



LOCAL STRUCTURE PLAN

ANKETELL NORTH



ROWEGROUP

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This report has been authorised by;



George Hajigabriel
General Manager



Kim Kyle
Manager Design



Jamie Baxter
Quality Control

CONTACT PERTH OFFICE

p 9221 1991 **e** info@rowegroup.com.au **w** rowegroup.com.au **a** 3/369 Newcastle Street, Northbridge 6003

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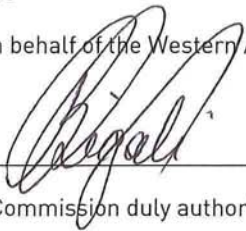
RECORD OF ENDORSEMENT

This structure plan is prepared under the provisions of the City of Kwinana Local Planning Scheme No.2

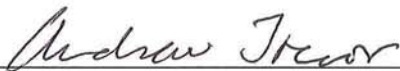
IT IS CERTIFIED THAT THIS STRUCTURE PLAN WAS APPROVED BY RESOLUTION OF THE
WESTERN AUSTRALIAN PLANNING COMMISSION ON:

17 December 2015

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



an officer of the Commission duly authorised by the Commission pursuant to section 16 of the Planning and Development Act 2005 for that purpose, in the presence of:



Witness

18-12-15

Date

17 December 2025

Date of Expiry



TABLE OF AMENDMENTS

Amendment No.	Summary of the Amendment	Amendment Type	Date Approved by the WAPC





EXECUTIVE SUMMARY

This Local Structure Plan (LSP) addresses an area of 97.8 hectares identified as 'Development Zone' within the Anketell locality approximately 5 kilometres north east of the Kwinana Town Centre. The site referred to as the 'Anketell North LSP area' is bound by Anketell Road to the north, Jandakot Underground Water Pollution Control Area to the east, Bush Forever Site 270 to the south and the west.

The majority of the LSP area was transferred to the Urban zone on the 1 December, 2009. The balance directly adjacent to Anketell Road was transferred on 27 May, 2014 following design resolution of the final extent of the future Anketell Road reserve.

The purpose of this LSP is to facilitate the development of the subject site for predominantly residential purposes.

The preparation of this Local Structure Plan has been undertaken in liaison with the City of Kwinana and government authorities.

Bush Forever Site 270 Part C whilst external to the LSP area has been given due consideration through the local structure planning process. Whilst zoned 'Rural' its hydrological relationship as well as its interface with the urban area has guided the design approach for the LSP area and is therefore detailed in the supporting reports to this LSP.



Local Structure Plan Summary

Item	Data	Section number referenced in report
Total area covered by the Structure Plan	98.4 hectares	1.2.2
Area of each land use proposed		
<u>Zones</u>		
Residential	45.1 hectares	4.1
<u>Reserves</u>		
Road Reserve	20.12 hectares	
Park Recreation and Drainage (Inclusion of WP Easement 4.3ha)	15.03 hectares	
Public Purpose – Community	1.67 hectares	
Public Purpose – Primary School	4 hectares	
<u>Excluded Area</u> ¹	12.48 hectares	
Estimated lot yield ²	1180 lots	4.3
Estimated number of dwellings ²	1180 dwellings	4.3
Estimated residential site density ²		
Dwellings Per Gross Urban hectare	12 dwellings	4.3
Dwellings Per Site hectare	26 dwellings per site hectare	
Estimated population ²	3304 people @2.8 people per household	4.3
Number of high schools	0 high schools	4.6
Number of primary schools	1 primary schools	4.6
Estimated area and % of public open space ²		
Total Public Open Space	12.4 hectares, (14.8%) * Community Purpose Site included in Total Public Open Space.	4.2
Unrestricted Public Open Space	10.7 hectares (12.7%)	
Restricted Public Open Space	0.5 hectares (0.6%)	
Composition of Public Open Space:		
Anketell Playing Fields	4.97 hectares, 1 oval	4.2
Neighbourhood Parks	5.3 hectares, 8 parks	
Local Parks	0.79 hectares, 3 parks	

1. The portion of LSP area which is most likely affected by noise is excluded from the LSP area until matters raised by the WAPC have been addressed to the satisfaction of the WAPC, including addressing the requirements of *SPP 5.4 Road and Rail Transport Noise and Freight Considerations in Land Use Planning*, inclusive of the appropriate land uses and the necessary noise mitigation strategy via a noise management plan.

2. Figures based on total LSP area including the development potential of the 'Excluded Area' subject to note 1.





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4. Water Management Responsibilities





TECHNICAL APPENDICES

Appendix Number	Document Title	Nature of Document	Referral/Approval Agency	Summary of Document Modifications
1.	Certificates of Title	Informational	N/A	
2.	Environmental Assessment	Environmental	DPaW	
3.	Flora and Vegetation Survey	Environmental	DPaW/ City of Kwinana	
4.	Wetland Management Strategy	Environmental	DPaW / City of Kwinana	
5.	Fire Management Plan	Fire	City of Kwinana	
6.	Indigenous Heritage Survey	Heritage	N/A	
7.	Landscape Masterplan and Cross Sections	Landscape	City of Kwinana	
8.	Transport Assessment	Transport	City of Kwinana	
9.	Local Water Management Strategy	Hydrology	DoW	
10.	Servicing Report	Engineering	WP, WC, City of Kwinana	





Part One

IMPLEMENTATION



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1. Structure Plan Area

This Structure Plan shall apply to the land contained within the inner edge of the line denoting the Structure Plan boundary on the Structure Plan Map.

2. Operation

This Structure Plan comes into effect on the day it is approved by the Western Australian Planning Commission.

3. Staging

Figure 19 of Part Two depicts indicative staging for the subdivision of the structure plan area.

4. Subdivision and Development Requirements

- a) Residential densities for the structure plan area are the residential densities shown on the Local Structure Plan Map.
- b) Public open space is to be provided in accordance with the Local Structure Plan Map.
- c) Land use permissibility within the structure plan area shall accord with the corresponding land use classification in the City of Kwinana Town Planning Scheme No.2.
- d) This Structure Plan is supported by a Bushfire Management Plan (BMP), *Fire Management Plan – Anketell North Local Structure Plan* (March 2015) as amended. Any land falling within 100 metres of a bushfire hazard identified in the BMP is designated as a Bushfire Prone Area for the purpose of the Building Code of Australia.
- e) Notifications on Title

The Council shall recommend to the Western Australian Planning Commission that a condition be imposed on the grant of subdivision approval for a notification to be placed on the Certificate of Title to suitably respond to the following:

- The Fire Management Plan for lots with a bushfire attack level (BAL) rating of 12.5 or higher;
- Transport noise for lots that are the subject of noise levels exceeding the noise target as per *State Planning Policy 5.4 – Road and Rail Transport Noise and Freight Considerations in Land Use Planning*.

- f) Management Plans

The Council shall recommend to the Western Australian Planning Commission that a condition be imposed on the grant of subdivision approval to respond to the following as identified by the structure plan:

- The preparation, approval and implementation of a wetland interface management plan providing for the protection of the adjoining wetland located in Bush Forever Site 470 Part C; and
- A mosquito and midge management plan.



5. Local Development Plans

Local Development Plan(s) are to be prepared for lots with one or more of the following attributes:

- a) Rear-loaded vehicle access;
- b) Having the potential for grouped and/or multiple dwellings;
- c) Frontages of less than 12 metres;
- d) The subject of a notification on title; and
- e) Having an R10 density coding.

6. Other Requirements

- a) Development Contribution Arrangements

Under the City of Kwinana Town Planning Scheme No. 2, the following development contribution arrangements apply and/or are contemplated:

- Development Contribution Area 9 for the funding of community infrastructure; and
- Development Contribution Area 4 for 'hard' infrastructure.



LEGEND

LOCAL SCHEME

LOCAL SCHEME RESERVES

- Park Recreation & Drainage

PUBLIC PURPOSES

- CF Community Facility
- PS Educational/Institutional
- PS Primary School

ZONES

- Residential - R10
- Residential - R25
- Residential - R30
- Residential - R40
- Residential - R40

OTHER

- District Distributor Integrator A
- District Distributor Integrator B
- Neighbourhood Connector A
- Neighbourhood Connector B
- Access Street B
- Structure Plan Boundary
- Western Power Easement

① The portion of LSP area which is most likely affected by noise is excluded from the LSP area until matters raised by the WAPC have been addressed to the satisfaction of the WAPC, including addressing the requirements of SPP 5.4 Road and Rail Transport Noise and Freight Considerations in Land Use Planning, inclusive of the appropriate land uses and the necessary noise mitigation strategy via a noise management plan.

0 150 300 Metres

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PLANNING DESIGN DELIVERY

W: www.rowegroup.com.au
E: info@rowegroup.com.au
P: 08 9221 1991

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Designer: P. Fitzgerald
Drawn: K. Trenberth
Projection: MGA50 GDA94
Plan ID: 4583-LSP-04-P



Anketell North Local Structure Plan Map

City of Kwinana



Part Two

EXPLANATORY SECTION



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Planning Background

1.1 Introduction and Purpose

This Local Structure Plan (LSP) has been prepared by Mammoth Nominees Pty Ltd and Well Holdings Pty Ltd as a precursor to subdivision for land zoned 'Development Zone' under the provisions of the City of Kwinana TPS2.

The purpose of the LSP is to refine the provisions under the district framework and ensure a comprehensive approach to planning and development is undertaken, with input from the local community, landowners, government agencies and other key stakeholders.

The LSP will guide future land use and development within the Anketell North LSP area, and provide a framework for more detailed planning at subdivision. This Part 2 of the Structure Plan provides explanation for the Statutory Part 1 provisions.

1.2 Land Description

1.2.1 Location

The LSP area is located within the metropolitan south west corridor, within the municipality of the City of Kwinana. The site is situated approximately 28 km south of Perth Central Area, and is accessible via the Kwinana Freeway. The Kwinana Town Centre is located approximately 8 km south and the Spectacle Regional Reserve approximately 1 km from the subject site.

The subject site is generally bounded by Anketell Road to the north, the Jandakot Groundwater Mound to the east and Bush Forever Site 270 to the south and west.

Refer to Figure 1 – Regional Location.

Refer to Figure 2 – Locality Plan.

1.2.2 Area and Land Use

The LSP area comprises approximately 98.4 hectares currently accessed by Treeby Road, which runs parallel to the Kwinana Freeway and connects to Anketell Road along the northern boundary of the Anketell North LSP area.

