

LOT 9 JINDALEE

LOCAL STRUCTURE PLAN 88

part 2 explanatory section

JANUARY 2012

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RPS, November 2010

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RPS, March 2011

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M P Rogers & Associates, February 2011

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EPCAD, November 2010

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RPS, January 2011

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Bruce Aulabaugh, November 2010

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Cossill & Webley

November 2010

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Australian Interaction Consultants,

October 2010

SECTION ONE: BACKGROUND AND PLANNING CONTEXT

1.0 INTRODUCTION

This Lot 9 Local Structure Plan (LSP) is prepared and lodged in accordance with Part 9 of the City of Wanneroo's District Planning Scheme No. 2. This document has been prepared on behalf of the landowner, Ocean Springs Pty Ltd.

This LSP provides the framework for future subdivision and development of Lot 9, and is consistent with the objectives and provisions of the agreed Butler Jindalee District Structure Plan No. 39. The LSP makes provision for the following;

- Recognition of a strong overall design philosophy focused on retention, celebration and integration of key natural landform and vegetation elements, in an urban setting drawing character from the coastal setting.
- Opportunity for the creation of approximately 1,600 dwellings made up of a combination of single lots of a variety of sizes, grouped and multiple dwellings, with residential densities ranging from R30 to R100.
- Higher residential density opportunities focused around the coastal village precinct, the local centre, main boulevard and entry road and key areas of public open space, consistent with the objectives of Liveable Neighbourhoods and the City of Wanneroo Local Housing Strategy.
- Setting aside approximately 10 hectares of public open space for passive and active recreation, retention of key landform features & areas of existing vegetation and integrated drainage. This public open space satisfies the 10% public open space requirement, in accordance with Liveable Neighbourhoods and more generally the City of Wanneroo's 'Public Open Space' Policy.
- Two local centres comprising 500m² and 300m² of retail floor space respectively, providing convenience services and amenity to visitors and residents within the LSP area.
- A defined coastal village precinct capable of developing a special character founded on density, activity, diversity and proximity to the beach. It includes both public and private domain elements seamlessly integrated with the coastal foreshore.
- Strong pedestrian movement connections to the east-west and north-south, linking coastal paths, primary school open spaces and the centres.
- Potential for public car parking, open space, commercial and community based facilities located within the foreshore reserve and linked to public access and use of the beach.
- A permeable network of neighbourhood connectors and local access streets providing a safe, efficient and attractive street network for vehicles, public transport

services, pedestrians and cyclists. The system promotes legibility and diffused traffic flows.

- A design response which recognises the outstanding view corridors reflecting the lower dunal heights to the south-west and entry views from Marmion Avenue.
- A primary school site of 3.2 - 3.5 hectares, co-located with active public open space.
- A more integrated approach to the development, use and enhancement of the foreshore area and other open spaces, ensuring balance and compatibility within the urban fabric.
- A strong focus on protecting environmental values and treating such assets as major design opportunities.

1.1 Report Structure

The structure and format of this LSP provides a framework for future subdivision and development building on the objectives, provisions and strategies of the Butler Jindalee District Structure Plan No. 39.

This Report comprises three major parts.

Part 1 Statutory Section contains the provisions that will facilitate the implementation of the various initiatives described in the Explanatory Section at future planning and development stages.

These provisions are given the force and effect of the Scheme, in accordance with Clause. 9.8.2 of the City of Wanneroo's District Planning Scheme No. 2. The format is derived from the City of Wanneroo Local Planning Policy and it recognises the:

- Butler Jindalee District Structure Plan No.39;
- District Planning Scheme No. 2; and
- Residential Design Codes.

Part 1 also contains the Agreed Local Structure Plan, Zoning Plan and the Residential Density Range Plan and introduces an important set of R-Code variations to facilitate a more efficient housing response.

Part 2 Explanatory Section examines the key outcomes and planning implications of the background and technical reports, and describes the planning framework and vision which will evolve. It explains all the responses to the identified opportunities and constraints.

Part 3 Technical Appendices is a separate document which includes:

- Environmental Assessment Report (November 2010) – RPS
- Foreshore Management Plan (November 2010) – RPS
- Coastal Setback Assessment Report (January 2010) – MP Rogers & Associates

- Traffic & Transport Report (November 2010) – Bruce Aulabaugh
- Landscape Management Plan (November 2010) – EPCAD
- Lot 9 Local Centres Planning (October 2010) – Shrapnel Urban Planning
- Engineering Servicing Report (November 2010) - Cossill & Webley Consulting Engineers
- Site Investigation Survey (October 2010) – Australian Interaction Consultants

These documents are extensively referenced within the Part 2 Explanatory Section and have been prepared in a very iterative fashion to ensure all correlate, cross reference and are consistent across disciplines.

1.2 Land Description

1.2.1 Location and Land Area

The Lot 9 LSP area is located within the City of Wanneroo. The site is approximately 108 hectares and is located 40 kilometres north of the Perth CBD, 10 kilometres south of the Yanchep town site and 14 kilometres north-west of the Joondalup Regional Centre (refer Figure 1: Location Plan).

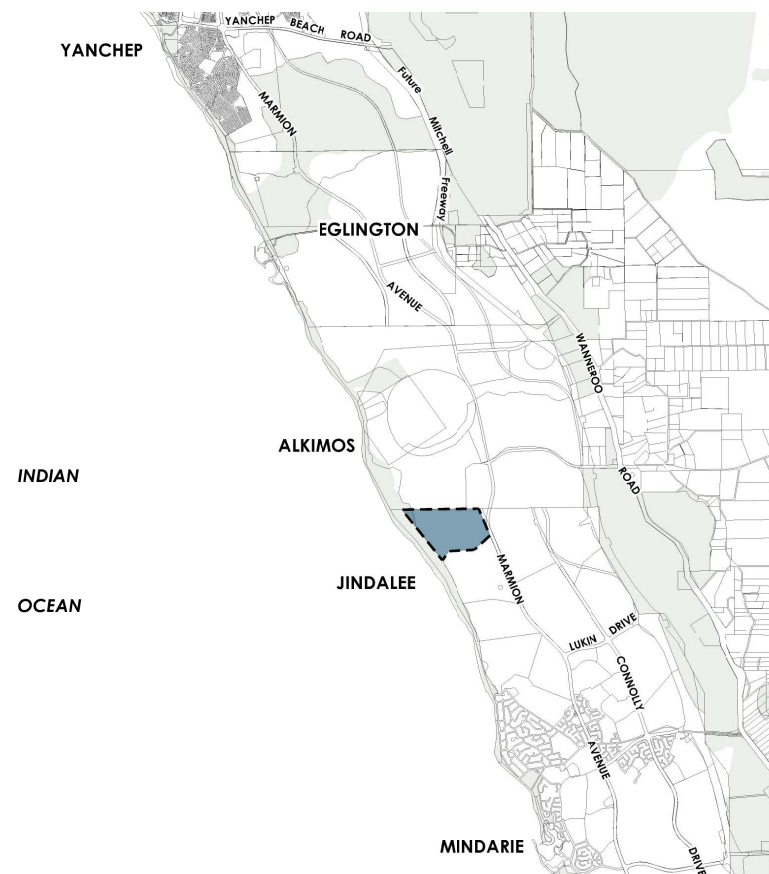


Figure 1: Location Plan



Plan No: 885-474-01

Figure 2: Site Plan

1.2.2 Ownership and Title Details

The land comprises three separate lots, being all of Lots 9 and 6002 and a portion of Lot 9309, Marmion Avenue.

This land is legally described as follows:

Lot Number	Plan	Volume	Folio
9	12464	1508	906
6002	60314	2704	928
9309	67827	2747	639

Lots 9 and 6002 are in the ownership of Ocean Springs Pty Ltd. Lot 9309 owned by the Department of Housing.

1.2.3 Existing Land Uses

The land is undeveloped and the eastern third has been cleared and bulk earthworked (refer Figure 2: Site Plan).

1.2.4 Surrounding Land Use

The land area is bound by Lots 1002 and 1004 Marmion Avenue, Alkimos to the north and Lot 10 Marmion Avenue, Jindalee to the south. All of these neighbouring sites are identified and zoned for future urban development, and are at various stages of the local structure planning process. Negotiations with all adjacent landowners and their consultants have occurred as part of the preparation of this structure plan.

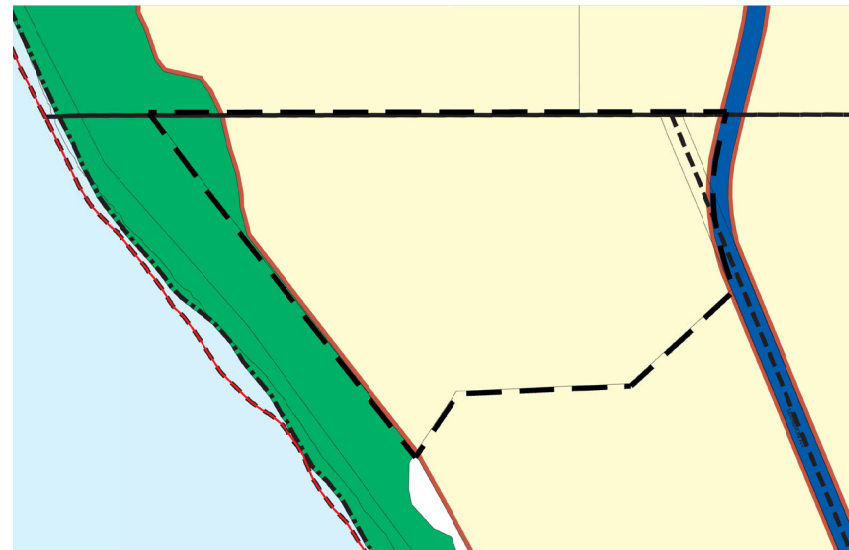
Marmion Avenue presently runs along the eastern boundary of the LSP area. Brighton Estate abuts the eastern boundary of Marmion Avenue with Lot 8 civil works well underway.

The western boundary of Lot 9 adjoins Foreshore Reserve 48306.



Plan No: 885-475-01

Figure 3: MRS Zoning



Plan No: 885-476-01

Figure 4: Scheme Zoning

1.3 Regional and Local Planning Framework

1.3.1 MRS Zoning

Lots 9, 6002 and 9309 are zoned 'Urban' under the Metropolitan Region Scheme. A 3.7 hectare portion in the north-western corner of Lot 9 is reserved as 'Parks and Recreation' (refer Figure 3: MRS Zoning).

Marmion Avenue to the east is reserved as 'Primary Regional Road – Other Regional Road', with Foreshore Reserve 48306 to the west reserved as 'Parks and Recreation' and classified as Site No. 397 in Bush Forever.

1.3.2 City of Wanneroo District Planning Scheme 2 (DPS2)

The Lot 9 LSP area is zoned 'Urban Development' under the City of Wanneroo's District Planning Scheme 2 (refer Figure 4: Scheme Zoning).

In accordance with Clause 3.14.2 of the Scheme, the objectives of the Urban Development zone are to:

- Designate land for future urban development;
- Provide for orderly and proper planning of large areas of land for residential and associated purposes through a comprehensive structure planning process; and
- Enable planning to be flexible and responsive to changing circumstances throughout the development stages of the area.

The Lot 9 LSP is lodged in accordance with Clause 9.11 of the Scheme, where a structure plan is required prior to subdivision or development in the 'Urban Development' zone.

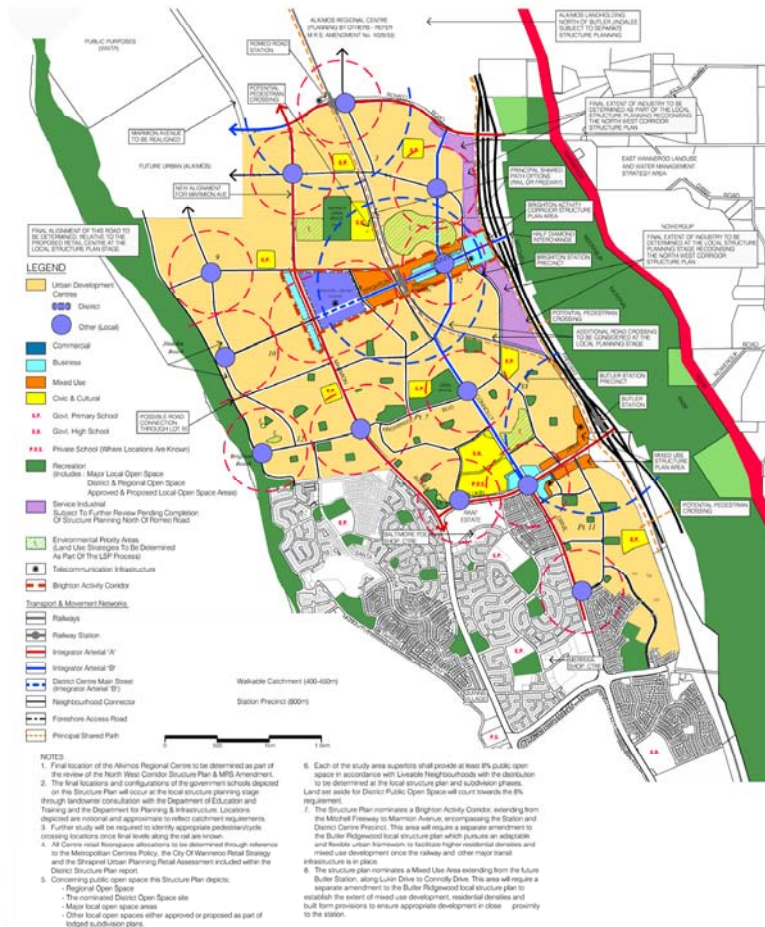


Figure 5: Agreed Butler Jindalee District Structure Plan

Plan No: 885-476-01

1.3.3 Butler Jindalee District Structure Plan (Agreed)

The LSP area is covered by the Agreed Butler Jindalee District Structure Plan No. 39 which establishes the district level planning framework for the area, providing for the broad disposition of land use, major roads, rail and other community infrastructure. The DSP is intended to guide and inform the preparation of future local structure plans (refer Figure 5: DSP).

The District Structure Plan identifies the following key elements that are relevant to the LSP area, all of which have been incorporated within the Lot 9 LSP:

- Predominately for residential development;
- A small 250m² to 600m² floorspace Local Centre, central to the LSP area;
- An east-west connector road alignment from Marmion Avenue, creating an access link from the Brighton District Centre through Lot 9 to the coast;
- Two north-south connector roads (including a coastal foreshore access road), allowing connectivity with the future development to the north and south of Lot 9; and
- One centrally located government primary school.

The LSP has been prepared to be consistent with the DSP subject to relevant detailed refinements as anticipated by the DSP.

1.3.4 Local Structure Plan 39 - Butler Ridgewood Local Structure Plan (Agreed)

LSP 39 covers the balance of the Brighton Estate on the eastern side of Marmion Avenue. The Lot 9 LSP is being undertaken as a separate structure plan as agreed with the City of Wanneroo and the Department of Planning,

The planning for the LSP has progressed acknowledging the reality that it is an urban extension to the Butler Ridgewood Local Structure Plan.

Many of the objectives and provisions of the Butler Ridgewood Local Structure Plan have therefore been transferred into the Lot 9 LSP, ensuring planning and subsequent development continuity between the sites.

1.3.5 Agreed Local Structure Plan 60 – Lots 1001 and 1002 Marmion Avenue, Alkimos (Trinity Estate)

Agreed Local Structure Plan No. 60 covers Lots 1001 and 1002 Marmion Avenue, Alkimos, encompassing the land situated to the north-east of the LSP area.

