEP 5 minute storm retained on site with no outflow other than infiltration	City of Cockburn requirements
3	Min. FFL freeboard	0.3m flood level of urban drainage system	City of Cockburn requirements
6	Runoff coefficients	0.70 for Road Area	Per AR and R 2016
		Lot Run Off Coefficient: 1% AEP – 0.31 10% AEP – 0.10 Less than 10% AEP - 0	As Per “At Lot” Calculations in Appendix C

4 Predevelopment Environment

4.1 Topography and Landform

The land falls steeply from east to west and gently from north to south. The eastern boundary of the site is at around RL18.0mAHD and falls west where the western

boundary grades from RL11.0mAHD on the northern boundary to around RL9.8mAHD on the southern boundary.

4.2 Soil Characteristics/Geotechnical

According to the Fremantle Environmental Geology Mapping (Part Sheets 2033 I and 2033 IV) (Gozzard JR, 1983)[1], the site is underlain by Tamala limestone for the majority of the site with a thin sliver of sand abutting Rockingham Road in the north western portion of the site.

A geotechnical investigation will be carried out across the site as part of the detailed subdivision works and urban water management plan.

4.3 Groundwater Aspects

The maximum groundwater level generally flows from east to west and is RL2.0mAHD some 750m east of the site and falls to RL1.0m AHD around 2.1km west of the site. By interpolation, the peak groundwater level is around 1.7mAHD.

The underground storage will be installed at a depth of around 2.4m to the base meaning that there will be a clearance to groundwater of some 5.7m, which is well clear of the peak groundwater levels.

4.4 Surface Water Aspects

The existing area is quite pervious and based on a review of the site and there is little evidence either physical or through historical reports.

5 Stormwater Management Strategy

5.1 Pre-Development Hydrology

As outlined in Section 4, the site consists of permeable substrate which is suitable for disposal of water by soakage.

The proposal is to capture all events up to and including the 1% AEP storm and dispose of this by soakage.

An effective runoff factor of 0.31 has been applied over the lots and 0.7 over the roads to establish the effective impervious catchment contributing to the drainage system.

5.2 Pre- & Post- Development Hydrology

The drainage strategy is to dispose of the stormwater by soakage. A conservative allowance of 4.00m/day has been allowed for the soakwell infiltration and a total storage of some 258 cubic metres of storage has been provided over the site which equates to 1 cubic metre of storage per 70 square metres of paved area.

A summary of the storages and average water depths in the soakwells is outlined in Table 1 below:

Table 1: Summary of Required Storm Volumes and Average Depths for Various AEp Storms

Storm AEP	Storage Volume required (m^3)	Average Depth in Soakwells (m)
1%	259	2.44
5%	150	1.34

Storm AEP	Storage Volume required (m^3)	Average Depth in Soakwells (m)
10%	111	0.95
1EY	53	0.37

The site is proposed to be divided into a series of small catchments such that drainage pits will capture the water from the roadways. Lots will have a minimum storage of 2 by 1.2m diameter by 1.2m deep soakwells (Some 2.71cubic metres) which will contain up to the 20% AEP storm without overflow. Beyond that the lot drainage system il, surcharge and be directed to the street where the soakwell system will have sufficient capacity to contain the 1% AEP storm.

5.3 1EY event/10% AEP Event

The 1EY event is typically seen as the storm where most nutrients and particulate matter is generated from and this event and all other rainfall events up to the 1% AEP storm will be retained on site without outflow.

It is proposed that all storms will be retained on site within the below ground storage/ soakwell system

5.4 1% AEP ARI event

All road areas will be graded and shaped to Rockingham Road with grades south to a large drainage area near the intersection of Stock and Rockingham Roads.

The internal drainage system will contain the 1% AEP storm to ensure there will be little or no outflow despite the available flow path.

5.5 Finished Floor Levels (Relative to the 1% AEP flood levels)

As outlined in Section 2.3, the land is proposed to be earthworked to terrace lots from Stock Road to Rockingham Road. All Lots will be above the road to ensure that any overland flow for major storms will follow and be contained within the road area.

6 Groundwater Management Strategy

6.1 Groundwater Level Management

No subsoil groundwater management is proposed given the development level is well above maximum groundwater levels.

6.2 Specifications for Imported Fill

Any fill material to be used on the site, inclusive of drainage backfill will consist of free draining material with a maximum of 7% passing the 75 micron sieve to ensure free drainage.

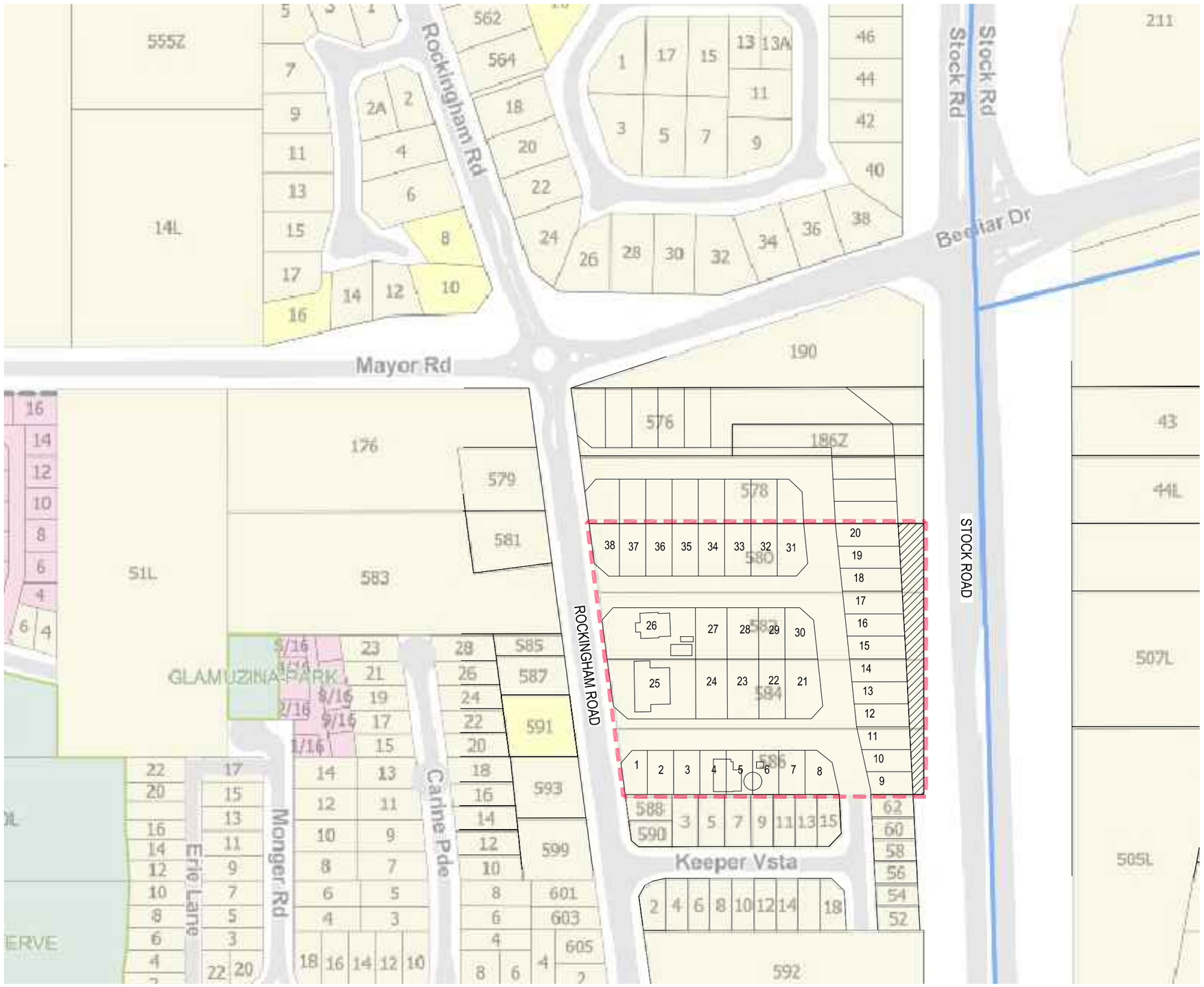
7 References:

1. Environmental Geology Mapping - Rockingham Part Sheets 2033 II and 2133 III, Gozzard JR 1983.

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APPENDIX A – LOCALITY PLANS

- - Locality Plan (U01)
- - Aerial Photo (U02)
- Proposed Structure Plan and Subdivision Concept Plan



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DEVELOPMENT ENGINEERING CONSULTANTS
SUITE 3, 123A COLIN ST, WEST PERTH, 6005 WESTERN AUSTRALIA
Ph: (08) 9481 1900
Fax: (08) 9481 1700

PROJECT: **LOTS 37 - 40 ROCKINGHAM ROAD LAKE COOGEE**
W.A.P.C. No. -

DRAWING: **DRAINAGE MANAGEMENT STRATEGY LOCALITY PLAN**
COORDINATE SYSTEM: PCG94, VERTICAL DATUM: AHD

SCALE	DRAWN	CHECK	REV No.
1:1000	JEG	SRA	A
DATE	DESIGNED	APPROVED	
15/8/24	JEG	SRA	

PROJECT NUMBER: LCOTER01
DRAWING NUMBER: L01
S:\TER\LCOTER01\Drawings\LCOTER01 L01.dwg 15/08/2024



LEGEND

SITE BOUNDARY

1:500 (A1)

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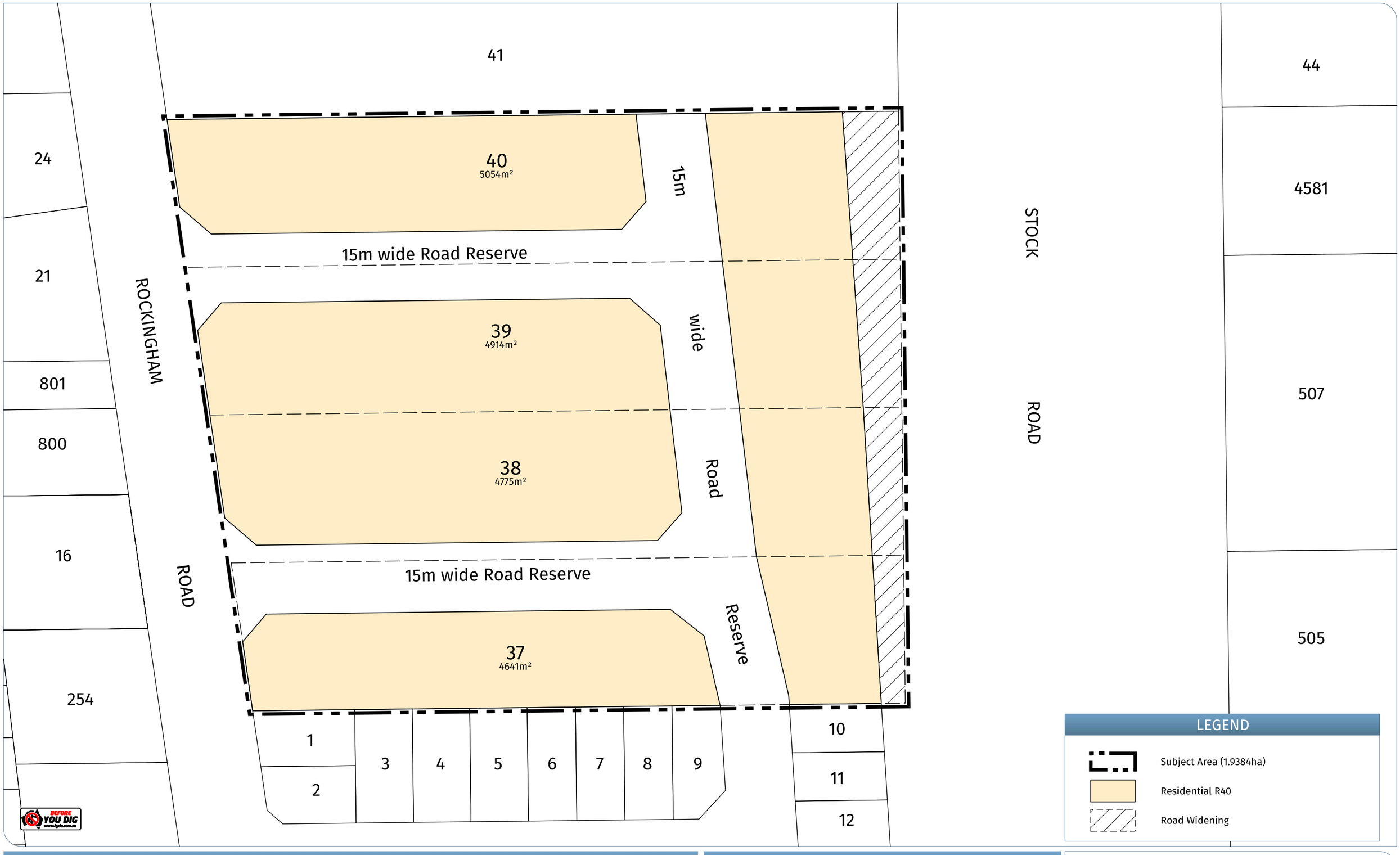
DEVELOPMENT ENGINEERING CONSULTANTS
SUITE 3, 123A COLIN ST,
WEST PERTH, 6005
WESTERN AUSTRALIA
Ph: (08) 9481 1900
Fax: (08) 9481 1700

