



PERRON GROUP

CLE Town Planning + Design

PART ONE
Implementation Section

STRUCTURE PLAN

Lots 705 & 707 Armadale Road,
Treeby

FEBRUARY 2024



Title: Lots 705 & 707 Armadale Road, Treeby
Structure Plan
Part One - Implementation Section

Prepared for: Perron Treeby Pty Ltd

CLE Reference: 2310Rep187H

Date: 22 February 2024

Status: Final

Review date: 22 February 2024

Prepared by: CLE Town Planning + Design

Project team: Town Planning + Design - CLE Town Planning + Design
Project Management - E.W.H. Pty Ltd
Engineering - Stantec
Hydrology - JDA Consulting Hydrologists
Environmental - 360 Environmental
Bushfire - Bushfire Safety Consulting
Traffic Consulting - Transcore
Acoustic - Herring Storer Acoustics
Landscape Design - EPCAD Consultants

This report is for the exclusive use of the Client, pursuant to Agreement between the Client and CLE Town Planning + Design. CLE accepts no liability or responsibility whatsoever in respect of any use of or reliance upon any information contained within this report by anyone who is not party to the Agreement and/or has come into possession of the Report through parties other than the Client or CLE.

CLE is not accountable for any information which may be contained within the Report which has been supplied by others and reproduced by CLE in this report.

Copyright and any other Intellectual Property arising from this report and the provision of the services in accordance with the Agreement belongs exclusively to CLE unless otherwise agreed and may not be reproduced or disclosed to any other person other than the Client without the express written authority of CLE.

Any reproduction by the Client is to reference CLE as the original author.

Plans and figures contained in this report have been prepared for general information purposes only and may inadvertently use uncontrolled data from external sources. CLE does not guarantee the accuracy of the plans and they should not be used for any detailed site design. The content of this report including all plans remains the property of CLE.

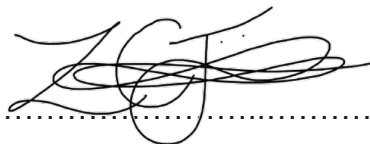
© CLE 2024

This structure plan is prepared under the provisions of City of Cockburn Town Planning Scheme No. 3.

IT IS CERTIFIED THAT AMENDMENT NO. 1 TO THE LOT 705 & 707 ARMADALE ROAD TREEBY STRUCTURE PLAN WAS APPROVED BY
RESOLUTION OF THE WESTERN AUSTRALIAN PLANNING COMMISSION ON:

10 May 2024

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

A handwritten signature in black ink, consisting of stylized, overlapping letters, positioned above a horizontal dotted line.

an officer of the Commission duly authorised by the Commission pursuant to section 24 of the *Planning and Development Act 2005* for that purpose.



Table of Amendments

AMENDMENT NO.	DESCRIPTION OF AMENDMENT	AMENDMENT TYPE	DATE APPROVED BY WAPC
1	Facilitate a childcare centre site opposite the primary school.	Minor	10 May 2024

Table of Density Plans

DENSITY PLAN NO.	AREA OF DENSITY PLAN APPLICATION	DATE APPROVED BY WAPC
CLE Ref. 2310-268B-01	All land with residential permissibility.	19 November 2020

CONTENTS

EXECUTIVE SUMMARY

- 1.0 STRUCTURE PLAN AREA
- 2.0 STRUCTURE PLAN CONTENT
- 3.0 STRUCTURE PLAN OPERATION
- 4.0 STAGING
- 5.0 SUBDIVISION AND DEVELOPMENT REQUIREMENTS
 - 5.1 Zones and Reserves
 - 5.2 Residential Densities
 - 5.2.1 Dwelling Target
 - 5.2.2 Residential Density
 - 5.2.3 Locational Criteria
 - 5.3 Residential Design Code Variations
 - 5.4 Local Centre Zone
 - 5.5 Public Open Space
- 6.0 LOCAL DEVELOPMENT PLANS

7.0 OTHER REQUIREMENTS

- 7.1 Vehicle Access to Armadale Road
- 7.2 Notifications on Title
- 7.3 Development Contributions

8.0 ADDITIONAL INFORMATION

PLANS

Structure Plan (CLE Ref. 2310-317A-01)

R-Code Plan (CLE Ref. 2310-268B-01)

EXECUTIVE SUMMARY

The structure plan for Lots 705 and 707 Armadale Road is prepared on behalf of landowners Perron Treeby Pty Ltd, a subsidiary of The Perron Group.

Lots 705 and 707 Armadale Road contain 48 hectares of Urban-zoned land and upon completion of development are anticipated to yield between 600 - 700 residential dwellings, a primary school, district playing fields, and a local centre.

The structure plan area has historically been used for sand quarrying and brick processing. Development of the site represents an outstanding opportunity to not only remediate the former quarry, but also to deliver a high quality residential estate in this highly sought-after infill precinct.

The structure plan provides a robust framework that is responsive to the physical attributes of the site, and its planning context within the broader Treeby DSP area. In addition to the land uses described above, the structure plan provides for the following attributes to be delivered as part of future subdivision and development:

A development concept that responds to the unique and challenging physical attributes of the site, including topography, vegetation, and interface to adjoining landholdings with varying land uses.

A flexible housing density range in order to ensure that lot and housing product can respond to market demand as it arises, as well as opening opportunities for innovative medium-density development in appropriate locations.

A designated 'Urban Core' located between two high-amenity areas of open space, a local centre and a future bus route, and with the potential to increase the diversity of the housing offering across the site.

Approximately 4.5 hectares of public open space, including district playing fields and a feature park with a lake and multi-access play facilities.

The retention and recognition of approximately 12.3ha of Bush Forever Area 390, including a management framework for ensuring the long term viability of the retained bushland.

A safe and permeable road network, including localised treatments of access streets to provide usable spaces for community connection, along with provision for future connections to other residential areas to the north and west of the structure plan area.

A plan that responds to bushfire and traffic noise hazards through the design approach, and the implementation of suitable built form controls.

An innovative response to the management of surface and groundwater, which includes at-source infiltration, sub-surface storage within the district open space, and subsoil drainage to manage fluctuating groundwater.

A comprehensive servicing strategy that ensures the site can be provided with essential infrastructure in keeping with development staging.

Further detail on the land use breakdown as proposed by this structure plan is provided in Table 1: Summary Table.



Table 1: Summary Table

ITEM	DATA	STRUCTURE PLAN REF.
Structure Plan area (gross Urban-zoned, ha)	47.9	Part 1, s. 1 Structure Plan Map
Residential (Net Developable, ha)	23.4	Structure Plan Map
Commercial (gross, ha)	0.8	Structure Plan Map
Estimated lot yield	600 - 700	Part 1, s. 5.2.1
Estimated dwelling yield	600 - 700	Part 2, s. 3.1
Estimated dwelling density	13-15 dph (gross Urban-zoned)	Part 1, s. 5.2.1
	26-28 dph (Net Developable)	Pat 2, s. 3.2.1
Estimated population	1625-1750	Part 1, s. 5.2.1
Number of secondary schools	Nil	Part 2, s. 3.6
Number of primary schools	One	Part 2, s. 3.6
Estimated commercial floorspace (Net Lettable, ha)	0.1	Part 1, s. 5.3
		Pat 2, s. 3.7
Open space (ha)	4.83	Part 2, s. 3.4

1.0 STRUCTURE PLAN AREA

This structure plan applies to the land within the line identified as the 'Structure Plan Boundary' on Plan A: Lots 705 and 707 Armadale Road, Treeby Structure Plan ('the Structure Plan Map').

2.0 STRUCTURE PLAN CONTENT

This structure plan consists of:

- Part One – Implementation Section (this section);
- Part Two – Explanatory Report; and
- Appendices – Technical reports supporting the structure plan.

Part One of the structure plan comprises the structure plan map and planning provisions. Part Two and all Appendices are a reference provided to guide the interpretation and implementation of Part One.

3.0 STRUCTURE PLAN OPERATION

This structure plan is prepared in accordance with Part 4 of Schedule 2 (Deemed Provisions) in the Planning and Development (Local Planning Schemes) Regulations 2015 ('the Regulations'). It fulfills the requirements of City of Cockburn Town Planning Scheme No. 3 for the applicable 'Development' zone.

The Regulations require decision-makers to have due regard for the provisions of this structure plan, which takes effect on the date on which it is approved by the Western Australian Planning Commission ('WAPC').

Unless otherwise specified in this Part, all words and expressions used in this structure plan have the same meaning as the same words and expressions in the Regulations and City of Cockburn Town Planning Scheme No. 3 (as amended).

4.0 STAGING

Subdivision and development of land within the structure plan area will be staged in an orderly fashion in response to service availability and market preferences. It is currently anticipated that development will commence in the south-eastern corner of the structure plan area to enable construction of the Armadale Road entrance, and proceed westward, then northward.

5.0 SUBDIVISION AND DEVELOPMENT REQUIREMENTS

5.1 Zones and Reserves

Subdivision and development of land within the structure plan area should be in accordance with the structure plan and the corresponding zone or reserve under City of Cockburn Town Planning Scheme No. 3.

5.2 Residential Densities

5.2.1 Dwelling Target

It is the objective of this structure plan to provide a minimum of 600 lots within the structure plan area, consistent with the Liveable Neighbourhoods objective of 22 dwellings per site hectare in new urban areas. Assuming 2.6 people per household, this accommodates a population of 1560.

5.2.2 Residential Density

The residential density ranges applicable to the structure plan area are shown on the Structure Plan Map. Specific residential density codes will be applied at the subdivision stage through an R-Code Plan assessed and approved by the WAPC.

The R-Code Plan:

- a. Is required to be submitted with each subdivision application/s, and shall be consistent with the density ranges and locational criteria in this structure plan.
 - b. Is to include a summary of the proposed lot yield of the subdivision application to which it relates.
 - c. Forms part of this structure plan once it has been approved by the WAPC (as part of its determination of the subdivision application).
 - d. May be varied subject to the further approval of the WAPC. A varied R-Code Plan will replace (entirely or partially) the previously-approved R-Code Plan.
- e. May not be required if the WAPC considers that the subdivision application is for one or more of the following:
 - (i) Amalgamation of lots, including for land assembly;
 - (ii) Provision of access, services or infrastructure;
 - (iii) Non-residential use, with reference to the zone or reserve indicated on this structure plan; or
 - (iv) In accordance with an already approved R-Code Plan.

5.2.3 Locational Criteria

- a. The allocation of residential densities shall be generally in accordance with the following criteria:
- b. A base residential density coding of R30 applies across the structure plan area.
- c. An R40 coding may be applied for lots that:
 - (i) Abut areas of POS;
 - (ii) Are serviced via a rear laneway;
 - (iii) Have frontage to a designated bus route; or
 - (iv) Are located at the end of a street block.
- d. An R60 or R80 coding may be applied to lots within the 'Urban Core' precinct shown on the structure plan map.

5.3 Residential Design Code Variations

The City of Cockburn Local Planning Policy 1.16 'Single House Standards for Medium Density Housing in the Development Zone' sets out acceptable variations to the deemed-to-comply provisions of the R-Codes for lots coded R25-R60. Except in a situation where an approved Local Development Plan (LDP) imposes R-Code variation to the deemed-to-comply provisions of the R-Codes, the standards set out in Local Planning Policy 1.16 shall apply to this Structure Plan.

5.4 Local Centre Zone

- a. A Local Centre comprising up to 1500 square metres of net lettable retail floorspace is permitted in the Local Centre zone adjacent to the lake.
- b. The Local Centre zone adjacent to the primary school is intended for a non-retail function. Any retail floorspace proposed for this site should be justified in the context of the City of Cockburn Local Commercial and Activity Centres Strategy.
- c. A Net Benefit Test in accordance with State Planning Policy 5.4: Activity Centres will be required if a proposal exceeds the retail floorspace envisaged by provisions (a) and (b) above.

5.5 Public Open Space

- a. A minimum of 10 per cent of the gross subdivisible area is to be provided as public open space, in accordance with the WAPC's Liveable Neighbourhoods policy. Public open space is to be provided generally in the locations shown on the Structure Plan Map and landscaped generally in accordance with the Landscape Management Plan appearing as an Appendix to this structure plan.

- b. Residential development in the Local Centre zone adjacent to the primary school is not assumed in the POS Schedule provided with this structure plan. Should residential development occur in this location, the POS Schedule should be updated and any POS shortfall covered through either a land or cash-in-lieu contribution, at the City's discretion.

5.6 Bush Forever Interface

The majority of the interface to Bush Forever Area 390 is to be landscaped and managed in accordance with the principles set out in the Environmental Assessment Report, Landscape Strategy and any future Management Plan appearing as an Appendices to this structure plan.

6.0 LOCAL DEVELOPMENT PLANS

At the subdivision stage, the City of Cockburn may request that the WAPC impose a condition/s of approval requiring local development plan/s to be prepared, in accordance with Part 6 of the Regulations, for lots that;

- Are rear-loaded (laneway access);
- Abut areas of POS;
- Are within the 'Urban Core' shown on the Structure Plan Map;
- Are within the Local Centre zone adjacent to the lake;

- May be affected by road transport noise and require noise mitigation measures at the development stage (as determined by the acoustic assessment appended to Part 2); and/or
- May be affected by aircraft noise and require noise mitigation measures at the development stage.

7.0 OTHER REQUIREMENTS

7.1 Vehicle Access to Armadale Road

Vehicle access is to be provided to the structure plan area via a gazetted road connecting to the Liddelow Road /Armadale Road roundabout.

7.2 Notifications on Title

In respect of applications for the subdivision of land the City of Cockburn may recommend to the WAPC that a condition be imposed on the granting of subdivision approval for a notification to be placed on the Certificate(s) of Title(s) of affected lots to advise of the following:

- a. The lot is situated in the vicinity of the Armadale Road transport corridor and is currently affected, or may in the future be affected by transport noise.
- b. This land is within a bushfire prone area as designated by an Order made by the Fire and Emergency Services Commissioner and is subject to a Bushfire Management Plan. Additional planning and building requirements may apply to development on this land.

- c. This lot is situated in the vicinity of Jandakot Airport, and is currently affected, or may in the future, be affected by aircraft noise. Noise exposure levels are likely to increase in the future as a result of increases in numbers of aircraft using the airport, changes in aircraft type or other operational changes. Further information about aircraft noise, including development restrictions and noise insulation requirements for noise-affected properties, are available on request from the relevant local government offices.

7.3 Development Contributions

This structure plan area is subject to the requirements of Development Contribution Plan Nos. 13 and 15 as detailed in Clause 5.3 and Table 10 of the City of Cockburn Town Planning Scheme No. 3.

7.4 Bushfire Hazard Management

The landowner/developer is to ensure compliance with State Planning Policy 3.7 - Planning in Bushfire-Prone Areas and the associated Guidelines for Planning in Bushfire-Prone Areas for each stage of subdivision.

8.0 ADDITIONAL INFORMATION

At the subdivision stage, as relevant, the WAPC may require and/or impose a condition/s of approval requiring the preparation and submission of the following technical reports:

ADDITIONAL INFORMATION	APPROVAL STAGE	CONSULTATION REQUIRED
Bushfire Management Plan (BAL Contour Plan)	Subdivision (pre-approval)	City of Cockburn Department of Fire and Emergency Services WAPC
Urban Water Management Plan	Subdivision (condition of approval)	City of Cockburn Department of Water and Environmental Regulation WAPC

Local road network and public open space is indicative only and subject to change and refinement at subdivision stage.

