Lancelin South (Stage One) Outline Development Plan

June 2011

Prepared for
Joe Matthews

Taylor Burrell Barnett
Town Planning & Design

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DOCUMENT HISTORY AND STATUS

Lancelin South (Stage One) Outline Development Plan (03/096)		Revision	Date Issued
Prepared By:	**Taylor Burrell Barnett Town Planning and Design** 187 Roberts Road SUBIACO WA 6008 Phone: 9382 2911 Fax: 9382 4586 admin@tbbplanning.com.au	0	19.10.10
		1	03.11.10
		2	07.01.11
		3	27.05.11
In association with:	**Tabec** **RPS** **Golder and Associates** **Bruce Aulabaugh** **Ecoscape**	4	22.06.11

CERTIFICATION OF OUTLINE DEVELOPMENT PLAN

CERTIFIED THAT LANCELIN SOUTH (STAGE 1) OUTLINE DEVELOPMENT PLAN WAS ADOPTED BY

RESOLUTION OF THE WESTERN AUSTRALIAN PLANNING COMMISSION ON

20th June 2011

Signed for and on behalf of the Western Australian Planning Commission

CM Sanders

an officer of the Commission duly authorised by the Commission pursuant to section 57 of the Western Australian Planning Commission Act 1985 for that purpose in the presence of:

M. Wiecha ..... Witness

29 June 2011 ..... Date

AND BY

RESOLUTION OF THE SHIRE OF GINGIN

21st December 2010

AND THE SEAL OF THE MUNICIPALITY WAS PURSUANT TO THE COUNCIL'S RESOLUTION HEREUNTO AFFIXED IN THE PRESENCE OF:

David Ross

Shire President, Shire of Gingin

Chief Executive Officer, Shire of Gingin

13.JULY.11 ..... Date

SHIRE OF GINGIN VIAS TUTAS CUPIMUS COMMON SEAL

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1 INTRODUCTION

The Lancelin South Stage One Outline Development Plan (ODP) had been prepared by Taylor Burrell Barnett to guide the subdivision and development of Lots 5243, 9504 and 9505 Perth-Lancelin Road, Lancelin for urban purposes, in accordance with the requirements of the Shire of Gingin Town Planning Scheme No. 8 (TPS8), for land zoned 'Urban Development'.

In the preparation of the ODP a number of supporting documents have been prepared. These include a Traffic Forecast and Intersection Design Report and a Local Water Management Strategy.

The ODP originally formed part of the Lancelin South Structure Plan (LSSP) document, and was considered by the Shire in this form on 21 September 2007. At its September 2007 meeting, the Council adopted the Structure Plan as the basis for the initiation of a Scheme Amendment to rezone the land to 'Urban Development' (Amendment 93) and adopted the ODP for the purpose of advertising in conjunction with Amendment 93.

The ODP has since been advertised for public comment, and comments were received and considered by Council at its meeting on 20 April 2010. It was advised by the Shire that the ODP would not be adopted until such time as the ODP had been separated from the Structure Plan into a standalone document. This ODP document has been prepared to satisfy the requirement of the Shire of Gingin TPS8 and Council's resolution of 20 April 2010.

2 SITE CONTEXT

2.1 TITLE PARTICULARS

The land subject to this Outline Development Plan is legally described as portions of Lot 5243 on Deposited Plan 206398, and Lots 9504 and 9505 on Deposited Plan 51420. Copies of the Certificates of Title are included as **Appendix A.**

The proprietor of each of these lots is Joseph Beck Matthews.

2.2 LOCATION

The Outline Development Plan (ODP) area is located approximately 2.2 kilometres southeast of the Lancelin town site, 3.5 kilometres north of Ledge Point, and 1.5 kilometres to the west of a rural residential estate known as 'Seaview Park'. The subject land is located 870 metres from the coast, and is adjacent to the existing Lancelin Sport and Recreation Club.

Regionally, the ODP area is located in the Shire of Gingin, approximately 100 kilometres north of Joondalup, and 128 kilometres north of the Perth CBD.

2.3 SITE AND SURROUNDING LAND USES

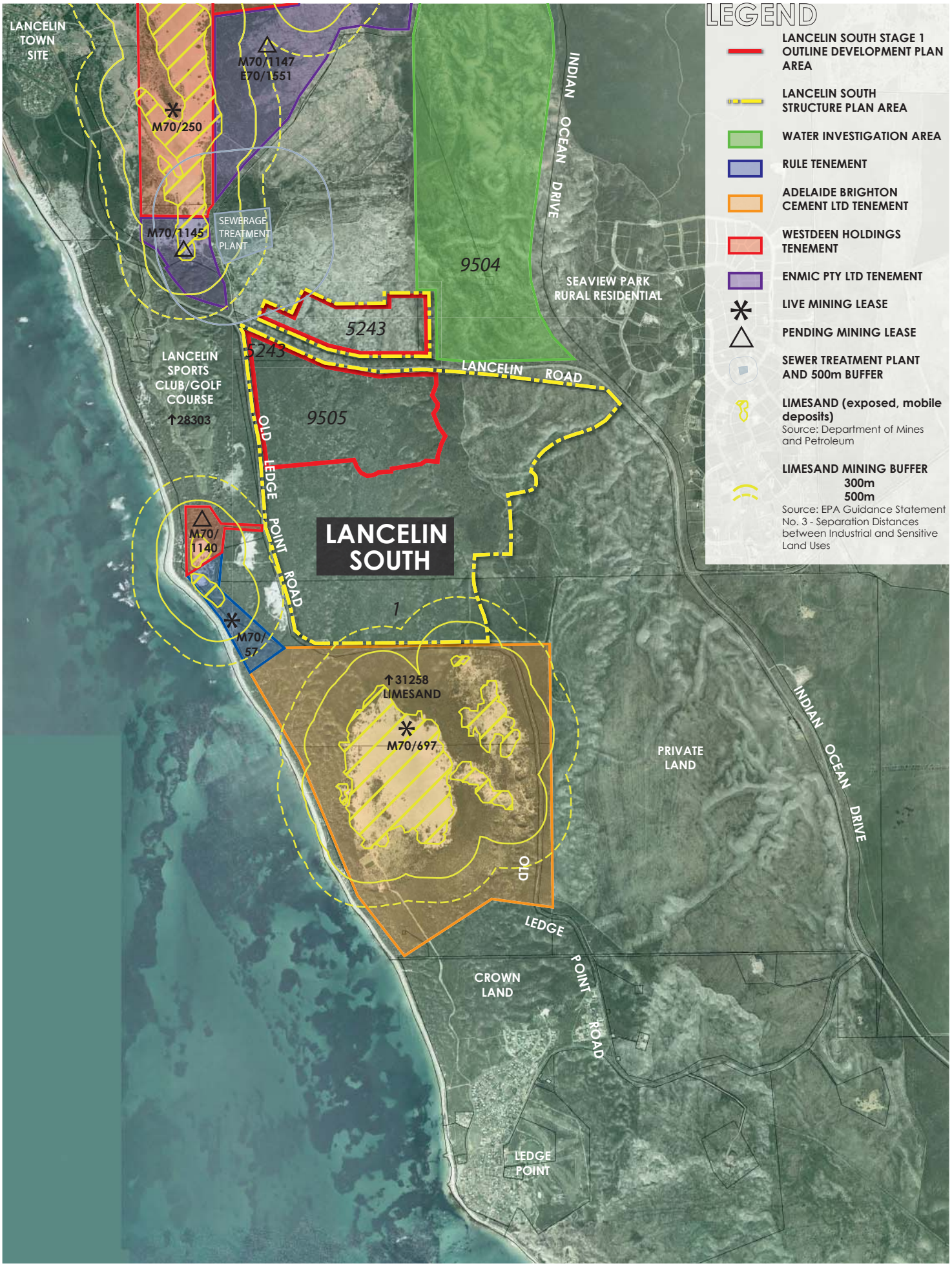
The land was previously used for livestock grazing and contains a number of related structures such as windmills, bores, stables and sheds that are in various states of repair. These existing structures are not identified as having any heritage value.

The surrounding area is impacted upon by lime sand mining activities to the south, west, and northwest (refer **Figure 1** – Site and Surrounding Land Uses). None of the buffers required by these mining activities intrude on the ODP area. This is discussed further in section 2.3.2.

Directly north of the ODP area is the Water Corporation's sewage treatment plant. The 500 metre buffer to this plant is shown to marginally extend over the northern part of the ODP area, however as this land is intended for development for non-sensitive land uses, including industrial and mixed business/commercial, this buffer is not a constraint to the development of the land. Furthermore, the generic 500 metre buffer is established from the lot boundary, and does not allow for the setback of the evaporation ponds that are located nearly 100 metres within this boundary.

The facilities of the Lancelin Sport and Recreation Club are located directly to the west of the ODP area. This established land use compliments the residential development envisaged by this ODP by providing a high level of public amenity and community facilities close to a growing population.

The Seaview Park rural residential estate comprises 310 residential lots ranging in size from 1 to 5 hectares.



LANCELIN SOUTH STAGE 1 OUTLINE DEVELOPMENT PLAN

Site & Surrounding Landuses

A Joe Matthews Project

0m 400m

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d: May 2011
j: 03/096

figure 01

2.3.1 MINING ACTIVITY

A number of mining tenements are located in relatively close proximity to the ODP area, including:

- M70/57 (granted)
- M70/250 (granted)
- M70/697 (granted)
- M70/1140 (pending)
- M70/1145 (pending)
- M70/1147 (pending)

These mining leases relate to the extraction of lime sand and limestone. Lime sand mining is undertaken on a seasonable basis between December and June, with the months of March, April & May accounting for approximately 80% of production.

Lime sand mining traffic has the potential to impact on Lancelin South primarily due to the potential conflicts between vehicles (trucks and cars) utilising Old Ledge Point Road and Lancelin Road during the peak mining period between March and May, as well as potentially creating dust and noise impacts. These potential impacts are addressed in this ODP.

The EPA's *Guidance Statement No. 3 – Separation Distances between Industrial and Sensitive Land Uses* establishes the buffer requirements for 'Extractive Industry – sand and limestone extraction' as 300 – 500 metres 'depending on size'. **Figure 1** identifies both the 300 metre and 500 metre buffers and clearly demonstrates that none of the buffers relating to mining activity directly impact the ODP area.

Throughout the scheme amendment and structure plan approval process, the Department of Minerals and Petroleum and all mining leaseholders were consulted and had the opportunity to comment on the buffers relating to extractive industries. This consultation process resulted in some amendments to **Figure 1** to ensure all mining interest were depicted, along with the relevant buffers.

2.4 EXISTING ROAD NETWORKS

The ODP area fronts Lancelin Road and extends west to OLPR and east toward the intersection to Indian Ocean Drive. These roads provide primary and secondary access to the ODP area, respectively.

Indian Ocean Drive links both Lancelin and Lancelin South to the regional road network, with this road recently upgraded by Main Roads Western Australia (MRWA) to improve the sight lines, increase pavement width and resurface this regional road. MRWA has recently extended Indian Ocean Drive to Cervantes, with plans to extend further north along the coast, thereby significantly increasing regional connectivity.

2.5 TOPOGRAPHY

The ODP area consists of a Quindalup Dune System, comprising calcareous sands forming beach ridges and two parallel parabolic dunes.

The site rises from approximately 5 m AHD in the west to approximately 30 metres AHD at the eastern boundary. Beyond the ODP area, the land generally rises to the east to 75 metres AHD at Indian Ocean Drive.

2.6 SOILS

The ODP Area comprises predominantly calcareous sand overlying limestone bedrock. While the subsoil conditions vary throughout the site, in general, the preliminary investigations by Golder Associates detailed in the Preliminary Geotech Report, dated July 2010, indicate:

- The topsoil is fine to medium grain sand extending to a maximum depth of 0.3 metres;
- Fine to medium sand, that is slightly lithified in places interspersed with limestone cobbles and boulders extends to depths of 0.45 to 8.2 metres;
- Fine to medium grained limestone varying from exposed outcrops to a depth greater than 8.2 metres

For more detailed survey and discussion on landform and soils, reference can be made to chapter 3 of the *Lancelin South Environmental Review (2008,)* prepared by Ecoscape.

2.7 FAUNA

As part of the scheme amendment process, the Environmental Protection Authority required an environmental review (ER) to assess and manage the environmental impacts of the proposed amendment and subsequent urban development of the ODP area. When initially commissioned, the ER considered the whole of the structure plan area.

In preparing this report, Ecoscape identified a total of 294 species of fauna that it would expect to be present in the area. During a subsequent site survey conducted in December 2005, 77 species were identified, including 51 birds, 15 reptiles, 10 mammals, and two (2) frogs. This sample included four (4) introduced species.

The ER notes that much of the subject land is already severely degraded due to a history of animal grazing and there did not appear to be any remaining significant habitat for terrestrial native fauna.

Notwithstanding the generally poor condition of the land with regard to native fauna habitat, the ER identifies two main threats to existing native fauna. The first threat is the clearing of extant native vegetation and the introduction of exotic flora. This process is likely to increase the proportion of fauna that prefers disturbed habitats.

The second significant threat involves the introduction of exotic fauna, either as pets, or as vermin or other pest fauna associated with increased human habitation (mice, rats etc). The introduction of significant numbers of exotic animals will impact native fauna either by competing for food resources or by acting as predators.

In order to manage and ameliorate the impact of the urban development on native fauna, the ER recommends the preparation and implementation of a number of management strategies. These include:

- Fauna movement: to design and conserve movement corridors within the urban area, and concentrate development in areas that are already significantly degraded;
- Fauna Habitat: preserve limestone ridges as these provide foraging vegetation for Carnaby's Black Cockatoo;
- Weed Control: weed management plan required to control current infestations and prevent future outbreaks;

- Resident education: new residents in the ODP area to receive education on the importance of light and noise, pet, and vermin control.

The preparation and implementation of these management plans is discussed in greater detail is section 5.2 of this report.

2.8 FLORA

As indicated in **Figure 2** – Vegetation Types, the ODP area is vegetated with a variety of acacia and melaleuca species. **Figure 3** – Priority Plant Taxa and Bushland Condition further describes the native vegetation as predominantly a mixture of poor and fair-good condition.

As discussed in greater detail in the LSSP and the ER, the ODP area is not identified as recommended for preservation, and sufficient native vegetation is preserved in the immediate vicinity.

In preparing the ER, Ecoscape conducted both a desktop study, and field surveys of the ODP area. The field survey identified a total of 188 plant taxa, including 42 weed species.

The ER identifies the whole of the structure plan area, and to a lesser extent, the ODP area as having some intrinsic ecological value due to:

- The excessive size of the site (Note: this assessment is based on the Structure Plan area of greater than 500 hectares);
- Overall, the bushland is in good condition;
- The location of four priority listed plant taxa and one plant taxon
- Good connectivity to other bushland areas.

Of the 146 native plants identified in the ODP area, three (3) are considered significant flora taxa (ER, p. 17), including:

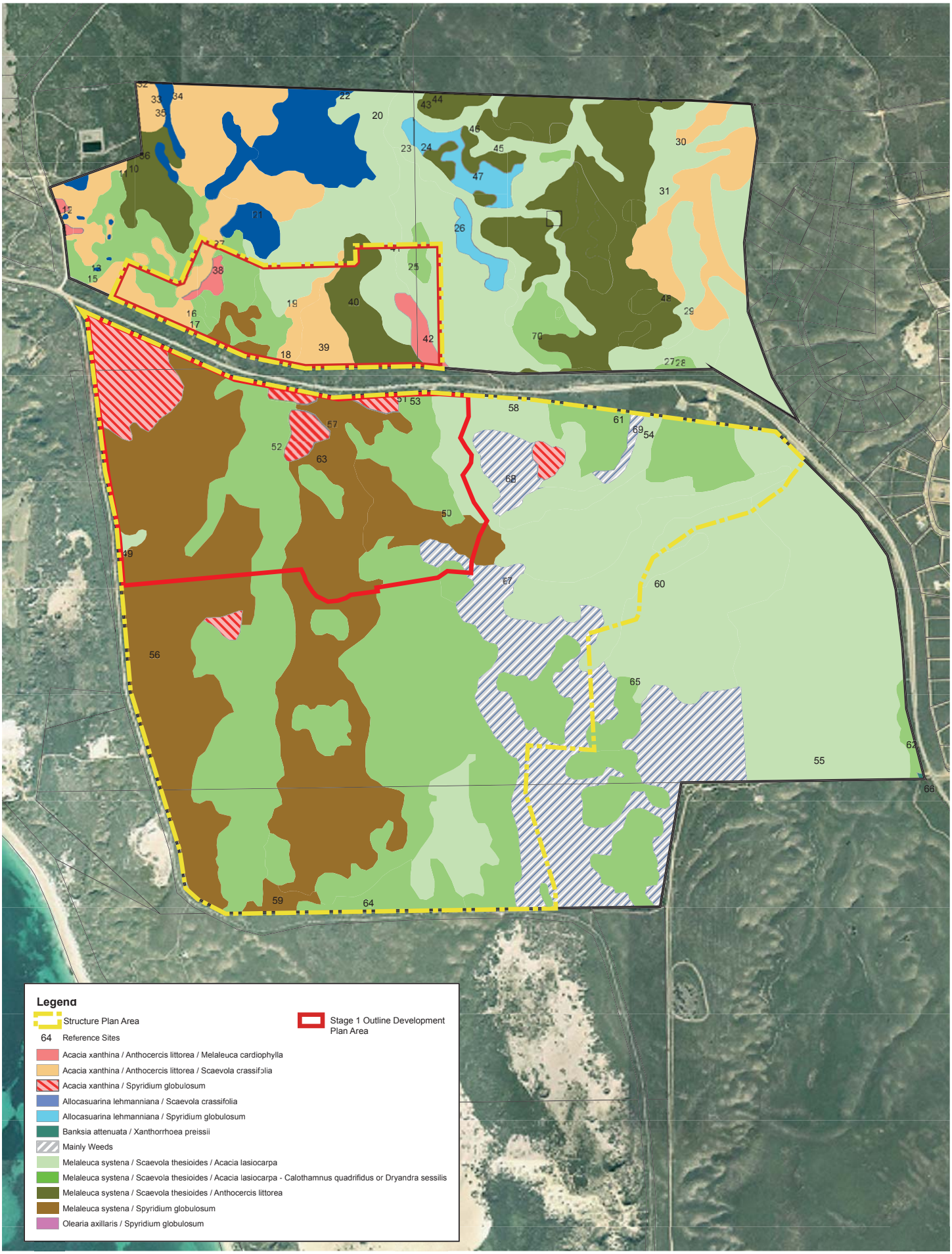
- Stulidium maritimum;
- Thryptomene sp. Lancelin; and
- Conostylis pauciflora subsp. Euryrhipsis

In reviewing these ecological values, it should be noted that this ODP includes only a portion of the land comprising the LSSP. Therefore, although the wider conclusions and recommendations from the ER should direct the strategic planning for the ODP, the rezoning of subsequent stages of the LSSP area from 'Rural' to 'Urban Development' will be subject to further approval of the Shire, EPA and the Minister for Planning.

2.9 HYDROLOGY AND HYDROGEOLOGY

The ODP area contains no natural surface water, with Karakin Lakes the nearest inland water body located approximately 10 km due east.

Groundwater is present in both superficial and confined aquifers, with the superficial aquifer located an average of 20 metres below ground level to a minimum of 5 and maximum of 30 metres depth. The distance to the superficial aquifer, that is located within Tamala Limestone and Safety Bay Sands is generally determined by the overlying dunal landform.



SOURCE: Ecoscape Australia Pty Ltd

LANCELIN SOUTH STAGE 1 OUTLINE DEVELOPMENT PLAN

Vegetation Types

A Joe Matthews Project

0m 250m

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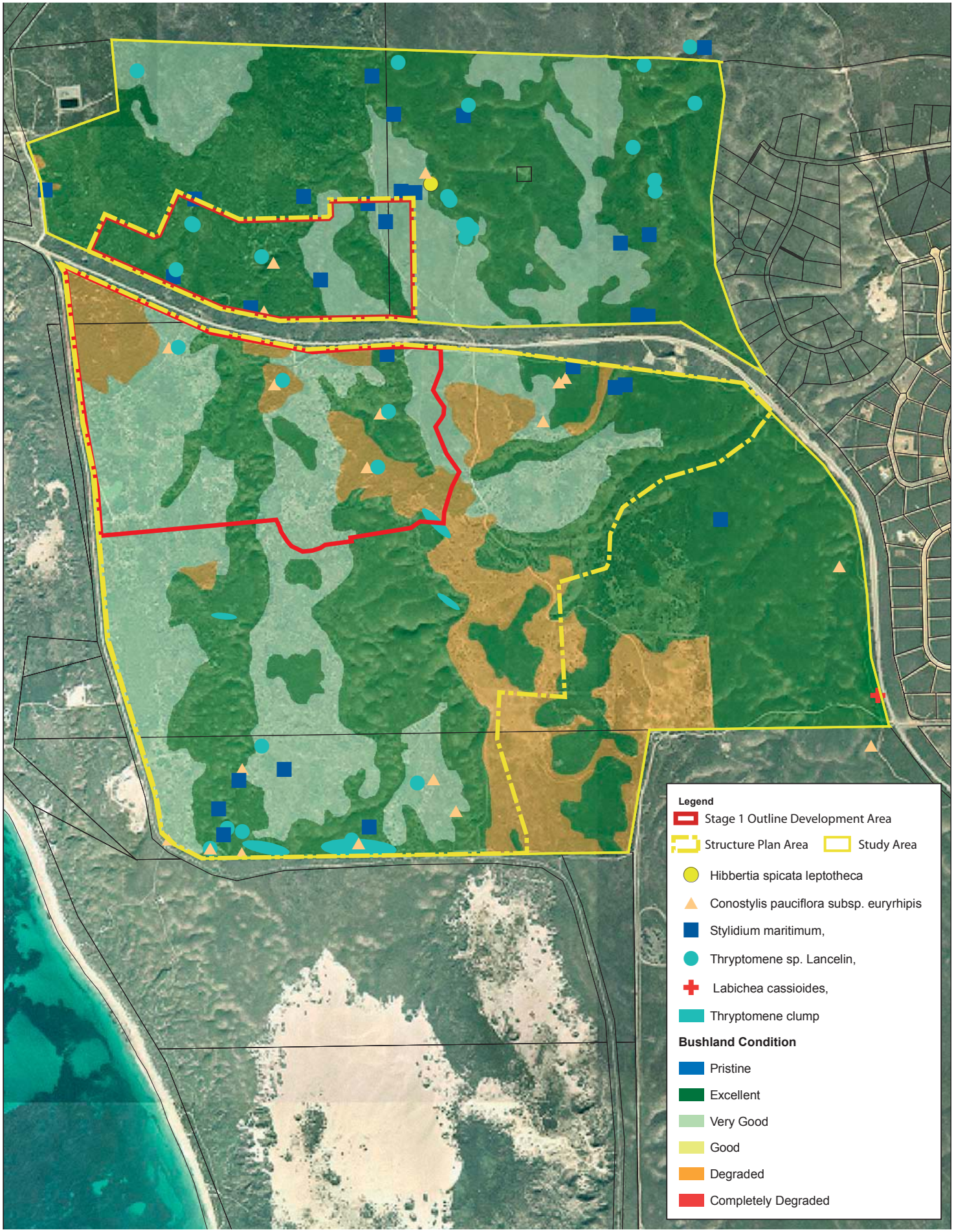
d: May 2011
j: 03/096

figure 02



SOURCE: Ecoscape Australia Pty Ltd

LANCELIN SOUTH STAGE 1 OUTLINE DEVELOPMENT PLAN

Priority Plant Taxa and Bushland Condition

A Joe Matthews Project

0m 250m

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figure 03

The following documents contain detailed assessment and analysis of the existing hydrology and hydrogeology of the subject land and should be referred to in relation to ground and surface water:

- Lancelin South Development: Environmental Review (Ecoscape 2008);
- Lancelin South Development Bore Completion report (URS, 2010); and
- Local Water Management Strategy – Lancelin South (RPS, 2010).

2.10 HERITAGE

During the preparation of the LSSP, Anthropos Australis Pty Ltd undertook a desktop study to determine the likelihood of any Aboriginal heritage sites within the structure plan area. This study is included as Appendix E to the LSSP and identified one site nearby, but not within the structure plan area in Ledge Point.

Notwithstanding the findings of the Indigenous heritage investigation, any development within the ODP area will be subject to the *Aboriginal Heritage Act 1973*, and any sites discovered during development will be treated in accordance with relevant legislation. In accordance with established protocols, all contractors will be advised of the existence of this site nearby and further consultation and surveys will be undertaken with the Yued native title claimants (the 'Traditional owners') prior to subdivision.

As noted earlier, there are a number of structures in the ODP area connected with its historical use for livestock grazing. None of these structures, including windmills, sheds, and stables are considered to have any significant heritage value, although consideration will be given to the incorporation of historical structures and representation of the historical use of the land as part of the detailed landscape design of the central POS area.

3 PLANNING CONTEXT

3.1 RELATIONSHIP WITH THE SCHEME

Prior to supporting any proposed subdivision or approving any other development on land zoned 'Urban Development', Clause 5.5.3 of TPS8 requires the preparation of an Outline Development Plan (ODP).

As required, this ODP designates land use zones and reserves that are consistent with the zones and reserves established in TPS 8. Provision has also been made for a transition from TPS 8 to TPS 9 with appropriate land use zones and reserves identified in TPS9.

This ODP relates only to the land subject to Amendment 93 that rezones approximately 177 hectares to 'Urban Development'. As this first stage nears full development, a new scheme amendment will be prepared in accordance with the LSSP to rezone additional land for residential development. When these subsequent scheme amendments are completed, additional ODPs will be prepared to guide the subdivision of the land.

3.2 RELATIONSHIP WITH LANCELIN SOUTH STRUCTURE PLAN

The *Lancelin South Structure Plan* (LSSP) was adopted by Council in October 2007 and provided the planning justification for and the rezoning of the land to 'Urban Development' under Amendment 93 to TPS8. As discussed earlier, the ODP was originally contained within the Structure Plan document; however, at the request of the Shire of Gingin, it has been separated from the Structure Plan and now comprises a stand-alone document.

The provisions of the ODP are in accordance with the provisions of the Structure Plan as adopted in October 2007.

Figure 4 – Structure Plan Context, outlines the area the subject of this ODP in relation to the approved Structure Plan.

3.3 REGIONAL PLANNING

3.3.1 CENTRAL COAST REGIONAL STRATEGY

The 1996 Central Coast Regional Strategy (CCRS) provides a vision for the development and protection of the central coast region and includes the Shires of Irwin, Coorow, Carnamah, Dandaragan and Gingin within the study area.

The strategy acknowledges that as Perth expands there will be increasing pressure on the Central Coast Region to provide urban, employment, recreation and tourism opportunities for an increasing number of residents, holiday makers and visitors. The strategy concludes by stating that the increased development pressure will result in demands for urban growth being within the Shire of Gingin.

To address this there are a number of planning units identified, which are based on five major surface water catchments. The subject site is located within the Cataby Coastal Catchment, which comprises the coast between Lancelin and Ledge Point. This catchment is where future settlement development is proposed to be facilitated within a townsite hierarchy.

This ODP is consistent with the intent of the CCRS.

LANCELIN ROAD

INDIAN OCEAN DRIVE

OLD LEDGE POINT ROAD

POSSIBLE RETIREMENT VILLAGE SITE (3.40 ha)

GH

LEGEND

- STAGE1 OUTLINE DEVELOPMENT PLAN AREA
- LOW DENSITY RESIDENTIAL
- RESIDENTIAL
- MEDIUM DENSITY RESIDENTIAL
- SCHOOLS / COMMUNITY
- RETAIL / COMMERCIAL
- TOURISM
- PUBLIC OPEN SPACE (to be developed)
- POS TO BE REATAINED AS NATURAL VEGETATION
- COMPOSITE INDUSTRIAL
- SERVICE COMMERCIAL
- LIGHT INDUSTRY

LANCELIN SOUTH STAGE 1 OUTLINE DEVELOPMENT PLAN

Structure Plan Context

A Joe Matthews Project

0m 50 100 150m

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j:03/096

TAYLOR BURRELL BARNETT

figure 04

3.3.2 GINGIN COAST STRUCTURE PLAN

The Gingin Coast Structure Plan was finalised by the WAPC in February 2006. It was prepared to '...guide the planning, development and management of the existing and potential land use changes in the coastal portion of the Shire of Gingin...'

As with the Central Coast Regional Strategy, the GCSP acknowledges the high demands placed on the Gingin Coastal region for residential development. Given this, the Structure Plan and this ODP, notes the importance of addressing the sustainable supply of water to meet the economic needs of the region, which will be derived from agriculture, horticulture, residential and tourism related activities.

The GCSP stipulates that the townsite of Lancelin is a Major Local Centre that will provide district and local level shopping and tourist facilities and have a population growth of 5,000 – 10,000 people by 2031. Lancelin South has been identified in the GCSP as 'Townsite Expansion Investigation Area'.

The GCSP acknowledges that the "..next step to progressing the expansion of urban development at Lancelin is the preparation of a detailed town site structure plan which addresses the opportunities and constraints to development'. To address this requirement two separate planning documents were prepared. The first is the Lancelin Townsite Expansion Plan (LTEP), which is a detailed townsite structure plan that identifies the opportunities and constraints to development in Lancelin. The second is a report prepared for DPI by Chris O'Neill and Associates, which examines the demand for urban land within Lancelin and the constraints to development in the area immediately adjacent to the existing town site. The LSSP, the Lancelin to Ledge Point Overall Structure Plan and this ODP have been prepared consistent with the findings and recommendations of the O'Neill report.

4 OUTLINE DEVELOPMENT PLAN

4.1 ZONES AND RESIDENTIAL DENSITIES

In accordance with Clause 5.5.3 (b) of the Shire of Gingin TPS8, **Figure 5** – Zoning and Residential Density Plan delineates and depicts the zones and the range of residential density codes applicable to the ODP area according to the legend thereon.

The zones and residential density codes ranges designated under this ODP apply to the land within it as if they were incorporated into the Scheme. A specific density code will be designated in individual Residential Density Coding Plans which will be approved in conjunction with subdivision applications.

All provisions, standards and requirements applicable to the zones and residential codes in the Scheme shall apply.