PROJECT: LOTS 37 - 40 ROCKINGHAM ROAD LAKE COOGEE
W.A.P.C. No. -

DRAWING: DRAINAGE MANAGEMENT STRATEGY AERIAL PHOTO
COORDINATE SYSTEM: PCG94, VERTICAL DATUM: AHD

SCALE	DRAWN	CHECK	REV No.
1:1000	JEG	SRA	A
DATE 15/8/24	DESIGNED JEG	APPROVED SRA	

PROJECT NUMBER: LCOTER01
DRAWING NUMBER: L02
S:\TER\LCOTER01\Drawings\LCOTER01 L02.dwg 15/08/2024



LEGEND

- Subject Area (1.9384ha)
- Residential R40
- Road Widening

STRUCTURE PLAN

Lot 37-40 (No. 580, 582, 854 & 586) Rockingham Road, LAKE COOGEE

Plan No. | 24222-02
Date | 04/07/24
Drawn | NP
Checked | CP
Revision | A

Scale | 1:750@A3

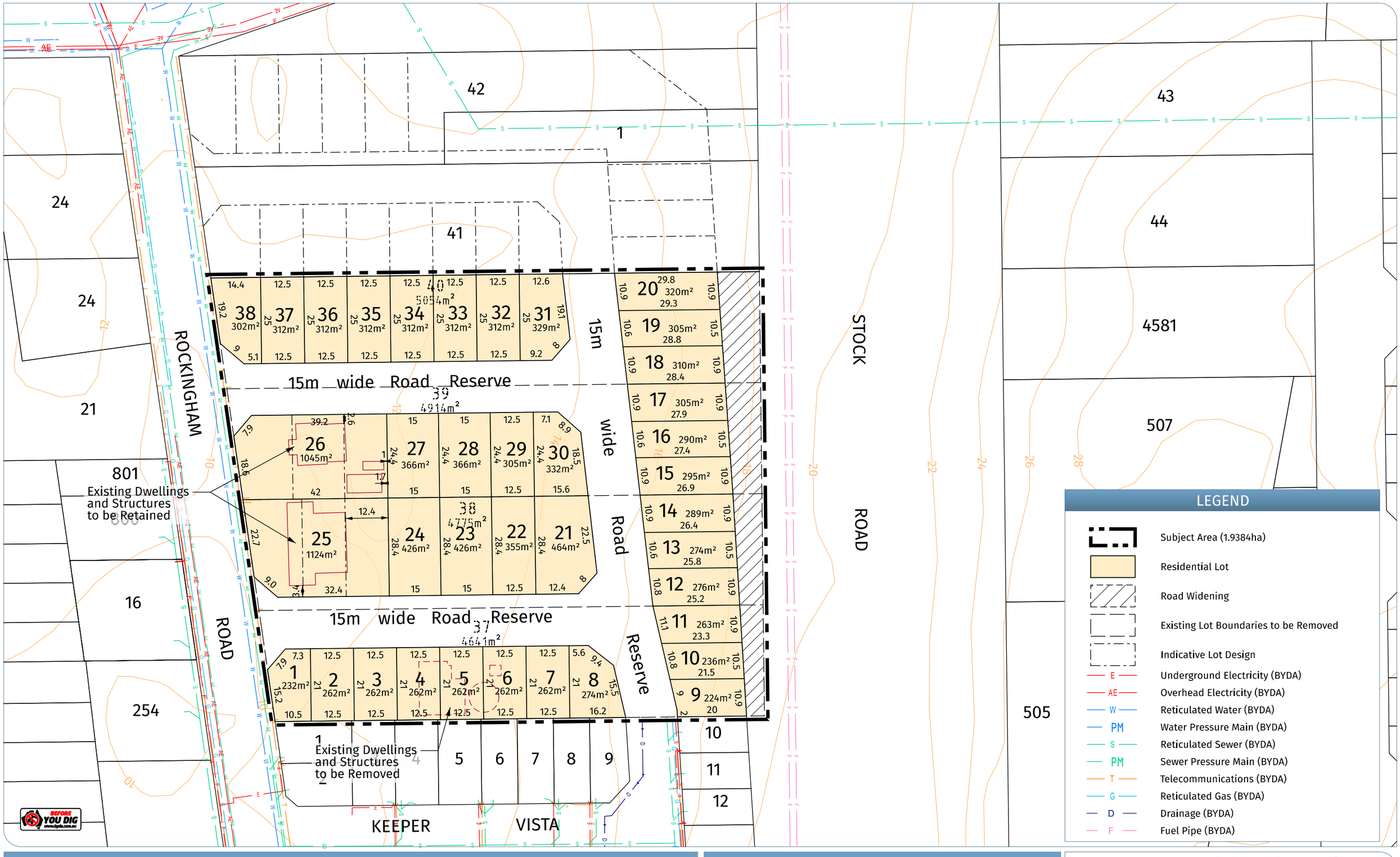
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PERTH & FORRESTDALE:
Lvl 1, 252 Fitzgerald St
PERTH WA 6000
15/2 Hensbrook Loop,
FORRESTDALE WA 6112
T: 08 9495 1947
E: metro@harleydykstra.com.au
ALBANY | BUNBURY | BUSSELTON | FORRESTDALE | PERTH

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CONCEPT SUBDIVISION PLAN

Lots 37-40 (No. 580, 582, 854 & 586) Rockingham Road, LAKE COOGEE

Plan No.	24222-01	
Date	30/10/24	
Drawn	NP	
Checked	JS	
Revision	D	
Scale	1:1000@A3	0 10m 20m 30m

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
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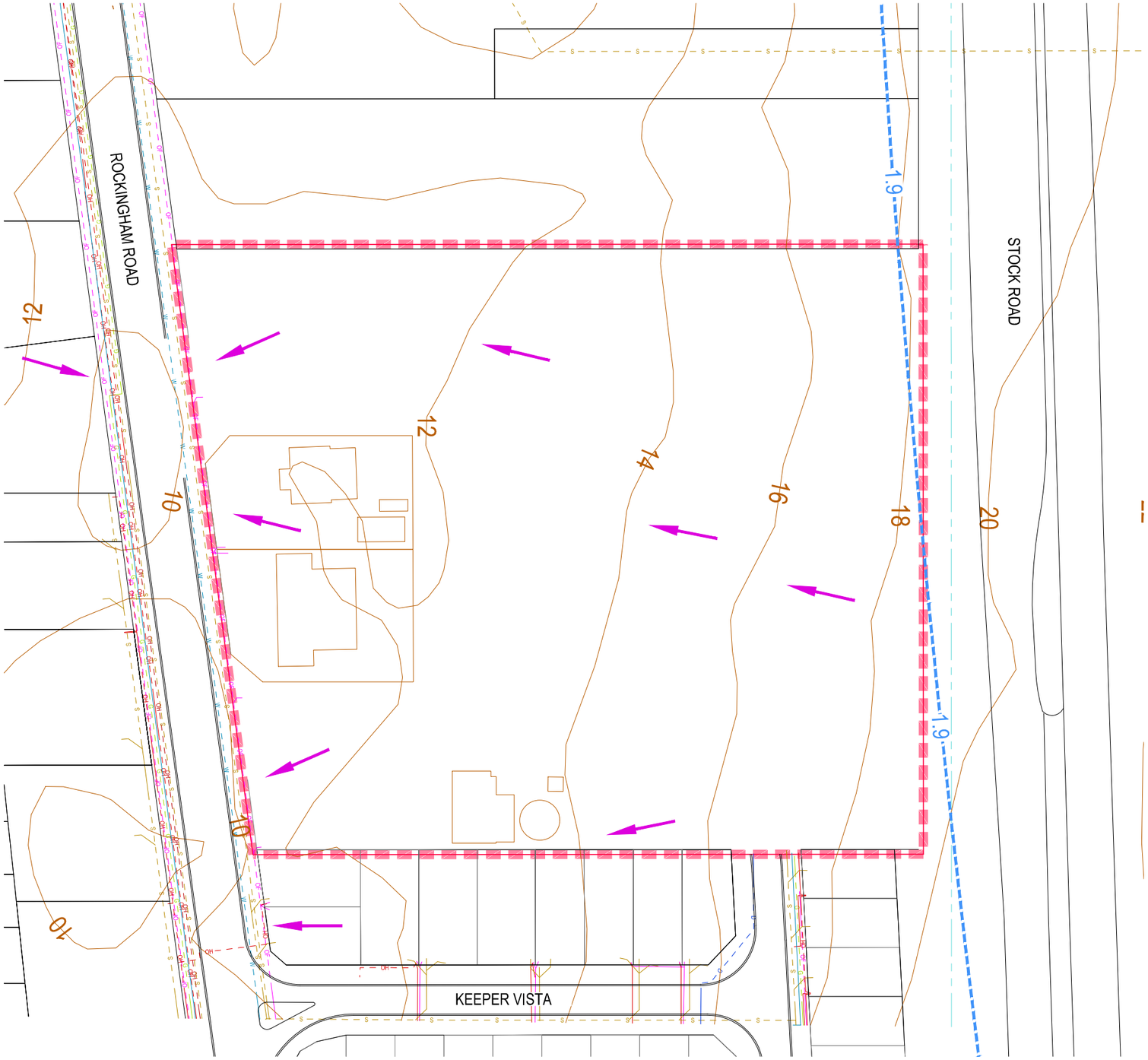
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APPENDIX B – DRAINAGE CATCHMENT PLANS

- - Pre Development Catchment Plan (U03)
- - Post Development Catchment Plan Sheet (U04)



LEGEND

- CATCHMENT AREA
- 23 — EXISTING SURFACE CONTOURS
- -2.90- — MAXIMUM GROUND WATER CONTOURS
- FLOW ARROW
- MB01 — NAME
  E 672.503m
  N 501.842m
  R.L. 10.00m — SURFACE LEVEL
  2.5m — DEPTH
  Ø150 — BORE DIAMETER
  MONITORING BORE

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DEVELOPMENT ENGINEERING CONSULTANTS
SUITE 3, 123A COLIN ST,
WEST PERTH, 6005
WESTERN AUSTRALIA
Ph: (08) 9481 1900
Fax: (08) 9481 1700

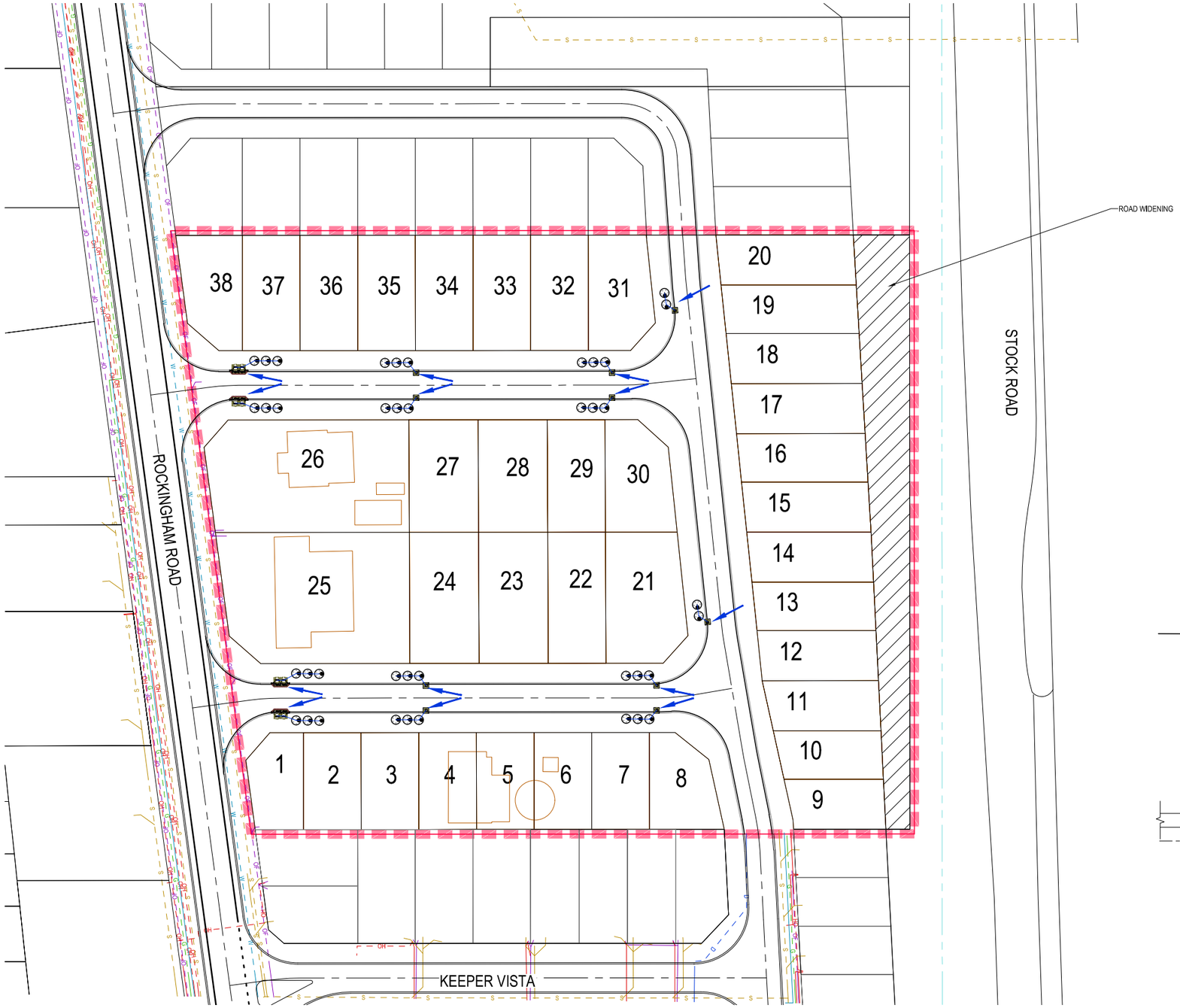
PROJECT: **LOTS 37 - 40 ROCKINGHAM ROAD LAKE COOGEE**
W.A.P.C. No. -

DRAWING: **DRAINAGE MANAGEMENT STRATEGY PRE-DEVELOPMENT CATCHMENT PLAN**
COORDINATE SYSTEM: PCG94, VERTICAL DATUM: AHD

SCALE	DRAWN	CHECK	REV No.
1:500	JEG	SRA	A
DATE	DESIGNED	APPROVED	
15/8/24	JEG	SRA	

PROJECT NUMBER: LCOTER01
DRAWING NUMBER: L03

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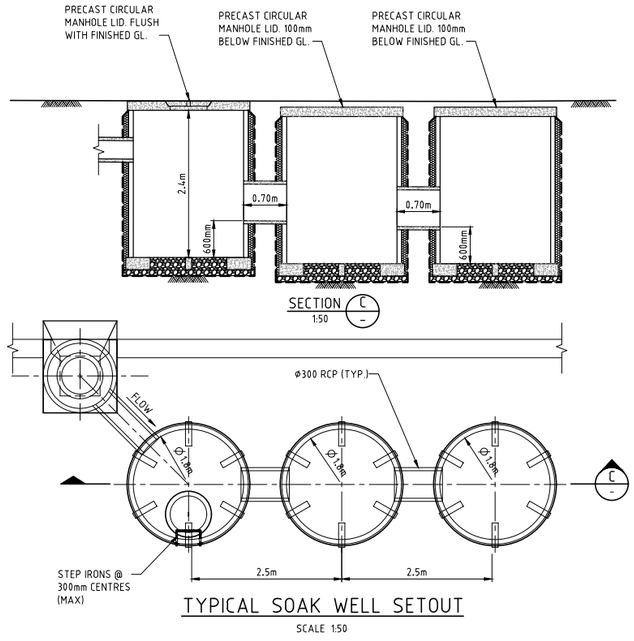
DRAINAGE LEGEND

- EXISTING WATER / PROPOSED WATER
- EXISTING TELSTRA / PROPOSED NBN
- EXISTING OPTIC FIBRE / PROPOSED OPTIC FIBRE
- EXISTING GAS / PROPOSED GAS
- EXISTING UNDERGROUND POWER / PROPOSED UNDERGROUND POWER
- EXISTING SEWER / PROPOSED SEWER
- IRRIGATION DUCT Ø225mm (U.O.N) (Ø100mm DUCTS INTO LOTS)
- PROPOSED DRAINAGE PIPE
- PROPOSED SUB-SOIL DRAINAGE PIPE
- EXISTING DRAINAGE PIPE
- FUTURE DRAINAGE PIPE
- OVERLAND FLOW ARROW