LEGEND

ZONES

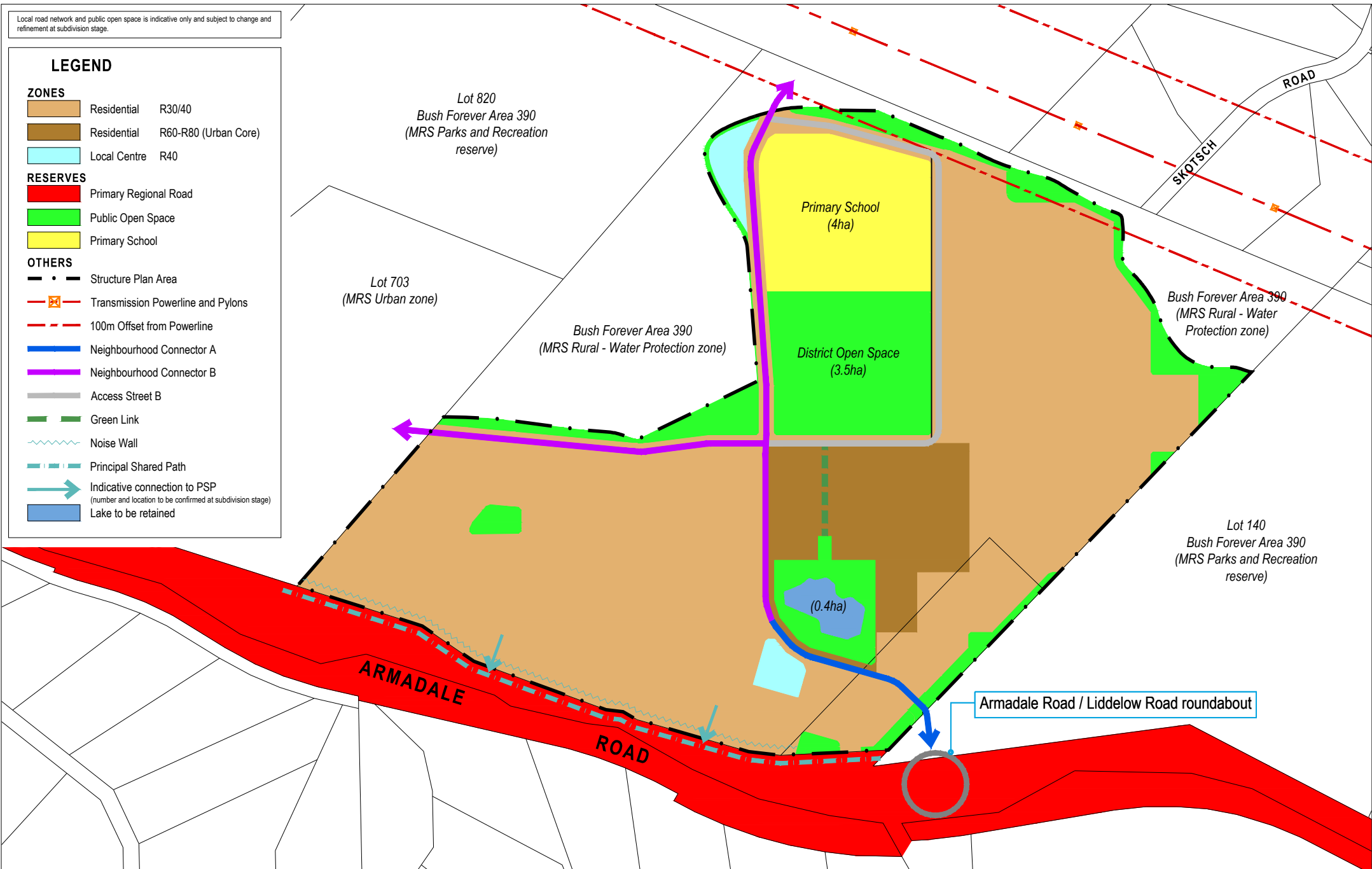
- Residential R30/40
- Residential R60-R80 (Urban Core)
- Local Centre R40

RESERVES

- Primary Regional Road
- Public Open Space
- Primary School

OTHERS

- Structure Plan Area
- Transmission Powerline and Pylons
- 100m Offset from Powerline
- Neighbourhood Connector A
- Neighbourhood Connector B
- Access Street B
- Green Link
- Noise Wall
- Principal Shared Path
- Indicative connection to PSP
(number and location to be confirmed at subdivision stage)
- Lake to be retained







P E R O N G R O U P

CLE Town Planning + Design

PART TWO

Explanatory Section

STRUCTURE PLAN

Lots 705 & 707 Armadale Road,
Treeby

FEBRUARY 2024



Title: Lots 705 & 707 Armadale Road, Treeby
Structure Plan
Part Two - Explanatory Section

Prepared for: Perron Treeby Pty Ltd

CLE Reference: 2310Rep188D

Date: 21 February 2024

Status: Final

Review date: 21 February 2024

Prepared by: CLE Town Planning + Design

Project team: Town Planning + Design - CLE Town Planning + Design
Project Management - E.W.H. Pty Ltd
Engineering - Stantec
Hydrology - JDA Consulting Hydrologists
Environmental - 360 Environmental
Bushfire - Bushfire Safety Consulting
Traffic Consulting - Transcore
Acoustic - Herring Storer Acoustics
Landscape Design - EPCAD

This report is for the exclusive use of the Client, pursuant to Agreement between the Client and CLE Town Planning + Design. CLE accepts no liability or responsibility whatsoever in respect of any use of or reliance upon any information contained within this report by anyone who is not party to the Agreement and/or has come into possession of the Report through parties other than the Client or CLE.

CLE is not accountable for any information which may be contained within the Report which has been supplied by others and reproduced by CLE in this report.

Copyright and any other Intellectual Property arising from this report and the provision of the services in accordance with the Agreement belongs exclusively to CLE unless otherwise agreed and may not be reproduced or disclosed to any other person other than the Client without the express written authority of CLE.

Any reproduction by the Client is to reference CLE as the original author.

Plans and figures contained in this report have been prepared for general information purposes only and may inadvertently use uncontrolled data from external sources. CLE does not guarantee the accuracy of the plans and they should not be used for any detailed site design. The content of this report including all plans remains the property of CLE.

CONTENTS

- 1.0 PLANNING BACKGROUND**
 - 1.1 Introduction and Purpose
 - 1.2 Land Description
 - 1.3 Planning Framework
- 2.0 SITE CONDITIONS AND CONSTRAINTS**
 - 2.1 Biodiversity and Natural Area Assets
 - 2.2 Landform and Soils
 - 2.3 Groundwater and Surface Water
 - 2.4 Bushfire
 - 2.5 Heritage
- 3.0 PROPOSED LAND USES**
 - 3.1 Plan Overview
 - 3.2 Residential
 - 3.3 Movement Network
 - 3.4 Public Open Space and Drainage
 - 3.5 Water Management
 - 3.6 Schools
 - 3.7 Activity Centres and Employment
 - 3.8 Infrastructure Co-ordination, Servicing and Staging
 - 3.9 Bushfire Hazard Management
 - 3.10 Transport Noise
 - 3.11 Building Requirements
 - 3.12 Developer Contributions

APPENDICES

- Appendix 1 Environmental Assessment Report (360 Environmental)
- Appendix 2 Bushfire Management Plan (Bushfire Safety Consulting)
- Appendix 3 Landscape Strategy (EPCAD)
- Appendix 4 Local Water Management Strategy (JDA Consulting Hydrologists)
- Appendix 5 Transport Impact Assessment (Transcore)
- Appendix 6 Traffic Acoustic Assessment (Herring Storer Acoustics)
- Appendix 7 Engineering Infrastructure Report (Wood & Grieve Engineers)
- Appendix 8 Explanatory Report for Amendment 1

1.0 PLANNING BACKGROUND

1.1 Introduction and Purpose

The Lots 705 and 707 Armadale Road, Treeby Structure Plan ('structure plan') has been prepared by CLE Town Planning + Design on behalf of the landowner, Perron Treeby Pty Ltd. The structure plan is prepared in accordance with Clause 15 of Schedule 2 – Deemed Provisions of the *Planning and Development (Local Planning Schemes) Regulations 2015*.

The structure plan provides a framework to guide the future subdivision and development of a portion of Lots 705 and 707 Armadale Road, Treeby ('the structure plan area'). The structure plan refines and supplements the planning detail in the Treeby District Structure Plan ('the Treeby DSP'), ensuring that all relevant environmental, social and economic matters are appropriately addressed before urban development proceeds.

The format of the structure plan accords with the Western Australian Planning Commission (WAPC) Structure Plan Framework (2015). The structure plan consists of two parts and technical appendices:

Part 1: Implementation Section - contains the Structure Plan Map and the planning provisions and requirements that will facilitate implementation of the initiatives described in the Explanatory Section. These provisions will guide future subdivision and development applications in the structure plan area.

Part 2: Explanatory Section - discusses the key outcomes and planning implications of the background and technical reports and describes the vision and planning justification for the structure plan area.

Technical Appendices – includes the following technical reports, which have been prepared in order to demonstrate the conformance of the structure plan with all statutory requirements and inform key land-use elements. The appendices are as follows:

1. Environmental Assessment Report (360 Environmental);
2. Bushfire Management Plan (Bushfire Safety Consulting);
3. Landscape Strategy (EPCAD);
4. Local Water Management Strategy (JDA Consulting Hydrologists);
5. Transport Impact Assessment (Transcore);
6. Traffic Acoustic Assessment (Herring Storer Acoustics); and
7. Engineering Infrastructure Report (Wood & Grieve Engineers).

The project team is largely the same as that which prepared the Treeby District Structure Plan, and as such is familiar with the site and its context. The structure plan will play a significant role in the growth of the emerging Treeby community through the creation of 600-700 lots, a primary school, district playing fields and a local centre.

Preparation of this structure plan has been undertaken in consultation with the City of Cockburn, the Department of Planning, Lands and Heritage, Main Roads WA, the Department of Biodiversity, Conservation and Attractions, the Department of Water and Environmental Regulation and relevant service authorities in accordance with the requirements of the Structure Plan Framework.

The following figures are included with this report:

Figure 1	Location Plan
Figure 2	Context Plan
Figure 3	Site Plan
Figure 4	MRS Plan
Figure 5	TPS 3 Plan
Figure 6	Treeby DSP
Figure 7	Topographic Map
Figure 8	Concept Master Plan
Figure 9	Forecast Traffic Volumes
Figure 10	Proposed Pedestrian and Cyclist Network
Figure 11	Landscape Master Plan
Figure 12	Concept Plan for Lake Park
Figure 13	Concepts for Estate Entry
Figure 14	Cross sections for key interfaces with BFA 390 (South)
Figure 15	Cross sections for key interfaces with BFA 390 (North)
Figure 16	Indicative throat treatment in accordance with Safe Street Principles
Figure 17	1EY Stormwater Event Plan
Figure 18	Staging Plan
Figure 19	BAL Contour Plan
Figure 20	Quiet House Design Requirement assuming 2.4m high noise wall

1.2 Land Description

1.2.1 Location

The structure plan area is located in the City of Cockburn, approximately 3km east of the Cockburn secondary centre and 20km south of the Perth city centre (refer Figure 1: Location Plan).

The structure plan area is located on the northern side of Armadale Road. It abuts vacant land zoned 'Urban' under the Metropolitan Region Scheme ('MRS') to the west, and Bush Forever sites reserved for 'Parks and Recreation' to the north-west and east. To the north is the Skotsch Road rural-residential area and vacant land identified for urban purposes in the Treeby DSP (refer Figure 2: Context Plan).

The Kwinana Freeway is located to the west of the subject land and can be accessed via the Armadale Road interchange at Cockburn Central.

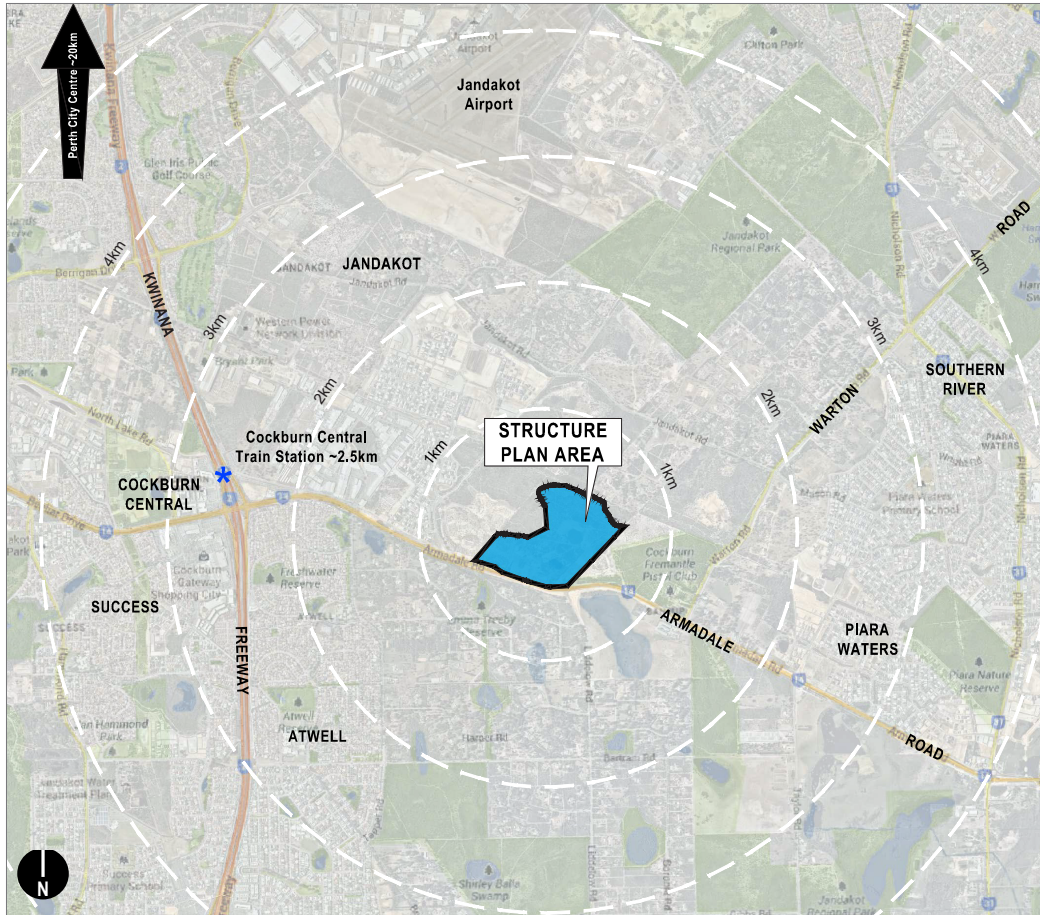


Figure 1 - Location Plan
Source: Nearnap



Figure 2 - Context Plan
Source: Nearnap



Figure 3 - Site Plan
Source: Nearmap

[1.2.2 Area and Land Use](#)

The structure plan area covers approximately 48 hectares and is largely cleared, having been used until recently as a sand quarry and brickworks (refer Figure 3: Site Plan). Part of Bush Forever Area 390 ('BFA 390') covers land to the north-west and north-east, generally coinciding with remnant vegetation

[1.2.3 Legal Description and Ownership](#)

The structure plan area consists of two separate titles on Armadale Road, as described in Table 1 below.

