

STRUCTURE PLAN

Lots 13, 14 & PT 21

Verita Road/Brand Highway, Rudds Gully

for Rosecrest Enterprises Pty Ltd

MARCH 2010

Prepared by:

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Appendix 1 – Local Water Management Strategy

Appendix 2 – Acoustic Assessment

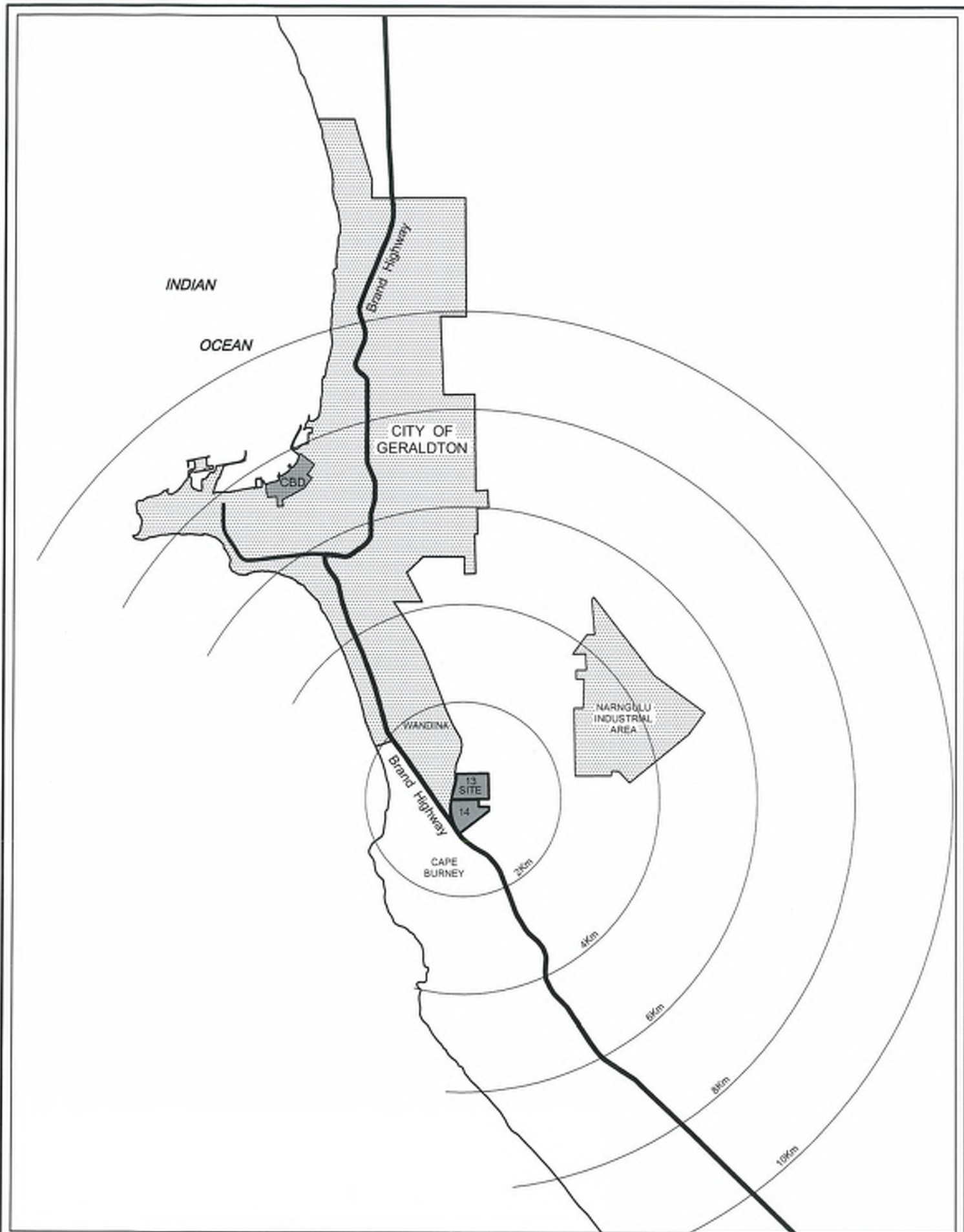
1.0 INTRODUCTION

This Structure Plan has been prepared on behalf of Rosecrest Enterprises Pty Ltd, owners of Lot 13 & 14 Verita Road/Brand Highway, Rudds Gully, Geraldton. The Structure Plan also incorporates a "battleaxe" leg associated with Lot 21, a water tank site owned by the Water Corporation.

Figure 1 locates the Structure Plan area showing it to be approximately 7km south of the Geraldton CBD, fronting Brand Highway and approximately 1.5km inland from the coast.

The Structure Plan area has been the subject of an Amendment to the City of Geraldton-Greenough Town Planning Scheme No. 4 (Greenough). Amendment No. 128, which was approved by the Hon. Minister for Planning on 8 March 2009, rezoned Lots 13 & 14 from "Single Residential R12.5" to "Development". Amendment No. 128 also rezoned the battleaxe leg of Lot 21 (the Water Corporation land) from "Rural" to "Development". The provisions of the "Development" Zone require a District or Local Structure Plan to be prepared prior to subdivision and to demonstrate the overall development proposal for the site as well as the context of the development.

The subject structure plan is a Local Structure Plan (LSP) and has been prepared in accordance with the requirements of the City of Geraldton-Greenough's 'Development' zone and also in accordance with the Western Australian Planning Commission's Liveable Neighbourhoods Checklist. The LSP has also been prepared in consultation with the City of Geraldton-Greenough and government agencies such as Water Corporation and Main Roads Western Australia.



25mm at scale

NOTES:

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0 Kilometres 2.5
Scale 1:100,000

A4



Date: 16 February 2009
Ref: 2490-03 Locality

All dimensions and areas subject to survey

FIGURE 1 - LOCALITY PLAN
LOTS 13 & 14 BRAND HIGHWAY
SHIRE OF GREENOUGH

2.0 EXISTING SITE AND CONTEXT ANALYSIS

2.1 Location, Area and Ownership

The land the subject of this LSP comprises Lots 13, 14 and part of Lot 21 Verita Road, Rudds Gully.

The first land parcel is Lot 13 on Plan 10118 Verita Road as contained in Certificate of Title Volume 1688 Folio 402. Lot 13 is owned by Rosecrest Enterprises Pty. Ltd. and has an area of 36.7176 ha.

The second landholding is Lot 14 on Plan 1108 as contained in Certificate of Title Volume 1890 Folio 723. Lot 14 is owned by Rosecrest Enterprises Pty. Ltd. and has a total area of 33.5998 ha.

The final land parcel contained in the LSP is Lot 21 on Diagram 77556 as contained in Certificate of Volume 1890 Folio 722. The site is owned by the Water Corporation and has a total area of 4.3445 ha however only the access leg of this lot is incorporated in the LSP.

2.2 Site Analysis

2.2.1 Access

Each of the lots have frontage to Verita Road, which deviates eastwards from Brand Highway. Brand Highway is the main road linking Geraldton to Perth and is a sealed, 2 lane road adjacent to the subject site.

Verita Road is constructed as an unsealed track and mainly provides access to the Water Corporation's tank site. Access to Lots 13 and 14 as well as Lot 21 is achieved from Brand Highway via the Verita Road access track.

2.2.2 Land Use

Historically the sites have been utilized for grazing but rural uses are no longer pursued over the site. As a result of its former use the site has been cleared of vegetation and remains predominantly void of vegetation with the exception of some re-growth. Both Lots 13 and 14 have been developed with dwellings and outbuildings but the remainder of the site is undeveloped. There is also some evidence of minor amounts of limestone having been extracted from Lot 14.

Lot 21 is utilized by the Water Corporation for the storage of potable water. From Lot 21 water is distributed, via gravity, to a water main that traverses Lot 13 to serve development in the north. No water treatment is conducted onsite so there are no buffers required to protect this land use.

The portion of Lot 21 containing the tank forms part of the Structure Plan area but is not being considered for any alternative land uses and will be retained as is. Careful consideration has been given to the protection of the water tank and main in the preparation of this LSP.

2.2.3 Landform

Figure 2 shows topographic contours together with a gradient analysis. The property is dominated by an historic dune ridge generally on a north/south trend. Landform rises from a low of around 27 metres AHD towards the south-west corner to a high of around 64 metres adjacent to the Water Corporation's tank site.

Gradients are generally moderate to steep, most commonly between 5% and 10% as illustrated on Figure 2.

2.2.4 Soils

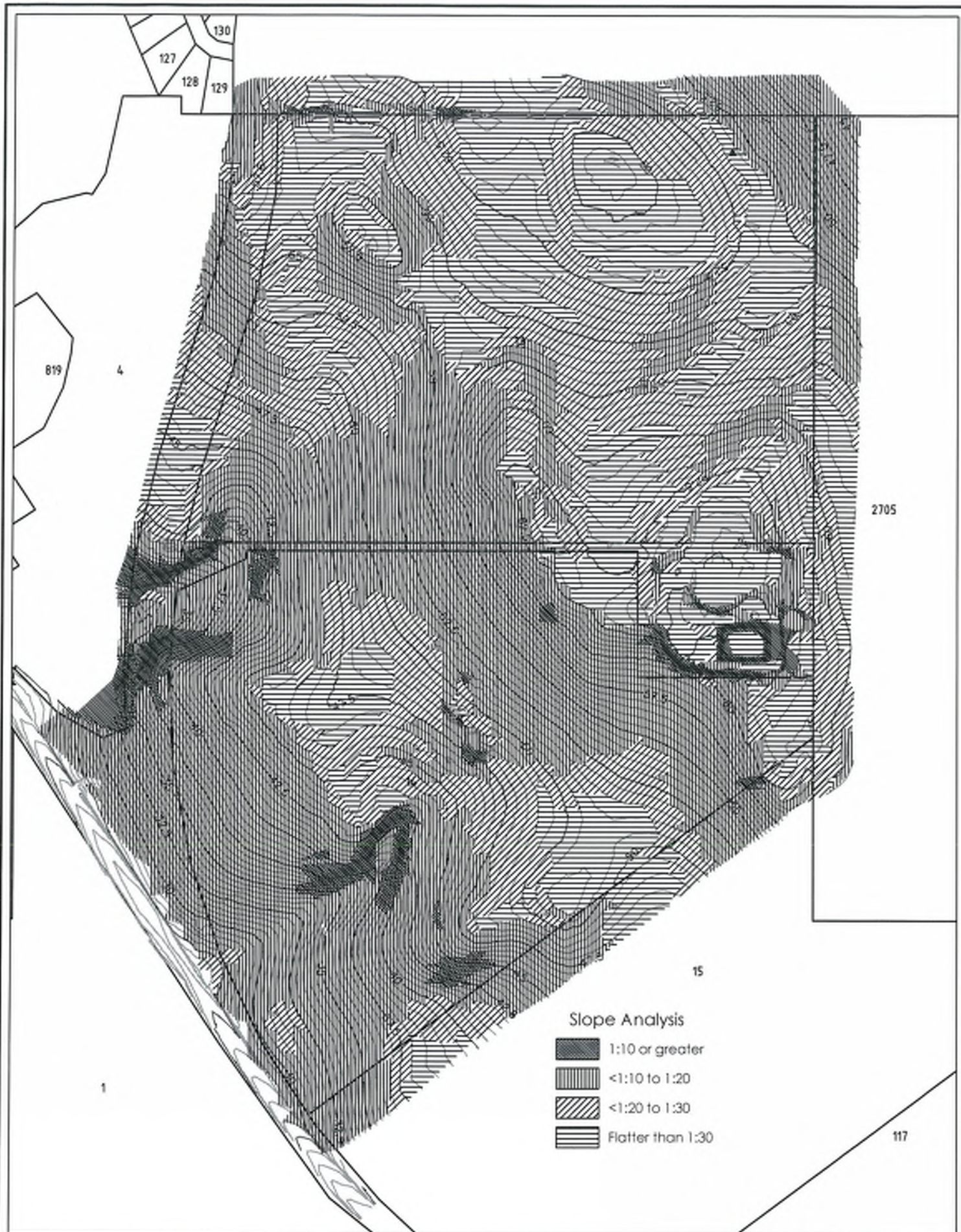
General soils mapping indicates the Structure Plan area comprises Tamala Limestone and calcareous sands, having a low risk of acid sulfate soils. A more detailed geotechnical analysis has been undertaken by Golder Associates and the results are provided at Figure 3 showing the land comprises three units.