34.03 — LEVEL OF PIT LID/GRATE
C12 — PIT NUMBER
1050 A — LINER DIAMETER, BASE TYPE
JP — PIT TYPE
CH.18.26 — CHAINAGE

DRAINAGE STRUCTURES

- (GP) GULLY PIT
- (SEP) SIDE ENTRY PIT
- (DSEP) DOUBLE SIDE ENTRY PIT
- (SW) SOAKWELL



TYPICAL SOAK WELL SETOUT
SCALE 1:50

1:500 (A1)

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No.	DATE	BY	REVISION	
A	15/8/24	JEG	INITIAL ISSUE	SRA

CLIENT: TERRANOVIS PTY LTD

DEVELOPMENT ENGINEERING CONSULTANTS
SUITE 3, 123A COLIN ST, WEST PERTH, 6005 WESTERN AUSTRALIA
Ph: (08) 9481 1900
Fax: (08) 9481 1700

PROJECT: LOTS 37 - 40 ROCKINGHAM ROAD LAKE COOGEE
W.A.P.C. No. -

DRAWING: DRAINAGE MANAGEMENT STRATEGY POST-DEVELOPMENT CATCHMENT PLAN
COORDINATE SYSTEM: PCG94, VERTICAL DATUM: AHD

SCALE	DRAWN	CHECK	REV No.
1:500	JEG	SRA	A
DATE	DESIGNED	APPROVED	
15/8/24	JEG	SRA	

PROJECT NUMBER: LCOTER01
DRAWING NUMBER: L04
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DEVELOPMENT
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APPENDIX C – DRAINAGE CALCULATIONS

- **- Soakwell Calculations (10% AEP and 1% AEP Calcs)**
- **At Lot Calculations to correlate run-off coefficient with peak allowable flow**

Development Engineering Consultants - Drainage Basin Spreadsheet

Client: Terranovis Pty Ltd/Julie Radonoich
Project: Lots 37-40 Rockingham Road, Lake Coogee
Location: Soakwell Calcs - Overall Road Catchment
Designer: SRA

Location:	**Rockingham Road, Lake Coogee**			**12-Aug-24**
Nearest grid cell:	**Latitude**	**32.1375(S)**	**Longitude**	**115.7875(E)**

DEVELOPMENT ENGINEERING CONSULTANTS

Data to be Input

		ARI	v Descriptor v
Rainfall AEP (Percentage)	1	100	Infrequent
63.2% AEP Impervious Catchment (Ha)	0.765		
Required Storage (63.2% AEP - 1hr) (m^3)	117.832		

Catchment Details	Lot Area	Road Area	Total
Total Area Paved (Ha)	**1.3132**	**0.5115**	**1.825**
Run-Off Co-efficient(C_{10})	0.31	0.70	
ARI Multiplier	1.00	1.00	
Run-Off Co-efficient(Cy)	0.31	0.70	
Impervious Area(Ha)	**0.407**	**0.358**	**0.765**

Effective C
0.42

Volume and Dimensions of Available Storage

Calculation of Storage in Proposed Pipework and Access Chambers

Water Level 41

Storage Location	X-Section Area	IL	Length	Volume
300 Dia Drai	0.07		11	0.78
375 Dia Drai	0.00		46.4	0.00
450 Dia Drai	0.00		84	0.00
Manholes				
Pit B1	0.89	39.40	17.60	15.71
ULTIMATE STORAGE PROVIDED IN SYSTEM				**16.49**

Storage provided manholes/pipe (m^3)	16.485	
Number of Soakwells	39.00	
Diameter of soakwells (m)	1.80	
Depth of each soakwell (m)	2.44	
Storage required soakwells (m^3)	**242.15**	
Strorage provided (m^3)	258.64	
Soakage rate ($l/s/m^2$)	0.046	*4.00 m/day*

Development Engineering Consultants - Drainage Basin Spreadsheet

Project: **Lots 37-40 Rockingham Road, Lake Coogee**
Location: **Soakwell Calcs - Overall Road Catchment**

Volume of storage required is 1m^3 per 70.55 m^2 of total area

T_C (mins)	T_C (hrs)	I (mm/hr)	Q_{IN} (l/s)	Total V_{IN} (m^3)	Q_{OUT} (soakage) (l/s)	V_{OUT} (soakage) (m^3)	Net storage (after soakage) (m^3)	V_{OUT} required (m^3)	Q_{OUT} (l/s)	Effective runoff C
10	0.17	129.00	274.2	164.51	25.03	15.02	149.49	0.00	0.00	0.00
15	0.25	103.00	218.9	197.02	25.03	22.53	174.50	0.00	0.00	0.00
20	0.33	87.30	185.5	222.66	25.03	30.04	192.62	0.00	0.00	0.00
30	0.50	68.00	144.5	260.15	25.03	45.06	215.09	0.00	0.00	0.00
45	0.75	52.80	112.2	303.00	25.03	67.58	235.41	0.00	0.00	0.00
60	1.00	44.10	93.7	337.43	25.03	90.11	247.32	0.00	0.00	0.00
90	1.50	34.40	73.1	394.81	25.03	135.17	259.65	1.01	0.19	0.00
120	2.00	28.90	61.4	442.25	25.03	180.22	262.03	3.39	0.47	0.00
150	2.50	25.85	54.9	494.47	25.03	225.28	269.20	10.56	1.17	0.01
180	3.00	22.80	48.5	523.36	25.03	270.33	253.03	0.00	0.00	0.00
240	4.00	15.10	32.1	462.15	25.03	360.44	101.70	0.00	0.00	0.00
300	5.00	14.42	30.6	551.67	25.03	450.55	101.12	0.00	0.00	0.00
360	6.00	13.74	29.2	630.78	25.03	540.66	90.12	0.00	0.00	0.00
480	8.00	12.38	26.3	757.80	25.03	720.88	36.91	0.00	0.00	0.00
720	12.00	9.71	20.6	891.54	25.03	1081.32	-189.78	0.00	0.00	0.00
960	16.00	8.08	17.2	989.58	25.03	1441.76	-452.18	0.00	0.00	0.00
1440	24.00	5.82	12.4	1068.75	25.03	2162.65	-1093.90	0.00	0.00	0.00
2880	48.00	3.24	6.9	1189.95	25.03	4325.29	-3135.35	0.00	0.00	0.00
4320	72.00	2.27	4.8	1250.55	25.03	6487.94	-5237.39	0.00	0.00	0.00

Outflow Configuration

Flow through orifice

$Q = C_D * A_o * \mathrm{Sqrt}(19.62 * dH)$

C_D= 0.61

Q (m^3/s)	Width of hole (mm)	Depth of hole (mm)	Ao (m^2)	Equivalent diameter (mm)	dH (m)
0.001	12	12	0.000144	14	9.10

Development Engineering Consultants - Drainage Basin Spreadsheet

Client: Terranovis Pty Ltd/Julie Radonoich
Project: Lots 37-40 Rockingham Road, Lake Coogee
Location: At Lot Detention Calculations to Establish Runoff Coefficient
Designer: SRA

Location:	**Rockingham Road, Lake Coogee**			
Nearest grid cell:	**Latitude**	**32.1375(S)**	**Longitude**	**115.7875(E)**

DEVELOPMENT ENGINEERING CONSULTANTS

Data to be Input

		ARI	v Descriptor v
Rainfall AEP (Percentage)	1	100	Infrequent
63.2% AEP Impervious Catchment (Ha)	0.022		
Required Storage (63.2% AEP - 1hr) (m^3)	3.326		

Catchment Details	Paved Area	Unpaved area	Total
Lot Area (SQM)			**300.00**
Proportion Paved	**80%**	**20%**	**100%**
Area Paved (Ha)	**0.024**	**0.006**	**0.030**
Run-Off Co-efficient(C10)	0.90	0.00	
ARI Multiplier	1.00	1.20	
Run-Off Co-efficient(Cy)	0.90	0.00	
Impervious Area(Ha)	**0.022**	**0.000**	**0.022**

Effective C
0.72

AEP	ARI	Effective C
63.2	1	0
50	1.44	0
20	4.48	0
10	9.49	0.1
5	20	0.17
2	50	0.26
1	100	0.31

Volume and Dimensions of Available Storage

Area above ground inundated to 0.03m deep	20.00	0.03	0.60
Storage provided manholes/pipe (m^3)	-		
Number of Soakwells	2.00		
Diameter of soakwells (m)	1.20		
Depth of each soakwell (m)	1.20		
Storage required soakwells (m^3)	**2.71**		
Strorage provided (m^3)	3.31		
Soakage rate ($l/s/m^2$)	0.02		

NOTE: All water is retained in soakwells up to and including 20% AEP (1 in 5yr ARI) without surcharge. For greater AEP storms water will surcharge soakwells and enter the laneway drainage system.

Volume of storage required is 1m^3 per 90.52 m^2 of total lot area

Development Engineering Consultants - Drainage Basin Spreadsheet

Project: Lots 37-40 Rockingham Road, Lake Coogee

Location: At Lot Detention Calculations to Establish Runoff Coefficient

T_C (mins)	T_C (hrs)	I (mm/hr)	Q_{IN} (l/s)	Total V_{IN} (m^3)	Q_{OUT} (soakage) (l/s)	V_{OUT} (soakage) (m^3)	Net storage (after soakage) (m^3)	V_{OUT} required (m^3)	Q_{OUT} (l/s)	Effective runoff C
10	0.17	129.00	7.7	4.64	0.60	0.36	4.28	0.97	1.61	0.15
15	0.25	103.00	6.2	5.56	0.60	0.54	5.02	1.70	1.89	0.22
20	0.33	87.30	5.2	6.29	0.60	0.72	5.56	2.25	1.87	0.26
30	0.50	68.00	4.1	7.34	0.60	1.09	6.26	2.94	1.64	0.29
45	0.75	52.80	3.2	8.55	0.60	1.63	6.92	3.61	1.34	0.30
60	1.00	44.10	2.6	9.53	0.60	2.17	7.35	4.04	1.12	0.31
90	1.50	34.40	2.1	11.15	0.60	3.26	7.89	4.57	0.85	0.30
120	2.00	28.90	1.7	12.48	0.60	4.35	8.14	4.82	0.67	0.28
150	2.50	25.85	1.6	13.96	0.60	5.43	8.53	5.21	0.58	0.27
180	3.00	22.80	1.4	14.77	0.60	6.52	8.26	4.94	0.46	0.24
240	4.00	15.10	0.9	13.05	0.60	8.69	4.35	1.04	0.07	0.06
300	5.00	14.42	0.9	15.57	0.60	10.86	4.71	1.39	0.08	0.06
360	6.00	13.74	0.8	17.81	0.60	13.04	4.77	1.46	0.07	0.06
480	8.00	12.38	0.7	21.39	0.60	17.38	4.01	0.70	0.02	0.02
720	12.00	9.71	0.6	25.17	0.60	26.07	-0.91	0.00	0.00	0.00
960	16.00	8.08	0.5	27.94	0.60	34.77	-6.83	0.00	0.00	0.00
1440	24.00	5.82	0.3	30.17	0.60	52.15	-21.98	0.00	0.00	0.00
2880	48.00	3.24	0.2	33.59	0.60	104.30	-70.71	0.00	0.00	0.00
4320	72.00	2.27	0.1	35.30	0.60	156.45	-121.14	0.00	0.00	0.00

Outflow Configuration

Flow through orifice

$Q = C_D * A_o * Sqrt(19.62 * dH)$

C_D= 0.61

Q (m^3/s)	Width of hole (mm)	Depth of hole (mm)	Ao (m^2)	Equivalent diameter (mm)	dH (m)
0.002	**12**	**12**	**0.000144**	**14**	**23.70**

Appendix F Transport Impact Statement

urbii

Sustainable Transport. Safe Solutions

Lots 37-40 Rockingham Rd, Lake Coogee

Proposed Residential Subdivision

TRANSPORT IMPACT STATEMENT



Prepared for:

Terranovis

November 2024

Lots 37-40 Rockingham Rd, Lake Coogee

Prepared for: Terranovis
Prepared by: Paul Ghantous
Date: 8 November 2024
Project number: U24.073

Version control

Version No.	Date	Prepared by	Revision description	Issued to
U24.073.r01	03/08/24	Paul Ghantous	DRAFT	Terranovis
U24.073.r01a	08/08/24	Paul Ghantous	FINAL	Terranovis
U24.073.r01b	08/11/24	Paul Ghantous	REVISED FINAL	Terranovis

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Urbii Consulting Pty Ltd
ABN 34 630 529 476
PO BOX 4315
BALDIVIS WA 6171
T: + 61 433 858 164
E: customer@urbii.com.au
W: www.urbii.com.au

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1 Introduction

This Transport Impact Statement has been prepared by Urbii on behalf of Terranovis with regards to the proposed residential subdivision at Lots 37-40 Rockingham Rd, Lake Coogee.

The subject site is situated on the eastern side of Rockingham Road, as shown in Figure 1. The site is mostly vacant with some existing homestead dwellings and structures. Stock Road runs along the eastern boundary of the site.

A residential subdivision is proposed for the site, delivering a potential 42 Lots over an area of approximately 1.9834ha.

The key issues that will be addressed in this report include the traffic generation and distribution of the proposed subdivision, traffic generation, service vehicles, car parking and access to the site for alternative modes of transport.



Figure 1: Subject site

2 Proposed subdivision

The proposed subdivision will deliver a potential 42 residential Lots, ranging between 224m^2 to 1,124m^2 in area. An internal road network is proposed with 15m wide road reservations.

The residential dwellings will be the primary generator of traffic in the subdivision. No major attractors of traffic are located within the subdivision.

The proposed subdivision plan is included in Appendix A.

3 Vehicle access and parking

The proposed road reservation layout is conceptually shown in Figure 2. Streets in the subdivision are proposed to be provided in 15m wide reservations. The internal road network provides connectivity to the external road network via two T-intersections on Rockingham Road. No road connections are proposed on Stock Road.

Lot 25 and 26 are existing dwellings which are proposed to be retained. These lots will retain the existing vehicle access on Rockingham Road. Alternative vehicle access via internal subdivision roads can be provided in the future if/when the lots are redeveloped.