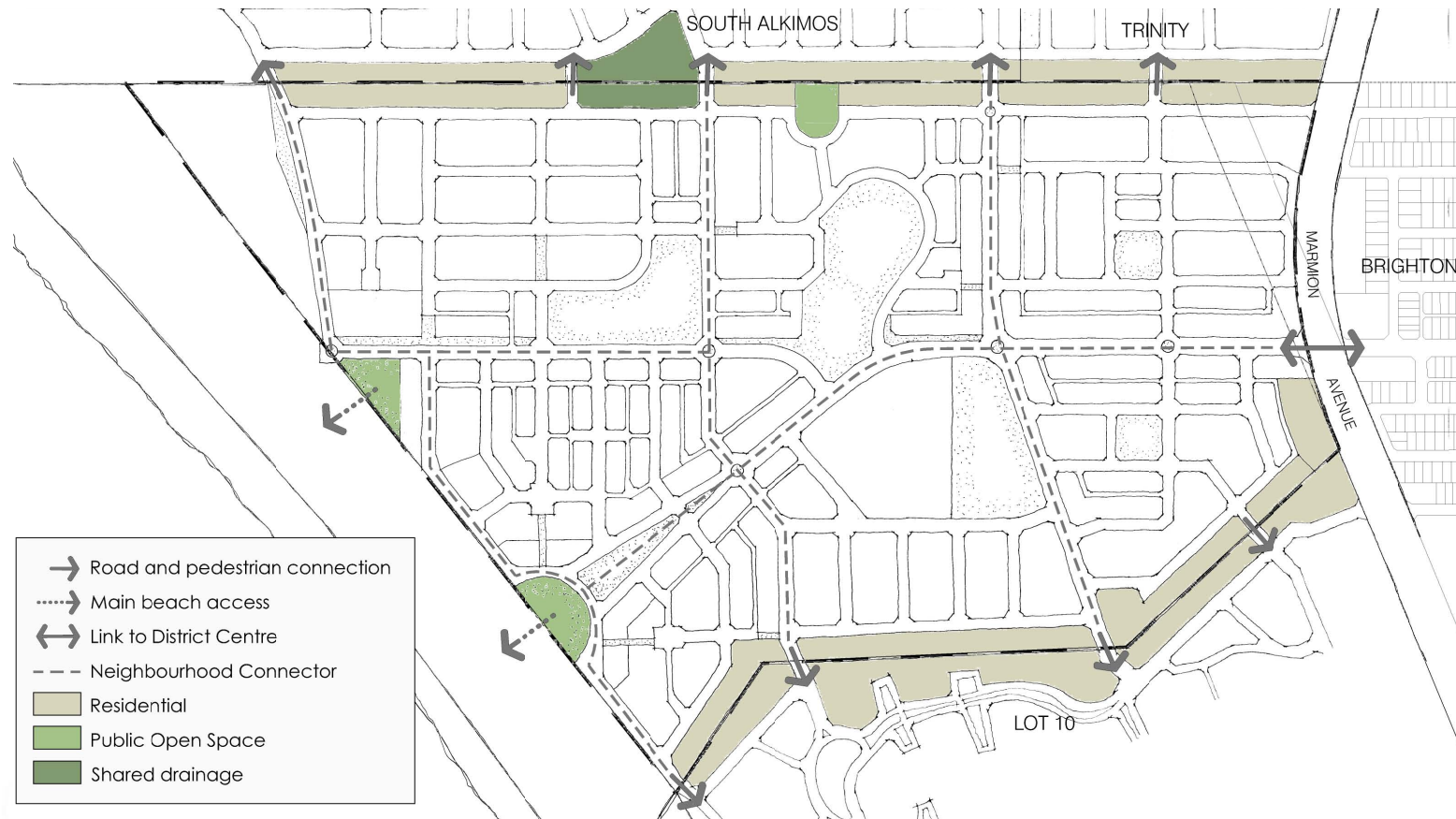
Key elements of that Plan are:

- A dwelling yield of approximately 2835 dwellings, with residential densities ranging from R20 to R50;
- Two local (commercial) centres;
- Co-location of one primary and one high school; and
- Approximately 5.5 hectares of District Open Space located adjoining the primary and high school site.

Lot 9 LSP has been integrated with the key land use elements of LSP60, with a local access road connecting the two LSP areas and the residential densities within the Lot 9 LSP reflecting those found in LSP60.

1.3.6 Proposed South Alkimos Local Structure Plan 72

Proposed South Alkimos Local Structure Plan No. 72 covers Lot 1004 Marmion Avenue, is the land abutting the north of Lot 9 and east of Agreed LSP60 (Trinity Estate). Proposed LSP72 is currently being advertised for public comment.



Plan No: 885-478-01

Figure 6: Interface Plan

The key elements being:

- A dwelling yield of approximately 2300 dwellings, with residential densities ranging from R15 to R80;
- Three local retail and commercial centres;
- One primary school (co-located with an area public open space) and one high school;
- Approximately 26 hectares of open space; and
- Two neighbourhood connector roads and one local access street, integrating with Lot 9.

Through discussions with the landowner of Lot 1004, the treatment of the interface between the Lot 9 LSP and LSP72 has been agreed, including the location and classification of all road connections and the abutting land uses and densities (refer Figure 6: Interface Plan).

1.3.7 Lot 10 Jindalee

Lot 10 is the land abutting south of the Lot 9 LSP area. It is subject to future planning with no overall local structure plan having been lodged for this site.

In consultation with the landowner of Lot 10, the Lot 9 LSP provides opportunities to integrate with the future development of Lot 10 to the south.

1.4 Key State Government Strategic Policy and Direction

1.4.1 Introduction

In fully appreciating both the status of the LSP and the many considerations which operate to shape the land use and urban design response, it is important to recognise the strategic planning and environmental considerations which apply to the land, and in particular the considerable historical context to these matters which guide the land use response. This section summarises these documents as relevant to the LSP.

1.4.2 Directions 2031 and Beyond (2010)

Directions 2031 is the new regional spatial framework and strategic plan that establishes a vision for the future growth of the Perth metropolitan region, for the delivery of housing, infrastructure and essential services.

Lot 9 falls within the North West Sub-Region, identified in Directions 2031 as part of the 'coastal urban front', being a key component of the metropolitan region urban expansion program for the medium term.

The Lot 9 LSP satisfies many of the key objectives and strategies of Directions 2031 through:

- Delivering for a logical (urban) expansion towards the areas of Alkimos-Eglington and Yanchep-Two Rocks, which are identified to accommodate growth in the Sub-Region over the next 20 years;
- Providing greater housing diversity, more choice and a range of affordability options, within the context of a location that offers high resident amenity;
- Supplies a critical mass that will in turn supports the development of the Yanchep Strategic metropolitan centre, the Alkimos Secondary centre and the Butler (Brighton) district centre;
- Supports the ongoing development of a robust public transport service, connecting the communities in the north-western corridor with jobs and services; and
- Maximises and improves the timing and coordination of essential infrastructure and services for the area.

1.4.3 State Planning Policy 2.6: The State Coastal Planning Policy

Located on the coast, the Local Structure Plan for Lot 9 must be mindful of key state and local government initiatives which control development both adjacent to and within the foreshore. Central to these is SSP 2.6 'The State Coastal Planning Policy' which sets out broad policy requirements related to the protection and management of Perth's coast. It references preferred development approaches, balancing the location of coastal facilities and the community's use of the beach with conservation of the natural coastal landscape.

With the support of a Foreshore Management Strategy and a Coastal Setback Assessment, the Lot 9 LSP demonstrates compliance with the Policy objectives. The LSP

- Establishes a coastal node precinct to focus development and coast access;
- Identifies appropriate areas and interfaces along the foreshore for housing, roads, tourism, recreation, drainage, amenities and beach access;

- Considers coastal processes such as erosion, accretion, storm surge, tides and sea level change when identifying development edges and interfaces; and
- Creates opportunities to protect, conserve and enhance coastal values through landscape, nature retention and protecting sites of indigenous significance.

The Foreshore Management Strategy and Coastal Setback Assessment are included as Appendix 2 and 3 respectively within Part 3, Technical Appendices of this Report

1.4.4 State Planning Policy 2.8: Bushland Policy for the Perth Metropolitan Area

The aim of the Bushland Policy is to provide a framework that will ensure the protection and management of significant bushland areas in the Perth Metropolitan Region.

The Policy identifies three key objectives:

- To establish a conservation system that is, as far as achievable, comprehensive, adequate and representative of the ecological communities of the Perth Metropolitan Region;

- To seek to protect and manage significant bushland recommended for protection and management for conservation purposes through a range of implementation mechanisms; and
- To provide a policy and implementation framework for significant bushland areas recommended for protection and management to assist conservation planning, planning assessment and decision-making processes.

This Policy's objectives have been a primary consideration in the design and preparation of the Lot 9 LPS, which considers the Bush Forever site as a practical extension to the foreshore reserve.



Plan No: 885-513-01

Figure 7: Jindalee Open Space Precinct (Draft Coastal Planning Strategy)

1.4.5 Draft Perth Coastal Planning Strategy

The Perth Coastal Planning Strategy is being prepared by the WAPC to direct the planning for conservation, recreation, infrastructure and development along Perth's metropolitan coastline, offering guidance in terms of location, scale and density.

This Strategy identifies the Lot 9 LSP area as the 'Jindalee Open Space Precinct', indicating that this precinct is to be dominated by passive recreation, good coastal facilities and community access to the beach.

The Lot 9 LSP responds to the Coastal Planning Strategy by identifying a major coastal village area with two activity nodes offering different intensity levels. This will facilitate the development of a responsive urban interface and land use configuration, essential public recreational facilities and controlled public access to the beach front (refer Figure 7: Jindalee Open Space Precinct).

A Foreshore Management Strategy has been prepared in conjunction with the LSP that demonstrates the location and management of the community infrastructure and activities within and abutting the foreshore reserve, including:

- Car parking and fencing;
- Controlled beach access by way of pathways and boardwalks;

- Grassed spaces, seating, BBQ's and shade structures for recreational purposes;
- Showers and ablution facilities;
- Kiosks/Cafés and other commercial functions;
- Public amenities.

This Foreshore Management Strategy provides for public amenity to areas while responsibly protecting the natural coastal environment (refer Appendix 2: Foreshore Management Strategy).

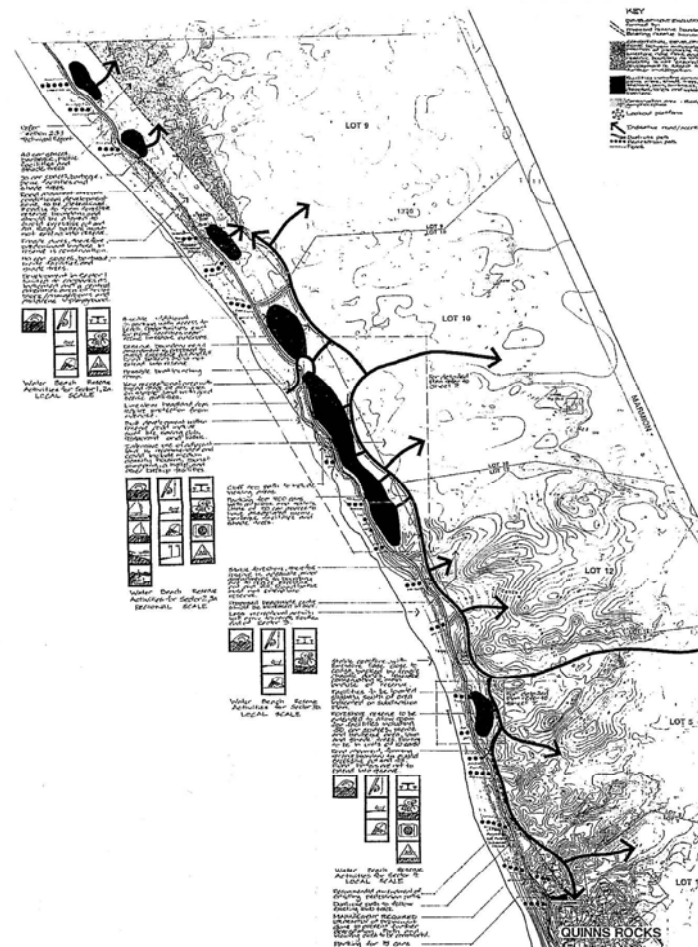


Figure 8: Coastal Planning Study

Plan No: 885-515-01

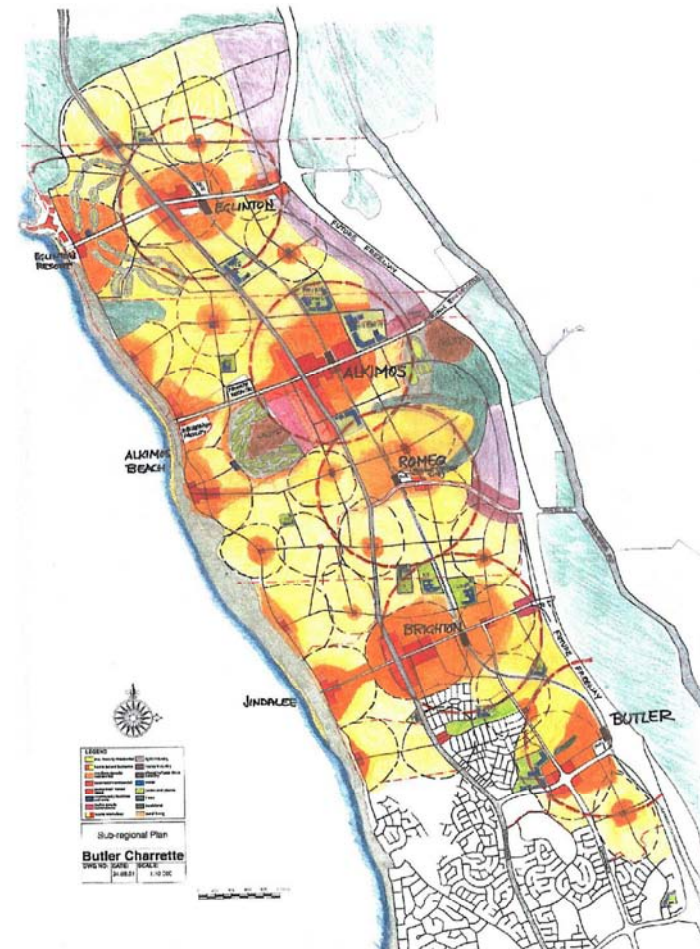


Figure 9: Sub Regional Plan (Butler-Brighton Charrette)

Plan No: 885-514-01

1.4.6 Coastal Planning Study – Burns Beach to Jindalee (1992)

The 1992 *Coastal Planning Study – Burns Beach to Jindalee* was prepared on behalf of the former Department for Planning and Infrastructure. This Study examined the coastal management and planning issues for the coastline between Burns Beach and Jindalee, recommending this stretch of the coastal foreshore is for suitable recreational use. This Study is an important source when considering suitable development along the coast (refer Figure 8: Coastal Planning Study).

The Study makes specific recommendations for the Lot 9 LSP, identifying three locations suitable for the development of public car parking and community recreational facilities to allow for the public use of the beach while protecting the natural dunal system.

The Lot 9 LSP recognises the Study's objectives, describing two activity areas within a broader coastal node precinct, featuring higher intensity residential development and related use and activities.

In effectively consolidating the number of coastal nodes from three down to two, the objective of allowing for suitable public use of the beach is achieved whilst also allowing for preservation of the dune system.

In accordance with the Study's recommendation, a Foreshore Management Strategy has been prepared that recognises the balance between the natural environment and recreation requirements.

1.4.7 Butler-Brighton Charrette (2001)

In late August 2001, the then Department for Planning and Infrastructure undertook an "enquiry by design" exercise for the Butler-Jindalee area, producing a number of principle outcomes to secure as the basis for subsequent district and local structure planning within the Butler-Brighton area. The *Butler-Brighton Charrette* identified indicative land uses, densities and road networks identified for Lot 9, including:

- Residential uses, ranging from low to medium density;
- A beachside activity node of increased residential density;
- A strong boulevard connection between the beachside activity node and Marmion Avenue to the east; and
- Creating good north-south connectivity between the landholdings to the north and south of Lot 9.

The *Butler-Brighton Charrette* formed the basis of further district and local structure planning for the area, including the Butler-Jindalee District Structure Plan and the Butler-Ridgewood Local Structure Plan (Agreed), and continues to shape the LSP response today in particular with respect to the major road network, development response adjacent the coast and broad land use allocations.

1.4.8 Liveable Neighbourhoods

The primary objective of Liveable Neighbourhoods is to create more vibrant, self sufficient and sustainable communities through providing a range of residential, recreational and service opportunities. Liveable neighbourhoods is an operational policy that has been adopted by the WAPC to guide structure planning and subdivision.

The Lot 9 LSP is consistent with the Liveable Neighbourhoods in:

- Creating and fostering a sense of community and strong local identity;
- Providing active street-land use interfaces, providing activity, surveillance and safety;
- Providing for a variety of lot sizes and housing choice, ranging from single houses to apartment living;
- Recognising and incorporating key cultural and environmental features into the design;
- Promoting an environment for safe, efficient and pleasant walking, cycling and driving; and
- Providing a comprehensive approach to the design of open space and urban water management.

1.5 Key Local Government Strategic Policy and Direction

1.5.1 Local Housing Strategy (2005)

The City of Wanneroo's Local Housing Strategy aims to guide future housing development in new residential areas, ensuring that adequate housing choice is available to meet the changing social and economic needs of the community.

The Housing Strategy provides a number of principles and recommendations for residential development, with some of the more specific principles relevant to Lot 9, as a coastal node, being:

- To consider any sensitive environmental features within the development design;
- Create opportunities for higher order leisure related activities and related employment;
- Increase housing diversity through a combination of low, medium and high density housing;
- Locate increased densities so as to support facilities and to take advantage of coastal amenity;

- Incorporate complementary land uses through providing mixed use diversity; and
- Specifically control building height so as to fit in with the surrounding landscape.

The LSP recognises the strategic location of Lot 9 as a coastal node, providing a range of housing types and density.

Section 7 includes a Housing Strategy for Lot 9, detailing product, yields and densities in response to many of the objectives contained in this and state policy.

1.5.2 Local Planning Policy 4.3: Public Open Space

The City of Wanneroo has a comprehensive Public Open Space Policy which seeks to ensure that a variety of open spaces are provided in a manner that optimises community benefit, with a balance of size, type, function and location. The forms of open space favoured include:

- Pocket parks at less than 0.5ha in area;
- Local parks at between 0.5ha to 1.0 hectare in area;
- Neighbourhood parks at between 1.0 to 7.0 hectares in area; and

- District & regional space that exceed 7.0 hectares in size.

The Policy includes a range of development standards and criteria that describe the amount of active and conservation open space areas and the credits applicable.

Liveable Neighbourhoods also sets a range of standards for open space planning at a local structure planning level, making provision for a range of recreation spaces from local to district parks, also specifying minimum standards related to size, use and location. The objectives are broadly (though not entirely) consistent with the City Policy.