Unit A – Caprock Limestone

In these areas well to very well cemented near surface limestone occurs. This area will pose difficulties in excavation.

Unit B – Sand/Silty Sand

This material is generally calcareous sand that contains about 10 to 15% silty fines and some relatively minor limestone zones (generally only to cobble size). The material has a relatively high CBR which would be expected to satisfy the Council requirements for pavements (to be confirmed). The material will be relatively easily excavated and could be readily used as fill although the infiltration rate will be relatively low due to the fine grained nature of the sand and the relatively high fines content. There are some localised areas of leached quartz sand with a fine content of about 5% however this does not occur extensively.



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Date: 24 July 2007

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All dimensions and areas subject to survey

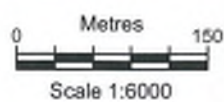
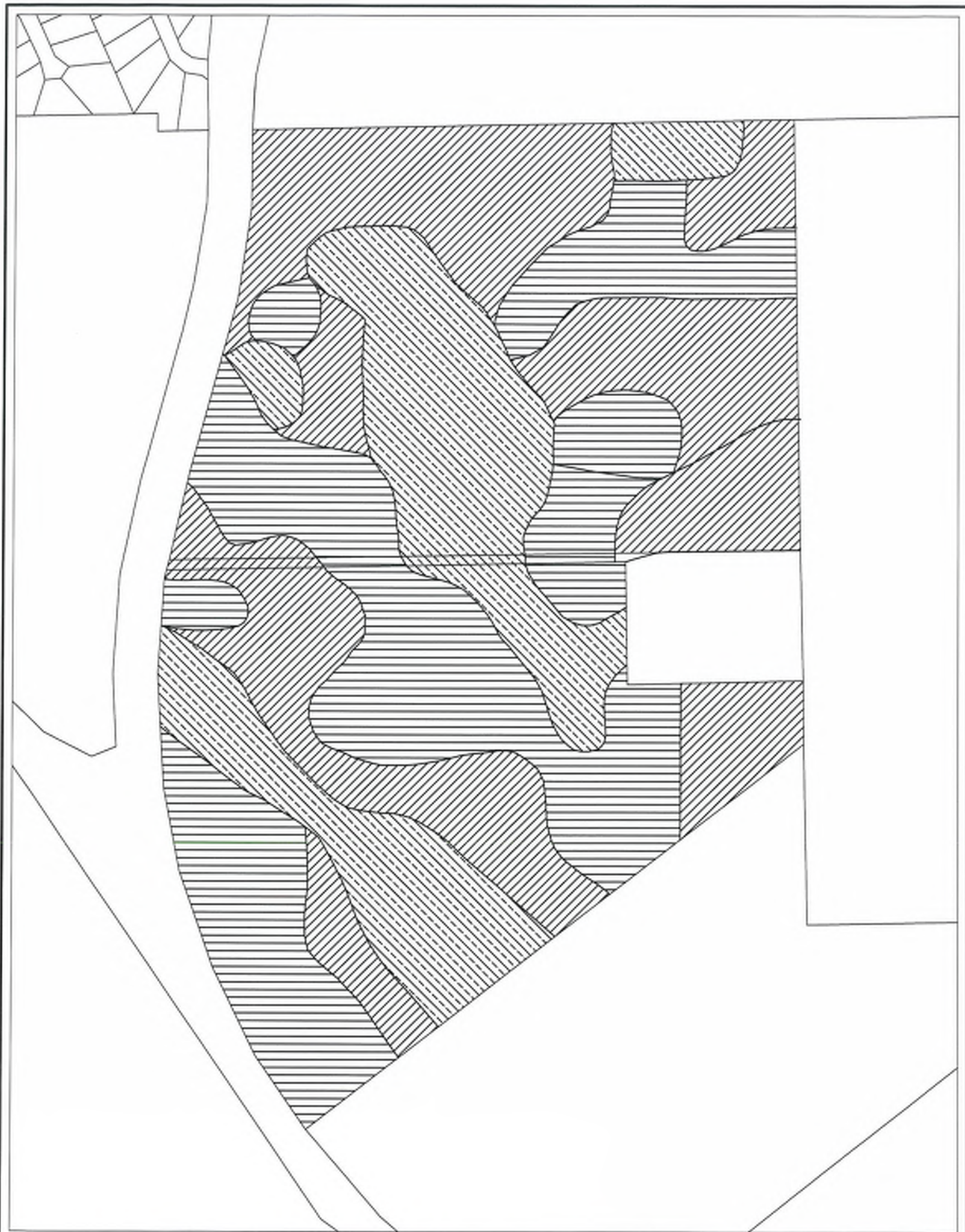


FIGURE 2
SLOPE ANALYSIS



25mm at scale

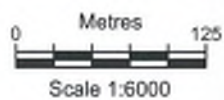
NOTES:

-  Caprock / Limestone - UNIT A
-  Sand/Silty Sand - Unit B
-  Sand/Silty Sand/Limestone - Unit C

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FIGURE 3
GEOTECHNICAL
INFORMATION

Unit C – Sand/Silty Sand/Limestone

In these areas limestone generally occurs as weakly to well cemented limestone in a sand/silty sand matrix (Unit B material). Well cemented zones do occur typically at depths greater than about 1 m and excavation for trenches below this depth may be difficult at some locations where a rock breaker may be required. However based on the results it does not appear that extensive areas of very well cemented limestone occurs and ripping with a dozer seems likely to be possible. It is likely that excavated material will generally be able to be used as fill with relatively minor quantities of boulders that will not break down under excavation and rolling.

2.2.5 Vegetation

The Structure Plan area has previously been cleared and used for grazing with the consequence that little natural vegetation remains apart from some acacia re-growth. **Figure 4** is an aerial view of the land showing the patches of re-growth amongst the cleared landscape on Lot 13 while Lot 14 contains very little growth other than pasture.



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0 Metres 500

Scale 1:20,000

Date: 15 August 2007
Ref: 2490/Des12-App/serial

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FIGURE 4
AERIAL PHOTOGRAPHY
RUDDS GULLY

3.0 PLANNING CONTEXT

3.1 Regional Planning Context

3.1.1 State Planning Strategy

The State Planning Strategy was adopted by the Western Australian Planning Commission (WAPC) in 1996. It is a land use strategy for the State, which focuses on the implementation of strategic planning and policy outside the Perth region. Geraldton is included in the Mid-West Region and the Strategy indicates that Geraldton will develop as the largest regional centre north of Perth, offering a wide range of facilities and attractions.

The Strategy makes reference to the need to finalise the Geraldton Region Plan and to identify and protect the areas required for the expansion of Narngulu industrial area. Both of these matters have been addressed in the finalization of the Narngulu Industrial Estate Future Land Use Directions Study and the Geraldton Region Plan and Greater Geraldton Structure Plan.

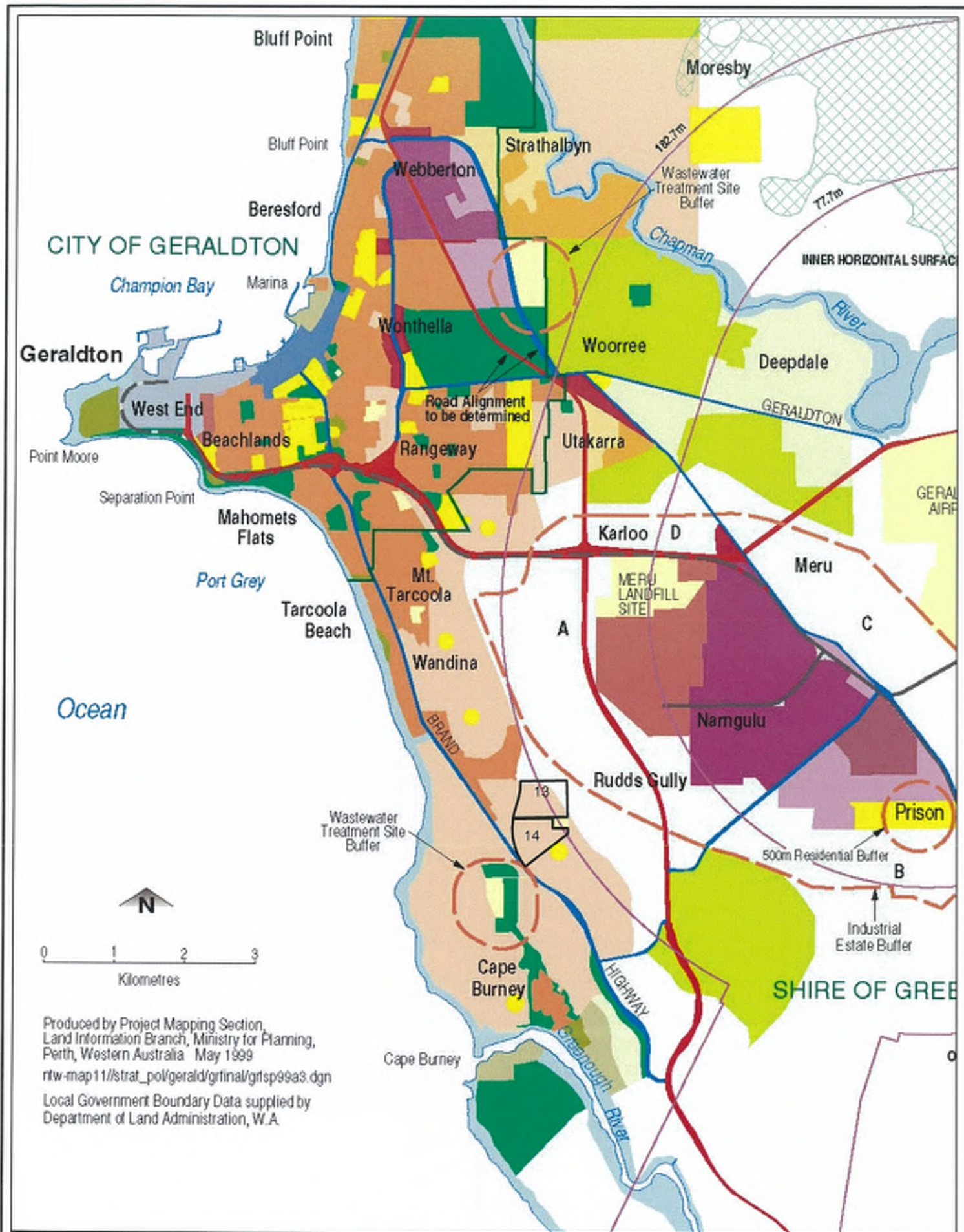
The development of Lots 13 and 14 for residential and mixed use development will assist in the ongoing supply of land for future residential development, which will assist in Geraldton developing as the largest regional centre north of Perth.