Table 1: Legal Description of Land

Lot / Reserve Number	Plan	Volume / Folio	Gross Area (ha)	Total Urban Area (ha)	Ownership
705	DP 413032	2941 / 50	58.5	44.4	Perron Developments No.2 Pty Ltd
707	DP 413033	2948 / 711	3.0	3.0	Perron Developments No.2 Pty Ltd
TOTAL			61.5	47.4	

1.3 Planning Framework

[1.3.1 Metropolitan Region Scheme](#)

The structure plan area is zoned 'Urban' in the MRS. The structure plan area was rezoned from 'Rural-Water Protection' to 'Urban' through MRS Amendment 1346/57 in April 2019 (refer Figure 4: MRS Zoning Plan).

In the vicinity of the structure plan area:

- The parts of Lot 705 that are not covered by this structure plan are zoned 'Rural-Water Protection' and form part of BFA 390;
- Lot 131 Jandakot Road, north-west of the structure plan area, is another former quarry site and is also in the control of Perron. It is partly zoned 'Urban' and partly zoned 'Rural-Water Protection' under the MRS. The portion zoned 'Rural-Water Protection' is part of BFA 390.
- North-east of the structure plan area is the Skotsch Road rural-residential precinct. This is currently zoned 'Rural-Water Protection' and is identified for 'Planning Investigation' in the Framework;
- Lot 820 Ghostgum Avenue, west of the structure plan area, and Lot 140 Armadale Road, to the east, is reserved for 'Parks and Recreation', and the 'Water Catchments' overlay applies. Both are part of BFA 390;
- Lot 703 Ghostgum Avenue, west of the structure plan area, is zoned 'Urban' and developing as the 'Kara' residential estate; and
- The Armadale Road reserve to the south is reserved for 'Primary Regional Roads'. South of Armadale Road is land generally zoned 'Rural-Water Protection' and developed for rural-residential purposes.

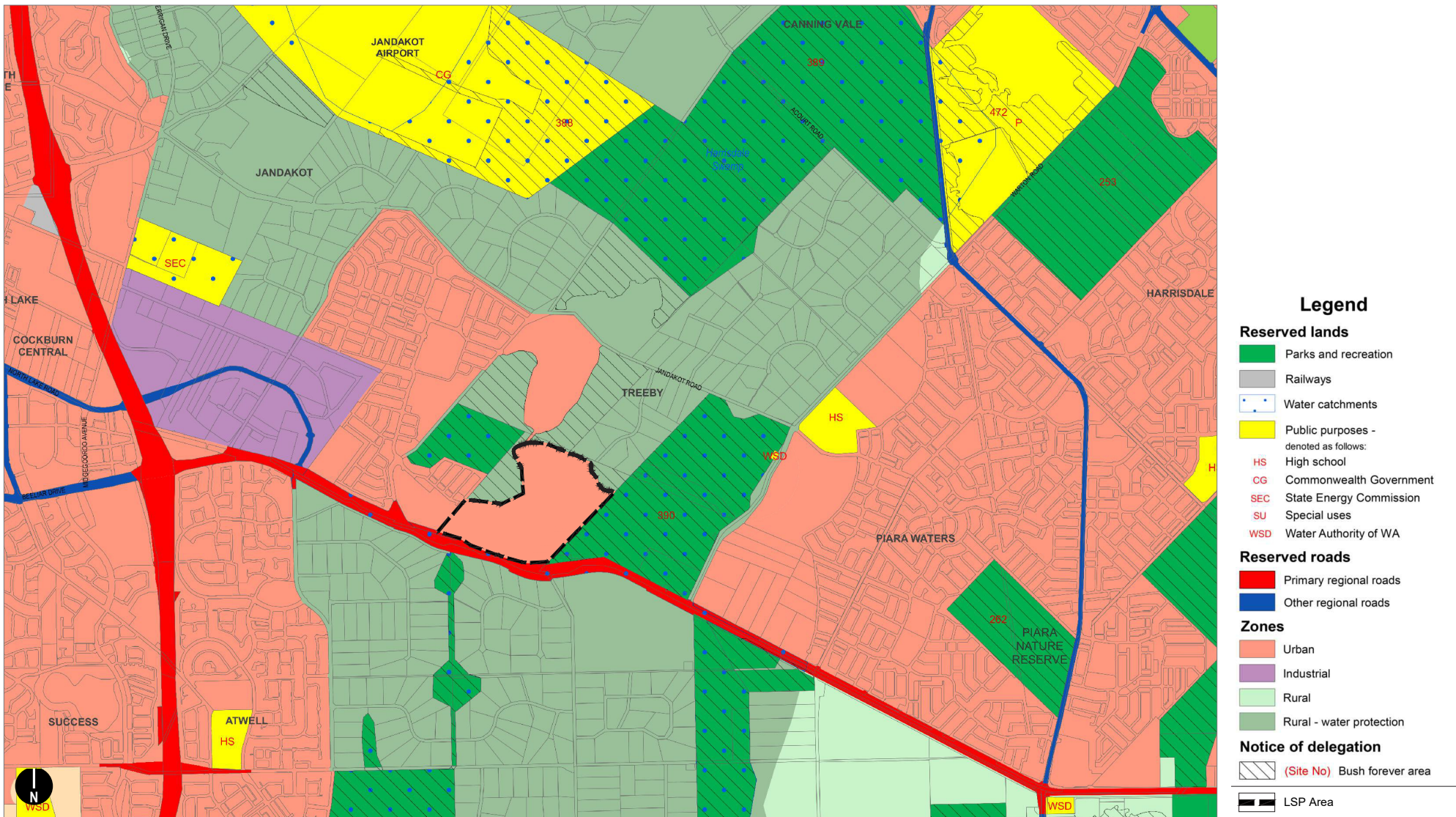


Figure 4 - MRS Map
Source: MNG 20130820_98202opm-002a



[1.3.2 City of Cockburn Town Planning Scheme No. 3](#)

The structure plan area is currently zoned 'Development' under the City of Cockburn's Town Planning Scheme No.3 ('TPS 3').

The purpose of the 'Development' zone is to facilitate the co-ordinated planning of sites for subdivision and development through structure plans. Table 9 of TPS 3 sets out the requirements and special conditions for each 'Development' zone, which are summarised in Table 2 below.

The site also falls within an area where development contributions will be required under TPS 3. For further information refer to section 3.11 of Part 2 of the Structure Plan, and section 5.3 and Table 10 of TPS 3.

Table 2: Development Area 43 Provisions

Reference No.	Area	Provisions
DA 43	Lots 705 and 707 Armadale Rd, Treeby	<ol style="list-style-type: none"> 1. An approved Structure Plan together with all the approved amendments shall be given due regard in the assessment of applications for subdivision, land use and development in accordance with Clause 27(1) of the Deemed Provisions. 2. The Structure Plan is to provide for an appropriate mix of residential and compatible land uses.



- LEGEND**
- REGION SCHEME RESERVES (MRS)**
- Other Regional Roads
 - Parks and Recreation
 - Primary Regional Roads
 - Railways
 - Water Catchments
 - Public Purposes
 - Public Purposes - High School
- LOCAL SCHEME RESERVES**
- Lakes and Drainage
 - Local Road
 - Parks and Recreation
 - Public Purposes : Primary School
 - Public Purposes : Water Corporation
- LOCAL SCHEME ZONES**
- Development
 - Industry
 - Lakes and Drainage
 - Local Centre
 - Mixed Business
 - Residential
 - Resource
 - Rural
 - Rural Living
 - Special Use
- OTHER CATEGORIES**
- Local Government Boundary
 - R20 R Codes
 - Additional Uses
 - Restricted Uses
 - Special Use Area
 - Building Envelope
 - DA1 Development Area
 - Development Contribution Area
 - Subject Site

Figure 5 - TPS Plan
Source: WAPC

[1.3.3 Strategic Planning Context](#)

1.3.3.1 Perth and Peel @ 3.5 million

The *Perth and Peel @ 3.5 million* (March 2018) suite of policies forms the spatial framework and strategic plan for Perth and Peel. Its purpose is to establish a blueprint for supporting a population of 3.5 million by 2050 through the finalisation of four sub-regional planning frameworks. The structure plan area is within the South Metropolitan-Peel area (see Section 1.3.3.2 below).

1.3.3.2 South Metropolitan-Peel Sub-regional Planning Framework

The Framework is part of the *Perth and Peel @ 3.5 million* suite of documents and provides guidance at a sub-regional level for land use and infrastructure. The majority of the structure plan area is within an area identified as being for 'Urban Investigation' for the period 2015-2031. This classification has been reflected in the MRS through the designation of the Urban zone in April 2019, and the initiation of Amendment 146 to TPS 3.

The balance of the structure plan area, within BFA 390, is identified as 'Open Space'. It is anticipated that this will be reserved in the MRS for 'Parks and Recreation' in due course, consistent with other parts of BFA 390.

1.3.3.3 Treeby District Structure Plan

The structure plan area is covered by the Treeby DSP (refer Figure 6: Treeby DSP), which was adopted by the City of Cockburn in September 2017 to provide guidance for more detailed structure planning, subdivision and development within the area generally bound by Solomon Road, Jandakot Road, Warton Road and Armadale Road.

Development within the DSP area is currently limited to the nearby Calleya estate being developed by Stockland in accordance with the Banjup Quarry Local Structure Plan. Development of Lot 703 Ghostgum Drive, immediately west of the structure plan area, is likely to proceed on a similar timeframe to this structure plan area. A structure plan for Lot 703 was advertised by the City of Cockburn from December 2019.

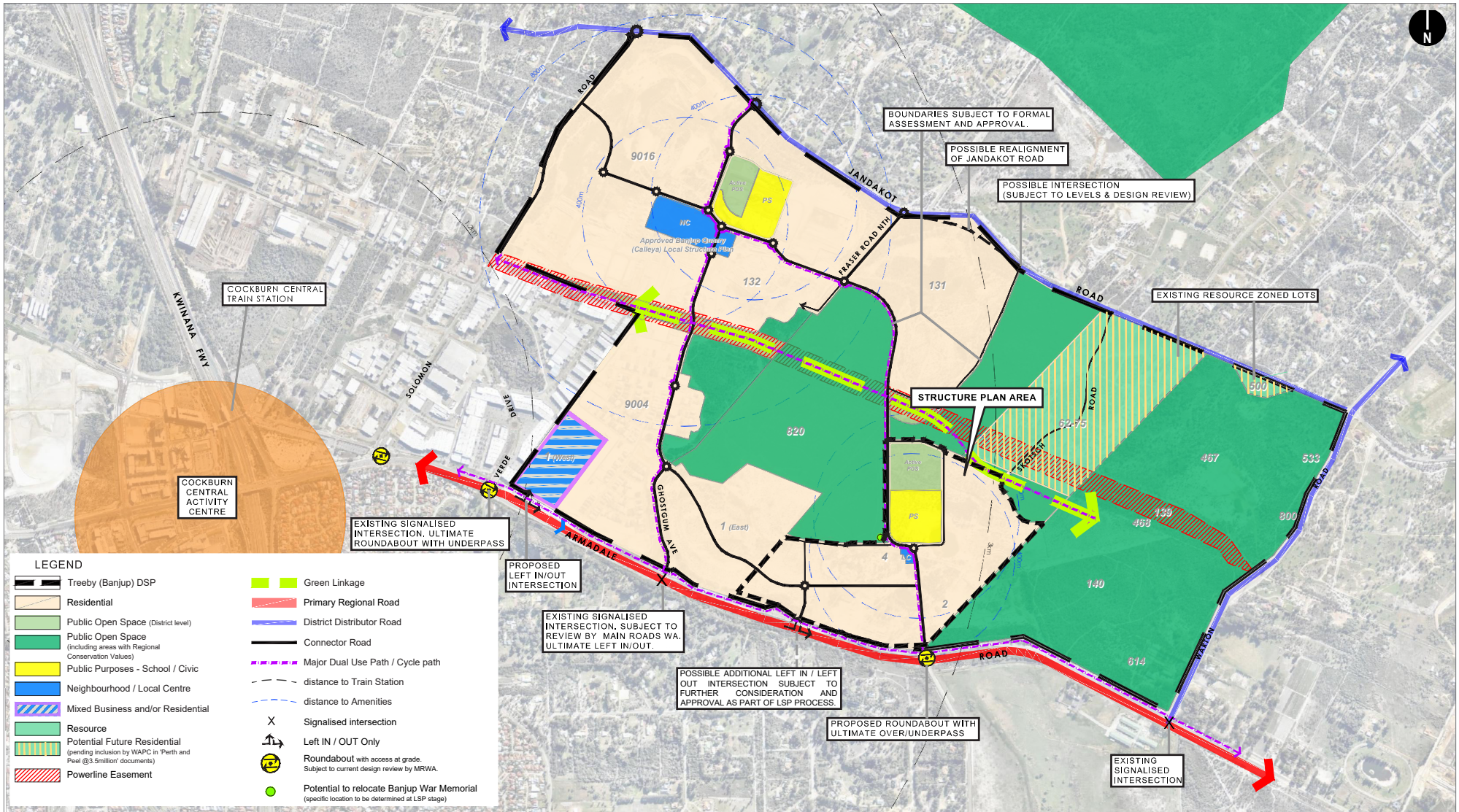


Figure 6 - Treeby District Structure Plan
Source: Nearmaps

The Treeby DSP contains the following features relevant to this structure plan:

- Residential land in the southern and eastern parts of the structure plan area;
- A 4 hectare primary school site, co-located with an active open space area, in the centre of the structure plan area, and another within Calleya. (No secondary schools are required);
- A Local Centre within the structure plan area, and a larger Neighbourhood Centre within Calleya;
- Public open space in the western part, coinciding with BFA 390;
- A Neighbourhood Connector road from Armadale Road northward to an off-site connection to Fraser Road;
- An east-west Neighbourhood Connector road through the southern part of the structure plan area;
- Lower-order roads (likely to be Access Streets) fringing BFA 390 and the primary school site; and
- A 'Green Linkage' along the northern edge of the structure plan area, coinciding with an existing transmission corridor, providing for east-west pedestrian movement. This has been constructed through Calleya, and its extension eastward will be facilitated by the progression of this structure plan.

The DSP is supported by the following technical reports, which assist to define the key land use principles and inform subsequent stages of planning:

- Environmental Assessment Report (360 Environmental, September 2016);
- Transport Assessment (Transcore, February 2017);
- District Water Management Strategy (JDA Consulting Hydrologists, September 2016);
- Engineering Infrastructure Report (Wood and Grieve, June 2016).

Part 1 of the Treeby DSP sets out the matters which subsequent local structure plans are expected to address. This includes an expectation that structure plans will generally conform with the layout illustrated within the DSP. In addition, the DSP sets out technical reporting requirements for subsequent local structure plans to include. These are summarised in Table 3 below.

The structure plan is generally consistent with the land use principles of the DSP. The structure plan refines and expands upon these principles to create a more specific plan for this particular area.