The LSP area comprises rural properties ranging in size from approximately 3 hectares through to 6 hectares, which are currently being utilised for agricultural purposes such as grazing, market gardening and horse agistment. A number of existing dwellings are also located within the LSP area, with associated outbuildings, fences and other structures. These are intended to be demolished and removed as part of the development of the site.

Part C of Bush Forever Site 270 forms part of Lot 13 Treeby Road within the Anketell North LSP area. As such, the northern portion of Lot 13 zoned 'Development' zone is included within the LSP area. Notwithstanding, whilst the southern portion of the site located outside of the LSP area, its interface with the urban cell requires specific management and therefore is given due consideration through the design response.

Western Power easements traverse the eastern portion of the site and externally to the site, along the western boundary.

Refer Figure 3 – Local Structure Plan Area.

Refer Figure 4 – Aerial, Contours and Cadastral (Site Plan).

1.2.3 Legal Description and Ownership

The LSP comprises twenty three (23) allotments, being:

Lot Number	Address	Plan/ Diagram No.	Land Ownership
652	652 Anketell Road	P3475	Filton Pty Ltd
2	664 Anketell Road	P4746	James
3	676 Anketell Road	P4746	Bazzo
4	686 Anketell Road	P4746	Marevich and Musulin
7	734 Anketell Road	P4746	Hill
89	748 Anketell Road	D92985	Ting
90	758 Anketell Road	D92984	Mincha Pty Ltd
189	19 Treeby Road	P25097	Grillo
188	28 Treeby Road	P25096	Abrahams
36	35 Treeby Road	D32446	Carsettai
30	36 Treeby Road	D32446	Gucce Holdings Pty Ltd
31	48 Treeby Road	D32446	Lu and Ju
37	49 Treeby Road	D32446	White
38	55 Treeby Road	D32446	Su
32	56 Treeby Road	D32446	Sanpoint Pty Ltd
39	63 Treeby Road	D32446	D'orsogna and Spring Park Pty Ltd
33	64 Treeby Road	D32446	Narrah Pty Ltd and Vacation Investments Pty Ltd
34	74 Treeby Road	D32446	Comley
40	73 Treeby Road	D32446	Dorn
35	82 Treeby Road	D32446	Bazzo
41	83 Treeby Road	D32446	Comley
100	96 Treeby Road	D89861	Well Holdings Ltd & Trevalley Investments Pty Ltd
13	140 Treeby Road	P4746	Well Holdings Pty Ltd

Mammoth Nominees and Well Holdings represent the landowners of Lots 13, 30, 35 and 100 Treeby Road and Lot 3 Anketell Road.

Refer to Appendix 1 - Certificates of Title.

2.1.1 Zoning and Reservations

Land within the LSP boundary is zoned 'Urban' under the Metropolitan Region Scheme (MRS), and 'Development' under the City of Kwinana Town Planning Scheme No. 2 (TPS 2).

The land was transferred to the 'Urban' zone under the MRS on December 2009, by notice in the Government Gazette [notice reference PL403]. Upon Gazettal of the urban zone, the site was concurrently zoned 'Development' under TPS 2, by resolution of the WAPC and notice in the Government Gazette.

To the east the LSP area abuts 'Rural Water Protection' zoned land.

Bush Forever Site 270 Parts A and B to the west and south east of the LSP area, are zoned 'Parks and Recreation', whilst Part C remains within the 'Rural' zone.

The lots abutting Anketell Road are also subject to an 'Urban Deferred' zoning under the MRS. This zoning is consistent with the extent of the ultimate Anketell Road reservation required to serve as an Other Regional Road and will be subject to reservation by the Western Australian Planning Commission (WAPC) in the future.

The Treeby Road reservation runs parallel to the Kwinana Freeway within the LSP area and provides access to the site from Anketell Road. Anketell Road itself is identified as a future freight route and as such will be subject to significant works to facilitate commercial traffic in the future.

Refer Figure 5 – Metropolitan Region Scheme Zoning.

Refer Figure 6 – City of Kwinana Local Planning Scheme No.2 Zoning.

2.1.2 Regional and Sub-Regional Structure Plan

2.1.2.1 Jandakot Structure Plan

The LSP is situated within the Jandakot Structure Plan area.

The Jandakot Structure Plan was finalised in August 2007 and provides a strategic direction to coordinate the development of the region while ensuring environmental, social and economic objectives are met.

Previously, the major constraint to urban development within this corridor was the resolution of groundwater and stormwater management. With the preparation of the Jandakot District Water Management Plan (JDWMP) however, these issues have now been resolved and have been accommodated in current planning for the cell under this LSP and the associated Local Water Management Strategy.

The district level requirements of the Jandakot Structure Plan, such as the identification and preservation of natural areas, the allocation of public open space and public purpose areas, road network and hierarchy, and the allocation of school sites have been further refined through the preparation of this LSP.

The Jandakot Structure Plan identifies the LSP area for urban development.

The proposed LSP is considered to be consistent with the intent and requirements of the Jandakot Structure Plan.

Refer Figure 7 – Jandakot Structure Plan.

2.1.2.2 Eastern Residential Intensification Concept (ERIC)

The City of Kwinana's draft District Structure Plan, referred to as the 'Eastern Residential Intensification Concept' (ERIC) was prepared by the City of Kwinana in 2005 to provide strategic direction and refinement of the future urban areas identified under the Jandakot Structure Plan. Whilst ERIC has yet to be finally adopted by Council, it provides a framework to the preparation of LSP's within the urban corridor.

The ERIC identifies the following land uses within the LSP area:

- ▲ Residential R20;
- ▲ Residential R25 and Higher;
- ▲ Local Open Space;
- ▲ Primary School, and
- ▲ Special Residential associated with the Western Power easement.

The LSP has been prepared giving due consideration to the provisions of ERIC, albeit updated to respond to current planning principles and objectives.

Refer Figure 8 – Eastern Residential Intensification Concept.

2.1.3 Policies

2.1.3.1 Liveable Neighbourhoods

Liveable Neighbourhoods (LN) represents the WAPC's primary policy to guide the design and assessment of structure plans and subdivision for new urban development of residential communities in Western Australia. The underlying objective is to create quality neighbourhoods with site responsive identity supportive of local community that reduce dependency on private vehicles, and are more energy and land efficient. As such, LN focuses on an urban structure based on walkable mixed-use neighbourhoods with interconnected street patterns. It functions by drawing together key policy aspects into a single 'integrated planning and assessment policy' to provide for a performance based approach to planning assessment.

It does so according to a range of considerations including:

- ▲ Community;
- ▲ Movement;
- ▲ Lot Layout;
- ▲ Urban Water Management;
- ▲ Public Open Space; and
- ▲ Schools.

Liveable Neighbourhoods identifies a series of Objectives and Requirements for Local Structure Plans that, when met, demonstrate compliance with the overall outcomes sought by LN. These objectives and

requirements relate to items such as road layout, relationship of housing to open space and schools, school location/distribution, POS layout and location and housing densities.

The LSP has been prepared to satisfy the various objectives and requirements of LN to ensure that more detailed proposals at subdivision stage are also capable of satisfying the relevant criteria.

2.1.3.2 Bush Forever

Bush Forever, prepared by the WAPC (2000), is a ten year strategic plan for the retention and protection of regionally significant bushland within the Perth Metropolitan region. Bush Forever presents a 'whole of government approach' to the protection of bushland (and associated wetlands), with the Bush Forever policy endorsed by the Government of Western Australia, WAPC, the EPA, and other key environmental agencies.

One of the principle aims of Bush Forever is to provide a guide to site implementation for landowners, developers and the community, by clearly distinguishing each Bush Forever site and associated site implementation recommendations.

Bush Forever Site 270, Part C, traverses Lots 13 and 100 in the southern portion of the Anketell North. Site 270 comprises three parts, being Part 'A' and Part 'B' – currently reserved 'Parks and Recreation' under the MRS, and Part 'C' – which encompasses both Lots 13 and 100, providing a bushland 'link' between Part A and B. We confirm Part C is not identified to be reserved under the MRS, however is identified as a 'Strategic Negotiated Planning Solution' (NPS) under the Bush Forever document.

The objectives of a Strategic NPS are defined as follows:

'To optimise conservation and planning objectives for sites with multiple ownership. To provide a fair and equitable distribution of open space (including Bush Forever Sites) when coordinating future development in areas of multiple ownership, while seeking to protect the Bush Forever Sites in their entirety where possible, and a reasonable outcome.'


The mechanism for reviewing and negotiating outcomes for a Strategic NPS site generally occurs at local structure planning stage, however may also be initiated through regional or district structure plans and rezoning under the MRS or TPS.

The current landowner entered into negotiations regarding Part C during the advertising of the (then) Bushplan (1998). As a result of submissions, this policy was revised and superseded with the publication of Bush Forever in 2000. It was through this process the need for a balanced approach to urban development and conservation was recognised, and the nominal boundary for the link within Part C was formally recognised. The revised link boundaries were formalised through the establishment of a Special Control Area (SCA) in the MRS addressing the delineation and management of Bush Forever sites and as outlined in State Planning Policy 2.8 Bushland Policy for the Perth Metropolitan Region. This Structure Plan reflects this SCA via its satisfaction of SPP 2.8 requirements outlined below

2.1.3.3 State Planning Policy (SPP 2.8) Bushland Policy for the Perth Metropolitan Region

State Planning Policy 2.8 (SPP 2.8) was gazetted in June 2010. The aim of SPP 2.8 is to provide a policy and implementation framework that will ensure bushland protection and management issues in the Perth Metropolitan Region are appropriately addressed and integrated with broader land use planning to secure long-term protection of biodiversity and associated environmental values.

The policy applies to the metropolitan region and addressed two distinct aspects of bushland management being, Bush Forever sites and local bushland.



The policy recognised the protection and management of significant bushland areas as a fundamental consideration in the planning process, while also seeking to integrate and balance wider environmental, social and economic considerations. Generally, the policy does not prevent development where it is consistent with policy measures.

Under the provisions of SPP 2.8, the site reflects the revised boundaries of Part C, as identified under the SCA and therefore only impacts Lot 13. Part C is also identified as an 'Urban, Industrial or Resource Development' site and further detailed as 'where negotiated planning solutions are at an advanced stage, the Bush Forever protection area now reflects the proposed conservation area.'

'Urban, Industrial or Resource Development' generally includes land zoned for Urban, Urban Deferred or Industrial purposes in the MRS or committed for future development through planning and environmental processes.

2.1.3.4 State Planning Policy (SPP 4.2) Activity Centres for Perth and Peel

State of Planning Policy 4.2 Activity Centre for Perth and Peel (SPP 4.2) provides a framework for the planning and development of new activity centres and the redevelopment and renewal of existing centres in Perth and Peel.