3.1.2 The Geraldton Region Plan and Greater Geraldton Structure Plan

The Geraldton Region Plan was adopted in June 1999 and covers the areas of the City of Geraldton, the Shire of Irwin, Shire of Chapman Valley, Shire of Northampton and Shire of Mullewa. The plan seeks to provide a framework for the future management, protection and co-ordination of regional planning and to identify planning objectives and actions necessary to achieve these objectives.

The Geraldton Region Plan includes the Greater Geraldton Structure Plan. This shows the land the subject of this Structure Plan and the general Rudds Gully locality to be 'Future Urban' as seen in **Figure 5 – Greater Geraldton Structure Plan**. The Water Corporation's site excluding the battleaxe leg is shown to be set aside for Community Purposes and another Community Purpose site is indicated to the south of the Water Corporations tank location, suggesting a primary school central to the Rudds Gully Future Urban area.

The Cape Burney land to the west is similarly shown to be Future Urban as is Wandina to the north. Since preparation of the Greater Geraldton Structure Plan however, the Wandina area has become more urbanized and would generally now be regarded as Urban rather than Future Urban.



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0 Kilometres 1.75
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Date: 16 February 2009

Ref: 2490-03 Fig5 GGSP

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FIGURE 5
GREATER GERALDTON
STRUCTURE PLAN 1999

The Narngulu Industrial area is shown to be set aside for Industrial purposes including a noxious trade's area (Noxious and Hazardous Industry). The Structure Plan shows a buffer around the Industrial area however, this buffer does not affect the Structure Plan area as identified on **Figure 6 – Rudds Gully Context Structure Plan**.

The Greater Geraldton Structure Plan retains the Brand Highway as a District Distributor Road, anticipating a future by-pass to the east of Rudds Gully and to the west of the Narngulu Industrial area. This realignment is shown as a Primary Distributor Road. The Greater Geraldton Structure Plan also shows a 'Public Purpose site over the subject land and this relates to the Water Corporation Tank site, which is excluded from the Structure Plan area.

3.1.3 Geraldton Land Development Program

The WAPC released the Geraldton Land Development Program 1998-2002 to advise the government on land use planning and the co-ordination of land development and infrastructure through the state. The WAPC has not prepared a follow up to this study as of yet. The Geraldton Land Development Program focuses on land development and major infrastructure issues for achieving the objectives of the Greater Geraldton Structure Plan.

The Geraldton Land Development Program identified some 62 ha of vacant land, zoned and serviceable land available in Rudds Gully, including the subject site. This assessment would have been based on the site's former R12.5 zoning. The rezoning of the site to 'Development' and the preparation of this Structure Plan with a variety of residential densities ranging from R20 to R30 will assist in meeting the demands for residential land.

3.1.4 Liveable Neighbourhoods

Liveable Neighbourhoods acts as the State's document for sustainable residential developments. It has been prepared to implement the objectives of the State Planning Strategy. Liveable Neighbourhoods addresses both strategic and operational aspects of structure planning and subdivision development. Principal aims of Liveable Neighbourhoods include:

- Providing for an urban structure of walkable neighbourhoods;
- To ensure that neighbourhoods are designed and accessible for all users;
- To foster a sense of community;
- To ensure active street and land use interfaces to improve personal safety;
and
- To maximise land efficiency wherever possible.



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Date: 10 March 2010
Ref: 2490-02 Fig 8

All dimensions and areas subject to survey

FIGURE 6
EXISTING CONTEXT

3.2 Local Planning Context

3.2.1 City of Geraldton-Greenough Town Planning Scheme No. 4 (Greenough)

As discussed in Section 1, Lots 13 and 14 and the battleaxe access leg of Lot 21 have been the subject of a recent rezoning by way of Amendment No. 128 to TPS No. 4 (Greenough). The Minister's recent approval of Amendment No. 128 has seen the zoning of Lots 13 and 14 change from 'Residential R12.5' to 'Development' and the zoning of the battleaxe access leg of Lot 21 change from 'Rural' to 'Development'.

Amendment No. 128 introduced the 'Development' zone to TPS No. 4 (Greenough) for the purpose of creating a zone whereby areas requiring comprehensive planning could be identified and subdivision and development could be co-ordinated under a Structure Plan framework.

As a result of Amendment No. 128 and the introduction of the 'Development' zone to TPS No. 4 (Greenough), it has been necessary to prepare a Structure Plan over the subject land. The Structure Plan has been prepared in accordance with Section 2.7 of TPS No. 4 (Greenough) introduced by way of Amendment No. 128, which details the requirements and process for a Structure Plan.

3.2.2 City of Geraldton-Greenough Local Planning Strategy

The WAPC endorsed the City of Geraldton-Greenough Local Planning Strategy in 2008. The Local Planning Strategy will be the basis for a future review of TPS No. 4 and TPS No. 1A. The strategy identifies planning directions for the City of Geraldton-Greenough and identifies the land the subject of this Structure Plan as suitable for future residential expansion and this is consistent with its zoning.

The Local Planning Strategy incorporates a Strategic Plan Map, which incorporates all of the land formerly in the Shire of Greenough. The plan favours land in close proximity to Geraldton for urban development and includes Lots 13 and 14. The aims for the future urban areas such as Lots 13 and 14 is to cater for a variety of housing types at urban densities, as well as providing neighbourhood shopping, schools, community and other facilities associated with urban living. The Local Planning Strategy requires that development in future residential nodes such as Rudds Gully and Lots 13 and 14 be in accordance with a detailed planning strategy adopted and endorsed by the Council and WAPC, respectively.

3.2.3 Rudds Gully Local Structure Plan

The Rudds Gully Local Structure Plan was endorsed by the former Greenough Shire Council but not by the WAPC. This Structure Plan relates to the area bound by Brand Highway and Verita Road to the west, Rudds Gully Road to the south, the future highway realignment to the east and the Narngulu industrial buffer to the north. The Structure Plan incorporates Lots 12, 13 and Lot 21.

The plan identifies residential and future residential areas. The residential areas are those that are to be developed in the short term and include Lots 12 and 13. The plan also identifies indicative commercial, mixed use and Public Open Space areas and shows a shopping centre site, Service Station and Tavern as well as a Mixed Use area abutting Brand Highway and in the southern area of the Lot 12 and 13.

3.2.4 Context Analysis

The LSP area is a large and predominantly undeveloped site. The site features excellent accessibility to the surrounding area by way of its frontage to Verita Road and Brand Highway.

The site slopes westwards and its elevation provides good views to the Indian Ocean. The slope of the land is conducive to residential development and will provide attractive housing lots. The soils of the site and the area are also supportive of residential development with the exception of ease of excavation.

The site is in a development corridor consisting of the Narngulu Industrial Estate, Wandina Residential Estate and the future subdivision and development of the remainder of the Rudds Gully, south of the subject site.

Figure 6 places the Structure Plan area within its existing District & Local Context. Key elements of this context include Rudds Gully's separation from the Wandina area to the north by the regional road reservation over Verita Road as well as its separation from the Cape Burney area to the west by Brand Highway.

There is an existing neighbourhood centre at Wandina, on the corner of Oceanside Drive and McDermott Avenue, as shown on **Figure 6**. A 450m radius "ped shed" is shown around this centre, illustrating that it has little influence on Rudds Gully, particularly in view of the alignment of Verita Road. A district centre is proposed near the south-western corner of the Structure Plan area, on the opposite side of the Brand Highway. Although separated from Rudds Gully by the Highway the scale and consequent gravitational effect of this centre will be such that it will test the viability

of any retail proposal within the Structure Plan area. Again, a 450m ped shed is shown around the proposed district centre on **Figure 6**.

The nearest existing primary school is at Mount Tarcoola, approximately 3.5km to the north of the Structure Plan area. The Mt Tarcoola Primary School site is depicted on **Figure 6** along with other proposed school sites external to the Structure Plan area. These include the future school sites on Lots 9 and 17 Verita Road, located to the north and south east of the Structure Plan area respectively. The nearest high school is the Geraldton Secondary College located to the south of the CBD approximately 6.5km north-west of the Structure Plan area.

The beach at Cape Burney is approximately 1.5km to the west of the Structure Plan area providing western and northern slopes of the rising landform with ocean views. Development designed to capitalize on this outlook will also be afforded good solar orientation.

4.0 STRUCTURE PLAN - PROPOSED DESIGN AND IMPLEMENTATION

The Structure Plan is illustrated on **Figure 7** and discussion on the various elements of the Plan follows. The elements of the plan are assessed in accordance with the WAPC's Liveable Neighbourhoods Checklist.

4.1 Community Design

4.1.1 Identity

Rudds Gully's identity will largely be forged by its close relationship with the proposed district centre opposite and the design response to the landform of the site. At full development, the mixed use area proposed as part of this development will become the landmark, the point of reference for locating Rudds Gully.

Rudds Gully's character will be that of a traditional neighbourhood based on a modified street grid providing good solar orientation and the opportunity to take advantage of commanding views over the Indian Ocean. Parks will be interspersed through the estate, combining the preservation of landscape features and creating a garden appearance.