To support and explain the overall open space strategy, the Lot 9 LSP is accompanied by comprehensive information, required in accordance with the City's Policy and Liveable Neighbourhoods, including:

- Public Open Space Schedule, refer Table 2;
- Public Open Space Concept, refer Appendix 4 of the Technical Appendices;
- Individual Description of each POS area, refer Section 5 of this report.

- Local Water Management Strategy , refer Appendix 5 of the Technical Appendices; and
- Provision in the Environmental Assessment Report for a Vegetation Management Plan at the time of subdivision.

All the criteria and standards of the open space that are relevant to the Lot 9 LSP are discussed in Section 5 of this report, as well as detailed in Open Space Schedule. The Lot 9 LSP makes provision for a range of open space areas, some of which will be determined at the time of subdivision and others identified in Part 1 of the LSP as strategic public open space areas.

1.5.3 Draft Local Planning Policy 3.8: Marmion Avenue Arterial Road Access

The City of Wanneroo have prepared and advertised a draft Marmion Avenue Arterial Road Access Policy, with this Policy providing a range of standards for the location of vehicle access points onto Marmion Avenue.

In accordance with the draft Policy, the LSP includes two intersections onto Marmion Avenue:

- Signalised 4-way intersection at a location recognised by the draft Policy; and

- Sign controlled T-junction, located with an adequate junction spacing, in accordance with Liveable Neighbourhoods.

In support of the road network, the LSP is accompanied by a detailed Traffic and Transport Assessment, in accordance with the City's draft Policy and Liveable Neighbourhoods (refer Appendix 6 of the Technical Appendices).

1.5.4 Local Planning Policy 4.2: Structure Planning

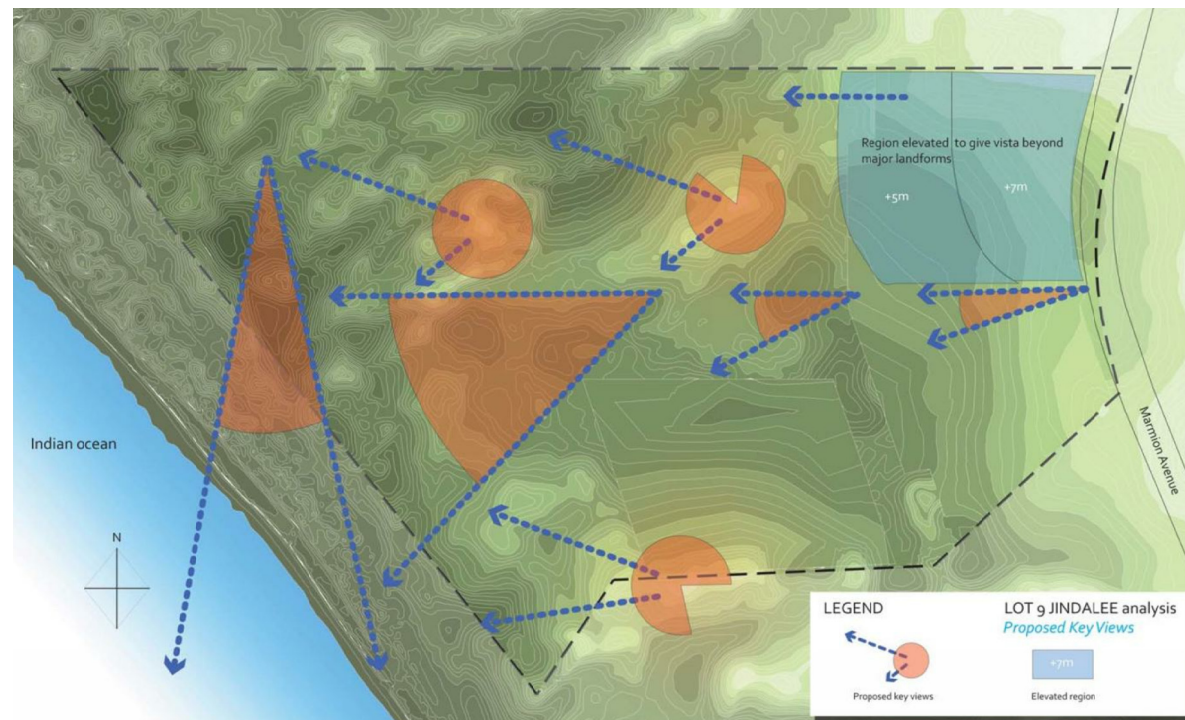
The City of Wanneroo's Structure Planning Policy looks to expand and elaborates on the Scheme provisions for structure planning with the objectives being to:

- Establish a structure planning hierarchy that allows for different types of planning issues to be addressed at the appropriate stage of the planning process.
- Detail the minimum requirements and assessment criteria for each type of structure plan in order to ensure a consistent approach to structure planning and improve planning outcomes in the City of Wanneroo.
- Refine and clarify the structure plan and structure plan amendment process to provide a robust, streamlined and consistent assessment process.

- Establish an agreed structure plan revocation process that allows for structure plans to be updated in a streamlined manner, providing for better planning outcomes in established areas.

The Lot 9 LSP has been prepared in accordance with the City's Policy requirements, providing the necessary statutory provisions of the structure plan, the explanatory information on the key planning outcomes and provides all the associated technical reports and studies that have shaped the Lot 9 LSP design.

This required information has been provides by way of the three parts that make up the Lot 9 LSP, as described above in section 1.1 of this report.



Plan No: 885-516-01

Figure 10: Key Site Views

Source: EPCAD

SECTION TWO: ENVIRONMENT, LANDFORM AND SITE CONDITIONS

2.0 ENVIRONMENT, LANDFORM AND SITE CONDITIONS

This section is a summary of the Environmental Assessment Report, (EAR) prepared by RPS Environmental, which describes the environmental considerations of the Lot 9 LSP.

A copy of the full EAR can be found as Appendix 1 within the Technical Appendices of this report.

2.1 Topography and Landform

The Lot 9 LSP area has a number of dominant landform features which provide an excellent opportunity to create a strong sense of place for the development, and to enhance views along the coast.

The existing topography is characterised by more 'chaotic' sand dunes closer to the coast with older, more stable dunes further inland and a number of prominent ridgelines, with elevations up to 40m AHD.

The coastal dune landforms tend to flatten and reduce in height to the south sector of the foreshore reserve, creating two natural access points to the beach, and giving rise to strong view corridors from the centre and eastern portion of the site of the site towards the west and south-west, refer Figure 10: Key Site Views.

The site's landform has been a key consideration in the design, with EPCAD's Landscape Management Plan, prepared as part of the LSP, retaining the dunal peaks as key landmarks and utilising the lower lying regions for development and recreation. This also allows for the existing view corridors to be retained and emphasised in within the public realm, refer Figure 11: Landscape Concept Frameworks.

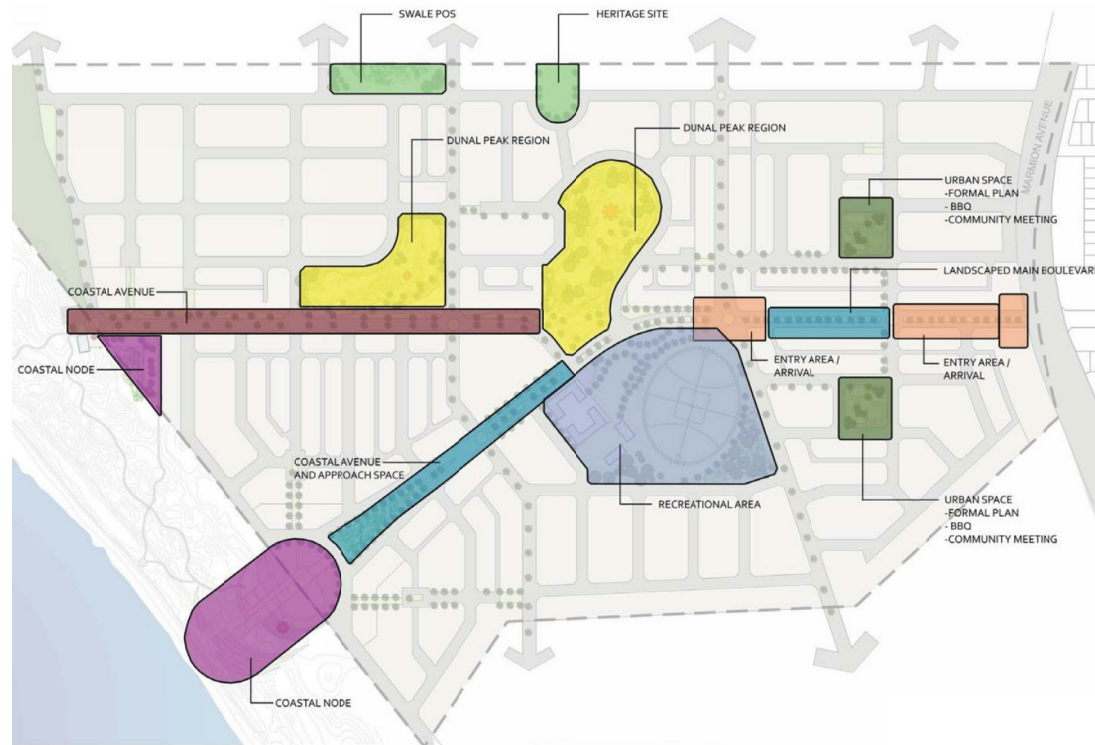
These dominant landform features, in combination with the use of prominent landscaping, will provide the development with a strong sense of arrival and place, providing a visual interest for the development.

2.2 Soils and Geotechnical

The Quindalup Dune System, which is largely comprised of Safety Bay Sands, dominates the Lot 9 geomorphology with sections of mixed with Tamala Limestone at depth.

This geology and soil type makes the LSP area well suited to development as the sandy soils overlying the limestone provide good geotechnical conditions for urban construction and services. The permeability of the LSP area also provides for good stormwater infiltration.

Cossill & Webley Consulting Engineers have advised that, based on the experience of development on adjoining sites, it is very unlikely that the LSP area contains any karstic ground formations. Nevertheless provisions will be made at subdivision stage for progressive inspections to be undertaken by qualified geotechnical engineers, confirming if any of these formations are on the site.



Plan No: 885-517-01

Figure 11: Landscape Concept Frameworks

Source: EPCAD

2.3 Hydrology

2.3.1 Surface Water

RSP Environmental have found there are no naturally occurring water courses or water bodies within the LSP area, with the highly porous nature of the dune sands resulting in excellent rainfall infiltration and groundwater recharge. These highly permeable sands are ideal for stormwater management through at source infiltration.

2.3.2 Ground Water

The Department of Water have confirmed to RSP Environmental that no on-site construction of monitoring bores will be required, due to the significant depth of the ground water.

The EAR has found that the depth of the groundwater across the LSP area varies between 11 metres below the surface along the western section of the site, down to 35 metres below the ridges along the eastern side of the site.

The development of the Lot 9 LSP is expected to increase the groundwater recharge to the superficial aquifer, which in turn will increase the quantity of groundwater through flow and water available for abstraction. The porous nature of the soils in the LSP area will result in only a negligible increase to the groundwater level.

The Lot 9 LSP is located within a Priority 3 Groundwater Source Protection Area, requiring the installation of reticulated sewerage and restricting noxious industry uses however this presents no constraints to the development, as sewerage is to be provided and no noxious industry uses are proposed.

The Water Corporation is planning for a superficial aquifer production bore to be located to the east of the LSP area, on Lot 8 Marmion Avenue, Butler. This will result in a 300 metre (radius) well head protection zone extending into the eastern end of the site, restricting polluting land uses within this protection zone. The Lot 9 LSP does not propose any polluting land uses, consistent with the protection zone.

2.4 Coastal Processes and Setbacks

As part of the suite of supporting technical reports, a preliminary Coastal Processes Setback Assessment was prepared by MP Rogers and Associates for Lot 9, consistent with the WAPC's State Planning Policy 2.6: State Coastal Planning Policy.

The assessment was undertaken to determine the appropriate Physical Processes Setback (PPS) for Lot 9.

In determining the PPS, in accordance with the State Planning Policy, the following criteria were considered:

- Acute Storm Erosion Allowance, being the allowance for short term erosion caused by a series of severe storms;



- Historic Shoreline Movement Allowance, being the allowance for chronic short term trends caused by local coastal dynamics; and
- Sea Level Change Allowance, being the allowance for the possible recession of the shoreline as a result of anticipated sea level rise.

Results included in the Report indicated that the foreshore reserve would provide an adequate setback distance to ensure that development would not be compromised by the coastline's natural processes and erosion.

More recently, the WAPC has reviewed the criteria within State Planning Policy 2.6, which affects how the PSS is determined and revised Coastal Processes Setback Assessment is being undertaken, to reflect the new criteria. This revised assessment will now incorporate the findings of a new geotechnical assessment of Lot 9, to determine the presence and extent of any coastal rock, which may further reduce the PPS.

A copy of the preliminary Coastal Setback Assessment is included as Appendix 3 within the Technical Appendices of this report.

2.5 Flora

A Level 2 Vegetation and Flora Survey was undertaken by RPS consultants for Lot 9 which found that there was no Threatened Ecological Communities (TEC) in the Lot 9 LSP area.

The survey found the best quality vegetation is already protected within the foreshore reserve with the balance of the site generally having a mid rating of 'good to very good' vegetation.

Importantly, the Lot 9 LSP design recognises the key landform features and associated vegetation areas within public open space and a detailed Vegetation Management Plan will be developed at subdivision, to address issues associated with the management of these areas, which will include:

- Delineation of areas of remnant vegetation, landforms and fauna habitat areas to be retained and protected;
- Identification of the retention and management actions to protect vegetation within the site;
- Description of management measures proposed to protect existing environmental values within the site pre-, during and post-construction;
- Ongoing monitoring and contingency actions; and
- Implementation timing and responsibilities for the above.

2.6 Bush Forever Site No. 397

Bush Forever Site No. 397 is located within the coastal foreshore reserve, adjacent to the west of Lot 9, and also extends into the north western corner of the LSP area. There are two Floristic Community Types (FCT) that are thought to occur within the Bush Forever site, with the Lot 9 LSP proposing no development within this area.

2.7 Fauna

In accordance with the Environmental Protection Authority's Guidance Statement No. 56 a Level 1 fauna survey has been undertaken by Bamford Consulting Ecologists as part of this LSP.

A site inspection undertaken as part of the fauna survey did not observe any threatened or priority species in the LSP area, recording only local and introduced species.

A management program will be undertaken at the subdivision stage, in consultation with the City of Wanneroo, which will include the following measures:

- Staged clearing in the direction of an area of vegetation that will be retained, to provide fauna with the maximum opportunity to escape;

- Fauna trapping for small mammals and reptiles will be undertaken in areas to be cleared prior to the commencement of clearing activities. If any individuals are found, they will be relocated by a specialised fauna expert in consultation with the DEC;
- Installation of signage in areas of POS to inform the community about significant fauna and habitats within the site; and
- Provision of Environmental Specifications to contracting staff with regard to fauna management measures during clearing and development

2.8 Matters of National Environmental Significance

In accordance with the Environment Protection and Biodiversity Conservation Act 1999 (EPBC Act, the relevant referral documentation and approvals through the Department of Environment, Water, Heritage and the Arts is being progressed and managed as a separate matter to the LSP.

A Protected Matters search for Matters of National Environmental Significance (NES) was undertaken in September 2010 for the LSP area, resulting in two identified species as being potentially affected by the development, being the Carnaby's Black Cockatoo and the Graceful Sun Moth.

2.8.1 Carnaby's Black Cockatoo

RPS have found that through preceding fauna surveys undertaken within the area, Carnaby's Black Cockatoos have been recorded within proximity to the LSP area but with only limited suitable foraging habitat known to be on the site. Due to the limited extent of this foraging habitat, Carnaby's Black Cockatoos are likely to be only an occasional visitor to the site.

2.8.2 Graceful Sun Moth

Based on advice from RPS the Lot 9 LSP has been designed to recognise the presence of the Graceful Sun Moth, with the inclusion of key habitat areas for this species co-located within areas of passive recreational public open space.

The protected matters search identified the Graceful Sun Moth as a potential inhabitant within the LSP area. *Lomandra maritime*, being a known habitat species for the Graceful Sun Moth, is known to be present in the LSP area.

A targeted Graceful Sun Moth survey was conducted in March 2010, with a total of fifteen Graceful Sun Moths recorded, with these recordings indicating a localised population around the northern central dune crest. The *Lomandra maritime* was then mapped in August 2010 so as to determine the Graceful Sun Moth habitat on the site.