Table 3: Response of this structure plan to the requirements of the Treeby DSP

DSP Requirement	Relevant section of this report	Relevant Appendix
Local Water Management Strategy consistent with any approved District Water Management Strategy	Section 3.5	Appendix 4: Local Water Management Strategy (JDA Consulting Hydrologists)
Environmental Assessment Report	Section 2	Appendix 1: Environmental Assessment Report (360 Environmental)
Bushfire Hazard Assessment	Section 3.9	Appendix 2: Bushfire Management Plan (including Bushfire Hazard Assessment) (Bushfire Safety Consulting)
Noise Impact Assessment	Section 3.10	Appendix 6: Traffic Acoustic Assessment (Herring Storer Acoustics)
Other submission requirements consistent with Schedule 2 – Deemed Provisions of the Planning and Development (Local Planning Schemes) 2015	Section 3.3	Appendix 5: Traffic Impact Assessment (Transcore)
	Section 3.4	Appendix 3: Landscaping Strategy (EPCAD)
	Section 3.8	Appendix 7: Engineering Infrastructure Report (Wood & Grieve)

1.3.4 State Planning Policies

The following sections summarise the policies and strategies relevant to the structure plan area as urbanisation proceeds.

1.3.4.1 Liveable Neighbourhoods

Liveable Neighbourhoods is the WAPC's operational policy guiding urban design for greenfield development. Liveable Neighbourhoods sets out the key considerations for master planning new communities including subdivision layout and movement networks, as well as the location of open space, community facilities, schools and activity centres.

This structure plan has been prepared in accordance with the principles and objectives of Liveable Neighbourhoods. Discussion about this structure plan in the context of the relevant Elements in Liveable Neighbourhoods appears in Section 3 of this report.

1.3.4.2 SPP 2.3: Jandakot Groundwater Protection

The recent transfer of the structure plan area to the 'Urban' zone, consistent with the Framework and the approach taken for land west of the structure plan area, was done following careful consideration of the likely hydrological impact of urban development and confirmation that the objectives of SPP 2.3 would be achieved should such development be permitted.

SPP 2.3 seeks to ensure that all development within the Jandakot Groundwater Protection Area is compatible with the long-term protection and management of that resource. This is achieved through a three-tier classification system consisting of Priority 1, Priority 2 and Priority 3 (P1, P2 and P3) categories defined on the basis of hydrological factors and land tenure. In addition, Wellhead Protection Zones are designated around abstraction bores. No Wellhead Protection Zones encroach upon the Amendment area, but the structure plan area is currently classified as P2. This generally precludes urban development of the nature proposed for part of the structure plan area. However, the Department of Water and Environmental Regulation's comments on MRS Amendment 1346/57 confirm that once the structure plan area has been zoned 'Urban', *"the Department would amend the PDWSA protection status of the groundwater resource from P2 to P3, which is compatible with urban development"*.

Guided by a principle of risk management (as opposed to risk avoidance in P1 areas and risk minimisation in P2), zones facilitating urban development are compatible with P3 areas provided that risk mitigation measures are implemented. These may include (but are not limited to) sewer connections to all properties, planting of public spaces with native species that require minimal irrigation and fertiliser and management of separation to groundwater. All these techniques are proposed to be used in the structure plan area. Discussion about this structure plan in the context of these criteria appears in Section 3.5 of this report.

1.3.4.3 SPP 2.7: Public Drinking Water Source Policy and SPP 2.9: Water Resources

These State Planning Policies provide high-level strategic guidance for policy-making and decision-making where water resources are a relevant consideration. Their policy measures seek to manage outcomes for water resources of all types and outline the WAPC's expectations for the protection of drinking water sources.

The only water resource that is relevant to this structure plan is the Jandakot Groundwater Protection Area, which is managed under SPP 2.3 (discussed above). SPP 2.3 encapsulates the objectives of SPPs 2.7 and 2.9, and as such, in complying with SPP 2.3, this structure plan also complies with SPPs 2.7 and 2.9.

1.3.4.4 SPP 3.7: Planning in Bushfire-Prone Areas

The structure plan area is identified in the mapping maintained by the Department of Fire and Emergency Services as being bushfire-prone. As such, SPP 3.7 is applicable. The purpose of this policy is to:

- Avoid any increase in the threat of bushfire to people, property and infrastructure;
- Reduce vulnerability to bushfire through the identification and consideration of bushfire risks in decision-making at all stages of the planning and development process;
- Ensure that strategic planning documents (which include structure plans) include specified bushfire protection measures;
- Achieve an appropriate balance between bushfire risk management measures and: biodiversity conservation values, environmental protection and biodiversity management, and landscape amenity, with consideration of the potential impacts of climate change.

To ensure that residential development in the structure plan area achieves the objectives of SPP 3.7, a Bushfire Management Plan (Bushfire Safety Consulting, December 2019) has been prepared in accordance with the SPP 3.7 Guidelines. The recommendations of the Bushfire Management Plan are summarised in Section 3.10, and the report itself constitutes Appendix 2.

1.3.4.5 SPP 5.3: Land Use Planning in the Vicinity of Jandakot Airport

SPP 5.3 provides guidance for planning on land affected by aircraft noise on the basis of Australian Noise Exposure Forecast (ANEF) levels. Although relatively close to Jandakot Airport and the employment precinct surrounding it, the structure plan area is not affected by ANEF contours above 20, which is the threshold for zoning and development restrictions. SPP 5.3 notes that “[g]iven noise nuisance may still be experienced below the 20 ANEF exposure level and that Jandakot Airport is a general aviation airport”. As such, a ‘Frame’ area is defined, and this takes in the structure plan area.

There is no restriction on zoning or development within the ‘Frame’ area, and noise attenuation measures are not mandated.

1.3.4.6 SPP 5.4: Road and Rail Transport Noise

The purpose of SPP 5.4 is to “*minimise the adverse impact of transport noise, without placing unreasonable restrictions on noise-sensitive residential development, or adding unduly to the cost of transport infrastructure.*”

SPP 5.4 is applicable to this structure plan by virtue of its location abutting Armadale Road, which is an existing Primary Distributor road reserved as a ‘Primary Regional Road’ under the MRS and identified as a freight route in the *Perth and Peel @ 3.5 million Transport Network* report. Works to duplicate Armadale Road, creating a 4-lane road, were recently completed, and long-term planning is for a 6-lane road. Main Roads’ traffic counts for Armadale Road indicate that on average, approximately 30,738 vehicles per day passed the structure plan area in 2017-18, 10.8% of which were heavy vehicles.

To investigate traffic noise from Armadale Road, a Traffic Acoustic Assessment (Herring Storer Acoustics, October 2019) has been prepared. This confirms that although parts of the structure plan area are affected by transport noise, appropriate mitigation measures are available and that transport noise is not a constraint to the development of the structure plan area for residential purposes.

The outcomes of the Transportation Noise Assessment are detailed at Section 3.10 of this report, and the Transportation Noise Assessment itself constitutes Appendix 6.

1.3.4.7 SPP 7.3: Residential Design Codes

The Residential Design Codes (R-Codes) form the basis for assessment of all single, grouped and multiple-dwelling developments in Western Australia. They are applicable to the structure plan area by virtue of the proposed Residential and Local Centre zones, within both of which dwellings are permissible.

The R-Codes can be varied through use of (relevantly) Local Planning Policies and Local Development Plans. Standard variations to the R-Codes will be available to the structure plan area through the reference to the City's Local Planning Policy 1.16 in Part 1 of the structure plan (see also Section 1.3.5.1 of this report), and other variations may become active in future through Local Development Plans.

1.3.5 City of Cockburn Policies

The following sections summarise the City of Cockburn policies relevant to the structure plan area as urbanisation proceeds.

1.3.5.1 LPP 1.16: Single House Standards for Medium-Density Housing in the Development Zone

In April 2016, the WAPC released Planning Bulletin 112, which contains a set of standard variations (known as the R-MD Codes) to the deemed-to-comply provisions of the R-Codes for single houses in 'Development' zones where a coding of R25 to R60 applies.

To enable these to be implemented on an estate-wide basis through reference in a structure plan, the City of Cockburn has adopted a Local Planning Policy, LPP 1.16. This is referenced in Part 1 of this structure plan, making the R-MD Codes applicable within the structure plan area. These apply unless a Local Development Plan containing additional variations has been approved in accordance with the *Planning and Development (Local Planning Schemes) Regulations 2015*.

1.3.5.2 LPP 1.12: Noise Attenuation

The purpose of LPP 1.12 is to:

1. *“Detail the noise attenuation and noise management reporting process when undertaking development within the City of Cockburn.*
2. *Provide details of the City’s requirements for the different types of acoustic reports.*
3. *Provide guidance to applicants as to when an acoustic consultant should be engaged and provide information on the type of assistance an acoustic consultant might provide.”*

LPP 1.12 makes recommendations for provision of Acoustic Reports in order to demonstrate compliance of (relevantly) structure plans with SPP 5.3 and 5.4. The structure plan’s response in this regard is detailed at Section 3.10.

1.3.5.3 LPP 5.1: Public Open Space

LPP 5.1 provides guidance additional to Liveable Neighbourhoods in respect of credits for public open space (‘POS’). Its purpose is:

1. *“To specify land features that will not be accepted by the City as part of the public open space requirement.*
2. *To clarify how bushfire protection zones and hazard separation zones will be considered in relation to public open space.”*

The provisions of LPP 5.1 are relevant to, and have been accommodated in, the POS Schedule that appears at Section 3.4.1 of this report.

1.3.5.4 LPP 5.2: Incorporating Natural Areas in Public Open Space and/or Drainage Areas

LPP 5.2 provides guidance for the use of natural areas, defined as wetlands (including their buffers) and bushland, within POS and drainage reserves that will, in due course, be handed over to the City to manage.

Although this structure plan envisages some use of the abutting Bush Forever site in conjunction with POS located within the structure plan area, the project team understands that the Bush Forever site is proposed to be vested in the State Government to manage, rather than the City. As such, LPP 5.2 is of limited relevance, although its principles are met.

2.0 SITE CONDITIONS AND CONSTRAINTS

The following sections outline the site conditions and constraints apparent within the structure plan area. This summary is informed by previous planning undertaken through the Treeby DSP and the technical reports prepared in support of both the DSP and the structure plan.

2.1 Biodiversity and Natural Area Assets

The structure plan covers the parts of Lots 705 and 707 that are outside BFA 390 and cleared, having previously been used as a sand quarry. The Environmental Assessment Report that appears at Appendix 1 confirms that there are no constraints associated with flora and fauna over the site. A summary of the Environmental Assessment Report is provided in the following sections.

[2.1.1 EPBC Act](#)

Urbanisation of the structure plan area has been referred to the Federal Department of the *Environment under the Environmental Protection and Biodiversity Conservation Act 1999* ('EPBC Act') and it was concluded that the proposed development is 'Not a Controlled Action'. This confirms that the proposed development does not significantly impact on any Matters of National Significance, such as black cockatoos or *Caladenia huegelii* (the King Spider Orchid). Three specimens of the latter are proposed to be relocated from the structure plan area into surrounding bushland, which was included as a proposal in the EPBC Act referral.

[2.1.2 Flora and Vegetation](#)

The structure plan area does not contain any Threatened Ecological Communities (TECs), Priority Ecological Communities (PECs), or Declared Rare or Priority flora, and the only overlap with BFA 390 is for the northward road connection shown in the Treeby DSP.

Almost all of the structure plan area comprises vegetation in 'Degraded' to 'Completely Degraded' condition, including areas of poor-quality rehabilitation and non-native plantings. There is one isolated parcel of vegetation in 'Excellent' vegetation, however, this is outside BFA 390 and was not identified in the Treeby DSP for conservation purposes. Management of this vegetation in an urban context would be impractical due to its size, isolation and the level difference (approximately 5m above the surrounding land) and the structure plan does not propose that it be retained.

[2.1.3 Fauna](#)

No conservation-significant fauna have been directly recorded within the structure plan area. The degraded condition of the vegetation within the structure plan area, the prevalence of non-native flora and the lack of understorey make the structure plan area generally unsuitable as habitat for native fauna.

[2.1.4 Bushland Management Plan](#)

A Bushland Management Plan will likely be prepared following subdivision approval for any subdivision application with a direct interface with BFA 390. This will ensure management of the interface and BFA 390 itself in terms of:

- Land management;
- Emergency access;
- Wetland management, including the buffer (refer also to Section 2.3.2 below);
- Weed and pathogen control.

In the interim, BFA 390 will be fenced off to restrict access until such time that the interface area is in its ultimate state.

There is no proposal in this structure plan for high frequency stormwater runoff to be discharged into BFA 390.

2.2 Landform and Soils

[2.2.1 Topography](#)

The structure plan area has previously been used for sand extraction. As such, it is generally lower (approximately 5 metres, on average) than the surrounding Bush Forever areas creating opportunities for topographical features to be incorporated into the urban form. The structure plan area is generally flat, having been levelled off following the cessation of sand extraction, but there are some localised low and high points and a steep interface between Lots 705 and 707 (refer Figure 7: Topographic Map).

As detailed in the Engineering Infrastructure Report appearing at Appendix 7, the topography is somewhat complex but not a constraint to development. Fixed levels are noted at the northern and western boundaries (adjacent to Bush Forever Area 390) and on the southern boundary, where optic fibre has been laid in the Armadale Road reserve in close proximity to the boundary of the structure plan area. Cut and fill (from on-site cut and other sources) will be undertaken across the structure plan area to ensure co-ordination with external levels and meet internal design objectives.

2.2.2 Soils

The structure plan area comprises Bassendean dunes in a heavily modified form, given the previous sand extraction activities. The soils associated with Bassendean dunes are generally suitable for urban development.

Geotechnical investigations undertaken as an input to the Engineering Infrastructure Report have identified some uncontrolled fill within the structure plan area. This will require remediation but is not an impediment to the achievement of a 'Class A' classification under the relevant Australian Standard (*AS2870:2011 – Residential Slabs and Footings*).

The structure plan area is not identified on DWER's register of contaminated sites and is within an area identified as being at 'moderate to low risk' of acid sulphate soil (ASS) disturbance within 3 metres of the soil surface. This does not pose a constraint to urban development as envisaged in this structure plan.