4.1.2 Design Response to Site and Context Analysis

Figure 8 shows the proposed development plan within its district and local context, including the Greenough River Estate at Cape Burney opposite. 450metre radius walkable catchments or "ped sheds" are shown around commercial sites. It can be seen that a substantial portion of the Structure Plan falls within the ped shed surrounding the proposed district centre within the Greenough River Estate.

At 10,000 – 12,000m² of retail space, the district centre will dominate retailing in the locality likely making any neighbourhood facility in the Structure Plan area unviable. There is a possible opportunity for some mixed used development along Brand Highway to interface with the District Centre and possibly a corner store at an estate entrance off Verita Road. This site may be able to take adequate advantage of the "movement economy" to survive and is therefore shown as such on the Structure Plan. A corner store is a permissible use class in the 'Development' Zone.

KEY ELEMENTS AND REQUIREMENTS

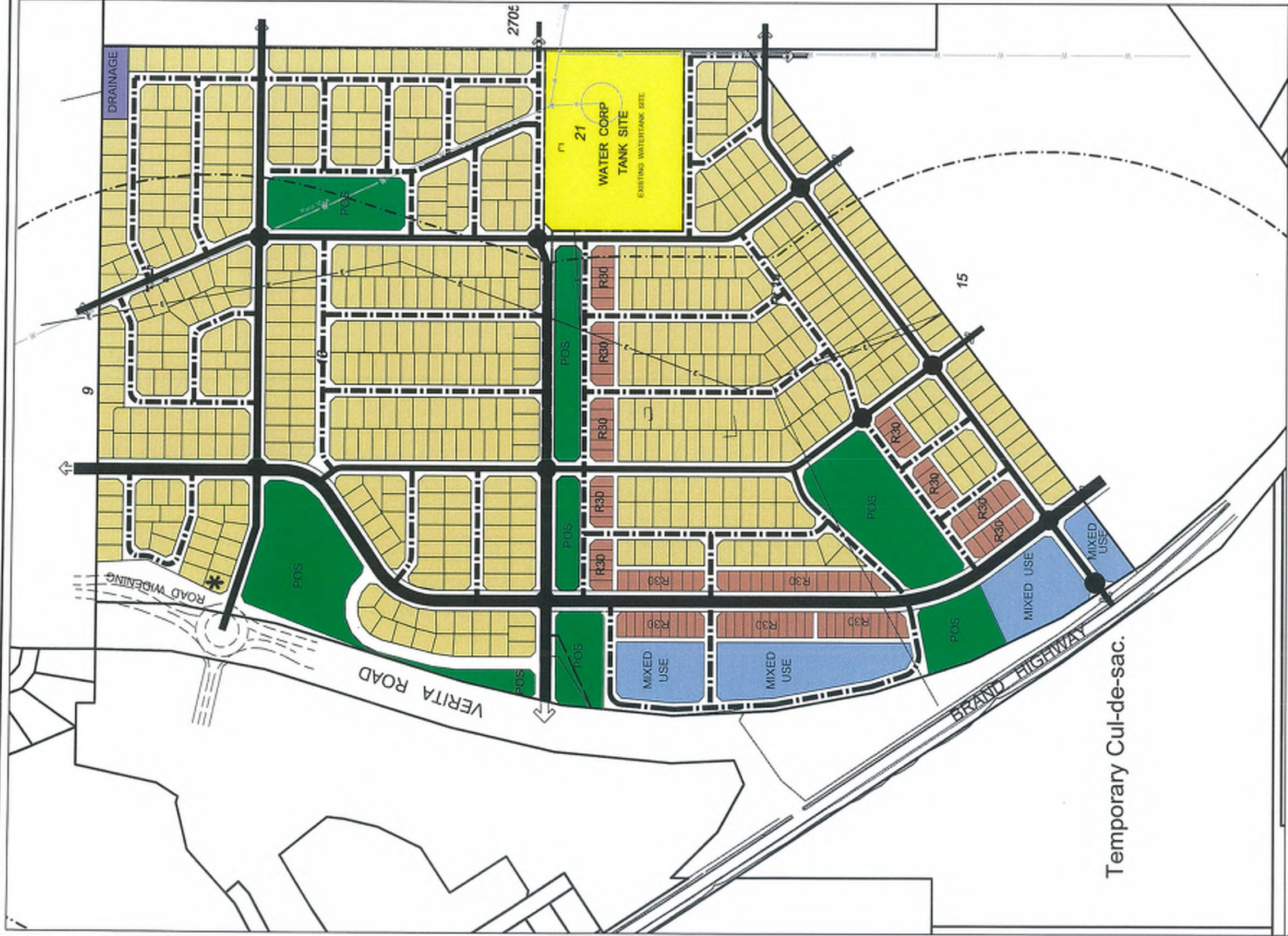
Subdivision to be consistent with the objectives of this Local Structure Plan, which includes:

- The development of a high quality residential estate at the entrance to the City of Geraldton Greenough.
- The development of a range of residential lot sizes within the R20 and R30 densities and the creation of home sites with optimal solar orientation and enhancement of coastal views.
- The development of a mixed-use precinct that provides for a mix of commercial, business and community uses that front Brand Highway/Verita Road and an appropriate range of higher density housing up to the R60 density.
- Detailed Area Plans will be required to be submitted to Council prior to any subdivision or development occurring within the Mixed Use precincts.
- The development of local and neighbourhood parks that provides for a range of active and passive recreational opportunities.
- Contribution to the construction of Verita Road to be calculated based on WAPC Policy (DC 1.7) and being the payment for half the earthworks and the construction of one carriageway (two lanes) for the length of the road that abuts the LSP area.
- Implementation of the recommendations contained in the Local Water Management Strategy and water sensitive urban design principles.
- Implementation of the recommendations contained in the Acoustic Assessment.
- Temporary Cui-de-sac. Access to Brand Highway subject to completion of Geraldton North-South Highway.
- Alternative access to Verita Road to be established during the first stage of subdivision.

FINAL APPROVAL
 Adopted for final approval by resolution of the City of Geraldton - Greenough at the Ordinary meeting of the council held on the ___ day of _____ and the Common Seal of the City of Geraldton - Greenough was hereunto affixed by the authority of a resolution of the Council in the presence of:

 MAYOR

 CHIEF EXECUTIVE OFFICER

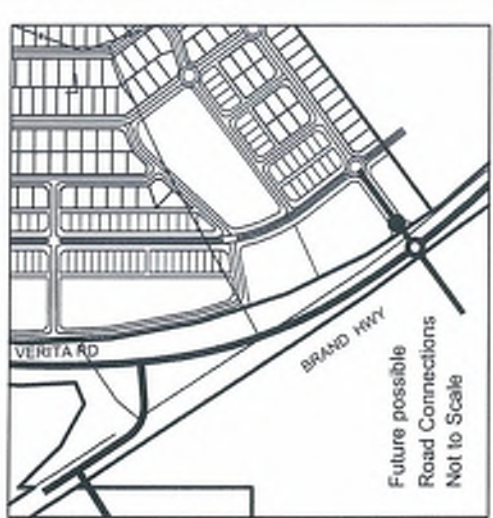
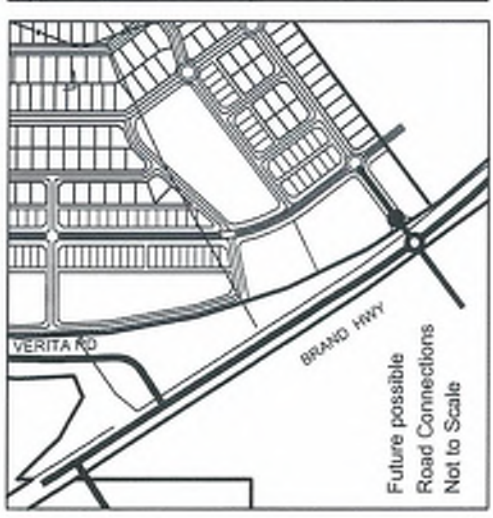


Residential R20	35.4228ha
Residential R30	3.3544ha
Mixed Use	3.2297ha
Drainage	0.2589ha
Public Purpose	3.5434ha
POS	7.0939ha
450m Ped Shed	
Water main	
Possible Corner Store	

Location to be determined subject to suitable access arrangements being achievable.

Public Open Space Calculations	
Total Site Area	71.1298ha
Deductions	0.8998ha
Drainage and Road Widening	70.2300ha
Effective Site Area	7.0250ha
POS (100%)	5.6184ha
may comprise:	1.4098ha
Minimum 80% unrestricted POS	7.0250ha
Maximum restricted use POS	
POS Provided	
Unrestricted: Local Parks	0.1917ha
Neighbourhood Parks	5.4906ha
Restricted: Drainage Basin/Local Parks	0.1258ha
Drainage Basin, Neighbourhood Parks	1.2816ha
Total POS Provided	7.0866ha

- NOTES:
- 24.4m Road Reserve
 - 18m Road Reserve
 - 15m Road Reserve
 - 6.01m Rear Access Lane



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A3

Scale 1:5000
 Metres 125
 0

Date: 29 July 2010
 Ref: 2460Dec08 Final Structure/A3 Struct
 All dimensions and areas subject to survey

Figure 7 - LOCAL STRUCTURE PLAN
LOTS 13, 14 & 21 VERITA ROAD
RUDDS GULLY, SHIRE OF GREENOUGH

Figure 9 illustrates the plan's response to site conditions. The grid street system takes advantage of the existing contours to create home sites with views to the west on the west facing slopes as well as to the north and north-west on the north facing slopes. In turn, this orientation also maximizes solar access.

Erosion patterns have sculpted a gully in the south-west of the site which is accommodated in open space allowing the preservation of this natural feature. Other open spaces are located to enhance views, accessibility and to combine drainage functions.

4.1.3 Land Use Distribution and Rationale

Lots 13 and 14 are currently zoned "Development" and as such the Structure Plan will guide future land use, subdivision and development.

The proposed land use is predominantly residential. The Structure Plan at **Figure 7** proposes two residential densities being 'Residential R20' and 'Residential R30'. The Structure Plan also identifies 'Mixed Use' development along Brand Highway to interface with the proposed District Centre. This will be discussed later in this report.

Towards the south west of the Structure Plan area, there is a Gully formed by drainage patterns in the area. This Gully creates a natural feature which helps to identify the character of Rudds Gully and it is proposed that it be incorporated within public open space. Other POS areas are located to ensure accessibility by residents and to allow for storm water infiltration.

The Structure Plan is to effectively establish a flexible zoning and coding basis for the development of the Rudds Gully area.

4.1.4 Design Objectives

The design objectives for this Structure Plan include the creation of a robust road system which is highly flexible in allowing development to ultimately continue to the north and south. It is also an objective of the design to create home sites with optimal solar orientation in a way which also enhances outlook and access to the coastal views available from the site. It is considered that the grid street system on north-south and east-west trends fulfils these objectives.



