City of Nedlands

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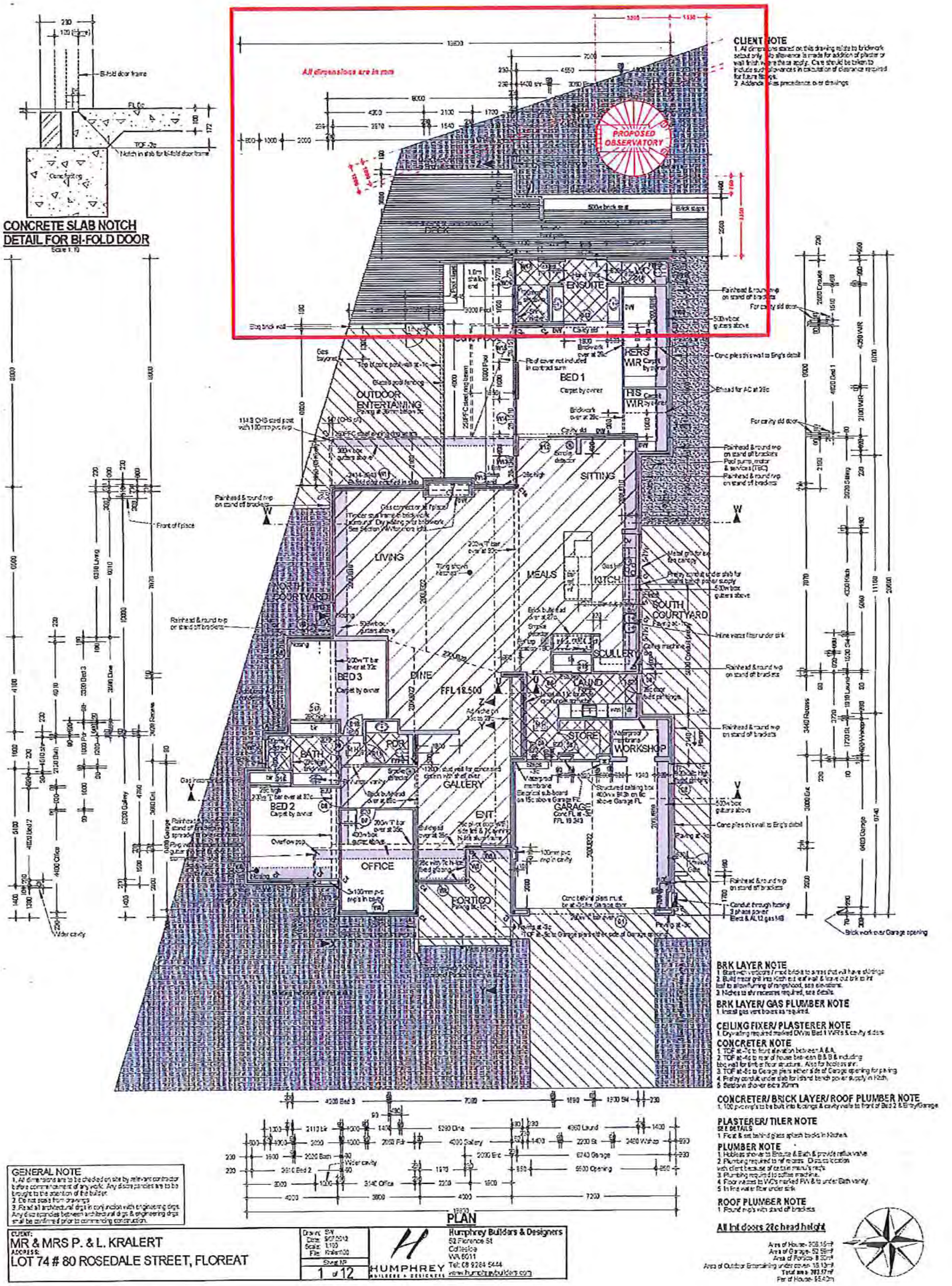
PD 32.13 – Attachment 1
Locality Plan