SPP 4.2 identifies the Wandi District Centre, as the key centre serving the ERIC Urban Corridor. The Wandi District Centre as identified within SPP 4.2, is proposed under ERIC to be predominantly located to the northern boundary of Anketell Road within the Wandi Urban Cell.

The LSP is therefore considered consistent with the provisions of SPP 4.2.

2.1.3.5 State Planning Policy (SPP 5.4) Road and Rail Transport Noise and Freight Considerations in Land Use Planning

In accordance with State Planning Policy 5.4 (SPP 5.4) future residential development within the LSP is considered a 'noise sensitive development', given the proximity of the LSP area to Anketell Road and the Kwinana Freeway.

Whilst the LSP area is within proximity to both roads, the location of Bush Forever Site Part A provides separation to the Kwinana Freeway ranging from 150m-470m.

Anketell Road, however, presents potential noise impacts to nearby development. As such, as part of a modification to the LSP an area approximately 150 metres distance away from Anketell Road has been excluded from the LSP. Its inclusion into the LSP area would be considered as part of a future amendment addressing a number of matters including the provision of a noise management plan for the LSP area that addresses SPP 5.4 and the response to it in terms of appropriate land uses and a noise mitigation strategy.

2.1.3.6 Planning for Bush Fire Protection (Edition 2)

The WAPC's Planning for Bush Fire Protection (Edition 2), provides a framework for considering bush fire hazard and mitigation requirements through the planning approvals process.

Given the LSP area is located adjacent to areas of vegetation (predominantly within the adjacent Bush Forever site), the LSP has been prepared in accordance with the requirements of Planning for Bushfire Protection and is supported by a Fire Management Plan.



2.1.4 Local Planning Policies

Development within the LSP area shall be in accordance with the following City of Kwinana Local Planning Policies, except where otherwise varied by this LSP, an approved Detailed Area Plan (DAP), or by the City of Kwinana.

- ▲ Design Guidelines for Medium Density Development;
- ▲ Conservation of Remnant Vegetation;
- ▲ Crossovers;
- ▲ Footpaths;
- ▲ Planning for Bushfire Protection Guidelines;
- ▲ Public Open Space;
- ▲ Residential Development;
- ▲ Residential Subdivision Development Guidelines;
- ▲ Residential Subdivision Road Standards;
- ▲ Retaining Wall Levels;
- ▲ Street Lighting;
- ▲ Street Naming; and
- ▲ Street Trees and Verge Treatments.

Site Conditions and Constraints

3.1 Biodiversity and Natural Area Assets

The following provides a summary of the environmental site conditions and constraints. For further information the Environmental Assessment Report is provided in Appendix 2.

3.1.1 Flora and Vegetation

A Level 2 Flora Survey was undertaken across the LSP area during spring 2009.

The survey identified the LSP area as being a mixture of predominantly cleared farmland with patches of eucalypts. A total of six vegetation types were mapped across the site, comprising of:

1. *Banksia attenuata* Low Woodland, with *Eucalyptus marginata*, *Dasypogon bromeliifolius*, *Phlebocarya ciliate*, local *Melaleuca preissiana*, *Pultenaea reticulata* and *Hypocalymma angustifolium*, some other natives and, commonly, weeds.
2. *Banksia attenuata* Low Woodland with *Eucalyptus marginata*, *Allocasuarina fraseriana* and understoreys of *Xanthorrhoea preissii*, *Adenanthos cygnorum*, *Acacia pulchella*, *Stirlingia latifolia* and other natives, and of weeds; much of it regenerating after 2004 fire.
3. *Banksia attenuata* Low Woodland, with thickets of *Adenanthos cygnorum*.
4. *Eucalyptus rudis* very healthy Open Forest in soak/spring, with *Melaleuca preissiana* and *M. Rhiphiophylla* tall trees, over *Pteridium esculentum* – *Cyathochaeta teretifolia* – *Baumea articulata* Closed Herb-Sedgeland; with *Lepidosperma longitudinale*, *Hemarthria uncinata*, *Hibbertia perfoliata*, *Dielsia stenostachya*, *Baumea vaginalis*, *Poa serpentum*; few aliens.
5. *Eucalyptus rudis* (largely leafless) Woodland (to Open Forest) over *Kunzea glabrescens* and *Astartea* sp. Closed Tall Scrubs, dense *Pteridium esculentum* and weeds; locally with healthy *Eucalyptus marginata* and *Melaleuca preissiana* trees.
6. *Kunzea glabrescens* Closed Tall to Tall Open Scrub; with, in more open sites, *Dasypogon bromeliifolius*, *Phlebocarya ciliate*, *Euchilopsis linearis* and other natives; some weedy degraded areas and many dead shrubs over 1 metre tall.

The condition of vegetation ranges in quality across the site from Excellent to Completely Degraded, with most remnant vegetation being in Very Good to Degraded condition. Weeds are common in the majority of the bushland existing across the site.

3.1.1.1 Protected Flora

A search of the DER's Declared Rare Flora (DRF) and Priority Flora database (2009) was undertaken to identify the potential for DRF or priority species to exist on the site. The results indicated there is evidence of one Priority Flora species being *Jacksonia gracillima*. Further survey work undertaken on Lot 100 in 2007, identified the Priority 3 species *Cyathochaeta teretifolia*. Both of these species being associated with wetlands.

A search of the Environment Protection and Biodiversity Conservation (EPBC) Act 1999 Protected Matters Search Tool (2009) was undertaken which identified three significant species of flora that have the potential to occur within the area, being:

- ▲ *Caladenia heugelii* (King Spider-orchid, Grand Spider- orchid, Rusty Spider orchid);
- ▲ *Drakaea elastic* (Glossy-leaved Hammer-orchid, Praying Virgin); and
- ▲ *Lepidosperma rostratum* (Beaked Lepidosperma).

The Level 2 spring survey confirmed no DRF were recorded as occurring on the site. *Jacksonia gracillima* was recorded from two quadrants, one within the site and one to the south of the site.

Although a DRF has previously been recorded for Lot 35, and an extensive search was undertaken, it was not able to be located.

The vegetation type and condition varied across the survey area with variations in the soil depth and distance from the lake.

3.1.1.2 Threatened Ecological Communities

A search of the DEC's Threatened Ecological Community (TEC) database (2009) indicates there are no TEC's known to exist on site.

In addition, there are two Priority Ecological Community (PEC) located to the south of the site, described by the DPaW as:

- ▲ *Banksia illicifolia* woodlands; and
- ▲ Low lying *Banksia attenuata* woodlands or shrublands.

Both of these PEC's are listed with a nominal 800m buffer which intersects the southern portion of the site.

A Level 3 PEC (*low lying Banksia attenuata woodlands or shrublands*) was confirmed as occurring on the site through a PATN analysis undertaken on the results of the flora and vegetation survey. The EAR advises with respect to vegetation that '*DEWHA recommends that proposed urban developments, for either housing or industry, in an area which contains nationally listed Threatened Species or Ecological Communities is likely to be significant under the EPBC Act and should be referred to the Minister ... the Spring 2009 flora and vegetation survey did not locate on site any flora or ecological communities listed under the EPBC Act.*'


Potential retention of the above vegetation species is depicted in Figure 9.

Refer to Appendix 3 – Flora and Vegetation Survey

3.1.2 Remnant Vegetation

The City's Biodiversity Policy suggests areas for vegetation retention should comprise large consolidated areas (at least 4 ha in size) with 75% of their area in good or better condition. Vegetation within the site which ranges from good to very good is predominantly located in the southern portion of the Anketell North LSP area, within the Part C Bush Forever link area. Other areas which have been identified as retaining good to very good vegetation, have also been identified for possible retention through areas of public open space – this is illustrated at the Landscape Masterplan referred to in the Public Open Space section of this report.

It should be noted, the existing topography will likely result in substantial earthworks across the site, retaining individual stands of vegetation and/ or individual trees will therefore prove to be problematic with cut to fill requirements.



On the basis of the above, the Bush Forever Part C area was considered the most appropriate way in which to provide a large consolidated area of vegetation, of good to very good condition and which is unconstrained by earthworks requirements. Notwithstanding, a significant tree survey will be undertaken for those areas of vegetation located within proposed areas of open space within the LSP area prior to construction to determine those trees which can be retained through the detailed design process.

3.1.3 Fauna

A search of the DEC's Threatened and Priority Fauna database has indicated that the following threatened and priority fauna have been recorded within a 5km radius of the site and have the potential to occur on the site:

- ▲ Forest Red-tailed Black-Cockatoo;
- ▲ Chuditch;
- ▲ Lined Skink;
- ▲ Quenda; and
- ▲ Western Brush Wallaby.

A search of the DEWHA's Protected Matters Search Tool was undertaken and identified three vulnerable and endangered species listed under the EPBC Act as potentially occurring on the site:

- ▲ Carnaby's Black Cockatoo;
- ▲ Baudin's Black Cockatoo;
- ▲ Quokka;
- ▲ Red-tailed Phascogale; and
- ▲ Chuditch or Western Quoll.

A Fauna Management Plan will be prepared as a condition of subdivision approval that details the protection measures applicable to the site.

3.1.4 Wetlands

There are no Ramsar wetlands or *Directory of Important Wetlands* within the LSP area (Environment Australia, 2001). The nearest *Directory of Important Wetlands* site is located approximately 1.2 km to the west of the Structure Plan area, known as 'Spectacles Swamp' (DEWHA, 2009), and forms part of the Spectacles Wetlands.

The DPaW's Geomorphic Database of Wetlands of the Swan Coastal Plan depicts the following wetlands within the LSP area:

- ▲ UFI 14148 Conservation Category Sumpland, extending across the north eastern corner of Lot 13 and centre to south east of Lot 100.
- ▲ UFI 15290 Conservation Category Sumpland, extending across the majority of Lot 13 and west to centre of Lot 100, which incorporated the Treeby Road Lake (sumpland)
- ▲ UFI 6666 Conservation Category Sumpland, located centrally within Lot 13 and bisected by the Peel Sub P Drain.

The portions of the above wetlands which extend into the LSP area will be subject to development. The proposed boundaries of the wetlands are however consistent with the boundaries agreed as part of the Bush Forever process which proposes a consolidation of the wetland area to coincide with the ecological link created by Part C. The Wetland Management Strategy provided in Appendix 4 includes correspondence confirming the outcomes of the wetlands through the definition of the Part C area.

A Wetland Management Plan will be required as a condition of subdivision approval.

Refer Figure 10 – Wetland Location.