25mm at scale

NOTES:

- ← Coastal Views.
- Lots with good solar orientation.

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0 Metres 125
Scale 1:5000

Date: 10 March 2010

Ref: 2490/Des25/A4 Response

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FIGURE 9
RESPONSE TO SITE CONDITIONS
RUDDS GULLY

A further objective of the design is to allow flexibility in terms of lot sizes providing for a fairly wide range of sizes across the estate. This is achieved through Amendment No. 128 to the Geraldton-Greenough Scheme as well as the consideration and approval of this Structure Plan. Lots 13, 14 and Pt 21 have a combined area of 71.1298 hectares.

Given the location of Rudds Gully, removed from the coast line and separated from district scale facilities by Brand Highway, it is envisaged that the Rudds Gully area will predominately cater for family housing. The Greenough River Estate on the other hand will provide for a far greater proportion of medium density accommodation including accommodation for singles, empty nesters and retirees. The development of Rudds Gully for family housing will therefore maintain a balance of housing styles in the southern part of the Greater Geraldton area.

4.2 Movement Network

The zoned land at Rudds Gully is only a portion of what is likely to be the future suburb of Rudds Gully. Ultimately, when development occurs to the north and south of the Structure Plan area and possibly to the east, there will be more road options for access to the Structure Plan area. The Structure Plan proposes two access points from Verita Road (See Figure 10) one of which will incorporate a round-about. The southernmost access to Verita Road will be implemented in association with the first stage of subdivision. Furthermore, in keeping with agreements made with Main Roads WA, the access to Brand Highway from Lot 14 within the Structure Plan area may only be established following the completion of the Geraldton Highway Bypass. A temporary cul-de-sac has been agreed to as a temporary measure on Lot 14 until this occurs. Figure 10 shows the location of proposed access and egress points from the Structure Plan area and the temporary cul-de-sac. In the interim, the southern Verita Road access point will form the main point of access/egress from the Structure Plan area.

4.2.1 Traffic Volumes

For the purposes of this exercise, traffic generation has been assessed at 8 vehicular trips per household. In addition to this and in order to determine traffic that will be generated from the 'Mixed Use' Precinct, potential traffic generation rates for commercial land uses have been calculated based on the Director General of Transport South Australia's 'Land Use Traffic Generation Guidelines'. These guidelines specify the following daily vehicle movement's specific to land use and have been the basis for calculating vehicle movements for the LSP:

-
- | | |
|----------------------------------|-----------------------------|
| • Shops up to 6000m ² | 112 trips/100m ² |
| • Offices | 20 trips/100m ² |
| • Medical Centre | 50 trips/100m ² |
| • Gymnasium/Health Centre | 80 trips/100m ² |

It is also assumed that all traffic leaves the Structure Plan area. **Figure 10** presents the likely volumes based on traffic being distributed to the points of access to Verita Road, in addition to the Brand Highway. The volumes indicated also take into account the volume of traffic envisaged resulting from the future development of Lot 15 to the south of the Structure Plan area (as requested by Main Roads WA), which is estimated to add an additional 2,206 vehicles egressing from Lot 14 onto the Brand Highway. As described above, the Verita Road access points will be the only locations where traffic may access/egress the Structure Plan area until the Geraldton Highway Bypass is completed. Therefore, **Figure 10** represents the final scenario for the future distribution of traffic, including access to Brand Highway.

4.2.2 Street Hierarchy

Based on these volumes and the road hierarchy established under Liveable Neighbourhoods, **Figure 11** classifies the roads within the Structure Plan. **Figure 12** shows the proposed street cross-sections.

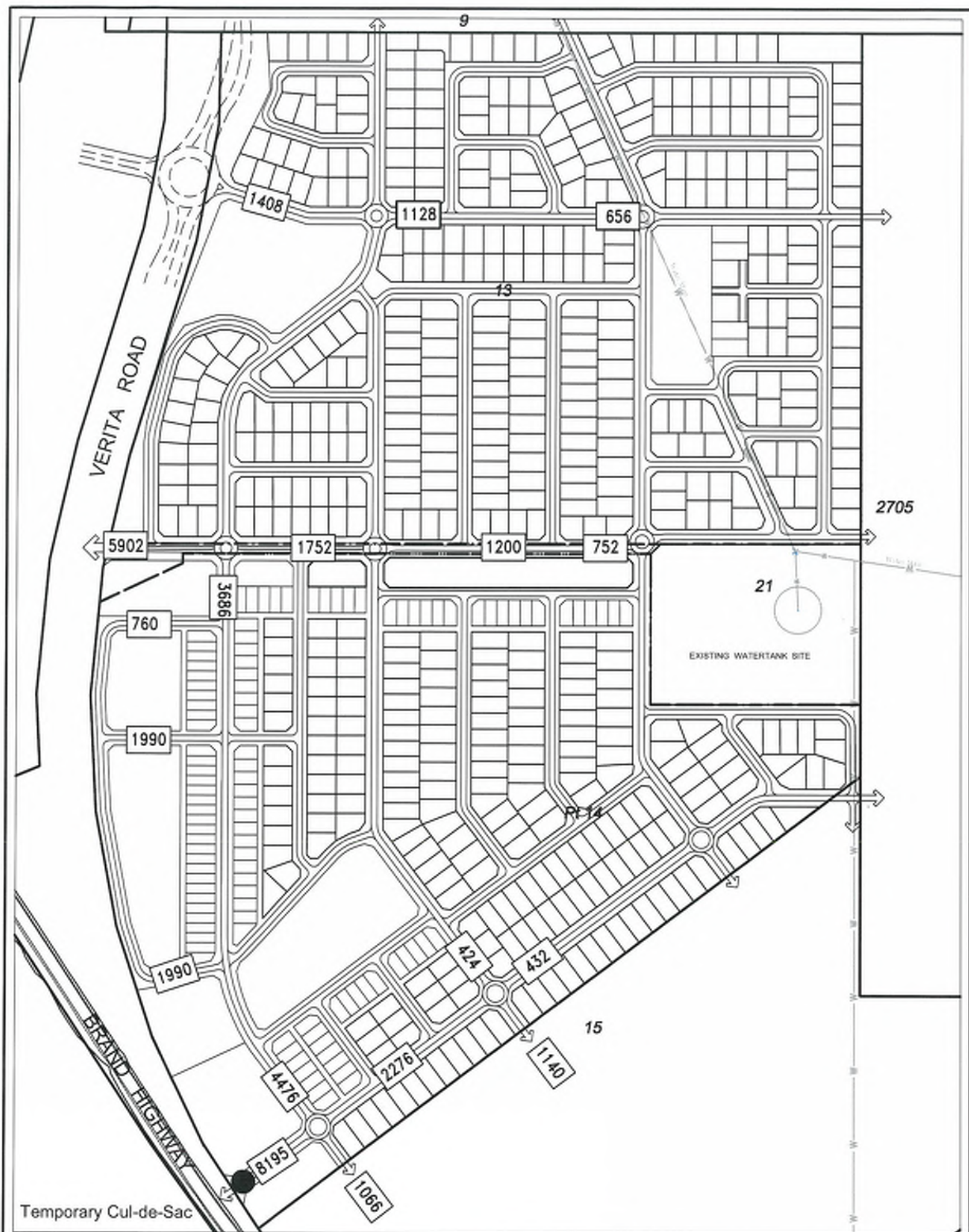
4.2.3 Public Transport

Bus services to the south of Geraldton currently terminate along Brand Highway at Mc Dermott Avenue, Wandina. With development and greater demand for service, it is likely that the route will be extended southwards along Brand Highway.

In the longer term future, the potential for a bus route through the Structure Plan area is accommodated within the north-south Neighbourhood Connector B link if required.

4.2.4 Pedestrian, Cyclists and Disabled

Path systems are to be provided in all streets in accordance with Liveable Neighbourhoods. Trunk pedestrian/cycle routes are shown on **Figure 13**. Trunk routes utilize the north-south Neighbourhood Connector B route as well as linear park systems.



25mm at scale

NOTES:

1090 Estimated Traffic Volume

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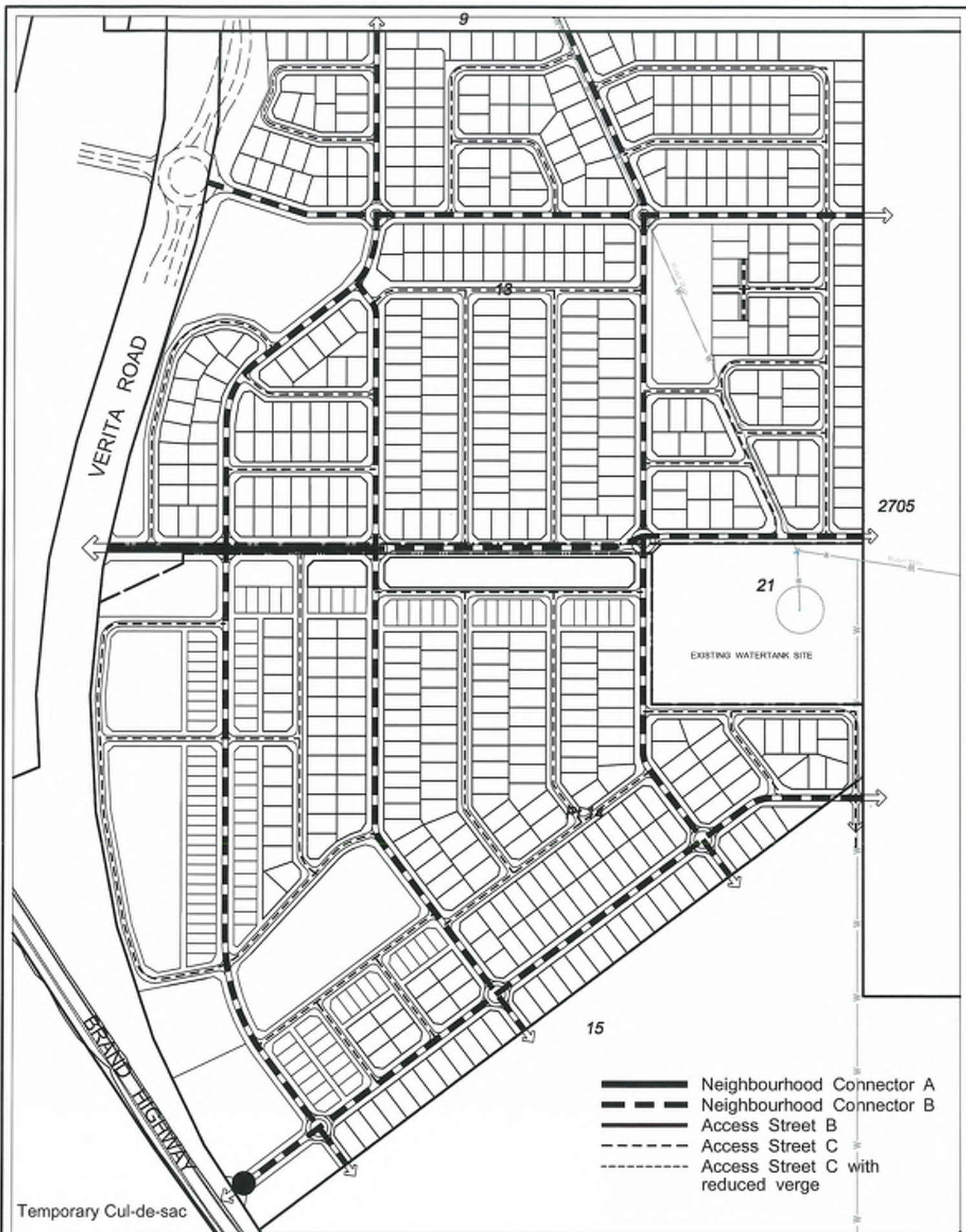
Ref: 2490/Des25/A4 traffic