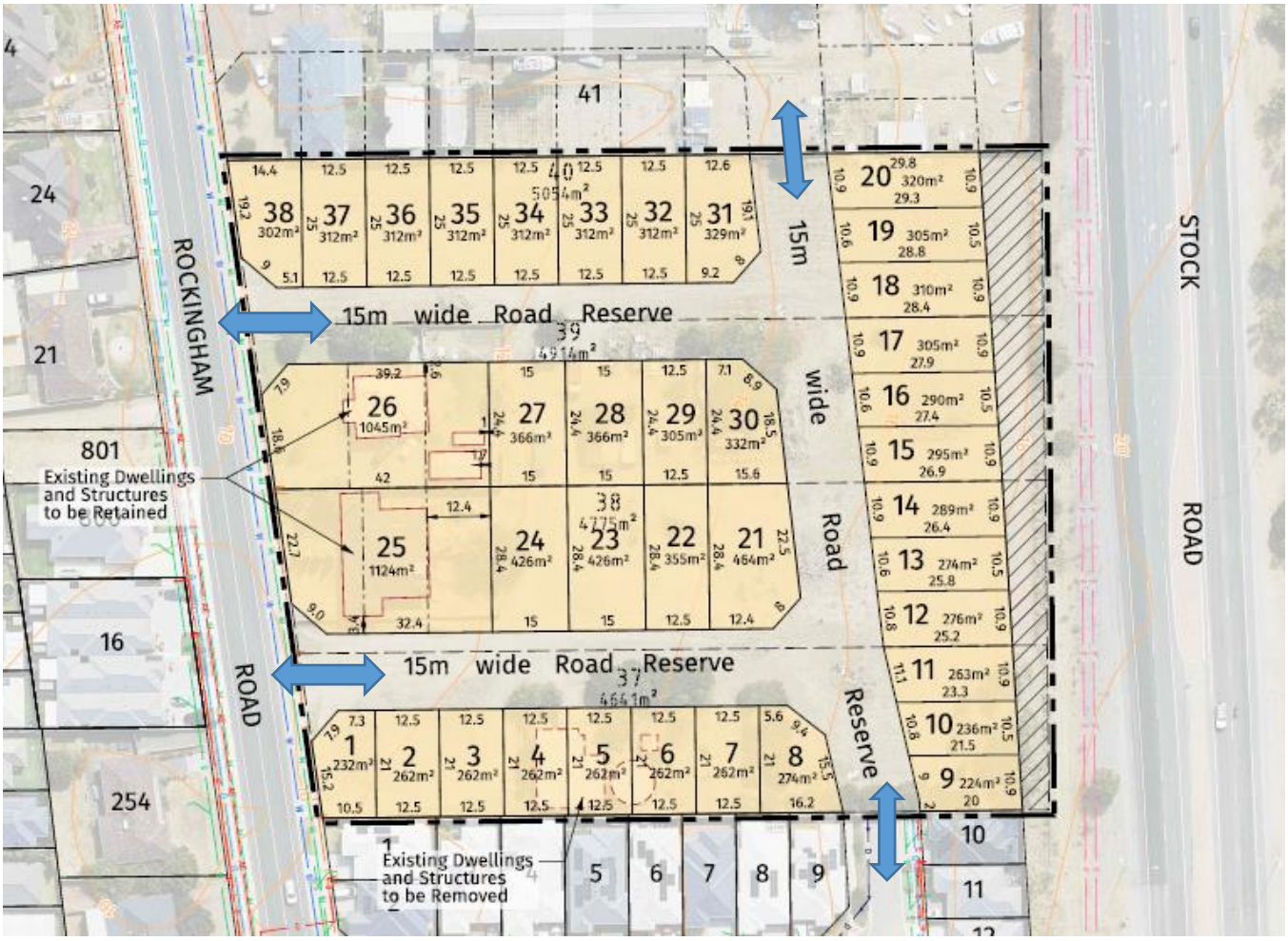


Figure 2: Proposed internal transport network

3.1 Road geometry

The proposed road reservation closely matches the typical reservation of an *Access street C* standard road in Liveable Neighbourhoods (Figure 3). An indicative street cross section is shown in Figure 4. The detailed civil design for the subdivision is still under development. However, given the road reservation width of 15m, 4.0m wide verges with 7.0m wide carriageways can accommodate the forecast internal traffic volumes. A footpath will be provided on at least one side of each street, with a minimum width of 1.5m. The footpath should ideally be positioned in the middle of the verges, with buffer space provided between the property lines and road kerbs.

Footpaths should continue through residential driveways, to reinforce priority for people using the paths.

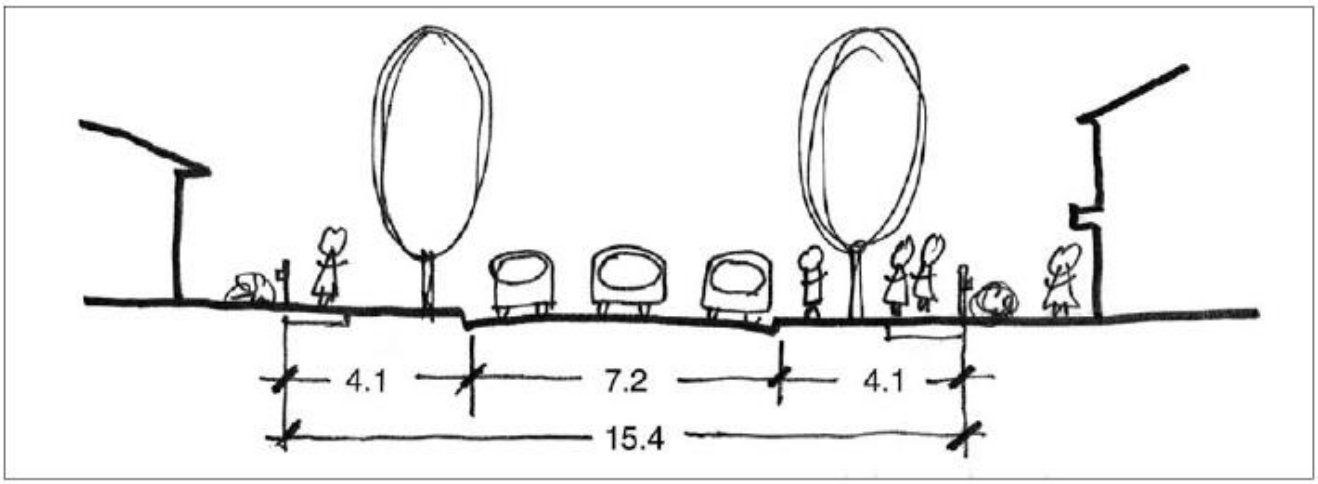


Figure 3: Access street C – typical cross section

Notes: yield (or give way) street – Target speed 40 km/hr (< 3000 vehicles per day)

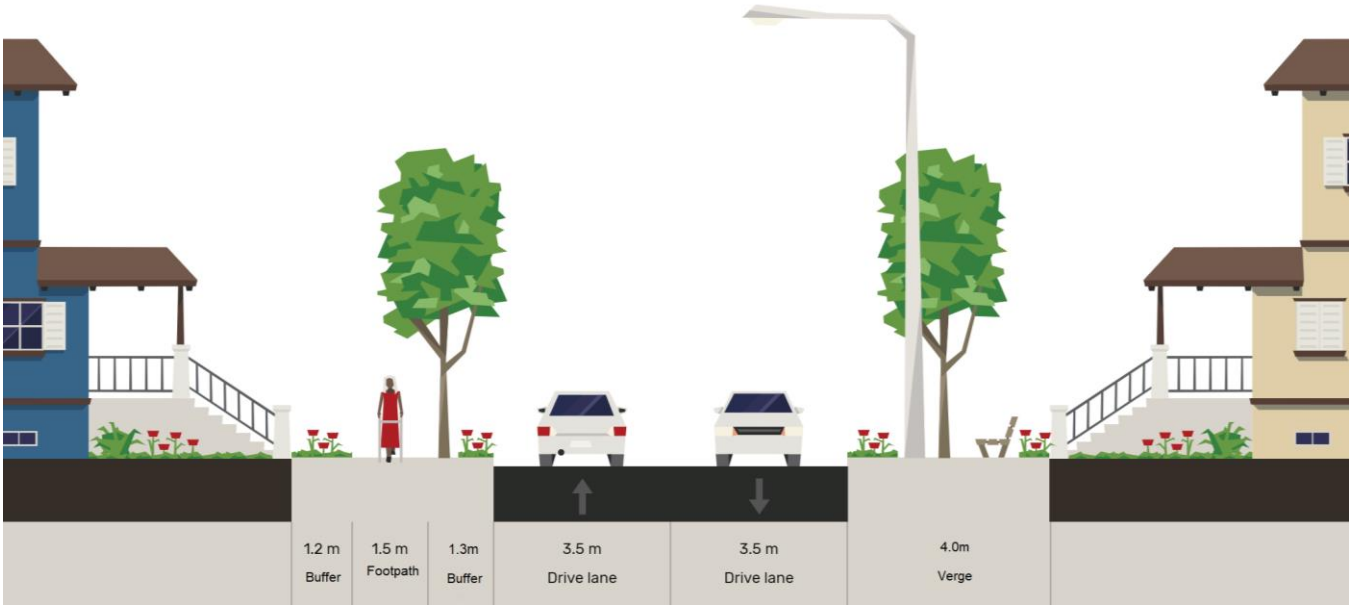


Figure 4: Indicative subdivision street cross section (15m wide reserves)

3.2 Intersections

The subdivision transport network is designed to avoid the formation of 4-way intersections internally. T-intersections are used internally and traffic will need to give-way at the end of terminating roads in accordance with road traffic regulations.

Reference was made to Australian Standard AS1742.2 - *Manual of uniform traffic control devices Part 2: Traffic control devices for general use*, for guidance on appropriate intersection controls:

2.5 CONTROL BY GIVE WAY AND STOP SIGNS

2.5.1 General

GIVE WAY signs and STOP signs are used to control traffic at intersections other than those controlled by means of roundabouts or traffic signals, by allocating priority to traffic on one of the intersecting roads.

These signs are provided as follows:

(a) GIVE WAY signs shall be provided at all intersections with four or more legs.

(b) GIVE WAY signs shall be provided at any three-way intersection where the layout is such that it is not clear how or whether the T-intersection rule would operate, for example, at a Y-intersection.

(c) GIVE WAY signs should be used for road safety reasons at unsignalized T-intersections where the continuing road (i.e. the bar of the T) is an arterial or sub-arterial road, urban or rural.

(d) STOP signs shall be provided instead of GIVE WAY signs on any controlled approach where intersection sight distance is substandard as determined in accordance with Clause 2.5.4. STOP signs shall not be used where intersection sight distance is adequate for GIVE WAY signs.

In all other cases, GIVE WAY signs are not required if the T-intersection rule operates satisfactorily and there is no requirement for STOP signs due to reduced intersection sight distance.

Figure 5: Intersection control by give way and stop signs

Source: Extracted from AS1742.2

All intersections with give way or stop signs must also be provided with give way or stop intersection line marking to indicate the safe position for a vehicle to be held at the intersection sign.

Give way or stop line marking may also be used to indicate the safe position for a vehicle to be held at a T-intersection or in any other location where a driver is legally required to give way to an intersecting or conflicting traffic stream.

At detailed civil design stage, all intersection sight distances need to be checked. At locations where sight distance is compromised, stop signs and line marking is required. At any locations where there is significant reduction in sight distance, raised intersection platforms with suitable warning signs and line marking should be considered, to slow traffic through the intersection (Figure 6). Based on the alignment of the road reserves, sight distances are expected to be

sufficient. However, sight distance will be calculated formally as part of the civil engineering design.



Figure 6: Typical raised safety platform treatment

Source: Main Roads WA *Low-Cost Urban Road Safety Program*

3.3 Parking supply and demand

All vehicle parking will be contained within individual properties. Residential streets typically permit car parking on the street for visitors and service vehicles.

4 Provision for service vehicles

The proposed subdivision is residential in nature and will not generate significant delivery and other service vehicle traffic. Bins will be presented on the internal streets for waste collection. No cul-de-sacs are proposed in the subdivision.

5 Hours of operation

For most residential subdivisions, the peak traffic hours typically coincide with the weekday AM and PM peak hours on the surrounding road network.

Traffic data obtained from Main Roads WA for Rockingham Road indicates that the weekday AM peak hour occurs between 8am to 9am and the weekday PM peak hour occurs between 4pm to 5pm (Figure 7). The peak hours for the proposed subdivision are anticipated to coincide at around these times.

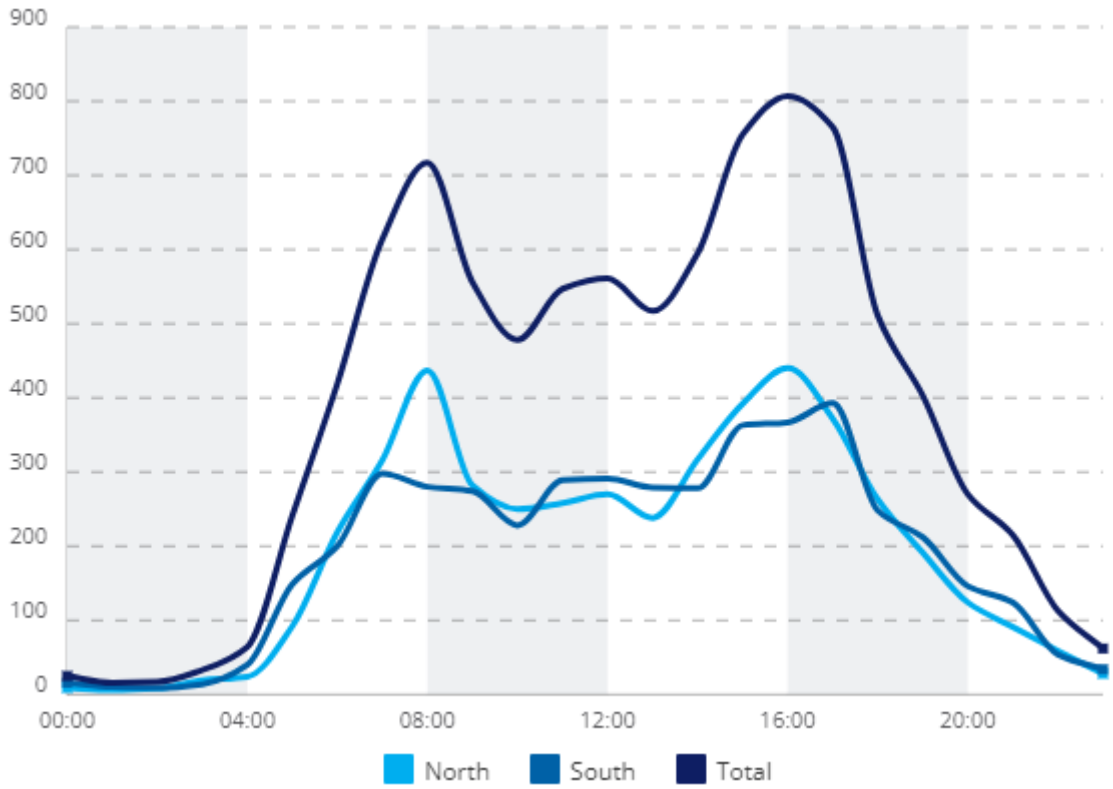


Figure 7: Hourly traffic profile – Rockingham Road

Source: Main Roads WA traffic data. Rockingham Road (North of Beeliar Drive), 2020

6 Daily traffic volumes and vehicle types

6.1 Trip generation rates

Residential traffic generation is typically estimated using the following trip generation sources:

- RTA NSW Guide to traffic generating developments;
- RTA NSW Technical direction TDT 2013/4A; and,
- WAPC *Transport Impact Assessment* Guidelines.