3.2 Landform and Soils

The subject site is situated near the interface of the Bassendean and Spearwood Dune systems, but is located wholly within the Bassendean Sands system (Gozzard, 1983). There are two geological units featured on the site, including:

- ▲ North West: Pale yellowish, brown, medium to coarse grained quartz sand derived from Tamala limestone. This area is likely to facilitate groundwater recharge. The soils in this area have no clay content (Gozzard, 1983).
- ▲ South and East: Very light grey at surface and yellow at depth Bassendean Sands. This area is likely to facilitate groundwater recharge (Gozzard, 1983).

The site is sloped radially around a high point to the north along Treeby Road, which measures approximately 41m AHD at the highest point. The lowest point on the site is located to the southwest and measures approximately 17m AHD (Department of Water, 2009).

3.2.1.1 Acid Sulphate Soils

The Department of Environmental Regulation (DER) Acid Sulphate Soil Risk Mapping identifies the north western portion of the LSP as having no known risk of acid sulphate spoils (ASS). There is however two incidences of high risk ASS mapped adjacent to the wetland area in the south west and south east of the site. The balance of the LSP area is mapped as having a moderate risk of Acid Sulphate Soils (ASS) occurring within three metres of natural soil surface.

In this regard, an ASS Management Plan will be required to be prepared and implemented as a condition of subdivision approval.

Refer to Figure 11 – Acid Sulphate Soil Risk Plan.

3.2.1.2 Contamination

As previously noted, land within the Anketell locality has historically been utilised for rural pursuits and as such, a number of lots within the subject site have and are currently being utilised for grazing, market gardening and horse agistment.

In regard to the market garden sites, organochlorine based pesticides and trace metals associated with fertilisers can persist in soils for many years.

Whilst no properties within the site are listed as contaminated on the DER (previously DEC) *Contaminated Sites Database* (DEC, 2009), further investigation will be undertaken to determine the extent of any contamination and, if required, the remedial measures required across the area. All investigations and potential remedial works required will be undertaken in accordance with the *Contaminated Sites Act 2003* and verified by an independent auditor prior to approval by the DER.

Market gardening is recognised by the DER as a potentially contaminating activity (DoE, 2004). Accordingly a series of Preliminary Site Investigations (PSI) for contamination will be undertaken throughout the LSP by the various landowners as they develop, focusing on lots which have been used for market gardening both currently and in the past. All investigations and potential remedial works required will be undertaken in accordance with the *Contaminated Sites Act 2003* prior to subdivision, and verified by an independent auditor prior to approval by the DER.

Table 3: Potential Contaminated Site Tasks

Action	Responsibility	Timing
Initial review, examine Contaminated Sites Database	Proponent of Structure Plan	Structure Plan Adoption
Preliminary Site Investigations – individual lots	Individual landowners	Subdivision
Site remediation	Individual landowners	Prior to subdivision/development

3.3 Groundwater and Surface Water

3.3.1.1 Surface Water

The Jandakot District Water Management Plan (Jandakot DWMP) identifies the Anketell North LSP area comprising three sub-catchments based on topographical features, with runoff either flowing to the northern or southern discharge points, as well an area of soakage within the north west. The pre-development surface water conditions as identified under the Jandakot DWMP and LWMS comprise:

- ▲ The Peel Sub R drain located north of the LSP area within the Wandi comprises the discharge point for the Wandi South LSP area, the Wandi District Centre site and the northern portion of the Anketell North LSP area.
- ▲ The Peel Sub P drain originates to the east of the study area and runs parallel to the southern boundary before heading south to the Peel Main Drain. The southern catchments of the LSP area drain via the Peel Sub P Drain with overflow discharge from Treeby Lake contributing to the open drain flows.
- ▲ The north eastern sub-catchments are fully integrated in the sandy soil with no discharge into the Bush Forever Site.

3.3.1.2 Groundwater

The Perth Groundwater Atlas indicates that regional groundwater levels in the Anketell North LSP area ranges from approximately 20mAHD in the eastern area of the LSP area to approximately 14mAHD in the western areas of the site. Groundwater flow direction is east to west with a gradient of approximately 0.003. Typically, bores located near the wetland feature show groundwater to be within 0.7m of the surface in wetter periods.

To facilitate local scale planning for the Anketell North LSP area, JDA Consultant Hydrologists undertook 2 years of groundwater monitoring from May 2005 to August 2007. Details of the monitoring undertaken and results are provided in the LWMS.

3.4 Bushfire Hazard

A Bushfire Management Plan has been prepared for the LSP in accordance with the WAPC Planning for Bushfire Protection Guidelines 2010. The Fire Management Plan also has considered the requirements of draft State Planning Policy 3.7: Planning for Bushfire Risk and Management. The Fire Management Plan is provided within Appendix 5 the following however provides an overview of fire management assessment undertaken and applicable provisions to development of the site.

3.4.1 Hazard Assessment

The Fire Management Plan (FMP) identifies the site as comprising predominantly a low to moderate fire hazard threat with areas of extreme hazard associated with existing vegetated areas within the LSP area. The fire hazard associated with the adjacent Bush Forever Site 270 is classified as 'moderate'.

The development of the LSP area as per the proposed layout will result in a reduced threat of bushfire.

The FMP identifies the resulting potential bush fire issues for the site:

- ▲ Limited fire hazard mitigation within Bush Forever areas adjoining the site;
- ▲ Difficulty of vehicular access within Bush Forever areas for fire fighting operations; and
- ▲ High level of human activity in the area increasing in the summer months.

3.4.2 Management Requirements

The FMP proposes a variety of measures to manage the fire hazard, including:

- ▲ A minimum 20 metre Building Protection Zones separating future development from fire hazard;
- ▲ Dwelling construction to a standard to align with the designated bush fire attack level (BAL) within the Building Protection Zone; and
- ▲ Compliance with and annual Fire Control Notice issued by the City of Kwinana under the Act.

The Bushfire Management Plan will be required to be implemented as a condition of subdivision approval.

3.5 Heritage

3.5.1.1 Indigenous Heritage

R and E O'Connor Pty Ltd undertook an Aboriginal Heritage Analysis of the Anketell North LSP area in May 2009. The purpose of the preliminary analysis was to establish whether there are currently any known Aboriginal heritage constraints which need to be taken into consideration in advance of development in the Anketell LSP area.

A search of the Department of Indigenous Affairs Aboriginal Heritage Inquiry System identified two sites of significance within close proximity to the subject site:

- ▲ ID: 3427 "Mandogalup Swamp/ The Spectacles", is a mythological hunting place and water source site listed as "Stored Data" under Open Access.

- ▲ ID: 3555 “Treeby Road Lake”, a camp and artefact scatter site and is listed as “Stored Data” rather than a registered Aboriginal site.

Both of the above Register listings are Stored Data rather than registered Aboriginal sites. The provisions of the Aboriginal Heritage Act (AHA) do not apply to Stored Data.

Refer Appendix 6 - Indigenous Heritage Survey.

3.5.1.2 Non-Indigenous Heritage

No places were identified on the Heritage Council of Western Australia Heritage Places Database or the City of Kwinana Municipal Heritage List for the LSP area.

3.6 Context and Other Land Use Constraints

3.6.1 Anketell Road

Anketell Road is identified as a future designated freight route therefore the existing road reserve width is not suitable to facilitate this ultimate use.

In order to facilitate the transfer of the area immediately abutting Anketell Road from Urban Deferred to Urban, detailed design undertaken by the landowners of the Wandi District Centre site to define the extent of the ultimate road reserved. This design work undertaken in consultation with Main Roads Western Australia (MRWA) and the Department of Planning (DoP), also included an access strategy which identified the final intersection arrangements for Anketell Road which comprise:

- ▲ Three restricted left in/ left out intersections – one north of Anketell Road to the Wandi District Centre, and two accessing the Anketell North LSP area within proximity to the Kwinana Freeway and Lyon Road.
- ▲ One full movement signalised intersection at the current Treeby and Anketell Roads intersection.

The above access arrangement was formalised through the transfer of land adjacent to Anketell Road from Urban Deferred to Urban under the MRS in May 2014. As such, the LSP reflects the access arrangements as described above.

3.6.2 Pedestrians and Cyclists

The status of Anketell Road as a proposed primary regional freight route will inhibit north/ south pedestrian and cycling movements between the Wandi District Centre and the Anketell North LSP area. The Anketell Road design has made provision for one pedestrian crossing point at the Treeby Road signalised intersection, however additional connections may be desired in future.

The WAPC has identified a grade separated crossing at Anketell Road may be required upon the ultimate upgrade of Anketell Road as a freight route. This grade separated crossing will need to be further investigated as part of the wider provision of pedestrian/ cycle connectivity, in response to the government inter-agency study of Anketell, Rowley and Thomas Roads.

Notwithstanding in the short to medium timeframe, Anketell Road will not be utilised for its ultimate freight purposes and therefore multiple connections could be provided as part of the local urban road network. Grade separated crossings to Anketell Road will need to be addressed as part of the Anketell Road ultimate upgrade by MRWA.

3.6.3 High Voltage Power Line Easement

Two 330kv transmission lines exist within the locality. The Kwinana to Kemerton / Oakley Terminal, series of lines are located within Bush Forever site to the west of the LSP area. The second, Shotts to Southern Terminal/ Oakley Terminal, is located within the eastern portion of the LSP area, extending from Anketell Road to the Bush Forever site. Easement requirements of 60m (30m from centre of steel tower) are applicable.

From ongoing discussions with the City of Kwinana and Western Power, the land encumbered by the High Voltage Power Line easement is to be ceded free of cost. For the purpose of the public open space calculation this area is excluded from the net site area.

3.7 Summary of Opportunities and Constraints

From the above assessment of the LSP area a number of site constraints and opportunities were identified for consideration in the design response, these include:

Constraints:

- ▲ The preservation, protection and appropriate interface treatment with Part C of Bush Forever Site 270;
- ▲ The treatment of the Western Power lines and easements;
- ▲ The adjacent rural residential community and any impact which residential development would have upon the existing lifestyle and amenity of the locality;
- ▲ High groundwater levels across the southern portion of the site;
- ▲ The protection and rehabilitation of remnant vegetation;
- ▲ The need for adequate edges to and separation distance from Fire Hazards such as the Bush Forever Site 270; and
- ▲ The potential freight route on Anketell Road and its treatment.

Opportunities:

- ▲ The protection and enhancement of the Bush Forever area as a community asset;
- ▲ A community which responds and reflects the attributes of its environmental context;
- ▲ Maximisation of residential population within 400m of the Wandi District Centre, and
- ▲ Providing for a range of land uses and housing diversity.