All dimensions and areas subject to survey

A4



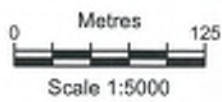
FIGURE 10
TRAFFIC VOLUMES
RUDDS GULLY



25mm at scale

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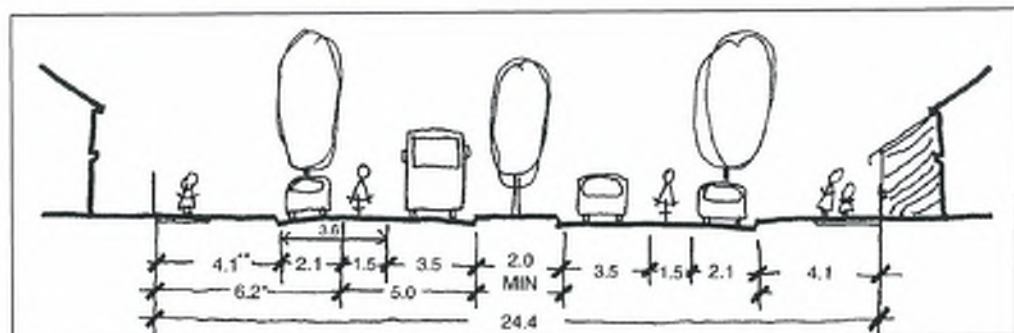


Date: 10 March 2010
Ref: 2490/Des25/A4-Hierarchy
All dimensions and areas subject to survey

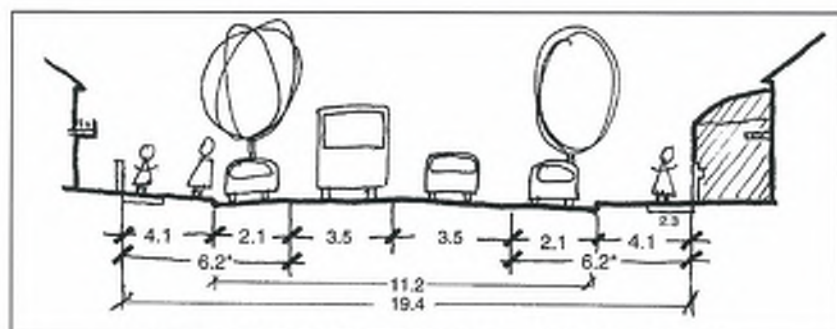
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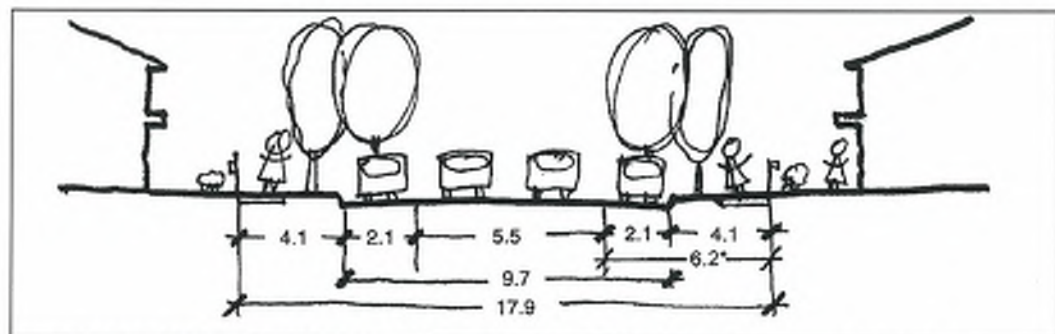
FIGURE 11
ROAD HIERARCHY
RUDDS GULLY



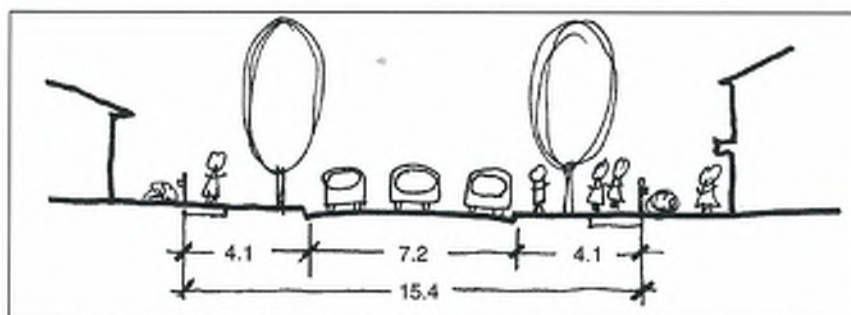
NEIGHBOURHOOD CONNECTOR A 50Km/hr (up to 7000 vpd, with >3000 vpd preferred)



NEIGHBOURHOOD CONNECTOR B 50Km/hr (<3000 vpd)



ACCESS STREET B - WIDER ACCESS STREET TARGET SPEED 40Km/hr (<3000 vpd)



ACCESS STREET C - YIELD (OR GIVE WAY) STREET TARGET SPEED 40Km/hr (<3000 vpd)

25mm at scale

NOTES:

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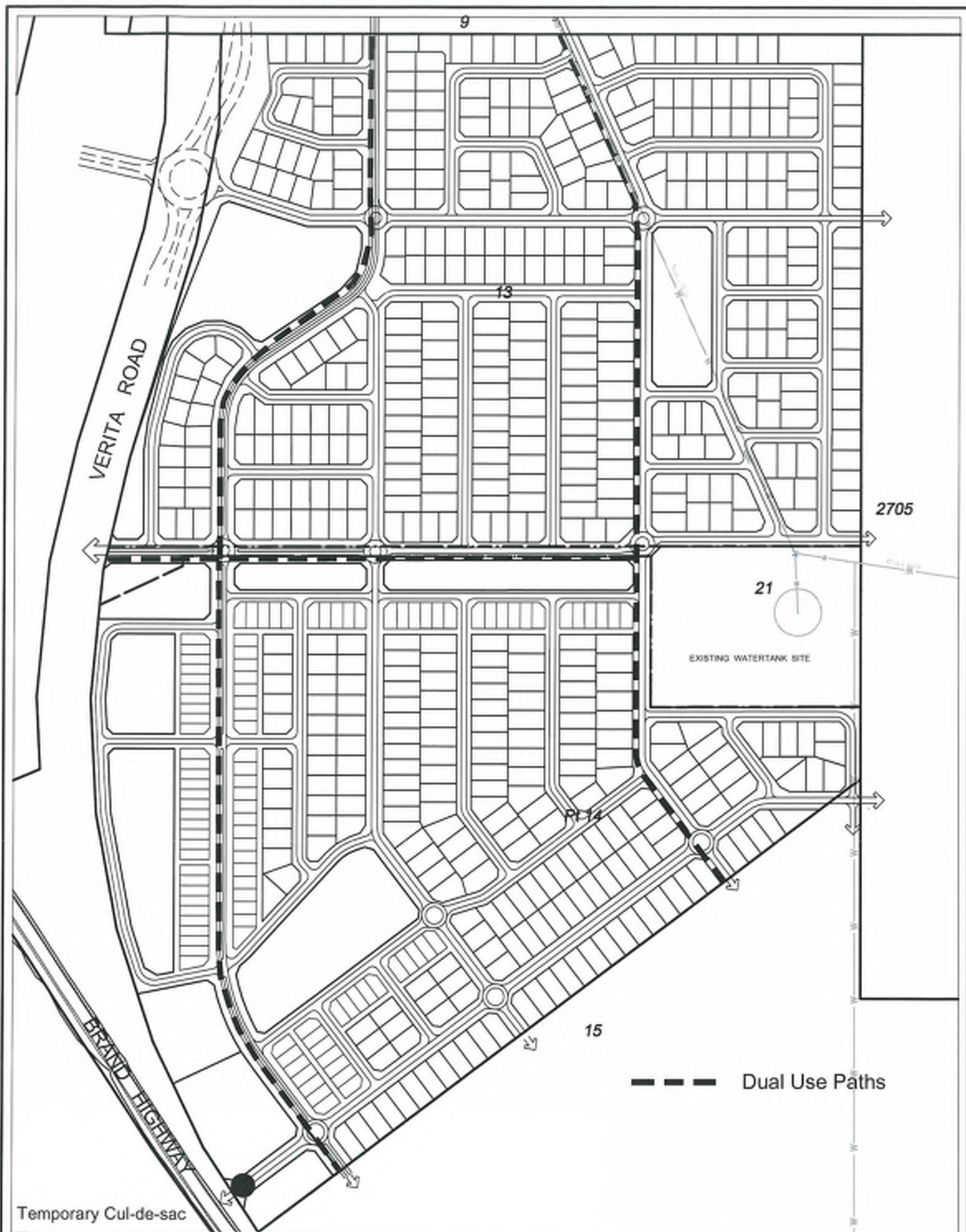
NOT TO SCALE

Date: 30 July 2007

Ref: 2480/Des11 app/A4Xsect

All dimensions and areas subject to survey

FIGURE 12
ROAD CROSS SECTIONS
RUDDS GULLY



25mm at scale

NOTES:

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A4



Date: 30 July 2010

Ref: 2490/Des26/A4 Pedest

All dimensions and areas subject to survey

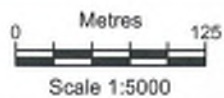


FIGURE 13
DUAL USE PATHS
RUDDS GULLY

It is proposed that path systems be designed in accordance with Australian Standards for disabled users.

4.2.5 Verita Road Widening

Council recently commissioned a design and land requirements study of Verita Road. The outcome of that study was that earthworks required for construction would extend into Lots 13 and 14. The study also identified that a road widening is required in the northern part of the Structure Plan area to accommodate the construction of a round-a-bout. This is shown on the subject LSP.