The trip generation rates adopted are detailed in Table 1.

Table 1: Adopted trip rates for traffic generation

Trip rate source	Daily rate	AM rate	PM rate	AM-in	AM-out	PM-in	PM-out
WAPC Guidelines (Residential dwellings)	8	0.8	0.8	25%	75%	65%	35%

6.2 Traffic generation

The estimated traffic generation of the proposed subdivision is detailed in Table 2. The proposed subdivision is estimated to generate a total of 336 vehicles per day (vpd), with 34 vehicles per hour (vph) generated during the AM and PM peak hours, respectively.

These trips include both inbound and outbound vehicle movements. It is anticipated that most of the vehicle types would be passenger cars and SUVs.

Table 2: Traffic generation – Weekday AM and PM peak hours

Land use	Quantity	Daily Trips	AM Trips	PM Trips	AM Peak Trips		PM Peak Trips	
					IN	OUT	IN	OUT
Residential	42	336	34	34	8	26	22	12

6.3 Impact on surrounding roads

The WAPC Transport Impact Assessment Guidelines for Developments (2016) provides the following guidance on the assessment of traffic impacts:

"As a general guide, an increase in traffic of less than 10 percent of capacity would not normally be likely to have a material impact on any particular section of road but increases over 10 percent may. All sections of road with an increase greater than 10 percent of capacity should therefore be included in the analysis. For ease of assessment, an increase of 100 vehicles per hour for any lane can be considered as equating to around 10 percent of capacity. Therefore, any section of road where development traffic would increase flows by more than 100 vehicles per hour for any lane should be included in the analysis."

The proposed subdivision will not increase traffic flows on any roads adjacent to the site by the quoted WAPC threshold of +100vph to warrant further analysis. Therefore, the impact on the surrounding road network is minor.

7 Traffic management on the frontage roads

Information from online mapping services, Main Roads WA, Local Government, and/or site visits was collected to assess the existing traffic management on frontage roads.

Rockingham Road is an approximately 10m wide, two-lane undivided road. Footpaths are provided along both sides of the road.

Rockingham Road is classified as a *Distributor B Road* in the Main Roads WA road hierarchy (Figure 8) and operates under a speed limit of 60km/h (Figure 9). Distributor B roads are the responsibility of Local Government and are typically for reduced capacity but high traffic volumes travelling between industrial, commercial and residential areas. (Figure 10).

Traffic count data obtained from Main Roads WA indicates that Rockingham Road carried around 9,300 vehicles per day in 2020, with 85th percentile speeds of 56km/h and 6.3% heavy vehicles.

Stock Road is an approximately 24m wide, four-lane dual carriageway road. It is abutting the site with no direct vehicle access proposed from Stock Road.

Stock Road is classified as *Primary Distributor* in the Main Roads WA road hierarchy (Figure 8) and operates under a sign posted speed limit of 70km/h (Figure 9). Primary Distributor roads are the responsibility of Main Roads Western Australia and are typically for the movement of inter-regional and/or cross town/city traffic (Figure 10).

Traffic count data obtained from Main Roads WA indicates that Stock Road carried around 24,000 vehicles per day in 2023, with 11% heavy vehicles.

The proposed subdivision is setback outside the Primary Regional Roads reservation, which is shown in Figure 11.

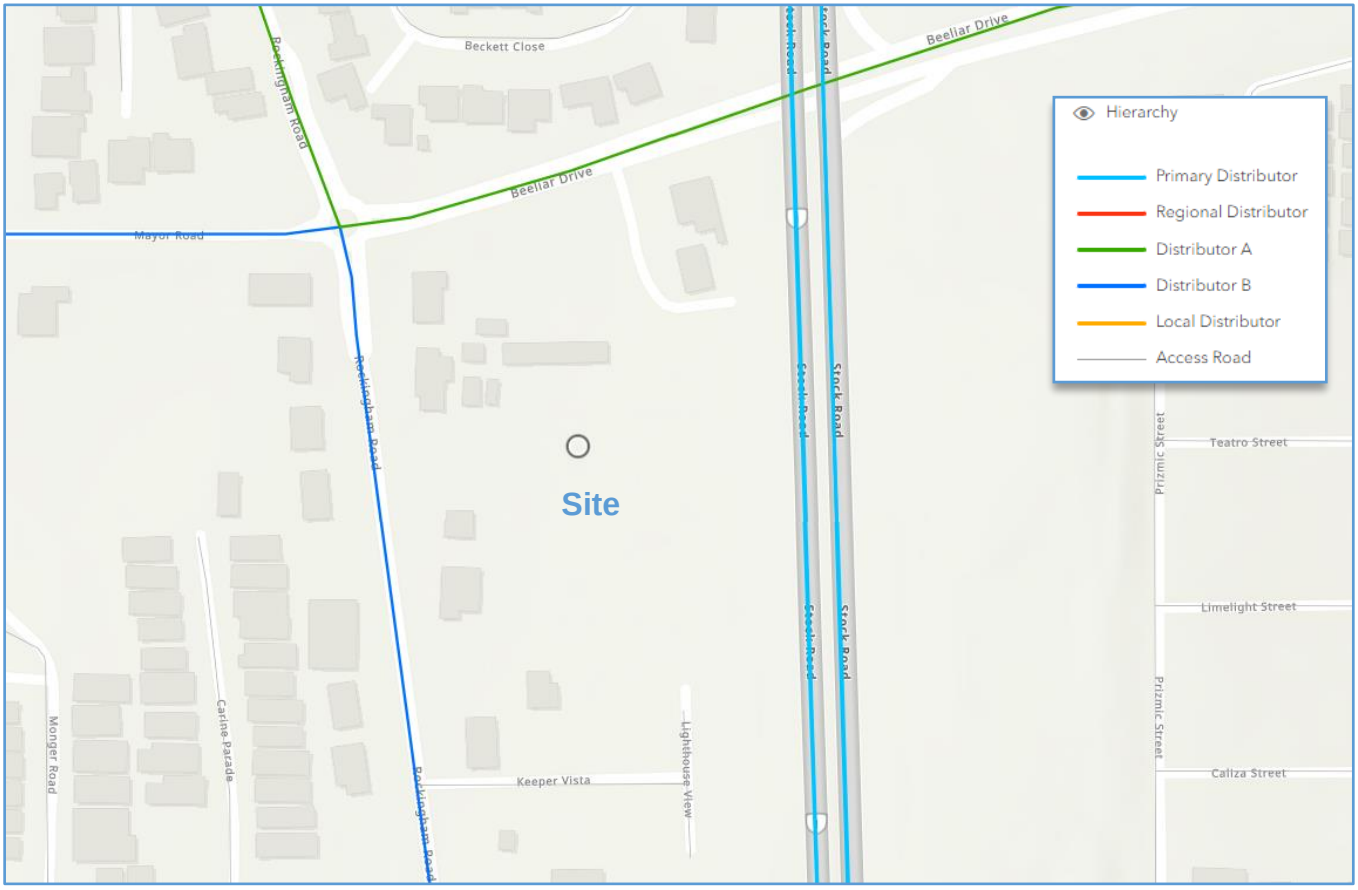


Figure 8: Main Roads WA road hierarchy plan

Source: Main Roads WA Road Information Mapping System (RIM)

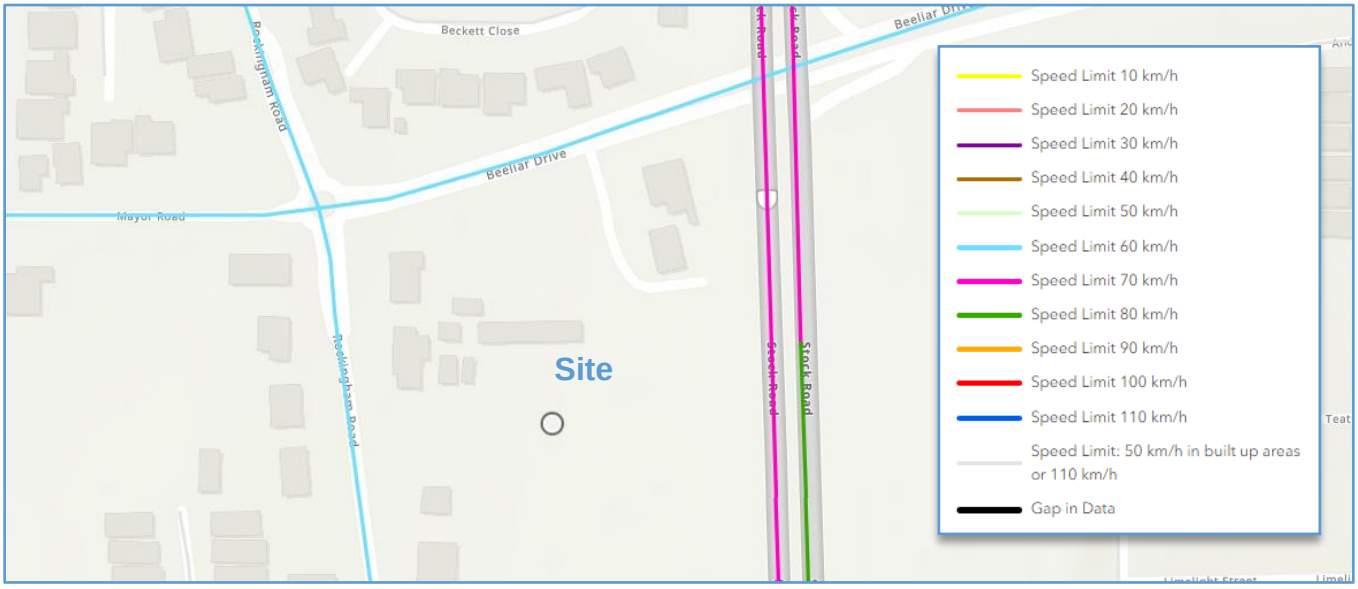


Figure 9: Main Roads WA road speed zoning plan

Source: Main Roads WA Road Information Mapping System (RIM)

ROAD HIERARCHY FOR WESTERN AUSTRALIA
ROAD TYPES AND CRITERIA (see Note 1)

CRITERIA	PRIMARY DISTRIBUTOR (PD) (see Note 2)	DISTRICT DISTRIBUTOR A (DA)	DISTRICT DISTRIBUTOR B (DB)	REGIONAL DISTRIBUTOR (RD)	LOCAL DISTRIBUTOR (LD)	ACCESS ROAD (A)
Primary Criteria						
1. Location (see Note 3)	All of WA incl. BUA	Only Built Up Area.	Only Built Up Area.	Only Non Built Up Area. (see Note 4)	All of WA incl. BUA	All of WA incl. BUA
2. Responsibility	Main Roads Western Australia.	Local Government.	Local Government.	Local Government.	Local Government.	Local Government.
3. Degree of Connectivity	High. Connects to other Primary and Distributor roads.	High. Connects to Primary and/or other Distributor roads.	High. Connects to Primary and/or other Distributor roads.	High. Connects to Primary and/or other Distributor roads.	Medium. Minor Network Role Connects to Distributors and Access Roads.	Low. Provides mainly for property access.
4. Predominant Purpose	Movement of inter regional and/or cross town/city traffic, e.g. freeways, highways and main roads.	High capacity traffic movements between industrial, commercial and residential areas.	Reduced capacity but high traffic volumes travelling between industrial, commercial and residential areas.	Roads linking significant destinations and designed for efficient movement of people and goods between and within regions.	Movement of traffic within local areas and connect access roads to higher order Distributors.	Provision of vehicle access to abutting properties
Secondary Criteria						
5. Indicative Traffic Volume (AADT)	In accordance with Classification Assessment Guidelines.	Above 8 000 vpd	Above 6 000 vpd.	Greater than 100 vpd	Built Up Area - Maximum desirable volume 6 000 vpd. Non Built Up Area – up to 100 vpd.	Built Up Area - Maximum desirable volume 3 000 vpd. Non Built Up Area – up to 75 vpd.
6. Recommended Operating Speed	60 – 110 km/h (depending on design characteristics).	60 – 80 km/h.	60 – 70 km/h.	50 – 110 km/h (depending on design characteristics).	Built Up Area 50 - 60 km/h (desired speed) Non Built Up Area 60 – 110 km/h (depending on design characteristics).	Built Up Area 50 km/h (desired speed). Non Built Up Area 50 – 110 km/h (depending on design characteristics).
7. Heavy Vehicles permitted	Yes.	Yes.	Yes.	Yes.	Yes, but preferably only to service properties.	Only to service properties.
8. Intersection treatments	Controlled with appropriate measures e.g. high speed traffic management, signing, line marking, grade separation.	Controlled with appropriate measures e.g. traffic signals.	Controlled with appropriate Local Area Traffic Management.	Controlled with measures such as signing and line marking of intersections.	Controlled with minor Local Area Traffic Management or measures such as signing.	Self controlling with minor measures.
9. Frontage Access	None on Controlled Access Roads. On other routes, preferably none, but limited access is acceptable to service individual properties.	Prefer not to have residential access. Limited commercial access, generally via service roads.	Residential and commercial access due to its historic status Prefer to limit when and where possible.	Prefer not to have property access. Limited commercial access, generally via lesser roads.	Yes, for property and commercial access due to its historic status. Prefer to limit whenever possible. Side entry is preferred.	Yes.
10. Pedestrians	Preferably none. Crossing should be controlled where possible.	With positive measures for control and safety e.g. pedestrian signals.	With appropriate measures for control and safety e.g. median/islands refuges.	Measures for control and safety such as careful siteing of school bus stops and rest areas.	Yes, with minor safety measures where necessary.	Yes.
11. Buses	Yes.	Yes.	Yes.	Yes.	Yes.	If necessary (see Note 5)
12. On-Road Parking	No (emergency parking on shoulders only).	Generally no. Clearways where necessary.	Not preferred. Clearways where necessary.	No – emergency parking on shoulders – encourage parking in off road rest areas where possible.	Built Up Area – yes, where sufficient width and sight distance allow safe passing. Non Built Up Area – no. Emergency parking on shoulders.	Yes, where sufficient width and sight distance allow safe passing.
13. Signs & Linemarking	Centrelines, speed signs, guide and service signs to highway standard.	Centrelines, speed signs, guide and service signs.	Centrelines, speed signs, guide and service signs.	Centrelines, speed signs and guide signs.	Speed and guide signs.	Urban areas – generally not applicable. Rural areas - Guide signs.
14. Rest Areas/Parking Bays	In accordance with Main Roads' *Roadside Stopping Places Policy*.	Not Applicable.	Not Applicable.	Parking Bays/Rest Areas. Desired at 60km spacing.	Not Applicable.	Not Applicable.