4.1.1 LAND USE ZONES

The ODP designates the following land use zones over the subject site:

- Residential
- Conservation Zone
- Commercial (or Town Centre under TPS 9)
- Industrial (or Mixed Business under TPS 9)
- Parks and Recreation Reserve
- Public Use (Primary School)

The land use zones and reserves combine to create a robust 'urban village' supported by a viable amount of employment opportunities and commercial uses.

For each of these land use zones, the permissible uses (P), the uses subject to Council's approval (AA), the uses subject to Council's special approval (SA), and incidental uses (IP) shall be in accordance with the corresponding land use zones in the Scheme, as depicted in Table 1 – Zoning Table. All other uses are not permitted.

4.2 RESIDENTIAL DENSITY ALLOCATIONS

The ODP provides for a range of lot sizes to cater for various housing types and the various housing needs of prospective residents today and into the future.

The ODP outlines a range of residential densities that will apply to the land and, in doing so, ensures the ODP is able to respond to the ever changing needs of the market and society, whilst also ensuring a viable and sustainable community for Lancelin South.

In accordance with Figure 5, low density development (R5-R20) will generally be provided for throughout the 'Residential' zoned areas of the ODP, with R5 – R10 density development generally within and adjacent to areas where natural vegetation and/or landform are to be retained. R15-R20 will generally apply elsewhere, with pockets of medium density (up to R40) in proximity to local centres, in areas of high amenity and other suitable locations to promote alternative housing forms.

LANCELIN SOUTH STAGE 1 OUTLINE DEVELOPMENT PLAN

Zoning and Residential Density

A Joe Matthews Project

0m 50 100m

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figure 05

A Residential Density Code Plan is to be submitted at the time of subdivision to the Western Australian Planning Commission and shall depict the specific Residential Density Code (RCode) for each lot included within the subdivision plan, in accordance with the Zoning and Density Code Plan included within this ODP (Figure 5) and the density requirements outlined above. Once approved by the WAPC, in conjunction with the corresponding subdivision plan, it shall be inserted into Appendix E and shall be used for the determination of future development applications.

4.3 LOT YIELDS

Indicative lot yield calculations have been undertaken for the ODP area on a precinct by precinct basis, based on the applied density codes and the LSSP. Refer **Figure 6** - Precinct Plan.

Table 1 – Indicative Lot Yield Schedule, indicates that, by applying the average lot size of the relevant RCode, approximately between 1032 and 2362 residential lots can be created in the ODP area, as well as 122 industrial/mixed business lots.

TABLE 1: INDICATIVE LOT YIELD SCHEDULE - LANCELIN SOUTH STAGE 1 OUTLINE DEVELOPMENT PLAN

Precinct	R Code	No. of Lots
Residential		
1	R15-R30#	243-589*
2	R20-R40#	318-698*
3	R5-R20#	26-113*
	R20-R40#	98-234*
4	R20-R40#	228-451*
5	R20-R40#	89-207*
6	R20-R40#	30-70*
Total		**1032-2362***
Mixed Business/Industrial		
A		49
B		29
C		44
Total		**122**

Notes:
 # Density Range
** Lower yield calculated by applying the lower density code in the range. Potential higher yield calculated by applying the higher density code in the range.*

4.4 PUBLIC OPEN SPACE PROVISION

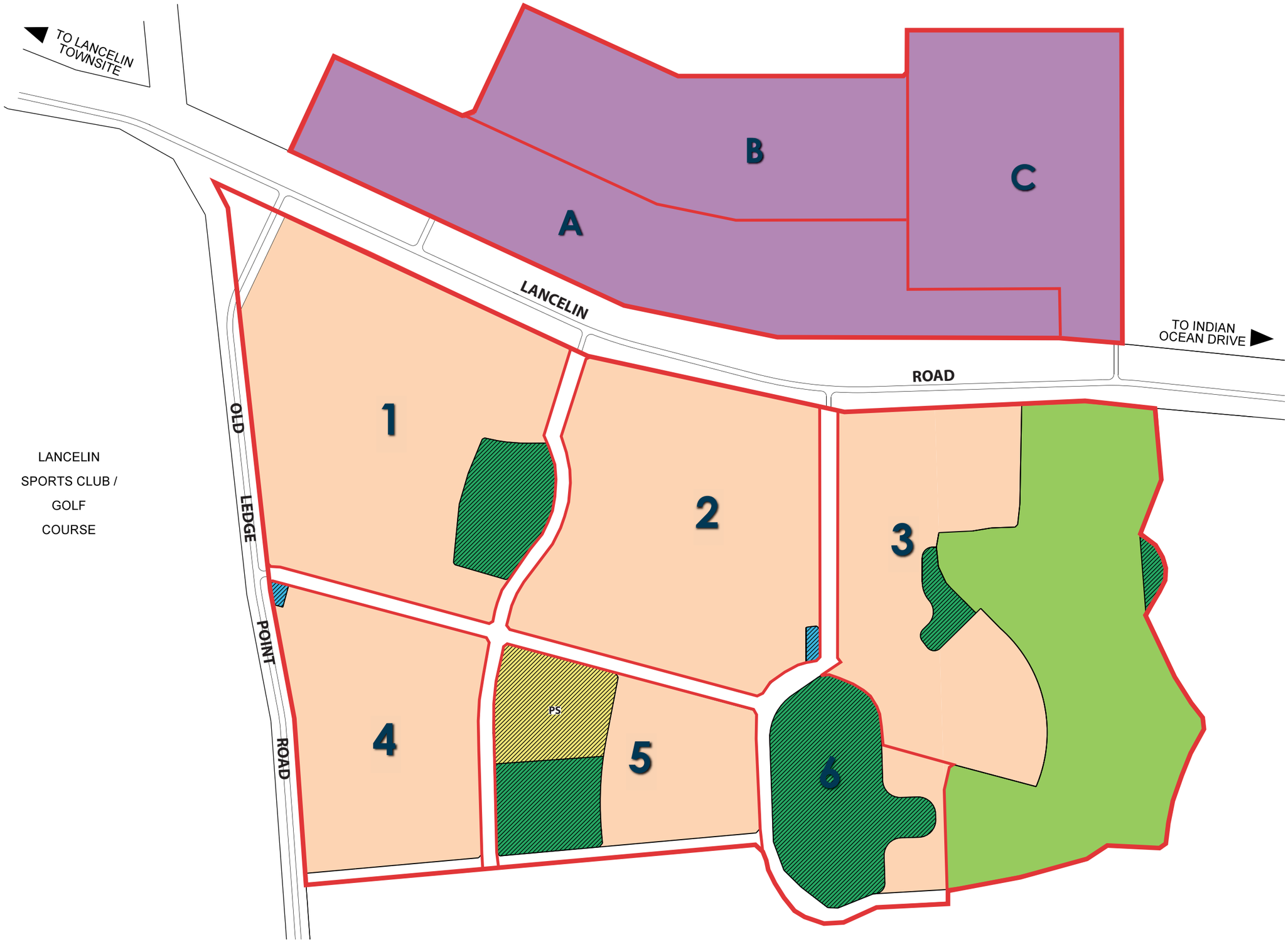
Public open space will be provided in both the residential area south of Lancelin Road, and within the industrial area north of Lancelin Road. **Figure 7** – Public Open Space Provision identifies the indicative location of key Public Open Space sites. Detailed localised POS and drainage will be identified in individual subdivision applications and will comprise a minimum of 10% of the ODP area and a minimum of 80% of the POS requirement as unrestricted Public Open Space and 20% of the POS requirement as restricted Public Open Space. Detail of the key Public Open Space areas are further outlined in **Table 2** – Public Open Space Schedule.

Localised areas of public open space will be provided for in the industrial/mixed business area to the north of Lancelin Road. These sites will serve as landscaped buffers to part of the industrial area from Lancelin Road, and will also have a positive impact on the amenity of this area.

While provision will be made for public open space in the mixed business/industrial area, as this is not a residential area, these sites will not be included in the required POS contribution calculations prepared in accordance with *Liveable Neighbourhoods*.

In total, excluding the mixed business/industrial area to the north and Conservation Area, approximately 13% of the site is to be dedicated to key open space. Additional public open space will be identified in individual subdivision applications. All calculations, credits and deductions for drainage and other non-residential uses are in accordance with the WAPC's *Liveable Neighbourhoods.*

The land designated for POS includes areas for passive and active recreation. Where sites are identified for passive recreation, natural vegetation is to be retained and/or rehabilitated, while active POS sites will be developed with a range of facilities, which may include playing fields and play equipment. This land will be ceded free of cost to the Crown.



LEGEND

- STAGE 1 OUTLINE DEVELOPMENT PLAN AREA

ZONES

- RESIDENTIAL
- COMMERCIAL
- INDUSTRIAL

RESERVES

- PARKS & RECREATION
- PUBLIC USE
  - PS PRIMARY SCHOOL

LANCELIN SOUTH STAGE 1 OUTLINE DEVELOPMENT PLAN

Precinct Plan

A Joe Matthews Project

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figure 06

LEGEND

- STAGE 1 OUTLINE DEVELOPMENT PLAN AREA

ZONES
- RESIDENTIAL
- COMMERCIAL
- INDUSTRIAL
- CONSERVATION

RESERVES
- PARKS & RECREATION
- PUBLIC USE
- PS PRIMARY SCHOOL

INDICATIVE POS PROVISION
RESIDENTIAL AREA

POS	AREA (ha)
PRECINCT 1	
1A	3.18
PRECINCT 2	-
PRECINCT 3	
3A	0.81
3B	0.37
PRECINCT 4	-
PRECINCT 5	
5A	2.85
PRECINCT 6	
6A	6.70
6B	0.53
TOTAL	**14.44**

Indicative location of key POS shown. Detailed localised POS and drainage will be identified in individual subdivision applications and will comprise a minimum of 10% of the ODP area and a minimum of 80% unrestricted POS and 20% restricted POS.

LANCELIN SOUTH STAGE 1 OUTLINE DEVELOPMENT PLAN
Public Open Space Provision

A Joe Matthews Project

0m 50 100m

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d:May 2011
j:03/096

figure 07

TABLE 2: PUBLIC OPEN SPACE SCHEDULE - LANCELIN SOUTH STAGE 1 OUTLINE DEVELOPMENT PLAN

Gross Site Area (m2)		**194.4400**
Deductions		
Primary School	3.5100	
Commercial	0.2474	
Mixed Business Area	56.67	
Drainage Basins (1:1yr Storm Event):		
POS 1A	0.7068	
POS 3B	0.5019	
POS 5A	0.6705	
POS 6A	1.0705	
Conservation Area	22.8579	
Total Deductions	**86.2350**	
Gross Subdivisible Area		108.2050
Required Public Open Space (10%)		**10.8205**
Public Open Space Requirements		
Unrestricted public open space – minimum 80%	8.6564	
Restricted public open space – maximum 20%	2.1641	
Total		**10.8205**
PUBLIC OPEN SPACE PROVISION		
Unrestricted Public Open Space		
POS 1A	3.1800	
POS 3A	0.8100	
POS 3B	0.3700	
POS 5A	2.8500	
POS 6A	6.7000	
POS 6B	0.5300	
Total Unrestricted Public Open Space		**14.4400**
Restricted Public Open Space		
Drainage Basins (1:5yr Storm Event)		
POS 1A	0.1387	
POS 3B	0.0916	
POS 5A	0.1400	
POS 6A	0.1519	
Total Restricted Public Open Space		**0.5222**
Total Public Open Space		**14.9622**
Percentage of Credited Public Open Space Provided		**13.8%**
(Unrestricted and Restricted POS Contribution)		

1. *To be read in accordance with Lancelin South Stage 1 Outline Development Plan Figure 6 - Public Open Space Provision.*
2. *Drainage calculations in accordance with TABEC Civil Engineering Consultants Drainage Plan - Drawing Number 2173-SK-028 Issue B.*

4.5 NON-RESIDENTIAL LANDUSES

The ODP area contains a total of 55 hectares north of Lancelin Road that is to be zoned and developed for mixed business/industrial purposes. This land is to be subdivided and released in a staged manner, largely determined by the demand.

In the ODP area south of Lancelin Road, three sites are identified for future commercial use. These lots, comprising 1066 m^2, 1404 m^2, and 940 m^2 are intended to be developed as local centres, providing limited convenience shopping to local residents and passing traffic.

In accordance with a Deed of Agreement between the Developer and the Shire, the Developer has undertaken to establish, and contribute to, a community facilities fund and a coastal facilities fund. These funds, to be administered by the Shire of Gingin, will provide for the construction of public facilities both within the ODP area and Lancelin generally. The Deed of Agreement dated 6 March 2001 and Deed of Variation dated 14 May 2010 are included as **Appendices B and C**.

4.6 MOVEMENT NETWORK

Bruce Aulabaugh Traffic Engineering & Transport Design has prepared a traffic forecast and intersection design report describing the new intersections and necessary upgrades to Lancelin Road and Old Ledge Point Road required to provide access to Lancelin South. This report is included as **Appendix D** and was revised following feedback from the review undertaken by Porter and Associates on behalf of the Shire in September 2010.

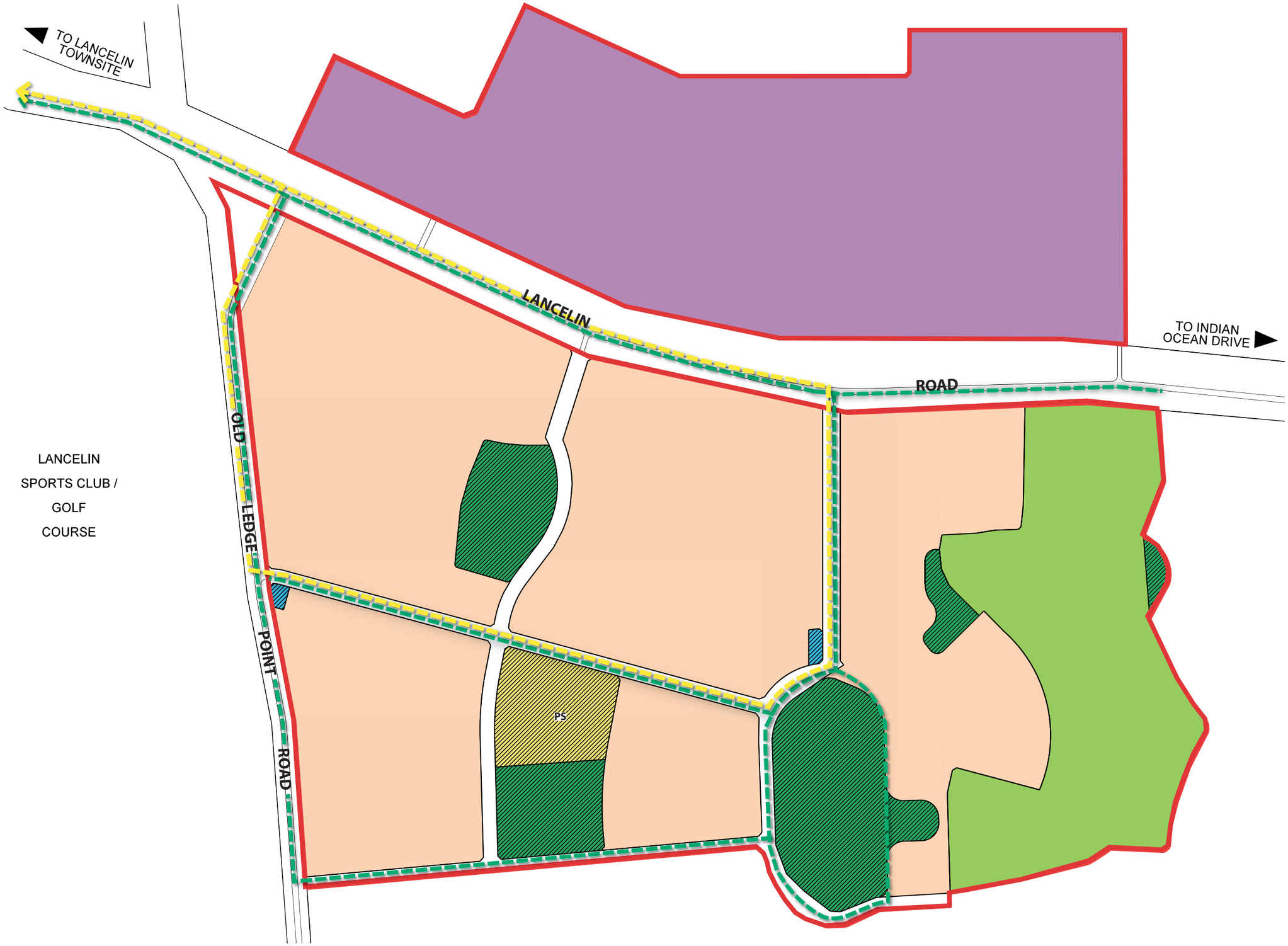
In summary, the traffic forecast and intersection design report makes the following recommendations regarding road upgrades:

- Lancelin Road to be upgraded to an Integrated Arterial B standard as defined in *Liveable Neighbourhoods;*
- Old Ledge Point Road to be sealed to a width of 7.5 – 8 metres to a point south of the proposed coastal access road or from any intersection from Lancelin South, whichever is further south;
- The intersection of Old Ledge Point Road with Lancelin Road to be realigned to provide a 90 degree angle of intersection.

In addition, the intersections with Lancelin Road and Old Ledge Point Road that are required to provide access to Lancelin South, are to be designed and constructed in accordance with the Traffic Report contained in **Appendix D**.

The residential portion of the ODP area (located south of Lancelin Road) will link to the regional road network from two (2) intersections with Lancelin Road. The precise location, design and staging of these intersections is outlined in the *South Lancelin Stage 1 Traffic Forecast & Intersection Design (October 2010)* prepared by Bruce Aulabaugh. As the staged development of the ODP area extends to its western extent, two intersections will also be constructed with Old Ledge Point Road that will provide more direct access from Lancelin South to Ledge Point and the Coast.

A further two (2) intersections will be constructed with Lancelin Road to provide access to the commercial area north of Lancelin Road. Initially, the LSSP anticipated three (3) intersections heading north from Lancelin Road, however, detailed consideration of required separation distances has resulted in the new intersection locations described in the ODP and outlined in **Figure 8** - Movement Network.



LEGEND

- STAGE 1 OUTLINE DEVELOPMENT PLAN AREA

ZONES

- RESIDENTIAL
- COMMERCIAL
- INDUSTRIAL
- CONSERVATION

RESERVES

- PARKS & RECREATION
- PUBLIC USE
  PS PRIMARY SCHOOL

- DUAL USE PATHWAY
- ROAD SUITED TO BUS ROUTE

NOTE: FOOTPATHS ARE TO BE GENERALLY PROVIDED ON ONE SIDE OF ALL ROADS IN ACCORDANCE WITH LIVEABLE NEIGHBOURHOODS.

LANCELIN SOUTH STAGE 1 OUTLINE DEVELOPMENT PLAN

Movement Network

A Joe Matthews Project

0m 50 100m

s:1:NTS@A3
d:May 2011
j:03/096

figure **08**

4.7 LOCAL WATER MANAGEMENT STRATEGY

A Local Water Management Strategy (LWMS) has been prepared by RPS to detail the integrated water management strategies for the site and facilitate future urban water management planning. A summary of the key elements is provided below:

Key LWMS Elements	Design and Compliance to Objectives
Water Conservation Strategy	• A Lancelin South Design Guidelines (LSDG) document will be prepared at the subdivision stage of the development and will be attached to the Contract of Sales. • The LSDG will include educational and promotional information which encourages water conservation measures and waterwise products and services. • The LSDG will also include guidelines for sustainable living detailing information relating to drainage controls, pollution reduction, fertiliser/pesticide application and illegal waste/spill reporting. • Conservation POS, if identified in future stages, will be retained and enhanced with existing vegetation and will not require irrigation. • Native gardens and waterwise plants will be used within POS, arborways, medians and verges. • Overall irrigation demand will be reduced through precise irrigation design and scheduling, using drip line irrigation, applying correct plant establishment methods. • Irrigation of POS will be from the Superficial Aquifer using abstraction bores located in the area, significantly reducing scheme water demand. •
Stormwater Management	• A conceptual drainage strategy demonstrates that the land is capable of retaining the 100 ARI events, while providing an indicative location of stormwater detention. • Structural and non-structural controls will be used to improve stormwater quality, as compared to a development that does not actively manage stormwater. • Rainfall from 1 year ARI (Annual Recurrence Interval) events will be retained and infiltrated as close to the source as possible. • Large rainfall events (>5 yr ARI to 100 yr ARI) will be conveyed and retained through a network of roads, drainage reserves and POS within each catchment. • It is anticipated that there will be no impacts from stormwater run-off to downstream ecosystems.

Key LWMS Elements	Design and Compliance to Objectives
Groundwater Management	• The intended stormwater structural controls will improve infiltrating stormwater water quality through reducing water velocities, biological uptake and increasing infiltration areas. • The site includes significant groundwater separation distances (generally greater than 3 m), which will provide further treatment of the stormwater as it infiltrates through the soil profile. • Minimise and control the levels of fertilisers and pesticides applied to the site through appropriate plant selection and operation and maintenance; • Maintain healthy and well established plants, particularly in vegetated drainage systems;
Monitoring	• Pre-development monitoring of the groundwater has commenced. • Post-development groundwater levels and quality monitoring will continue biannually for three years after practical completion to verify pre-development values are being maintained or improved. • Contingency measures will be implemented in the event of trigger values being exceeded in two consecutive monitoring events.
Implementation	• Roles and responsibilities involved in the implementation of the LWMS are identified.

For further detail, please refer to the LWMS prepared by RPS and lodged with the Department of Water and the Shire of Gingin which has been modified to incorporate feedback following independent review by Porter Consulting Engineers, on behalf of the Shire of Gingin.

4.8 SITE WORKS AND DRAINAGE

4.8.1 EARTHWORKS/SITE WORKS

As previously noted, the ODP area varies in elevation, with a major ridge aligned north/south which roughly dissects the site into two major stormwater catchments. There is also a general grade across the site, from a maximum height of approximately 60 metres AHD on the eastern boundary, to low areas of approximately 5 metres AHD at the western boundary. In accordance with the Structure Plan design, the earthworks programme will retain the existing vegetation located on the ridge lines.

The site works component of the construction programme will involve the clearing of vegetation and stripping of topsoil in the development areas, except where vegetation is to be retained in lots. It is expected that hard rock may be encountered on site during initial earthworks programmes and also in trenching activities during the installation of services.

In undulating areas, it may be necessary to construct retaining walls to achieve developable lots, however, these will be avoided where possible.. In the more elevated and steeper areas, larger lots are proposed that will facilitate the retention of much of the native vegetation. These larger lots and the lower residential density will reduce the need for retaining walls.

Road widths will vary throughout the proposed development, with dual lane boulevards being constructed on the major estate entrances. A combination of 7.4 m and standard 6.0 m roads will comprise the road reserve widths within the subdivision and laneways with a width of 6.0 m will also be constructed in the higher density areas. Due to the undulating nature of the site, and the developers intent to retain existing ridge lines it will be necessary for detailed design to be undertaken in select areas. Innovative design solutions will be implemented at the time of subdivision in order to minimise the impact of earthworks on areas of bushland being retained and the steep ridges.. All roads will be designed and constructed to the engineering standards of the Shire of Gingin, and Main Roads WA where appropriate.

Road design will consider sustainable drainage strategies and include opportunities that minimise standard road kerb and piped systems. Where possible, flush kerbing will be included on POS boundaries and where verge or median swales are included in the road design to accommodate stormwater infiltration.

Roads will be kerbed and asphalted with brick paved intersections or red asphalt treatments. Bollards will be installed along road reserve boundaries adjacent to POS where flush kerbing is incorporated in the road design to restrict unauthorised vehicular access into these areas.

In order to ameliorate the impact of trucks transporting lime sand from mining leases located to the south and south-west of the ODP area, the Developer will seal a portion of Old Ledge Point Road, including the intersection with Lancelin Rd.

4.8.2 DRAINAGE

Water sensitive urban design initiatives will be implemented into the detailed drainage design. In particular, storm water collected in the road reserves will be infiltrated as close as possible to the collection point for immediate groundwater recharge.

Based on the undulating land, and the numerous areas of POS as identified in the Structure Plan, a number of small drainage swale facilities will be incorporated within select sites.

Flush kerbing will be utilised on POS boundaries and where median and verge swales may be constructed in the road reserves. Where necessary, the piped drainage systems will transfer the 1 in 5 year storm event to infiltration basins capable of storing the 1 in 10 year storm event. Soak wells and baseless pits will also be included to reduce the dependency on downstream facilities and to promote direct infiltration. Given the sandy nature of the soils on site, this would be appropriate and will be included where sufficient elevation is provided above the groundwater table.

4.9 SERVICING

4.9.1 WATER SUPPLY

The potable water supply for Lancelin South will be provided in a staged manner, with the first stage of development temporarily utilising the existing groundwater extraction bore and treatment/storage facility located at the nearby Seaview Park, The Water Corporation anticipate that a temporary upgrade of this existing facility with additional storage capacity will adequately service the first 250 dwellings at Lancelin South. No additional chlorination facilities will be required, and sufficient space exists on the site to construct a new temporary tank. **Figure 9** demonstrates one of the indicative alignments of the water main to be constructed from this existing facility that may require the construction of an additional storage tank.

The connection from the additional storage tank to Lancelin South maybe provided through a DN200 water main from Seaview Park, along Lancelin Road to the initial stage of subdivision. While the new water main alignment predominantly runs through public road reserves, a number of easements may be required where the main traverses private land or POS. It is noted that at the time of preparing this report the final alignment for the water line was not yet known and this will be subject to detailed engineering works at the time of construction.

Beyond the first 250 lots, additional servicing investigation and detailed planning is required by the water service provider. In anticipation of this new potable water supply, the Developer has constructed an appropriately licensed bore into the confined aquifer north of Lancelin Road (refer **Figure 9** – Servicing). This bore is constructed to the specification and satisfaction of the Water Corporation and is anticipated to complement the first stage potable water reticulation scheme to supplying Lancelin South.

While detailed servicing planning is yet to be completed, it is anticipated that this bore will pump to a common tank for treatment and storage. A probable scenario will be to further increase the storage capacity at Seaview Park to take advantage of the existing infrastructure and elevated site, however a number of other elevated sites are available for the new storage tank if required.

4.9.2 WASTEWATER

The Lancelin Townsite is serviced by a wastewater treatment facility located at Lot 1 Lancelin Road that is 500 metres north of Lancelin Road. While this treatment plant has some capacity to service additional lots, the facility requires expansion to cater for the ultimate Lancelin South development. It is noted that there is sufficient room within the site for the construction of additional evaporation ponds. The timing for any increased capacity will be determined by the Water Corporation and will be largely dependent on additional demand created by Lancelin South and further urban infill of the Lancelin Townsite.

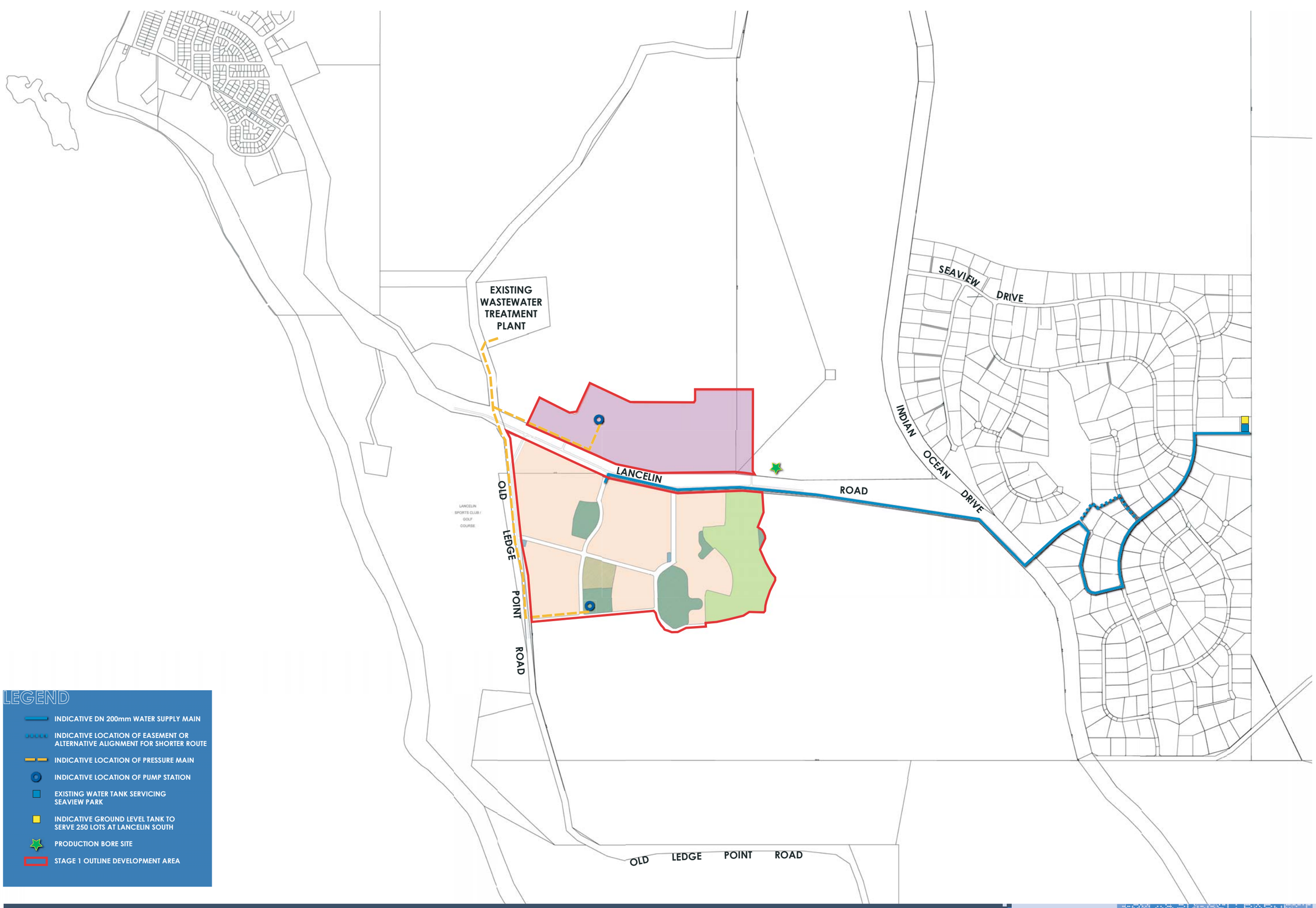
While the Water Corporation is yet to commence the detailed planning and needs assessment, preliminary consideration of the population growth anticipated in this area has prompted consideration of the following four potential wastewater treatment options for the Gingin coast:

1. Decommission the Lancelin and Ledge Point facilities and construct a new facility at an as yet undetermined location, with the capacity to service the existing and predicted population growth;
2. Decommission the Ledge Point facility and increase the capacity of the Lancelin site;
3. Decommission the Lancelin facility and increase the capacity of the Ledge Point site; or
4. Increase the capacity of both sites to accommodate the anticipated population growth in each respective local area.