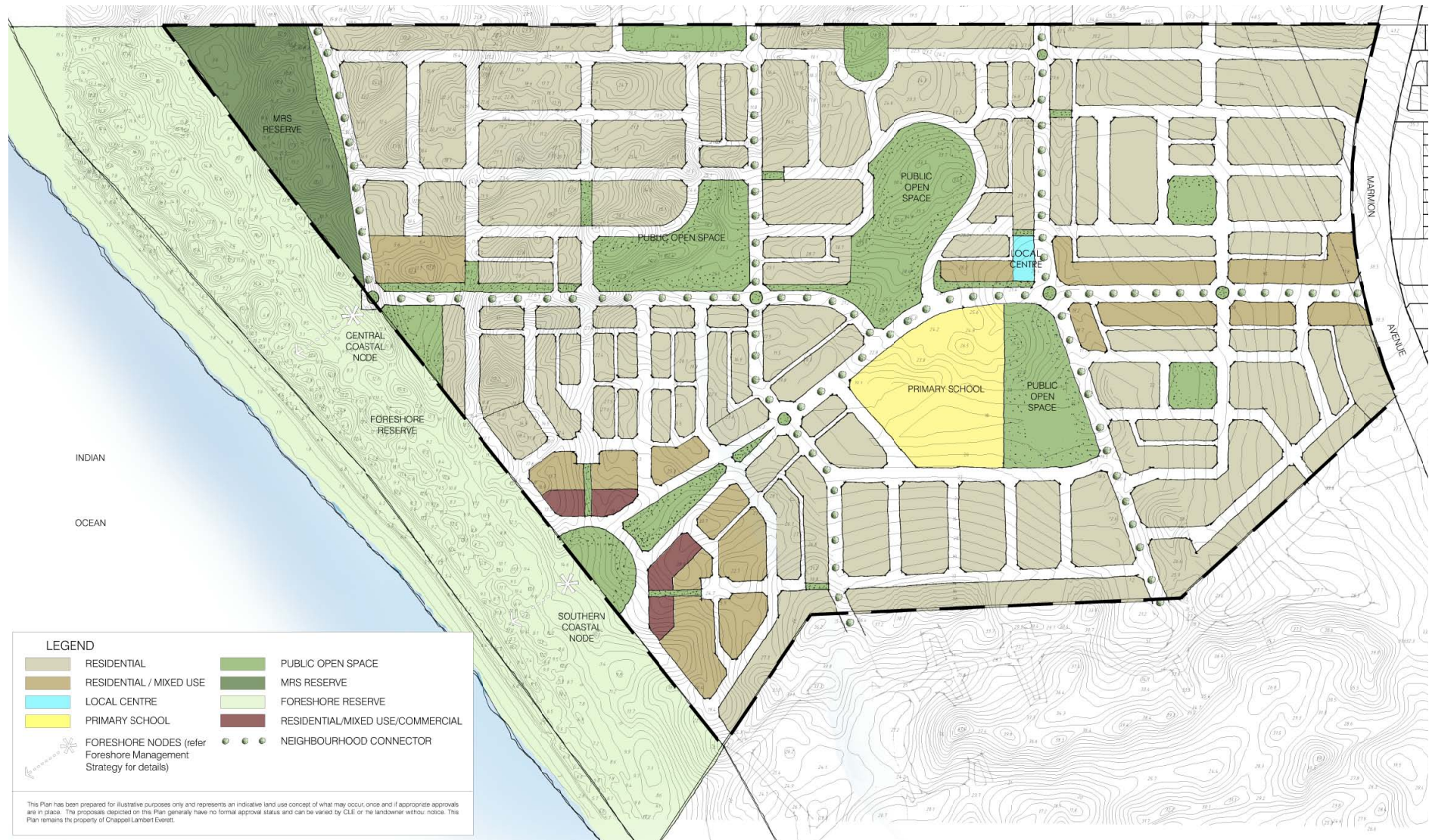
2.9 Heritage

An Aboriginal Heritage Report was undertaken for the LSP area by Australian Interaction Consultants (AIC), with a search of the Department of Indigenous Affairs (DIA) Aboriginal Heritage Enquiry System indicating the presence of one identified cultural site (DIA 24406 Dunes) located within the LSP area.

The Lot 9 LSP recognises this ethnographic site, with this site being located and protected within an area of public open space. The landowners are continuing to consult with the appropriate Elders regarding development in the area and impacts on Aboriginal sites of significance and cultural sensitivity.

Further surveys are being conducted by AIC as a separate matter to the LSP, to identify the requirement for a section 18 license under the Aboriginal Heritage Act 1972,

There are no listed European sites of heritage significance located in the LSP area.



Plan No: 885-511-01

SECTION THREE: LOCAL STRUCTURE PLAN

3.0 DESIGN APPROACH AND PHILOSOPHY

The Lot 9 LSP is the coastal extension of the Brighton Estate, and will provide for a wider range of lot and housing opportunities within neighbourhoods, defined by proximity to the coast, landform, open spaces and the road network.

The planning response, is guided by the following key planning priorities:

- Ensuring subdivision and development balances the development response, pressures for coastal enjoyment & access and the need to respect and preserve key natural values;
- Recognising the key natural site features within, and adjacent to, the land as character defining urban design elements, ensuring a strong natural based coastal theme to development;
- Focussing the more intensive development forms, beach amenities and access opportunities at points which can best accommodate these demands;
- Ensuring logical integration between development, public infrastructure and the natural environment, within and adjacent to the foreshore reserve;
- Creating a discernible coastal village, comprising higher residential densities and mixed uses with potential for built forms above 5 storeys;
- Recognise the key areas of natural landform and vegetation features through site responsive design and sensitive POS location;
- Provide a mix and balance of open space types, recognising also the proximity to the beach;
- Create a strong and legible road network which provides for linkages to and along the coast, and allows efficient and safe pedestrian & cyclist movements;
- Create a land use framework that encourages good solar orientation of lots and recognises coastal views from both the private and public realms; and
- Create potential for a wide range and diversity of housing product, of varying densities, based on key contextual elements.

A Development Concept Plan (DCP) is included at Figure 12. It demonstrates a possible development outcome for the land which may eventuate from the LSP. It is indicative at this time but also consistent with the statutory intent of the Part 1 document. It is extensively referenced in this LSP.

TABLE 1: LOT 9 JINDALEE LOCAL STRUCTURE PLAN LAND USE SCHEDULE

Gross Application Area	109.70ha
Non Residential Land Uses	8.28ha
Primary School	3.5ha* ²
Local Centre	0.2ha
Regional Open Space	3.67ha
Drainage	0.91ha
TOTAL	8.28ha
Gross Residential Area (109.70 - 8.28)	101.42ha
POS Required at 10% of Gross Residential Area	10.14ha
POS Provided in this Application	10.44ha
Gross	11.35ha
1 in 1 year	0.91ha
Credit	10.44ha
Net Residential Area (101.42 - 10.44)	90.98ha
Area of Roads and Lanes (30% of GRA/33.5% of NRA)	30.54ha
Site Area of Lots (9098 - 30.54)	60.48ha
Predicted Lot and Dwelling Yields	1590 du
Single Lots	1320
Apartments/Units	270
TOTAL	1590
Densities Based on du/ha	
Gross Residential	13 lots/ha, 15.7 du/ha
Site Area	22 lots/ha, 26.3 du/ha

*NOTES:

1. See Public Open Space Schedule at Table 2 for details of calculation.
2. For the purposes of the Schedule and the POS calculation a Primary School area of 3.5ha has been assumed, although detailed planning may result in a smaller area (3.2ha) subject to DoE support.
3. This Schedule is based on the land use concept in the Development Concept Plan and is subject to review and refinement at subsequent planning stages.

4.0 LAND USE OVERVIEW

In summary, the Lot 9 Local Structure Plan (refer also the DCP at Figure 12) will provide a framework for:

- An estimated 1600 dwellings (including 1300 lots), with residential densities ranging from R20 to R100, with higher residential densities and built form focused around the coastal precinct, the local commercial centre, major entry roads and key areas of public open space.

Two local centres comprising of 500m² and 300m² retail floor space respectively, providing convenience services and amenity to the residents of the LSP area and servicing coastal recreation related demands.

- Approximately 10 hectares of public open space, for passive & active recreation, drainage as well as retaining key areas of existing vegetation and the natural landform. This public open space meets the required minimum of 10% public open space.
- A coastal village prec as part of a coastal node to include a small convenience store and cafés or small restaurants, along with residential development that reflects the desirable location within proximity to the coastal foreshore;
- Beach based activities in the foreshore reserve integrated into the village and adjacent urban forms and including more recreation and community based amenities and facilities serving the needs of beachgoers;

- Pedestrian connections, car parking, open space and the possibility of other community facilities located within and adjacent the foreshore reserve, providing public access and use of the beach;
- A primary school site of 3.2 - 3.5 hectares, co-located with an area of active public open space.
- A permeable road network of neighbourhood connectors and local access streets that provides a safe, efficient and attractive street network for use not only for private vehicles but also for public transport services, pedestrians and cyclists.
- Guidance in preparing subsequent subdivision design and allocating final densities.
- Landscape theme and integrated drainage response
- A broad earthworks strategy recognising areas for retention of landform

A Land Use Schedule is included in Table 1 which also describes the potential allocation of land area to lots and roads. It should be read in conjunction with Figure 12 and the POS Schedule (refer Table 2).



5.0 INTEGRATED PUBLIC OPEN SPACE AND LANDSCAPE STRATEGY

5.1 Introduction

A primary feature in the design process of the Lot 9 LSP has been to identify, in the first instance, those key natural features on site which can be protected and readily integrated into the design outcome, ensuring that the development provides a wide range of recreation potentials, recognises significant environmental elements and emphasises the amenity component of the landscape strategy

In this regard the Public Open Space and Landscape Strategies have been formulated in a very multidisciplinary manner, reflecting the findings and recommendations of the Environmental Assessment Report (EAR), responding to the detailed Landscape Analysis undertaken as part of the Landscape Management Plan (LMP), reflecting the integrated approach to drainage described in the Local Water Management Strategy (LWMS) and integrating with the Foreshore Management Strategy (FMS) to ensure a thorough and comprehensive planning approach.

The allocation of the various open space elements, and the recommended approach to their use and development, has also been guided significantly by the objectives of the City of Wanneroo's new Local Planning Policy 4.3: Public Open Space and the provisions of Liveable Neighbourhoods, both of which seek to ensure residents are provided with good access to a range of recreation and open space facilities.

5.2 Summary of Major Landscape and Environmental Opportunities

Excellent opportunities exist for a planning and landscaping response which balances and maximises the environmental and landscaping benefits of the development, through a design which locates strategic open spaces adhering to the following objectives:

- Recognising and protecting the two key dunal landform elements in the north section of Lot 9 within public open space;
- Recognising important representative areas of vegetation and habitat in those landform based public open spaces, the foreshore area and the MRS reserved land, allowing for managed public access to these areas as part of separate management plans;
- Adopt a multi function approach to open space to better integrate recreation, landscape and conservation priorities;
- Adopting a sensitive approach to the planning of environmental edges particularly the foreshore reserve and ensuring user pressures are directed to specific areas;
- Providing for managed access and infrastructure within specified areas of the foreshore reserve which are tied back to the adjacent urban form;



Plan No: 885-525-01

Figure 13: Public Open Space

- Providing for the integration of drainage with open space, through the use of infiltration swales; and
- Adopting a landscape philosophy, species retention and general approach which reflects on the coastal location.

5.3 Description of Open Space Areas

Figure 13 indicates the general location of the planned open space areas as indicated on the Development Concept Plan and selectively included in Part 1 Structure Plan. A Landscape Concept Master Plan has been prepared by EPCAD as part of the Landscape Management Plan and is also included at Figure 14 providing more detail to the planned landscape response.

Key strategic open space areas are indicated on Figure 13 and will be fixed as part of the Lot 9 LSP in the Part 1 statutory documentation of the Lot 9 LSP. Others will be identified and refined at the time of subdivision.

The following section provides a summary of each of the open space areas indicated on the Development Concept Plan and the LLMP, referencing key elements from the Landscape Management Plan (LMP), Environmental Assessment Report (EAR) and Local Water Management Strategy (LWMS).

5.3.1 Local Pocket Parks 1 and 2

These are two notional areas of POS indicated on the Development Concept Plan which will be refined during the subdivision process.

Currently it is anticipated that these two areas of POS will be approximately 4000m², consistent with Liveable Neighbourhoods and the City of Wanneroo Open Space Policy and will be developed as more formalised spaces, providing local amenity and recreation space for those residents either side of the entry boulevard.

Figure 14 depicts one design option and, in accordance with the LWMS, both spaces are planned to take drainage. This is reflected in the POS Schedule at Table 2.

5.3.2 Central Neighbourhood Park 3

This is an active space of approximately 2.2 hectares which will be co-located with the primary school site. Centrally located, this space has excellent exposure, with road access to two neighbourhood connectors and local streets. The City of Wanneroo has indicated a preference for junior oval (110 to 130 metres in length with 30 metre buffers) and both the POS and the adjoining primary school site have been configured accordingly.

As described in the LWMS, the periphery of the park will also accommodate swale drainage. The LMP indicates a preliminary layout for this space, demonstrating the relationship to the school, ovals and the treatment of the drainage.



Plan No: 885-543-01

Figure 11: Landscape Concept Masterplan

Source: EPCAD

5.3.3 Strategic Open Space Areas 4 and 5

These are two 'landform responsive' open space areas of approximately 3.2 and 2.4 hectares respectively, which respond to agency preferences for the preservation of the representative landform, vegetation and natural features, recognising the environmental and landscape based objectives of the LMP and the EAR.

The LMP has identified these landforms as important local site features, providing dramatic relief and the potential for walk trails and viewing platforms, carefully located to preserve environmental values in accordance with a future management plan.

The EAR similarly has selected the same areas as being worthy of protection in order to retain areas of *Lomandra maritime*, a habitat species for the Graceful Sun Moth.

Selected pockets of these open space areas will also be developed for minor passive recreation pursuits, such as picnic and barbeque facilities, potentially associated with a lookout in Strategic Open Space Area 4.

Together with the existing foreshore reserve and the MRS Reserve (Bush Forever Site 397) to the north-west, these spaces will provide an excellent opportunity for a truly mixed use open space approach which, while facilitating public use and enjoyment, will also retain a strong focus on the environment and its preservation. Management plans will be prepared at the time of subdivision, pursuant to the EAR.

Due to the nature of the terrain, no drainage will be disposed of into these two public open space areas.

A Conservation Management Plan will be prepared, detailing the management of these two open space areas.

5.3.4 Northern Neighbourhood Park 6

In accordance with the LWMS, the primary purpose of this neighbourhood park is to accommodate a drainage catchment which extends from the Lot 9 LSP and crosses over to the adjoining Landcorp Alkimos structure plan area.

A co-ordinated design approach has been adopted by both landowners in order to select the actual location of this neighbourhood park, which is to be landscaped with a usable passive drainage swale. Approximately 5500m² of this park is being located within Lot 9, which is in proportion to the drainage catchment size of the LSP area.

5.3.5 Local Heritage Park 7

The Aboriginal Heritage Report prepared by AIC has identified a site of cultural significance on a small ridge in this area, which is now proposed to be protected within this 4000m² parkland area.

The small outcrop will be retained in its natural state and opportunities examined later for a minor component of passive recreation amenities on some of the surrounding area. This is contingent on duly recognising cultural values.



5.3.6 Northern Coastal Node Neighbourhood Park 8

This park serves a dual purpose, providing context and a recreation focus to the small coastal node in this location, whilst also accommodating drainage from the north-west catchment. The size and configuration of this space will be finalised at the time of subdivision.

The LWMS requires some drainage in this location, which will be accommodated within a landscaped swale straddling both the open space and the foreshore reserve.

Importantly the landscaped swale will be integrated into the overall plan for this space, generally in the manner depicted in the LMP, while still recognising the requirements of the Foreshore Management Strategy and subsequent Foreshore Management Plan, which is to be prepared as a condition of subdivision.

This integrated approach will provide for:

- Car parking and fencing
- Beach access paths, boardwalks etc
- Grassed space, seating, shade structures, showers and ablutions
- BBQs
- Integrated drainage as part of grassed spaces

At this stage, a notional land area of 5000m² is indicated on the Development Concept Plan and referenced in the Open Space Schedule, with a development concept included within the LMP.

5.3.7 Southern Coastal Node Neighbourhood Park 9

The review of opportunities and constraints associated with landform and vegetation found that the southern portion of Lot 9 presented the most accessible option for a mixed use coastal village, being the most suitable location in terms of landform, beach activity and access. This was also consistent with numerous policies and studies as outlined in preceding Section 1.4 - Key State Government Strategies and Policy.

The focal point of this node, where all the recreational activity will be concentrated, is the circular open space area which straddles the boundary of Lot 9 and integrates into the foreshore reserve, leading down to the beach.

This open space performs a critical role as a community based centre for the coastal village precinct as well as being the key transition area from the more urban forms through to the foreshore and beach.

It can serve a multitude of activities and functions through the provision of;

- Grassed recreation areas and facilities including barbeques, shade structures and seating;
- Integrated drainage disposal within the grassed spaces;



- Beachside parking and fencing;
- Children's play equipment;
- Landscaping planting and information;
- Ablutions and shower facilities;
- Kiosk/Café and other public amenities;
- Constructed pedestrian and cyclist pathways ;
- Emergency vehicle access;
- Lighting; and
- Storage facilities for surf skis, kayaks and surfboards.

Further detail on how this open space area may be treated is included within the associated Landscape Management Plan and the Foreshore Management Strategy.

5.3.8 Foreshore Approach Park 10

Integral to the development of Southern Coastal Node Neighbourhood Park, this space performs a range of functions and is a key part of the water management approach described in the LWMS. It accommodates as much drainage as possible so as to limit the amounts which will need to be disposed of within the southern coastal node open space.

This open space will be designed to take the entire 1 year storm event so the southern coastal node open space swales need only accommodate the 5 and 100 year events.

The foreshore "approach" open space will be landscaped as a high quality entry to the beach facilities and will provide additional recreation and amenity options for the surrounding higher density development.

The other important feature is the "conical" configuration which enhances views to the west and south-west, opening up the visual linkages to the beach and spreading the betterment.

5.4 Regional Open Space

Approximately 3.7 hectares of the north-west corner of the Lot 9 LSP area is reserved for 'Parks and Recreation' under the Metropolitan Region Scheme.