Figure 10: Road types and criteria for Western Australia

Source: Main Roads Western Australia D10#10992



Figure 11: Primary Regional Road reservation

8 Public transport access

Information was collected from Transperth and the Public Transport Authority to assess the existing public transport access to and from the site.

The subject site has access to the following bus services within walking distance:

- Bus Route 530: Cockburn Central Stn - Fremantle Stn via Yangebup Rd.
- Bus Route 531: Cockburn Central Stn - Fremantle Stn via Marvell Av & The Grange.
- Bus Route 532: Cockburn Central Stn - Fremantle Stn via Beeliar Dr.
- Bus Route 549: Fremantle Stn - Rockingham Stn via Rockingham Rd & Kwinana Town Centre.

Public transport services provide a viable alternative mode of transport for residents and visitors of the proposed subdivision.

The closest bus stops are located on Rockingham Road and Beeliar Drive, less than 500m walk from the site (Figure 12). Bus services provide excellent coverage and connectivity to the rail network.

The public transport network plan is shown in Figures 13 to 15.



Figure 12: Closest bus stops serving the proposed development

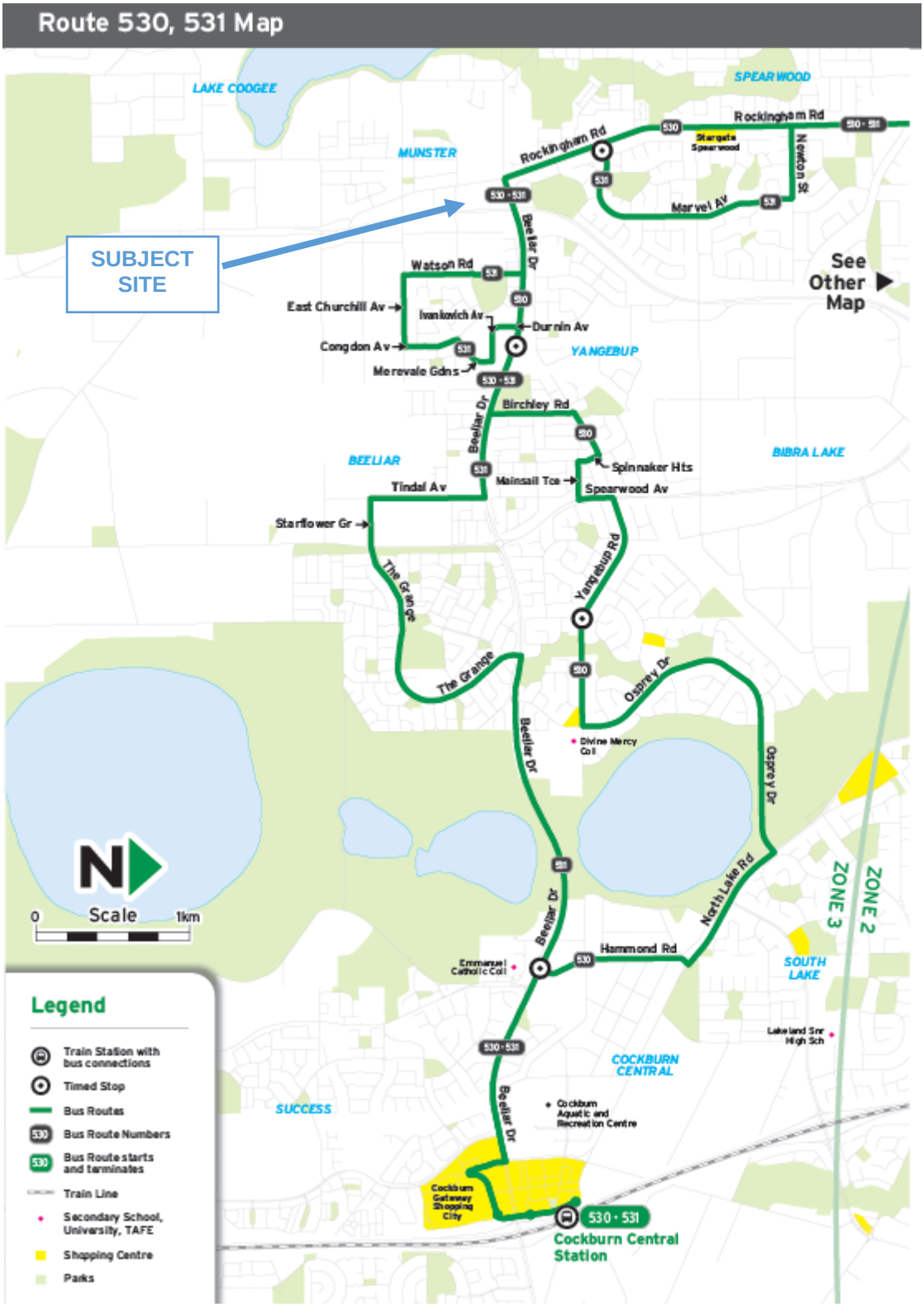


Figure 13: Transperth public transport plan (Routes 530 & 531)

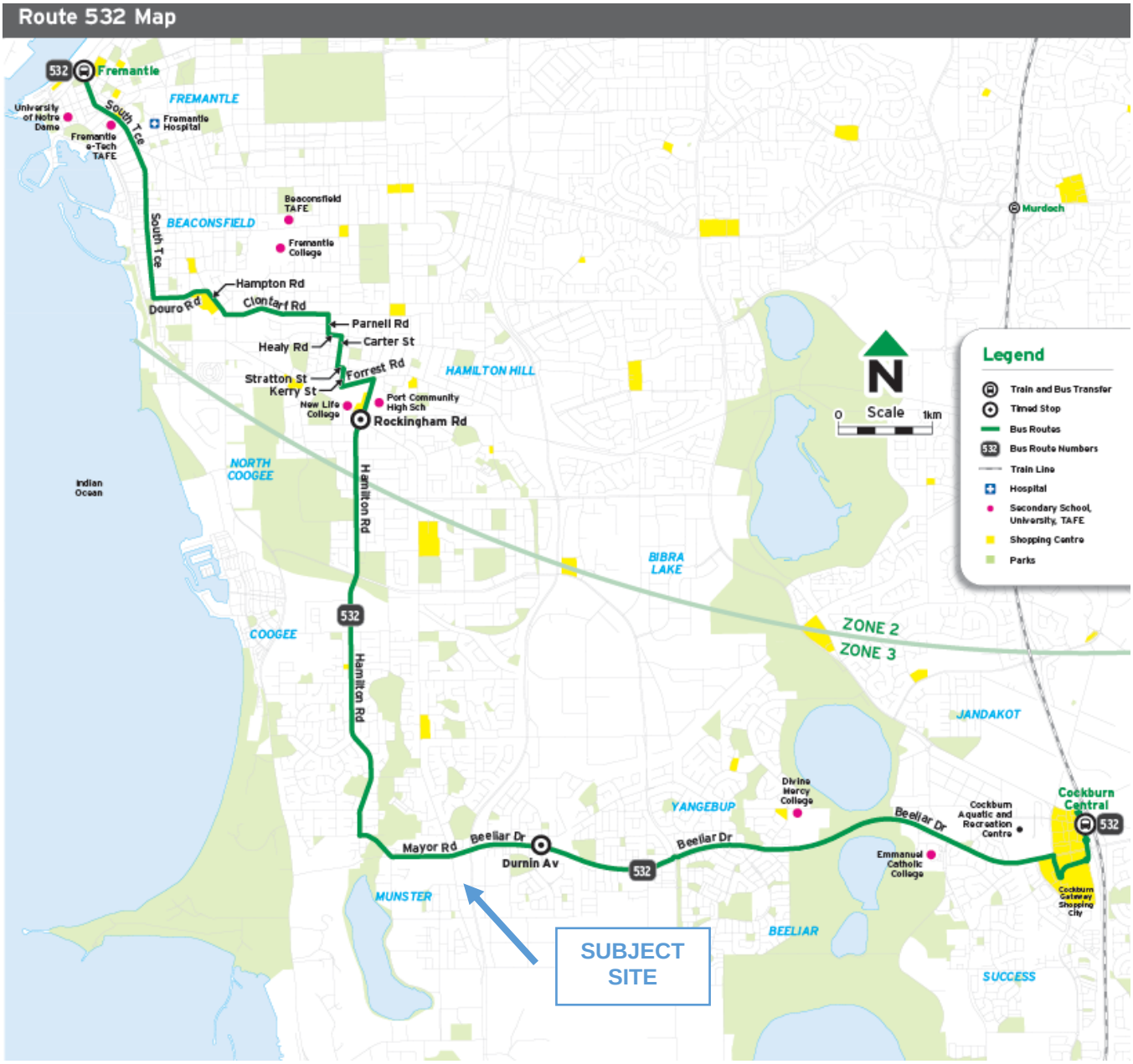


Figure 14: Transperth public transport plan (Route 532)

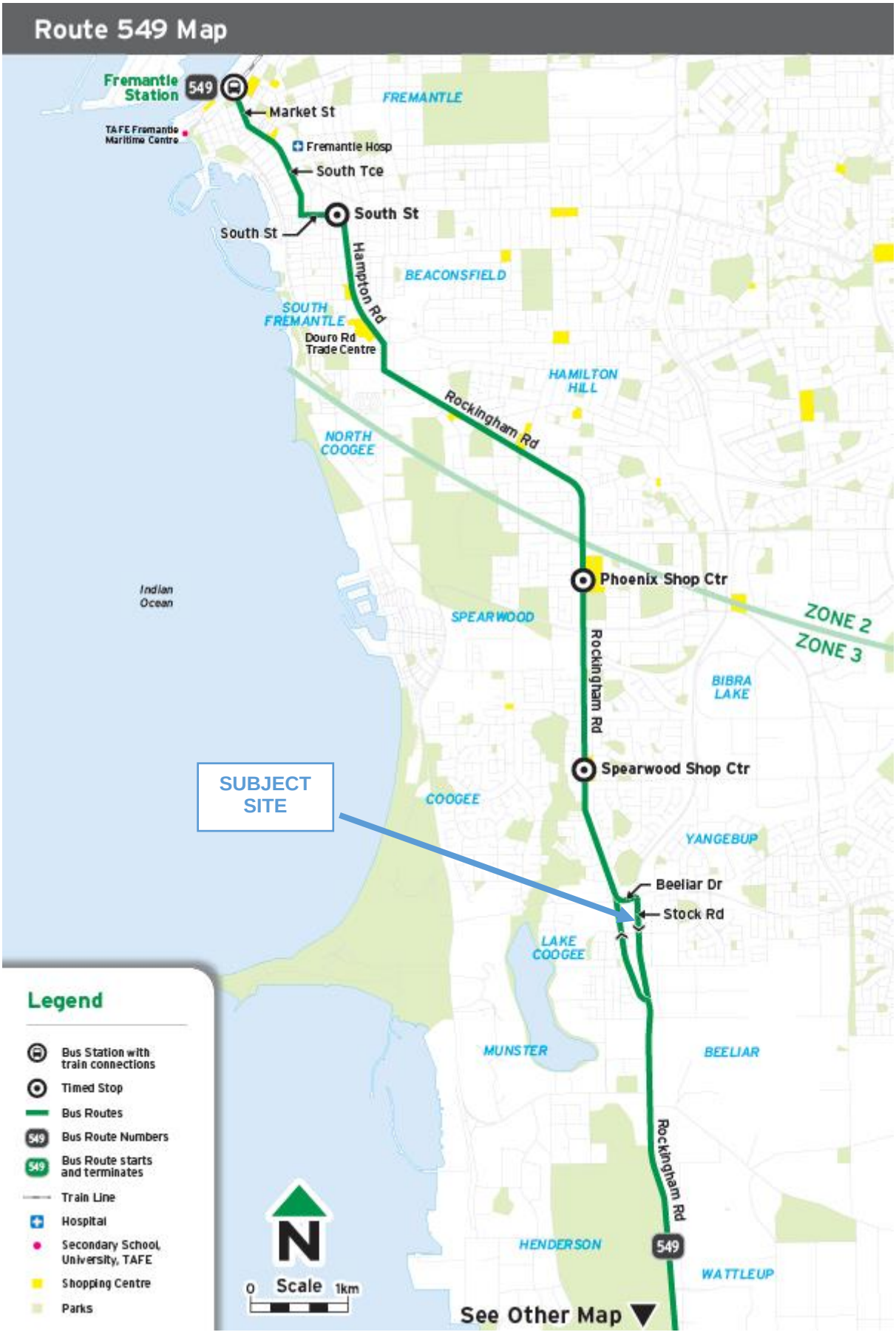


Figure 15: Transperth public transport plan (Routes 549)

9 Pedestrian access

The WAPC Transport Impact Assessment Guidelines for Developments (2016) provide warrants for installing pedestrian priority crossing facilities. This is based on the volume of traffic as the key factor determining if pedestrians can safely cross a road. The guidelines recommend pedestrian priority crossing facilities be considered once the peak hour traffic exceeds the volumes detailed in Table 3.

The traffic volumes in this table are based on a maximum delay of 45 seconds for pedestrians, equivalent to Level of Service E. Traffic volumes on the internal subdivision road network are below the threshold for safe pedestrian crossing. Therefore, pedestrian crossing level of service is satisfactory on the internal subdivision roads.

Table 3: Traffic volume thresholds for pedestrian crossings

Road cross-section	Maximum traffic volumes providing safe pedestrian gap
2-lane undivided	1,100 vehicles per hour
2-lane divided (with refuge)	2,800 vehicles per hour
4-lane undivided*	700 vehicles per hour
4-lane divided (with refuge)*	1,600 vehicles per hour

All streets in the subdivision will have a minimum 1.5m wide footpath on at least one side of the road.

10 Bicycle access

Information from online mapping services, Department of Transport, Local Government, and/or site visits was collected to assess bicycle access for the proposed development.

10.1 Bicycle network

The Department of Transport Perth Bicycle Network Map (see Figure 11) shows the existing cycling connectivity to the subject site. On-street cycling lanes on Stock Road and a shared path on Beeliar Drive are located within short cycling distance, which connect to the broader cycling network.