Of these options, the first and third are the preferred planning outcomes, as these allow for the relocation of the wastewater facility that currently obstructs the urban integration of Lancelin South with the Lancelin townsite.

Should the Water Corporation determine to pursue option one, a new site would need to be located in the context of the *Overall Structure Plan* on suitable land with sufficient buffer distances from existing or proposed land uses. This planning has not yet commenced, and the Water Corporation has not identified this as a priority task at this time.

Preliminary investigations indicate that two new sewer pump stations are required to service the ODP area. As the detailed planning required to specifically site these pump stations is yet to commence, **Figure 9** shows indicative locations that take advantage of local relief, and publicly owned land as suggested sites. The exact locations of the permanent pump station sites will be established at the time of subdivision.



LEGEND

- INDICATIVE DN 200mm WATER SUPPLY MAIN
- INDICATIVE LOCATION OF EASEMENT OR ALTERNATIVE ALIGNMENT FOR SHORTER ROUTE
- INDICATIVE LOCATION OF PRESSURE MAIN
- INDICATIVE LOCATION OF PUMP STATION
- EXISTING WATER TANK SERVICING SEAVIEW PARK
- INDICATIVE GROUND LEVEL TANK TO SERVE 250 LOTS AT LANCELIN SOUTH
- PRODUCTION BORE SITE
- STAGE 1 OUTLINE DEVELOPMENT AREA

LANCELIN SOUTH STAGE 1 OUTLINE DEVELOPMENT PLAN

Servicing Options

A Joe Matthews Project

0m 100 200m

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figure 09

Construction of the permanent sewer pump-stations and pressure main are to be pre-funded by the Developer, with permanent infrastructure to be constructed to the Water Corporation's specification and satisfaction.

4.9.3 ELECTRICITY/POWER

The existing Western Power infrastructure, consisting of three-phase overhead power cables located on the northern side of Lancelin Road are sufficient to provide power to all development proposed within the ODP area.

Western Power is aware of the pending development of Lancelin South through the consultation process required for Amendment 93. Further detailed planning and coordination regarding matters such as timing of development, location and construction of electricity infrastructure will be addressed during the subdivision process.

4.9.4 TELECOMMUNICATIONS

Lancelin South will be serviced from existing Telstra infrastructure for landline telecommunications, and is also serviced by multiple mobile telecommunications service providers.

4.9.5 GAS

Lancelin is not serviced with a reticulated gas supply for residential consumption with the nearest distribution main located approximately 75 kilometres to the south. There are no plans to extend this existing supply, or draw a service from the Dampier to Bunbury gas pipeline that is located approximately 30 kilometres to the east.

All gas requirements will therefore be limited to bottled liquefied natural gas.

5 IMPLEMENTATION

5.1 SUBDIVISION

Following approval of the ODP by the Shire and the WAPC, subdivision applications will be lodged for the approval of the WAPC. As part of the assessment and approval process, the subdivision application will be referred to the Shire for a recommendation, including a recommendation on the conditions to be imposed on the subdivision approval.

A Residential Density Code Plan shall also be submitted at the time of subdivision to the WAPC, depicting the specific Residential Density Code (RCode) for each lot included within the subdivision plan, in accordance with the Zoning and Residential Density Plan included within this ODP (Figure 5) and the density requirements outlined in the ODP. Approval of the Residential Density Code Plan shall be undertaken at the time of determination of the subdivision application by the Western Australian Planning Commission.

Once the Residential Density Code Plan has been approved by the Western Australian Planning Commission the plan will then form part of the Outline Development Plan and be used for the determination of future development applications. Variations to the Residential Density Code Plan will require further approval from the WAPC. A copy of the proposed Residential Density Code Plan and proposed Subdivision Plan for the stage 1 subdivision area shall be inserted into Appendix E of this ODP report for reference purposes.

The following schedule has been prepared in order to identify the matters to be addressed by the subdivider at the time of subdivision, in addition to the standard service infrastructure requirements associated with subdivision and imposed by the WAPC:

TABLE 3: SCHEDULE OF MATTERS TO BE ADDRESSED AT SUBDIVISION STAGE

Item	Requirement
Community Facilities Fund	Establishment of a Community Facilities Fund with funds to be paid on the sale of each residential lot at a rate per lot being the value of the single vacant lot minimum annual residential rate. Community facilities will be constructed in accordance with the priorities set by the Shire, and the Community Facilities Fund to be paid on the sale of each lot.
Maritime Facilities Fund	Establishment of a Maritime Facilities Fund for $207 per lot upon the sale of each residential lot. Funds to be paid on the sale of each residential lot.
Coastal Access and Development Plan	Preparation of a Coastal Access and Development Plan incorporating vehicular link including dual use path from development area to the coast, car parking and coastal amenities such as power, water, telephone services, and ablution facilities. The Coastal Access and Development Plan is to be required as a condition of subdivision.
Coastal Link	Prior to the clearance of the subdivision of the first lot, Council will require the construction of a coastal link for vehicle, pedestrian, bicycle use and car parking. Prior to the clearance of subdivision conditions for the first lot, the Council will require a bond or bank guarantee for an amount no less than the cost of the construction of: - A coastal link in the form of a Dual Use Path; and - Coastal amenities including provision of power, water, telephone services, car park lighting and ablution facilities. In a period no longer than one year from the date that a certificate of occupancy is granted by the Council for the 50th dwelling in Lancelin South, the developer shall construct the coastal link

Item	Requirement
	in the form of a dual use path and the coastal amenities referred to above.
Dual Use Path Way	Prior to the clearance of subdivision conditions for the first lot, the Council will require a bond or bank guarantee for an amount no less than the cost of the construction of: • A Dual Use Pathway Plan linking the Development Area to the Lancelin Community Sporting Club Rooms and from the Lancelin Sporting Club Rooms to the existing Dual Use Path system in the Lancelin Townsite. In a period no longer than one year from the date that a certificate of occupancy is granted by the Council for the 50th dwelling in Lancelin South, the developer shall construct the Dual Use Pathway referred to above.
Design Guidelines	Design guidelines will be prepared by the Developer in consultation with the Shire of Gingin in order to achieve a high level of built form amenity. The design guidelines will be made available to all prospective land purchasers and may address such matters as – front and side setbacks, location of garages and crossovers, site responsive design with regard to extant vegetation and landform, recommended building materials, optimum thermal efficiency, water and energy use efficiency, landscaping, bushfire prevention and protection, building height and any agreed Residential Design Code variations. Implementation and enforcement of these Design Guidelines will be negotiated with the Shire of Gingin and may include adopting the Guidelines as a local planning policy.
Acoustic Report	An acoustic report for the ODP area is required to be prepared by the developer in order to determine which lots, if any, may be adversely affected by noise as a result of being located adjacent to Lime sand Haulage Routes. The Council will require the Acoustic Report as a condition of subdivision.
Old Ledge Point Road	As a condition of subdivision, the Shire will require the Developer to seal Old Ledge Point Road from the intersection at Lancelin Road to the Coastal Link and the intersection adjacent to the Subdivision, to the satisfaction of the Shire, to ameliorate dust impacts on newly created 'Urban' lots from extractive industries and/or mining tenements operating on those roads. Further construction and upgrading of Old Ledge Point Road shall be required upon connection of any new subdivision roads within the Lancelin South Outline Development Plan (ODP) area to Old Ledge Point Road, taking into consideration the urban traffic volumes generated by the subdivision, to a standard to be determined in the Traffic Engineering Study, prepared for the ODP.

5.2 ENVIRONMENTAL MANAGEMENT STRATEGIES

The environmental review prepared by Ecoscape for the whole of the Lancelin South Structure Plan Area includes a number of management strategies to be implemented to protect and enhance key environmental attributes.

Environmental Management Strategies may be required to be prepared at the appropriate stage of subdivision and may be imposed as a condition of subdivision approval, to address the following -

- Vegetation Clearing Strategy
- Rehabilitation Management Strategy
- Weed Management Strategy
- Construction Management Strategy
- Bushfire Management Strategy
- Fauna Relocation and Management Strategy

These plans will be prepared in accordance with the Environmental Review and are briefly described below.

5.2.1 VEGETATION CLEARING STRATEGY

This strategy will identify vegetation to be cleared to make way for development, establish appropriate provisions for consideration during clearing, and determine the methods of disposing of cleared material. The Clearing Strategy will be prepared prior to subdivision works commencing with advice from the Department of Environment and Conservation and implemented by the Developer.

5.2.2 REHABILITATION MANAGEMENT STRATEGY

A Rehabilitation strategy will apply to areas of vegetation to be retained and will be prepared prior to subdivision works commencing in relevant areas. It will include:

- A rehabilitation and revegetation strategy for relevant POS (conservation) that emphasises the use of local, native flora;
- Provision for enhancing ecological corridors;
- Mitigation strategies to ameliorate impact of development;
- Establishment of monitoring criteria and evaluation program to determine success of the rehabilitation and revegetation activities; and
- Timing, implementation, and review schedules.

5.2.3 WEED MANAGEMENT STRATEGY

The Weed Management Strategy will inform the subdivider and future landowners of control and management of weed species on public and private space, and also focus on the disposal of garden waste to restrict weed proliferation.

5.2.4 CONSTRUCTION MANAGEMENT STRATEGY

The Construction Management Strategy will be prepared prior to subdivision works commencing and will regulate actions during construction of public and private works to ensure that:

- Minimal clearing and vegetation disturbance occurs during construction;
- Dust, noise, and other emissions are controlled within acceptable limits;
- Wind erosion is considered and controlled; and
- Environmental protection clauses are required in all relevant construction contracts.

5.2.5 BUSHFIRE MANAGEMENT STRATEGY

A Bushfire Management Strategy (FMS) shall be prepared by an appropriately qualified consultant to the satisfaction of the Fire and Emergency Services Authority of Western Australia (FESA) and the Shire of Gingin as a condition of subdivision approval. The FMS shall include:

- Assessment of key fire management issues;
- A detailed risk assessment for wildfires within the development area and adjoining land;
- Strategies for fire management (e.g. firebreaks, separation distances) to be implemented during detailed planning;

- Fire management strategies and programs implemented by the Developer throughout the life of the development to control fire risk;

The FMS shall be prepared in accordance with all relevant Government policies, regulations and guidelines.

5.2.6 FAUNA RELOCATION AND MANAGEMENT STRATEGY

A Fauna Relocation and Management Strategy (FRMS) will be prepared prior to subdivision works with regard to identified key fauna habitat areas. This plan shall be implemented at the time of subdivision and include a considered approach to clearing native vegetation to reduce impacts on resident fauna and flora habitat.

5.3 URBAN WATER MANAGEMENT

In accordance with *Better Urban Water Management (2008)*, an Urban Water Management Plan (UWMP) will be required to accompany and support subsequent applications for subdivision. The UWMP will provide the practical implementation of the recommendations of the LWMS including the following:

- Compliance with all LWMS criteria and objectives to Shire and Department of Water satisfaction
- Detailed stormwater drainage design;
- Average annual maximum groundwater levels to be monitored and modelled with trigger values to be established as part of groundwater management;
- Subdivision layout to consider overland stormwater flows and drainage layout when determining cut to fill levels;
- Groundwater modelling to allow for improved groundwater management.

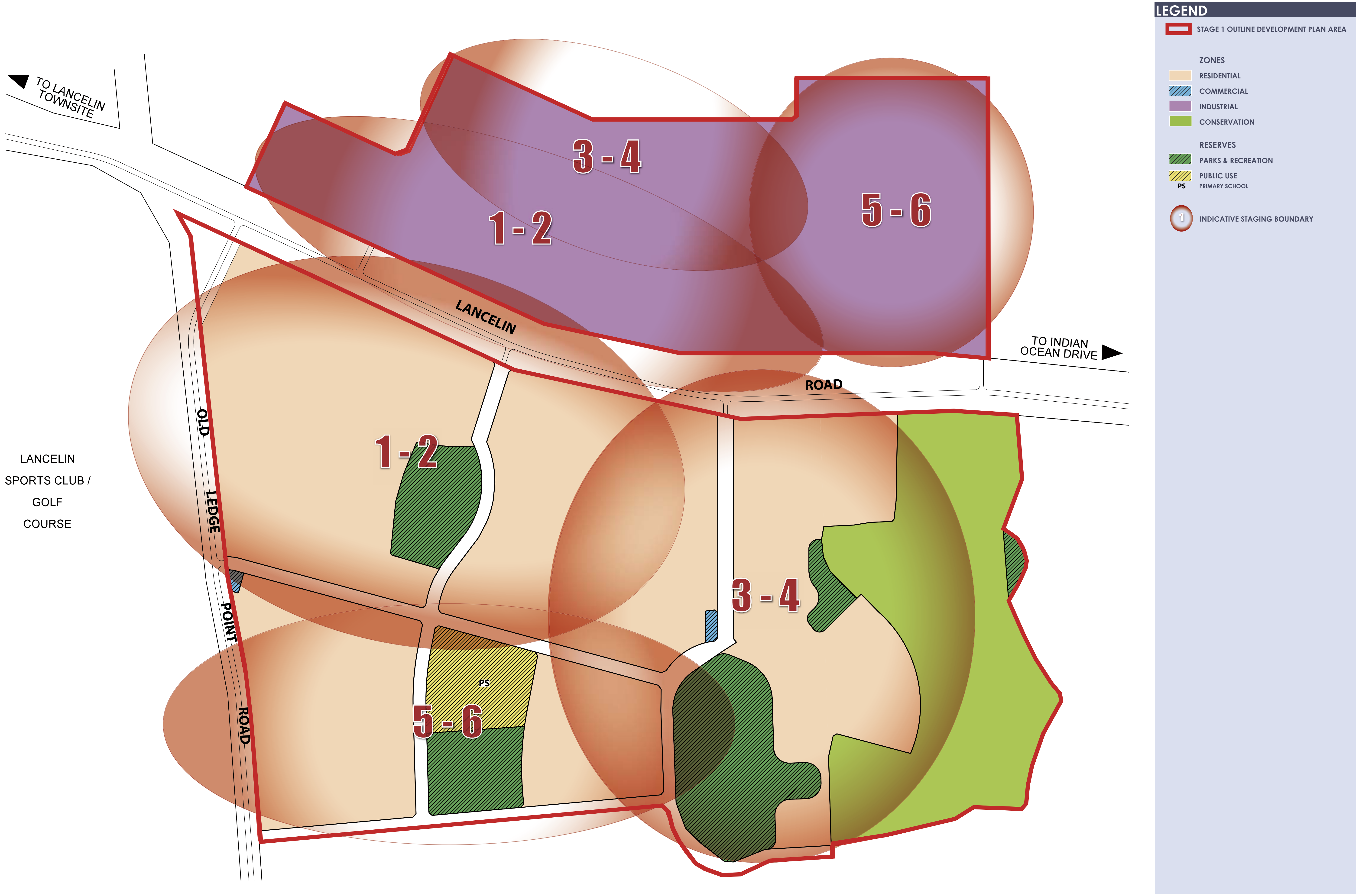
5.4 STAGING

The subdivision and development of the Lancelin South ODP area will be undertaken in a staged manner.

Figure 10 – Staging Plan outlines the proposed subdivision staging for the ODP area and addresses the following:

- A range of lot sizes and densities to provide a variety of product to the market.
- The first stage has been located in a position that can accommodate, and be accessible to, essential infrastructure and minimise the cost of extending power, water and infrastructure.
- The main entry road is located central to the first few land release areas and allows easy vehicle circulation between each release area.
- Stage 1 is located and proposed to be developed to enable establishment of a suitable sized residential population that can grow as a critical mass to support the development of key features and facilities.

Other factors may impact on the staging of development. A continuous review of staging will be undertaken, as the land is progressively developed and land sales are reviewed.



LANCELIN SOUTH STAGE 1 OUTLINE DEVELOPMENT PLAN

Staging Plan

A Joe Matthews Project

0m 50 100m

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d:May 2011
j:03/096

figure 10

APPENDIX A
Certificates of Title

WESTERN AUSTRALIA

REGISTER NUMBER	
5243/DP206398	
DUPLICATE EDITION	DATE DUPLICATE ISSUED
N/A	**N/A**

RECORD OF CERTIFICATE OF TITLE

UNDER THE TRANSFER OF LAND ACT 1893

VOLUME **1696** FOLIO **283**

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

REGISTRAR OF TITLES

REGISTRAR OF TITLES WESTERN AUSTRALIA

LAND DESCRIPTION:

LOT 5243 ON DEPOSITED PLAN 206398

REGISTERED PROPRIETOR:
(FIRST SCHEDULE)

JOSEPH BECK MATTHEWS OF ABILENE, TEXAS, UNITED STATES OF AMERICA
(T D037558) REGISTERED 5 JUNE 1985

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

1. THE LAND THE SUBJECT OF THIS CERTIFICATE OF TITLE EXCLUDES ALL PORTIONS OF THE LOT DESCRIBED ABOVE EXCEPT THAT PORTION SHOWN IN THE SKETCH OF THE SUPERSEDED PAPER VERSION OF THIS TITLE.
2. *I049280 CAVEAT BY SHIRE OF GINGIN LODGED 20.3.2002.

Warning: A current search of the sketch of the land should be obtained where detail of position, dimensions or area of the lot is required.
* Any entries preceded by an asterisk may not appear on the current edition of the duplicate certificate of title.
Lot as described in the land description may be a lot or location.

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

STATEMENTS:

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

SKETCH OF LAND: 1696-283 (5243/DP206398).
PREVIOUS TITLE: 1319-700.
PROPERTY STREET ADDRESS: NO STREET ADDRESS INFORMATION AVAILABLE.
LOCAL GOVERNMENT AREA: SHIRE OF GINGIN.

NOTE 1: A000001A LAND PARCEL IDENTIFIER OF SWAN LOCATION 5243 (OR THE PART THEREOF) ON SUPERSEDED PAPER CERTIFICATE OF TITLE CHANGED TO LOT 5243 ON DEPOSITED PLAN 206398 ON 30-JUL-02 TO ENABLE ISSUE OF A DIGITAL CERTIFICATE OF TITLE.

NOTE 2: THE ABOVE NOTE MAY NOT BE SHOWN ON THE SUPERSEDED PAPER CERTIFICATE OF TITLE OR ON THE CURRENT EDITION OF DUPLICATE CERTIFICATE OF TITLE.

WESTERN AUSTRALIA

REGISTER NUMBER	
9504/DP51420	
DUPLICATE EDITION	DATE DUPLICATE ISSUED
2	**10/1/2007**

RECORD OF CERTIFICATE OF TITLE

VOLUME **2646** FOLIO **96**

UNDER THE TRANSFER OF LAND ACT 1893

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

REGISTRAR OF TITLES

REGISTRAR OF TITLES WESTERN AUSTRALIA

LAND DESCRIPTION:

LOT 9504 ON DEPOSITED PLAN 51420

REGISTERED PROPRIETOR:
(FIRST SCHEDULE)

JOSEPH BECK MATTHEWS OF ABILENE, TEXAS, UNITED STATES OF AMERICA
(AF K042374) REGISTERED 2 JANUARY 2007

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

1. RESTRICTIVE COVENANT BENEFIT - SEE DEPOSITED PLAN 51420 AND INSTRUMENT K42376
2. RESTRICTIVE COVENANT BENEFIT - SEE DEPOSITED PLAN 51420 AND INSTRUMENT K42377.

Warning: A current search of the sketch of the land should be obtained where detail of position, dimensions or area of the lot is required.
* Any entries preceded by an asterisk may not appear on the current edition of the duplicate certificate of title.
Lot as described in the land description may be a lot or location.

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

STATEMENTS:

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

SKETCH OF LAND:	DP51420 [SHEET 1,4,5].
PREVIOUS TITLE:	2625-276.
PROPERTY STREET ADDRESS:	NO STREET ADDRESS INFORMATION AVAILABLE.
LOCAL GOVERNMENT AREA:	SHIRE OF GINGIN.

WESTERN AUSTRALIA

REGISTER NUMBER	
9505/DP51420	
DUPLICATE EDITION	DATE DUPLICATE ISSUED
2	**10/1/2007**

RECORD OF CERTIFICATE OF TITLE

VOLUME **2646** FOLIO **97**

UNDER THE TRANSFER OF LAND ACT 1893

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

REGISTRAR OF TITLES

LAND DESCRIPTION:

LOT 9505 ON DEPOSITED PLAN 51420

REGISTERED PROPRIETOR:
(FIRST SCHEDULE)

JOSEPH BECK MATTHEWS OF ABILENE, TEXAS, UNITED STATES OF AMERICA
(AF K042374) REGISTERED 2 JANUARY 2007

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

1. RESTRICTIVE COVENANT BENEFIT - SEE DEPOSITED PLAN 51420 AND INSTRUMENT K42376
2. *H712992 CAVEAT BY SHIRE OF GINGIN LODGED 4.4.2001.
3. RESTRICTIVE COVENANT BENEFIT - SEE DEPOSITED PLAN 51420 AND INSTRUMENT K42377.

Warning: A current search of the sketch of the land should be obtained where detail of position, dimensions or area of the lot is required.
* Any entries preceded by an asterisk may not appear on the current edition of the duplicate certificate of title.
Lot as described in the land description may be a lot or location.

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

STATEMENTS:

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

SKETCH OF LAND:	DP51420 [SHEET 1,4,5].
PREVIOUS TITLE:	2625-276.
PROPERTY STREET ADDRESS:	NO STREET ADDRESS INFORMATION AVAILABLE.
LOCAL GOVERNMENT AREA:	SHIRE OF GINGIN.

APPENDIX B
Deed of Agreement
(Shire of Gingin & Mr Matthews, 16 March 2001)

DATED _____ 2001

JOSEPH BECK MATTHEWS

AND

SHIRE OF GINGIN

D E E D

McLEOD & CO
SOLICITORS
220-222 STIRLING HIGHWAY
CLAREMONT WA 6010
Telephone: 9383 3133
Facsimile: 9385 2693
Reference: McL/N8 12063
(c#d)

THIS DEED is made the 6th day of March 2001

BETWEEN:

JOSEPH BECK MATTHEWS of Abilene,)
Texas in the United States of America)
("the Developer"))

AND

TAX INVOICE - ABN 45 320 599 544
WESTERN AUSTRALIA STAMP DUTY
MOR 19/03/01 13:13 001648293-002
FEE $ **********2,000
SD $ ******5.00 PEN $********.00

SHIRE OF GINGIN of 7 Brockman Street,)
Gingin in the State of Western Australia)
("the Shire"))

RECITALS:

A. The Developer is registered as the proprietor of an estate in fee simple in the land described in Item 1 of the Schedule hereto ("the Land").

B. The Land is situated within the district of the Shire and is the subject of the Lancelin Coastal Village Structure Plan ("the Structure Plan") which has been approved by the Council of the Shire ("the Council") and a copy of which is annexed hereto as Annexure 1.

C. The Council is contemplating rezoning the Land from "Rural" to "Urban Development" ("the Rezoning") to enable the development of a residential community within the area of the Structure Plan.

D. On 18 July 2000 the Council resolved as follows:

"1. Where Council is satisfied that an adequate mechanism for community facility provision has been achieved, Council is unlikely to insist on a staged rezoning of the structure plan area;

2. Council accepts the applicant's suggestion for a managed strategy, whereby a community facilities contribution for facilities within the development is made on a per lot basis, matched by the local authority, and paid into a Reserve fund.

3. A Deed of Agreement would need to be prepared by Council's solicitors, with legal costs shared equally between both parties, and should include:

(a) Common understanding that the agreement is based on the Lancelin Coastal Village Structure Plan and any urban development zoning and subdivision that may occur within the context of this Plan;

(b) Details for establishment of a Reserve Fund and the management structure for this fund, with Council being the administrator of the Reserve. A Community Management Group will be established and constituted as an advisory committee of Council, and will make recommendations to Council with respect to expenditure from this Reserve;

(c) Statement of purpose, namely, the establishment of a mechanism for the funding and staged implementation of community facilities to service the Lancelin Coastal Village Structure Plan area;

(d) A list of possible community facilities;

(e) A mutual commitment to contribute the equivalent of a single vacant lot minimum annual residential rate, payable into the Reserve Fund upon the sale of each lot within the subdivision area;

(f) Other contingencies considered necessary by Council solicitors.

(g) A commitment from the developer to the provision of maritime facilities and coastal access links through the recreation reserve."

("the Conditions")

E. The Council requires the Developer to enter into this Deed to address the Conditions prior to the Council initiating the Rezoning.

OPERATIVE PART:

1. INTERPRETATION

Interpretation

Unless expressed to the contrary:

(a) words importing:

(i) the singular include the plural and vice versa;

(ii) any gender include the other gender;

(b) if a word or phrase is defined cognate words and phrases have corresponding definitions;

(c) a reference to:

(i) a person includes a firm, unincorporated association, corporation and a government or statutory body or authority;

(ii) a person includes its legal personal representatives, successors or assigns;

(iii) a statute, ordinance, code, regulation, award or other law includes regulations and other statutory instruments made or issued under them and consolidations, amendments, re-enactments or replacements or any of them;

(iv) a right includes a benefit, remedy, discretion, authority or power;

(v) an obligation includes a warranty or representation and a reference to a failure to observe or perform an obligation includes a breach of warranty or representation;

(vi) provisions or terms of this Deed or another document, agreement, understanding or arrangement include a reference to both express and implied provisions and terms;

(vii) time is to be local time in Perth, Western Australia;

(viii) "$" or "dollars" is a reference to the lawful currency of Australia;

(ix) this or any other document includes the document as varied or replaced and notwithstanding any change in the identity of the parties;

(x) writing includes any mode of representing or reproducing words in tangible and permanently visible form, and includes facsimile transmissions;

(xi) any thing (including, without limitation, any amount) is a reference to the whole or any part of that thing and a reference to a group of things or persons is a reference to any one or more of them.

Headings

Headings do not affect the interpretation of this Deed.

Schedule

The Schedule and Annexures form part of this Deed.

2. **ACKNOWLEDGEMENTS AND COVENANTS RELATING TO REZONING AND SUBDIVISION**

2.1 The Developer HEREBY ACKNOWLEDGES that the Shire's agreement to initiate the Rezoning is based on the provisions of the Structure Plan and the Shire being satisfied that:

(a) an adequate mechanism for the provision of community facilities is put in place;

(b) adequate and appropriate reserve funds are established to be administered by the Shire with advice being provided by a community management group as an advisory committee to the Council on the allocation and expenditure of funds from the reserve fund relating to the community facilities.

2.2 The Developer agrees with the Shire that:

(a) within three years of the date of gazettal of the Rezoning, the Developer must:

(i) seek and obtain approval from the Western Australian Planning Commission for the Subdivision;

(ii) act on the Subdivision approval by commencing and using its best endeavours to complete the development works contemplated by the conditions of Subdivision approval; and

(iii) use his best endeavours to comply with and obtain certificates of clearance for the conditions of subdivision approval.

(b) If the Developer does not comply with subclause 2.2(a) the Shire may again rezone the Land without complaint from or liability to the Developer;

2.3 The Shire agrees that if the Developer is unable to comply with subclause 2.2(a) because of delay which in the opinion of the Shire is not attributable to the Developer, the Shire will allow a further period of time that the Shire considers reasonable to enable the Developer to fulfil his obligations under subclause 2.2(a).

2.4 The Developer acknowledges that nothing in this Deed affects or purports to fetter the statutory discretion of the Shire.

3. DEVELOPER'S COVENANTS

In consideration of the Shire agreeing to initiate the Rezoning the Developer HEREBY COVENANTS AND AGREES with the Shire that:

3.1 any subdivision and development of the Land shall be in accordance with the Structure Plan and the requirements of the Shire;

Community Facilities

3.2 he will facilitate the establishment by the Shire of a reserve fund ("the Community Facilities Fund") in accordance with the provisions of the Local Government Act 1995 from which funds will be drawn for the construction

and/or maintenance of community facilities ("the Community Facilities") to service each part of the Structure Plan area as it is created by the subdivision of the Land ("the Subdivision");

3.3 on the sale of the fiftieth (50^{th}) lot forming part of the Subdivision he will establish a community management group which will be created as an incorporated association ("the Community Association") the rules of which must be satisfactory to the Shire and which will become an advisory committee to the Council to make recommendations with respect to expenditure from the Community Facilities Fund for the provision of the Community Facilities;

3.4 he will ensure that the rules of the Community Association provide inter alia:

(i) that the purchaser or occupier of any residential lot within the Subdivision will be eligible to become a member of the Community Association; and

(ii) that a committee be elected and that membership of the committee shall include one Councillor of the Council and an officer of the Shire both appointed by the Council and a representative of the Developer; and

(iii) that the committee of the Community Association must liaise with the Shire in regard to the construction and cost of the Community Facilities specified in the Structure Plan Report for each part of the Subdivision as that part of the Subdivision is created;

3.5 on the sale of each residential lot within the Subdivision the Developer will contribute to the Community Facilities Fund an amount equivalent to the single vacant lot minimum annual residential rate applicable at the time of sale;

3.6 the Community Facilities will be constructed in accordance with priorities set by the Shire in consultation with Developer and the Community Association, or, when the Developer is no longer involved, the Community Association, and

although the Shire shall have due regard to the recommendations of the Community Association, it shall not be bound to draw funds from the Community Facilities Fund in accordance with any recommendation made to it.

3.7 in the event that the Community Association becomes defunct or ceases to operate effectively because of lack of membership then the Shire shall be the sole arbiter of the need for Community Facilities and shall have the power to draw on the Community Facilities Fund for the construction and/**or** maintenance of the Community Facilities;

Maritime Facilities

3.8 (i) the Developer on the sale of each residential lot within the Subdivision shall contribute the amount specified in paragraph (ii) of this clause into another reserve fund ("the Maritime Facilities Fund") under the control of the Shire and the monies in the Maritime Facilities Fund shall be used for the construction and/or maintenance by the Shire of maritime facilities in the Upper Coastal Ward within the local government district of the Shire which maritime facilities may include, without limitation, boat launching facilities and boat launching facility access as and when determined necessary by the Shire.