It is proposed that the development of Lots 13 and 14 include earthworks and retaining walls where necessary to avoid the need to widen Verita Road to incorporate batters. On this basis, the Structure Plan only accommodates widening in the northern portion of Lot 13.

Future developer contributions toward the construction of Verita Road will be calculated based on WAPC Development Control Policy 1.7. More specifically the developer's of the subject land will be responsible for payment of half the earthworks and the construction of one carriageway (two lanes) for the length of the road that abuts the LSP area.

4.3 Activity Centre's and Employment

4.3.1 Type of Centre

Given the location of the future District Centre on the western side of Brand Highway any commercial development that occurs on the site shall be mixed use development incorporating small 'boutique type' retail and commercial business including shops, offices and medical centres in a residential scale environment.

The Structure Plan incorporates 4 mixed use precincts, which will interface with Verita Road/Brand Highway. The proposed mixed use development area as identified on the LSP has a total area of 3.656 ha. The mixed use precincts are intended to provide for a mix of commercial, business and community uses and an appropriate range of higher density housing up to the R60 density.

Land uses permitted in the mixed use precincts will be assessed against the requirements of the 'Mixed Use' zone, which is to be included in the Scheme upon the gazettal of Amendment No. 42 to TPS No. 3 (Geraldton). Detailed Area Plans (DAP's) will be required to be submitted to Council prior to any subdivision or development occurring within these precincts and to address the requirements of the Scheme and the subject LPS.

4.3.2 Employment Rates

Commercial and industrial land use data collected by DPI (and its predecessors) over a substantial period of time suggests the following generalized employment rates.

Retailing	-	1 employee per 30m ² of floorspace
Offices	-	1 employee per 25m ² of floorspace

Schools also provide significant opportunities for local employment. In this regard, primary schools can be expected to offer up to 50 jobs while high school employment opportunities range from around 100 to 150 depending on whether it is a senior high school or not.

4.3.3 Land Use Distribution and Employment Opportunities

As indicated above, the proposed Mixed Use Precinct has a total area of 3.656 ha. Assuming that the half of this area would be taken up by on-site car parking and that the mix of uses could incorporate residential, retailing and offices, at full development the precinct could generate the following job opportunities.

6,100 m ² Retail @ 1 job per 30m ²	=	203 jobs
6,000m ² Offices @ 1 job per 25m ²	=	240 jobs
6,000m ² Restaurant/Entertainment etc	=	150 jobs (say)
Total	=	593 jobs

At full development, the Greenough River District Centre will likely provide the following job opportunities.

12,000m ² Retail @ 1 job per 30m ²	=	400 jobs
7,000m ² Offices @ 1 job per 25m ²	=	280 jobs
12,000m ² Showrooms @ 1 job per 40m ²	=	300 jobs
Mixed Business/Entertainment etc	=	120 jobs (say)
Total	=	1,100 jobs

The Greenough River Estate Structure Plan also anticipates 4 public primary schools, one private primary school and one public high school to the west of Brand Highway. Combined, these will create 350 – 400 local job opportunities. Tourism and potential home occupation opportunities add to the local employment potential.

The Department of Education and Training (DET) have advised that the level of development proposed within the Structure Plan area and surrounding locality to the east of Brand Highway, will result in the need for the establishment of two primary schools located to the north and south of the Structure Plan area. These may generate approximately 50 jobs each in the future.

The Geraldton CBD provides the principal location for government, civic and entertainment employment. It is located approximately 7.5km to the north-west of the Structure Plan area. Industrial areas exist at the Port, Webberton and at Narngulu, 2-3km east of Rudds Gully. Major industrial development is also mooted at Oakajee to the north of Geraldton.

4.4 Lot Layout

4.4.1 Lot Size and Variety

The Structure Plan proposes two residential densities being R20 and R30. Within these densities a range of lot sizes are being promoted and will range from 300m² to 750m². The average area of the R30 lots will be approximately 350m² compared to an average area of the R20 lots being 630m².

The location of the estate in relation to the coast and District level facilities at Greenough River opposite suggest that Rudds Gully will be primarily a family housing area in the traditional mold. Provision for greater variety of densities and life style choices is made at Greenough River.

4.4.2 Land Use Description

The Structure Plan anticipates a single family housing area with associated open spaces and the potential for a corner store. This land use pattern has been developed in the knowledge of planning proposals for the Greenough River Estate immediately to the west of the Brand Highway. The Greenough River Estate makes provision for a wide range of commercial and business functions, community facilities, tourist accommodation and a variety of residential densities.

4.4.3 Climate Responsive Design

The Structure Plan proposes a modified grid pattern of streets predominately on north/south, east/west alignments. This results in lots being orientated to take good advantage of solar access. In all, some 80% of proposed lots are on a north/south, east/west alignment leaving just 20% less well orientated.

The design also takes account of the prevalent SSW sea breezes of the area in the provision of open spaces. As much as reasonable, these have an east-west orientation, reducing the length of open ground over which the winds can gather strength. Housing and street trees along the southern borders of these linear parks will help to create pleasant play and recreational spaces.

4.4.4 Density Target

It is proposed to achieve a gross residential density of 25 dwellings per hectare. Variety of lot size is achieved through coding the land R20 instead of R30. **Figure 14** shows density targets as well as indicating areas where Detailed Area Plans (DAP's) are required. These relate to those sites with direct frontage to POS.

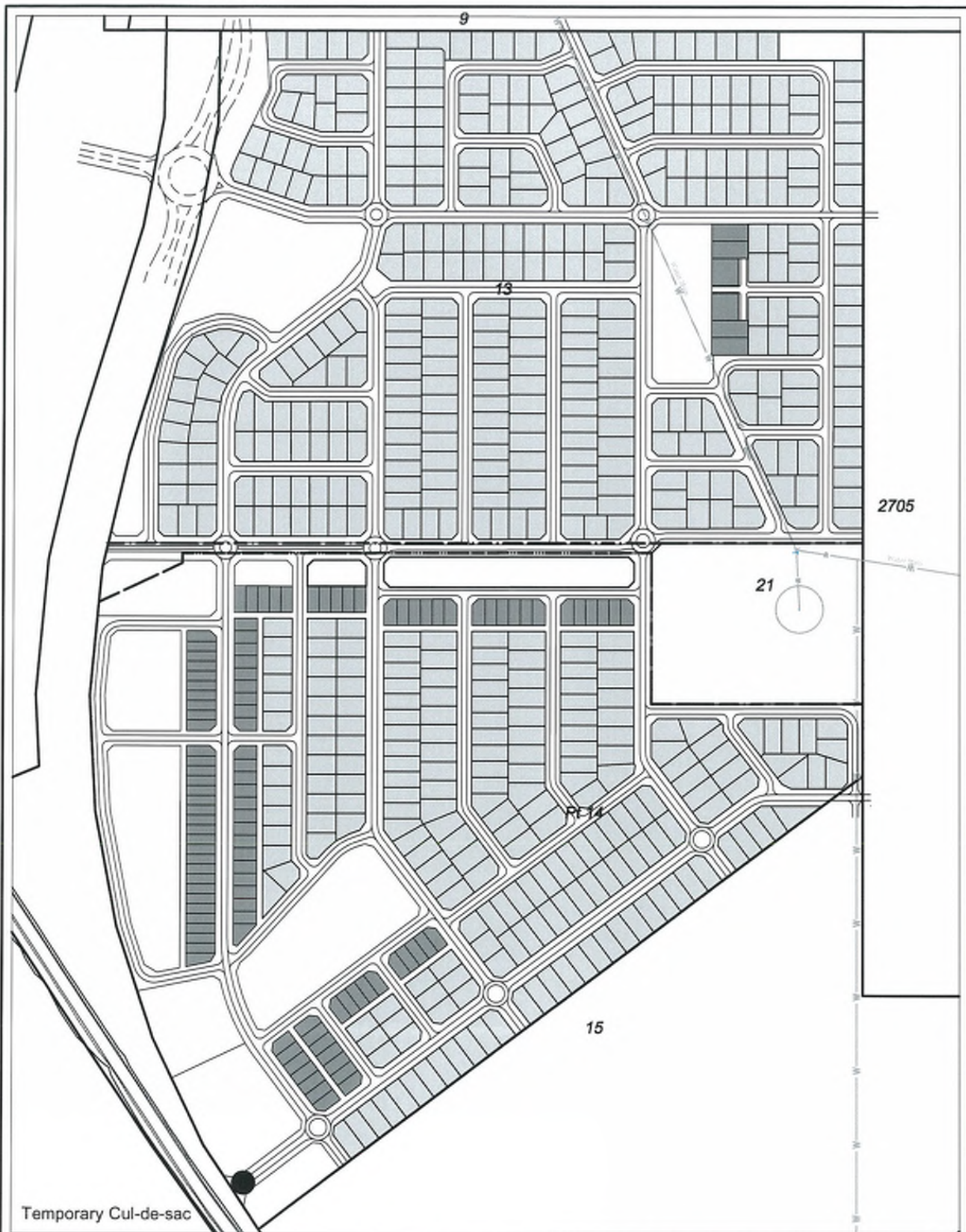
4.5 Public Parkland

4.5.1 Size and Distribution of Public Open Space

Proposed public open space areas are located on **Figure 15**. A total of 7 separate reserves are shown although 5 of these are effectively linked together, separated by only roads. The sizes of the reserves range from 0.15ha to 2.5ha.

The reserves are designed to perform a range of functions. A linear POS system forms a spinal vista up and down the hill, central to the estate. It will allow a view in both directions, allowing spectacular public views to the coast and ocean horizon as well as a vista up the hill punctuated by the Water Corporation's water tank which could be a site for a public mural or even a lookout. Being central, this linear reserve can also provide a trunk pedestrian/cycle link.

The dimensions of the linear park and housing along the southern side afford a degree of wind protection making this an ideal location for play grounds, small kick around spaces and locations to simply sit, chat to neighbours and admire the view. Other parks generally have more generous width except for a triangular reserve adjacent to the main road connection to Verita Road. This reserve is designed to create a landscaped entry statement to the estate and is strongly linked to a drainage function being situated to the foot of the hill.