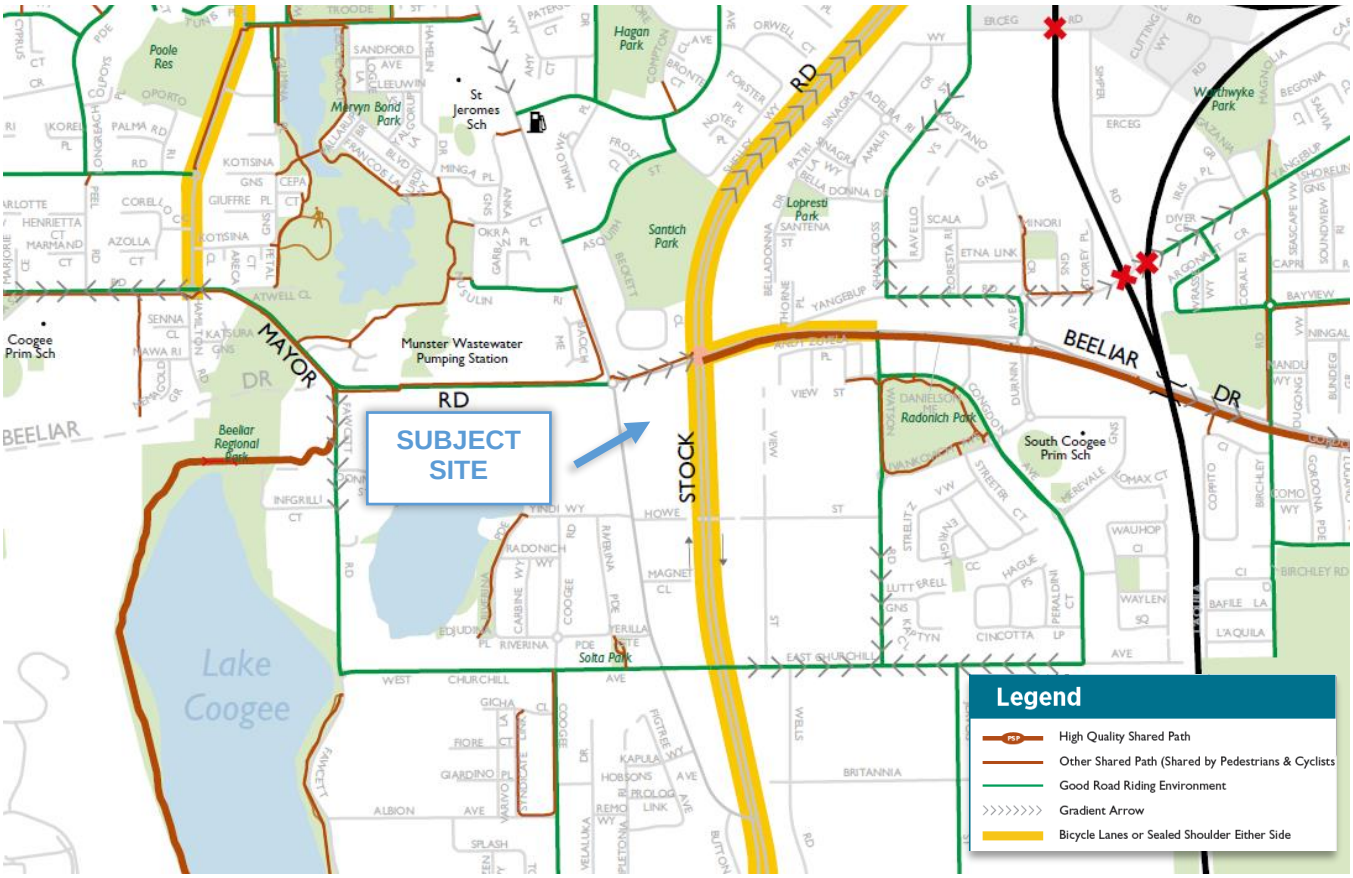


Figure 16: Perth bicycle network plan

The Cycling Aspects of Austroads Guides 2017 provides guidance on the separation of cyclists and motorists. Traffic volumes on the internal subdivision roads are typically low enough so that roads can be shared for driving and cycling (Figure 17).

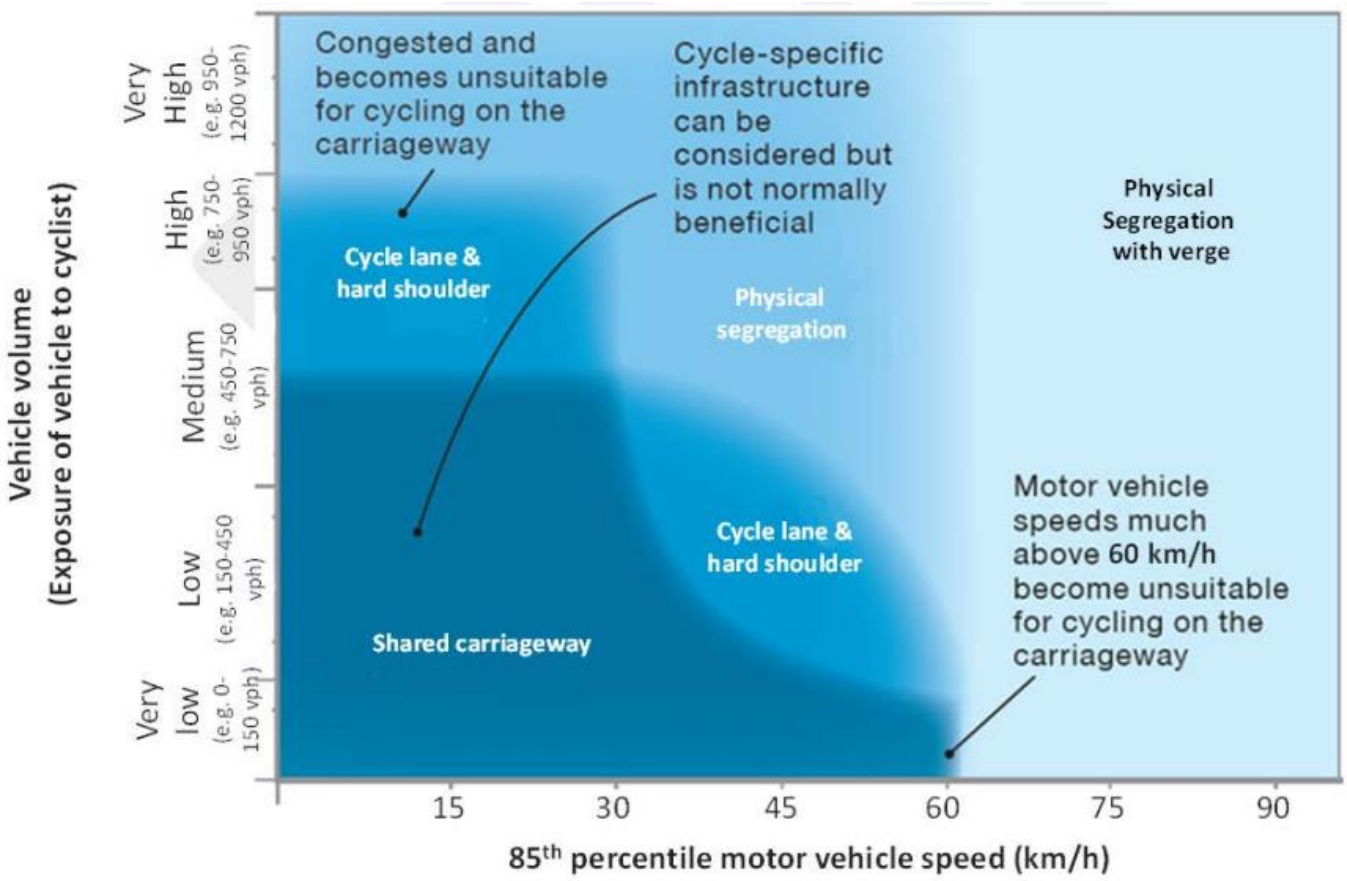


Figure 17: Guidance on the separation of cyclists and motor vehicles

Source: Cycling Aspects of Austroads Guides, June 2017

The Strava cycling heatmap tool shows that Rockingham Road and Beeliar Drive are relatively popular cycling routes in the area (Figure 18).

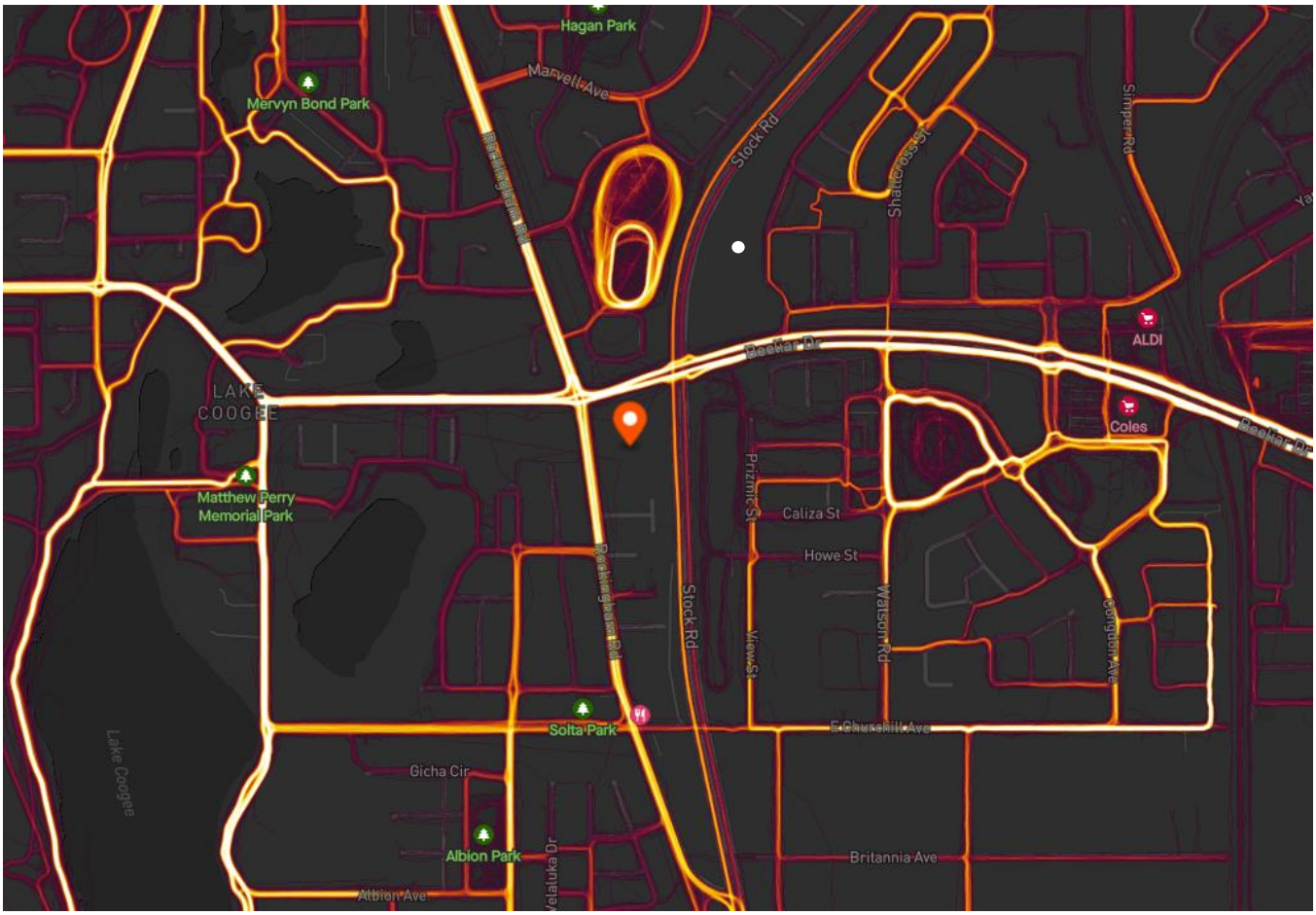


Figure 18: Strava cycling heatmap

11 Site specific issues

No additional site-specific issues were identified within the scope of this assessment.

12 Safety issues

The five-year crash history in the vicinity of the site was obtained from Main Roads WA. As detailed in Figure 19, there were 32 crashes recorded in the study area. The detailed crash record is presented in Table 4. All crashes were recorded at the roundabout intersection of Rockingham Road / Beeliar Drive.



Figure 19: 5-year crash history map (2019 to 2023)

Source: Main Roads WA crash map

Table 4: 5-year crash history summary

Severity	No.	%
Fatal	0	0
Hospital	1	3.13
Medical	2	6.25
PDO Major	24	75.00
PDO Minor	5	15.63

Year	No.	%
2019	9	28.13
2020	5	15.63
2021	5	15.63
2022	3	9.38
2023	10	31.25

Nature	No.	%
Head On	0	0
Hit Animal	0	0
Hit Object	2	6.25
Hit Pedestrian	0	0
Non Collision	0	0
Not Known	0	0
Rear End	10	31.25
Right Angle	19	59.38
Right Turn Thru	1	3.13
Sideswipe Opposite Dirn	0	0
Sideswipe Same Dirn	0	0

Light	No.	%
Dark - Street Lights Not Provided	0	0
Dark - Street Lights Off	0	0
Dark - Street Lights On	8	25.00
Dawn Or Dusk	3	9.38
Daylight	16	50.00
Not Known	0	0
Other / Unknown	5	15.63

Conditions	No.	%
Dry	24	75.00
Not Known	0	0
Wet	8	25.00

Alignment	No.	%
Curve	5	15.63
Not Known	0	0
Other / Unknown	11	34.38
Straight	16	50.00

Total	32

Period: 2019 to 2023

13 Conclusion

This Transport Impact Statement has been prepared by Urbii on behalf of Terranovis with regards to the proposed residential subdivision at Lots 37-40 Rockingham Rd, Lake Coogee.

The subject site is situated on the eastern side of Rockingham Road. The site is mostly vacant with some existing homestead dwellings and structures. Stock Road runs along the eastern boundary of the site.

A residential subdivision is proposed for the site, delivering a potential 42 Lots over an area of approximately 1.9834ha.