(ii) in the 2001 calender year the Developer shall contribute $140 to the Maritime Facilities Fund upon the sale of a residential lot within the Subdivision, and in each subsequent calendar year the amount to be contributed shall be increased cumulatively by an amount proportional to the percentage annual increase in the minimum single vacant lot annual residential rate.

Link Road and Coastal Facilities

3.9 he will prepare and submit to the Shire prior to the Subdivision of the Land a Coastal Access and Development Plan to the satisfaction of the Shire showing:

(i) the pedestrian/vehicular link shown in the Structure Plan for access from the Land to the coast ("Link Road"); and

(ii) provision for beach-front vehicle parking and associated infrastructure and facilities ("Coastal Facilities").

3.10 the construction of the Link Road and Coastal Facilities will include a dual use path incorporated with the Link Road, provision for and construction of power and telephone services, pathway access to the beach and two beach carparks with a total of 80 car bays.

3.11 subject to obtaining all necessary approvals, he will construct the Link Road and Coastal Facilities (including the associated infrastructure referred to in clause 3.10) in accordance with the Coastal Access and Development Plan referred to above as modified from time to time by the Developer with the written approval of the Shire;

Expenditure by Shire

3.12 if, for any reason the funds held by the Shire in the Community Facilities Fund or the Maritime Facilities Fund are in the opinion of the Shire in excess of that required for the reasonable construction and/or maintenance of the Community Facilities or the Maritime Facilities, the Shire may expend monies from either Fund at its absolute discretion towards any developments or works within the Upper Coastal Ward, whether or not the expenditure is connected with the Subdivision.

4. **NO DISPOSAL**

The Developer must not sell, agree to sell, transfer, mortgage, lease, charge, assign or otherwise dispose of or encumber any part of the Land in its englobo state to any person without the prior written consent of the Shire which consent will not be withheld if the person to whom any such right or interest in the Land is to be granted has first executed a deed of covenant to be prepared by the Shire's solicitors at the cost of the Developer or such person whereby that person covenants to observe and perform such of the covenants, conditions and stipulations herein contained (including this covenant) as the Shire shall require as if that person had been a party to this Deed.

5. **CHARGE AND CAVEAT**

5.1 The Developer HEREBY CHARGES his interest in the Land in favour of the Shire with the performance of his obligations set out in this Deed and with the payment of all or any monies payable or which may become payable by the Developer to the Shire pursuant to this Deed and for the purpose of securing the same authorises the Shire to lodge an absolute caveat at the Department of Land Administration against the Land or any part thereof in order to protect the rights and interests of the Shire under this Deed

5.2 Providing there is no existing unremedied breach of this deed and provided that the developer complies with clause 4 herein, the Shire shall at the written request of the Developer provide an executed withdrawal of caveat to permit the registration of a mortgage over the Land to raise development funds in respect of the Land, with the Shire having a right to replace such caveat immediately following registration of such mortgage.

6. **SHIRE'S COVENANTS**

In consideration of the Developer agreeing to undertake the obligations set out in this Deed the Shire HEREBY COVENANTS AND AGREES with the Developer that:

6.1 it shall on the execution of this Deed by the Developer initiate the Rezoning;

6.2 if the Rezoning and Subdivision are achieved it shall set up and administer the Community Facilities Fund and Maritime Facilities Fund in accordance with the provisions of the Local Government Act;

6.3 on the sale of each residential lot within the Subdivision it will contribute to the Community Facilities Fund an amount equivalent to the single vacant lot minimum annual residential rate applicable at the time of sale;

6.4 it shall recommend clearance of conditions of subdivision approval where:

(a) the provisions of this Deed; and

(b) the conditions of the subdivision approval

have been satisfied;

6.5 it shall if the provisions of the Local Government Act permit accept the office bearers or nominated members of the Community Association as an advisory committee of the Council making recommendations with respect to expenditure from the Community Facilities Fund for the construction of Community Facilities; and

6.6 the Link Road may be constructed on a staged basis consistent with the level of development of the Subdivision as determined by the Shire.

7. COSTS

The costs of and incidental to the preparation (including drafts) execution and stamping of this Deed and all stamp duty payable hereon shall be shared equally between the Developer and the Shire and the cost of preparing and lodging any caveat lodged pursuant to the terms of this Deed and any withdrawal or replacement thereof shall be borne by the Developer.

ANNEXURES

Annexure 1: Copy of the Structure Plan.

SCHEDULE

ITEM 1: LAND

Lot 1 the subject of Diagram 24526 and being the whole of the land comprised in Certificate of Title Volume 1240 Folio 35

Portion of Swan Location 3203 and being the whole of the land comprised in Certificate of Title Volume ~~2133~~ 2158 Folio ~~275~~ 899

Portion of Swan Location 5243 and being the whole of the land comprised in Certificate of Title Volume 1696 Folio 283.

EXECUTED BY THE PARTIES as a DEED:

SIGNED by the said JOSEPH BECK MATTHEWS in the presence of:)

WITNESS SIGN: Toby Nicholls.

PRINT NAME: TOBY JAMES NICHOLLS

ADDRESS: 60 DOVER ROAD, SCARBOROUGH, WA. 6019.

OCCUPATION: SOLICITOR.

THE COMMON SEAL of the SHIRE OF GINGIN was duly affixed hereto in the presence of:)

SHIRE OF GINGIN VIAS TUTAS CUPIMUS COMMON SEAL

PRESIDENT

CHIEF EXECUTIVE OFFICER

(12063deed/cs/d)

APPENDIX C
Deed of Variation
(Shire of Gingin & Mr Matthews, 14 May 2010)

The Quadrant
1 William Street, Perth
Western Australia 6000

GPO Box F338, Perth
Western Australia 6841

Tel +61 8 9288 6000
Fax +61 8 9288 6001
www.lavanlegal.com.au

Deed of Variation

Joseph Beck Matthews
Shire of Gingin

Table of contents

Parties

Joseph Beck Matthews of Abilene, Texas in the United States of America **(the Developer)** care of Lavan Legal 1 William Street Perth in the State of Western Australia

Shire of Gingin of 7 Brockman Street, Gingin in the State of Western Australia **(the Shire)**

Background

A The Parties entered into a Deed of Agreement dated 6 March 2001, a copy of which is annexed hereto as Annexure 1 (**Agreement**) concerning the future provision for community and other facilities for the Developer's land as described in Item 1 of the Schedule to the Agreement (the **Land**), then the subject of the Lancelin Coastal Village Structure Plan (**LCVSP**).

B In October 2007 the Shire adopted a new Structure Plan in respect of the Land known as the Lancelin South Structure Plan (**LSSP**) replacing the LCVSP and initiated a rezoning amendment described as Amendment No. 93 (**Rezoning Amendment**) to the Shire's Local Planning Scheme No. 8 (**Scheme**) to rezone the Land from Rural zone to Urban Development zone.

C On 20 April 2010 the Council of the Shire granted its final approval to the Rezoning Amendment. The resolution of Council is attached as Annexure 2 (**Council Resolution 10.0089**). In order to satisfy the requirements of Council Resolution 10.0089 and the LSSP, the parties have agreed to amend the Agreement by this Deed of Variation on the terms and conditions set out herein.

1 Variations to Agreement

The Agreement is varied as follows:

1.1 References to 'the Rezoning' where it appears in the Agreement shall be taken to be a reference to the Rezoning Amendment and the definition of "Rezoning" in Recital C as denoted by the text "("the Rezoning")" is deleted.

1.2 References to 'the Structure Plan' where it appears in the Agreement shall be taken to be a reference to the LSSP and the definition of "Structure Plan" in Recital B as denoted by the text "("the Structure Plan")" is deleted.

1.3 References to 'Upper Coastal Ward' where it appears in the Agreement shall be taken to be a reference to the Lancelin town site and surrounds.

1.4 Clause 2.1(b)to be amended to read as follows:

1.4.1 '(b) adequate and appropriate reserve funds paid or payable by the Developer are established to be administered by the Shire.'

1.5 Sub clauses 3.3 and 3.4.are deleted.

1.6 Sub clause 3.6 to be amended to read as follows:

1.6.1 'The Community Facilities will be constructed in accordance with priorities set by the Shire.'

1.7 Sub - clause 3.7 be deleted.

1.8 Sub -Clause 3.8(ii) be amended by deleting '2001' and substituting that with '2010' and deleting '$140' and substituting that with '$207'.

1.9 All references in the Agreement to 'Link Road' shall be substituted with 'Coastal Links'.

1.10 Clause 3.9 shall be substituted with the following:

'he will prepare and submit to the Shire prior to the Subdivision of the Land a Coastal Access and Development Plan to the satisfaction of the Shire showing:

(i) the vehicle/pedestrian/bicycle link depicted in the LSSP as the Southern Coastal Link ("Southern Coastal Link") and the dual use path link depicted in the LSSP as the Northern Coastal Link ("Northern Coastal Link"), as generally shown in the LSSP for access from the Land to the coast (together "The Coastal Links"); and.

(ii) provision for beachfront vehicle parking and associated infrastructure and facilities ("Coastal Facilities").'

1.11 Clause 3.10 shall be substituted with the following:

'the construction of the Coastal Links and Coastal Facilities will include a dual use path linking the area the subject of the LSSP to Lancelin town site, provision for and construction of power, water and telephone services, ablution facilities, pathway access to the beach and two beach carparks with a total of 80 car bays.'

1.12 Delete the words 'Department of Land Administration' in sub -clause 5.1 and substitute with 'Landgate'.

1.13 Sub –clauses 6.1, 6.3 and 6.5 are deleted.

1.14 The Agreement shall incorporate the following provisions:

1.14.1 The following provision shall be inserted as clause 3.13:

"in addition to the Developer's other commitments the Developer will also be required to undertake the following:

(a) Relocation and re-establishment of the fairways and greens of the Lancelin Golf Course following decommissioning as a result of construction of the Coastal Links to a condition that

is not less than the current Lancelin Golf Course standard; and

(b) construction and installation of all other standard public infrastructure associated with Subdivision to the satisfaction of the Western Australian Planning Commission,

1.14.2 The following provision shall be inserted as clause 3.14:

"prior to clearance of subdivision for the first lot of the Subdivision, the Shire will require and the Developer shall undertake the construction of the Southern Coastal Link.

1.14.3 The following provisions shall be inserted as clause 3.15:

"prior to clearance of subdivision for the first lot of the Subdivision, the Shire will require and the Developer shall provide to the Shire a bank guarantee or bond, as mutually agreed, for an amount no less than the cost of the construction of:

i) The Northern Coastal Link;

ii) Coastal Facilities including provision of power, water, telephone services, car park lighting and ablution facilities;

iii) A Dual Use Pathway linking the Development area to the Lancelin Community Sporting Club Rooms and from the Lancelin Community Sporting Club Rooms to the existing Dual Use Path System in the Lancelin Town site.

In a period of no longer than one year from the date that a certificate of occupancy is granted by the Council for the 50th dwelling in Lancelin South, the developer shall construct the Coastal Facilities and Dual Use Pathways referred to in i), ii) & iii) above and upon completion of the construction to the satisfaction of the Shire, the bank guarantee or bond shall be released."

1.14.4 The following provision shall be inserted as clause 3.16:

"at the time of subdivision, the Shire will require the Developer to seal Old Ledge Point Road from the intersection at Lancelin Road to the Southern Coastal Link and the intersection adjacent to the Subdivision, to the satisfaction of the Shire, to ameliorate dust impacts on newly created 'Urban' lots from extractive industries and/or mining tenements operating on those roads. Further construction and upgrading of Old Ledge Point Road shall be required upon connection of any new subdivision roads within the Lancelin South Outline Development Plan ('ODP') area to Old Ledge Point Road, taking into consideration the urban traffic volumes generated by the subdivision, to a standard to be determined in the Traffic Engineering Study, prepared for the ODP."

1.14.5 The following provision shall be inserted as clause 3.17:

"prior to clearance of the first lot of the Subdivision, the Developer shall provide an Acoustic Report for that portion of the Land the subject of Stage 1 of the Subdivision, in order to determine those lots which may be adversely affected by noise as a result of being located adjacent to Limesand Haulage Routes. Each lot so affected will be required, at a minimum, to have a notification pursuant to section 70A of the Transfer of Land Act 1893 lodged on its certificate of title to notify prospective purchasers of the potential for adverse amenity impact as a result of being located adjacent to Limesand Haulage Routes and nearby Extractive Industries.

2 Agreement to remain in effect

The Agreement remains in full force and effect, as varied by this document.

3 Inconsistency

If there is any inconsistency between the terms of the Agreement and this document, then this document will prevail to the extent of any inconsistency.

4 When variations effective

The variations to the Agreement set out in this document come into effect on the date of execution of this document.

Execution

Executed as a Deed of Variation

Date: MAY 14 **2010**

Joseph Beck Matthews)
in the presence of:)

Joseph Beck Matthews

Signature

Signature

DIANE M FLYNN
Name

Name

ADMIN. ASSISTANT
Position

Position

Shire of Gingin

The Common Seal of the)
Shire of Gingin)
is affixed in the presence of:)

SHIRE OF GINGIN VIAS TUTAS CUPIMUS COMMON SEAL

Signature

David Roe
Signature

DAVID T BULL
Name

DAVID WILLIAM ROE
Name

CHIEF EXECUTIVE OFFICER
Position

ACTING SHIRE PRESIDENT
Position

Annexure 1

Agreement dated 6 March 2001

DATED _____ 2001

JOSEPH BECK MATTHEWS

AND

SHIRE OF GINGIN

D E E D

McLEOD & CO
SOLICITORS
220-222 STIRLING HIGHWAY
CLAREMONT WA 6010
Telephone: 9383 3133
Facsimile: 9385 2693
Reference: McL/N8 12063
(cdd)

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("the Developer"))

AND

TAX INVOICE - ABN 45 320 599 544
WESTERN AUSTRALIA STAMP DUTY
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(c) Statement of purpose, namely, the establishment of a mechanism for the funding and staged implementation of community facilities to service the Lancelin Coastal Village Structure Plan area;

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(vi) provisions or terms of this Deed or another document, agreement, understanding or arrangement include a reference to both express and implied provisions and terms;

(vii) time is to be local time in Perth, Western Australia;

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(a) within three years of the date of gazettal of the Rezoning, the Developer must:

(i) seek and obtain approval from the Western Australian Planning Commission for the Subdivision;

(ii) act on the Subdivision approval by commencing and using its best endeavours to complete the development works contemplated by the conditions of Subdivision approval; and

(iii) use his best endeavours to comply with and obtain certificates of clearance for the conditions of subdivision approval.

(b) If the Developer does not comply with subclause 2.2(a) the Shire may again rezone the Land without complaint from or liability to the Developer;

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3.1 any subdivision and development of the Land shall be in accordance with the Structure Plan and the requirements of the Shire;

Community Facilities

3.2 he will facilitate the establishment by the Shire of a reserve fund ("the Community Facilities Fund") in accordance with the provisions of the Local Government Act 1995 from which funds will be drawn for the construction

and/or maintenance of community facilities ("the Community Facilities") to service each part of the Structure Plan area as it is created by the subdivision of the Land ("the Subdivision");

3.3 on the sale of the fiftieth (50th) lot forming part of the Subdivision he will establish a community management group which will be created as an incorporated association ("the Community Association") the rules of which must be satisfactory to the Shire and which will become an advisory committee to the Council to make recommendations with respect to expenditure from the Community Facilities Fund for the provision of the Community Facilities;

3.4 he will ensure that the rules of the Community Association provide inter alia:

(i) that the purchaser or occupier of any residential lot within the Subdivision will be eligible to become a member of the Community Association; and

(ii) that a committee be elected and that membership of the committee shall include one Councillor of the Council and an officer of the Shire both appointed by the Council and a representative of the Developer; and

(iii) that the committee of the Community Association must liaise with the Shire in regard to the construction and cost of the Community Facilities specified in the Structure Plan Report for each part of the Subdivision as that part of the Subdivision is created;

3.5 on the sale of each residential lot within the Subdivision the Developer will contribute to the Community Facilities Fund an amount equivalent to the single vacant lot minimum annual residential rate applicable at the time of sale;

3.6 the Community Facilities will be constructed in accordance with priorities set by the Shire in consultation with Developer and the Community Association, or, when the Developer is no longer involved, the Community Association, and

although the Shire shall have due regard to the recommendations of the Community Association, it shall not be bound to draw funds from the Community Facilities Fund in accordance with any recommendation made to it.

3.7 in the event that the Community Association becomes defunct or ceases to operate effectively because of lack of membership then the Shire shall be the sole arbiter of the need for Community Facilities and shall have the power to draw on the Community Facilities Fund for the construction and/or maintenance of the Community Facilities;

Maritime Facilities

3.8 (i) the Developer on the sale of each residential lot within the Subdivision shall contribute the amount specified in paragraph (ii) of this clause into another reserve fund ("the Maritime Facilities Fund") under the control of the Shire and the monies in the Maritime Facilities Fund shall be used for the construction and/or maintenance by the Shire of maritime facilities in the Upper Coastal Ward within the local government district of the Shire which maritime facilities may include, without limitation, boat launching facilities and boat launching facility access as and when determined necessary by the Shire.

(ii) in the 2001 calender year the Developer shall contribute $140 to the Maritime Facilities Fund upon the sale of a residential lot within the Subdivision, and in each subsequent calendar year the amount to be contributed shall be increased cumulatively by an amount proportional to the percentage annual increase in the minimum single vacant lot annual residential rate.

Link Road and Coastal Facilities

3.9 he will prepare and submit to the Shire prior to the Subdivision of the Land a Coastal Access and Development Plan to the satisfaction of the Shire showing:

(i) the pedestrian/vehicular link shown in the Structure Plan for access from the Land to the coast ("Link Road"); and

(ii) provision for beach-front vehicle parking and associated infrastructure and facilities ("Coastal Facilities").

3.10 the construction of the Link Road and Coastal Facilities will include a dual use path incorporated with the Link Road, provision for and construction of power and telephone services, pathway access to the beach and two beach carparks with a total of 80 car bays.

3.11 subject to obtaining all necessary approvals, he will construct the Link Road and Coastal Facilities (including the associated infrastructure referred to in clause 3.10) in accordance with the Coastal Access and Development Plan referred to above as modified from time to time by the Developer with the written approval of the Shire;

Expenditure by Shire

3.12 if, for any reason the funds held by the Shire in the Community Facilities Fund or the Maritime Facilities Fund are in the opinion of the Shire in excess of that required for the reasonable construction and/or maintenance of the Community Facilities or the Maritime Facilities, the Shire may expend monies from either Fund at its absolute discretion towards any developments or works within the Upper Coastal Ward, whether or not the expenditure is connected with the Subdivision.

4. NO DISPOSAL

The Developer must not sell, agree to sell, transfer, mortgage, lease, charge, assign or otherwise dispose of or encumber any part of the Land in its englobo state to any person without the prior written consent of the Shire which consent will not be withheld if the person to whom any such right or interest in the Land is to be granted has first executed a deed of covenant to be prepared by the Shire's solicitors at the cost of the Developer or such person whereby that person covenants to observe and perform such of the covenants, conditions and stipulations herein contained (including this covenant) as the Shire shall require as if that person had been a party to this Deed.

5. CHARGE AND CAVEAT

5.1 The Developer HEREBY CHARGES his interest in the Land in favour of the Shire with the performance of his obligations set out in this Deed and with the payment of all or any monies payable or which may become payable by the Developer to the Shire pursuant to this Deed and for the purpose of securing the same authorises the Shire to lodge an absolute caveat at the Department of Land Administration against the Land or any part thereof in order to protect the rights and interests of the Shire under this Deed

5.2 Providing there is no existing unremedied breach of this deed and provided that the developer complies with clause 4 herein, the Shire shall at the written request of the Developer provide an executed withdrawal of caveat to permit the registration of a mortgage over the Land to raise development funds in respect of the Land, with the Shire having a right to replace such caveat immediately following registration of such mortgage.

6. SHIRE'S COVENANTS

In consideration of the Developer agreeing to undertake the obligations set out in this Deed the Shire HEREBY COVENANTS AND AGREES with the Developer that:

6.1 it shall on the execution of this Deed by the Developer initiate the Rezoning;

6.2 if the Rezoning and Subdivision are achieved it shall set up and administer the Community Facilities Fund and Maritime Facilities Fund in accordance with the provisions of the Local Government Act;

6.3 on the sale of each residential lot within the Subdivision it will contribute to the Community Facilities Fund an amount equivalent to the single vacant lot minimum annual residential rate applicable at the time of sale;

6.4 it shall recommend clearance of conditions of subdivision approval where:

(a) the provisions of this Deed; and

(b) the conditions of the subdivision approval

have been satisfied;

6.5 it shall if the provisions of the Local Government Act permit accept the office bearers or nominated members of the Community Association as an advisory committee of the Council making recommendations with respect to expenditure from the Community Facilities Fund for the construction of Community Facilities; and

6.6 the Link Road may be constructed on a staged basis consistent with the level of development of the Subdivision as determined by the Shire.

7. COSTS

The costs of and incidental to the preparation (including drafts) execution and stamping of this Deed and all stamp duty payable hereon shall be shared equally between the Developer and the Shire and the cost of preparing and lodging any caveat lodged pursuant to the terms of this Deed and any withdrawal or replacement thereof shall be borne by the Developer.

ANNEXURES

Annexure 1: Copy of the Structure Plan.

SCHEDULE

ITEM 1: LAND

Lot 1 the subject of Diagram 24526 and being the whole of the land comprised in Certificate of Title Volume 1240 Folio 35

Portion of Swan Location 3203 and being the whole of the land comprised in Certificate of Title Volume ~~2133~~ 2158 Folio ~~275~~ 899

Portion of Swan Location 5243 and being the whole of the land comprised in Certificate of Title Volume 1696 Folio 283.

EXECUTED BY THE PARTIES as a DEED:

SIGNED by the said JOSEPH BECK MATTHEWS in the presence of:) Joseph Beck Matthews

WITNESS SIGN: Toby Nicholls.

PRINT NAME: TOBY JAMES NICHOLLS

ADDRESS: 60 DOVER ROAD, SCARBOROUGH, WA. 6019.

OCCUPATION: SOLICITOR.

THE COMMON SEAL of the SHIRE OF GINGIN was duly affixed hereto in the presence of:)

PRESIDENT

CHIEF EXECUTIVE OFFICER

(12063deed/cs/d)

Annexure 2

Council Resolution 10.0089

PRIOR TO DELIBERATION ON RECOMMENDATION TWO, THE CONTRACT PLANNER CIRCULATED AN AMENDED RECOMMENDATION, A COPY OF WHICH IS ATTACHED AS APPENDIX 9.

AT 5.04 PM THE CONTRACT PLANNER LEFT THE CHAMBER TO ENSURE THAT THE AMENDED RECOMMENDATION WAS CORRECTLY WORDED.

COUNCILLOR RULE RETURNED TO THE CHAMBER AT 5.04 PM AT WHICH TIME THE SHIRE PRESIDENT ADVISED HIM OF THE DECISION WHICH HAD MATERIALISED DURING THE TIME HE WAS ABSENT FROM THE CHAMBER.

THE CONTRACT PLANNER RETURNED TO THE CHAMBER AT 5.14 PM.

DELIBERATION ON THIS ITEM RECOMMENCED AT 5.27 PM.

COUNCILLOR RULE DECLARED A PROXIMITY INTEREST IN THIS ITEM AS HE OWNS THE ADJOINING M70/57 MINING LEASE AND LEFT THE CHAMBER AT 5.27 PM.

COUNCILLOR MALEY LEFT THE CHAMBER AT 5.28 PM AND DID NOT RETURN TO THE MEETING.

RESOLUTION 10.0089

Moved Councillor Ammon that Council:

1. **Receive and endorse the Schedule of Submissions for Town Planning Scheme Amendment No. 93.**

2. **Subject to the receipt of:**

    i) **Scheme Amendment documents which reflect the following modifications:**

    - **Delete reference to Dot Point 3 in the final adoption page which reads *Inserting a new clause under section 5.5 advising that the rezoning of Lots 5243, 9504 and 9505 Indian Ocean Drive, Lancelin from 'Rural' to "Urban Development' shall not proceed to final approval prior to the proponent demonstrating that a sufficient potable water source is available to supply the subject land.***

    - **Insert Appendix 11 and Appendix 12 into the Scheme Text, as below, and alter the Scheme Maps accordingly:**

Appendix 11- Developer Contribution Area

Area of Subject Land	Provisions
DCA No.1 Lots 5243, 9504 and 9505 commonly known as "Lancelin South" and Reserve 7269 Old Ledge Point Road and Lancelin Road Stage 1	The Developer will be required to provide for: - Community Facilities Fund; - Coastal links; - Dual Use Pathway linking the Development area to the Lancelin Community Sporting Club Rooms and from the Lancelin Community Sporting Club Rooms to the existing Dual Use Path System in the Lancelin Townsite; - Maritime Fund; - Coastal amenities including provision of power, water, telephone services, car park, car park lighting and ablution facilities; - Relocation and re-establishment of the fairways and greens following decommissioning as a result of construction of the coastal links to a condition that is not less than the current Lancelin Golf Course standard; and - All other standard public infrastructure associated with Subdivision to the satisfaction of the Western Australian Planning Commission, as referenced in the Deed of Agreement made between the Shire and the Developer. Prior to clearance of the subdivision for the first lot Council will require the construction of:

	i) A coastal link for vehicle, pedestrian, bicycle use and carparking as referred to in the Deed of Agreement made between the Shire and the Developer for Developer Contributions for Community Facilities; and **Prior to the clearance of subdivision conditions for the first Lot, the Council will require a bond mutually agreed for an amount no less than the cost of the construction of:** **i) A Coastal link in the form of a Dual Use Path;** **ii) A Dual Use Pathway linking the Development area to the Lancelin Community Sporting Club Rooms and from the Lancelin Community Sporting Club Rooms to the existing Dual Use Path System in the Lancelin Town site; and** **iii) Coastal amenities including provision of power, water, telephone services, car park lighting and ablution facilities.** **In a period of no longer than one year from the date that a certificate of occupancy is granted by the Council for the 50th dwelling in Lancelin South, the developer shall construct the Dual Use Pathways and Coastal Amenities referred to in i), ii) and iii) above and the bond shall therefore be released.** **If, in the opinion of Council, the Deed of Agreement for Developer Contributions for Community Facilities is considered unsuitable at later stages of rezoning, the Shire reserves**

	the right to require a new Deed to be prepared to ensure the appropriate delivery of Community Infrastructure for the Development site. As an alternative, the Applicant may prepare a Development Contribution Plan, in accordance, generally, with the provisions of State Planning Policy for Developer Contributions.

Appendix 12 – Environmental Constraints

Area of subject Land	Provisions
Lots 5243, 9504 and 9505 commonly known as "Lancelin South" Old Ledge Point Road and Lancelin Road	At the time of Subdivision, Council will require the Applicant to provide an Acoustic Report for the land, the subject of Stage 1, in order to determine those Lots which may be adversely affected by noise as a result of being located adjacent to Limesand Haulage Routes. The Lots, if applicable, will be required, at a minimum, to have Memorials placed on Title to notify prospective purchasers of the potential for adverse amenity impact as a result of being located adjacent to Limesand Heavy Haulage Routes and nearby Extractive Industries. At the time of Subdivision, as a minimum, Council will require the Developer to seal Old Ledge Point Road from the intersection at Lancelin Road to the coastal access link and the intersection adjacent to the Subdivision to ameliorate dust impacts on newly created "Urban" Lots from extractive industries and/or mining tenements operating on those roads.

ii) A modified Deed of Agreement/draft Deed of Variation to be altered to the satisfaction of the Shire's Acting Chief Executive Officer to incorporate provision for the satisfactory construction and delivery of the Community Infrastructure, including all items referenced in Appendix 11.

3. Provided the amended and executed Scheme Amendment documents and Deed of Agreement/Deed of Variation (which includes provisions for items listed in Appendix 11), is submitted to the Shire by 12 May 2010, resolve, under Section 87 of the *Planning and Development Act* 2005, to give final adoption to its Town Planning Scheme Amendment No. 93, with modification, to:

i) Rezone portions of Lots 9504 and 9505 Indian Ocean Drive, Lancelin from 'Rural' to 'Urban Development' Zone.

ii) Deleting the notation 'AA' from the Use Class Dwelling and Grouped Dwellings in column 9 (Urban Development Zone) of Table 1 – Zoning Table and insert the following text in the entire column applying to all Use Classes for the Urban Development zone:

The permissibility of uses in the Urban development zone shall be determined in accordance with the provisions of the adopted Outline Development Plan for the land which has been prepared and adopted in accordance with the relevant provisions of the Local Planning Scheme.

iii) Insert Appendix 11 and Appendix 12 into the Scheme Text, as below, and amend the Scheme Maps accordingly:

Appendix 11- Developer Contribution Area

Area of Subject Land	Provisions
DCA No.1 Lots 5243, 9504 and 9505 commonly known as "Lancelin South" and Reserve 7269 Old Ledge Point Road and Lancelin Road Stage 1	The Developer will be required to provide for: - Community Facilities Fund; - Coastal links; - Dual Use Pathway linking the Development area to the Lancelin Community Sporting Club Rooms and from the Lancelin Community Sporting Club Rooms to the existing Dual Use Path System in the Lancelin Townsite; - Maritime Fund;

	- Coastal amenities including provision of power, water, telephone services, car park, car park lighting and ablution facilities; - Relocation and re-establishment of the fairways and greens following decommissioning as a result of construction of the coastal links to a condition that is not less than the current Lancelin Golf Course standard; and - All other standard public infrastructure associated with Subdivision to the satisfaction of the Western Australian Planning Commission. as referenced in the Deed of Agreement made between the Shire and the Developer. Prior to clearance of the subdivision for the first lot Council will require the construction of: i) A coastal link for vehicle, pedestrian, bicycle use and carparking as referred to in the Deed of Agreement made between the Shire and the Developer for Developer Contributions for Community Facilities; and Prior to the clearance of subdivision conditions for the first Lot, the Council will require a bond mutually agreed for an amount no less than the cost of the construction of: i) A Coastal link in the form of a Dual Use Path;

	ii) A Dual Use Pathway linking the Development area to the Lancelin Community Sporting Club Rooms and from the Lancelin Community Sporting Club Rooms to the existing Dual Use Path System in the Lancelin Town site; and iii) Coastal amenities including provision of power, water, telephone services, car park lighting and ablution facilities In a period of no longer than one year from the date that a certificate of occupancy is granted by the Council for the 50th dwelling in Lancelin South, the developer shall construct the Dual Use Pathways and coastal amenities referred to in i), ii) and iii) above and the bond shall therefore be released. If, in the opinion of Council, the Deed of Agreement for Developer Contributions for Community Facilities is considered unsuitable at later stages of rezoning, the Shire reserves the right to require a new Deed to be prepared to ensure the appropriate delivery of Community Infrastructure for the Development site. As an alternative, the Applicant may prepare a Development Contribution Plan, in accordance, generally, with the provisions of State Planning Policy for Developer Contributions.