25mm at scale

NOTES:

-  R20
-  R30

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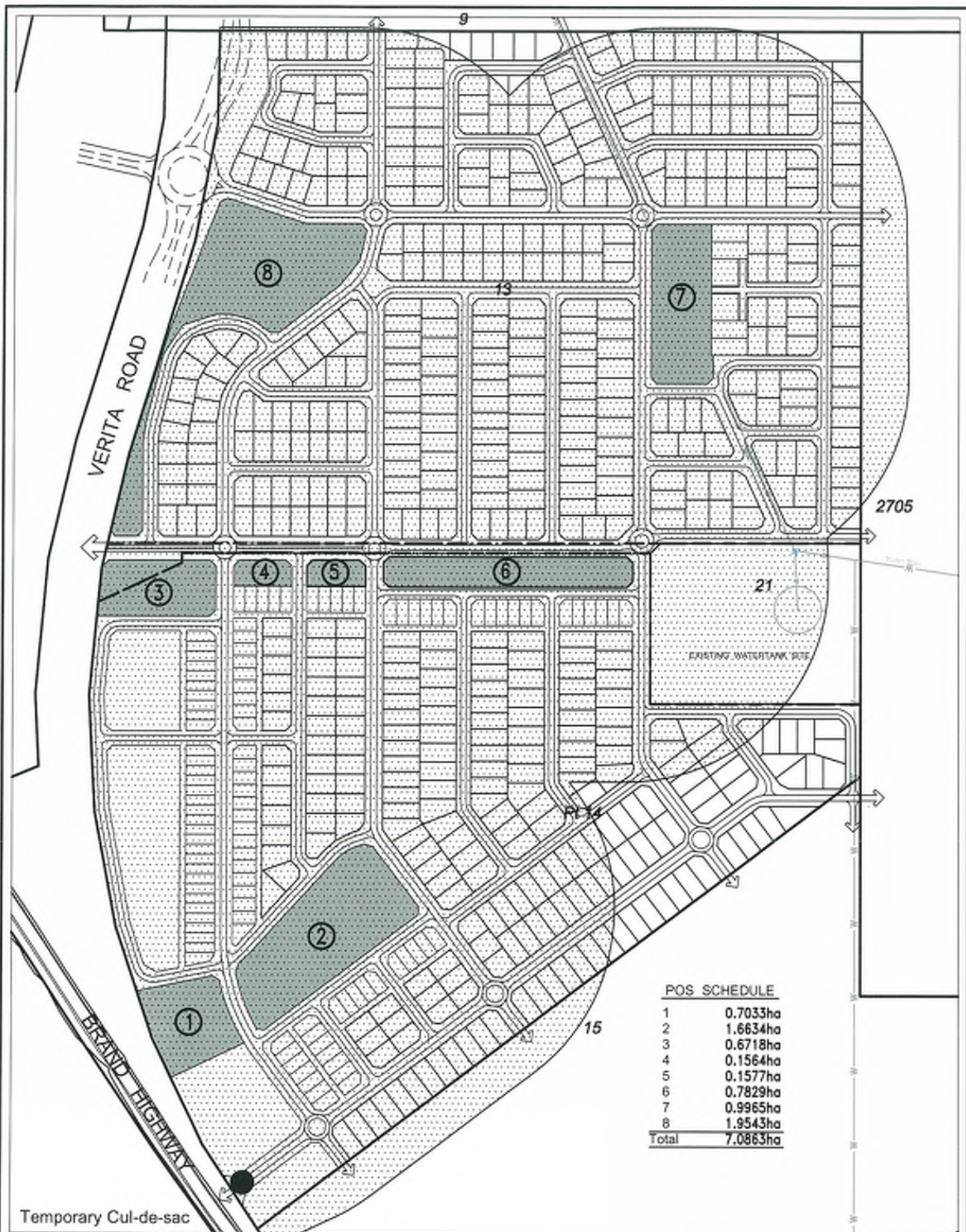


Date: 10 March 2010

Ref: 2490/Des25/A4 Density



All dimensions and areas subject to survey

FIGURE 14
SITE DENSITY PLAN
RUDDS GULLY



25mm at scale

NOTES:

-  Public Open Space
-  200m radius from POS

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A4



0 Metres 125
Scale 1:5000

Date: 10 March 2010

Ref: 2490/Des25/A4 POS

All dimensions and areas subject to survey

FIGURE 15

PUBLIC OPEN SPACE DISTRIBUTION

RUDDS GULLY

The most southerly reserve is proposed to preserve a naturally occurring gully which provides an interesting landscape feature, helping to create a sense of place in keeping with the locality name, "Rudds Gully".

In general, the contour of the site makes the provision of large, active open spaces physically difficult. The reserves are therefore dispersed to provide a high degree of accessibility. **Figure 15** illustrates that over 85% of all lots are within 200 metres of a POS reserve. They are also sited to be aligned with drainage functions avoiding ugly, special purpose drainage reserve in all but one instance.

While there is no provision for major active spaces, the reserves are sufficiently large to provide for casual, active use or, in other words, kick around spaces for younger as well as older children.

The POS reserves are numbered on **Figure 15** and tabled below together with the areas required for drainage (preliminary design).

4.5.2 POS Schedule

Table 1 below is a POS Schedule that has been prepared for the purpose of this Structure Plan. Whilst exact areas of POS may change in the future, the principles that underlay this Schedule will not change and the general location of POS areas will also not change.

It is proposed that approximately 1.4ha of the POS will be used for drainage purposes. The drainage area will be designed to be integrated into the POS, having a shared function. The POS with a shared function equals approximately 20% of the total POS (1.4ha of 7.0ha) as permitted under Liveable Neighbourhoods.

Table 1 POS Schedule

Total Area (ha)	
Lot 13	36.7176
Lot 14	33.5998
Pt Lot 21	0.8124
Total	71.1298
Deductions	
Verita Road Widening	0.5998
Drainage	0.3000
Total Deductions	0.8998
Net Development Area	70.2300
10% POS Requirement	7.0230
POS Provided (ha)	
Area 1	0.7033
Area 2	1.6634
Area 3	0.6718
Area 4	0.1564
Area 5	0.1577
Area 6	0.7829
Area 7	0.9965
Area 8	1.9543
Total	7.0863 (10.09%)

4.6 Schools

4.6.1 Catchment Requirements

The Structure Plan proposes the creation of approximately 677 lots and of itself does not create sufficient catchment for one primary school site (1,500-1,800 lot catchment). However, the Department of Education and Training (DET) have advised that the level of development proposed within the Structure Plan area and surrounding locality, is likely to result in the need for the establishment of two primary schools to the east of Brand Highway. The indicative location for these two primary schools is depicted on **Figure 8**.

A potential primary school site was previously identified to the east of the existing water tank site. However, given that these lands are now identified for future rural small holding development (as shown on Figure 8). An alternative indicative location has been identified by the DET on Lot 9 Verita Road, abutting the northern boundary of the Structure Plan area. The second proposed primary school site is located on Lot 17 Brand Highway, adjoining lands identified for future rural small holding development (see Figure 8).

Similar to catchment requirements in relation to primary schools, the Structure Plan area is too small to create a high school catchment and forms part of a much bigger catchment.

4.6.2 Size and Distribution of School Sites

As indicated above, primary school sites are proposed to the south and to the north of the Structure Plan area. It is expected that these sites are likely to range between 3.5ha and 4ha, depending on their future association with active open spaces.

High school facilities exist to the north and a new high school site is to be established within the Greenough River Estate Structure Plan area. It is likely that Rudds Gully will ultimately fall within the catchment of this new High School.

4.6.3 School Site Access and Detailed Design

The Structure Plan allows adequate road connections to the north and south to provide good access to the proposed primary school sites. The Structure Plan area is located approximately 1km from the proposed Greenough River High School site. Access will be via Verita Road and Brand Highway southwards to a primary distributor road into the Greenough River Estate, to which the proposed high school fronts.

As no schools are within this Structure Plan area, detailed design issues are not addressed.

4.7 Urban Water Management Strategy

A Local Water Management Strategy (LWMS) has been prepared by VDM Consulting and is contained in **Appendix 1** of this report. The LWMS provides an appropriate mechanism to ascertain broad level designs and management measures for flood mitigation and storm water management. The storm water management strategy and design concepts for Lots 13 and 14 are consistent with the principles of Water Sensitive Urban Design and will ensure that storm water that reaches downstream surface waters will be of a high standard. The storm water management strategy will entail:

- Lot soakwells
- Use of flush kerbing around POS to minimize the extent of the piped drainage network
- Pipes to direct runoff to infiltration/detention basins
- Use of semi mountable kerbing where appropriate to ensure surface runoff is retained within the road pavement.
- Directing all storm water runoff in excess of localised infiltration capacity to an infiltration basin.

The LWMS identifies the need for drainage basins to store and treat storm water runoff so it can be infiltrated to the groundwater. The anticipated basin surface areas are detailed below:

Basin A1	1,184m ²
Basin A2	615m ²
Basin A3	615m ²
Basin A4	2,600m ²
Basin B1	1,850m ²
Basin B2	2,815m ²
Basin C1	2,304m ²
Basin C2	2,440m ²

Some of the stormwater is to be accommodated in a dedicated reserve in the north-eastern corner and the balance combined with open space functions. Disposal areas will be landscaped, assisting the absorption of nutrients and creating an attractive residential environment. The gully in the south-west is proposed to be landscaped to form a vegetated riparian corridor consistent with the objectives of Element 5 of Liveable Neighbourhoods.

The locality is not a main drainage area. Accordingly, management responsibilities will rest with Council following a 12 month maintenance period.

4.8 Utilities

The Structure Plan is reasonably close to existing urban areas and service extensions (water, sewerage, power and telecommunications) are expected to be arranged through normal negotiations with service providers.

A water main extending north-west from the Water Corporation tank site will need to be realigned within future road reserves.

4.9 Traffic Noise

The Structure Plan area's frontage to the Brand Highway creates the potential for noise impacts on new housing. In their comments on Amendment 128, the Environmental Protection Authority recommended that the potential for traffic noise impacts be investigated. Herring Storer Acoustics were commissioned to model potential noise impacts and their report comprises **Appendix 2**.

The report recommends that commercial uses be located adjacent to Brand Highway in the Mixed Use Precinct to provide a noise barrier to any residences locating above and/or behind them. The report concludes that 'Quiet House' design and notification on titles would apply to the residential premises located in the Mixed Use precinct, including any built above the commercial components of the development.

The report also recommends that the R30 lots to the east of the Mixed Use Precinct that fall within the 60 dB(A) contour have a notification placed on the Titles to advise of vehicle noise associated with the Brand Highway.

The Acoustic Assessment has determined that development can occur over Lots 13 and 14 without any adverse impact from noise associated with the Brand Highway.

5.0 CONCLUSION

The subject LSP proposes the development of a residential neighbourhood, which will be well serviced by a legible grid road system, having good connections to the city centre and community facilities such as schools and shopping facilities. The development will be well serviced by open space areas and will have good access to other recreational areas such as the Indian Ocean.

The LSP provides a framework for future development of the structure plan area consistent with the requirements of the 'Development' zone. The principles of the Structure Plan are consistent with the principles and objectives of relevant State and local strategic and statutory planning documents applicable to the land and the locality.