Existing site conditions

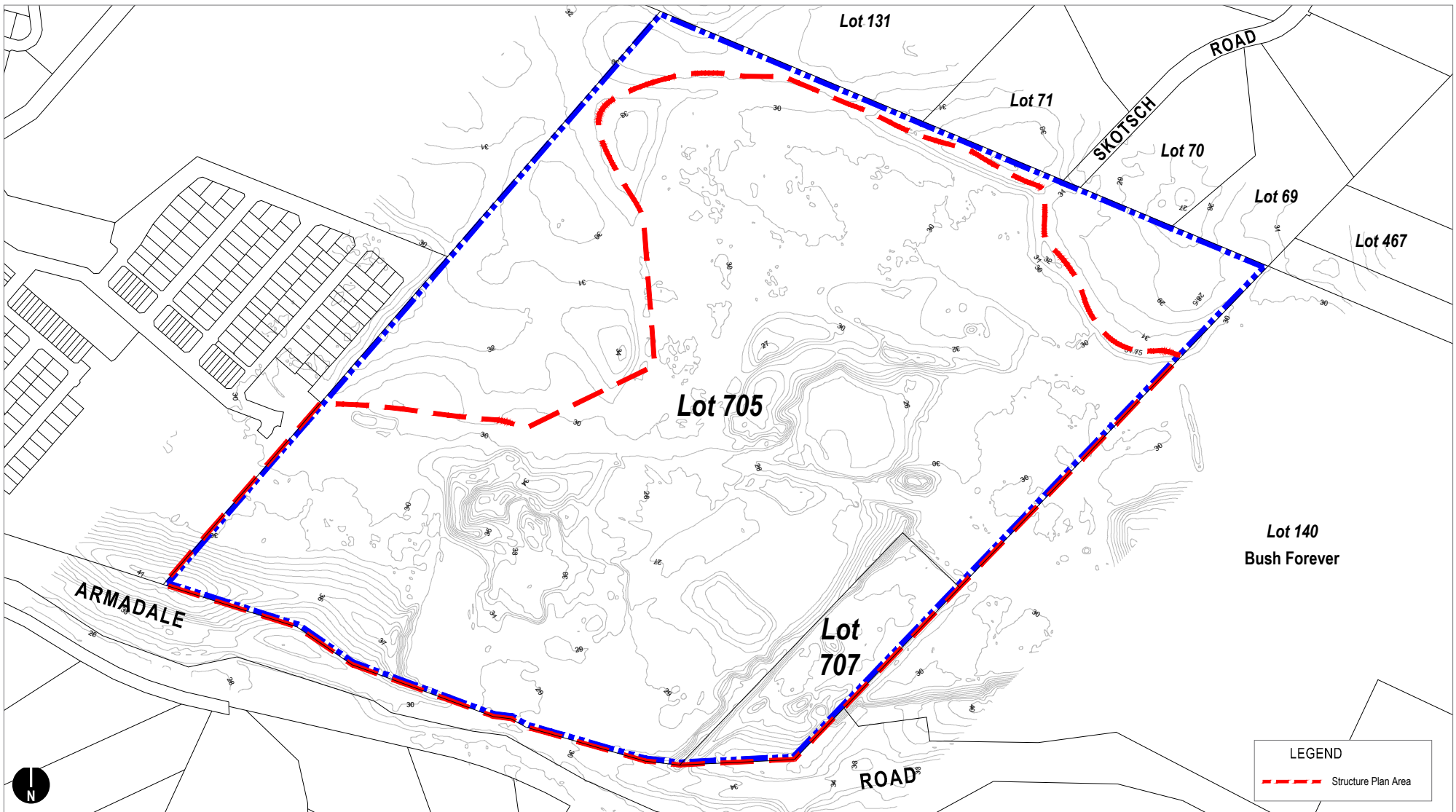


Figure 7 - Topographic Map
Source: MNG 20130820_98202opm-002a

2.3 Groundwater and Surface Water

2.3.1 Groundwater

As noted in Section 1.3.4.2 above, the structure plan area is within the Jandakot Underground Water Pollution Control Area, the purpose of which is to regulate land use and development over a drinking water source. The Department of Water and Environmental Regulation's groundwater mapping indicates that depth to groundwater (the superficial aquifer known as the Jandakot Mound) is approximately 7 metres across the structure plan area. The groundwater level has been observed to fluctuate by approximately 1.5m over the course of the year, as a consequence of the winter-dominated local rainfall pattern. As discussed in Section 3.5 of this report, groundwater levels will be managed through sub-soil drainage infrastructure; the fluctuation is not a constraint to development.

Three geological formations – Bassendean Sand, Gnangara Sand and Ascot Formation – are evident within the superficial aquifer, which exhibits a thickness of approximately 40 metres. The highest formation (the Bassendean Sand) contains ferruginous (iron-rich) sand. In order to avoid staining of irrigated areas from groundwater, abstraction will need to occur from below this layer.

There are two surface expressions of groundwater (the superficial aquifer) within the structure plan area, both of which are a product of excavation undertaken during the previous quarrying activities. The northerly lake covers approximately 1.2 hectares and is not proposed for retention, being of limited environmental value. The southerly lake is smaller (0.4 hectares) but deeper, and there are numerous mature trees on its banks and in the vicinity. This creates an outstanding opportunity for a landmark feature within POS. Consistent with the pattern for the superficial aquifer more generally, there is seasonal variation in the water level. This can be managed through landscaping and drainage systems, and along with many of the trees in the vicinity, the lake is proposed for retention.

The superficial aquifer overlies the confined Leederville and Yarragadee aquifers, which are drinking water sources for Perth.

Full details of the water quality protection measures proposed to be implemented through the structure plan are provided at Section 3.5 of this report.

2.3.2 Surface Water

There are no natural surface water features in the structure plan area. The two lakes mentioned in Section 2.3.1 are surface expressions of groundwater and hydrologically distinct from surface water.

Adjacent to the structure plan area is a Resource Enhancement Wetland for which a 50 metre buffer has been provided. The buffer encroaches on the structure plan area to a very limited extent and is accommodated within POS.



Lake proposed for retention
Source: EPCAD

2.4 Bushfire

As noted in Section 1.3.4.4 of this report, the structure plan area is identified as being bushfire-prone in the map database administered by the Department of Fire and Emergency Services. In accordance with the requirements of State Planning Policy 3.7: *Planning in Bushfire-Prone Areas*, a Bushfire Management Plan (Bushfire Safety Consulting, December 2019; 'the BMP') incorporating a Bushfire Attack Level (BAL) contour map forms part of this structure plan. This is described at Section 3.9 of this report and confirms that all bushfire hazards affecting the structure plan area can be managed through subdivision design and built form controls, and is therefore not a constraint to subdivision and development.

2.5 Heritage

[2.5.1 Aboriginal Heritage](#)

The structure plan area contains no sites listed on the Aboriginal heritage register maintained by the Department of Aboriginal Affairs under the *Aboriginal Heritage Act 1972*.

[2.5.2 European Heritage](#)

The structure plan area contains no sites listed on the State Heritage Register maintained by the Western Australian Heritage Council under the *Heritage of Western Australia Act 1990*.



3.0 STRUCTURE PLAN

3.1 Plan Overview

The structure plan proposes a site-responsive and permeable urban form. It facilitates legible internal access and provides connections to neighbouring estates and external amenities. Through implementation of this structure plan, the structure plan area will become an integral part of the Treeby urban precinct that delivers a diverse choice of housing in a natural setting.

The Structure Plan Map contained in Part 1 is the framework that will guide subdivision design and development. It is based on the following key principles:

Enable the creation of a diverse range and density of high-quality housing that is consistent with planning requirements and responsive to market preferences.

Provide a robust urban form that responds to the site's location within the wider Treeby urban precinct and integrates with surrounding development.

Celebrate the natural amenity of the site through appropriate management and the preservation of existing bushland within well-planned open space.

Provide accessible, attractive and multi-functional open space that addresses drainage requirements as well as offering a range of opportunities for active and passive recreation.

Extend necessary service infrastructure in a timely and co-ordinated manner to support development.

Provide a framework for the timely delivery of the proposed public primary school.

Facilitate the development of a local activity centre providing a local convenience offering for the future community.

Based on these key principles, the structure plan provides the framework for:

- Between 600 and 700 dwellings, with residential densities of R30 to R80, with:
 - R30 being the base residential density code;
 - R40 being designated for lots abutting POS, accessed from a laneway, on the end of a street block and close to a bus route;
 - R60 or R80 being designated within a central 'Urban Core', which provides a diversity of dwelling product and a distinctive focal point for the community in a high-amenity location.
- Creation of the east-west and north-south Neighbourhood Connector roads shown in the Treeby DSP and the provision of a legible modified grid network of local streets.
- Well-distributed POS areas that are site responsive and provide a range of recreational opportunities and facilitate the retention and rehabilitation of mature trees, especially in the park near the entrance to the structure plan area.
- Appropriate management of interfaces to BFA 390, in terms of access, delineation and bushfire hazard, through the strategic placement of streets and POS.
- Creation of the primary school site shown in the Treeby DSP on a co-located site with an active open space and provided with street access on all sides.
- Accommodation of the powerline easement along the northern boundary of the site as well as supporting a pedestrian access route connecting to the east and west.

These features are encapsulated in the conceptual master plan included with this report as Figure 8. This is not intended to be a rigid concept; it demonstrates one development scenario and will be refined at the subdivision stage in response to contemporary market preferences. The intent of the conceptual master plan is to provide direction on how the development will respond to the opportunities and constraints inherent to the structure plan area. It also underpins the Structure Plan Map in Part 1.



Figure 8 - Concept Plan
Source: Nearmaps

3.2 Residential

The structure plan provides a framework to support delivery of a diverse range of housing. The density and style of housing is responsive to the characteristics of different parts of the site and will be delivered with the objective of creating high quality built form and streetscapes.

3.2.1 Dwelling Yields and Density Targets

The *Perth and Peel @3.5 million* planning framework sets an overall residential density target of 15 dwellings per gross hectare of urban-zoned land. This target was carried over from the previous planning framework, *Directions 2031 and Beyond*, and its purpose is to ensure efficient use of urban-zoned land in the metropolitan region. Site-specific constraints and geographic characteristics influence the distribution of density; some areas are suitable for higher densities, whilst in other areas it will only be feasible to provide lower densities.

The structure plan delivers a potential for a dwelling yield of 14.6 dwellings per gross urban hectare through a combination of residential densities ranging from R30 to R80. This is generally consistent with the aforementioned target. It has been achieved notwithstanding the relatively high rate of POS provision, which itself is a product of the gross subdivisible area containing a senior oval as well as other passive recreation, conservation, drainage spaces, bushfire hazard separation and the 4ha primary school. This is larger than a standard co-located primary school (3.5ha), further reducing developable area.

3.2.2 Lot/Dwelling types

The range of residential densities permissible under this structure plan enables the development of a diverse mix of lot and housing product, including traditional home sites, smaller contemporary front-loaded lots, and rear-loaded cottage lots. The structure plan provides maximum flexibility in order to ensure that future subdivision can respond effectively to contemporary market preferences and innovations in housing typology and construction.

The structure plan proposes a base residential density of R30, which permits lot sizes at an average of 300 square metres. At strategic locations guided by locational criteria, pockets of housing at the R40 density are proposed (average of 220 square metres). The characteristics of each can be summarised as follows:

Table 4: Typical lot products for the structure plan area outside the Urban Core

	Contemporary front-loaded	Rear-loaded cottage
R-Code	R30	R40
Typical location	Base code for the structure plan area	As per R30, where access is obtained from a rear laneway
Typical width (m)	10.5 to 15	6 to 10.5
Typical depth (m)	25 to 30	25 to 30
Approx. area (sqm)	260+	180+
Primary built form control	R-Codes varied via R-MD Codes	R-Codes varied via R-MD Codes; LDPs
Built form	Single dwellings; single or double-storey; sold as either land-only or house-and-land packages	<ul style="list-style-type: none"> Single and grouped dwellings Lots less than 10m wide typically built out and sold as a house- and-land package Opportunities for terrace housing



Examples of R30 Housing



Examples of R40 Housing

The focal point of the structure plan area is the Urban Core, which encompasses the Lake Park, Local Centre, and the boulevard-style entry road, and benefits from direct linkage to the Activity Park. Responding to these amenities, relatively high residential densities (R60 and R80) are proposed. These densities and the resultant lot sizes are designed to encourage two-storey development and innovative housing product. The type of lot product envisaged for this area is as per Table 2 below.



Example R60 Terrace Housing

Table 5: Typical lot products for the Urban Core

	Terrace	Small Front-load	Apartment and Maisonettes
R-Code	R60 and R80	R80	R80
Typical width (m)	4.5 to 6	7.5	n/a
Typical depth (m)	25 to 30	15	n/a
Approx. area (sqm)	110 to 180	110 to 130	n/a
Built form control	R-Codes; LDPs	R-Codes; LDPs	R-Codes; LDPs
Built form	Two-storey attached dwellings built out by developer’s partner builders and sold complete	Two-storey attached dwellings either built out by developer’s partner builders and sold complete or sold as house-and-land packages	Multiple dwellings in terrace form by the developer’s partner builders and sold complete

[3.2.3 Local Development Plans](#)

Local Development Plans (LDPs) can be prepared for select lots at the subdivision stage to mandate appropriate noise and bushfire mitigation measures, ensure quality built form and facilitate variations to the deemed-to-comply criteria of the Residential Design Codes, as applicable. LDPs may be prepared for lots that:

- Are rear-loaded (laneway access);
- Abut areas of POS;
- Are within the 'Urban Core' shown on the Structure Plan Map;
- Are within the Local Centre zone;
- May be affected by road transport noise and require noise mitigation measures at the development stage (as determined by the acoustic assessment appended to Part 2); and/or
- May be affected by aircraft noise and require noise mitigation measures at the development stage.

[3.2.4 R-Codes Variations](#)

The Regulations do not include provision for structure plans to vary the deemed-to-comply provisions of the R-Codes. Local Development Plans, Local Planning Policies and scheme amendments are the means by which such variations can be made.

The City of Cockburn has a Local Planning Policy, namely, LPP 1.16: *Single House Standards for Medium-Density Housing in the Development Zone* that introduces the R-Codes variations specified in the WAPC's Planning Bulletin 112: *Medium-Density Single House Development Standards – Development Zones* (usually referred to as 'the R-MD Codes') for all land zoned 'Development' within the City.

3.3 Movement Network

A Transport Impact Assessment has been prepared by traffic consultants Transcore to identify projected traffic volumes, specify road hierarchies and confirm that the proposed movement network is appropriate (refer Appendix 5). Assuming a lot yield of 660, the Transport Impact Assessment concludes that the structure plan area will generate in the order of 5,280 vehicle movements per day, which is found to be within the capacity of all external and internal intersections and streets.

The Transport Impact Assessment is consistent with the WAPC's *Transport Impact Assessment Guidelines* (August 2016) and reflects the principles of the Treeby DSP. The modelling assumes that the neighbouring Calleya estate, Lot 703 Armadale Road and Lot 131 Jandakot Road (the balance of the Treeby DSP area) are fully developed and that all external roads are carrying forecast 2031 volumes.

3.3.1 Regional Road Network

The main entrance to the structure plan area is from Armadale Road, with additional, future accesses anticipated to become available from Lot 131 Jandakot Road to the north, and Lot 703 Armadale Road to the west.

Armadale Road is classified as a Primary Distributor road in Main Roads WA's *Metropolitan Functional Road Hierarchy* and reserved as a Primary Regional Road in the MRS. It is currently constructed as a single-carriageway road but is in the process of being upgraded to a four-lane, dual-carriageway road with a roundabout at the Liddelow Road intersection. A fourth leg will be constructed off this roundabout to facilitate access into the structure plan area.

The Treeby DSP also proposes Neighbourhood Connector roads into:

- Lot 131 Jandakot Road, connecting to Fraser Road on the eastern boundary of Calleya. Fraser Road connects into Jandakot Road to the north, providing an alternative east-west access for the structure plan area. Jandakot Road terminates at Warton Road to the east and Berrigan Drive to the west, which has an interchange with the Kwinana Freeway.
- Lot 703 Armadale Road, connecting to Ghostgum Avenue within Calleya. Ghostgum Avenue becomes Clementine Avenue further north, which ultimately connects with Jandakot Road.