Appendix 12 – Environmental Constraints

Area of subject Land	Provisions
Lots 5243, 9504 and 9505 commonly known as "Lancelin South" Old Ledge Point Road and Lancelin Road	At the time of Subdivision, Council will require the Applicant to provide an Acoustic Report for the land, the subject of Stage 1, in order to determine those Lots which may be adversely affected by noise as a result of being located adjacent to Limesand Haulage Routes. The Lots, if applicable, will be required, at a minimum, to have Memorials placed on Title to notify prospective purchasers of the potential for adverse amenity impact as a result of being located adjacent to Limesand Heavy Haulage Routes and nearby Extractive Industries. At the time of Subdivision, as a minimum, Council will require the Developer to seal Old Ledge Point Road from the intersection at Lancelin Road to the coastal access link and the intersection adjacent to the Subdivision to ameliorate dust impacts on newly created "Urban" Lots from extractive industries and/or mining tenements operating on those roads.

4. Refuse to approve Scheme Amendment No. 93, should the modified documents referenced in Dot Point 2, above, not be submitted to the Shire by 12 May 2010, given that Council is concerned that:

   i) The Deed of Agreement does not provide adequately for the timely delivery of Community Infrastructure, particularly the Coastal Access Link and Associated Coastal Infrastructure as a component of the clearance of the first Lot of subdivision; and

   ii) The sealing of a portion of Old Ledge Point Road is required to ameliorate the dust impacts on newly created "Urban" Lots from Extractive Industries and/or mining tenements operating on those roads.

5. Advise the Applicant that:

i) If the Developer is not willing to enter into a voluntary Deed of Agreement for the timely provision of Community Infrastructure as indicated in the above Resolution, the Developer may prepare a Developer Contributions proposal in accordance with the Western Australian Planning Commission Statement of Planning Policy 3.6 – Developer Contributions, subject to Council's satisfaction, for the purposes of the provision of Community Infrastructure. It is, however, likely that the same provisions will result;

ii) The Shire will not support an Application for Subdivision to the Western Australian Planning Commission until the Outline Development Plan is endorsed by the Shire's Acting Chief Executive Officer and the Western Australian Planning Commission;

iii) In accordance with advice from the EPA, this proposal has not been referred to the Commonwealth under the EPBC Act, and the developer would need to satisfy its own obligations in accordance with the requirements of the EPBC Act;

iv) In accordance with the *Aboriginal Heritage Act* 1972, the Developer or his agents are to cease work immediately should cultural or skeletal material be discovered, the site recorded and the Department of Indigenous Affairs notified immediately; and

v) Council will assist in determining an appropriate location for the placement of a coastal link.

6. Advise the Department of Planning that:

i) Given the Scheme Amendment area is not a Priority Resource Location in SPP2.4, but acknowledging the significant future geological supplies – limestone is location in close proximity, as identified by the Department of Planning, Council respectfully requests that the mater is elevated for Ministerial consideration in regards to consideration of the amendment area to be rezoned in relation to this matter and the general application of buffer distances. In recommending Final Approval to this amendment, the Shire has had due regard to SPP2.4; and

ii) The Shire notes that a Special Control Area depicting a 500m buffer from the nearby sewerage treatment plant may be required to be denoted on Scheme Maps, however, this element has been incorporated into the Shire's draft Local Planning Scheme No. 9.

CARRIED UNANIMOUSLY

APPENDIX D
Traffic Report (Bruce Aulabaugh)

SOUTH LANCELIN STAGE 1 ODP:

TRAFFIC FORECAST & INTERSECTION DESIGN

SHIRE OF GINGIN

Final Report

For

Matthaus Limited Partnership

October 2010

Bruce Aulabaugh

Traffic Engineering & Transport Planning

Integrated Transport Solutions for Sustainable Communities

SOUTH LANCELIN STAGE 1

TRAFFIC FORECAST & INTERSECTION DESIGN

Final Report

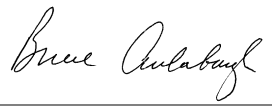
For:
Matthaus Limited Partnership

October 2010

This report has been prepared in accordance with the scope of services described in the contract or agreement between Bruce Aulabaugh and the Client.

The report relies upon data, surveys, measurements and results taken at or under the particular times and conditions specified herein.

Any findings, conclusions or recommendations only apply to the aforementioned circumstances and no greater reliance should be assumed or drawn by the Client. Furthermore, the report has been prepared solely for use by the Client and Bruce Aulabaugh accepts no responsibility for its use by other parties.

Approved by:	*Bruce Aulabaugh (Traffic/ Transport Engineer)*
Signed:	
Date:	6 October 2010

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ATTACHMENTS

EXECUTIVE SUMMARY

Introduction

This report investigates:

- the future design standard for Lancelin Road (at ultimate development); and
- the staging of South Lancelin Stage 1 ODP intersections along Lancelin Road.

The Lancelin Road ultimate design standard recommendation is based on an estimate of future Lancelin Townsite traffic generation and the additional traffic generated by the whole of the South Lancelin Structure Plan. The future development of Lancelin Townsite is estimated from development area measurements provided by Taylor Burrell Barnett (TBB). The future Lancelin Townsite traffic generation estimate is based on a proportional extrapolation of the existing development traffic generation.

The South Lancelin Stage 1 ODP intersection staging is based on traffic movement forecasts for incremental development of approximately 1100 dwelling units (south side of Lancelin Road) and a commercial/ industrial area (north of Lancelin Road). The traffic forecast for the Stage 1 ODP is derived from traffic figures taken from the South Lancelin Structure Plan Traffic Overview (Riley 2006) and also from existing traffic count data provided by the Shire of GinGin.

Lancelin Road Traffic Forecast and Design Standard at Ultimate Development

The ultimate Lancelin Road weekday traffic is estimated to be as high as 9200 vpd and weekend traffic is estimated to be as high as 12,000 vpd. Peak holiday traffic could reach 16,000 veh/day on Lancelin Road.

Liveable Neighbourhoods Policy Identifies 15,000 vpd as the upper level for an Integrator Arterial Type B (IAB) road. The IAB has one through lane in each direction, separated by a 6m median which serves to provide right turn pockets at intersections. At high volume intersections, roundabout or signal control may be used. With parking restrictions and under roundabout control or signal control (with the addition of right and left turn lanes), the capacity of this road can reach up to 20,000 veh/day. It would appear reasonable, based on the traffic estimates and LN policy information presented above, to plan Lancelin Road ultimate design for an IAB standard at ultimate development stage.

South Lancelin Stage 1 ODP Traffic and Lancelin Road Intersections

Stage 1 ODP South Lancelin traffic is estimated to be as much as 3000 veh/day out of 7900 veh/day on Lancelin Road at the time Stage 1 ODP is complete.

At these traffic levels, the South Lancelin Stage 1 ODP intersections can be designed and constructed (in accordance with Austroads & Shire of GinGin design standards) on the assumption that Lancelin Road will still operate adequately as a 2-lane, 2-way single carriageway road beyond completion of Stage 1 ODP.

Stage 1 ODP Intersection Design (Residential Area, south of Lancelin Road)

Turn movement estimates and Austroads 2009 turn lane traffic warrants have been used to produce an intersection geometry staging strategy for the Stage 1 ODP intersections (overleaf).

- Phase 1 & 2: Construct Intersection 1 with BAR/ BAL geometry (serves up to 220 units).
- Phase 3: Upgrade Intersection 1 to CHR(S)/ BAL geometry and construct Intersection 2 with CHR(S)/ BAL geometry (serves up to 660 dwelling units).
- Phase 7: Upgrade Intersection 1 and 2 to CHR/ AUL(S) geometry (serves beyond completion of Stage 1 ODP, i.e. 1100+ dwelling units)

Lancelin Road Intersection Capacity Simulation with SIDRA Software

SIDRA software was used to confirm that Stage 1 ODP local roads intersecting Lancelin Road would operate satisfactorily with a single approach lane (shared right and left turn lane). For the ultimate traffic case, separate right and left turn lanes are recommended on the minor road approach.

Lancelin Road Intersection Consolidation and Spacing Recommendation:

Based on the Austroads 2009 T-junction design dimensions (Attachment 1), it is recommended that the intersection locations for South Lancelin Stage 1 ODP be rationalised at the west portion of the application area. *Figure 2* (in body of this report) shows the suggested adjustments to intersection locations.

Stage 1 ODP Commercial Site Intersection Design and Capacity

Turn movement estimates and Austroads turn lane traffic warrants suggest that BAR/ BAL geometry would be suitable at Stage 1 ODP intersections for the commercial site on the north side of Lancelin Road. Notwithstanding this result, the following staging strategy incorporates early implementation of right turn lanes on Lancelin Road at the commercial site intersections to more safely manage right turns by slower turning larger commercial vehicles:

- Phase 1: Construct Commercial Intersection #1 with CHR(S)/ BAL geometry. Intersection 1 would serve up to 50% of the proposed commercial area.
- Phase 2: Construct Commercial Intersection #2 when commercially desired or when 50% of whole commercial area is developed. Construct Intersection 2 also with CHR(S)/ BAL geometry.
- Phase 3: Upgrade Commercial Intersection 1 & 2 with CHR/ AUL(S) geometry before Phase 7 of the residential development (south side) is complete.

Ledge Point Road Traffic and Road Design Standard

Review of the Riley report shows traffic on Ledge Point Road is only expected to reach 1400 veh/day. This level of traffic can be suitably handled with a 2-lane undivided local distributor road.

Initially, Ledge Point road will be treated with a bitumen seal project to ameliorate dust problems associated with existing truck activity. However, when Stage 1 ODP subdivision traffic starts using Ledge Point Road (via subdivisional road connections), it is recommended that Ledge Point Road be upgraded to the final recommended standard (i.e. 7.0-7.5m surfaced travel way).

Finally, at the time that Stage 1 ODP subdivision traffic is expected to use Old Ledge Point Road, the intersection with Lancelin Road should be reconstructed at its final location (with suitable intersection angle).

Lancelin South ODP, Stage 1:
Traffic Forecast & Intersection Design

Introduction

This report investigates:

- the future design standard for Lancelin Road (at ultimate development); and
- the staging of South Lancelin Stage 1 ODP intersections along Lancelin Road.

The Lancelin Road ultimate design standard recommendation is based on an estimate of future Lancelin Townsite traffic generation and the additional traffic generated by the whole of the South Lancelin ODP. The future development of Lancelin is estimated from development area measurements provided by Taylor Burrell Barnett (TBB). The future Lancelin Townsite traffic generation estimate is based on an extrapolation of the existing development traffic generation.

The South Lancelin Stage 1 ODP intersection staging is based on traffic movement forecasts for incremental development of approximately 1100 dwelling units (south side of Lancelin Road) and a commercial/ industrial area (north of Lancelin Road). The traffic forecast for the Stage 1 ODP is derived from traffic figures taken from the South Lancelin Structure Plan Traffic Overview (Riley 2006) and also from existing traffic count data provided by the Shire of GinGin.

Lancelin Townsite Expansion (Excerpt from TBB emails).

After reviewing some previous advice from Landcorp, we estimate the likely development scenario will be:

- *Future development =38 ha*
- *Existing development = 150 ha*

This is based on our understanding that the two southernmost sites (104ha and 15 ha) are extremely unlikely to be developed, particularly if Lancelin South goes ahead. Also, we only anticipate one third of the northernmost site being made available for development, reducing the 29 ha to 9 ha.

Townsite Traffic Growth Calculation and Ultimate Traffic on Lancelin Road

An important input to determining the final road cross-section for Lancelin Road in vicinity of the 'South Lancelin ODP' is the growth in existing traffic due to future Lancelin Townsite growth (as separate from South Lancelin generated traffic). This calculation uses a simple 'traffic growth multiplier' which is applied to the existing traffic.

That multiplier is determined by the following ratio:

Existing Traffic Growth Multiplier (ETGM) =
(Existing development area plus future development area) /(Existing development area).
Note: future development area excludes South Lancelin ODP which has its own calculated traffic impact.

Based on the information provided in emails below (from TBB), the ETGM would be calculated as (150ha+38ha)/150ha = 188/150 = 1.253. One further adjustment is made to reflect possible additional development in the existing townsite area and also to reflect the effects of future development being to higher density and vitality (and thus traffic generation) than existing areas.

This adjustment may be termed a 'Consolidation and Vitality Traffic Growth Factor' (CVTG) and it has been somewhat arbitrarily assigned a value of 1.20 (i.e. 20% higher development or traffic generation from same area). It seems reasonable to do this because as coastal towns grow the existing businesses often trade better and the resident population becomes a higher % of total population. These are contributing factors in addition to any actual 'redevelopment or infill densification' that might occur.

ETGM x CVTGF = 1.253 x 1.2 = 1.504

Existing Lancelin Road traffic counts from April 2006 (see attached files) show the following 'low-high ranges' for weekday, weekend and Easter Weekend.

Table 1: 2006 Traffic and Estimate 2010 Traffic on Lancelin Road

	2006			2010	compound annual rate
	Range (low-high) vpd			1.12551	0.03
				low	high
weekdays	1200	1550		1351	1745
weekends	1700	2000		1913	2251
Easter weekend	3200	3500		3602	3939

Applying the Townsite ETGM and CVTGF gives the following estimate (Table 2, below) for ultimate development traffic on Lancelin Road (excluding South Lancelin ODP traffic)

Table 2: Ultimate Lancelin Road Traffic Estimate (excl South Lancelin ODP traffic)

1.504	Lancelin Townsite Traffic Growth Factors (ETGM x CVTGF)				
				Ultimate*	Ultimate*
				Low	High
weekdays				2031	2624
weekends				2878	3386
Easter weekend				5417	5925
** excludes Lancelin South ODP traffic*					

The summer/ autumn season upper range ultimate traffic values on Lancelin Road (excluding South Lancelin ODP traffic) will be around:

- Weekday: 2600 vpd;
- Weekends: 3400 vpd;
- Easter Weekend (or other holidays): 5900 vpd

The South Lancelin Structure Plan is estimated by Riley to add the following traffic to Lancelin Road:

- Weekdays (to west of the site): 6600 vpd;
- Weekdays (at the site): 5000 vpd to Lancelin Road);
- Weekdays (to the east of site): 4400 vpd to Lancelin Road.

The weekend to weekday multiplier is estimated to be 1.3 (e.g. 3386vpd weekend upper estimate/2624vpd weekday upper estimate). This would seem to be a reasonable adjustment to make because Riley's weekday traffic generation rates reflected a 'Lancelin style' percentage of holiday homes which in turn implies 'Lancelin style' weekend activity increase.

The resulting weekend values for these South Lancelin Structure Plan traffic estimates would be:

- 6600 x 1.3 = 8580vpd (weekend, to west of site)
- 5000 x 1.3 = 6500vpd (weekend, at site)
- 4400 x 1.3 = 5720 vpd (weekend, to east of site)

The weekend traffic values are multiplied by a further 15% increase factor to estimate higher Holiday activity within South Lancelin Structure Plan area than on a typical weekend. The combined effect is that the Holiday weekend traffic is estimated to be approximately 50% higher than the typical weekday traffic.

The following table combines Lancelin South Structure Plan traffic with the Lancelin Townsite Ultimate Traffic to yield a 'total Lancelin Road traffic estimate'.

Table 3: Total Townsite + South Lancelin ODP Traffic for Lancelin Road at Ultimate Development

Time of Year	Traffic Source		
(Summer/ Autumn)	Lancelin Townsite	South Lancelin Structure Plan	Total
Weekday	2600vpd	4400-6600vpd	7000-9200vpd
Weekend	3400vpd	5720-8580vpd	9120-11980vpd
Holiday Weekend	5900vpd	6580-9870vpd	12480-15770vpd

The ultimate estimated weekday traffic is estimated to be as high as 9200 vpd and weekend traffic is estimated to be as high as 12,000 vpd. Peak holiday traffic could reach 16,000 veh/day on Lancelin Road.

Lancelin Road Ultimate Design Standard

Liveable Neighbourhoods Policy Identifies 15,000 vpd as the upper level for an Integrator Arterial Type B (IAB) road. The IAB has one through lane in each direction, separated by a 6m median which serves to provide right turn pockets at intersections. At high volume intersections, roundabout or signal control may be used. With parking restrictions and under roundabout control or signal control (with the addition of right and left turn lanes), the capacity of this road can reach up to 20,000 veh/day.

It would appear reasonable, based on the traffic estimates and LN policy information presented above, to plan Lancelin Road ultimate design for an IAB standard at ultimate development stage.

Information provided by David Porter (Shire of GinGin consultant representative for this study) indicates that during 2010, the Shire of GinGin intend to improve Lancelin Road to an 8m wide sealed surface. This standard 2-lane undivided road will reach Level of Service C limit at traffic levels 7,900 vpd and Level of Service D limit at 13,500 veh/day (refer to Table 4, below - excerpted from the Riley Report).

Table 4: Level of Service Traffic Limits (excerpt from Riley Traffic Report, based on Highway Capacity Manual Level of Service Estimation)

LOS-	Single Carriageway[1]	Dual Carriageway (4 lanes)[2]
A	2,400vpd	13,000vpd
B	4,800vpd	28,000vpd
C	7,900vpd	38,000vpd
D	13,500vpd	48,000vpd
E	22,900vpd	58,000vpd

[1] based on Table 3.9
[2] based on Table 4.8. Hourly flow reduced by 250v- 70/30 split assumed. Daily = hourly x 10.

When the Lancelin Road traffic reaches approximately 10,000 veh/day, it would be reasonable to design any new intersections (e.g. South Lancelin Structure Plan junctions) to the IAB '2-lane boulevard' standard. Should multiple, closely spaced intersections be constructed simultaneously, they should be done to IAB standard and any road segments 'in-between' the intersections should also be constructed to IAB standard.

South Lancelin Stage 1 ODP Traffic and Lancelin Road Intersections

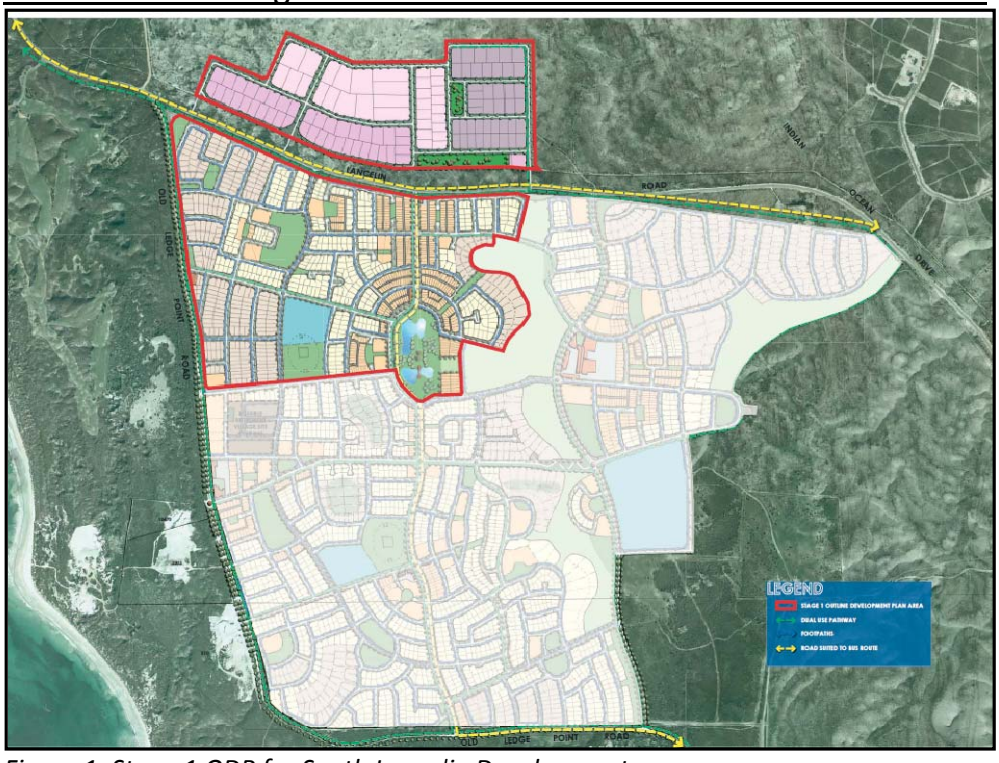


Figure 1: Stage 1 ODP for South Lancelin Development

The South Lancelin Stage 1 ODP will have approximately 31% of the projected total residential development of South Lancelin (email from TBB June 2010). It will also have small local centres, serving internal local trips. Stage 1 will also include the whole of the commercial zoned land to the north of Lancelin Road.

Key Assumptions for Stage 1 ODP Residential Traffic using Lancelin Road:

- 1100 dwelling units
- 4 vehicle trips per dwelling per day -1 trip per dwelling per day for local education, shopping and recreation = 3 daily veh-trips external per dwelling (weekday trip rate derived from Riley report)
- 1100 d.units x 3 veh-trips/ day = 3300 external vehicle trips per day.

Vehicle Trip Assignment Assumptions for 3300 external vehicle trips:

- 200 trips to nearby commercial site (approximately 20% of commercial site attractions).
- 1860 trips to Lancelin Townsite (60% x 3100 veh-trips);
- 1240 trips to Indian Ocean Drive (40% x 3100 veh-trips);
  = 3300 external veh-trip ends/ day from Stage 1 residential area.

The Riley 2006 report estimates approximately 1000 vehicle trips to/from the commercial area located north of Lancelin Road.

The assignment of this Stage 1 ODP traffic is forecast as follows:

- 200 trips to/from Stage 1 ODP area (20% of attractions)
- 400 trips to/from Lancelin Townsite (40% of attractions)
- 400 trips to/from Indian Ocean Road (40% of attractions)
  = 1000 external veh-trip ends/ day from Stage 1 commercial area.

Table 5: Lancelin Townsite Interim Growth + Stage 1 South Lancelin ODP Traffic for Lancelin Road

Time of Year	Traffic Source		
(Summer/ Autumn)	Lancelin Townsite – Interim Stage *(1.25 growth factor applied to 2010 traffic estimate instead of 1.5 ultimate factor)*	Stage 1 South Lancelin ODP	Total
Weekday	2200vpd	1640-2260vpd	3840-4460vpd
Weekend*	2800vpd	1810-2620vpd	4610-5420vpd
Holiday Weekend**	4900vpd	2100-3030vpd	7000-7930vpd

**Weekend Multiplier = 1.3 for residential traffic and 0.5 for commercial traffic*
*** Holiday Weekend Multiplier = 1.5 for residential traffic and 0.6 for commercial traffic*

Table 5 shows the estimated Lancelin Road traffic when the South Lancelin Stage 1 ODP is complete. It assumes that Lancelin Townsite traffic has increased at this 'interim stage' but added only half of its' estimated ultimate traffic growth (beyond the 2010 traffic level).

This means that the Lancelin Townsite Interim Stage traffic growth multiplier is 1.25 upon completion of South Lancelin Stage 1 ODP, instead of 1.5 which is the multiplier that applies upon ultimate development of all Lancelin Townsite Expansion Areas.

At completion of South Lancelin Stage 1 ODP development, Lancelin Road is forecast to operate at < 4500 vpd weekdays, < 5500 vpd weekends and < 7950 vpd holiday weekends.

On the basis of this analysis, it is concluded that the South Lancelin Stage 1 ODP intersections can be designed and constructed (in accordance with Austroads & Shire of GinGin design standards) on the assumption that Lancelin Road will still operate adequately as a 2-lane, 2-way single carriageway road.

Stage 1 ODP Intersection Design (Residential Area, south of Lancelin Road)

Attachment 1 and Attachment 2 provide Austroads design standards for various turn treatments at rural road t-junctions. The choice between these intersection design standards is based on traffic volume warrants relating to through traffic and turning traffic at the intersection of concern.

The major road maximum traffic limit (Qm) is provided for various turning traffic volumes (Qr or Ql) in Table 6A (overleaf). The Lancelin Road traffic forecast (Qmr or Qml) is compared to the Qm Limiting value to determine the required design standard for the intersection. The results for right turns are provided in Table 6B and the results for left turns are provided in Table 6C.

The results are presented for 10 interim periods of development, equivalent to construction and occupation of 110 dwelling units per period (i.e. Stage 1 comprises approximately 1100 dwelling units in total).

The assumption has been made that one residential subdivisional road T-junction on Lancelin Road is provided for phase 1 and phase 2 (first 220 dwelling units) and that a second subdivisional T-junction is constructed prior to the start of phase 3. The timing of a third subdivisional T-junction is not consequential to the results but the findings on geometric requirements are similar for all intersections.

The traffic figures also include development of the commercial site (north side of Lancelin Road) in 3 separate phases. :

- Phase 1 commercial development is assumed to coincide with phase 3 of the residential area.
- Phase 2 commercial development is assumed to coincide with phase 6 of the residential area.
- Phase 3 commercialdevelopment is assumed to coincide with phase 9 of the residential area.

Commercial traffic generation information was taken from the Riley traffic report.

The conclusions drawn from the traffic forecast and the Austroads traffic warrants are:

- BAR/ BAL geometry is suitable up to the end of phase 1 & phase 2 (i.e. 220 dwelling units).
- CHR(S)/ BAL geometry is required at start of phase 3 through phase 6 (i.e. 660 dwelling units).
- CHR/ AUL(S) geometry is required prior to completion of phase 7 (i.e. 770 dwelling units).

A possible construction strategy could be:

- Phase 1 & 2: Construct Intersection 1 with BAR/ BAL geometry (serves up to 220 units).
- Phase 3: Upgrade Intersection 1 to CHR(S)/ BAL geometry and construct Intersection 2 with CHR(S)/ BAL geometry (serves up to 660 dwelling units).
- Phase 7: Upgrade Intersection 1 and 2 to CHR/ AUL(S) geometry (serves beyond completion of Stage 1 ODP, i.e. 1100+ dwelling units)

If at the time that Phase 7 is being considered for development, the Shire of GinGin brings forward the decision to upgrade Lancelin Road to Integrator Arterial Type B standard (or higher), then the Phase 7 intersection upgrades would logically be undertaken according to the Integrator Arterial Type B 'boulevard' urban standards (not Austroads rural intersection standards).

Table 6a: Qm Max for Right & Left Turn Designs

AUSTROADS AGRD04A 2009 Figure 4.9

	Qm MAX		Qm MAX
	CHR(S)/ AUL(S) trigger		CHR/ (AUL or CHL) trigger
Qr or QL			
	veh/hr		veh/hr
10	420	10	1000
15	345	15	830
20	310	20	725
25	280	25	680
30	260	30	620
35	235	35	570
40	220	40	530
45	210	45	510
50	200	50	480
55	195	55	470
60	190	60	450
70	185	70	430
80	180	80	400
>80	180	>80	400

Lancelin Road Traffic for Qm calculation

Qm = for Qr, Qm is the sum of both directions of major road traffic

Qm = for QL, Qm is major road traffic (not turning)

period	Lancelin WB+EB traffic veh/hr	Lancelin WB Traffic veh/hr
1	**191**	**115**
2	**200**	**120**
3	**231**	**136**
4	**240**	**142**
5	**249**	**147**
6	**279**	**163**
7	**288**	**169**
8	**297**	**174**
9	**327**	**190**
10	**345**	**201**

Table 6b: Qr vs QmR determines Right Turn Design Requirement

rounded QR	Period	total dwellings	QR	QmR / QmL adjustments due to adjacent intersection turns	QmR after adjustment	QmR trigger for AUR/CHR(S)- use QR and Qm Max table	QmR > QmR limit?	QmR trigger for CHR (use QR and Qm Max table)	QmR > QmR limit?
25	1	110	**23**	0	**191**	**280**	no- ok	**680**	no- ok
45	2	220	**45**	0	**200**	**210**	no- ok	**510**	no- ok
35	3	330	**34**	51	**281**	**235**	**yes- turn lane needed**	**570**	no- ok
45	4	440	**45**	68	**307**	**210**	**yes- turn lane needed**	**510**	no- ok
55	5	550	**56**	84	**333**	**195**	**yes- turn lane needed**	**470**	no- ok
70	6	660	**68**	101	**381**	**185**	**yes- turn lane needed**	**430**	no- ok
80	7	770	**79**	118	**406**	**180**	**yes- turn lane needed**	**400**	**yes- turn lane needed**
90	8	880	**90**	135	**432**	**180**	**yes- turn lane needed**	**400**	**yes- turn lane needed**
100	9	990	**101**	152	**479**	**180**	**yes- turn lane needed**	**400**	**yes- turn lane needed**
115	10	1100	**113**	169	**514**	**180**	**yes- turn lane needed**	**400**	**yes- turn lane needed**
			PM IN- Left						
	Period	total dwellings	**QL**	**QmR / QmL adjustments due to adjacent intersection turns**	**QmL after adjustment**	**QmL trigger for AUL(S)**	**QmL > QmL limit?**	**QmL trigger for AUL/CHL (use QL and Qm Max table)**	**QmL > QmL limit?**
15	1	110	**15**	0	**115**	**345**	no - ok	**830**	no- ok
30	2	220	**30**	0	**120**	**260**	no - ok	**620**	no- ok
25	3	330	**23**	17	**153**	**280**	no - ok	**680**	no- ok
30	4	440	**30**	23	**164**	**260**	no - ok	**620**	no- ok
40	5	550	**38**	28	**175**	**220**	no - ok	**530**	no- ok
45	6	660	**45**	34	**197**	**210**	no - ok	**510**	no- ok
55	7	770	**53**	39	**208**	**195**	**yes- turn lane needed**	**470**	no- ok
60	8	880	**60**	45	**219**	**190**	**yes- turn lane needed**	**450**	no- ok
70	9	990	**68**	51	**241**	**185**	**yes- turn lane needed**	**430**	no- ok
75	10	1100	**75**	56	**257**	**185**	**yes- turn lane needed**	**430**	no- ok

Table 6c: Ql vs QmL determines Left Turn Design Requirement

Lancelin Road Intersection Capacity Simulation with SIDRA Software

In order to be conservative when testing intersection capacity at completion of South Lancelin Stage 1 ODP's 1100 dwelling units, it has been assumed that only 2 out of the 3 planned residential sub-division intersections are constructed and carrying the south side residential site traffic. The resulting South Lancelin Stage 1 ODP intersection traffic forecasts for AM/ PM design periods (shown in Table 7) are below the capacity limits identified in Table 2.4 pg 14 of Austroads Part 7 of Guide to Traffic Management (2009).