04

Land Use and Subdivision Requirements

4.1 Land Use

The LSP sets out land use, residential densities, public open space, public and private transport provision, environmental considerations and servicing requirements.

The LSP is proposed to comprise residential development ranging from R10 to R60 densities. The LSP also comprises a range of local and neighbourhood public open space areas in accordance with Liveable Neighbourhoods requirements, as well as a Primary School site and community facilities.

The following describes the design response proposed under the LSP and addresses the relevant elements of LN.

Please also refer to the Structure Plan Map – LSP and Figure 12–Indicative Plan of Subdivision.

4.2 Public Open Space

Under the provisions of Liveable Neighbourhoods a range of site responsive urban parkland is required, which appropriately addresses district, neighbourhood and local needs of residents, comprising a mixture of unrestricted and restricted open space.

The LSP therefore provides a framework for the hierarchy and location of public open space areas across the site, considering the requirements for drainage and vegetation retention, defining key strategic areas of open space as identified on The Structure Plan Map. Detailed subdivision design will provide further refinement to the LSP public open space framework, defining the configuration, uses and treatment within each public open space area.

The LSP provides for approximately 12.4 hectares of public open space (POS) across the LSP area by way of one formal playing field, eight neighbourhood parks, three local parks and a community site. This comprises 10.7 hectares of unrestricted (12.7% of gross subdivisible area) and 0.5 hectares of restricted open space (0.6% of gross subdivisible area).

As noted above, the hierarchy and location of POS areas have been designed to ensure residents are within:

- ▲ 400m of a neighbourhood park; and
- ▲ 600m – 1km of a district/ active playing field.

Additional public open space is provided within the Western Power Easement (4.3 hectares) however does not form part of the open space calculation. This area is considered to provide an important north/ south pedestrian and cycling connection, which combined with a number of strong east/ west links via the road network, ensure appropriate connectivity within and external to, the Anketell North LSP area.

A Landscape Master Plan has been prepared for the LSP area, depicting the anticipated use and intent of each of the public open space areas (Appendix 7).

The following provides a detailed overview of the public open space design response proposed under the LSP.

Refer Figure 13 - Public Open Space Plan, Figure 14 - Public Open Space Schedule.

4.2.1 Anketell North Playing Fields

Given the topography of the LSP area, the Anketell North Playing Fields are located separate to the Primary School in the southern portion of the LSP area. As such, both a junior (within the Primary School grounds) and a senior oval will be provided within the LSP area.

The playing field site has been designed to accommodate the City's Multi Purpose Playing Fields Layout, comprising a site area of approximately 4.9 hectares.

Refer Figure 15 - Indicative Playing Field Layout.

The playing fields are located adjacent to the Western Power easement, central to the LSP area. This provides for a greater catchment within the LSP area, whilst also being adjacent to the linear pedestrian and cycling corridor created by the Western Power easement. Furthermore, the location of the Western Power easement along the site's eastern boundary provides for future opportunities for car parking. Any works within the easement will however be subject to future approvals from Western Power.

4.2.2 Community Site

Under the provisions of ERIC and Developer Contribution Plan 9 (DCA 9), a number of community infrastructure sites are identified within the general Wandi District Centre location.


Through discussions with the City's Technical Officers it was however determined the recreation centre was ideally located at the intersection of Anketell and Treeby Roads, on the basis of the following design considerations:

- ▲ The high accessibility afforded by the signalised intersection to allow for pedestrian and cycling movements between the Wandi and Anketell LSP Areas;
- ▲ Its location within close proximity to the retail core and bus routes;
- ▲ The land intensive nature of the use and the ability to maximise the residential population within a 400m walkable catchment of the Wandi District Centre, with its location south of Anketell Road;
- ▲ The ability to utilise sterilised land within the easement for parking;
- ▲ The opportunity to provide a built form statement to the Anketell North LSP area at a prominent intersection, and
- ▲ The opportunity to provide a land use buffer to Anketell Road for residential uses within the LSP area.

As such, a site of 1.67 hectares is provided at the intersection of Anketell and Treeby Road. This site is sought for inclusion within the public open space provision to enable a cost share arrangement within the Anketell North LSP area for the delivery of this site under DCA 4 (proposed Amendment 100A).

4.2.3 Bush Forever Site

The Negotiated Planning Solution progressed under Bush Forever and the subsequent transfer of the Anketell North and South Cells to the Urban zone under the MRS, defined the boundaries of the Part C area.



Whilst the Bush Forever Site is located external to the LSP area, wetland UFI 15290 which forms part of the Bush Forever Site Part C area extends within the LSP. As such, development within the LSP area, particularly aspects relating to water management and landscape treatments, need to be considered given the relationship between the urban area and adjacent reserve.

Furthermore, given the relatively constrained nature of the ERIC corridor and the extent of wetland conservation areas under the control and management of the City, consolidation of this key wetland area in a high quality conservation reserve was considered to provide a net environmental outcome for the Anketell Cell (comprising both the North and South LSP areas) whilst providing the City with a manageable consolidated conservation area.

The proposed design response therefore aims to deliver:

- ▲ A large and consolidated area of remnant vegetation;
- ▲ Maintain the ecological corridor and linkage between Parts A and B of Bush Forever Site 270;
- ▲ The provision of a 50m buffer for Treeby Road Lake (sumpland);
- ▲ Maintain a suitable hydrological regime for Treeby Road Lake and dampland habitat within the proposed conservation area;
- ▲ Manage stormwater, water quality and flood mitigation to ensure development does not impinge upon the ecological values of Treeby Road Lake or the environmental values of the proposed conservation reserve;
- ▲ Flora communities, priority flora and vegetation condition to be retained within the ecological corridor;
- ▲ Public and vehicular access should be controlled to protect the environmental values of the proposed conservation reserve, and
- ▲ Provision of utility services, roads, fire management and emergency vehicle access requirements should complement conservation objectives for the proposed ecological corridor where practicable.

Although modified and degraded through existing land uses, human usage, and public infrastructure such as the construction of roads, freeway and drainage systems, the core wetland area (Treeby Road Lake) is proposed to be retained as public open space, thereby reinstating the linkage between Part A and B of Bush Forever Site No. 270. This linkage also retains areas of upland vegetation providing a transect of vegetation types from seasonally inundated sumpland to Eucalyptus woodland communities, which is also consistent with the intent of the City's Local Biodiversity Policy for the protection of areas of upland vegetation.

The interface of the LSP area has been determined in liaison with the City considering fire management requirements, access and conservation requirements. Given the historic use and degradation of the site, the City have indicated their in principle support of a landscape edge treatment which allows for restricted community access to the Part C area in order for its use as passive recreation area. Treatments of this area will however be subject to further detailed design and review with the City.

For further detailed information regarding the geomorphological, drainage, hydrological and flora considerations which informed the design process is provided within the Wetland Management Strategy provided in Appendix 4 of this Report.

4.2.4 Western Power High Voltage Lines

The Western Power high voltage power lines traversing the eastern portion of the site from Anketell Road through to Part B of Bush Forever Site 270, presents a physical separation to neighbourhoods as well as placing limitations on construction in, and adjacent to, the easement.

The easement is therefore proposed to be utilised for a linear POS link, providing a strong north-south pedestrian and cycling network to the proposed Wandii District Centre. This link combined with strong east-west connections via the road network will ensure connectivity within the LSP area. The easement is provided as restricted POS however as advised by the Department of Planning shall not be credited under the POS schedule.

The easement land shall be ceded to the City free of cost as a condition of subdivision approval as a freehold title.

4.3 Residential

The LSP achieves an average residential density of 26 dwellings per site hectare and 12 dwellings per gross urban hectare. This is consistent with Liveable Neighbourhoods requirement, which stipulates a minimum average of 22 dwellings per site hectare for Greenfields subdivision areas.

The LSP however does not achieve the Directions 2031 target being a minimum 15 dwellings per gross urban hectare on the basis of the following site characteristics:

- ▲ The Western Power Easement which comprises 4.3 hectares of the total gross urban area;
- ▲ The non-residential land uses within the LSP including, the Recreation Centre site and the Primary School site;
- ▲ The inclusion of the City's standard playing fields design which requires additional POS provision above the 10% requirement; and
- ▲ The inclusion of the R10 interface along the eastern boundary of the LSP area.

Given the location of the LSP area within proximity to the Wandii District Centre, subdivision must however meet the standard 30 – 40 dwellings per site hectare within 400m of the District Centre. From the Indicative Plan of Subdivision, the proposed design and density allocation achieves 35 dwellings per site hectare within 400m of the Wandii District Centre.


The LSP therefore allocates an R30 coding to the majority of the site, with areas of R40 and R60 allocated to lots within proximity to areas of high amenity and access to schools, and adjacent to public transport or neighbourhood connector routes. Within the eastern portion of the LSP area R25 is the predominant density utilised with an interface of R10 to the adjacent rural residential lots.

An Indicative Subdivision Plan has been prepared for the site, identifying a yield of approximately 1180 lots.

4.3.1 Residential R10

R10 lots are proposed to provide a transitional interface from rural to residential to minimise the amenity impacts to existing rural residents.

Detailed Area Plans (Local Development Plans) will be required for R10 lots to provide further guidance for development in regard to:

- 
- ▲ Landscape/ Vegetation Areas;
 - ▲ Setbacks and building envelope;
 - ▲ Access, and
 - ▲ Bush Fire Management requirements.

4.3.2 Climate

Under the provisions of LN lots should be oriented to facilitate siting of dwellings and private open space to optimise solar access. Given the site characteristics and design applicable to the LSP area, almost all lots would have their long axis within the range N20°W to N30°E or E20°N to E30°S as presented in Figure 17.

4.4 Movement Networks

The following provides a summary of the proposed movement network. For further information it is recommended the reader consult the Transport Assessment included at Appendix 8.

Refer Figure 18 - Indicative Movement Network.

4.4.1 Existing Road Network

Anketell Road

Anketell Road is classified as a District Distributor A Road in the Main Roads Functional Road Hierarchy and is constructed as a single lane two-way road to a rural standard. Current traffic data from Main Roads indicates 3,682vpd east of the Kwinana Freeway (2008). The data indicates an even split with peak periods occurring between 6am to 7am (335 vehicles) and then 3pm to 4pm (330 vehicles). There has been limited development in the locality and traffic flows would not be expected to have increased significantly in the past 6 years.

Through detailed design undertaken with MRWA and DoP, the ultimate Anketell Road reserve has now been defined and reflected in the transfer of the land adjacent to the Urban zone in May, 2014.