The structure plan proposes Neighbourhood Connector roads in locations that are generally consistent with the Treeby DSP, ensuring that connections to the regional road network are provided in accordance with existing planning. Both Neighbourhood Connector roads carry relatively low volumes of traffic (less than 3000 vehicles per day) and are proposed at 'Neighbourhood Connector B' standard, with reference to Liveable Neighbourhoods. This excludes the first section of the north-south Neighbourhood Connector. This road will be at 'Neighbourhood Connector A' standard, in the form of a boulevard, due to its higher anticipated volumes and role as the main entrance to the structure plan area.

The Treeby DSP contains a left-in / left-out intersection onto Armadale Road west of the Liddelow Road intersection, but this is not proposed in the structure plan as it is not supported by Main Roads. Removal of this left in / left out intersection is not to the detriment of accessibility to the site.

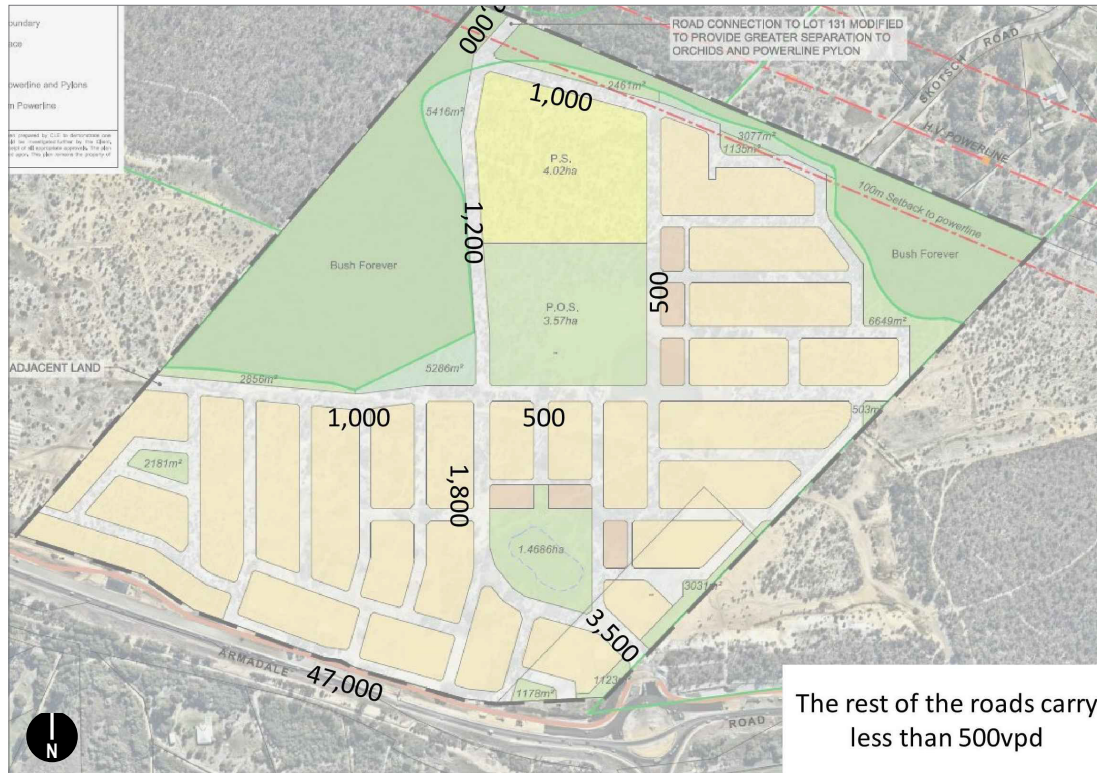


Figure 9 - Forecast Traffic Volumes
Source: Transcore

3.3.2 Proposed Structure Plan Roads

The structure plan adopts the two Neighbourhood Connector roads listed above and uses them as a framework for lower-order access streets. This network has been designed on the basis of the following principles:

- A permeable and legible modified grid pattern of access streets with reserve widths of 15-18 metres, consistent with *Liveable Neighbourhoods*. The precise location and alignment of these will be determined at subdivision stage;
- Orientation of streets in a manner that creates view corridors into BFA 390, fostering a natural aesthetic and sense of place;
- Provision of clear delineation between urban areas and BFA 390, assisting in interface and bushfire hazard management;
- Provision of streets on all four sides of the co-located primary school/oval site, consistent with *Liveable Neighbourhoods*;
- A pedestrian-focused street linking the southernmost park and the oval, encouraging non-motorised forms of transport and creating a shared-use space.

Aside from the Neighbourhood Connector roads, all streets are proposed to be at Access Street D standard except the road around the eastern boundary of the co-located school and oval, which is proposed to be at Access Street B.

The Transport Impact Assessment confirms that none of the streets proposed in the structure plan will carry more than 5,000 vehicles per day. Above this number, *Liveable Neighbourhoods* recommends that egress in forward gear be enabled. The highest-trafficked street in the structure plan area is expected to be the entrance road, which is forecast to carry up to 3,500 vehicles per day.

[3.3.3 Intersection Analysis](#)

The primary point of access to the structure plan area is the roundabout currently being constructed at the intersection of Armadale Road and Liddelow Road. Capacity analysis of this intersection has been undertaken as part of Transcore's Transport Impact Assessment and confirms that it will operate satisfactorily following full build-out of the Treeby DSP, including at peak times.

Internally, the network of Neighbourhood Connector roads and Access Streets has been designed in accordance with *Liveable Neighbourhoods* in terms of reserve widths, intersection spacing and treatments. The Transport Impact Assessment confirms that all intersections will function satisfactorily as priority T-intersections with the exception of one at the south-western corner of the co-located primary school site. This is the meeting point of the north-south and east-west Neighbourhood Connector roads (Access Street B toward the east).

The precise nature and function of all internal intersections will be confirmed at detailed design stage.

[3.3.4 Public Transport](#)

The structure plan area is within 3km of the Cockburn Central railway station, which is on the Perth-Mandurah line. It will also, from the 2020s, provide access eastward to the Armadale line via Thornlie. Stage 1 of the State Government's Metronet initiative contains an extension to the Thornlie line.

The Transport Impact Assessment indicates that the Public Transport Authority is likely to provide a bus route along the north-south Neighbourhood Connector proposed in this structure plan, connecting to Cockburn Central railway station, in future. The timing of such a service is dependent on the rate and location of development across the Treeby DSP.

In the longer term, the *Perth and Peel @ 3.5 million – The Transport Network* report proposes a "high-priority transit corridor" along Armadale Road, linking Cockburn Central and Armadale. This will further improve public transport connections for the structure plan area.

3.3.5 Cycling and Pedestrian Movement

The structure plan proposes a permeable, legible road network, creating a welcoming environment for pedestrians and cyclists. The Structure Plan Map illustrates the proposed shared path network for the structure plan area. The network consists of north-south and east-west shared paths along the Neighbourhood Connector roads and a portion of the Access Street B on the eastern boundary of the co-located school and oval.

Footpaths will be provided on at least one side of all Access Streets at the subdivision stage, and all laneway lots will be provided with footpath access to nearby visitor parking bays. Connections to the Principal Shared Path along Armadale Road will be provided at locations to be determined at subdivision stage.

The precise location and alignment of all paths will be determined in consultation with the City of Cockburn as part of detailed civil design following subdivision approval. Generally, they will be provided in accordance with the following principles:

- Paths to a width of 2.0 metres on at least one side of all roads.
- Paths to a width of 2.5 metres in areas likely to experience relatively high pedestrian numbers, such as the proposed Local Centre and co-located school and oval.
- Shared paths generally in accordance with the Structure Plan Map connecting to the Principal Shared Path in the Armadale Road reserve.

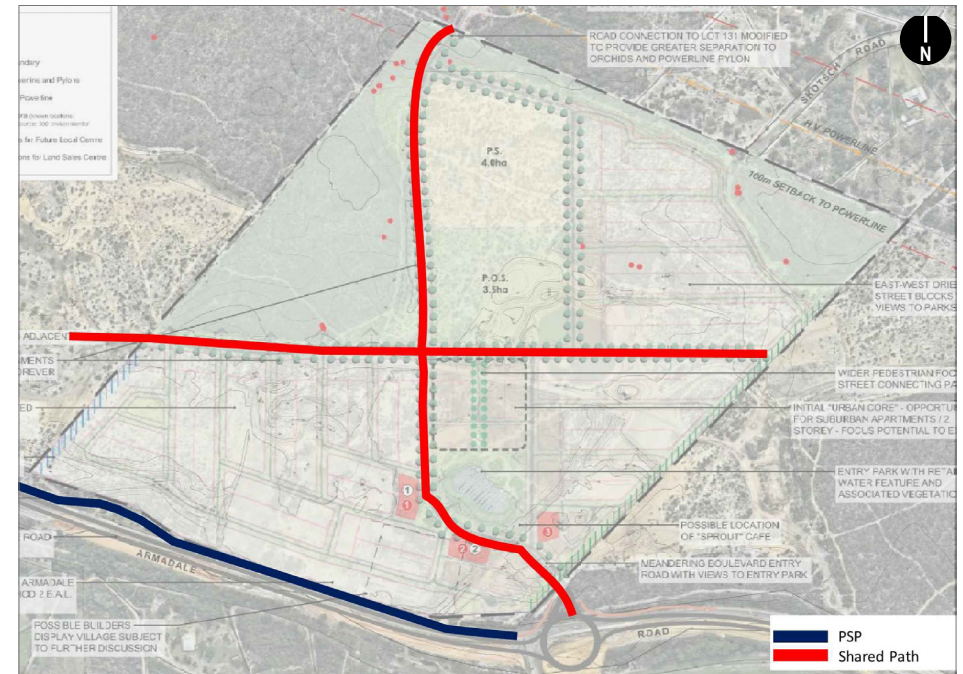


Figure 10 - Proposed Pedestrian and Cyclist Network
Source: Transcore

3.4 Public Open Space and Drainage

3.4.1 [Public Open Space Provision](#)

The structure plan makes provision for approximately 4.5 hectares of creditable POS. This has been distributed and designed in accordance with the following principles:

- Provide spaces for passive and active recreation incorporating high-quality landscaping;
- Create an appropriate interface with BFA 390, which provides a distinctive natural backdrop for the structure plan area;
- Make use of the Western Power easement that crosses the structure plan area from west to east as a linear open space providing connectivity to neighbouring landholdings;
- Create a co-located active open space suitable for use by the primary school and the broader community;
- Provide local open space in strategic locations to ensure a high degree of accessibility for local residents;
- Accommodate drainage and bushfire setbacks in a manner that positively enhances the locality.

Detail on the style and function of each open space is provided in the series of Landscape Concept Plans (EPCAD, November 2019) attached to this report. A summary of this document is provided at Section 3.4.2 below.

Liveable Neighbourhoods requires 10% of the gross subdivisible area of the structure plan area to be ceded for POS. Provision for POS in the structure plan is 10.1% as described in the following POS Schedule appearing as Table 6.

Table 6: Public Open Space Schedule (all areas in hectares)

Site Area		61.57
Existing Deductions		
Bush Forever Area 390	12.12	
Total existing deductions	12.12	
Net Site Area		49.5
Structure Plan Deductions		
Primary school	4.01	
1:1 Drainage within POS	0.00	
Local Centre	0.68	
Lake (waterbody only)	0.41	
Sewer pump station	0.11	
Uncredited interface POS	3.00	
Restricted Open Space Surplus	0.00	
Total Structure Plan Deductions	8.21	
Gross Subdivisible Area		41.24
POS @ 10%		4.12
Public Open Space Requirement		
May Comprise:		
Min 8% unrestricted POS	3.30	
Max 2% restricted POS	0.82	
TOTAL POS REQUIRED		4.12
Public Open Space Provided	Unrestricted POS Area	Restricted POS Area
Lake Park (ex waterbody; inc northern connection)	1.13	0.00
Activity Park	3.50	0.00
Western Pocket Park	0.18	0.00
TOTAL (ha)	4.82	0.00
Additional Deductions		
Restricted Open Space Surplus		0.00
Revised Public Open Space Contribution		
Min 8% unrestricted POS provided	4.82	11.7%
Max 2% restricted POS provided	0.00	0.0%
Total Creditable POS Provided	4.82	11.7%

2310POS234F

Notes:

1. In accordance with Liveable Neighbourhoods: the area subject to inundation more frequently than a one year average recurrence interval rainfall event is not included as restricted or unrestricted open space and is a deduction from the net site area (LN R33); areas for the detention of stormwater for a greater than one year average recurrence interval up to the five year recurrence interval is restricted open space up to 20%, the area greater than 20% is a deduction (not applicable in this case) (LN R26 & Table 11); areas for the detention of stormwater for a greater than five year average recurrence interval is within unrestricted open space (LN R25).
2. This Schedule is for plan CLE Ref. 2310-244F-01 incorporating 2310-267K and 2310-339-01 and uses the drainage calculations in the LWMS prepared by JDA (JDA ref. J6667e, December 2019).

3.4.2 Description of Open Space Areas

This section provides an overview and description of the proposed location, function and design of each open space area proposed in the structure plan. Design of the open space areas is being guided by a Landscape Strategy prepared by EPCAD (refer Figure 11: Landscape Master Plan) with the objective of celebrating the natural setting of the structure plan area. Each individual space has been located and designed to capture or respond to pre-existing features, which include:

- Bush Forever Area 390, with which the structure plan area has an extensive interface.
- Mature remnant trees that have survived the site's time as a quarry.
- The southernmost lake, which is a unique feature worthy of rehabilitation and retention.

These features are proposed to be enhanced through landscape design guided by the following principles contained in the Landscape Strategy:

Places, parks and streets, to instill wellbeing in the user.

Street tree planting to ameliorate the urban heat island effect.

Provide logical connections throughout all areas of residential development.

Provide new landmark views and relationships that assist in orientation and legibility.

Create highly utilised and valued open spaces that are venues and catalysts for community development.

Provide diverse spaces, from retained bushland to managed parkland incorporating play, community and family facilities.

Provide a hierarchy of walks and circuits, from short walks through the more manicured parklands and extending into longer walks through bushland for those more adventurous.

Integrate planned urban water management into valued open spaces in accordance with the LWMS.

With these principles in mind, the following sections provide a brief description of the design and function for the key areas of open space.



Figure 11 - Landscape Master Plan
Source: EPCAD

3.4.2.1 Activity Park

The Activity Park consists of the co-located school oval, a clubhouse, community pavilion, car-park, cricket nets and fitness area. Primarily, its design has been guided by the:

- Co-located nature of the primary school;
- Provisions of the Treeby DSP, which identify the land for a district-level playing field;
- Specifications of the draft Development Contribution Plan No. 15, which will facilitate cost-sharing across Jandakot and Treeby for:
 - The 'over and above' cost of providing a district-level, formalised playing field relative to a standard neighbourhood oval; and
 - A clubroom and parking for 40 vehicles. The clubroom is likely to accommodate change-rooms, a small kitchen and a small, internal community space.
- Need to accommodate both active and passive recreation.