Monday, 18 March 2013

1:500

N

PROPOSED OBSERVATORY
80 ROSEDALE ST, FLOREAT



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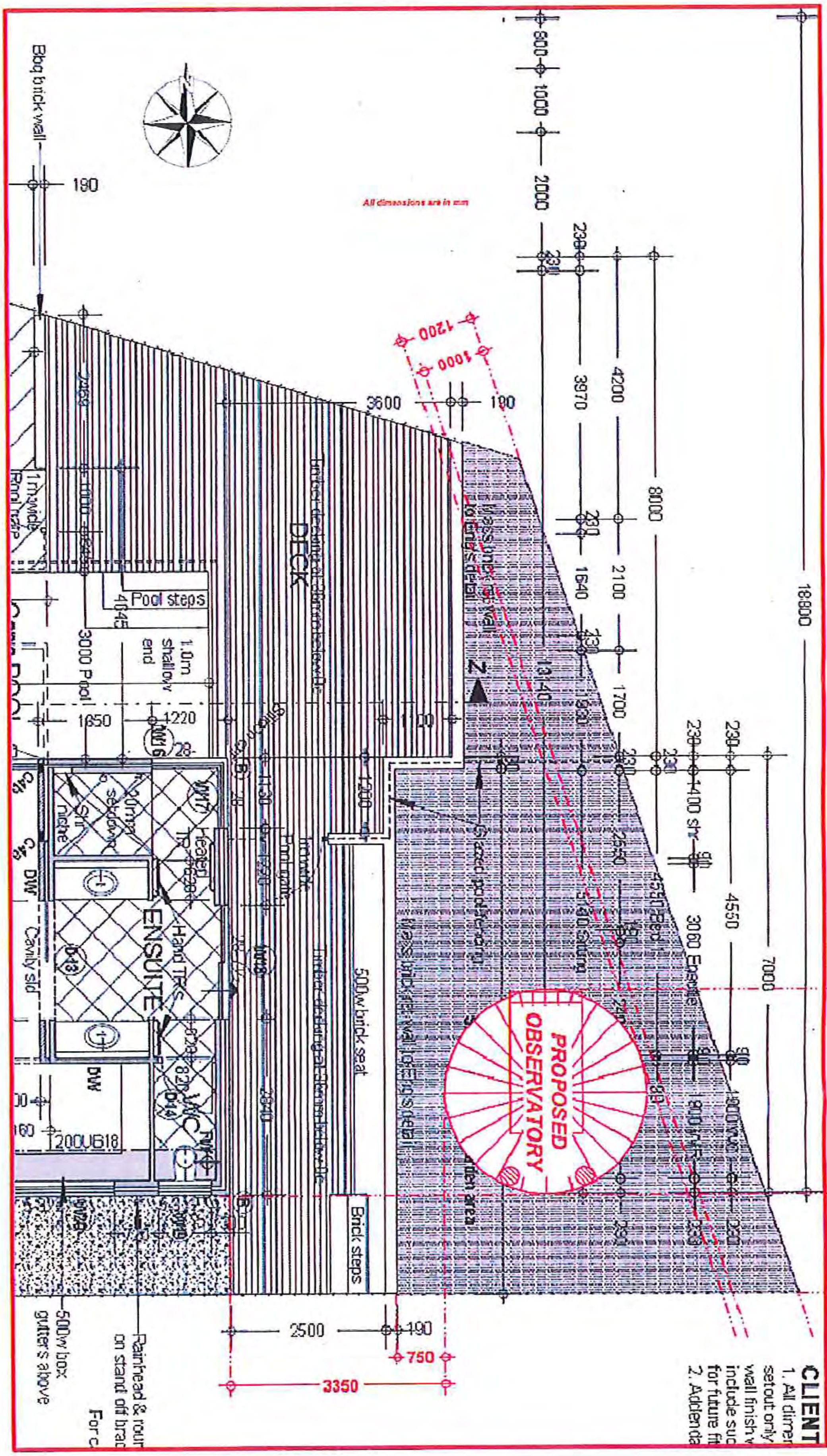
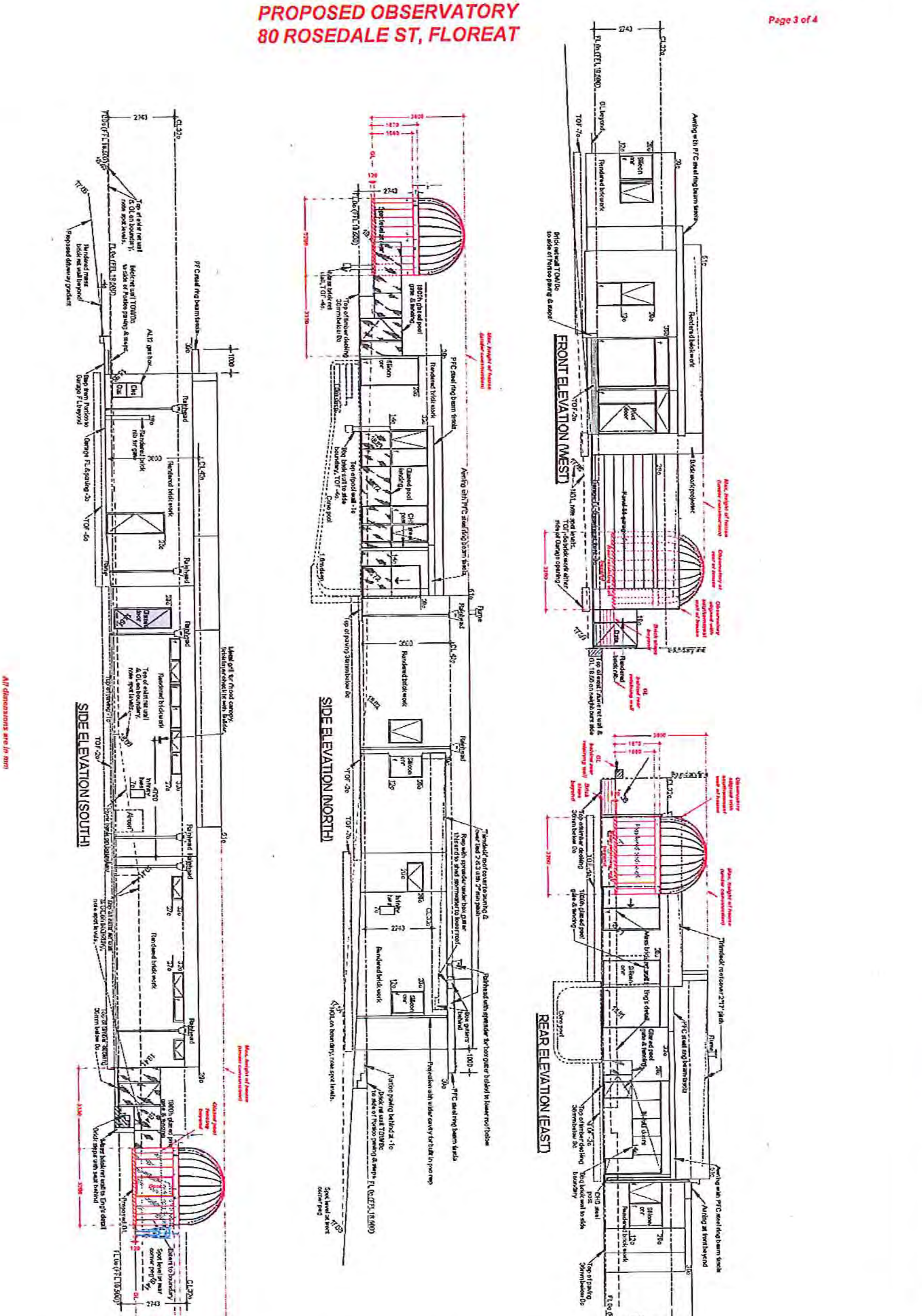