Treeby Road

Treeby Road is a local road, situated centrally within the Anketell North Cell, providing local access to the existing rural residential allotments. Treeby and Anketell Roads intersect at the northern boundary of the LSP area in the form of a priority T-intersection. The southern portion of Treeby Road is currently unconstructed and therefore there is no connection through to Thomas Road. There is a need for Treeby Road to be constructed south to connect with the Anketell South LSP area to provide secondary access as per the fire management plans for both Anketell North and South LSP areas.

4.4.2 Proposed Road Network

The proposed road hierarchy for the LSP has been determined from modelling based on the indicative subdivision layout, and provides for simple and efficient vehicle movements through the site.

The movement network reflects a strong north-south and east-west modified grid configuration, with direct connections to Anketell Road. The Treeby Road extension will provide a direct connection south to Thomas Road via the Anketell South LSP area. The street block lengths are consistent with the requirements of LN, providing for connectivity and permeability through the site, for both pedestrians and vehicles.

The indicative road network is proposed to comprise of the following road classifications:

Road Classification	Indicative Upper Traffic Volume (Vehicles Per Day)	Indicative Road Reserve Width
Integrator B	15,000	25.2 metres
Neighbourhood Connector A	7,000	25.2 metres
Neighbourhood Connector B	3,000	19.4 metres
Access Street B	<3,000	16.9 metres
Access Street C	*N/A	15.4 metres
Access Street D (where services are on one side of the street only)	*N/A	13.2 metres

*Widths are a requirement of the City and are not dependent on traffic volumes

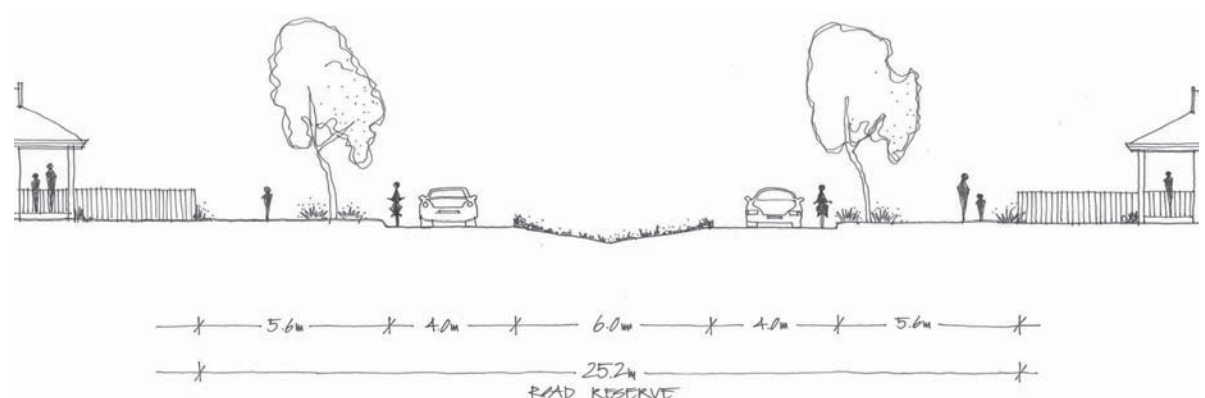
The road hierarchy primarily consists of Access Streets, with a central Integrator B/ Neighbourhood Connector A and an Access Street B providing a north south link connection through the site.

Treeby Road

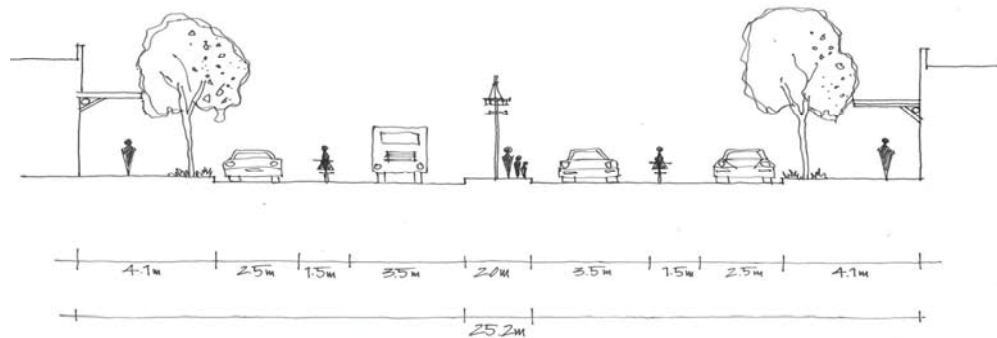
Treeby Road is proposed to be upgraded and in part realigned, through the site to an Integrator B and Neighbourhood Connector A standard. Treeby Road will be upgraded from the full movement intersection at Anketell Road and ultimately connect through to Thomas Road via the proposed Anketell South LSP Neighbourhood Connector.

Given the traffic volumes along the Treeby Road extension are anticipated to range from 3,000vpd in the southern portion of the LSP area through to 10,000 vpd at the Anketell Road intersection, the road design in the southern portions of the LSP area will reflect the typical Neighbourhood Connector cross section utilised in the Wandi Cell of 25.2m. This cross section allows for a central swale and on-street bicycle lanes. Further north in the LSP area where traffic volumes increase, an Integrator B - Centres cross section of 25.2m will be utilised with a reduced centre median to allow for on-street parking.

Typical Neighbourhood Connector A Cross-Section



Typical Integrator B Cross-Section



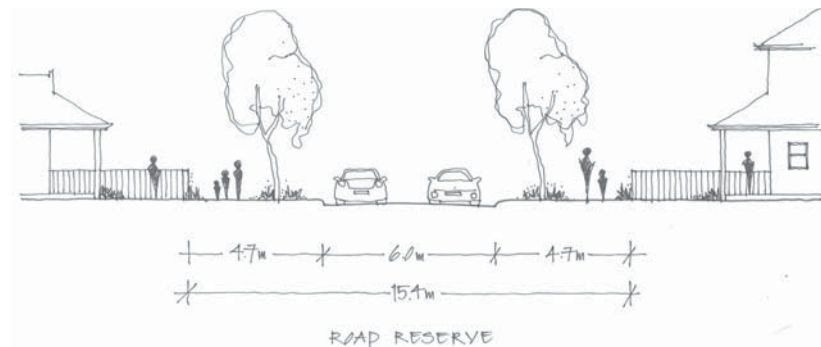
Access Streets

The access streets are proposed to primarily consist of Access Street C roads, designed to a 15.4 metre cross-section. Where services are only required to one side of the road, such as adjacent to public open space or the Kwinana Freeway reserve, a reduced Access Street D cross-section of 13.2 metres is proposed. This is consistent with road cross sections approved within the ERIC corridor.

Traffic volumes along the access roads are typically estimated to be in the order of 1,000 to 3,000 vehicle movements per day, which is consistent with the road hierarchy classification under Liveable Neighbourhoods.

An Access Street B is proposed within the western portion of the LSP area and provides a secondary connection from Anketell Road through to the Primary School site and Treeby Road the volumes anticipated for the Access Street B road ranges from 2,800vpd within proximity to Anketell Road to 1,800 vpd connecting through to Treeby Road.

Typical Access Street C Road Cross-Section



4.4.2.1 Anketell Road Intersection Treatments

As previously noted, Anketell Road may ultimately accommodate freight vehicles and traffic volumes in excess of 50,000vpd. Given this, the number of intersections, their spacing and general access arrangements present limitations for access to the Anketell LSP Area. Through discussions with MRWA and the detail design work undertaken for Anketell Road, three intersections between the Kwinana Freeway and the existing Lyon Road intersection have been secured, being:

- ▲ The upgrade of the Treeby / Anketell Roads intersection to a full movement, signalised intersection; and
- ▲ Two restricted movement, left in left out intersections between the Kwinana Freeway and Treeby Road intersection and in proximity to Lyon Road.

These three access points to Anketell Road have been managed through the proposed road hierarchy proposed to ensure traffic movements can be evenly distributed through the Anketell Cell.

4.4.2.2 Truncation Variation – Small Lot Product

In accordance with the provisions of LN, Element 2 – Movement Network R55, truncations of 3m x 3m are to generally be provided on corner lots. Notwithstanding, truncations of 6m x 6m have been the traditional standard applied by Local Governments in greenfield areas.

With the introduction of small lot product, the traditional 6m x 6m truncations significantly impede on small lot sites. As such, discussions with the City's Technical Services have indicated that reduced truncations of 3m x 3m in accordance with LN may be entertained at subdivision, subject to an assessment of appropriate sightlines in accordance with Austroads Standards.

Further assessment and documentation is proposed to be undertaken at detailed subdivision, to enable truncations and kerb radii in accordance with R55 and R57 of LN.

4.4.2.3 Connectivity for Pedestrians and Cyclists

In accordance with Liveable Neighbourhoods requirements, footpaths will be provided on at least one side of every street. Footpaths are also proposed along:

- ▲ The Integrator B/ Neighbourhood Connector running north-south through the site;
- ▲ The Access Street B adjacent to the proposed Primary School; and
- ▲ On both sides of the street in areas within 400m of the primary school.

As previously noted, the Anketell Road reservation design has made provision for one pedestrian crossing point at the Treeby Road signalised intersection however additional connections may be desired in future.

As previously noted, grade separated pedestrian/ cycle connections between Anketell and the Wandri District Centre should form part of the inter-agency study of Anketell, Rowley and Thomas Roads.

The Perth Bike Map series shows an existing principal shared path along the western side of Kwinana Freeway. The Perth Bike Map also designates Anketell and Thomas Road for bicycle lanes to connect to the regional bike network. Future subdivision approvals should consider the extension of the local bicycle network to connect with the existing shared path network.

4.4.3 Public Transport

The LSP area is not currently directly serviced by public transport. The closest existing bus service is Bus Route No. 57, which runs along Lyon Road, north of Rowley Road through Aubin Grove, approximately 500 metres east of the site. The extension of this route via Honeywood Avenue to the District Centre Site and Anketell Road is anticipated in 2015.

Timing for the extension of bus services through to Anketell Road is not known at this stage, however the upgrade to Treeby Road is designed to accommodate buses, upon the future establishment of services.

The Perth to Mandurah railway line is situated to the west of the site, within the Kwinana Freeway reserve. The closest passenger station to the site is the Kwinana Station, approximately 2.7 kilometres to the south. An additional station is also planned for Russell Road / Success, approximately 6.3 kilometres to the north.

4.5 Water Management

This section addresses the proposed urban water management network.

4.5.1 Water Management Strategies and Planning

4.5.1.1 Regional Water Management Strategy

An overarching draft Drainage Water Management Plan (DWMP) was released by the Department of Water in August 2008. The draft DWMP provides district scale flood modelling, surface water management strategy and groundwater management strategy which specify post-development levels and flows to address the City of Kwinana District structure plan (ERIC).