Absent of this reservation, the land could be developed for residential purposes consistent with the adjacent land. Nonetheless the reservation ensures the protection of this area and the consolidation of a large conservation node which includes the foreshore reserve.

The protection of these dunes, in effect, provides for a 400 metre wide coastal reserve in this portion of the site, which consolidates the typical fore dunes and primary dunes of the foreshore, as identified in the Landscape Management Plan.

TABLE 2: LOT 9 JINDALEE LOCAL STRUCTURE PLAN PUBLIC OPEN SPACE SCHEDULE

No.	Description	Stat	Category	Gross Area	Estimated Drainage Areas (TWL)				POS Credit (Adjusted)
					1:1	1:1 to 1:5	1:5 to 1:100	Total	
1	N.E Pocket Park		Pocket	0.40	0.05	0.06	0.11	0.22	0.395
2	S.E Pocket Park		Pocket	0.40	0.04	0.06	0.09	0.19	3.957
3	Central Neighbourhood Park	✓	Neighbourhood	2.20	0.38	0.28	0.41	1.07	1.820
4	Central Strategic Park	✓	Neighbourhood	3.20	-	-	-	-	3.200
5	Western Strategic Area	✓	Neighbourhood	2.40	-	-	-	-	2.400
6	Northern Park		Local	0.55	0.12	0.12	0.15	0.39	0.430
7	Heritage Park	✓	Local	0.40	-	-	-	-	
8	North Coast Park		Local	0.50	0.12	0.12	0.15	0.39	0.38
9	South Coast Park	✓	Local	0.65	-	0.09	0.10	0.19	0.65
10	South Approach Park		Local	0.65	0.20	-	-		0.45
	SUB TOTALS			11.35	0.91	0.73	1.0	2.45	10.44
11	Regional Open Space	✓	Regional	3.67	-	-	-	-	N/A
	TOTAL			15.17	-	-	-	-	NA

*NOTES:

- Areas expressed in hectares.
- All areas are approximate and subject to refinement and confirmation at subdivision and/or development stage.
- TWL supplied by Cossill & Webley.
- Adjusted POS Credit areas;
 - No credit for 1:1 TWL Area (deduction)
 - Full credit for 1:1 to 1:5 TWL Area as restricted POS
 - Full credit for 1:5 year plus
- POS Area 9 is calculated to accommodate half of drainage with balance shared in Foresore. No 1:1 event here.
- Total area of 1:1 to 1:5 at 0.73ha as restricted POS is less than the 2% of 10% limit.

5.5 Public Open Space Schedule

As the Lot 9 LSP does not define every open space area, it is unnecessary for the open space schedule to produce a definitive and detailed contribution calculation as part of this documentation.

Nevertheless, in order to understand the intent behind the open space strategy, and to guide the ongoing provision of open space at the time of subdivision, a Public Open Space Schedule has been prepared, shown as Table 2 and is based generally on the Development Concept Plan. The Schedule also identifies those strategic POS areas which are "fixed" as part of the Part One statutory plans with the rest notional and not defined at this time.

This Public Open Space Schedule examines in some detail, the potential open space contributions when taking into account the preliminary drainage calculations supplied by Cossill & Webley Consulting Engineers (refer Figure 21) and other requirements appropriate at this level.

For the sake of this exercise, and in accordance with Liveable Neighbourhoods, drainage areas for the 1 in 1 year storm event (being a total of around 1.0 hectare) are treated as a deduction in the Land Use Schedule. The small amount of Restricted POS does not exceed the 2% limit.

Similarly, as Reserved land (under the MRS), the Regional Open Space area is treated as a deduction for the purpose of calculating the 10% open space requirement, as are the Local Centres, primary school and all other non-residential areas.

From the POS Schedule shown as Table 2, the 10% open space requirement relevant to the Lot 9 LSP equates to approximately 10.14 hectares. The public open space shown on the Development Concept Plan indicates an amount between 10 and 11 hectares (15 hectares with the regional open space), consistent with the 10% requirement, acknowledging this is indicative as only the strategic open spaces are being locked away as part of the LSP. The open spaces being shown on the Development Concept Plan equates to 11.35 hectares, or 10.44 hectares when adjusted for drainage.



Plan No: 885-518A-01

Figure 15: Road Hierarchy and Arterial Access

Source: Bruce Aulabaugh

6.0 MOVEMENT NETWORKS

A comprehensive Traffic and Transport Assessment has been undertaken by Bruce Aulabaugh, Traffic Engineering and Transport Planning, to inform the planned road network for the Lot 9 LSP. The Traffic and Transport Assessment is Appendix 6 in the Technical Appendices.

The following section summarises the key findings of this Report.

6.1 Existing Transport Network

6.1.1 Road Network

The Lot 9 LSP is located within a framework of existing and planned regional roads, which will provide access to surrounding regional and district infrastructure. Marmion Avenue forms the eastern boundary of Lot 9, and is ultimately to be constructed as a four lane divided urban arterial road.

Currently Marmion Avenue is constructed as a four lane divided arterial road to Lukin Drive, from Lukin Drive to Benendon Avenue is a two lane boulevard and north of Benendon Avenue up to Yanchep Beach Road, is constructed as a two lane undivided rural road standard.

Access to Marmion Avenue from the LSP area will be managed by a four-way signalised intersection at Cambourne Parkway and a sign controlled T-junction to the north, allowing left in and left out movements.

The Mitchell Freeway is currently constructed up to Burns Beach Road however, is to be extended further north beyond Yanchep Beach Road by 2021. Beyond the Mitchell Freeway, Wanneroo Road will provide the important north-south road connection, until the Mitchell Freeway's extension.

6.1.2 Public Transport

The Lot 9 LSP provides a critical mass that will in turn support the development of a robust public transport service for the north-western corridor.

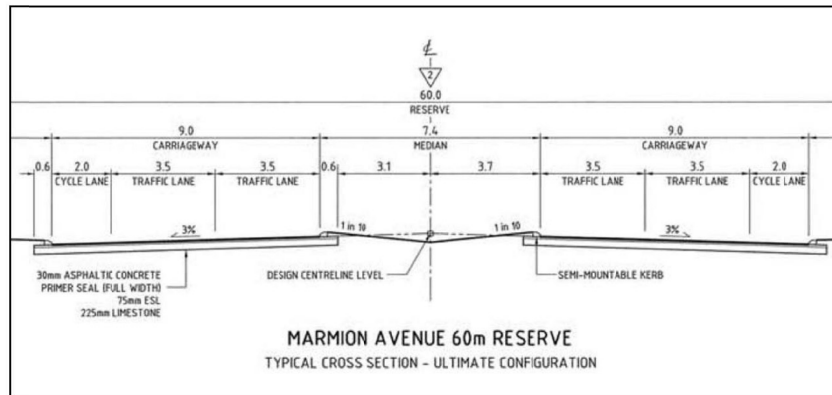
Currently the Northern Suburbs Passenger Rail Line runs to Clarkson Station, approximately 8 kilometres to the south.

The MRS rail reservation located one kilometre to the east, passing through the adjacent Brighton Estate, provides the basis for the northern extension of the passenger rail service, with stops to the proposed Butler and Brighton Stations. There are opportunities to provide feeder bus connections through the LSP area, connecting to the Butler and Brighton Stations.

These stations are planned to be in operation by the end of 2014.

6.2 Planned Road Network

The Road Hierarchy and Arterial Access Plan (refer Figure 15) shows the road network for the Lot 9 LSP, which has been designed in accordance with the Liveable Neighbourhoods.



Plan No: 885-519-01

Figure 16: Marmion Avenue Cross Section

Source: Bruce Aulabaugh

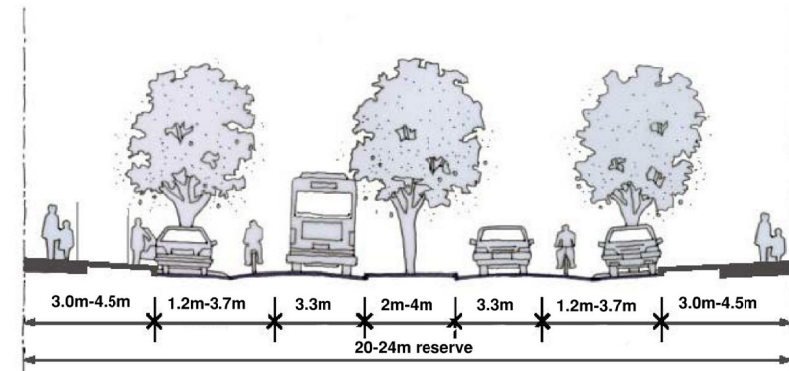


Figure 17: Boulevard Neighbourhood Connector Cross Section

Plan No: 885-521-01

Source: Bruce Aulabaugh

The network provides a robust and permeable layout throughout the LSP area, with strong, direct linkages in both an east-west direction (to and from the coast), and in a north south direction (ultimately integrating the Lot 9 LSP with development to the north and south). This road network reflects the Butler-Jindalee District Structure Plan which indicates this strong north-south and east-west connectivity by way of Neighbourhood Connector roads.

The road network has been planned and modelled to the forecast traffic volumes and will be further refined to the City of Wanneroo's standards as part of the subdivision process. The key features of the road network are discussed below.

6.2.1 District Distributor

Marmion Avenue is already classified as a District Distributor Type A and is reserved under the Metropolitan Region Scheme as an 'Other Regional Road.' The ultimate design for Marmion Avenue is as a four lane divided arterial road, with a total road reserve with of 60 metres (refer Figure 16; Marmion Avenue Cross Section).

Access to the Lot 9 LSP area will be limited to two intersections from Marmion Avenue, one being a signalised four-way intersection at Cambourne Parkway and the other 'left in / left out' T-junction, with priority given to Marmion Avenue.

The signalised four-way traffic signals are recognised in the City of Wanneroo's Draft Local Planning Policy 3.8: Marmion Avenue Access Policy.

6.2.2 Neighbourhood Connectors

A number of neighbourhood connectors are proposed across the site, consistent with the DSP, with their purpose being to distribute local traffic and accommodate bus routes through the LSP area.

Neighbourhood connectors will typically have a minimum 20 metre wide road reserve that provides for a pavement width of 7.4 metres. Neighbourhood connectors will have a shared path on at least one side of the road, with a pathway on the opposite side. Embayed parking will generally be provided adjacent to medium/high residential development and commercial sites.

The 'Boulevard' neighbourhood connector road (the primary east-west road from Marmion Avenue that leads to the coast) has a road reserve width of up to 24 metres. This additional width is to respond to the higher traffic volumes expected along this road, while still allowing for the provision of cycle lanes and embayed parking. This road will become a key entry statement to the Lot 9 LSP area, refer Figure 17: Boulevard Neighbourhood Connector Cross Section.

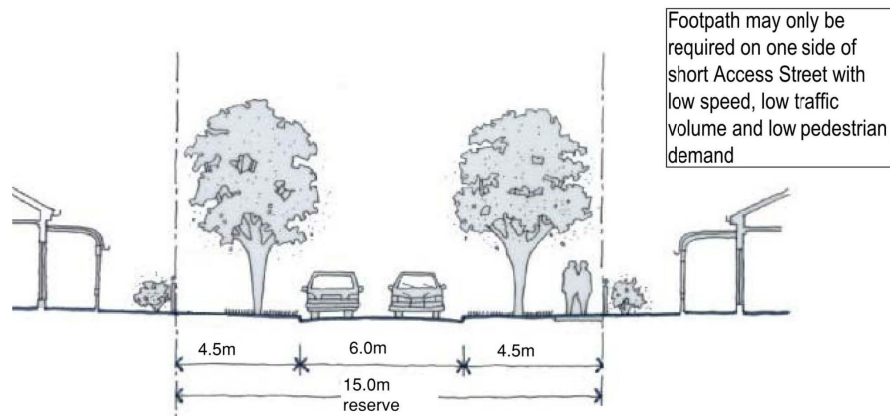


Figure 18: Narrow Access Street Cross Section

Plan No: 885-522-01

Source: Bruce Aulabaugh

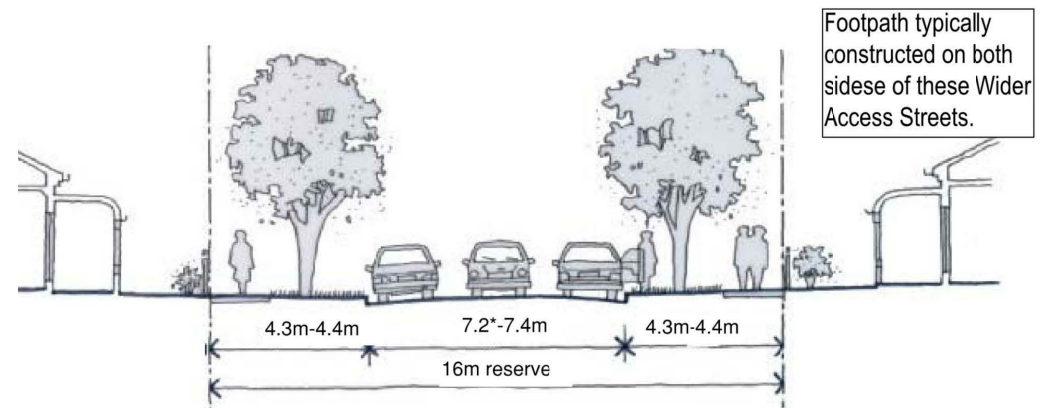


Figure 19: Wider Access Street Cross Section

Plan No: 885-523-01

Source: Bruce Aulabaugh

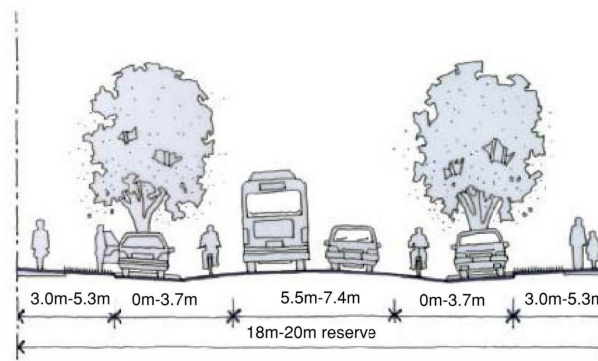


Figure 20: Special Access Street Cross Section

Plan No: 885-524-01

Source: Bruce Aulabaugh

6.2.3 Access Streets

Access Streets will form the majority of the local streets within the Lot 9 LSP, with their reserve widths ranging between 15 - 20 metres, dependent upon specific traffic, parking and pedestrian/cyclist needs of each location. Access streets will be refined at subdivision stage.

A 'narrow' access street, having a road reserve width of 15 metres, can be used in instances where traffic volumes are less than 1000 vehicles a day, providing for a pavement width of 6 metres and a 4.5 metre verge on both sides, refer Figure 18: Narrow Access Street Cross Section.

A 'wider' Access Street, having a road reserve width of approximately 16 metres, will be where traffic volumes fall between the range of 1000 and 3000 vehicle a day, allowing the provision of a wider pavement width of 7.4 metres, refer Figure 19: Wider Access Street Cross Section.

Where laneway lots front an access road and embayment parking is proposed the reserve will typically be 16m to 17m to accommodate the 6.0m pavement, parking, footpath and landscaping

'Special' Access Streets will be used where traffic volumes exceed 3000 vehicles a day yet do not merit being a Neighbourhood Connector. These 'Special' Access Street will typically have the wider pavement width of 7.4 metres however may also be made to accommodate cycle lanes and embayed parking where this is desirable given its context, refer Figure 20: Special Access Street Cross Section.

6.3 Traffic Volumes Forecast

Detailed traffic modelling has been undertaken for the Lot 9 LSP local road network, demonstrating that the road hierarchy and the associated road reserve widths have the capacity to accommodate the expected traffic volumes for the ultimate development.

The forecast traffic volumes all fall within the acceptable limits prescribed by the WAPC's Liveable Neighbourhoods and the traffic model developed for the Butler-Brighton District Structure Plan.

Marmion Avenue, being a District Distributor Type A, is forecast to experience approximately 1,500 and 1,700 vehicle movements per hour for the southbound and northbound direction respectively. Taking into account peak traffic volumes, this equates to a maximum daily traffic forecast of 34,700 vehicles, which is within the acceptable limits for Marmion Avenue.

The forecast traffic of the Neighbourhood Connectors and Access Streets all fall within the range of 2000-4000 vehicles per day, with the single exception of the main entry road (Neighbourhood Connector) near Marmion Avenue, which is forecast to carry 5000-7000 vehicles per day.

6.4 Intersection Treatments and Special Design Investigations

6.4.1 Marmion Avenue

In recognition of the City's 'Marmion Avenue Road Access' Policy, the Lot 9 LSP has two intersections on Marmion Avenue, the first being a signalised four-way intersection, and the second a sign controlled T-junction.

The new four-way signalised intersection is critical in providing the primary access point to the LSP area, while offering safe pedestrian movement across Marmion Avenue. This will integrate the Lot 9 development with the Brighton Estate situated on the opposite side of Marmion Avenue. This four-way intersection is recognised in the City's 'Marmion Avenue Road Access' Policy.

The sign controlled T-junction, located 335 metres north of the signalised intersection, is to allow left in, left out and right in movements, striking a balance between a full access T-junction and a left-in, left out junction.

This T-junction is adequately distanced from the controlled four-way intersection, as prescribed by Liveable Neighbourhoods and City Policy, and will not compromise the road safety or operation of the signalised intersection.