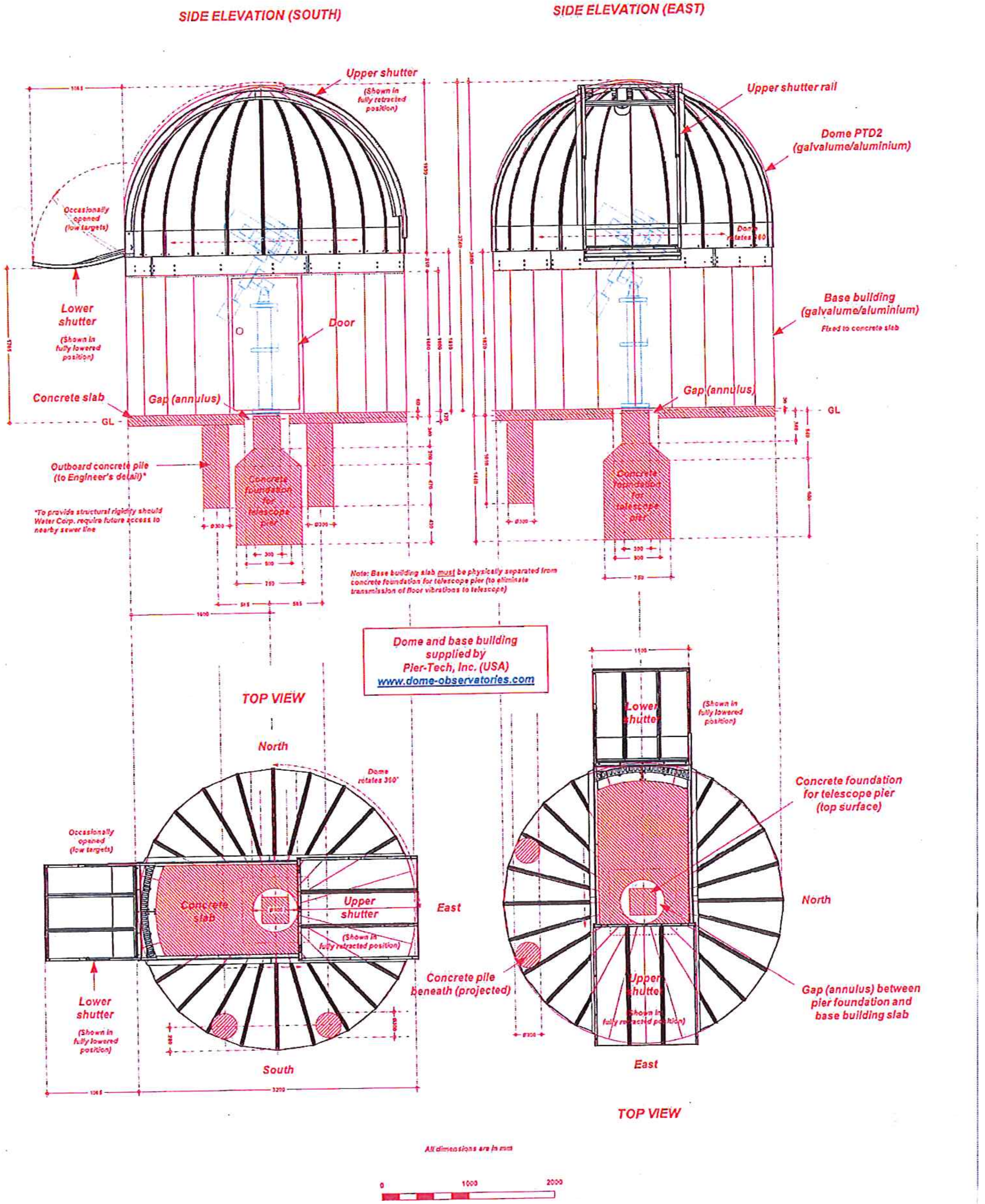
PROPOSED OBSERVATORY
80 ROSEDALE ST, FLOREAT