4.5.1.2 District Water Management Strategy

A District Water Management Strategy (DWMS) was prepared in 2009 and provides guidance on water re-use options, stormwater detention basins, monitoring requirements, and structural and non-structural controls for stormwater treatment. The DWMS has been approved by both the City of Kwinana and the Department of Water (October, 2009).

4.5.1.3 Local Water Management Strategy

A Local Water Management Strategy (LWMS) has been prepared in support of this LSP, and is provided as Appendix 9.

The LWMS addresses the LSP area, and provides a refinement of flood modelling, the surface water management strategy and the groundwater management strategy to a local scale. The LWMS has been prepared in accordance with the water sensitive urban design practices as described in the Stormwater Management Manual of WA.

4.5.2 Proposed Drainage Network and Infrastructure Requirements

Surface water flows are to be managed at a lot level and development scale to maintain predevelopment hydrology by retaining or detaining surface water, and to infiltrate runoff close to source. The design concepts for managing stormwater within the LSP areas are as follows:

- ▲ Employ soakwells in lots to retain and infiltrate the 1:1 yr ARI event and avoid direct runoff to the street conveyance system. This will increase infiltration and detention periods whilst reducing peak flow rates;
- ▲ Rain gardens/ swales (where appropriate) along roads to infiltrate 1:1 yr ARI events;
- ▲ Provide pipe systems within the road reserve to convey runoff for storm events up to the 1:5 yr event to the basins and Legal Discharge Points (LDP);
- ▲ To provide adequate storage and attenuate post-development flows to predevelopment conditions and maintain the required free-board to finished lot levels; and
- ▲ Discharge to receiving environment – to provide an outlet to the nearest regional drainage line and ensure that flow rates and water qualities are within the design limited.

The western power easement is to contain its own runoff, with no additional drainage from the development.

4.5.2.1 Local Drainage

The local stormwater drainage system has been designed using a major/minor approach.

The major drainage system is designed to manage rainfall events greater than the 5 year ARI, up to the 100 year ARI. The key elements of the major drainage system strategy are as follows:

- ▲ The road kerb system will convey flows that exceed the capacity of the pipe drainage system in the 1:100yr event, discharging into the proposed detention basins. Detailed design of the drainage system will be undertaken during the UWMP to ensure that adequate freeboard is achieved.
- ▲ The road network provides flood storage as well as conveyance in the 100 year event.
- ▲ Minimum habitable floor level to be a minimum 0.5m above the 100 year event to ensure public safety.

This design strategy is consistent with the objectives provided in the DWMS.

The minor drainage system is designed to manage rainfall events up to the 5 year ARI. The following strategies are proposed:

- ▲ Soakwells will collect and infiltrate roof runoff at source up to the minimum 1 year event.
- ▲ A road pipe drainage system with leaky manholes will collect and convey flows up to the 5 year ARI event, discharging into bio-retention pockets and infiltration systems incorporated into the median of the collector roads and within the designated drainage reserves.
- ▲ Bubble-up pits are proposed at the entrance of the bio-retention systems where runoff cannot enter as overland flow. These bio-retention pockets have been sized to infiltrate/retain up to the 1 year 1 hour ARI event from all connected impervious areas on the site.

In accordance with the processes defined under *Better Urban Water Management*, an Urban Water Management Plan (UWMP) will be required to be prepared and implemented at the time of subdivision. The UWMP will refine and implement the proposed drainage network/system, as defined under the LWMS.

4.5.2.2 Minimising Impacts to Treeby Road Lake

Predevelopment surface flows generated in the LSP area predominantly drain to Treeby Road Lake prior to ultimately discharging at the southern Legal Point of Discharge (LDP) at Thomas Road. Changes proposed under the LSP will generate increased flows to Treeby Road Lake and in order to maintain the current hydrological regime the following design objectives have been applied to the LWMS;

- ▲ Flows less than the 5 year ARI are not to enter Treeby Road Lake;
- ▲ Ensure the maximum depth of the lake is not increased by more than 10%;
- ▲ Maximise infiltration of runoff to ensure the lake continues to be fed by groundwater, and
- ▲ Allowing the large ARI events to continue to enter the lake.

Outlet structures of the detention basins have been designed such that the low flow culverts will discharge to either the piped drainage network, or as overland flow into the Peel Sub P Drain. This will ensure the smaller ARI events (< 5 year) do not enter the lake.

4.5.2.3 Groundwater Management

Groundwater contours refined to a local scale are in general agreement with the controlled groundwater level presented in the draft DWMP. In areas where finished level depth to groundwater is <1.2m then subsoils are proposed to be laid at or above the CGL consistent with the draft DWMP. For lots, fill of 1.5m above the subsoils is proposed so that soakwells can be installed (or else filled at least 1.2m above draft DWMP defined post-development phreatic line).

4.5.2.4 Ongoing Management and Responsibilities

The ongoing water management and responsibilities are summarised in the table below.

Table 5: Water Management Responsibilities

Organisation	Role/Responsibility
City of Kwinana	Assumes future long term responsibility for roads and storm water infrastructure including the ongoing operation and maintenance thereof subsequent to agreed handover by the developer.
Water Corporation	Assumes future responsibility for the potable water supply and sewerage infrastructure including the ongoing operations and maintenance thereof.
Developer	Obtain approval of the UWMP. Implement approved Acid Sulphate Soils and Dewatering Management Plans, and Taking Water and Disposal Licenses during construction of subdivision works. Demonstrate that the proposed subdivision designs supportive of the UWMP can achieve the water quantity and quality objectives and criteria set by this document. Undertake post development monitoring, including the provision of appropriate monitoring locations, for a period of 2 years following sale of the last lot within the development. Utilise monitoring data to amend or provide BMPs to ensure that water quality objectives are achieved. Construct and subsequently maintain stormwater control measures until handover to the CoK.


4.6 Education Facilities

In accordance with ERIC, the LSP proposes one primary school located generally centrally within the Anketell North LSP area.

The provision of one primary school is also consistent with the catchment requirements under Liveable Neighbourhoods, which stipulates an average of one primary school per 1,500 lots. Based on current planning, it is anticipated the Anketell North and South LSP areas have the potential to yield up to 1,500 lots combined.

Whilst it is preference for the Anketell North Playing Field (as identified under ERIC) to be co-located with the proposed Primary School site to facilitate a shared playing field arrangement, the topography of the site is prohibitive. The topography experienced would result in the co-located site being subject to a significant fall with extensive retaining required.

The proposed location of the school site enables an appropriate separation distance from the Western Power Easement and the Bush Forever Site as required by the DoE. To reinforce access for the cell to the school the proposed street network and linear areas of POS create direct pedestrian access. The



relocation of the playing field to its central location ensures a high level of accessibility to this facility for a greater proportion of the LSP area.

The proposed Anketell Primary School site is bounded by three proposed Access B streets. We confirm these road reserves have been provided to accommodate on-street parking. The street network/street block pattern surrounding the school has been designed such that lots/dwellings shall be oriented towards the school for surveillance purposes. Subdivision design for land surrounding the school will need to demonstrate appropriate parking, public transport and walking/cycling. The subdivision application itself must address CPTED/safety principles and housing access.

A search of the DoE system identifies the Anketell area as currently being within the intake areas for the Hammond Park Primary School, Gilmore College (Kwinana Senior High School), and Atwell College. In addition it is anticipated the Wandi Primary School will be opened in the coming 5 years, as such the above school sites will likely service the proposed Anketell population until such time as the Anketell Primary School and Wandi High School are delivered.

4.7 Activity Centres and Employment

4.7.1 Secondary Centres

In accordance with *State Planning Policy 4.2: Activity Centres for Perth and Peel* (SPP 4.2), the closest secondary centres to the LSP area are Cockburn Gateway (approximately 8.7 kilometres to the north) and the Kwinana Town Centre (approximately 7.5 kilometres to the south west).

Beside the Perth City Centre (Strategic Metropolitan Centre), these centres comprise the main regional activity centres within relatively close proximity to the Anketell North LSP area. They provide a diversity of uses, providing for a range of economic and community services required to service the future population.

4.7.2 District Centre

Current strategic planning identifies the future Wandi District Centre to be located within Wandi on Anketell Road, east of the Kwinana Freeway.


Under the City of Kwinana's Local Commercial and Activity Centres Strategy (LCACS), the Wandi District Centre has been allocated approximately 20,000m² of retail floor space and 10,000m² of non-retail floor space. This floor space allocation is capable of supporting two full line supermarkets and a discount department store, as well as a wide range of complementary specialty shops.

Upon finalisation of the draft LCAC Policy, a structure plan will be lodged for the District Centre. It is anticipated this will occur in 2015.

4.7.3 Employment

Given the location of the site in relation to the Kwinana City Centre, Cockburn Central, Fremantle and its accessibility to the Perth City Centre afforded by access to the Kwinana Freeway and the Perth to Mandurah train line, there are a number of regional employment opportunities available to the community.

Locally within the City there are a number of existing and proposed district employment generators. The Kwinana Industrial Area provides approximately 26,000 employment positions and is located approximately 6 kilometres from the LSP area. The LSP area is also located approximately 3.5



kilometres from the Latitude 32 Industrial Areas (Hope Valley Wattleup Redevelopment Area) which are expected to ultimately provide for 10,000 additional jobs. The City of Kwinana itself is a large employer within the municipality with the City Centre identified as a Secondary Centre under SPP 4.2 and Directions 2031. The centre is fulfilling this charter through projects such as the City Centre Hub Redevelopment.

Additional employment areas are located within the Casuarina Cell comprising the mixed business precinct and the neighbourhood centre located on Mortimer Road, which will also provide local employment opportunities. The existing mushroom farm located within the Casuarina Cell is one of the largest private employers in the locality.

Proposed school sites within Wandí, Anketell and Casuarina will also provide employment opportunities for the ERIC corridor.

4.8 Infrastructure Coordination, Servicing and Staging

The following provides a summary of the infrastructure and servicing for the LSP area, however for further information it is recommended the reader consult the Engineering Services Report provided as Appendix 10.

4.8.1 Water Supply

The Water Corporation has made provision for water supply to the Anketell North Cell in its planning for servicing the south-east corridor. The site is located within the Water Corporation's 'Thomson's Lake' Gravity water supply scheme fed from existing water storage facilities located on Henderson Road, Beeliar.