As its name suggests, the Activity Park is a place for active recreation, but it will also incorporate quiet spaces providing opportunities for passive recreation and social time, where space permits. Pedestrian connections into BFA 390 will also be provided, extending opportunities for circuit walks and jogging trails. The Activity Park has been sized and designed such that it can accommodate a senior-sized oval, including appropriate buffers, as well as a car-park, clubrooms and other essential infrastructure, whilst also ensuring the efficient use of Urban-zoned land. The oval overlaps into the adjacent school site by approximately 0.5ha, which is the industry standard for co-located open space.

Underground drainage infrastructure will be incorporated into the Activity Park, particularly below the oval, in the interest of ensuring that the oval is unconstrained by drainage infrastructure and useable space is maximised. Further detail in this regard is provided in Section 3.5 below.

3.4.2.1 Lake Park

In the southern portion of the structure plan area is an existing lake fringed with mature vegetation. This is a surface expression of groundwater that has been created as a result of historical quarrying activities, and its extent has remained largely consistent over at least the past decade. The quality of the fringing vegetation and the aesthetic value of the lake itself warrant its retention in the Landscape Strategy within POS.

The Lake Park is located as the heart of the structure plan area, being a high-quality, high-amenity space with strong connectivity to other parts of the estate. The design approach for the lake relies upon formalisation of the edges of the lake and an earthworks design that accommodates trees worthy of retention.

Trees and the lake edge will be managed through a combination of low walls, boulders and rock pitching, and low shrub plantings. Where trees are not present, a more formal interface comprising low walls and fences will provide a closer relationship with the water. A footpath will ring the lake at varying distances and provide visual and physical access to different parts.

Around the lake, a mix of natural and more formalised treatments are envisaged. Combined, these spaces will accommodate a range of uses, including low-key quiet spaces beneath existing trees with yoga decks and reclined seating through to more active spaces of educational play and activity for all ages.

The Lake Park has strong connections to all residential areas within the estate and, importantly, the other public spaces. South of the Lake Park is the local centre, which initially is likely to accommodate a sales office and a pop-up café to ensure early activation. To the north, the Lake Park will connect to the Activity Park via a landscaped, pedestrian-focused street shown as a 'Green Link' on the Structure Plan Map. Features such as arbours, shade trees and sculptural elements are all envisaged within this 'Green Link', with the objective of encouraging walking and engagement with the public realm.



Figure 12 - Concept Plan for Lake Park
Source: EPCAD

3.4.2.1 Arrival Experience

The primary point of access into the structure plan area will be from Armadale Road, which is a busy road carrying trucks and relatively high volumes of traffic. The objective of the entrance is to passively encourage traffic to slow down and promote a narrative of a green, calm place that contrasts to the pressures of the outside world.

The road layout is designed to bifurcate around a group planting of large trees, and is slightly raised to slow traffic and to give the feeling that the trees pre-date the development. Public art, in the form of an entry statement, is proposed on each side of the entry road, and the small parks beyond these, on each side, are part of the circular pedestrian network around the structure plan area. This network will connect into the Principal Shared Path constructed along Armadale Road as part of recent upgrade works.



Figure 13 - Concepts for Estate Entry
Source: EPCAD

3.4.2.1 Interfaces to Bush Forever Area 390

A feature of the structure plan area is the natural backdrop provided by Bush Forever Area 390, which embraces the development. Management of the interfaces will be distinct but sensitive, consisting of a perimeter road and, beyond that, a landscaped public space. These will present as a linear space and accommodate part of the pedestrian network, including nodal spaces in which to linger, and transitional plantings. Pedestrian paths will consist of standard hardstand surfaces and boardwalks, whilst compacted gravel paths could be provided to and through Bush Forever Area 390. Nodes could include outdoor classrooms for use by the nearby primary school and interpretive material will be provided to encourage an understanding and appreciation of the local environment among residents.

The safety and security of all users of the interfaces areas and Bush Forever Area 390 itself will be facilitated through design in accordance with the principles of Crime Prevention through Environmental Design (CPTED). Lighting, signage, passive surveillance from nearby dwellings and will be used to foster an active, safe space. A conservation fence will be provided along the length of the boundary with Bush Forever Area 390, with gates at selected locations if agreement is reached with the relevant management authority for formalised access to and through the reserve.

The interface parks will also perform a practical function in terms of managing level differences between the residential areas and filtrating stormwater. All drainage infrastructure and level management will be designed in a holistic manner to ensure that it complements the landscaping being provided through the parks.

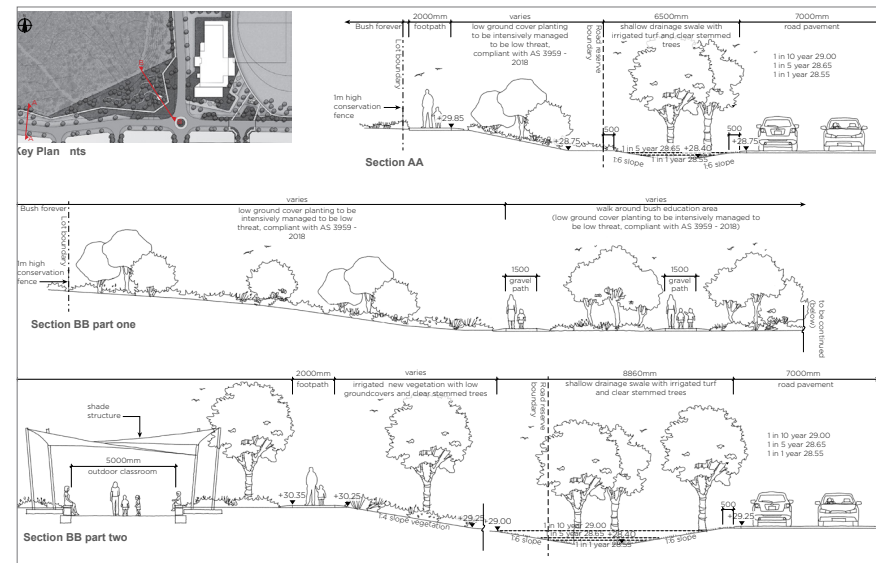


Figure 14 - Cross sections for key interfaces with BFA 390 (South)
Source: EPCAD

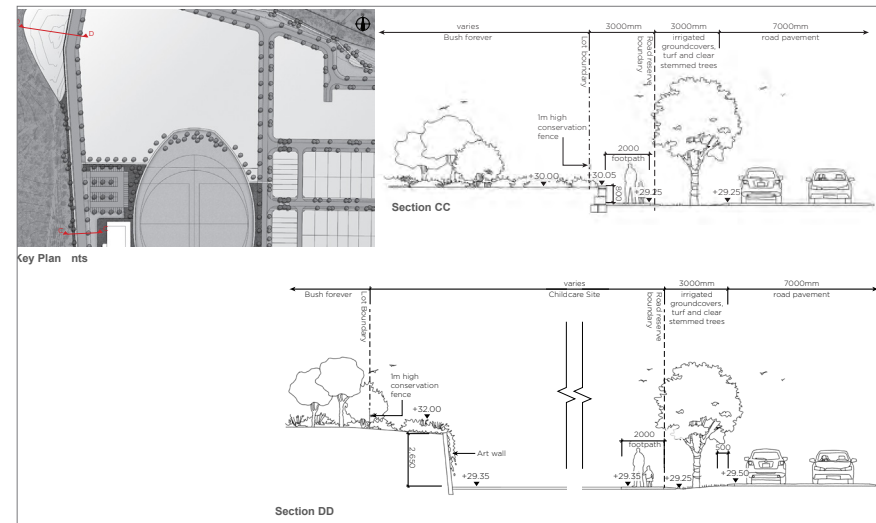


Figure 15 - Cross sections for key interfaces with BFA 390 (North)
Source: EPCAD

3.4.2.1 Streetscapes and Pocket Parks

Providing safe and beautiful streets is a key objective of this structure plan, in the interest of delivering a distinctive estate and encouraging pedestrian activity. Landscape design creates legible connections between private homes, parks (including those discussed above and the pocket park in the west) and local amenities, including the primary school and local centre.

This structure plan has been designed to accommodate 'Safe Streets' principles into its movement network, which encourage lower vehicle speeds and improve the pedestrian experience, fostering streets as a shared-use space rather than one dominated by cars. This is achieved using design techniques such as:

- A focus on grouped tree plantings to create shade and visual interest;
- Entrance ('throat') treatments at intersections, where the lower-order road has a narrower opening than the carriageway beyond;
- Offset carriageways to accommodate plantings and encouraging lower speeds by creating meanders.

The structure plan area is being designed with close attention to how best to adopt the character of the bushland setting and introduce it as a consistent theme. Native plantings are important to this, and new trees are a key tool for implementing 'Safe Streets' principles. There are obvious synergies between the two.



Figure 16 - Indicative throat treatment in accordance with Safe Streets principles

Source: EPCAD

3.5 Water Management

3.5.1 LWMS Approach

A Local Water Management Strategy (JDA, December 2019; 'the LWMS', refer Appendix 4) forms part of this structure plan. This uses the District Water Management Strategy approved as part of the Treeby DSP, which was also prepared by JDA, as its basis, and it confirms that all surface and groundwater-related aspects of the proposed development can be managed appropriately. The LWMS demonstrates compliance with all relevant policies, including in particular the *Stormwater Quantity Management Manual for Western Australia* (Department of Water, 2007) and *Better Urban Water Management* (WAPC, 2008).

Water management initiatives for the structure plan area are arranged in the context of four topics, being:

- Sustainability of supply, use and disposal.
- Stormwater management.
- Groundwater management.
- Water quality management.

Implementation measures are also listed and responsibilities allocated.

Water Conservation and Sustainability

The LWMS endorses the strategic measures incorporated into the structure plan in respect of the design approach to POS, use of non-potable supplies for appropriate purposes, and use of native species and water-saving landscaping materials. The objective for water use is for the estate to achieve the State Water Plan target for water use of 100 kilolitres per person, per year.

Stormwater Management

The structure plan area is divided into seven catchments for the purposes of stormwater management, which will be designed using a ‘major/minor’ approach incorporating:

- A ‘major’ drainage system comprising the roads, drainage reserves infiltration basins and open space and designed to provide safe passage of stormwater during significant rainfall events (events less frequent than 20% AEP).
- A ‘minor’ drainage system comprising ‘pit and pipe’ infrastructure designed to facilitate on-site infiltration of stormwater for small storm events and bioretention infrastructure for at-source infiltration of larger events, up to those more frequent than 20% AEP.

All stormwater drainage management infrastructure will be located outside BFA 390 and the Resource Enhancement Wetland buffer. Further detail is available in the LWMS.

Groundwater Management

The LWMS’ objective in respect of groundwater management is to minimise change to groundwater levels and quality following development. The stormwater management measures outlined above are fundamental to this, as is a sub-soil drainage network to manage fluctuation in the level of local aquifers and an outlet to Atwell Drain. In recent years, probably as a consequence of urbanisation elsewhere in Treeby, groundwater levels have risen relative to the long-term trend. The LWMS confirms that this can be managed and mitigated.

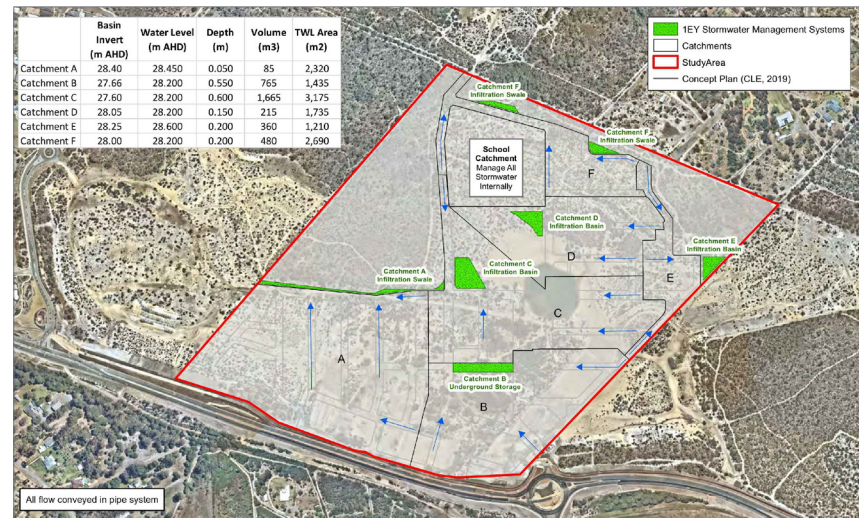


Figure 17 - 1EY Stormwater Event Plan
Source: JDA Consulting Hydrologists

Water Quality Management

The LWMS seeks to ensure that the objectives of SPP 2.3: *Jandakot Groundwater Protection* for Priority 3 Underground Water Pollution Control Areas (the anticipated future classification of the structure plan area) are met. These include use of native species requiring minimal irrigation and fertiliser and management of separation to groundwater. The LWMS proposes measures such as:

- Inclusion of a 50% target for native plant species;
- A schedule of street-sweeping and pit eductions;
- Incorporation of bioretention basins to treat road runoff;
- Maintenance of separation to groundwater through sub-soil drainage infrastructure.

3.5.2 Implementation of the LWMS

The LWMS advocates implementation of its recommendations in two stages; firstly, through an Urban Water Management Plan prepared as a condition of subdivision approval and secondly as part of development work undertaken subsequently. Full detail in this regard is provided at Section 6 of the LWMS.

3.6 Schools

In accordance with the Treeby DSP, the structure plan area contains one 4 hectare, co-located primary school site. At the request of the Department of Education, the primary school site has been increased from the standard 3.5 hectares (with reference to *Liveable Neighbourhoods*) in order to accommodate higher than usual student numbers within the catchment. Its location is consistent with *Liveable Neighbourhoods*, which advocates school sites on (relevantly) “*the neighbourhood connector road between two neighbourhoods*”. The school site will be created as a lot and ceded to the Crown at an appropriate stage of subdivision.

The configuration of the primary school is generally consistent with the Treeby DSP, and the opportunity has been taken to switch the oval from north to south. This has the benefit of making the school more central to its catchment (which encompasses the structure plan area and Lot 131 Jandakot Road to the north) and simplifying access arrangements, through a reduction in the number of lots opposite the school buildings and car-parks. It also connects the playing fields with the local centre and Lake Park to form a high-amenity core.

The primary school is one of two primary school sites shown in the Treeby DSP, serving (broadly) eastern and western catchments. Both primary schools currently form part of the Atwell College intake area. In future both primary schools are likely to fall within the catchment of a new secondary school planned for a site near the intersection of Warton Road and Jandakot Road.

3.7 Activity Centres and Employment

3.7.1 Existing Centres and Employment Opportunities

Identification of the structure plan area for urbanisation in the Framework reflects its convenient location relative to employment opportunities within the Central sub-region and nearby parts of the South Metropolitan sub-region. Consistent with the relevant objective in the *Perth and Peel @ 3.5 million* report, the proposed estate will optimise the use of existing and planned facilities.

The City of Cockburn's *Local Commercial Activity Centre Strategy* (Pracsys, 2012) makes note of numerous activity centres readily accessible to the structure plan area. These include the Cockburn Secondary Centre and Jandakot Airport industrial area, and several lower-order centres. These will not only offer services and employment for the planned new community but also benefit from increased trade generated by a larger population base.

Further afield, the Harrisdale District Centre, Forrestdale Business Park, Maddington-Kenwick industrial area and Western Trade Coast provide diverse employment opportunities, and the Perth city centre is 20km north via the Kwinana Freeway or Perth-Mandurah railway.