CLIENT: MR & MRS P. & L. KRALERT ADDRESS: LOT 74 # 80 ROSEDALE STREET, FLOREAT	Drawn: SH Date: 9012012 Scale: 1:100 File: Kralert00 Sheet Nº 3 of 12	HUMPHREY	Humphrey Builders & Designers 52 Florence St Cottesloe WA 6011 Tel: 08 9384 5444 www.humphreybuilders.com

PD 32.13 – Attachment 4
Elevation plan of observatory

PROPOSED OBSERVATORY
80 ROSEDALE ST, FLOREAT



No. 80 Rosedale Street, Floreat

Photos above & below: location of proposed observatory (when looking towards the rear)

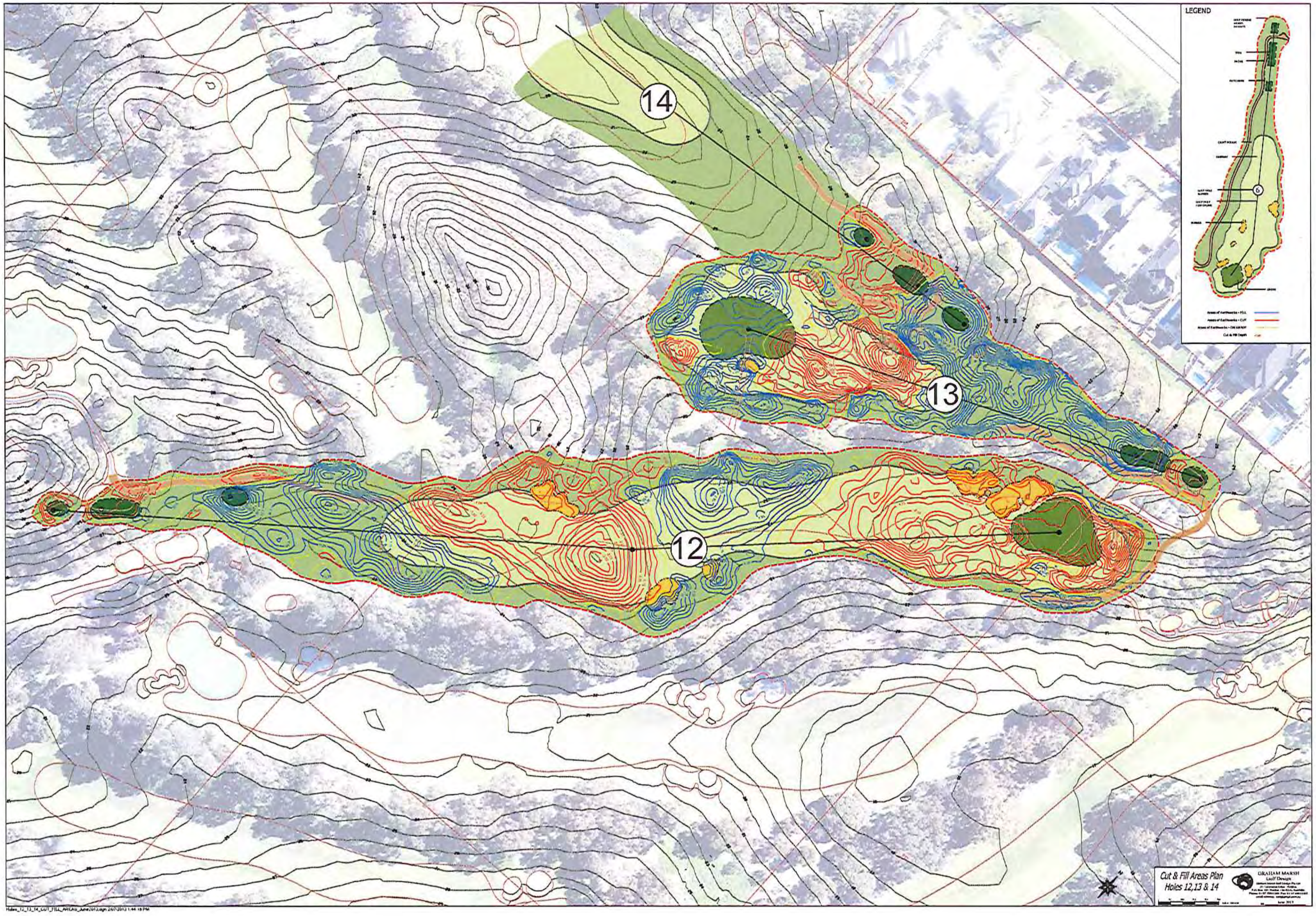
Photo above: location of proposed observatory (when looking from the rear)