Further preliminary investigations with the Water Corporation have resulted in a review of the current Water Corporation scheme planning. To service Anketell North a water supply will have to ultimately extend from the distribution mains required for the Wandí Cells. In addition an injection via an additional distribution main (700mm diameter) from the west side of the Kwinana Freeway is required. Preliminary investigations suggest this distribution main would cross under the Kwinana Freeway near to the existing Peel Main Drain Crossing. MRWA has confirmed that a crossing at Rowley Road is not feasible and Water Corporations preference is for a crossing south of Rowley Road. Ultimately the actual crossing location is to be determined by the Water Corporation.

Subject to the status of the Water Corporation Capital Works Program the development of the site may require the prefunding of water supply distribution mains.


Any extensions/upgrades that are necessary for development shall be the responsibility of the developer as part of the normal subdivision process.

4.8.2 Sewerage

The Water Corporation has made provision for a reticulated sewerage scheme for the Anketell LSP area in its planning for servicing the south-east corridor. The site is located within the Water Corporation's 'Thomson's Lake' sewerage catchment which is connected to the Bibra Lake Main sewer that discharges into the Woodman Point Wastewater Treatment Plant.

Preliminary investigations with the Water Corporation have confirmed the establishment of four prefunded pump stations subject to final Water Corporation design checks being;

- a) Type 90 Pump Station East of the Kwinana Freeway.

- 
- b) Type 90 Pump Station West of the Kwinana Freeway.
 - c) Type 10 Pump Station West of the Kwinana Freeway, Southern area.
 - d) Type 40 Pump Station East of the Kwinana Freeway adjacent to Thomas Road.

The Anketell North and South LSP areas are proposed to be serviced from pump stations 'a' and 'd'. The northern half of the Anketell North LSP area will be serviced through a gravity sewerage system to pump station 'd' which will be pumped via a pressure main back up into the Anketell North gravity system which ultimately discharges into pump station 'a'.

Subject to the status of the development front north of the site and the Water Corporation's Capital Works Program, the development of the site may require the prefunding of this sewerage infrastructure or alternative arrangements being agreed with the Water Corporation.

Any extensions/upgrades that are necessary for development shall be the responsibility of the developer as part of the normal subdivision process.

4.8.3 Electricity

There is an existing overhead 22Kv power line and low voltage network on Treeby Road, and a small section on the south western corner on Thomas Road, which will need to be removed and replaced with an underground power network. The initial system will connect to the existing overhead/ underground systems located in adjoining roads.

Street lighting will be installed in accordance with the relevant Australian Standards and in accordance with approved Western Power and City of Kwinana designs. The theme is to be determined at subdivision in consultation with the City.

Any extensions/upgrades that are necessary for development shall be the responsibility of the developer as part of the normal subdivision process.

4.8.4 Natural Gas

Westnet Energy has advised the closest supply of gas is 1.6 kilometres south from Thomas Road. Westnet Energy is expected to charge for a capital works contribution for a Pressure Reducing Station and Headworks Gas Main Extension that will need to be paid by the developer.

4.8.5 Communications

There are existing Telstra services within the vicinity of the LSP area. It is intended all lots within the LSP area will be serviced with telecommunication services. This will be either by way of standard Telstra services.

The service provider will be responsible for installing telecommunication facilities within the development. The developer will fund the provision of trenches for cable laying. Alternatively, where cable routes are on the same alignment as Western Power underground power supply routes, the telecommunications will use, where possible, the Western Power trenches in lieu of the developer providing additional trenching.

Head works charges for telecommunication service extensions are anticipated.

4.8.6 Staging

An Indicative Staging plan has been included at Figure 19.

It illustrates that development is likely to commence in the south-western extent of the Structure Plan area and move northwards towards Anketell Road.

As market gardens are decommissioned over time, development opportunities will increasingly open up on the eastern side of Treeby Road.

Given the uncertainty of timing for the cessation of market garden uses on Lot 90, the north eastern corner of the Structure Plan area is seen as likely latter stages of development.

4.8.7 Site Works

The LSP area comprises some low lying areas for development that will require fill to provide for suitable clearance above groundwater. Areas of higher ground will be re-contoured to meet the development constraints, provide for fill and to meet desirable grades applicable to each land use. Bulk earthworks will also be used to ensure adequate grades for drainage and sewerage, and to provide acceptable slopes for building in accordance with marketing and maximum allowable engineering grades.

The LSP is currently used for rural living purposes and whilst the majority of the site has been historically, or is currently cleared, some additional clearing for urbanisation will be required.

Preparatory works for development are as follows:

- ▲ Demolition of any existing outbuildings and existing improvements;
- ▲ Removal of farm debris, fencing and other improvements as necessary, however, retaining as many existing and significant trees and vegetation as possible;
- ▲ Stripping and grubbing of areas to be earth-worked with due regard to vegetation preservation in selected areas;
- ▲ Strip and stockpiling topsoil;
- ▲ Proof-roll existing sand;
- ▲ Bulk Cut to Fill across site and import as required; and
- ▲ Replace topsoil where required.

Ewing VDM anticipates the bulk earthwork operations for the recommended development option will be completed using material available from site to fulfil the development requirements.

4.9 Developer Contribution Arrangements

The LSP area is situated within the Anketell Cell for the purposes of Developer Contribution Arrangements, and forms part of Development Contribution Area 9 (DCA 9) for community infrastructure.

DCA 9 was introduced to TPS 2 by way of Scheme Amendment 115 (Gazetted on 19 June 2012), and is intended to have an operation period of 20 years (2011 to 2031).

The following items are currently listed under TPS 2 as being subject to funding by DCA 9.

DCA 9	Item
Sub-Regional	Community Knowledge and Resource Centre (excluding leasable office space and cafe component)
	Destination Park (Calista)
	Wells Beach Foreshore Upgrade (Park and Boating facility)
District A	Sporting Pavilion
	Community Centre
	Youth Centre
	Dry Recreation Centre
	Branch Library
Local	Local Community House/Centre
	Local Sports Pavilion
Admin	Administrative Costs

Notwithstanding the above, it is understood the City of Kwinana are currently reviewing the community infrastructure needs for the ERIC corridor on the basis of the reduced urban catchment within Mandoglaup. This is likely to result in a reduced need for facilities to be provided within the ERIC corridor.

Scheme Amendment (Amendment 100A) was initiated by the City of Kwinana at its December, 2014 meeting to introduce 'hard' infrastructure items to the Scheme. Upon gazettal of Amendment 100A, the Anketell Cell will also be subject to Development Contribution Area 4 (DCA 4).

Whilst the items to be included within DCA 4 are yet to be finalised, it is understood the indicative list of items includes the following:

- ▲ Thomas Road;
- ▲ Anketell Road;
- ▲ Treeby Road;
- ▲ Public Open Space; and
- ▲ Conservation Areas.

Should the review of DCA 9 and the finalisation of Amendment 100A not be complete prior to subdivision within the LSP area, it is likely a legal agreement will be entered into between the City of Kwinana and the Developer for the payment of interim costs, to be reconciled upon Gazettal of Amendment 100A and any amendments to the existing DCA 9.

Management Plans

Given the fragmented landownership within the Anketell North LSP area, a number of management plans and additional site investigations are required. The following details the additional investigations/works to be undertake prior to, or as a condition of, subdivision approval.

5.1 Wetland Management Plan

A Wetland Management Plan is to be developed for the central wetland area within Bush Forever Site Part C. The Wetland Management Plan should be developed in accordance with DEC *Guidelines Checklist for Preparing a Wetland Management Plan*, December 2008, for wetlands and associated buffer vegetation.

The Wetland Management Plan for the site shall include details pertaining to the following:

- ▲ Wetland (Treeby Road Lake) Monitoring Program;
- ▲ Additional Spring Survey work (if required);
- ▲ Identify improvements proposed to be undertaken by the developer (landscaping and design intent), estimated costs as well as the ongoing costs of maintenance and replacement costs for the City;
- ▲ Areas of remnant vegetation within Bush Forever Part C and shall include objectives and strategies to address issues of fire management, access control (vehicle, pedestrian and emergency vehicle), reserve fencing, weed management, revegetation (species selection, species composition, species density, revegetation rates and survival rates), feral species control and fauna management; and
- ▲ Include a formalised handover arrangement to be outlined and endorsed by the City of Kwinana.

5.2 Mosquito and Midge Management Plan

The Mosquito and Midge Management Plan for the site shall include, but not be limited to, the following:

- ▲ Mosquito monitoring, surveys and reports (larval, adult, timing) requirements;
- ▲ Provision of geographical survey – identify breeding habitats;
- ▲ Identify land ownership and responsibilities;
- ▲ Identify applicable environmental legislation;
- ▲ Identify key stakeholders;
- ▲ Determine and identify management options;
- ▲ Develop a control program;
- ▲ Determine potential operational resources (operational timeframes, funding requirements and contributions, community awareness), and
- ▲ Ongoing assessment and review of timeframes.

5.3 Acid Sulphate Soil Management Plan

The Acid Sulphate Soil Management Plan shall include, but not be limited to, the following:

- ▲ Identify potential issues associated with Acid Sulphate Soils and what measures may be necessary to prevent these issues from arising, and
- ▲ The location of services and cut to fill processes.

Engineering drawings are to be finalised prior to approval of the Management Plan.

The Management Plan will be prepared in accordance with the relevant legislation relating to Acid Sulphate Soil management.

5.4 Federal Fauna Management Plans and Fauna Surveys

Previous environmental work has indicated Black Cockatoo habitat is present at the site. Further investigations prior to subdivisional works will need to be undertaken to define the impacts of the development under the *Environment Protection and Biodiversity Conservation Act 1999* ('EPBC Act').

5.5 Landscape Management Plan and Maintenance Programme

Landscaping treatments have been broadly identified through the Landscape Master Plan in Part 2 as well as the indicative cross sections for drainage basins and swales. Whilst the plan and cross sections are provided to illustrate potential development outcomes, further discussion and detailed design is required through the preparation of Landscape Management Plans to finalise proposed treatments.

Landscape Management Plans will give due consideration to the following design criteria:

- ▲ Security, safety and surveillance matters, particularly with lots which abutting public open space.
- ▲ Minimising the amount of irrigated and turfed areas, without limiting the ability to provide for a suitable range of open space areas for different groups in the community.
- ▲ Fire management considerations, specifically with relation to interface treatments and fuel loads.
- ▲ Ensure the proposed streetscape, landscaping and fencing design meets the standards of the City and is maintained to an appropriate standard by the developer until such a time as agreed for handover by the City.
- ▲ Management Plans shall include a formalised handover arrangement to be outlined and endorsed by the City of Kwinana.

Amendment 100A provides a framework for the cost share arrangements within the Anketell North Cell for POS delivery in accordance with the LSP.



FIGURES



ROWE GROUP