Progression of this structure plan and the urban development that will follow will be the catalyst for the provision of the facilities envisaged in the Treeby DSP, including primary schools and local-level activity centres to the west and south.

3.7.2 Proposed Local Centre near Lake Park

The structure plan identifies approximately 3000sqm of land for a Local Centre near the Lake Park, in response to the provisions of the Treeby DSP. As noted in Section 1.3.3.3 of this report, the Treeby DSP identifies a Local Centre on the north-south Neighbourhood Connector road adjacent to the primary school site. Uses such as “a *deli, café, medical services, childcare and/or local offices, depending on market demand*” within approximately 1500sqm of Net Lettable Area are envisaged.

The Local Centre is not shown in the City's Local Commercial Activity Centre Strategy, being in an area that was not identified for urbanisation at the time it was published. However, its provisions for Local Centres, which reflect those in the WAPC's State Planning Policy 4.2: Activity Centres for Perth and Peel, are relevant:

- “*Local Centres provide for daily and some weekly household shopping needs, and a very small range of other convenience services*”, and will be “*a local employment node with moderate levels of convenience retail employment*”.
- “*The public realm in local centres is generally provided within the street environment, and sometimes parks.*”
- *Local Centres will have “[f]ine-grained walk[ing] and off-road network providing direct and convenient access...throughout the centre and be a “stopping/transfer point for bus network”.*
- *In terms of intensity, Local Centres will have “[m]oderate levels of local retail/household services within centre with potential for incremental increases in residential densities within centre and defined areas of influence”, with a 200m walkable catchment.*

Initially, the Local Centre will be activated through location on the site of the sales office for the estate and potentially a pop-up coffee shop, taking advantage of views across the Lake Park. Ultimately, it is envisaged that the Local Centre will mature in accordance with the characteristics and land use mix described in the *Local Commercial Activity Centre Strategy* and the Treeby DSP.

[3.7.3 Local Centre near primary school](#)

The structure plan identifies another 5000sqm of land for a Local Centre near the primary school site. Approximately 3400sqm of this land is subject to a bushfire hazard, whilst the balance (approximately 1600sqm) is intended to be developed as a childcare centre site. Detail in this regard is provided with Appendix 8 to this report.

3.8 Infrastructure Co-ordination, Servicing and Staging

Engineering consultants Wood and Grieve have prepared a detailed Engineering Infrastructure Report (November 2019; see Appendix 7) confirming that although upgrades and extensions to infrastructure in the local area will be required, there are no site-specific constraints to the structure plan area being serviced. Further, more detailed infrastructure planning and design will be undertaken as the development of the structure plan area proceeds.

The Engineering Servicing Report ('the Engineering Report') is summarised in the following sub-sections.

[3.8.1 Earthworks](#)

The objective of the earthworks design process is to provide flat building sites. This is to be achieved in the context of the need to provide clearance to drainage and groundwater, and provision of flood routes (within road carriageways) for major events. In addition, fixed levels are noted at the northern and western boundaries (adjacent to Bush Forever Area 390) and on the southern boundary, where optic fibre has been laid in the Armadale Road reserve in close proximity to the boundary of the structure plan area.

The structure plan area varies in elevation from RL25 near the centre to RL41.5 near Armadale Road in the south, with undulation evident. Cut and fill will be undertaken across the structure plan area to deliver co-ordination with external levels and meet internal design objectives. The undulating nature of the topography enables some fill material to be obtained on-site (from cut), which will be used in conjunction with imported fill.

Geotechnical investigations undertaken as an input to the Engineering Report have identified some uncontrolled fill within the structure plan area. This will require remediation but is not an impediment to the achievement of a 'Class A' classification under the relevant Australian Standard (AS2870:2011 – *Residential Slabs and Footings*).

[3.8.2 Wastewater](#)

The Engineering Report confirms that the Water Corporation has commenced conceptual wastewater network planning for the structure plan area. All lots will be connected to a reticulated sewer network gravitating to a new Type 40 wastewater pump station at the lowest point in the catchment, at the south-eastern corner of the central POS. This will be accommodated in an easement benefiting the Water Corporation and covering approximately 0.1ha, and a 30m odour buffer will apply. Its precise size and location will be confirmed at the subdivision stage.

The pump station will outfall via a pressure main leading to existing infrastructure to the west, in Clementine Boulevard, Treeby (part of the 'Calleya' estate being developed by Stockland).

[3.8.3 Water Supply](#)

The Engineering Report confirms that the Water Corporation has commenced conceptual water supply planning for the structure plan area. Water supply will be extended as part of the Thomson Lake Gravity Supply Scheme and a reticulated network will be constructed within road reserves in the normal manner.

[3.8.4 Electricity Supply](#)

Review of Western Power's Network Capacity Mapping Tool has confirmed to the project team that the relevant sub-station (the Southern River zone sub-station) has sufficient spare capacity to supply the structure plan area, which is expected to draw approximately 3 MVA of electricity.

The provision of an electricity supply to each proposed lot will be achieved by the construction of an underground high-voltage network connecting into an underground low-voltage network through switchgear and transformers. The installation of street lights forms part of the electricity network installation program.

[3.8.5 Telecommunications](#)

The provision of a telecommunications connection to each proposed lot would be achieved by the construction of an extension to the National Broadband Network (NBN) from neighbouring developments. Installation of pipe and pit infrastructure would be funded and undertaken by the developer, and that infrastructure transferred to NBN Co via the execution of a Master Development Agreement in exchange for the provision of data infrastructure within the pit and pipe network.

The pit and pipe system will be laid in a common trench extended inside the communications corridor, installed in a common trench with the underground electricity network.

[3.8.6 Gas](#)

The Engineering Report confirms that a high-pressure gas main is located in the Armadale Road reserve and can be used to service the structure plan area. Installation of a pressure-reducing valve will be necessary to facilitate this connection. A reticulated gas supply will be provided by ATCO Gas using a common trench with the water supply network.



Figure 18 - Staging Plan
Source: Wood & Grieve

3.8.7 Staging and Access

The structure plan will be implemented on a staged basis in response to commercial imperatives. It is currently anticipated that development will commence in the south-eastern corner, which will enable the construction of the entry road off the Armadale Road/Liddelow Road roundabout and the development of a sales office, display village and initial POS.

Subsequent stages are currently envisaged to progress westward, then northward, by which time population growth is expected to have catalysed the primary school. All local streets will be constructed on the basis of Transcore's traffic advice and the applicable City of Cockburn standards.

3.9 Bushfire Hazard Management

The Bushfire Management Plan (Bushfire Safety Consulting, December 2019; 'the BMP') confirms that the structure plan makes an appropriate response to bushfire risk.

The BMP indicates that the primary bushfire hazard affecting the structure plan area is Bush Forever Area 390, which abuts the structure plan area to the north, east and west, and unmanaged vegetation south of Armadale Road. This has been classified as 'Forest', 'Woodland' and 'Scrub', with a limited area of 'Shrubland'.

Other hazards include potentially unmanaged vegetation ('Woodland' and 'Grassland') within the Skotsch Road rural-residential area to the north and, temporarily, unmanaged vegetation on Lot 703 to the west ('Scrub'). A structure plan for Lot 703 is currently being assessed, and it is anticipated that development of the site will commence in 2020.

New landscaping within the Armadale Road reserve adjacent to the structure plan area consists of groundcovers and prostrate shrubs, which result in a vegetation classification of 'Shrubland'. This has been incorporated as an input to the bushfire hazard levels described below, as have the existing Principal Shared Path and the future noise wall.

All POS within the structure plan area has been designed to be suitable for maintenance in a low-threat state. The BMP recommends the following management measures:

- *“Under pruning of shrubs, scrub and trees of all fine fuels (<6mm) 2 metres from ground level*
- *Annually removing leaf litter, accumulated fine fuels and dead plants and/or plant material.*
- *Keeping garden beds irrigated and turf areas mown and grass green.*
- *Pruning to keep clumps of trees and shrubs separated from one another.*
- *Removal of weeds and regenerating eucalypts, acacia and other native plants not intended to be included as part of the landscape plans.”*

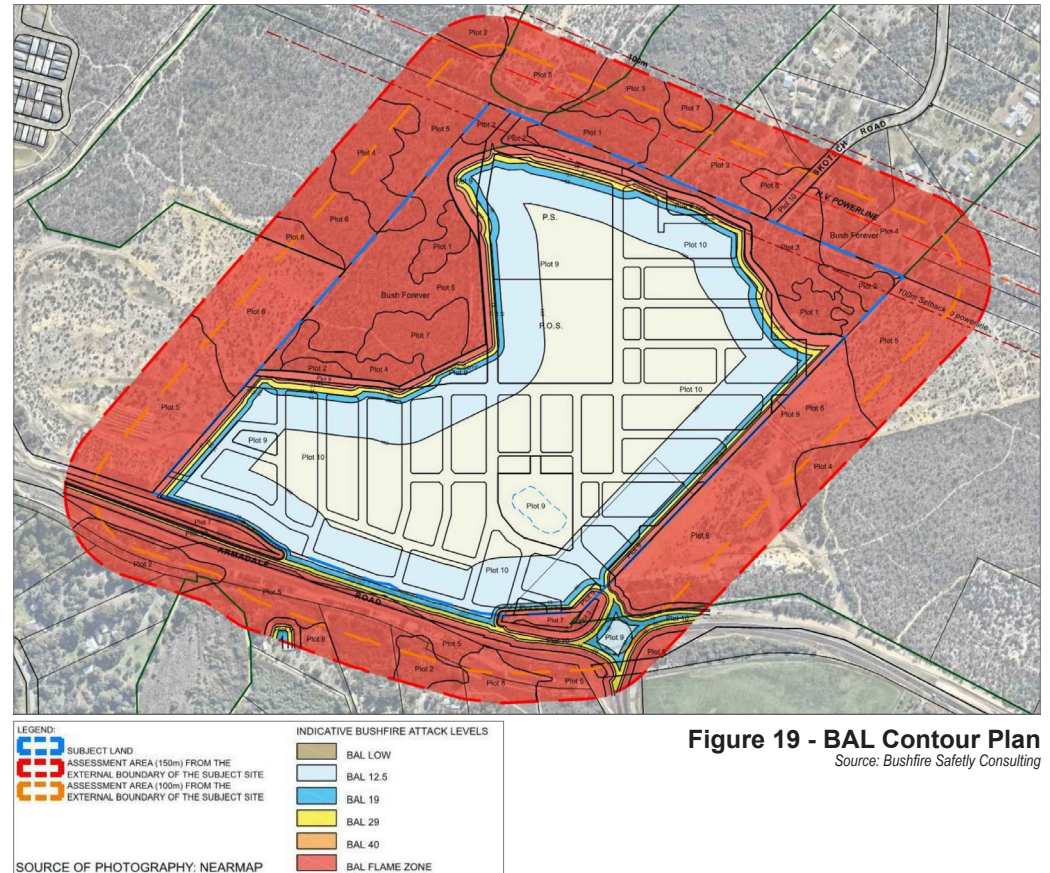


Figure 19 - BAL Contour Plan
Source: Bushfire Safely Consulting

The bushfire hazards mentioned above translate to Bushfire Attack Level (BAL) ratings of up to BAL-29 for some lots. This is proposed to be achieved through the following management measures:

- Provision of a permanent perimeter Asset Protection Zone ('APZ') along the northern, eastern and north-western boundaries within road reserves and POS. This provides separation to vegetation on abutting land, which is planned to remain in its natural state and/or be rehabilitated.
- Provision of a temporary APZ along the boundary with Lot 703. This will be required only until, as planned, urbanisation of Lot 703 occurs in accordance with the applicable 'Development' zone.
- Landscaping of POS in accordance with the tailored approach advocated in the Landscape Management Plan and maintenance in the manner described above.

Ultimately, three external access points will be available to the structure plan area, and reticulated water supply will be provided.

To manage bushfire hazards on a stage-by-stage basis, the BMP recommends the creation of a 100 metre wide Asset Protection Zone ahead of the development front. In addition, for the period between lot creation and sale, the developer will manage bushfire hazard on individual lots.

3.10 Transport Noise

As noted in Section 2.6.1, the structure plan area abuts Armadale Road, which triggers application of the WAPC’s SPP 5.4. To address the requirements of SPP 5.4, a Traffic Acoustic Assessment (Herring Storer Acoustics, October 2019; refer Appendix 6) has been prepared.

The Traffic Acoustic Assessment was prepared in accordance with the SPP 5.4 Guidelines and uses noise modelling to estimate the level of noise likely to be experienced by the structure plan area once developed. Noise monitoring has not been possible given that the relevant noise source, Armadale Road, is currently under construction. The outcome of the noise modelling is that transport noise is not an impediment to residential development in accordance with the proposed structure plan, but that noise levels will exceed the relevant noise Targets without noise mitigation measures being implemented. The recommended mitigation measures comprise the following:

- Construction of a 2.4m high noise wall along the boundary between the structure plan area and the Armadale Road reserve.
- Quiet House construction standards for dwellings along Armadale Road.
- Notifications on the certificates of title of all lots subject to Quiet House construction standards.

The recommendations of the Traffic Acoustic Assessment will be implemented at the subdivision and development stages as appropriate. In particular, finalisation of the lot layout will enable confirmation of the lots requiring Quiet House construction standards and notifications on title.



Figure 20 - Quiet House Design Requirements assuming 2.4m high noise wall

Source: Herring Storer Acoustics

3.11 Building Requirements

Amendments to the *Building Regulations 2012* commencing from 1 May 2024 will apply to Class 9 buildings from that date and may impact the development of certain land uses in bushfire-prone areas.

3.12 Developer Contributions

3.12.1 Standard Infrastructure

The structure plan area is in single ownership, and the structure plan itself does not contain any standard infrastructure items (such as road intersections) that will be of sufficient shared benefit to warrant cost-sharing arrangements with neighbouring landowners.

3.12.2 Community Infrastructure

The structure plan area is within Development Contribution Area 13, which is a community infrastructure DCA covering most of the City of Cockburn. The facilities it covers are listed at Table 10 of the City's Local Planning Scheme No. 3. The structure plan area is liable for the Regional, Sub-regional (East) and selected Local items (Banjup Playing Field and Banjup Community Centre). Contributions are payable on a per-lot basis at the time of subdivision clearance.

The City's Community, Sport and Recreation Facilities Plan (2017-2031) identifies 'neighbourhood-level' playing fields and a pavilion at Lot 705. These are scheduled for delivery between 2024 and 2027.

The City initiated an amendment to TPS 3 (Amendment 141) in early 2019 to create a Development Contribution Area ('DCA 15') and Development Contribution Plan to secure funding for this community infrastructure via development contributions. At the time of writing, Amendment 141 has been adopted by the City of Cockburn post-advertising, and is currently with the WAPC and Minister for Planning for further consideration and determination. The proposed amendment is inconsistent with the 2019 draft State Planning Policy 3.6, and the likelihood of it being approved by the Minister in its current form is uncertain.

The structure plan provides sufficient space for this infrastructure should Amendment 141 be endorsed. In the event that it is not endorsed by the Minister, the City may wish to reconsider its infrastructure requirements for this park, in which case the size and function of the open space may change in the future. If that does occur, the refinement can be made at subdivision stage without a change to the structure plan.