6.4.2 Internal Intersections

There are a number of intersections throughout the road network of the Lot 9 LSP, providing maximum efficiency and permeability for the estate.

A number of the higher order intersections have been identified for control and traffic management treatments, of which typically may include:

- Raise speed plateaus;
- Splitter islands and supplementary stop or give way signs;
- Roundabouts;
- Intersection widening; or
- Median closure or turn restrictions.

The specific treatment of each of the proposed intersections will be confirmed following subdivision approval in consultation with the City of Wanneroo..

6.4.3 Traffic Management at the School

With the Lot 9 LSP having a primary school site, more specific traffic management principles will be considered in and around this site, which may include the following:

- 40km/h speed zone being established around the school site;
- On-street parking being provided around the school;
- Adequate road reserve widths that can accommodate Controlled Access places;

- Median island to be provided along the north Neighbourhood Connector road, to assist pedestrian crossings; and
- Roundabouts at selected intersections within proximity to the school to slow traffic.

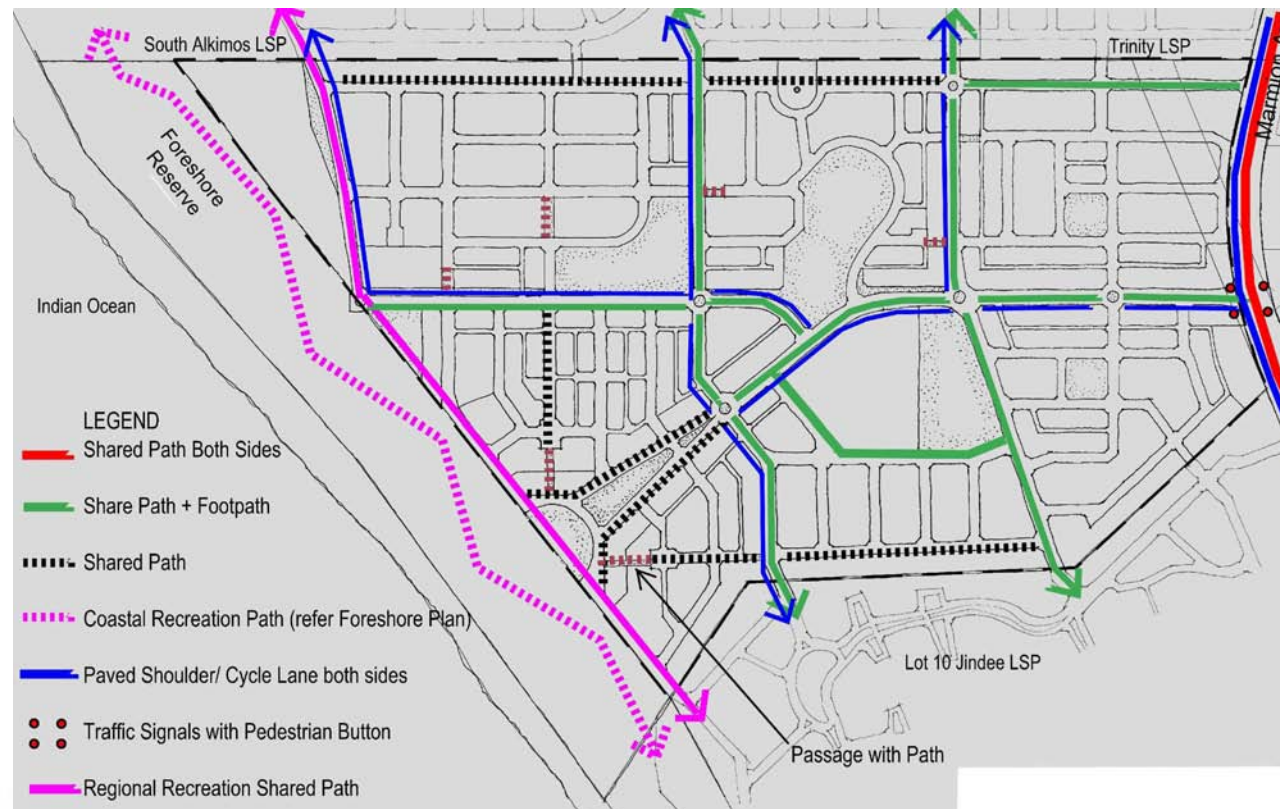
Further detailed traffic management and safety investigation will be undertaken, identifying the appropriate use of these, and other, management controls. This further investigation will need to be undertaken at subdivision and construction stages of the school site.

6.5 Public Transport

The Lot 9 LSP will provide a critical mass in the expansion of the north-south bus routes that will ultimately run through the Lot 9 LSP area, feeding the Northern Suburbs Passenger Rail Line through stops at the Clarkson, Butler, Brighton and Alkimos train stations. These services will connect the residents of the Lot 9 LSP to district and regional facilities.

The PTA has advised that Route 482 is planned to run a service between the future Alkimos and Clarkson train stations, passing through the LSP area by way of the neighbouring Lot 12 and Lot 10 sites to the north and south respectively.

Route 480, like Route 482, will run a service between the future Alkimos and Clarkson train stations, but with a deviation to the Butler Station, via Marmion Avenue. The Lot 9 LSP will be served by this service through embayed bus stops along Marmion Avenue.



Plan No: 885-607-01

Figure 22: Pedestrian and Cyclist Facilities

Source: Bruce Aulabaugh

6.6 Pedestrian and Cyclist Facilities

The Lot 9 LSP provides an indicative system of path ways that provide excellent access to parks, schools, commercial sites, the coast and neighbouring communities, consistent with Liveable Neighbourhoods.

These pathways are based on the following principles:

- Footpaths will generally be provided on at least one side of all roads.
- Neighbourhood Connector roads (Local Distributors) will generally have a shared path provided on one side of the road with a footpath also provided on the opposite side.
- Marmion Avenue, being a District Distributer Type A road, will provide shared paths to both sides of the road.
- On-road cycle space, by way of a cycle lane or paved shoulder, will generally be provided on all Neighbourhood Connector roads that carry traffic above 3000 vehicles per day.
- Regional Recreational Shared Path will be provided adjacent to the Lot 9 foreshore reserve.

The type, size and location of footpaths, shared paths and on road cycle facilities will be confirmed at subdivision stage.



7.0 HOUSING STRATEGY

7.1 Introduction

As described elsewhere in this report, Lot 9 by virtue of location and physical attributes creates enormous opportunity for the development of a very distinctive coastal community defined by its sensitive response to coastal landform and environment both within and external to the site. At the structure planning level the response is defined largely through the design placement of important roads & movement networks, allocation of neighbourhood precincts, land uses & density codes and sensible placement of greenspaces and other major uses.

Within these broader LSP parameters those areas identified as being suitable for residential or mixed development can then provide both the policy, statutory and contextual basis to facilitate delivery of diverse and responsive housing outcomes, ensuring housing choice, aiding affordability and satisfying density standards set by key local and state strategic documents.

The purpose of this section is to describe the type of lot and housing outcomes which can be developed once the LSP and its statutory components are in place. It is not intended to be prescriptive or even definitive as the market will play a key role in determining suitable outcomes and may generate alternative solutions not contemplated at this time.

7.2 Housing Policy Directions

The Structure Plan recognises the important housing and density directions which are contained in the City of Wanneroo Local Housing Strategy, Liveable Neighborhoods, SPP4.2 (Activity Centres) and more recently the Directions 2031 document.

All of these documents encourage a more sustainable approach to housing through the provision of greater product diversity, more choice, a range of affordable options, and generally higher densities set within an efficient planning and land use framework.

In general for typical residential neighbourhoods not within the catchment of major centres the targets set by these documents range from 12 to 15 dwellings per gross hectare and 22 to 25 dwellings per net hectare (or site area as defined by LN).

This section demonstrates through detailed calculation and reasonable assumptions concerning product mix, that the LSP area can ultimately achieve yields of around 15.7 dwellings per gross hectare and 26 dwellings per net hectare satisfying all targets.

In addition, whilst not possible to definitively describe the eventual mix of housing types, this Section describes the three distinct neighbourhood precincts identified in the LSP and suggests the type of product which can be expected given land use context and R coding, demonstrating a very wide mix of opportunities from small apartments to traditional homes.

7.3 Neighborhood Precincts

In understanding the proposed approach to density, development, subdivision and then understanding the range of potential housing forms which will develop, it is important to describe the plan with reference to what are three relatively discernable character based neighbourhood precincts defined by a combination of factors including:

- General location within project area and local land use context;
- Topography, views, vegetation, habitat and site conditions;
- Proximity to foreshore, beach and access; and
- Proximity to major movement routes, public transport and centres.

These factors all provide context to the anticipated density and housing response. The tables following briefly describe each Precinct, highlighting special characteristics, suggesting the type of lot and housing responses anticipated and predicting yield based on these features and the applied density range from Part 1.

SOUTHERN COASTAL NEIGHBOURHOOD - VILLAGE PRECINCT**LOCATION & CONTEXT**

- South westernmost 7.5ha of the estate with a direct interface to the foreshore reserve and swimming beach
- Identified in previous studies as the preferred location for a coastal node based activity centre
- Lower traffic flows through here as a result of support neighbourhood connector network - strengthens coast connection and interface opportunities
- Existing 200m wide foreshore reserve

LANDFORM AND CHARACTER

- Less chaotic dunal landform with elevation providing coastal views and strong coastal relationships
- Smaller foredunes in abutting reserve creates greater potential for beach access and development of substantial facilities in this location
- Interfaces with more stable coastline conditions
- No singularly prominent features or vegetation areas requiring retention

LAND USE AND DESIGN RESPONSE

- Strong boulevard connection to Marmion Avenue which maximises access and view corridors
- Strong landscape and integrated drainage theme with split boulevard
- Open space at termination of road to be seamlessly integrated with foreshore uses
- Strong north south linkages with coastal access road and pedestrian movement - potential bus route to service node
- Extensive use of rear lanes recommended to enhance streetscapes
- Strong high density residential and mixed use focus within this core (to be zoned Centre)
- Potential high density development to 5-9 storeys in Village precinct
- Requires a subsequent Centre Structure Plan (Zoned Centre)

VILLAGE PRECINCT PLAN**HOUSING & DENSITY RESPONSE - VILLAGE PRECINCT**

Gross Area		7.40ha	
Residential Site Area		4.00ha	
R-Code		R80/100	
Projected Yields			
Description	Mix %	Average	Yield
Traditional	-	-	-
Medium Density	-	-	-
High Density	100%	NA	220 du
TOTAL			

Notes: Yield estimates in this precinct are purely speculative given limited commercial directions available for this market at this early project phase.

SOUTHERN COASTAL NEIGHBOURHOOD - FRINGE PRECINCT

LOCATION & CONTEXT

- 12.5 hectares of supporting fringe to the more intensive coastal village precinct
- Filtered traffic flows and support neighbourhood connector network strengthen relationship to the village
- Northern section with direct interface to foreshore reserve and major low point
- Transition area from higher density residential to traditional housing

LANDFORM AND CHARACTER

- Less chaotic dunal landform with elevation providing coastal views and strong coastal relationships
- Elevation providing outstanding views to the south (from north) and to the west and east;
- Low point to the north provides option for secondary beach access node
- No singularly prominent features or vegetation areas requiring retention

LAND USE AND DESIGN RESPONSE

- Strong boulevard connection from Marmion swings south to maximise access and views
- Strong landscape and integrated drainage theme with split boulevard through the node
- Open space at termination of road to be seamlessly integrated with foreshore uses
- Strong north south linkages with coastal access road and pedestrian movement - potential bus route to service node
- Extensive use of rear lanes recommended to enhance streetscapes
- Strong high density residential and mixed use focus within node core (to be zoned Centre)
- Potential high density development to 5-9 storeys in Village precinct

FRINGE PRECINCT PLAN



HOUSING & DENSITY RESPONSE - FRINGE PRECINCT

Gross Area		12.50ha	
Residential Site Area		7.85ha	
R-Code		R30/60	
Projected Yields			
Description	Mix %	Average	Yield
Traditional	-	-	-
Medium Density (lots)	85%	275m²	280 lots
Medium Density (du)	15%	(units)	50 du
High Density	-	-	-
TOTAL	100%	NA	330 du

Notes: Yield estimates in this precinct are purely speculative given limited commercial directions available for this market at this early project phase.

CENTRAL WEST NEIGHBOURHOOD PRECINCT

LOCATION & CONTEXT

- Central core of the project area which will be dominated by more traditional housing forms
- Located between the more intensive development areas adjacent the coast and Marmion Avenue
- Portion of land not within any real major activity catchments
- Contains significant non residential components

LANDFORM AND CHARACTER

- Northern portion of the Precinct characterised by chaotic dunal topography
- North west portion adjacent foreshore reserved for Parks and Recreation
- Housing in northern section remote from direct coast access (500 metres in parts)
- Outstanding views of the coast to the west and south
- Includes two notable topographic features which also comprise good quality vegetation and habitat
- Ethnographic site in the north (protected in POS)
- Low and flat point centrally located with few views

LAND USE AND DESIGN RESPONSE

- Setting aside of significant areas of this Precinct as open space
- Road network designed to facilitate protection of key areas, enhancement of views, access to the coast and general connectivity
- Primary school on central flatter land central to catchment and co-located with POS
- Small local centre on entry road

CENTRAL WEST PRECINCT PLAN



HOUSING & DENSITY RESPONSE - CENTRAL WEST PRECINCT

Gross Area		58.43ha	
Residential Site Area		31.00ha	
R-Code		R30/60	
Projected Yields			
Description	Mix %	Average	Yield
Traditional	80%	510m²	450
Medium Density	20%	375m²	170
High Density	-	-	-
TOTAL	100%	450m²	620 lots

MARMION EAST NEIGHBOURHOOD PRECINCT

LOCATION & CONTEXT

- Easternmost neighbourhood with exposure and road access to Marmion Avenue in two locations
- More heavily trafficked section of the main entry road with future mixed use potentials either side
- Minor activity node context given connections back to district centre
- No direct physical relationship with the coast except from sweeping entry views

LANDFORM AND CHARACTER

- Entire precinct has been earthworked as part of works for the main Quinns sewer which runs along the western edge
- No vegetation remains in this precinct
- Prominent location with elevation which provides sweeping entry views to the coast and south

LAND USE AND DESIGN RESPONSE

- Fixed entry location from Marmion Avenue operates as the main entry boulevard which runs through to the coast
- Smaller rear access residential lots either side of entry to encourage mixed use and enhance streetscape by eliminating crossovers
- Two pocket parks providing focus for "sub precincts" either side of the boulevard
- Strong north south connections to adjacent estates as per DSP
- Orientation of roads to pick up long views

MARMION EAST PRECINCT PLAN



HOUSING & DENSITY RESPONSE - MARMION EAST PRECINCT

Gross Area		29.53ha	
Residential Site Area		19.00ha	
R-Code		R30/60	
Projected Yields			
Description	Mix %	Average	Yield
Traditional	60%	510m ²	265
Medium Density	40%	300m ²	155
High Density	-	-	-
TOTAL	100%	410m ²	421 lots

7.4 Lot and Housing Typologies

The strategic planning policies mentioned earlier stress the need for improved density & yield outcomes, in specific areas and generically throughout an estate. The policies all encourage more diversity of both lot and housing product. Lot 9 is ideally suited to the delivery of such sustainable outcomes providing both context and opportunity for diversity.

This section outlines the wide range of lot and housing potentials that arise following adoption of the LSP and is included for information purposes. It is not intended to be either prescriptive or exhaustive in describing these. This section also recognises that the new R-Code allocation format under the Part 1 Section, which assigns a wider range of density options over the site to be refined at the time of subdivision via the Residential Density Code Plan. This is a very flexible approach.

The product which is likely to form the bulk of the housing on Lot 9 can be broken into three main categories being;

- Traditional lots and single housing (R30),
- Medium density lots and single/terrace/grouped housing (R60),
- High density group & multiple dwellings (R80/100+),

Each of these typologies is described in the information presented in the balance of this section. These particular forms have also been referenced in the previous neighbourhood precinct section where an image of each Precinct can be understood based on the type of housing response expected.