Although detailed capacity analysis is not needed for the period to completion of Stage 1 ODP and 50% of Lancelin townsite's projected traffic growth, SIDRA software was used to confirm that a single lane approach would be adequate for the minor road. SIDRA summary results are presented in Table 8 (overleaf).

Table 7: Turn Movements for Residential (south side) Intersection at full development of Stage 1 ODP

Intersection 1: PM Peak		Intersection 1: AM Peak	
Period 10 turn movements	vph	Period 10 turn movements	vph
WB thru	201	WB thru	173
WB left in	75	WB left in	24
EB thru	145	EB thru	173
EB right in	113	EB right in	56
right out	24	right out	75
left out	56	left out	113

Table 2.4 Austroads Guide to Traffic Management (2009)

- The following table may be used as an initial guide to determine the need for a detailed traffic analysis in accordance with the procedure provided in Part 3 of the Guide to Traffic Management. When the volumes at an intersection are less than those shown, a detailed analysis to demonstrate that adequate capacity is available is unlikely to be necessary. Furthermore, flaring of the approaches is unlikely to be needed based on capacity. However, separate lanes for left or right-turning vehicles may be desirable on the major road for safety reasons.

Major road type[1]	Major road flow (vph)[2]	Minor road flow (vph)[3]
Two-lane	400	250
	500	200
	650	100
Four-lane	1000	100
	1500	50
	2000	25

Notes:

1. Major road is through road (i.e. has priority).
2. Major road flow includes all major road traffic with priority over minor road traffic.
3. Minor road design volumes include through and turning volumes.

Table 8: SIDRA Intersection Assessment for Lancelin Road Intersections

	Delay		Queue	
AM	**Minor L/R**	**Major Right**	**Minor L/R**	**Major Right**
Stage 1*	13 seconds	11 sec	15m	2m
Ultimate**	20 sec/ 69 sec	12.4 sec	37m/ 69m	3m
PM				
Stage 1*	13 sec	11 sec	6m	4m
Ultimate**	14 sec/ 60 sec	12.5 sec	7m/ 23m	10m

**Stage 1 ODP geometry assumes single lane approach on minor leg (combined right + left turn lane).*
*** Ultimate South Lancelin development assumes separate right and left turn lanes on minor leg.*

Table 8 results confirm that a minor road constructed with a single lane for right and left turns is adequate to completion of the Stage 1 ODP development. Table 8 also provides an estimate of what delays and queuing distances will be at ultimate development traffic levels for Lancelin Road intersections. Refer to Attachment 4 for SIDRA assessment data.

Lancelin Road Intersection Consolidation and Spacing Recommendation:

Based on the Austroads T-junction design dimensions (Attachment 1), it is recommended that the intersection locations for South Lancelin Stage 1 ODP be rationalised at the west portion of the application area. *Figure 2* shows the suggested adjustments to intersection locations.

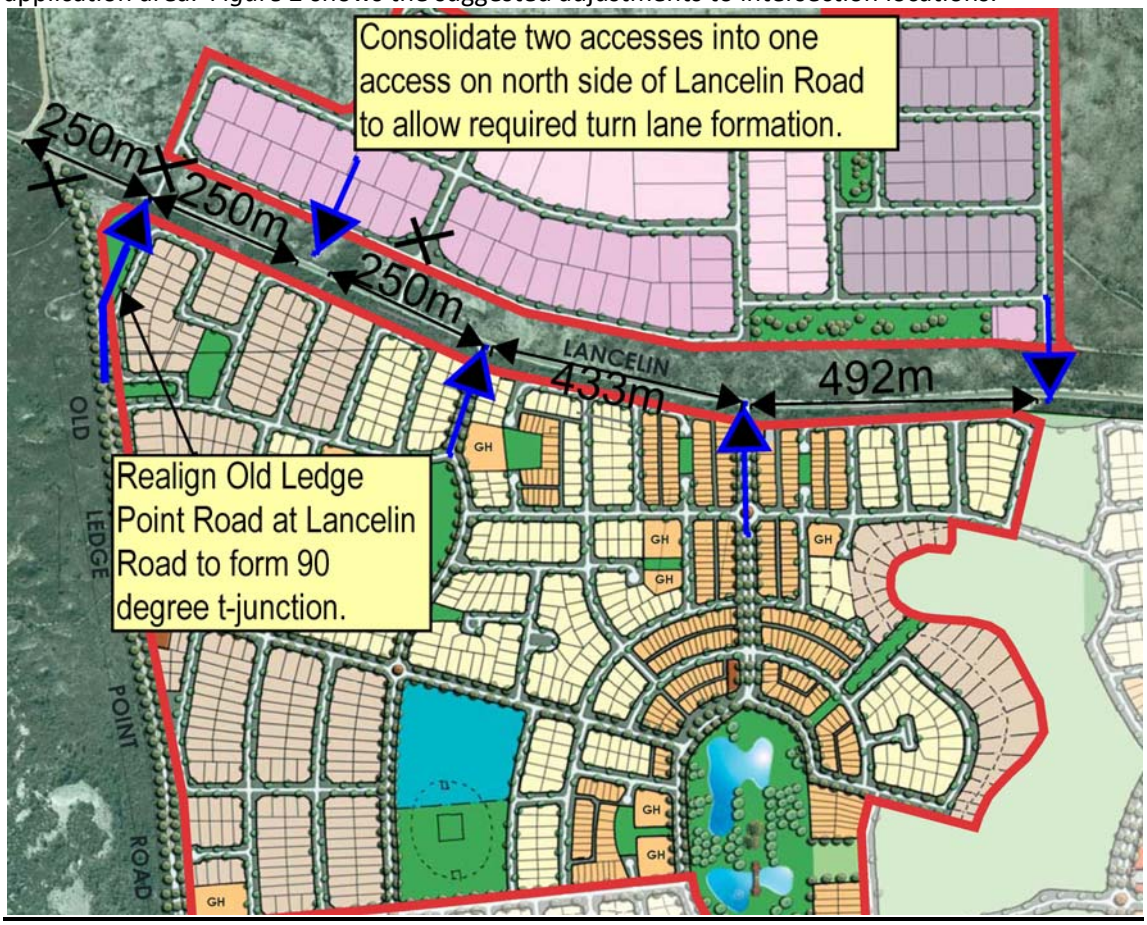


Figure 2: Intersection Location Changes for South Lancelin Stage 1 ODP

Figure 2 shows Old Ledge Point Road being realigned near Lancelin Road to provide a 90 degree angle of intersection and 250m separation from the existing road intersection to the west (on the north side of Lancelin Road).

Figure 2 also shows rationalisation of the accesses serving the 'commercial/ industrial' area (i.e. one access instead of the two accesses at the west end of commercial/ industrial area). This single access should be a minimum of 250m to the east of the realigned Old Ledge Point Road intersection and a minimum of 250m to the west of the central subdivisional road which serves the south side residential area.

The spacings in *Figure 2* are consistent with the recommendations contained in Porter Consulting Engineers letter dated 21 September 2010 addressed to the Shire of Gingin and titled: *South Lancelin Stage 1: Review of Traffic Forecast and Intersection Design Report*. Refer to Attachment 6 for a copy of this letter.

Stage 1 ODP Commercial Site Intersection Design and Capacity

The Riley Report indicates 1000 veh-trips/day traffic generation for the commercial site located within Stage 1 ODP on the north side of Lanceliln Road. With the intersection consolidation proposed above, this traffic would be spread across two intersections.

A peak hour factor of 0.13 would yield a total of approximately 130 veh-trip ends in the peak hour. Spreading this traffic across two intersections gives an approximate load of 65 veh-trip ends per intersection (once both intersections are constructed and the development is completely built out).

This amount of traffic is relatively low when compared to that handled by the residential subdivision intersections (as reported above) and Austroads traffic warrants would show 'later trigger dates' for various turn lane treatments.

However, due to the higher percentage of heavy vehicles expected to use the commercial site intersections, road safety would be significantly improved if these large, slower right turning vehicles were provided with a right turn lane at initial intersection construction. Left turning commercial vehicles do not pose the same safety risk because they face no opposing traffic and do not 'store' in the roadway.

The following staging strategy incorporates early implementation of right turn lanes on Lancelin Road at the commercial site intersections:

- Phase 1: Construct Commercial Intersection #1 with CHR(S)/ BAL geometry. Intersection 1 would serve up to 50% of the proposed commercial area.
- Phase 2: Construct Commercial Intersection #2 when commercially desired or when 50% of whole commercial area is developed. Construct Intersection 2 also with CHR(S)/ BAL geometry.
- Phase 3: Upgrade Commercial Intersection 1 & 2 with CHR/ AUL(S) geometry before Phase 7 of the residential development (south side) is complete.

If at the time that Phase 3 intersection improvements are being considered, the Shire of GinGin brings forward the decision to upgrade Lancelin Road to Integrator Arterial Type B standard (or higher), then the Phase 3 commercial site intersection upgrades would logically be undertaken according to the Integrator Arterial Type B 'boulevard' urban standards (not Austroads rural intersection standards).

Ledge Point Road Traffic and Road Design Standard

Review of the Riley report shows traffic on Ledge Point Road is only expected to reach 1400 veh/day. This level of traffic can be suitably handled with a 2-lane undivided local distributor road. A typical paved surface of 7.0-7.5m would generally be considered suitable for the expected traffic.

Discussions with TABEC Engineers indicate that initially, Ledge Point road will be treated with a bitumen seal project to ameliorate dust problems associated with existing truck activity. However, when Stage 1 ODP subdivision traffic starts using Ledge Point Road (via subdivisional road connections), it is recommended that Ledge Point Road be upgraded to the final recommended standard (i.e. 7.0-7.5m surfaced travel way).

Finally, at the time that Stage 1 ODP subdivision traffic is expected to use Old Ledge Point Road, the intersection with Lancelin Road should be reconstructed at its final location (with suitable intersection angle) as discussed earlier in this report.

Attachments:

1. Austroads AGRD04 09 Turn Lane Design Information
2. CH(S) and CH Design Dimension Tables (compiled by Bruce Aulabaugh)
3. South Lancelin Stage 1 ODP Intersection Turn Movements at completion.
4. SIDRA Outputs.
5. Existing Traffic Counts for Lancelin Road
6. Porter Engineering Consultants – Letter 21 Sept 2010

Attachment No. 1 – Austroads AGRD04 09 Turn Lane Design Information

Austroads (AGRD04 09) identifies two design typologies for 'rural' style T-junctions:

- Basis Turn Treatments (Type BA) includes widening but not a designated turn lane; and
- Channelised Turn Treatments including 'shortened short lane type (CH(S)) and full length turn lane type (CH).

Type BAR Intersection Geometry

The minimum 'basic' rural intersection right turn widening (for low level traffic) is defined as type BAR geometry, shown below in *Figure 1 (taken from Figure 7.5 AGRD 04A)*.

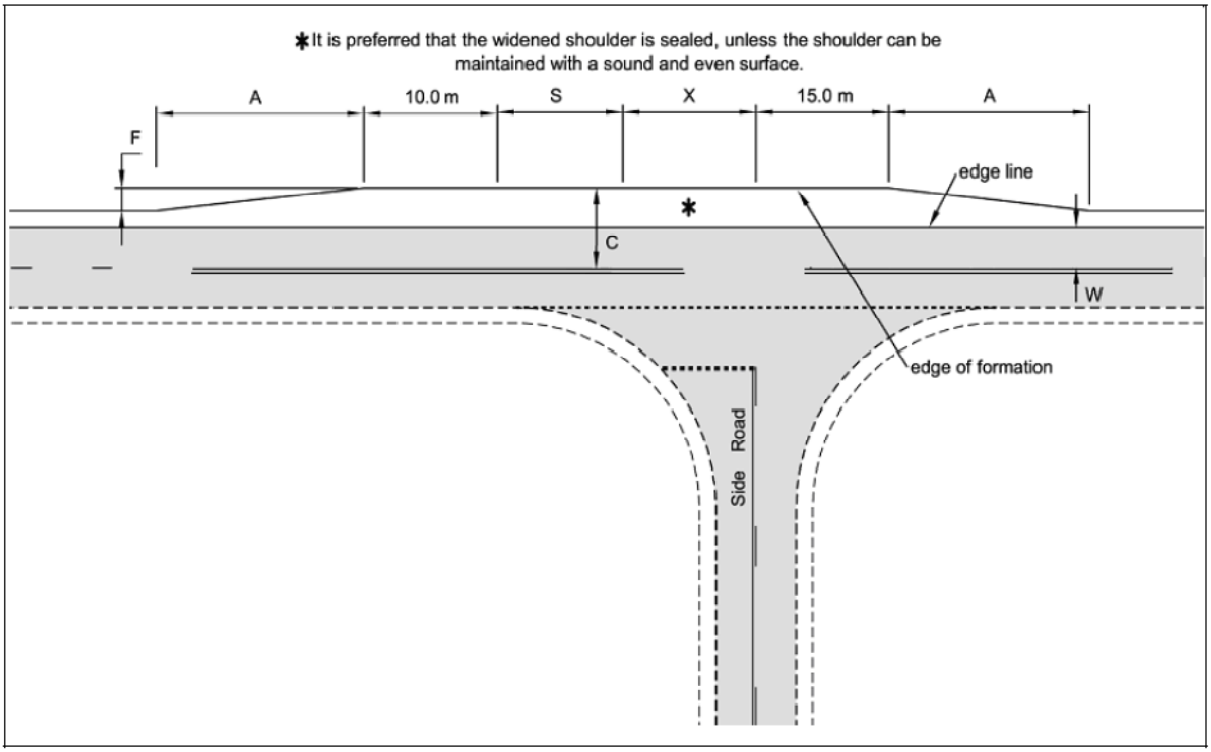


Figure 1 'BAR' type design for 'rural' intersections (refer to Table 1 for design dimensions).

'BAR' design dimensions are shown in *Table 1* for 80km/hr and 90km/hr design speeds.

Table 1: Design Dimensions for BAR intersection (assuming 5.5m to 7.0m half carriageway width).

	Total Length of Treatment for 80km/hr		Total Length of Treatment 90km/hr
17	A approach side taper	19	A approach side taper
22.5	B approach side straight	22.5	B approach side straight
15	Departure Straight	15	Departure Straight
17	A departure side taper	19	A departure side taper
71	metres	**75**	metres
39	approach side length	41	approach side length
32	departurn side length	34	departurn side length

Channelised Intersection Design (type CH(S) and CH)

Figure 2 and Figure 3 show the design for right turns only, for CHR(S) and CHR type intersections, respectively. The figures are taken from AGRD 04A Figure 7.6 and 7.7.

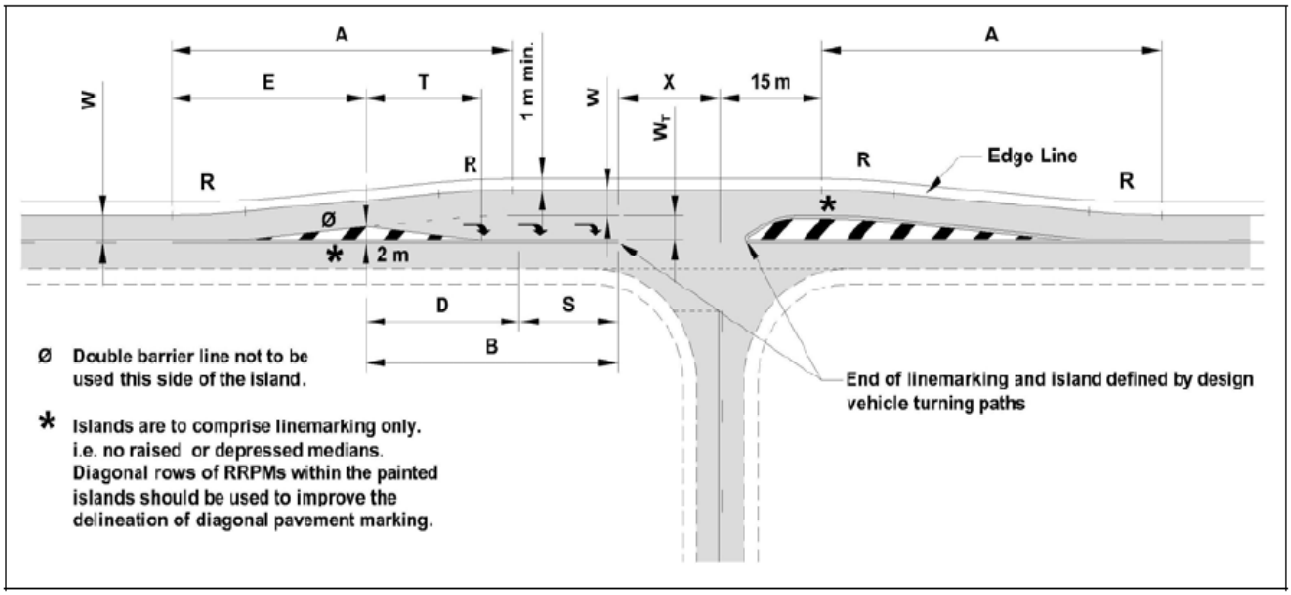


Figure 2 CHR(S) design for 'rural' intersections (refer to Attachment 1 for design dimensions).

The main differences between CHR(S) and CHR intersection designs are:

1. Road widening Taper A overlaps the diverge/deceleration area D in type CHR(S) but does not overlap in type CHR; and
2. Diverge/ Deceleration distance D is based on 3.5m/s/s for CHR(S) and 2.5m/s/s for CHR; and
3. Storage S is based on one design turning vehicle in CHR(S) and is based on estimated queue storage in CHR.

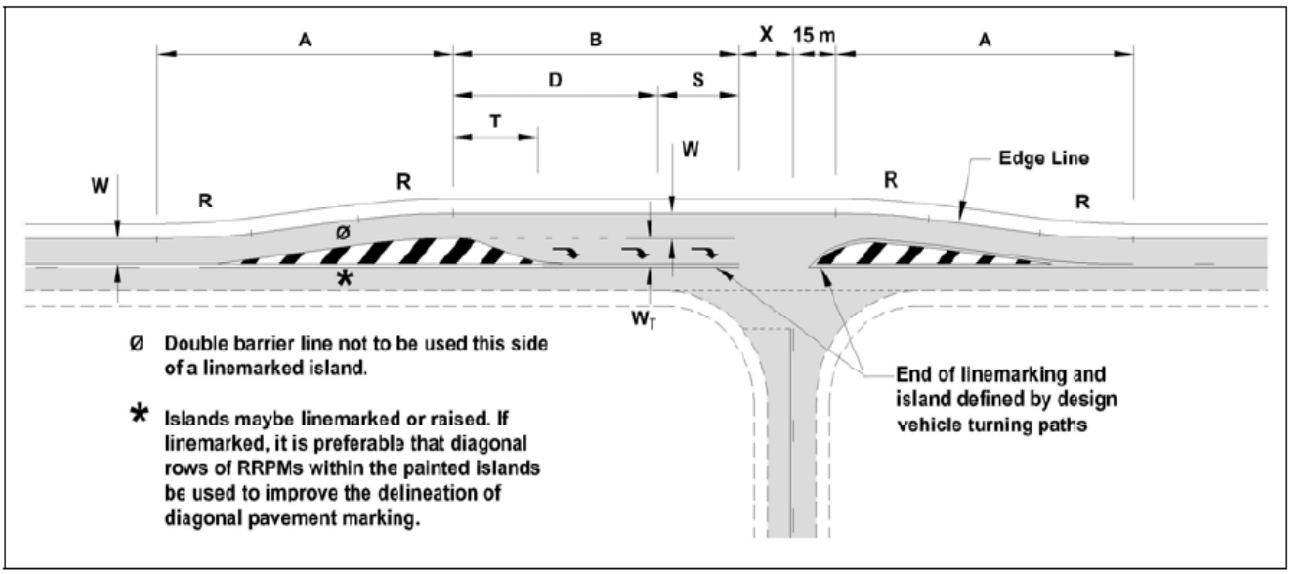


Figure 3 CHR design for 'rural' intersections (refer to Attachment 1 for design dimensions).

Type BAL Left Turn Intersection Geometry

The minimum left turn geometry (BAL) is shown in Figure 4.

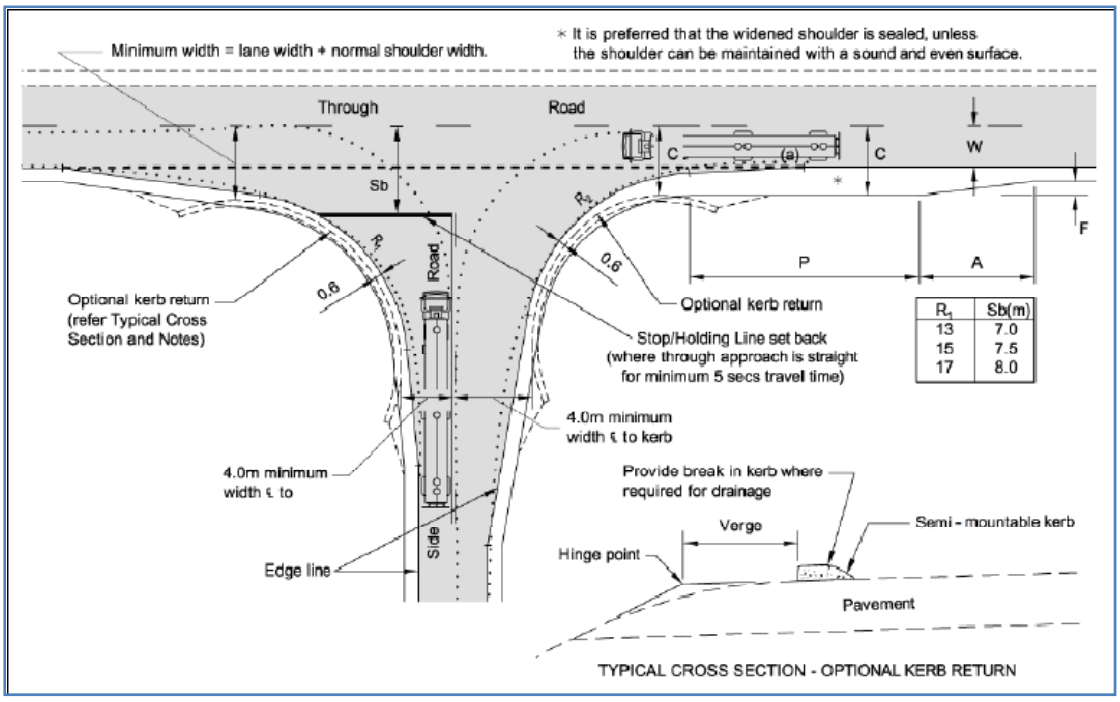


Figure 4 BAL design for 'rural' intersections.

Minimum dimension for 'C' is 6.0m (with widening added on curves). 'A' is determined from (0.5*V*F)/(3.6) = (0.5*80*2)/3.6 = 22.2m taper for 80km/hr design speed and a 2m widening.

Table 2: Dimension of Parallel Widened Shoulder for BAL design

Design speed of major road approach (km/h)	Minimum length of parallel widened shoulder P (m)
50	0
60	5
70	10
80	15
90	20
100	25
110	35
120	45

Type AUL(S) Left Turn Intersection Geometry

The short version auxiliary left turn lane geometry, AUL(S) is shown in Figure 5.

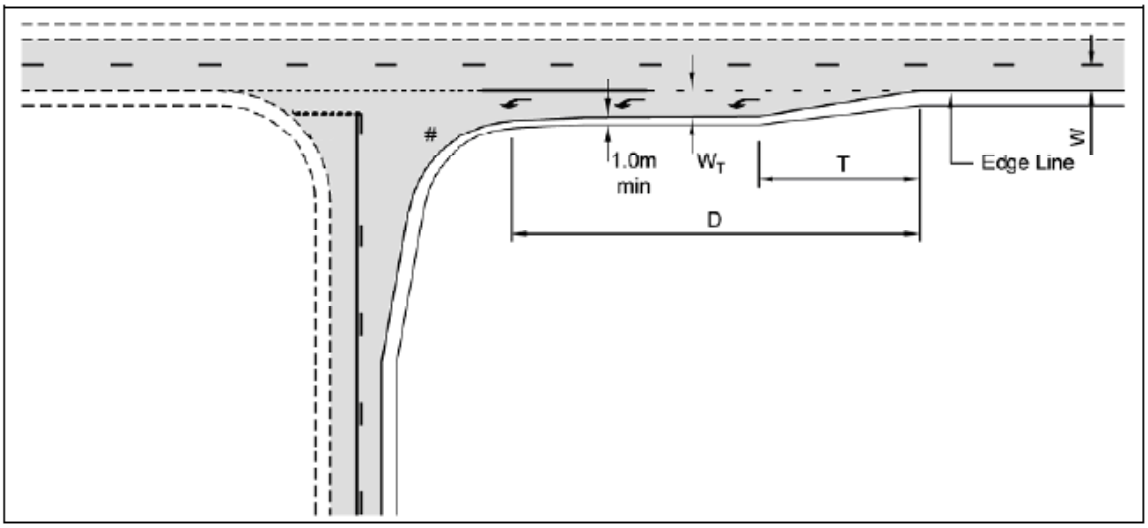


Figure 5 AUL(S) design for 'rural' intersections.

Table 3: Dimensions for AUL(S) Left Turn Geometry

Design speed of major road approach (km/h)	Diverge/deceleration length D (m)1	Taper length T (m)2
50	15	15
60	25	15
70	35	20
80	45	20
90	55	25
100	70	30
110	85	30
120	100	35

The channelised intersection types, namely CH(S) and CH, apply when certain traffic levels are reached.

Attachment No. 2 – Austroads Turn Lane Dimension Tables.

CHR(S) Intersection Design Dimension Table.

CHR(S) - shorter version of right turn (refer to Figure 4.9 for nomograph using QL, QR, QM to determine CHR(S) vs CHR design							
v (km/hr)	**50**	**60**	**70**	**80**	**90**	**100**	**110**
Width Turn Lane 'Wt'	3 3.5	3 3.5	3 3.5	3 3.5	3 3.5	3 3.5	3 3.5
Outside Road Edge Active Taper 'A' at start and end of 'widening' for 3m width	40	50	60	65	75	85	95
Outside Road Edge Active Taper 'A' at start and end of 'widening' for 3.5m width	47	58	70	76	88	99	111
Median Development Taper distance to 2m width: E = 2*A/Wt for 3.0m lane	27	33	40	43	50	57	63
Median Development Taper distance to 2m width: E = 2*A/Wt for 3.5m lane	27	33	40	43	50	57	63
Median Diverge/ Deceleration (D) -	15	25	35	45	55	70	85
Storage (S) for 1 Design Turning Vehicle	20	20	20	20	20	20	20
Distance X offset to intersection typically 10-15m based on Design Turning Vehicle	15	15	15	15	15	15	15

Summary CHR(S)							
v (km/hr)	**50**	**60**	**70**	**80**	**90**	**100**	**110**
Start Pt to Intersection (E+D+S+X) for 3.0m width	77	93	110	123	140	162	183
Start Pt to Intersection (E+D+S+X) for 3.5m width	77	93	110	123	140	162	183
Intersection to End Pt. (A+15) for 3.0m width	55	65	75	80	90	100	110
Intersection to End Pt. (A+15) for 3.5m width	62	73	85	91	103	114	126

Figure 4 – CHR Intersection Design Dimension Table.

CHR - Standard right turn (refer to Figure 4.9 for nomograph using QL, QR, QM to determine CHR(S) vs CHR design							
v (km/hr)	50	60	70	80	90	100	110
Width Turn Lane 'Wt'	3 3.5	3 3.5	3 3.5	3 3.5	3 3.5	3 3.5	3 3.5
Outside Road Edge Active Taper 'A' at start and end of 'widening' for 3m width	40	50	60	65	75	85	95
Outside Road Edge Active Taper 'A' at start and end of 'widening' for 3.5m width	50	60	70	80	90	100	110
Median Diverge/ Deceleration (D) - Table 5.2 for 0km/hr exit speed and 2.5m/s/s decel rate	40	55	75	100	125	155	185
Storage (S) from Sidra Calculation	20	20	20	20	20	20	20
Distance X offset to intersection typically 10-15m based on Design Turning Vehicle	15	15	15	15	15	15	15

Summary CHR							
v (km/hr)	50	60	70	80	90	100	110
Start Pt to Intersection (A+D+S+X) for 3.0m width	115	140	170	200	235	275	315
Start Pt to Intersection (A+D+S+X) for 3.5m width	125	150	180	215	250	290	330
Intersection to End Pt. (A+15) for 3.0m width	55	65	75	80	90	100	110
Intersection to End Pt. (A+15) for 3.5m width	65	75	85	95	105	115	125

Attachment No. 3 –

South Lancelin Stage 1 ODP Intersection Turn Movements at completion.