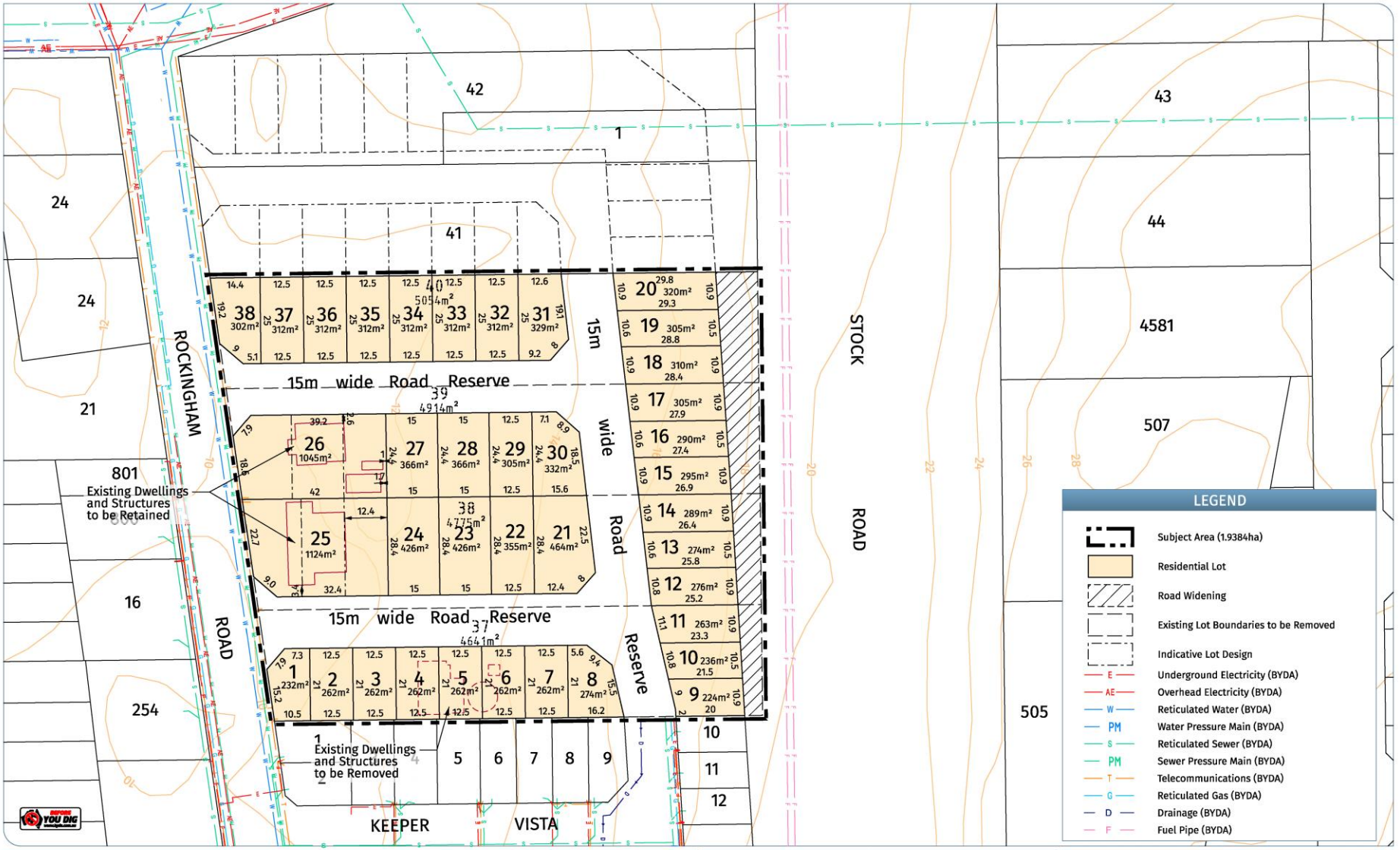
The site features good connectivity with the existing road, cycling and walking network. There is good public transport coverage through nearby bus services.

The traffic analysis undertaken in this report shows that the traffic generation of the proposed subdivision is minimal and as such would have a negligible impact on the surrounding road network.

It is concluded that the findings of this Transport Impact Statement are supportive of the proposed subdivision.

Appendices

Appendix A: Proposed subdivision plan



CONCEPT SUBDIVISION PLAN

Lots 37-40 (No. 580, 582, 854 & 586) Rockingham Road, LAKE COOGEE

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Drawn	NP
Checked	JS
Revision	D
Scale	1:1000@A3

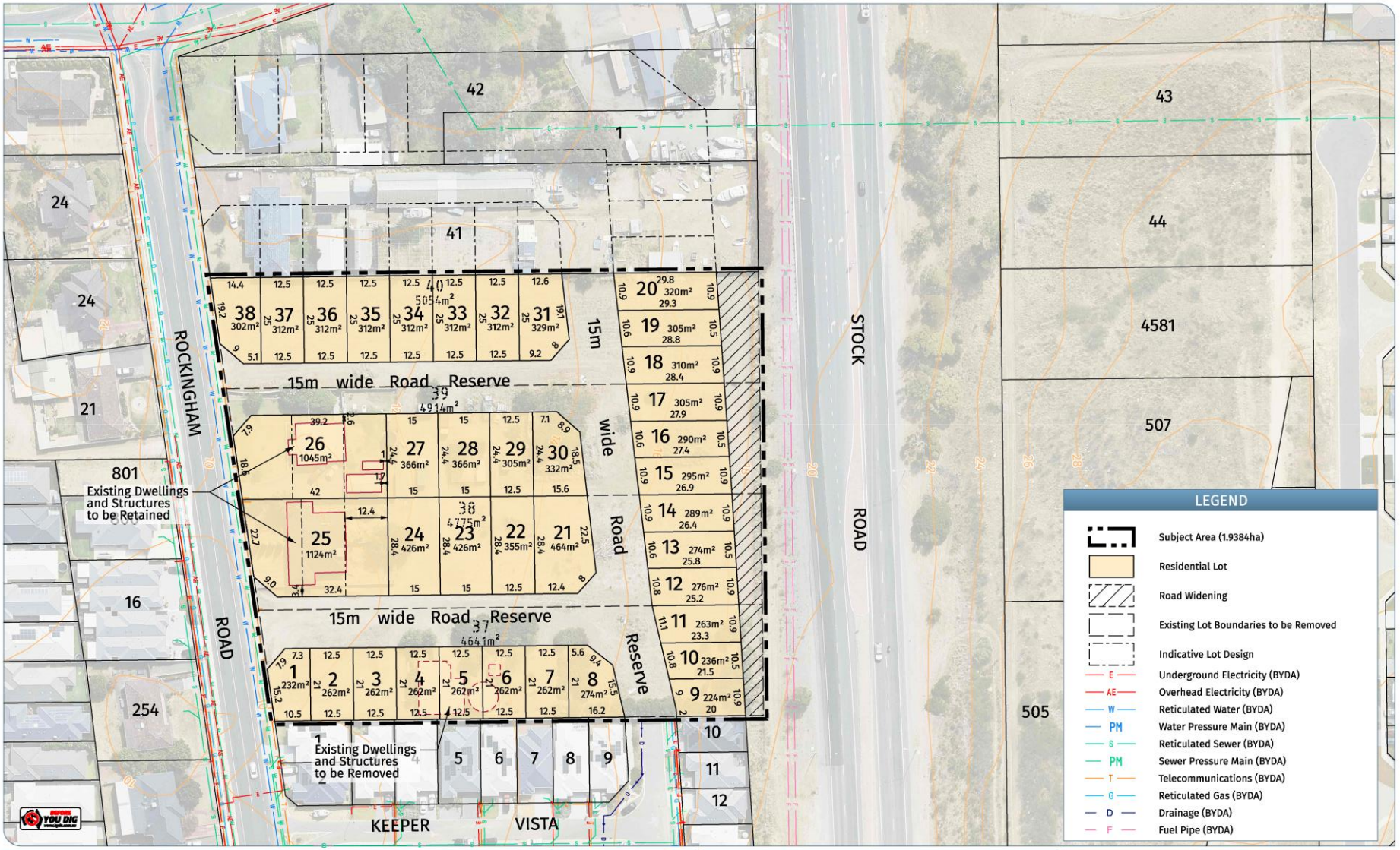
PERTH & FORRESTDALE:
Lvl 1, 252 Fitzgerald St
PERTH WA 6000
15/2 Hensbrook Loop,
FORRESTDALE WA 6112
T: 08 9495 1947
E: metro@harleydykstra.com.au
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NOTE: This plan has been prepared for planning purposes. Areas, Contours and Dimensions shown are subject to survey

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CONCEPT SUBDIVISION PLAN

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Drawn	NP
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Revision	D
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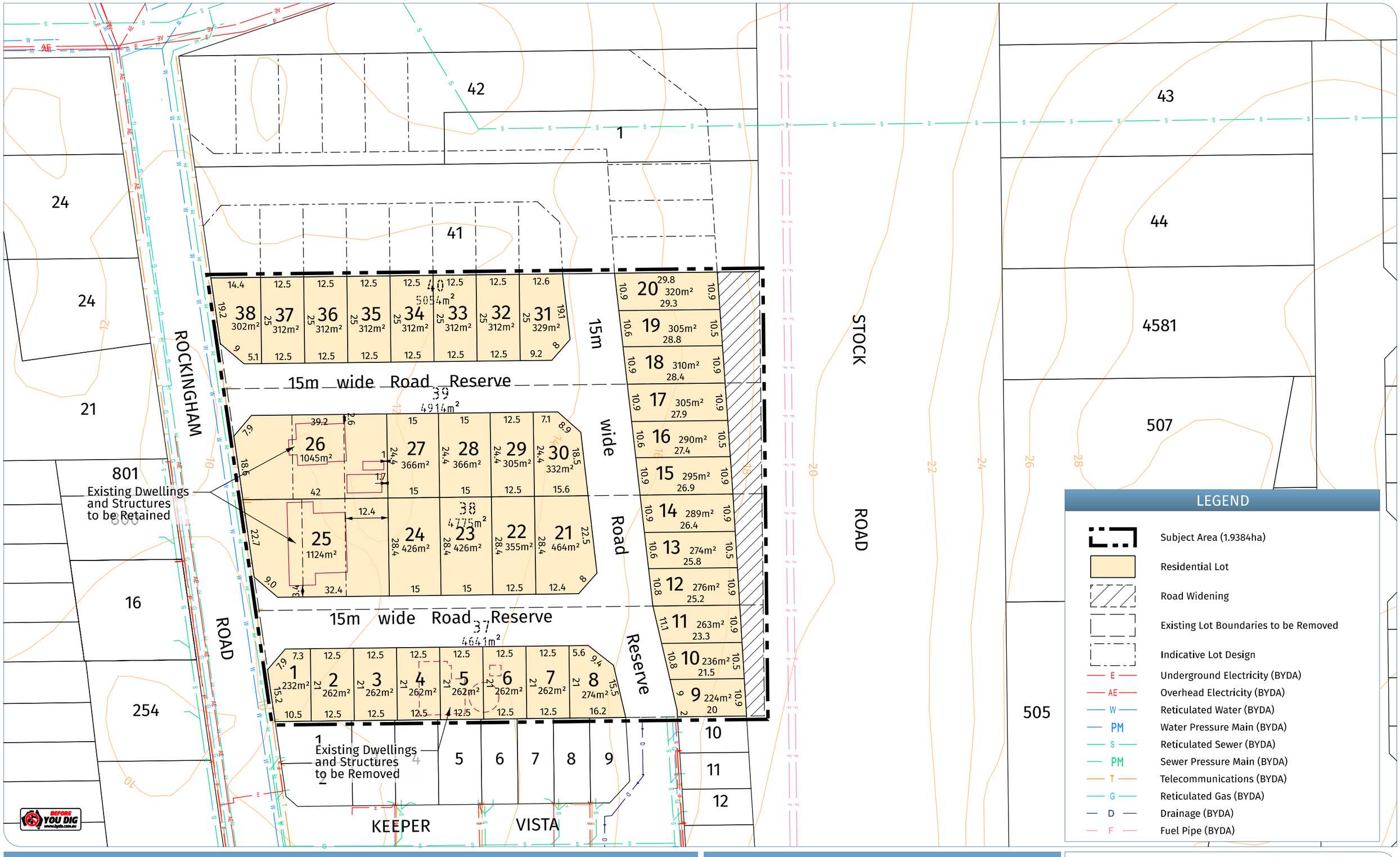
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Appendix G Lot Yield Layout



CONCEPT SUBDIVISION PLAN

Lots 37-40 (No. 580, 582, 854 & 586) Rockingham Road, LAKE COOGEE

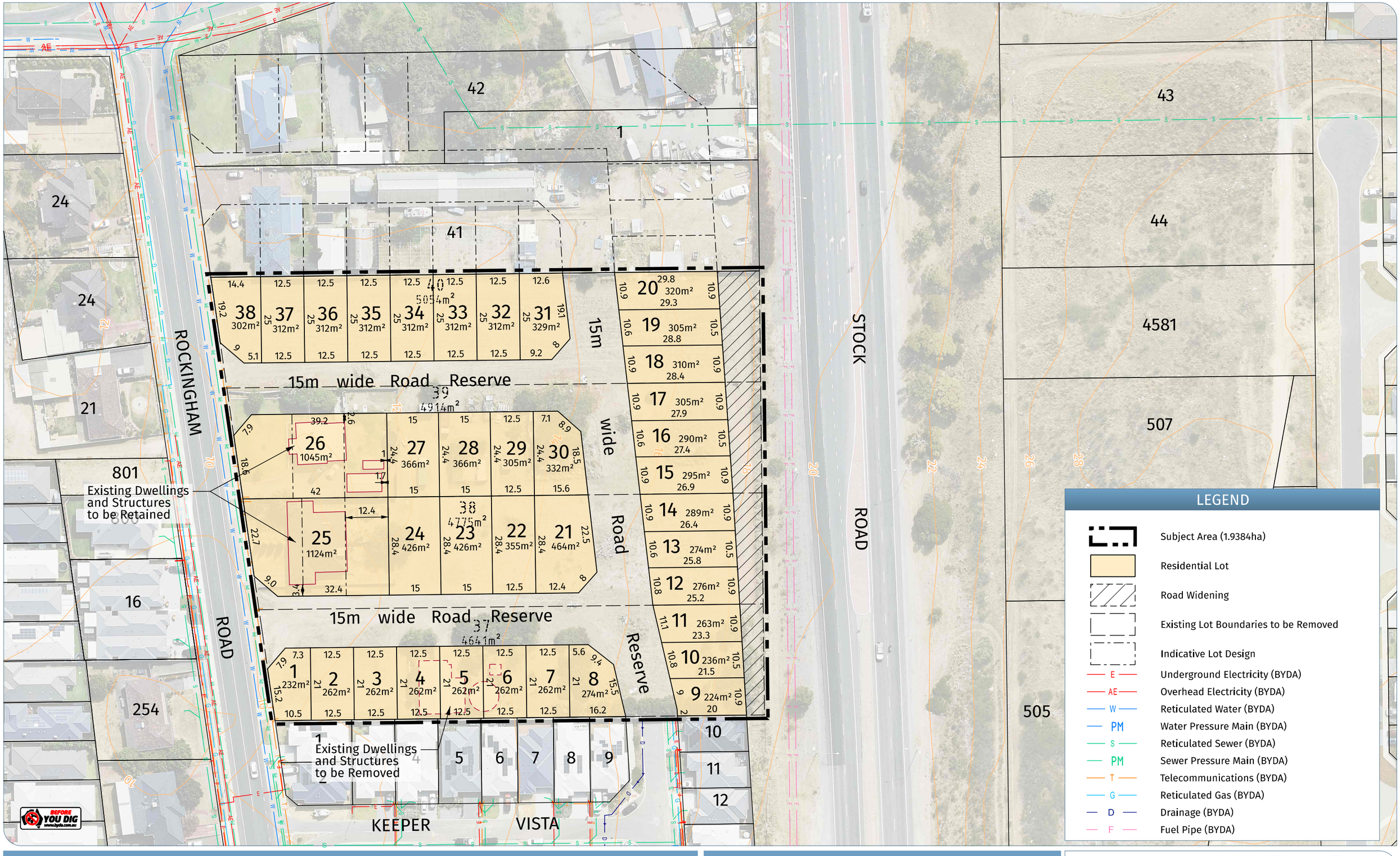
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Revision	D	
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