LOT AND HOUSING TYPOLOGIES FAMILY HOUSING

APPLICABLE CODING	R20 - R30	
AVERAGE LOT AREA (Range)	525m ² - 600m ²	
TYPICAL LOT FRONTAGE (Range)	17m - 18m	
TYPICAL LOT DEPTH (Range)	30m - 32m	
VEHICLE ACCESS	Road (Primary and secondary)	
TITLE/DELIVERY/MARKET	Green title single lots	
HOUSING RESPONSE POTENTIALS	Single and double storey single dwellings	
CONTROLS & SITE PLANNING	R-Code variations and/or DAPs not essential to delivery	
	Design guidelines optional	
SUITABLE LOCAL CONTEXT	Suburban	
PREFERRED LOT 9 PRECINCTS	Primary	Central West
	Secondary	Marmion East





LOT AND HOUSING TYPOLOGIES
LIFESTYLE HOUSING

APPLICABLE CODING	R30	
AVERAGE LOT AREA (Range)	450m ² - 500m ²	
TYPICAL LOT FRONTAGE (Range)	15m	
TYPICAL LOT DEPTH (Range)	30m - 32m	
VEHICLE ACCESS	Road (Primary and secondary)	
TITLE/DELIVERY/MARKET	Green title single lots	
HOUSING RESPONSE POTENTIALS	Single and double storey single dwellings	
CONTROLS & SITE PLANNING	R-Codes - Minimal variations required to deliver Design guidelines optional	
SUITABLE LOCAL CONTEXT	Suburban	
PREFERRED LOT 9 PRECINCTS	Primary	Central West
	Secondary	Marmion East





LOT AND HOUSING TYPOLOGIES
MEDIUM DENSITY - COTTAGE (REAR)

APPLICABLE CODING	R40 - R60	
AVERAGE LOT AREA (Range)	300m ² - 360m ²	
TYPICAL LOT FRONTAGE (Range)	10m with 11/12m frontage on corners	
TYPICAL LOT DEPTH (Range)	30m	
VEHICLE ACCESS	Exclusively rear or side lane with occasional secondary street access for duplex development	
TITLE/DELIVERY/MARKET	Green title single or duplex lots	
HOUSING RESPONSE POTENTIALS	Single and two storey detached or semi attached dwellings plus Studios	
CONTROLS & SITE PLANNING	R-Codes - Variations required for efficient delivery and DAPs optional Design guidelines - Preferable	
SUITABLE LOCAL CONTEXT		
PREFERRED LOT 9 PRECINCTS	Primary	All (very versatile product)
	Secondary	All (very versatile product)





LOT AND HOUSING TYPOLOGIES

TRADITIONAL - COTTAGE (FRONT)

APPLICABLE CODING	R30/R60	
AVERAGE LOT AREA (Range)	300m ² - 375m ²	
TYPICAL LOT FRONTAGE (Range)	10m - 12.5m	
TYPICAL LOT DEPTH (Range)	30m	
VEHICLE ACCESS	Road (Primary and secondary)	
TITLE/DELIVERY/MARKET	Green title single lots	
HOUSING RESPONSE POTENTIALS	Single and double storey single dwellings	
CONTROLS & SITE PLANNING	R-Codes - variations or DAPs preferred	
	Design guidelines recommended	
SUITABLE LOCAL CONTEXT	Suburban (preferably mixed within a street block with larger product) and centre edge	
PREFERRED LOT 9 PRECINCTS	Primary	Marmion East
	Secondary	Central West/ Southern Coastal





LOT AND HOUSING TYPOLOGIES MEDIUM DENSITY - TERRACE

APPLICABLE CODING	R40/R60	
AVERAGE LOT AREA (Range)	225m ²	
TYPICAL LOT FRONTAGE (Range)	5.0m - 6.0m and 7.0m - 7.5m	
TYPICAL LOT DEPTH (Range)	28m - 30m	
VEHICLE ACCESS	Laneway (rear and side)	
TITLE/DELIVERY/MARKET	Green title and strata	
HOUSING RESPONSE POTENTIALS	Single and two storey attached (occasionally integrated with grouped housing) plus studios	
CONTROLS & SITE PLANNING	R-Codes - variation package and/or DAPs critical to efficient and affordable delivery	
	Design guidelines - preferable to protect streetscape	
SUITABLE LOCAL CONTEXT	High amenity areas, neighbourhood connectors and centres	
PREFERRED LOT 9 PRECINCTS	Primary	Southern Coastal
	Secondary	Marmion East





LOT AND HOUSING TYPOLOGIES

MEDIUM DENSITY - GROUPED HOUSING

APPLICABLE CODING	R60 - R100	
AVERAGE LOT AREA (Range)	Parent title area will vary from around 600m ² upwards	
TYPICAL LOT FRONTAGE (Range)	NA	
TYPICAL LOT DEPTH (Range)	Where set in a uniform street block suited to 25m to 35m depths	
VEHICLE ACCESS	Variable though typically rear or side access to parking area	
TITLE/DELIVERY/MARKET	Strata and builtform	
HOUSING RESPONSE POTENTIALS	Two - three storey terrace	
CONTROLS & SITE PLANNING	Typically built and sold as finished strata product often integrated with green title lots	
SUITABLE LOCAL CONTEXT	Neighbourhood connectors, centres and nodes	
PREFERRED LOT 9 PRECINCTS	Primary	Southern Coastal
	Secondary	Marmion East





LOT AND HOUSING TYPOLOGIES

MEDIUM DENSITY - RESIDENTIAL MIXED USE

APPLICABLE CODING	R60 - R100	
AVERAGE LOT AREA (Range)	200m ² +	
TYPICAL LOT FRONTAGE (Range)	Variable from 5.0m+	
TYPICAL LOT DEPTH (Range)	Variable but suitable for 30m depth	
VEHICLE ACCESS	All options possible depending on product	
TITLE/DELIVERY/MARKET	Built form or single lots controlled with DAPs or Guidelines	
HOUSING RESPONSE POTENTIALS	Single, double (with loft) on a modest residential scale	
CONTROLS & SITE PLANNING	R-Codes with suitable variations and or DAPs essential to assist delivery	
	Design guidelines preferred	
SUITABLE LOCAL CONTEXT	Centre	
PREFERRED LOT 9 PRECINCTS	Primary	Southern Coastal
	Secondary	Marmion East





LOT AND HOUSING TYPOLOGIES HIGH DENSITY APARTMENT LIVING

APPLICABLE CODING	R100/R160	
AVERAGE LOT AREA (Range)	NA	
TYPICAL LOT FRONTAGE (Range)	NA	
TYPICAL LOT DEPTH (Range)	NA	
VEHICLE ACCESS	Variable generally with undercroft parking	
TITLE/DELIVERY/MARKET	Strata titled units (multiple dwellings)	
HOUSING RESPONSE POTENTIALS	Apartments at 5 to 9 storeys	
CONTROLS & SITE PLANNING	R-Code multi unit	
SUITABLE LOCAL CONTEXT	Centre and node	
PREFERRED LOT 9 PRECINCTS	Primary	Southern Coastal
	Secondary	NA

7.5 Conclusion

This section has attempted to synthesise and describe the planning and design drivers behind the LSP with respect to the anticipated lot and housing responses which will emerge and be refined as subdivision and development commences. The design being presented through this LSP is extremely robust and versatile and the r code ranges provide the potential for a wide range of housing types and density outcomes to be delivered.



8.0 DESCRIPTION OF PART 1 STATUTORY PROVISIONS

8.1 Background

The Brighton Project continues to pioneer innovative yet simple R-Code variations tailored specifically to greenfields estates. These address in a pragmatic format a number of the shortcomings of the R-Codes in recognising the particular building and site control demands which are associated with building affordable single storey dwellings on smaller cottage lot product – which in this outer urban market will continue to represent a substantial proportion of the housing form.

The concessions relevant to the R60 and some R30 lots are incentive driven and cover matters such as private open space and site cover, setbacks, boundary walls, private open space, overshadowing and privacy, and have now been widely adopted as an industry standard – following Brighton experiences.

Importantly, many of these concessions are also linked to achieving better sustainability and solar performance outcomes than would otherwise be achieved.

For example, to take advantage of the site cover concessions, the dwelling must achieve a set of standards addressing the size and effective placement of the outdoor space, and the relationship of that space to the dwelling layout, to maximise solar gain and usability.

These are simple incentive based reforms which have operated very successfully for many years at Brighton and elsewhere, and will be re-introduced into the Lot 9 Local Structure Plan.

8.2 Objectives

The variations to the R-codes recognise and respond to the following key driving forces:

- The imperative to encourage and provide for improved solar responsive and energy efficient design outcomes on small lots;
- Accommodate the site planning demands that accompany development on smaller single lots which require more flexible standards addressing boundary setbacks, walls on boundaries, site coverage and private open space, overshadowing and visual privacy in order to achieve practical building envelopes and more affordable designs;
- The need to reduce and better manage front setbacks, to improve flexibility in building design and importantly, to ensure better streetscape and public realm interface;

- Recognise demographic changes that are increasing the need for flexible living arrangements such as ancillary accommodation (studios over garages or 'granny flats');
- Recognise that greenfield development provides the opportunity for the introduction of more site responsive design controls from inception, as all purchasers have a clear understanding of these potentials from the beginning.

Importantly, the R-Code variations provide certainty for landowners as to what are permissible variations and possible development outcomes for themselves and adjoining landowners, minimising conflict and concern.

The variations relate to the following R-Code sections:

- Design Element 2 - Streetscape
- Design Element 3 – Boundary Setbacks
- Design Element 4 – Open Space
- Design Element 5 - Access and Car Parking
- Design Element 8 - Privacy

- Design Element 9 – Design for Climate
- Part 7.1 - Ancillary Accommodation.

8.3 Application of the Variations

The variations apply to all of the R60 coded lots and to any rear lane accessed cottage lots in the R30 precincts which similarly benefit from the concessions. A minor site cover concession also applies generally to the R30 lots to encourage improved solar performance and recognises the fact that small front loaded lots are becoming common as a product within these street blocks.

If required, the standards can be supplemented by a detailed area plan, if a graphic depiction is necessary for some lots, and with design guidelines if the developer so chooses.

8.4 Setbacks

Primary Street

At present the R-Codes require an average 4.0 metre setback from the primary street, with a minimum of 2.0 metres to the dwelling, in areas coded R30 and greater.

For the smaller lots where the dwelling should be encouraged to locate further forward, the large averaging requirement can comprise the opportunity for a more uniform streetscape and efficient house design, as only portion of the dwelling can be at 2.0 metres with the balance forced back an extra 2.0 metres.

To overcome this 'stagger' problem and, provide additional home design flexibility and ensure more usable outdoor spaces can be created as courtyards, the LSP retains a 2.0m minimum for the dwelling but relaxes the average to 3.0m. It also allows for a verandah at 1.5m to encourage these important front elevation features to be added without impacting on home design.

In summary;

- Minimum of 2.0 metres to the dwelling and 1.5 metres for a verandah; and
- Average of 3.0 metres to the dwelling.

Importantly this standard operates for both laneway and front loaded lots in the R60 precincts where the R-Codes still require a substantial garage setback of 4.5 metres or 1.0 metre behind the dwelling. This ensures that under no circumstances can a garage be forward of the dwelling, which is an excellent streetscape outcome for these R60 precincts.

Garage Setbacks to Laneways

To improve design efficiency, reduce pavement coverage and create more intimate laneway environments (where lanes appear more like lanes than a de facto road system), Brighton currently has a set of new garage setback standards that allow for subdivision designs to accommodate 5.0 metre rather than 6.0 metre lanes.

Importantly, to ensure adequate maneuvering space, the LSP introduces more responsive garage setback standards of 0.5 metre for a 6.0 metre lane and a 1.0 metre setback for a 5.0 metre lane.

8.5 Site Cover

The R Codes currently require 45% of the site to be retained as private open space. This standard imposes unrealistic limits on the design and floorspace options for more affordable single storey dwelling design on smaller lots. A variation to 25% has been demonstrated to be necessary to successfully achieve and implement terrace style housing and facilitate the delivery of affordable and diverse dwellings especially in the R60 areas.

Most importantly this variation concession is performance based and tied to the requirement to also provide a more useable and efficient configuration for that private open space with standards being set related to minimum size, dimensions and location (on solar side boundary). To take advantage of the site cover concession these new standards must be met.

As stated this variation applies to;

- all lots coded R60; and
- R30 coded laneway lots.

With the balance of the R30 coded area (and relevant to non laneway lots) a more modest incentive based concession of 40% applies.

8.6 Boundary Walls

The R Codes currently allow, as of right, a single storey wall for up to two thirds of the length of one boundary within R30-R60 coded areas. Second storey boundary walls are not permitted 'as of right'. This precludes 'as of right' terrace style development and restricts design options on smaller lots where efficient use of space is critical. It also acts to discourage two storey developments. Greater flexibility consistent with the new standards in the table below is required so housing forms on the smaller green title lots are able to respond appropriately.

Boundary Walls are now permitted 'as of right' on both side boundaries (with the exception of laneway boundaries) in accordance with the following table:

BOUNDARY WALLS		
Description	Max. Height	Max. Length
Single Storey	3.5m	No limit
Two Storey	6.5m	5m

8.7 Design for Climate

The standards for overshadowing applicable to lower density areas cannot reasonably be applied in the same way in higher density single residential precincts without severely impacting on the quality and efficient design of the dwellings. For example, the overshadowing provisions would limit, or in some situations preclude the majority of single storey development on the 7.5m and 10m wide cottage lots, and would preclude almost all two storey development. As such, the overshadowing standards do not apply.

8.8 Privacy

Like overshadowing, the standards for privacy applicable to lower density single lot areas cannot be applied in the same way in higher density precincts or smaller lots without severely impacting on the quality and form of dwellings. For example, the 7.5m balcony privacy setback would preclude provision of balconies on almost all of the R60 lots due to the narrowness of lots.

Again, greater flexibility is being introduced as a necessary prerequisite to achieving efficient building forms on the smaller lots. As such, the standard privacy provisions do not apply, with a reduced privacy setback of 4.5m applying to major openings to all habitable spaces, including bedrooms and balconies. This approach has been successfully implemented in other areas, and is widely accepted by the building industry, local authorities and WAPC.

8.9 Ancillary Accommodation and Parking

The R-Codes prevent ancillary accommodation on lots under 450m² as of right, restricting the capacity for studios / granny flats. This undermines the ability to deliver alternative, high density, affordable housing options in suitable locations. The provisions remove this restriction where the lot is accessed via a rear laneway, supporting more diverse and affordable housing options.

The R-Codes require an additional car parking bay for ancillary accommodation. An additional car parking bay is unnecessary for ancillary accommodation located within higher density precincts with good access to public transport. Providing three car bays per lot in such close proximity to public transport infrastructure is unnecessary and unachievable, undermining the ability to deliver innovative outcomes. This requirement is removed where any additional parking demand that is generated can be accommodated through on street parking.

8.10 Open Space Interface

Part 1 introduces a number of generic provisions which can be applied to lots directly abutting POS areas to address issue such as permeable fencing, surveillance, boundary walls and setbacks.

8.11 Statutory Plans

Part 1 of the Local Structure Plan comprises the statutory framework that will underpin the development of Lot 9, and includes three plans:

- Plan 1: Structure Plan Map;
- Plan 2: Zoning Map; and
- Plan 3: Residential Density Range Map;

Any future subdivision and development on Lot 9 shall be in general accordance with the Structure Plan Map which indicates the neighbourhood connector road network, strategic open space areas, the primary school site and the MRS Reserve (Parks & Recreation) of Lot 9. This Plan also identifies residential land and the two coastal foreshore nodes, with their notional controlled beach access.

Residential density codes are in accordance with the ranges shown on the Residential Density Range Map with a Residential Density Code Plan required to be lodged at the time of subdivision to allocate final densities consistent with the allocation criteria contained in Part 1. At the time of determining the subdivision, the WAPC will endorse the Residential Density Code Plan, which will then form part of the Local Structure Plan.

These three Plans, along with the other statutory provisions contained in Part 1, are given the force and effect of the City of Wanneroo's District Planning Scheme No. 2.

8.12 Coastal Neighbourhood Village Precinct

The Explanatory Report explains the broader rationale behind the identification of the southern part of the site (refer Figure 12: Development Concept Plan) as the primary coastal activity precinct for the LSP.

Both the Foreshore Management Strategy (lodged with the LSP) and the Foreshore Management Plan (to be prepared as part of the subdivision process) will guide important matters to be considered relative to activity and development in and adjacent to the foreshore reserve, and the treatment of interfaces with roads, public access and private development.

In a purely statutory sense, the private land component of the coastal node can be considered in two parts, being the 'Village' core precinct and the residential periphery referred to here as the 'Fringe' precinct (refer Section 7.3 Neighbourhood Precincts).

This different land use potential of each is reflected in the zoning and R-Code allocations in Part 1. The 'Village' is coded R80/100 where intensive development forms are anticipated, with the potential for buildings beyond 5 storeys (and potentially up to 9 storeys) with mixed use and commercial on the ground floor. The balance 'Fringe' area will comprise a greater residential focus based on R60 coding.

This core 'Village' area will also require more detailed future planning in its own right (separate to this LSP), to fully examine and detail these potentials, and ultimately to produce an appropriate statutory framework for delivery, either in the form of a separate Detailed Area Plan or a development application.

It is critical at this stage however, that the true development potentials and intents are clearly illustrated and documented in the LSP and that basic density controls anticipating the higher densities and heights - assigned now through Part 1.

As a result, the Part 1 document includes the 'Village' within the Residential Zone under the LSP and within the R80 density coding, and includes a statement which alludes to potential development form which may occur here.

The 'Fringe' precinct comprises predominantly of residential uses in a medium density setting. It retains a medium density residential focus and is included in the Residential Zone of the Lot 9 LSP, coded R30/60.



9.0 RETAIL ASSESSMENT

The Butler Jindalee District Structure Plan includes a small 500m² local retail centre in the Lot 9 LSP area. The Lot 9 LSP retains this local centre at the intersection of two neighbourhood connector roads and near the primary school.

Consistent with the draft Perth Coastal Strategy, the Butler-Brighton Charrette and the Burns Beach to Jindalee Coastal Planning Study, the Lot 9 LSP provides for a small retail land use component to develop within the coastal village precinct. This will act as a focal point for the medium to high density residential development and providing a commercial/service outlet for beach users and those relocating or seeking lifestyle opportunities.

This commercial component within the coastal precinct is to be relatively low key but may include a local convenience store for the residents, as well as having the prospect for a café or restaurant.