Weekend Traffic - Intersection 1

South Lancelin Stage 1 ODP

30% weekend extra traffic

AM		3.9	weekday external trip rate per dwelling per day
peak hour veh trip rate External per		**0.4875**	peak hour trip rate per dwelling
		0.13	
in	**0.3**	peak hour/ daily	
right turn	**left turn**		
0.7	**0.3**		
out	**0.7**		
right turn	**left turn**		
0.4	0.6		

PM	
0.4875	

in	0.7
right turn	left turn
0.6	0.4

out	0.3
right turn	left turn
0.3	0.7

South Lancelin Stage 1 ODP				
dwelling units		cumulative		**Intersection No. 1 share**
Period		0	**Peak hour trips**	
1	110.00	110	**54**	**100%**
2	110.00	220	**107**	**100%**
3	110.00	330	**161**	**50%**
4	110.00	440	**215**	**50%**
5	110.00	550	**268**	**50%**
6	110.00	**660**	**322**	**50%**
7	110.00	770	**375**	**50%**
8	110.00	**880**	**429**	**50%**
9	110.00	990	**483**	**50%**
10	110.00	1100	**536**	**50%**

1100 checksum on Stage 1 dwellings

	AM in right	**AM in left**	**AM out right**	**AM out left**
1	11	5	15	23
2	23	10	30	45
3	17	7	23	34
4	23	10	30	45
5	28	12	38	56
6	34	14	45	68
7	39	17	53	79
8	45	19	60	90
9	51	22	68	101
10	56	24	75	113

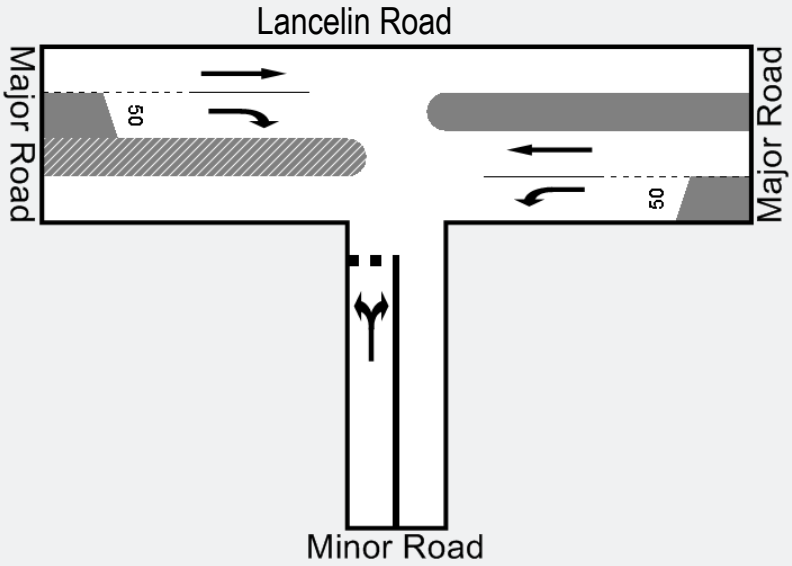
	PM in right	**PM in left**	**PM out right**	**PM out left**
1	23	15	5	11
2	45	30	10	23
3	34	23	7	17
4	45	30	10	23
5	56	38	12	28
6	68	45	14	34
7	79	53	17	39
8	90	60	19	45
9	101	68	22	51
10	113	75	24	56

Attachment No. 4 –

SIDRA Intersection Simulation Data

T-junction Geometry input to SIDRA

Stage 1 ODP



South Lancelin Stage 1 ODP Junction

AM Peak Hour Simulation: Stage 1 ODP Completion

MOVEMENT SUMMARY

Site: AM Lancelin Stage 1 single lane approach

AM Peak Hour - Single Side Road Approach Lane
Lancelin Road Stage 1 ODP Junctions Typical Layout
End Stage 1 Development
1100 dwellings
Existing Lancelin Traffic x 1.25 factor
Giveway / Yield (Two-Way)

Movement Performance - Vehicles

Mov ID	Turn	Demand Flow veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	95% Back of Queue Distance m	Prop. Queued	Effective Stop Rate per veh	Average Speed km/h
South: Minor Road											
1	L	133	2.5	0.301	13.1	LOS B	2.1	14.9	0.55	0.70	47.3
3	R	88	2.5	0.301	13.1	LOS B	2.1	14.9	0.55	0.82	47.3
Approach		221	2.5	0.301	13.1	LOS B	2.1	14.9	0.55	0.75	47.3
East: Major Road											
4	L	28	2.5	0.015	10.2	LOS B	0.0	0.0	0.00	0.71	65.6
5	T	182	6.0	0.097	0.0	LOS A	0.0	0.0	0.00	0.00	80.0
Approach		210	5.5	0.097	1.4	LOS B	0.0	0.0	0.00	0.10	77.9
West: Major Road											
11	T	182	6.0	0.097	0.0	LOS A	0.0	0.0	0.00	0.00	80.0
12	R	66	2.5	0.048	10.9	LOS B	0.2	1.8	0.31	0.67	64.3
Approach		248	5.1	0.097	2.9	LOS B	0.2	1.8	0.08	0.18	75.4
All Vehicles		680	4.4	0.301	5.7	NA	2.1	14.9	0.21	0.34	67.4

LOS (Aver. Int. Delay): NA. The average intersection delay is not a good LOS measure for two-way sign control due to zero delays associated with major road movements.
Level of Service (Worst Movement): LOS B. LOS Method for individual vehicle movements: Delay (HCM).
Approach LOS values are based on the worst delay for any vehicle movement.

SIDRA INTERSECTION

PM Peak Hour Simulation Results: Stage 1 ODP Completion

MOVEMENT SUMMARY

Site: PM Lancelin Stage 1 single lane approach

PM Peak Hour - Single Side Road Approach Lane
Lancelin Road Stage 1 ODP Junctions Typical Layout
End Stage 1 Development
1100 dwellings
Existing Lancelin Traffic x 1.25 factor
Giveway / Yield (Two-Way)

Movement Performance - Vehicles

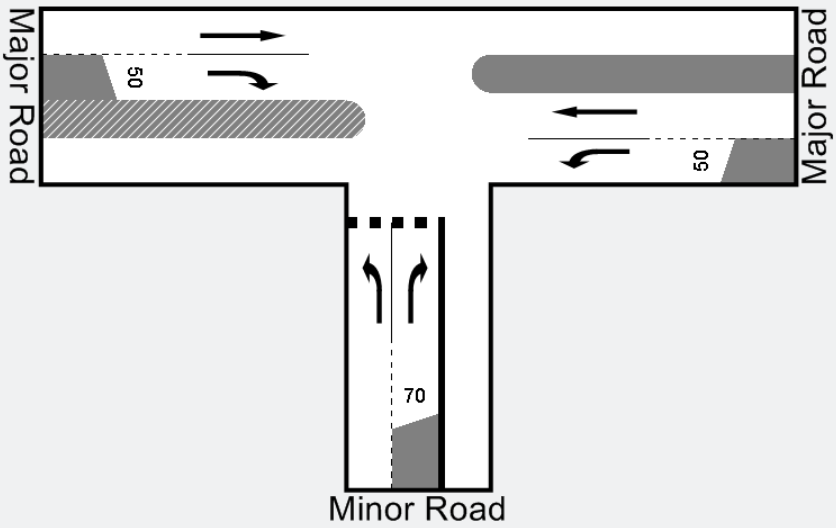
Mov ID	Turn	Demand Flow veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	95% Back of Queue Distance m	Prop. Queued	Effective Stop Rate per veh	Average Speed km/h
South: Minor Road											
1	L	66	2.5	0.138	13.2	LOS B	0.8	6.0	0.54	0.71	47.2
3	R	28	2.5	0.138	13.2	LOS B	0.8	6.0	0.54	0.82	47.2
Approach		94	2.5	0.138	13.2	LOS B	0.8	6.0	0.54	0.74	47.2
East: Major Road											
4	L	88	2.5	0.048	10.2	LOS B	0.0	0.0	0.00	0.71	65.6
5	T	212	6.0	0.113	0.0	LOS A	0.0	0.0	0.00	0.00	80.0
Approach		300	5.0	0.113	3.0	LOS B	0.0	0.0	0.00	0.21	75.4
West: Major Road											
11	T	153	6.0	0.081	0.0	LOS A	0.0	0.0	0.00	0.00	80.0
12	R	133	2.5	0.097	11.3	LOS B	0.6	4.0	0.39	0.70	64.0
Approach		286	4.4	0.097	5.3	LOS B	0.6	4.0	0.18	0.32	72.0
All Vehicles		680	4.4	0.138	5.4	NA	0.8	6.0	0.15	0.33	70.3

LOS (Aver. Int. Delay): NA. The average intersection delay is not a good LOS measure for two-way sign control due to zero delays associated with major road movements.
Level of Service (Worst Movement): LOS B. LOS Method for individual vehicle movements: Delay (HCM).
Approach LOS values are based on the worst delay for any vehicle movement.

SIDRA INTERSECTION

T-junction Geometry input to SIDRA

Full Build Out Case



AM Peak Hour: Ultimate Development Case

MOVEMENT SUMMARY

Site: AM Lancelin Ultimate dual lane approach

AM Peak Hour
Lancelin ODP Junctions Typical Layout
Ultimate Development
3300 dwellings plus commercial plus
Existing Lancelin Traffic x 1.504 factor
Giveway / Yield (Two-Way)

Movement Performance - Vehicles

Mov ID	Turn	Demand Flow veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	95% Back of Queue Distance m	Prop. Queued	Effective Stop Rate per veh	Average Speed km/h
South: Minor Road											
1	L	286	2.5	0.550	20.5	LOS C	5.2	36.8	0.77	1.10	41.3
3	R	191	2.5	0.840	68.5	LOS F	9.7	69.4	0.96	1.48	22.8
Approach		476	2.5	0.839	39.7	LOS F	9.7	69.4	0.85	1.25	31.2
East: Major Road											
4	L	48	2.5	0.026	10.2	LOS B	0.0	0.0	0.00	0.71	65.6
5	T	524	6.0	0.279	0.0	LOS A	0.0	0.0	0.00	0.00	80.0
Approach		572	5.7	0.279	0.9	LOS B	0.0	0.0	0.00	0.06	78.6
West: Major Road											
11	T	289	6.0	0.154	0.0	LOS A	0.0	0.0	0.00	0.00	80.0
12	R	72	2.5	0.069	12.4	LOS B	0.4	2.7	0.53	0.76	63.2
Approach		361	5.3	0.154	2.5	LOS B	0.4	2.7	0.10	0.15	76.2
All Vehicles		1410	4.5	0.840	14.4	NA	9.7	69.4	0.31	0.49	58.1

LOS (Aver. Int. Delay): NA. The average intersection delay is not a good LOS measure for two-way sign control due to zero delays associated with major road movements.
Level of Service (Worst Movement): LOS F. LOS Method for individual vehicle movements: Delay (HCM).
Approach LOS values are based on the worst delay for any vehicle movement.

SIDRA INTERSECTION

PM Peak Hour: Ultimate Development Case

MOVEMENT SUMMARY

Site: PM Lancelin Ultimate dual lane approach

PM Peak Hour
Lancelin Road Ultimate Junctions Typical Layout
3300 dwellings plus commercial plus
Existing Lancelin Traffic x 1.504 factor
Giveway / Yield (Two-Way)

Movement Performance - Vehicles

Mov ID	Turn	Demand Flow veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	95% Back of Queue Distance m	Prop. Queued	Effective Stop Rate per veh	Average Speed km/h
South: Minor Road											
1	L	107	2.5	0.173	13.9	LOS B	1.0	7.1	0.60	0.82	46.6
3	R	72	2.5	0.528	59.7	LOS F	3.1	22.5	0.94	1.09	24.8
Approach		179	2.5	0.527	32.3	LOS F	3.1	22.5	0.74	0.93	34.5
East: Major Road											
4	L	167	2.5	0.092	10.2	LOS B	0.0	0.0	0.00	0.71	65.6
5	T	364	6.0	0.194	0.0	LOS A	0.0	0.0	0.00	0.00	80.0
Approach		531	4.9	0.194	3.2	LOS B	0.0	0.0	0.00	0.22	75.1
West: Major Road											
11	T	449	6.0	0.239	0.0	LOS A	0.0	0.0	0.00	0.00	80.0
12	R	251	2.5	0.230	12.5	LOS B	1.4	9.7	0.55	0.80	63.2
Approach		700	4.7	0.239	4.5	LOS B	1.4	9.7	0.20	0.29	73.3
All Vehicles		1410	4.5	0.528	7.5	NA	3.1	22.5	0.19	0.34	68.0

LOS (Aver. Int. Delay): NA. The average intersection delay is not a good LOS measure for two-way sign control due to zero delays associated with major road movements.

Level of Service (Worst Movement): LOS F. LOS Method for individual vehicle movements: Delay (HCM).

Approach LOS values are based on the worst delay for any vehicle movement.

SIDRA INTERSECTION

Attachment No. 5 –

Existing Traffic Counts for Lancelin Road (provided by Shire of GinGin)

MetroCount Traffic Executive
Weekly Vehicle Counts

WeeklyVehicle-36 -- English (ENG)

Datasets:

Site:	**[Lancelin Road] MCSurvey field repair setup**
Direction:	7 - North bound A>B, South bound B>A. **Lane:** 0
Survey Duration:	00:00 07 April 2006 => 11:23 01 May 2006
Zone:	
File:	Lancelin Road01MAY2006.EC0 (Plus)
Identifier:	N215XDGQ MC56-L4 [MC55] (c)Microcom 19Sep03
Algorithm:	Factory default (v3.21 - 15275)
Data type:	Axle sensors - Paired (Class/Speed/Count)

Profile:

Filter time:	**00:00 07 April 2006 => 11:23 01 May 2006**
Included classes:	1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12
Speed range:	10 - 160 km/h.
Direction:	North (bound)
Separation:	All - (Headway)
Name:	Default Profile
Scheme:	Vehicle classification (AustRoads94)
Units:	Metric (meter, kilometer, m/s, km/h, kg, tonne)
In profile:	Vehicles = 19606 / 39202 (50.01%)

Weekly Vehicle Counts

WeeklyVehicle-36
Site: Lancelin Road.0.0NS
Description: **MCSurvey field repair setup**
Filter time: **00:00 07 April 2006 => 11:23 01 May 2006**
Scheme: Vehicle classification (AustRoads94)
Filter: Cls(1 2 3 4 5 6 7 8 9 10 11 12) Dir(N) Sp(10,160) Headway(>0)

	Mon	Tue	Wed	Thu	Fri	Sat	Sun	Averages	
	03 Apr	04 Apr	05 Apr	06 Apr	07 Apr	08 Apr	09 Apr	1 - 5	1 - 7
Hour									
0000-0100	*	*	*	*	0	2	2	0.0	1.3
0100-0200	*	*	*	*	0	5	2	0.0	2.3
0200-0300	*	*	*	*	4	0	2	4.0	2.0
0300-0400	*	*	*	*	1	2	1	1.0	1.3
0400-0500	*	*	*	*	9	9	8	9.0	8.7
0500-0600	*	*	*	*	5	5	8	5.0	6.0
0600-0700	*	*	*	*	5	33	9	5.0	15.7
0700-0800	*	*	*	*	19	72	18	19.0	36.3
0800-0900	*	*	*	*	48	78	34	48.0	53.3
0900-1000	*	*	*	*	40	76	51	40.0	55.7
1000-1100	*	*	*	*	39	**101<**	**70<**	39.0	70.0
1100-1200	*	*	*	*	**59<**	99	68	**59.0<**	**75.3<**
1200-1300	*	*	*	*	67	89	**71<**	67.0	**75.7<**
1300-1400	*	*	*	*	45	63	55	45.0	54.3
1400-1500	*	*	*	*	41	81	37	41.0	53.0
1500-1600	*	*	*	*	47	75	27	47.0	49.7
1600-1700	*	*	*	*	69	54	41	69.0	54.7
1700-1800	*	*	*	*	60	50	28	60.0	46.0
1800-1900	*	*	*	*	**79<**	**94<**	23	**79.0<**	65.3
1900-2000	*	*	*	*	58	48	24	58.0	43.3
2000-2100	*	*	*	*	38	7	5	38.0	16.7
2100-2200	*	*	*	*	18	8	3	18.0	9.7
2200-2300	*	*	*	*	11	6	6	11.0	7.7
2300-2400	*	*	*	*	7	9	2	7.0	6.0
Totals									
0700-1900	*	*	*	*	613	932	523	613.0	689.3
0600-2200	*	*	*	*	732	1028	564	732.0	774.7
0600-0000	*	*	*	*	750	1043	572	750.0	788.3
0000-0000	*	*	*	*	769	1066	595	769.0	810.0
AM Peak	*	*	*	*	1100	1000	1000		
	*	*	*	*	59	101	70		
PM Peak	*	*	*	*	1800	1800	1200		
	*	*	*	*	79	94	71		

*** - No data.**

Weekly Vehicle Counts

WeeklyVehicle-36
Site: Lancelin Road.0.0NS
Description: **MCSurvey field repair setup**
Filter time: **00:00 07 April 2006 => 11:23 01 May 2006**
Scheme: Vehicle classification (AustRoads94)
Filter: Cls(1 2 3 4 5 6 7 8 9 10 11 12) Dir(N) Sp(10,160) Headway(>0)

	Mon	Tue	Wed	Thu	Fri	Sat	Sun	Averages	
	10 Apr	11 Apr	12 Apr	13 Apr	14 Apr	15 Apr	16 Apr	1 - 5	1 - 7
Hour									
0000-0100	0	1	0	0	7	2	7	1.6	2.4
0100-0200	1	0	0	1	4	1	4	1.2	1.6
0200-0300	2	1	1	4	1	2	5	1.8	2.3
0300-0400	1	2	0	1	1	0	0	1.0	0.7
0400-0500	9	0	4	4	1	2	2	3.6	3.1
0500-0600	8	7	11	6	8	1	2	8.0	6.1
0600-0700	4	0	2	5	57	23	11	13.6	14.6
0700-0800	22	16	12	15	120	70	38	37.0	41.9
0800-0900	40	42	51	63	169	126	77	73.0	81.1
0900-1000	31	39	54	49	236	167	117	81.8	99.0
1000-1100	**51<**	40	49	49	269	**224<**	173	91.6	122.1
1100-1200	45	**44<**	**59<**	**74<**	**312<**	207	**180<**	**106.8<**	**131.6<**
1200-1300	46	37	55	93	**286<**	**201<**	**161<**	**103.4<**	**125.6<**
1300-1400	34	28	58	93	217	162	109	86.0	100.1
1400-1500	45	45	56	116	168	140	99	86.0	95.6
1500-1600	49	45	48	125	146	130	89	82.6	90.3
1600-1700	**58<**	**55<**	69	137	103	108	65	84.4	85.0
1700-1800	37	44	**69<**	146	88	99	58	76.8	77.3
1800-1900	30	39	43	**148<**	57	71	44	63.4	61.7
1900-2000	17	20	31	141	27	45	22	47.2	43.3
2000-2100	4	12	14	143	15	31	17	37.6	33.7
2100-2200	1	6	8	52	7	27	11	14.8	16.0
2200-2300	5	2	2	52	4	18	1	13.0	12.0
2300-2400	2	3	7	16	10	9	4	7.6	7.3
Totals									
0700-1900	488	474	623	1108	2171	1705	1210	972.8	1111.3
0600-2200	514	512	678	1449	2277	1831	1271	1086.0	1218.9
0600-0000	521	517	687	1517	2291	1858	1276	1106.6	1238.1
0000-0000	542	528	703	1533	2313	1866	1296	1123.8	1254.4
AM Peak	1000	1100	1100	1100	1100	1000	1100		
	51	44	59	74	312	224	180		
PM Peak	1600	1600	1700	1800	1200	1200	1200		
	58	55	69	148	286	201	161		

*** - No data.**

Weekly Vehicle Counts

WeeklyVehicle-36
Site: Lancelin Road.0.0NS
Description: **MCSurvey field repair setup**
Filter time: **00:00 07 April 2006 => 11:23 01 May 2006**
Scheme: Vehicle classification (AustRoads94)
Filter: Cls(1 2 3 4 5 6 7 8 9 10 11 12) Dir(N) Sp(10,160) Headway(>0)

	Mon	Tue	Wed	Thu	Fri	Sat	Sun	Averages	
	17 Apr	18 Apr	19 Apr	20 Apr	21 Apr	22 Apr	23 Apr	1 - 5	1 - 7
Hour									
0000-0100	4	0	0	2	1	7	2	1.4	2.3
0100-0200	2	1	1	2	1	2	1	1.4	1.4
0200-0300	1	1	2	1	1	0	3	1.2	1.3
0300-0400	1	0	0	1	0	1	0	0.4	0.4
0400-0500	6	4	5	7	6	6	6	5.6	5.7
0500-0600	8	2	1	4	1	4	1	3.2	3.0
0600-0700	14	9	10	14	11	6	4	11.6	9.7
0700-0800	22	23	17	29	16	18	26	21.4	21.6
0800-0900	54	29	32	37	38	54	31	38.0	39.3
0900-1000	75	35	45	69	42	53	66	53.2	55.0
1000-1100	121	58	**63<**	70	45	**110<**	**95<**	71.4	80.3
1100-1200	**135<**	**67<**	62	**77<**	**72<**	85	81	**82.6<**	**82.7<**
1200-1300	**129<**	75	61	73	52	**103<**	**79<**	**78.0<**	**81.7<**
1300-1400	84	55	**62<**	65	60	82	60	65.2	66.9
1400-1500	71	**79<**	58	54	49	67	66	62.2	63.4
1500-1600	51	47	61	**76<**	77	93	64	62.4	67.0
1600-1700	64	53	52	69	68	66	53	61.2	60.7
1700-1800	38	56	49	49	**92<**	49	38	56.8	53.0
1800-1900	32	57	41	49	69	53	23	49.6	46.3
1900-2000	8	26	17	15	50	31	12	23.2	22.7
2000-2100	8	6	10	7	28	20	13	11.8	13.1
2100-2200	2	9	3	10	17	5	3	8.2	7.0
2200-2300	7	3	3	7	5	8	1	5.0	4.9
2300-2400	1	3	5	1	8	6	1	3.6	3.6
Totals									
0700-1900	876	634	603	717	680	833	682	702.0	717.9
0600-2200	908	684	643	763	786	895	714	756.8	770.4
0600-0000	916	690	651	771	799	909	716	765.4	778.9
0000-0000	938	698	660	788	809	929	729	778.6	793.0
AM Peak	1100	1100	1000	1100	1100	1000	1000		
	135	67	63	77	72	110	95		
PM Peak	1200	1400	1300	1500	1700	1200	1200		
	129	79	62	76	92	103	79		

*** - No data.**

Weekly Vehicle Counts

WeeklyVehicle-36
Site: Lancelin Road.0.0NS
Description: **MCSurvey field repair setup**
Filter time: **00:00 07 April 2006 => 11:23 01 May 2006**
Scheme: Vehicle classification (AustRoads94)
Filter: Cls(1 2 3 4 5 6 7 8 9 10 11 12) Dir(N) Sp(10,160) Headway(>0)

	Mon	Tue	Wed	Thu	Fri	Sat	Sun	Averages	
	24 Apr	25 Apr	26 Apr	27 Apr	28 Apr	29 Apr	30 Apr	1 - 5	1 - 7
Hour									
0000-0100	2	4	0	1	1	0	0	1.6	1.1
0100-0200	0	1	5	1	0	0	0	1.4	1.0
0200-0300	6	0	1	1	1	0	0	1.8	1.3
0300-0400	3	0	0	1	1	0	0	1.0	0.7
0400-0500	3	8	6	6	5	0	0	5.6	4.0
0500-0600	2	29	2	6	0	0	0	7.8	5.6
0600-0700	6	8	9	8	6	0	0	7.4	5.3
0700-0800	17	19	14	15	17	0	0	16.4	11.7
0800-0900	33	36	22	41	34	0	0	33.2	23.7
0900-1000	46	65	41	44	47	0	0	48.6	34.7
1000-1100	59	**99<**	45	**57<**	**55<**	0	0	**63.0<**	**45.0<**
1100-1200	**77<**	92	**64<**	52	16	**0<**	**0<**	60.2	43.0
1200-1300	58	**92<**	45	58	0	0	0	**50.6<**	**36.1<**
1300-1400	66	53	44	50	0	0	0	42.6	30.4
1400-1500	37	45	49	**61<**	0	0	0	38.4	27.4
1500-1600	66	32	44	44	0	0	0	37.2	26.6
1600-1700	**67<**	47	**56<**	50	0	0	0	44.0	31.4
1700-1800	56	42	44	54	0	0	0	39.2	28.0
1800-1900	38	21	39	35	0	0	0	26.6	19.0
1900-2000	23	12	31	31	0	0	0	19.4	13.9
2000-2100	19	7	11	16	0	0	0	10.6	7.6
2100-2200	11	2	4	6	0	0	0	4.6	3.3
2200-2300	12	2	5	2	0	0	0	4.2	3.0
2300-2400	7	0	3	7	**0<**	**0<**	**0<**	3.4	2.4
Totals									
0700-1900	620	643	507	561	169	0	0	500.0	357.1
0600-2200	679	672	562	622	175	0	0	542.0	387.1
0600-0000	698	674	570	631	175	0	0	549.6	392.6
0000-0000	714	716	584	647	183	0	0	568.8	406.3
AM Peak	1100	1000	1100	1000	1000	1100	1100		
	77	99	64	57	55	0	0		
PM Peak	1600	1200	1600	1400	2300	2300	2300		
	67	92	56	61	0	0	0		

*** - No data.**

Weekly Vehicle Counts

WeeklyVehicle-36
Site: Lancelin Road.0.0NS
Description: **MCSurvey field repair setup**
Filter time: **00:00 07 April 2006 => 11:23 01 May 2006**
Scheme: Vehicle classification (AustRoads94)
Filter: Cls(1 2 3 4 5 6 7 8 9 10 11 12) Dir(N) Sp(10,160) Headway(>0)

	Mon	Tue	Wed	Thu	Fri	Sat	Sun	Averages	
	01 May	02 May	03 May	04 May	05 May	06 May	07 May	1 - 5	1 - 7
Hour									
0000-0100	0	*	*	*	*	*	*	0.0	0.0
0100-0200	0	*	*	*	*	*	*	0.0	0.0
0200-0300	0	*	*	*	*	*	*	0.0	0.0
0300-0400	0	*	*	*	*	*	*	0.0	0.0
0400-0500	0	*	*	*	*	*	*	0.0	0.0
0500-0600	0	*	*	*	*	*	*	0.0	0.0
0600-0700	0	*	*	*	*	*	*	0.0	0.0
0700-0800	0	*	*	*	*	*	*	0.0	0.0
0800-0900	0	*	*	*	*	*	*	0.0	0.0
0900-1000	0	*	*	*	*	*	*	0.0	0.0
1000-1100	0	*	*	*	*	*	*	0.0	0.0
1100-1200	0<	*	*	*	*	*	*	0.0<	0.0<
1200-1300	*	*	*	*	*	*	*	*	*
1300-1400	*	*	*	*	*	*	*	*	*
1400-1500	*	*	*	*	*	*	*	*	*
1500-1600	*	*	*	*	*	*	*	*	*
1600-1700	*	*	*	*	*	*	*	*	*
1700-1800	*	*	*	*	*	*	*	*	*
1800-1900	*	*	*	*	*	*	*	*	*
1900-2000	*	*	*	*	*	*	*	*	*
2000-2100	*	*	*	*	*	*	*	*	*
2100-2200	*	*	*	*	*	*	*	*	*
2200-2300	*	*	*	*	*	*	*	*	*
2300-2400	*	*	*	*	*	*	*	*	*
Totals									
0700-1900	*	*	*	*	*	*	*	*	*
0600-2200	*	*	*	*	*	*	*	*	*
0600-0000	*	*	*	*	*	*	*	*	*
0000-0000	*	*	*	*	*	*	*	*	*
AM Peak	1100	*	*	*	*	*	*		
	0	*	*	*	*	*	*		
PM Peak	*	*	*	*	*	*	*		
	*	*	*	*	*	*	*		

*** - No data.**

MetroCount Traffic Executive
Weekly Vehicle Counts

WeeklyVehicle-37 -- English (ENG)

Datasets:

Site:	**[Lancelin Road] MCSurvey field repair setup**
Direction:	7 - North bound A>B, South bound B>A. **Lane:** 0
Survey Duration:	00:00 07 April 2006 => 11:23 01 May 2006
Zone:	
File:	Lancelin Road01MAY2006.EC0 (Plus)
Identifier:	N215XDGQ MC56-L4 [MC55] (c)Microcom 19Sep03
Algorithm:	Factory default (v3.21 - 15275)
Data type:	Axle sensors - Paired (Class/Speed/Count)

Profile:

Filter time:	**00:00 07 April 2006 => 11:23 01 May 2006**
Included classes:	1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12
Speed range:	10 - 160 km/h.
Direction:	South (bound)
Separation:	All - (Headway)
Name:	Default Profile
Scheme:	Vehicle classification (AustRoads94)
Units:	Metric (meter, kilometer, m/s, km/h, kg, tonne)
In profile:	Vehicles = 19565 / 39202 (49.91%)

Weekly Vehicle Counts

WeeklyVehicle-37
Site: Lancelin Road.0.0NS
Description: **MCSurvey field repair setup**
Filter time: **00:00 07 April 2006 => 11:23 01 May 2006**
Scheme: Vehicle classification (AustRoads94)
Filter: Cls(1 2 3 4 5 6 7 8 9 10 11 12) Dir(S) Sp(10,160) Headway(>0)

	Mon	Tue	Wed	Thu	Fri	Sat	Sun	Averages	
	03 Apr	04 Apr	05 Apr	06 Apr	07 Apr	08 Apr	09 Apr	1 - 5	1 - 7
Hour									
0000-0100	*	*	*	*	0	1	3	0.0	1.3
0100-0200	*	*	*	*	1	1	3	1.0	1.7
0200-0300	*	*	*	*	1	1	2	1.0	1.3
0300-0400	*	*	*	*	2	1	5	2.0	2.7
0400-0500	*	*	*	*	7	5	2	7.0	4.7
0500-0600	*	*	*	*	12	4	9	12.0	8.3
0600-0700	*	*	*	*	25	8	9	25.0	14.0
0700-0800	*	*	*	*	27	25	18	27.0	23.3
0800-0900	*	*	*	*	41	42	49	41.0	44.0
0900-1000	*	*	*	*	40	51	97	40.0	62.7
1000-1100	*	*	*	*	41	68	**100<**	41.0	69.7
1100-1200	*	*	*	*	**49<**	**87<**	97	**49.0<**	**77.7<**
1200-1300	*	*	*	*	48	87	97	48.0	77.3
1300-1400	*	*	*	*	54	91	95	54.0	80.0
1400-1500	*	*	*	*	45	88	77	45.0	70.0
1500-1600	*	*	*	*	**56<**	**113<**	**110<**	**56.0<**	**93.0<**
1600-1700	*	*	*	*	35	89	101	35.0	75.0
1700-1800	*	*	*	*	30	48	67	30.0	48.3
1800-1900	*	*	*	*	28	20	22	28.0	23.3
1900-2000	*	*	*	*	8	16	7	8.0	10.3
2000-2100	*	*	*	*	10	13	7	10.0	10.0
2100-2200	*	*	*	*	8	4	1	8.0	4.3
2200-2300	*	*	*	*	4	4	2	4.0	3.3
2300-2400	*	*	*	*	2	5	1	2.0	2.7
Totals									
0700-1900	*	*	*	*	494	809	930	494.0	744.3
0600-2200	*	*	*	*	545	850	954	545.0	783.0
0600-0000	*	*	*	*	551	859	957	551.0	789.0
0000-0000	*	*	*	*	574	872	981	574.0	809.0
AM Peak	*	*	*	*	1100	1100	1000		
	*	*	*	*	49	87	100		
PM Peak	*	*	*	*	1500	1500	1500		
	*	*	*	*	56	113	110		

*** - No data.**

Weekly Vehicle Counts

WeeklyVehicle-37
Site: Lancelin Road.0.0NS
Description: **MCSurvey field repair setup**
Filter time: **00:00 07 April 2006 => 11:23 01 May 2006**
Scheme: Vehicle classification (AustRoads94)
Filter: Cls(1 2 3 4 5 6 7 8 9 10 11 12) Dir(S) Sp(10,160) Headway(>0)

	Mon	Tue	Wed	Thu	Fri	Sat	Sun	Averages	
	10 Apr	11 Apr	12 Apr	13 Apr	14 Apr	15 Apr	16 Apr	1 - 5	1 - 7
Hour									
0000-0100	0	0	1	1	5	2	7	1.4	2.3
0100-0200	1	1	1	1	2	2	6	1.2	2.0
0200-0300	0	1	0	3	1	1	2	1.0	1.1
0300-0400	1	3	1	3	2	1	2	2.0	1.9
0400-0500	2	6	2	5	4	3	6	3.8	4.0
0500-0600	10	9	14	11	2	4	2	9.2	7.4
0600-0700	38	18	31	25	4	14	18	23.2	21.1
0700-0800	36	26	31	27	21	22	21	28.2	26.3
0800-0900	44	38	35	46	35	64	62	39.6	46.3
0900-1000	**56<**	41	49	57	44	69	141	49.4	65.3
1000-1100	50	**51<**	37	42	83	118	189	52.6	81.4
1100-1200	42	49	**55<**	**63<**	**101<**	**185<**	**252<**	**62.0<**	**106.7<**
1200-1300	44	33	**65<**	58	128	186	**236<**	65.6	107.1
1300-1400	**54<**	42	61	**87<**	120	**187<**	205	**72.8<**	**108.0<**
1400-1500	47	42	42	59	**151<**	183	180	68.2	100.6
1500-1600	50	41	53	65	148	180	180	71.4	102.4
1600-1700	49	**45<**	41	61	146	157	154	68.4	93.3
1700-1800	24	34	24	38	63	88	131	36.6	57.4
1800-1900	18	18	34	28	55	50	55	30.6	36.9
1900-2000	3	6	17	6	22	32	29	10.8	16.4
2000-2100	7	6	23	13	17	27	15	13.2	15.4
2100-2200	1	7	8	11	7	19	4	6.8	8.1
2200-2300	4	0	5	3	7	8	3	3.8	4.3
2300-2400	1	2	2	2	2	4	5	1.8	2.6
Totals									
0700-1900	514	460	527	631	1095	1489	1806	645.4	931.7
0600-2200	563	497	606	686	1145	1581	1872	699.4	992.9
0600-0000	568	499	613	691	1154	1593	1880	705.0	999.7
0000-0000	582	519	632	715	1170	1606	1905	723.6	1018.4
AM Peak	0900	1000	1100	1100	1100	1100	1100		
	56	51	55	63	101	185	252		
PM Peak	1300	1600	1200	1300	1400	1300	1200		
	54	45	65	87	151	187	236		

*** - No data.**

Weekly Vehicle Counts

WeeklyVehicle-37
Site: Lancelin Road.0.0NS
Description: **MCSurvey field repair setup**
Filter time: **00:00 07 April 2006 => 11:23 01 May 2006**
Scheme: Vehicle classification (AustRoads94)
Filter: Cls(1 2 3 4 5 6 7 8 9 10 11 12) Dir(S) Sp(10,160) Headway(>0)

	Mon	Tue	Wed	Thu	Fri	Sat	Sun	Averages	
	17 Apr	18 Apr	19 Apr	20 Apr	21 Apr	22 Apr	23 Apr	1 - 5	1 - 7
Hour									
0000-0100	5	0	2	0	1	5	6	1.6	2.7
0100-0200	4	2	1	1	2	3	3	2.0	2.3
0200-0300	0	1	1	0	0	3	2	0.4	1.0
0300-0400	3	1	5	1	1	2	1	2.2	2.0
0400-0500	4	7	6	5	5	3	2	5.4	4.6
0500-0600	8	22	14	10	11	9	6	13.0	11.4
0600-0700	16	25	27	33	16	12	8	23.4	19.6
0700-0800	30	35	21	35	30	20	16	30.2	26.7
0800-0900	55	52	42	34	45	40	21	45.6	41.3
0900-1000	207	62	55	51	56	**77<**	55	86.2	80.4
1000-1100	223	**84<**	56	77	**64<**	68	91	100.8	94.7
1100-1200	**239<**	67	**63<**	**83<**	53	68	**92<**	**101.0<**	**95.0<**
1200-1300	255	65	51	**96<**	54	57	75	104.2	93.3
1300-1400	274	**90<**	**76<**	74	60	75	93	114.8	106.0
1400-1500	**287<**	80	67	70	**70<**	**75<**	**115<**	**114.8<**	**109.1<**
1500-1600	257	80	67	69	50	65	103	104.6	98.7
1600-1700	159	60	48	66	55	65	87	77.6	77.1
1700-1800	102	40	34	45	30	42	63	50.2	50.9
1800-1900	62	15	19	20	21	27	28	27.4	27.4
1900-2000	21	14	9	12	11	5	18	13.4	12.9
2000-2100	7	9	9	9	6	8	28	8.0	10.9
2100-2200	3	5	0	3	6	5	3	3.4	3.6
2200-2300	5	3	1	1	6	5	1	3.2	3.1
2300-2400	3	2	4	2	4	6	2	3.0	3.3
Totals									
0700-1900	2150	730	599	720	588	679	839	957.4	900.7
0600-2200	2197	783	644	777	627	709	896	1005.6	947.6
0600-0000	2205	788	649	780	637	720	899	1011.8	954.0
0000-0000	2229	821	678	797	657	745	919	1036.4	978.0
AM Peak	1100	1000	1100	1100	1000	0900	1100		
	239	84	63	83	64	77	92		
PM Peak	1400	1300	1300	1200	1400	1400	1400		
	287	90	76	96	70	75	115		

*** - No data.**

Weekly Vehicle Counts

WeeklyVehicle-37
Site: Lancelin Road.0.0NS
Description: **MCSurvey field repair setup**
Filter time: **00:00 07 April 2006 => 11:23 01 May 2006**
Scheme: Vehicle classification (AustRoads94)
Filter: Cls(1 2 3 4 5 6 7 8 9 10 11 12) Dir(S) Sp(10,160) Headway(>0)

	Mon	Tue	Wed	Thu	Fri	Sat	Sun	Averages	
	24 Apr	25 Apr	26 Apr	27 Apr	28 Apr	29 Apr	30 Apr	1 - 5	1 - 7
Hour									
0000-0100	1	2	1	1	0	0	0	1.0	0.7
0100-0200	1	2	2	2	1	0	0	1.6	1.1
0200-0300	2	0	2	0	0	0	0	0.8	0.6
0300-0400	2	0	2	1	2	0	0	1.4	1.0
0400-0500	2	6	4	4	4	0	0	4.0	2.9
0500-0600	15	7	14	8	10	0	0	10.8	7.7
0600-0700	25	26	34	29	33	0	0	29.4	21.0
0700-0800	25	31	34	22	27	0	0	27.8	19.9
0800-0900	40	35	49	39	41	0	0	40.8	29.1
0900-1000	46	45	48	36	36	0	0	42.2	30.1
1000-1100	64	99	49	37	**60<**	0	0	**61.8<**	**44.1<**
1100-1200	**66<**	**107<**	**49<**	**49<**	26	**0<**	**0<**	59.4	42.4
1200-1300	**80<**	96	**54<**	66	0	0	0	59.2	42.3
1300-1400	70	105	53	**76<**	0	0	0	**60.8<**	**43.4<**
1400-1500	71	**114<**	44	60	0	0	0	57.8	41.3
1500-1600	59	92	53	68	0	0	0	54.4	38.9
1600-1700	77	97	41	51	0	0	0	53.2	38.0
1700-1800	38	46	35	35	0	0	0	30.8	22.0
1800-1900	25	16	18	19	0	0	0	15.6	11.1
1900-2000	19	12	8	5	0	0	0	8.8	6.3
2000-2100	5	6	4	6	0	0	0	4.2	3.0
2100-2200	1	9	4	4	0	0	0	3.6	2.6
2200-2300	2	0	4	1	0	0	0	1.4	1.0
2300-2400	2	0	7	0	**0<**	**0<**	**0<**	1.8	1.3
Totals									
0700-1900	661	883	527	558	190	0	0	563.8	402.7
0600-2200	711	936	577	602	223	0	0	609.8	435.6
0600-0000	715	936	588	603	223	0	0	613.0	437.9
0000-0000	738	953	613	619	240	0	0	632.6	451.9
AM Peak	1100	1100	1100	1100	1000	1100	1100		
	66	107	49	49	60	0	0		
PM Peak	1200	1400	1200	1300	2300	2300	2300		
	80	114	54	76	0	0	0		

*** - No data.**

Weekly Vehicle Counts

WeeklyVehicle-37
Site: Lancelin Road.0.0NS
Description: **MCSurvey field repair setup**
Filter time: **00:00 07 April 2006 => 11:23 01 May 2006**
Scheme: Vehicle classification (AustRoads94)
Filter: Cls(1 2 3 4 5 6 7 8 9 10 11 12) Dir(S) Sp(10,160) Headway(>0)

	Mon	Tue	Wed	Thu	Fri	Sat	Sun	Averages	
	01 May	02 May	03 May	04 May	05 May	06 May	07 May	1 - 5	1 - 7
Hour									
0000-0100	0	*	*	*	*	*	*	0.0	0.0
0100-0200	0	*	*	*	*	*	*	0.0	0.0
0200-0300	0	*	*	*	*	*	*	0.0	0.0
0300-0400	0	*	*	*	*	*	*	0.0	0.0
0400-0500	0	*	*	*	*	*	*	0.0	0.0
0500-0600	0	*	*	*	*	*	*	0.0	0.0
0600-0700	0	*	*	*	*	*	*	0.0	0.0
0700-0800	0	*	*	*	*	*	*	0.0	0.0
0800-0900	0	*	*	*	*	*	*	0.0	0.0
0900-1000	0	*	*	*	*	*	*	0.0	0.0
1000-1100	0	*	*	*	*	*	*	0.0	0.0
1100-1200	0<	*	*	*	*	*	*	0.0<	0.0<
1200-1300	*	*	*	*	*	*	*	*	*
1300-1400	*	*	*	*	*	*	*	*	*
1400-1500	*	*	*	*	*	*	*	*	*
1500-1600	*	*	*	*	*	*	*	*	*
1600-1700	*	*	*	*	*	*	*	*	*
1700-1800	*	*	*	*	*	*	*	*	*
1800-1900	*	*	*	*	*	*	*	*	*
1900-2000	*	*	*	*	*	*	*	*	*
2000-2100	*	*	*	*	*	*	*	*	*
2100-2200	*	*	*	*	*	*	*	*	*
2200-2300	*	*	*	*	*	*	*	*	*
2300-2400	*	*	*	*	*	*	*	*	*
Totals									
0700-1900	*	*	*	*	*	*	*	*	*
0600-2200	*	*	*	*	*	*	*	*	*
0600-0000	*	*	*	*	*	*	*	*	*
0000-0000	*	*	*	*	*	*	*	*	*
AM Peak	1100	*	*	*	*	*	*		
	0	*	*	*	*	*	*		
PM Peak	*	*	*	*	*	*	*		
	*	*	*	*	*	*	*		

*** - No data.**

Attachment No. 6 –

Porter Engineering Consultants Letter 21 Sept 2010

Our Ref: ELW/L0836.10
Job No: 10-08-163

21 September 2010

RECEIVED
23 SEP 2010
BY: Rachel

Shire of Gingin
7 Brockman Street
GINGIN WA 6503

Porter Consulting Engineers

Level 2 Kishorn Court
58 Kishorn Road
Mount Pleasant WA 6153

PO Box 1036
Canning Bridge WA 6153

Tel: (08) 9315 9955
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Attention: Lisa Edwards

Dear Lisa

RE: SOUTH LANCELIN STAGE 1 - REVIEW OF TRAFFIC FORECAST AND INTERSECTION DESIGN REPORT

Porter Consulting Engineers are engaged by Taylor Burrell Barnett to undertake a review on behalf of the Shire of Gingin of the South Lancelin Stage 1, Traffic Forecast and Intersection Design Report, July 2010 by Bruce Aulabaugh.

Lancelin Road (Route 60) is a rural road which presently has three speed zones along the length between Indian Ocean Drive and Casserley Way. The speed zones are 2.5km at 110km/h west from Indian Ocean Drive. This reduces to 90km/h 300m east of Old Ledge Point Road. This 90km/h speed zone extends for 2.3km, reducing to 70km/h 500m south of Casserley Way.

Bruce Aulabaugh's Traffic and Intersection Design report presents discussion and recommendations based on future traffic flows arising from development trip generation. Accordingly, recommendations for the geometry of the road carriageway and intersections are based on traffic flows. No discussion is included on speed zones with corresponding sight distance requirements and geometric considerations including turn lanes length.

The majority of Lancelin Road fronting South Lancelin Stage 1 from Indian Ocean Drive to Old Ledge Point Road is presently speed zoned at 110km/h with only 300m east of Old Lancelin Road speed zoned at 90km/h. On pages 15 and 17 of the report some geometric dimensions are evaluated on the basis of a design speed of 80km/h and on page 16 Table 1 is presented with dimensions for design speed of 80kmh and 90km/h.

The report makes recommendations for intersection spacing which the Executive Summary states are said to be based on Austroads 2009 T-junction design dimensions included in Attachment 1 of the report and presented as Figure 2. The geometry of intersections and consequent spacing is determined by design speed. The report includes tables covering design speeds from 50km/h to 120km/h. The actual design speed used to present the results for geometry and spacing is not stated.

Standard practice for new works is to design at 10km/h above the posted speed limit to allow a factor of safety. If the report is assuming a design speed of 80km/h then it is also assuming that the posted speed limit will be 70km/h. There are currently no sections of Lancelin Road abutting the proposed development speed zoned at 70km/h or 80km/h. If the report is assuming that in the

future there will be speed limit changes to Lancelin Road then a suitable evaluation of speed limits should be included with justification presented for change.

The overall Lancelin South Structure Plan adopted by the Shire of Gingin on 2 October 2007 proposes 3 new T-junction intersections on the southern side of Lancelin Road and 3 new intersections on the northern side. The existing Old Ledge Point Road will also be utilised. In Stage 1 only the most eastern intersection on the southern side is not included.

The traffic report discusses intersection spacing and identifies there will be insufficient safe separation between intersections and recommends that two intersections on the northern side are consolidated into a single intersection spaced approximately centrally between two of the southern intersections. And that the Old Ledge Point Road intersection is realigned toward the east to improve geometry. No discussion is however made on separation between this intersection and the nearby Refuse Site access road intersection.

Currently the Refuse Site access road and Old Ledge Point Road have approximately 90 metres separation distance along Lancelin Road. With increased development comes increased production of waste and the number of trips to/from the Refuse site will increase. Trip generation on Old Ledge Point Road from subdivision development will increase as described in the traffic report. A realignment of Old Ledge Point Road to 90 degree geometry is unlikely to be sufficient to provide adequate safe separation distance between these two intersection under the current speed limit environment of 90km/h. Further separation of these intersections to accord with the design speed is recommended.

Notwithstanding that the report has not included a speed limits evaluation, it is my opinion some reduction in speed limit from the existing 110km/h will be needed in the future to suit introduction of the several new road connections intersecting with Lancelin Road.

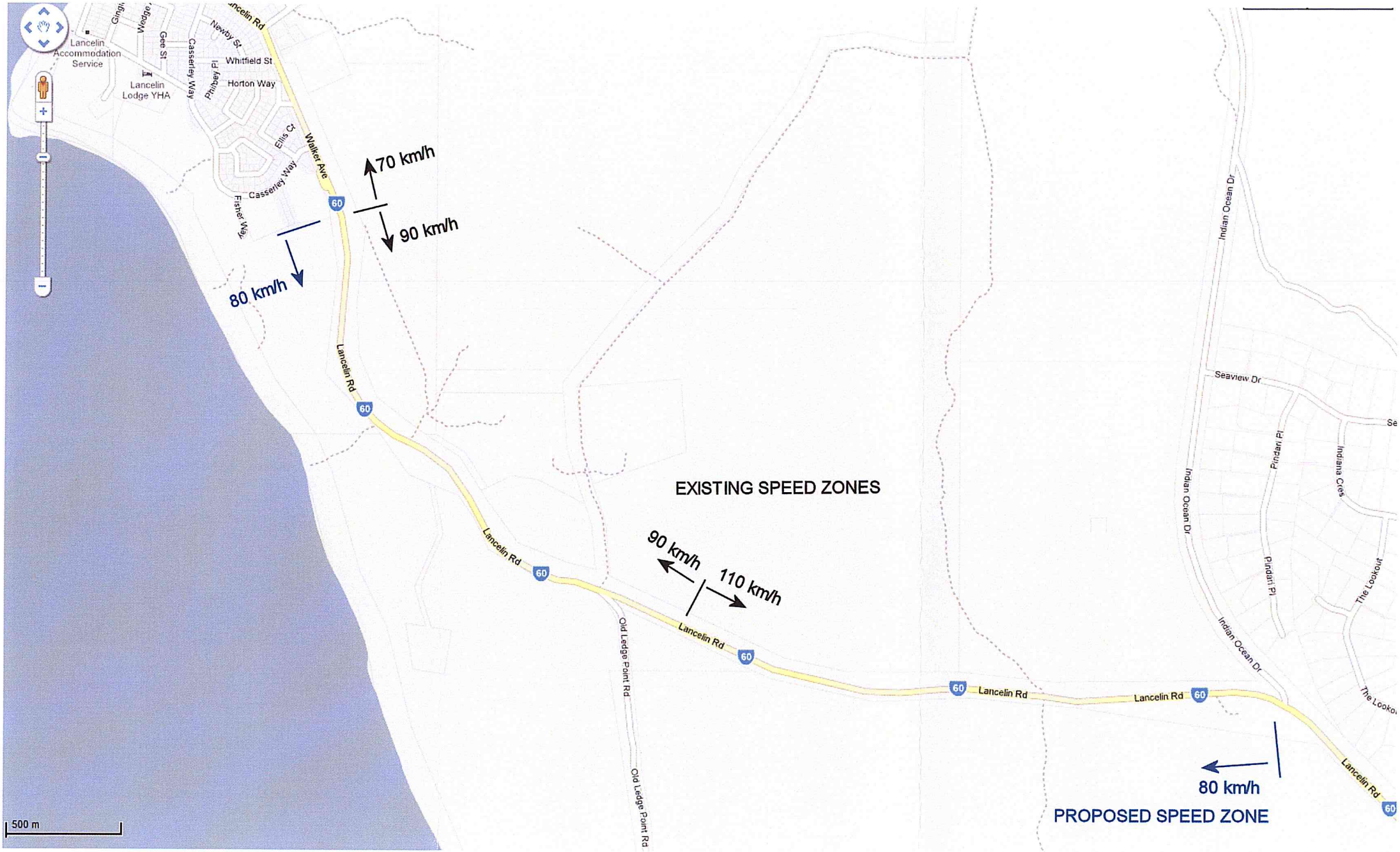
Reducing the speed zone on Lancelin Road to 80km/h allows for a practical minimum separation distance between opposite T-intersections of 250 metres with separate right-turn pockets at each. Attached are diagrams presenting recommendations for speed zoning and intersection separation. This includes realignment/relocation of the Refuse Access road by approximately 40m west and realignment/relocation of Old Ledge Point Road by approximately 120m east to achieve a minimum separation of 250m between intersections. It is agreed with the Traffic Report that two of the proposed northern intersections need to be consolidated into one, however it is recommended that the intersection spacing from Old Ledge Point Road is increased to achieve not less than 250m separation.

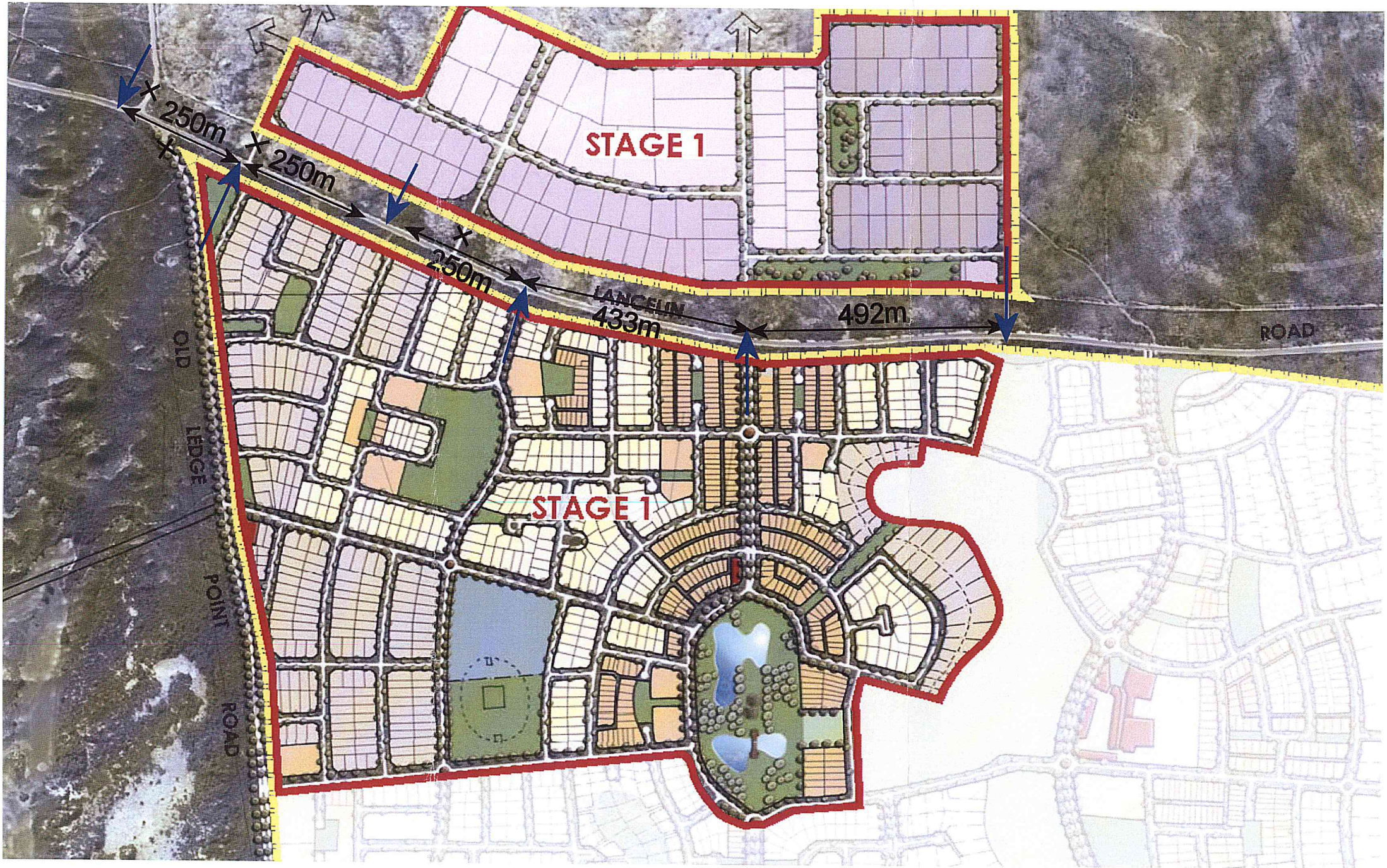
Yours faithfully

E. Williams

EVAN WILLIAMS
SENIOR CIVIL/TRAFFIC ENGINEER

cc Rachel Chapman-Willey, Taylor Burrell Barnett


Lancelin Accommodation Service
Lancelin Lodge YHA
Gee St
Casserley Way
Newby St
Whitfield St
Horton Way
Phillacey Pl
Ellis Ct
Walker Ave
Casserley Way
Fisher Way
Lancelin Rd
60
70 km/h
90 km/h
80 km/h
EXISTING SPEED ZONES
90 km/h
110 km/h
Old Ledge Point Rd
Indian Ocean Dr
Seaview Dr
Pindari Pl
Indiana Cres
The Lookout
80 km/h
PROPOSED SPEED ZONE
500 m


STAGE 1
STAGE 1
250m
250m
250m
LANCELIN
433m
492m
ROAD
OLD
LEDGE
POINT
ROAD

APPENDIX E
Residential Density Coding Plan

Residential Density Coding Plan - Lot 5243 and 9505

LANCELIN SOUTH - STAGE 1

A JOE MATTHEWS PROJECT

plan: 03/096/023
date: 28/02/2011
projection: LCG 94
designed: WHB
checked: RC
drawn: TB
scale: 1:2000@A1 | 1:4000@A3
0 40 80m

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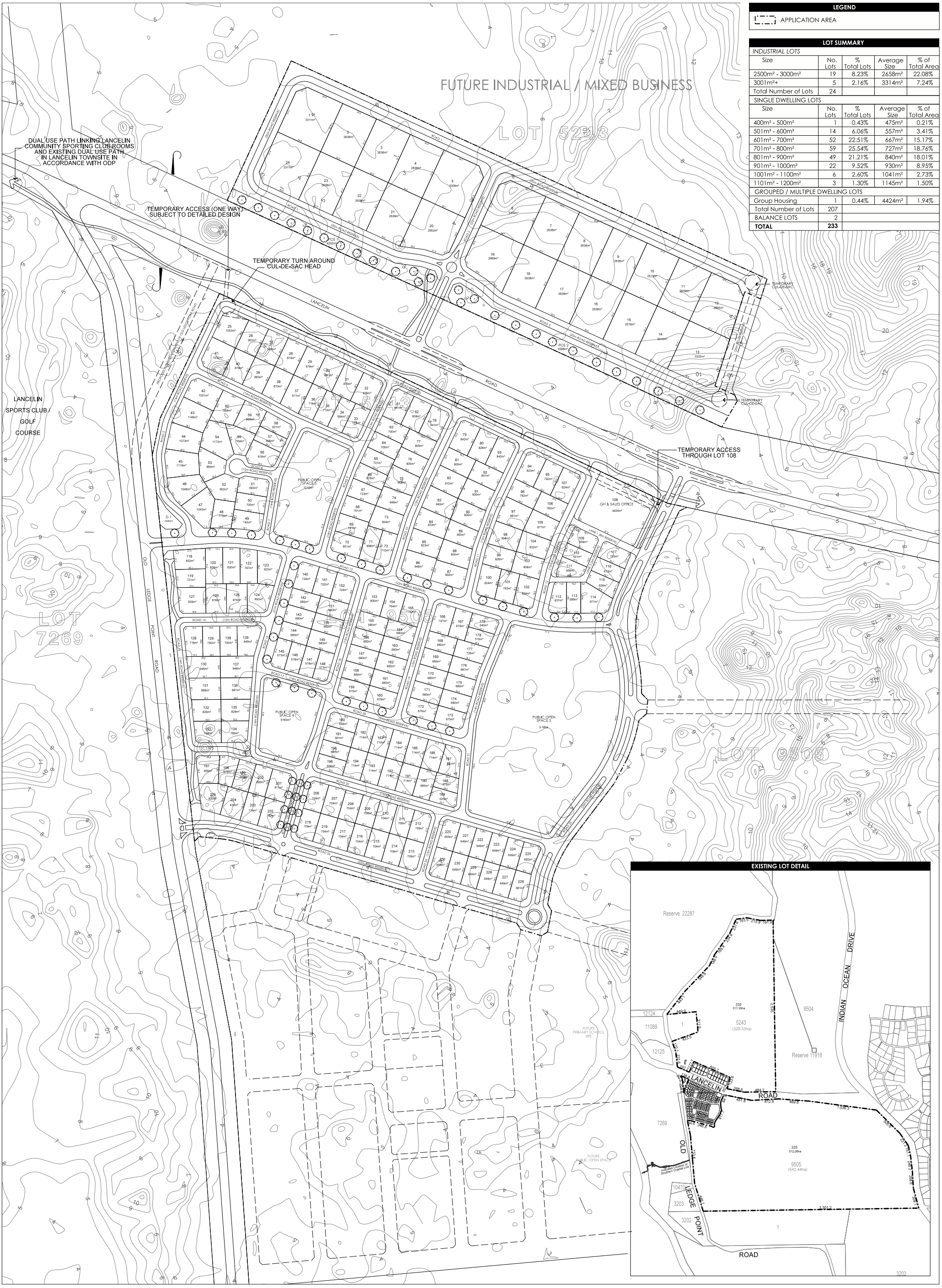
APPENDIX F
Stage 1 Subdivision Plan



LEGEND

APPLICATION AREA

LOT SUMMARY

INDUSTRIAL LOTS

Size	No. Lots	% Total Lots	Average Size	% of Total Area
2500m² - 3000m²	19	8.23%	2658m²	22.08%
3001m²+	5	2.16%	3314m²	7.24%
Total Number of Lots	24			

SINGLE DWELLING LOTS

Size	No. Lots	% Total Lots	Average Size	% of Total Area
400m² - 500m²	1	0.43%	475m²	0.21%
501m² - 600m²	14	6.06%	557m²	3.41%
601m² - 700m²	52	22.51%	667m²	15.17%
701m² - 800m²	59	25.54%	727m²	18.76%
801m² - 900m²	49	21.21%	840m²	18.01%
901m² - 1000m²	22	9.52%	930m²	8.95%
1001m² - 1100m²	6	2.60%	1041m²	2.73%
1101m² - 1200m²	3	1.30%	1145m²	1.50%
GROUPED / MULTIPLE DWELLING LOTS				
Group Housing	1	0.44%	4424m²	1.94%
Total Number of Lots	207			
BALANCE LOTS	2			
TOTAL	**233**			

Plan of Subdivision - Lot 5243 and 9505

LANCELIN SOUTH - STAGE 1

A JOE MATTHEWS PROJECT

plan: 03/096/022	designed: WHB	scale: 1:2000@A1 | 1:4000@A3	
date: 28/02/2011	checked: RC	0 40 80m	
projection: LCG 94	drawn: TB		

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