Shrapnel Urban Planning has prepared a 'Local Centres Planning' assessment for the Lot 9 LSP, to review and update the retail planning for the LSP area (refer Appendix 7 of the Technical Appendices).

The Assessment reviews the retail potential for the LSP area based on:

- The anticipated additional number of dwellings and residents proposed for the Lot 9 LSP area, in comparison

- to those forecast earlier as part of the District Structure Plan;
- The anticipated above-average socio-economic characteristics of the future residents of Lot 9; and
- The slight shift in the location of the main local centre eastwards within the LSP area.

The key findings of the Local Centres Planning Assessment are as follows:

- It is appropriate to include some retail floor space as part of a focal point for the medium and high density residential development in the coastline node, significantly increasing the convenience of the residents living in the coastal precinct.
- The proposed coastal precinct is orientated towards a park, has ocean views and therefore would be suitable for inclusion of some leisure oriented facilities such as a restaurant and a coffee shop, in addition to a convenience retail outlet.
- A small local centre would complement, rather than compete with the significantly larger coastal centre planned for the south.
- A local centre containing approximately 300m² of retail floor space can be supported in the coastal precinct, providing the opportunity for a local convenience store, a restaurant and a coffee shop.



10.0 PRIMARY SCHOOL SITE

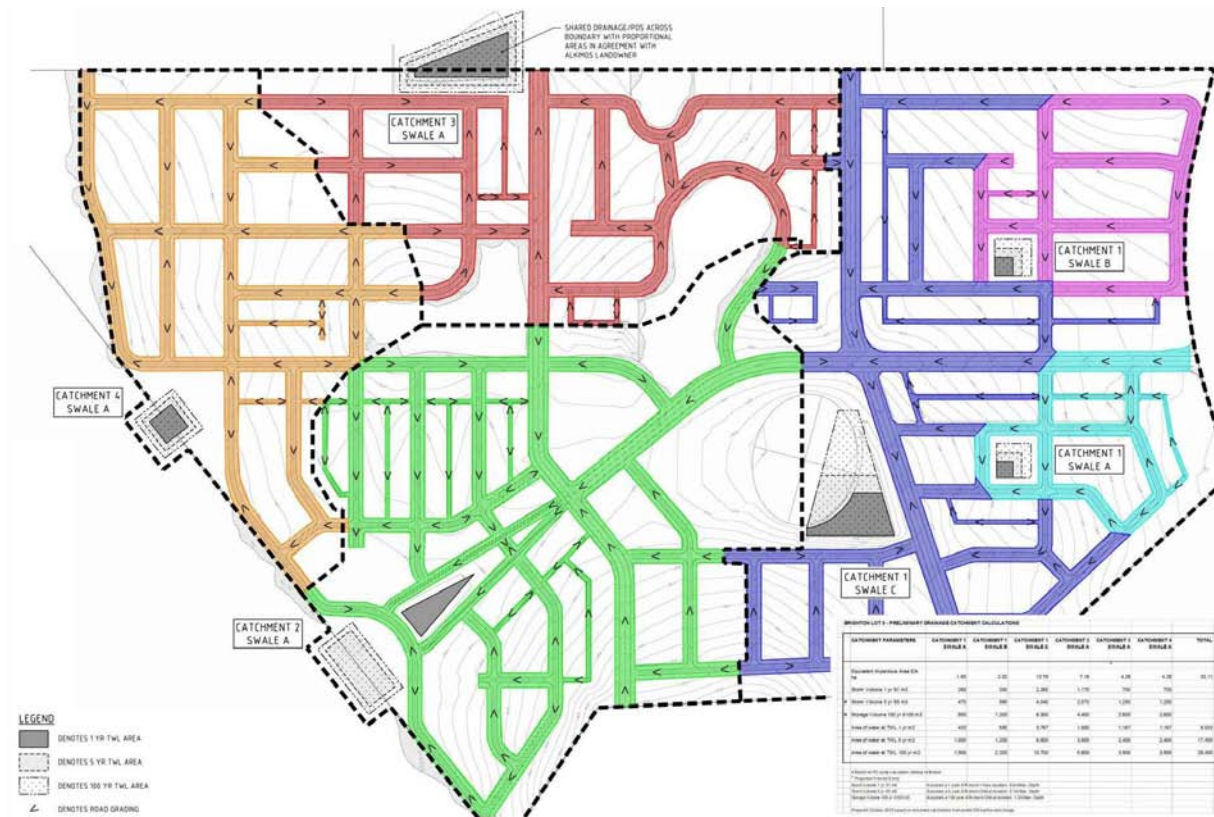
The Butler Jindalee District Structure Plan includes a primary school site for Lot 9 and acknowledges that the final location and configuration shall be determined as part of the local structure planning, in consultation with the Department of Education.

The LSP supports the DSP and continues to propose a 3.2ha - 3.5ha primary school site co-located with approximately 2.2 hectares of shared active public open space. The Lot 9 LSP area represents slightly less than one primary school catchment, with approximately 1600 dwelling units of which it is estimated approx 1300 will be single lots. The site is generally level which will ensure less earthworks are required.

The site is also surrounded by road reserves on three boundaries, allowing for good access and circulation, consistent with the principles of Liveable Neighbourhoods.

The Department of Education has indicated its support for the size and location of the primary school site.

The co-location of the primary school site with the adjacent area of active open space is consistent with Liveable Neighbourhoods and the City of Wanneroo's POS Policy, allowing for increased surveillance of the school, improved maintenance efficiencies and encouraging the increased use of the open space.



Plan No: 885-527A-01

Figure 22: Concept Drainage Strategy

Source: RPS

11.0 LOCAL WATER MANAGEMENT STRATEGY

The Lot 9 LSP will create a high quality and sustainable urban environment, adopting water sensitive design principles with regards to water management.

In accordance with the WAPC's Better Urban Water Management Guidelines, a Local Water Management Strategy (LWMS) has been prepared by RPS Environmental as part of the Lot 9 LSP.

The LWMS demonstrates that stormwater runoff and groundwater quality can be easily managed as part of the development of the Lot 9 LSP, providing a framework for the preparation of Urban Water Management Plans at subdivision.

The highly porous nature of the sands found onsite, along with the considerable depth to the groundwater, makes the site highly suitable for urban development, providing excellent rainfall infiltration and groundwater recharge, ideal for stormwater management through at source infiltration.

The LWMS provides key principles for stormwater and groundwater management. These principles will be elaborated upon and implemented as part of an Urban Water Management (UWMP) Plan following subdivision approval.

11.1 Stormwater Management

The LWMS outlines stormwater disposal and groundwater recharge through the following principles:

- Rainfall from the 1 year annual recurrence interval (ARI) storm event will be infiltrated at source through the use of soak wells.
- The 5 year ARI storm event will flow via a pipe system that will be installed within the road layout, leading to catchment swales within areas of POS which will be adequately sized to receive the stormwater runoff from their respective catchments. Bottomless side entry pits to also be incorporated into the road drainage network.
- Flush edge kerbing will be used on areas adjacent to public open space to encourage stormwater overflow to enter and infiltrate in the open space.
- Storm events greater than the 5 year ARI will be conveyed and retained through a network of catchment swales located within designated areas of public open space and reserves. These catchment swales are designed and positioned to detain stormwater from events up to and including the 100 year ARI storm event.

The Concept Drainage Strategy, as prepared by RPS, is included as Figure 21.



11.2 Water Sustainability Initiatives

The LWMS includes water sustainability initiatives at both the lot and estate level.

At an estate level landscaping within public open space areas and streetscapes will be designed to minimise irrigation requirements, creating a sustainable, waterwise urban development.

Irrigation of public spaces will be managed to minimise extraction in accordance with Department of Water requirements and used at appropriate times of the day and intervals. The irrigation system should be maintained and checked regularly to ensure it continues to operate at maximum efficiency.

At the lot level, water conservation will be encouraged by the developer through the promotion of native, water wise gardens and water efficient devices and appliances. The developer will provide information packages to all lot purchasers encouraging the implementation of these strategies.

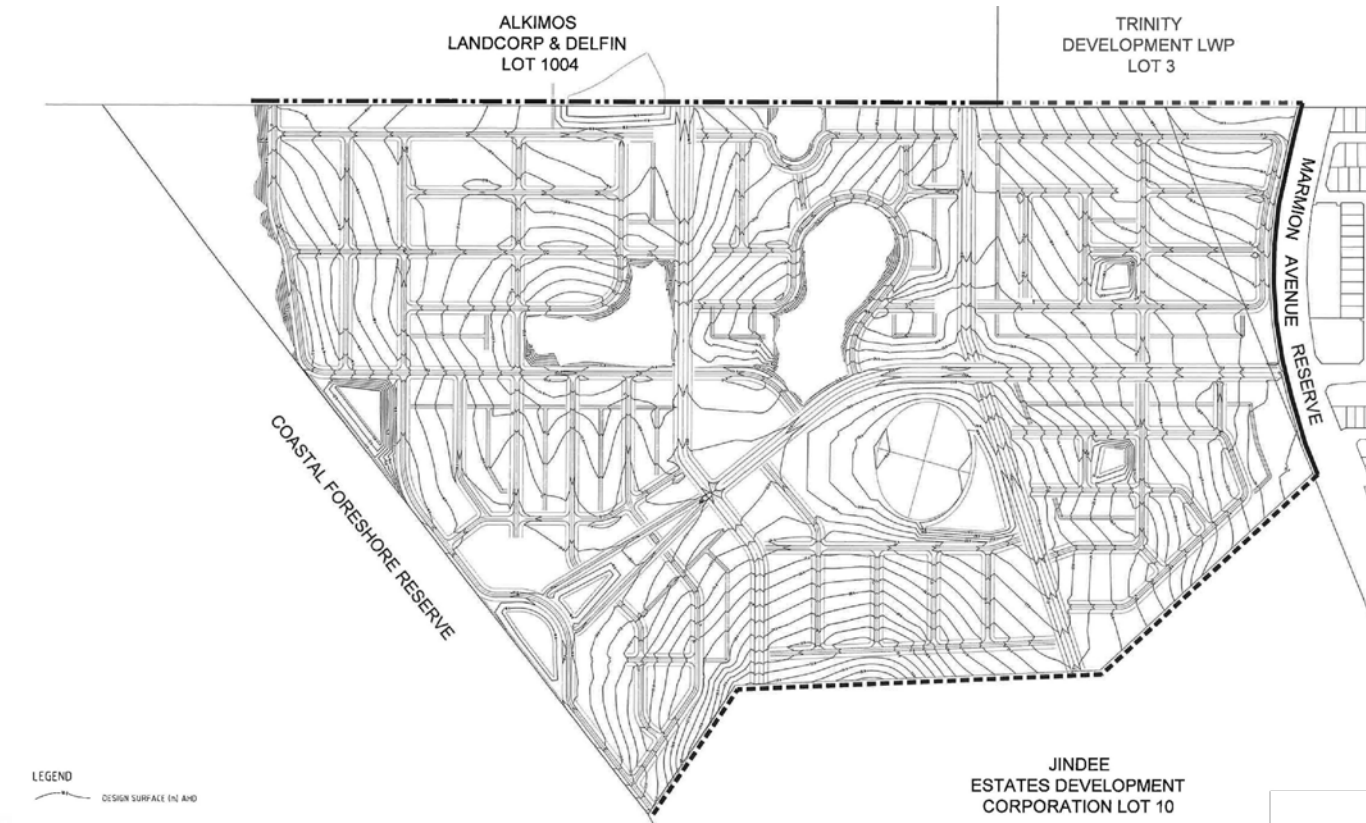
11.3 Groundwater Management

Through the use of the stormwater management strategies previously described, the nature of the soils and the significant groundwater separation distance of the LSP area, groundwater contamination is highly unlikely.

The Department of Water have confirmed to RSP that no on-site construction of monitoring bores will be required and that,

if required, groundwater monitoring can be undertaken from existing DOW monitoring bores.

The LWMS, as prepared by RPS, is contained in its entirety as Appendix 5 within Part 3: Technical Appendices and details the storage volumes for each of the catchments within the Lot 9 LSP.



Plan No: 885-528A-01

Figure 23: Preliminary Earthworks Strategy

Source: Cossill & Webley

12.0 EARTHWORKS AND SERVICING

The following section provides a summary of the engineering considerations for the Lot 9 LSP, based on advice from Cossill & Webley Consulting Engineers (refer Appendix 8 of the Technical Appendices). It demonstrates that the site can be readily earthworked and serviced by existing and planned infrastructure.

12.1 Earthworks Strategy

With the current trend being to create smaller, more sustainable lots, level sites terraced between retaining walls represent the ideal building site to accommodate the modern residential dwelling. This approach results in reduced construction costs, rationalises retaining wall layouts and designs and enables lots to be terraced up natural slopes to maintain elevation, landform and views.

In order to facilitate the creation of the terraced lots, some changes to the topography will be required however, the overall aim is to retain the general form of the topography in accordance with the principles of the LSP and assist in creating the sense of the natural.

In order to recognise the significant topographic features and to allow for roads and development sites to be graded to follow the existing topography, the following responsive approach is to be adopted for the earthworks across the site:

- Road levels adjacent to the two dune ridges retained as areas of public open space, will be located and designed so that there is minimum earthworks battering and loss of vegetation affecting these ridges;
- In areas of gentle slopes, minimal site works will be carried out a part of subdivision, with the grades of these lots being dealt with as part of building works;
- In areas of moderate sloping sites, earthworks will be undertaken as part of subdivision to the extent that resulting grades of individual lots will allow building works to be accommodated;
- In areas of steeply sloping sites, increased earth working will be carried out. The construction of retaining walls will be minimised and only provided where necessary to create individual lots which will accommodate the construction of a residential house without the need for special building forms; and
- In areas where the topography is particularly steep, special design areas may be designated where special building form, such as split level homes and framed construction, may be employed which will not require level lots.

The broad earthworks strategy prepared to accompany and inform the LSP design and to form the basis for the preparation of other technical reports is included as Figure 22.

12.2 Waste Water

Lot 9 is capable of being provided with fully reticulated waste water infrastructure.

The Water Corporation of WA has commissioned the first stage of the Alkimos Water Treatment Plant, which will service the Lot 9 LSP through collecting all waste water by way of the trunk gravity sewer main that traverse north through the site. This sewer main is known as the Quinns Main Sewer.

The initial strategy for the LSP area will involve the extension of a local gravity sewer from the Quinns Main Sewer, with a section of 300mm diameter main and 225mm diameter main having already been constructed from the Quinns Main Sewer, in order to service the Brighton Estate located to the east of Marmion Avenue.

It is anticipated that early stages of development will be serviced through connected into the existing 300mm diameter main.

As development of the LSP area continues beyond the limit to which the area can be sewered by gravity, a pump station will be installed within the LSP area, with staged delivery of emergency overflow storage provided at the site or in the collection system.

12.3 Water Supply

Lot 9 can be provided with potable water supply.

The Lot 9 LSP is located within the WCWA's future ground water source area for potable water supply with water supply to the site ultimately being via a series of groundwater bores that will be located throughout the Butler-Jindalee area. These bores will be linked by collector water mains to a central treatment plant and reservoir.

As the LSP area is near the boundary of both the existing Neerabup treatment and reservoir scheme and the proposed Carabooda reservoir service area, the development may receive water from either source, depending on water demand at the time.

Initially the supply of water to the LSP area will be through an extension to the water reticulation in Brighton Estate, east of Marmion Avenue. Provision has been made for a 200mm diameter reticulation main to cross Marmion Avenue, providing water supply to the LSP area.

The WCWA has indicated that the longer term plan for the area is to extend the 700mm diameter water main up along Marmion Avenue, with this main currently terminating to the south of the LSP area, at the intersection of Marmion Avenue Kingsbury Boulevard to the south. The extension of this 700mm diameter water main, which is planned to take place in 2012/2013, will provide additional capacity to service the LSP area as development progresses in the area.

12.4 Electrical Supply

The LSP area will be serviced by way of an existing 22kV high voltage underground cable that extends the entire frontage of the site, along Marmion Avenue. The local network will be incrementally extended from this HV cable, with the required feeds, switch station and transformers being provided as required.

It is also anticipated that as development of the north-western corridor progresses, additional high voltage feeds will also be made available to provide alternative power network infrastructure for the area, if required.

12.5 Gas Supply

The installation of a high pressure gas main along Marmion Avenue has already commenced, with an expected completion date of early 2011. WestNet, being the service provider responsible for the gas main, has advised that this high pressure gas main will have capacity for all future development within the area, including the Lot 9 LSP area.

12.6 Telecommunications

Telstra has an existing exchange building adjacent to Marmion Avenue, located approximately 2 kilometres south of the LSP area, with this exchange having capacity to service the development. An optic fibre extension from the adjoining land east of Marmion Avenue can easily be installed.

In recent years, Telstra has been providing optic fibre to home services by way of a 'Telstra Velocity' agreement, being a commercial agreement available to developers of new estates.

The Federal Government is now stating an objective to roll out optic fibre to all residences within metropolitan areas under National Broadband Network (NBN), with the responsibility of delivering wholesale fibre to the home system being transferred to the Government with a number of retail service providers likely to offer services over the network. However, if the Government does not obtain support for the NBN, the delivery method may revert to the current arrangement where Telstra is required to provide every home site with a telecommunication service but not necessarily a high speed service.

At this stage it is being anticipated that this fibre will be installed within the LSP area under the NBN initiative however, regardless of whether this is delivered under a NBN or not, provision will be made for all lots to receive pit and pipes which will allow for the future installation of this cable.