Issue: **Glare**	Summary of submissions received:	The dome of the observatory will be visual above the fence line and the roof finish could be reflective and cause glare to my backyard and family room area.
	Applicant's justification:	*"My intention has always been to select a colour that:* *(a) blends in with the surroundings and* *(b) minimises reflected light from the sun (we don't want any glare either)"*
	Officer's technical comment:	**Noted -** if the application is approved, it is recommended that the standard condition in relation to glare from building materials is imposed. The condition requires that if it is deemed that the building material produces glare which will have detrimental affect on the amenity of a neighbouring property, than the owner/s will be required to treat the material to reduce the reflectivity of the material.
Issue: **Privacy**	Summary of submissions received:	Our privacy will be compromised as the observatory will overlook our backyard
	Applicant's justification:	*"The design of the observatory/telescope/pier combination is such that one cannot physically train the telescope on targets at altitudes of less than 20 degrees. This means that it will simply not be possible to look into the backyards of neighbouring properties. (Note that the height of the "base building" is 181 cm above the observatory floor.) In any case, it is rare that objects closer to the horizon will be targeted since atmospheric turbulence/distortion always becomes problematic at low altitudes. Moreover, the eastern part of the sky will be largely avoided because of the ever-present light pollution or "glow" from the city. Of course, the observatory will only be used at night, so the position of the lower hatch will not have an impact on the amount of sun reaching the adjoining properties."*
	Officer's technical comment:	**Not upheld** - the observatory will not directly overlook or impact the privacy between properties. This is due to the specialised use of the building the

		observatory would only be used at night, and if the observatory is used for its intended purposes (i.e. astronomy) the observer would not be able to look into the adjoining properties. It is also noted that the adjoining property to the east has landscaping along the boundary line and the residence is not adjacent to the observatory, whilst the adjoining property to the south the ground level of the residence is considerable lower and the only view line would be to the roof of the property.
Issue: **Aesthetics**	Summary of submissions received:	The structure will be imposing and aesthetically displeasing
	Applicant's justification:	In my opinion, the manufacturer builds some of the most beautiful, classic, dome-shaped buildings in the world. There's a choice of more than 30 exterior colours and my intention has always been to select a colour that (a) blends in with the surroundings and (b) minimises reflected light from the sun (we don't want any glare either).
	Officer's technical comment:	**Upheld** - the observatory will be a dominating structure within the rear setback area. The dome roof is above the existing fence line and will be visible to the adjoining eastern property. The roof structure is bulky and could be considered to be visually obtrusive.
Issue: **Access to sunlight**	Summary of submissions received:	If the observatory hatch is open, it will cause the sunlight to be blocked to the rear of our backyard
	Applicant's justification:	*"The observatory will only be used at night, so the position of the lower hatch will not have an impact on the amount of sun reaching the adjoining properties".*
	Officer's technical comment:	**Not upheld** – the proposed observatory will not restrict access to sunlight to the property or adjoining properties residences or outdoor living areas. Due to the lot orientation, the observatory will not adversely overshadow

		the eastern adjoining property's back yard.
Issue: **Noise**	Summary of submissions received:	The observatory will be used in the evening and there could be noise issues associated
	Applicant's justification:	-
	Officer's technical comment:	**Noted –** noise from the property is to be in accordance with the *Environmental Protection (Noise) Regulations 1997*. It is considered that noise from the use of the observatory will not exceed the prescribed noise levels.
Note: A full copy of all relevant consultation feedback received by the City and the applicants justification has been given to the Mayor & Councillors prior to the meeting.		

PD 33.13 – Attachment 1– Proposed Site Plan



Cottesloe Golf Club (Inc)

COURSE WORKS – HOLES 12, 13 & 14

TREE CLEARING PLAN

Please find outlined below details of selected trees which have been identified for removal as part of the proposed course design changes to holes 12, 13 and 14 at Cottesloe Golf Club.

<u>Section 1</u>

- Two (2) x Coastal Moort
- Two (2) x Sugar Gum
- Two (2) x Rottnest Tea Tree

Section 2

- Seven (7) x WA Peppermint
- Eight (8) x Rottnest Tea Tree

Section 3

- One (1) x Tuart (possibility to save)
- Two (2) x Coastal Moort

Section 4

- One (1) X WA Peppermint
- One (1) x Coastal Moort

Section 5

- Three (3) x Spotted Gum
- Three (3) x Sugar Gum
- Two (2) x Coastal Moort

Section 6

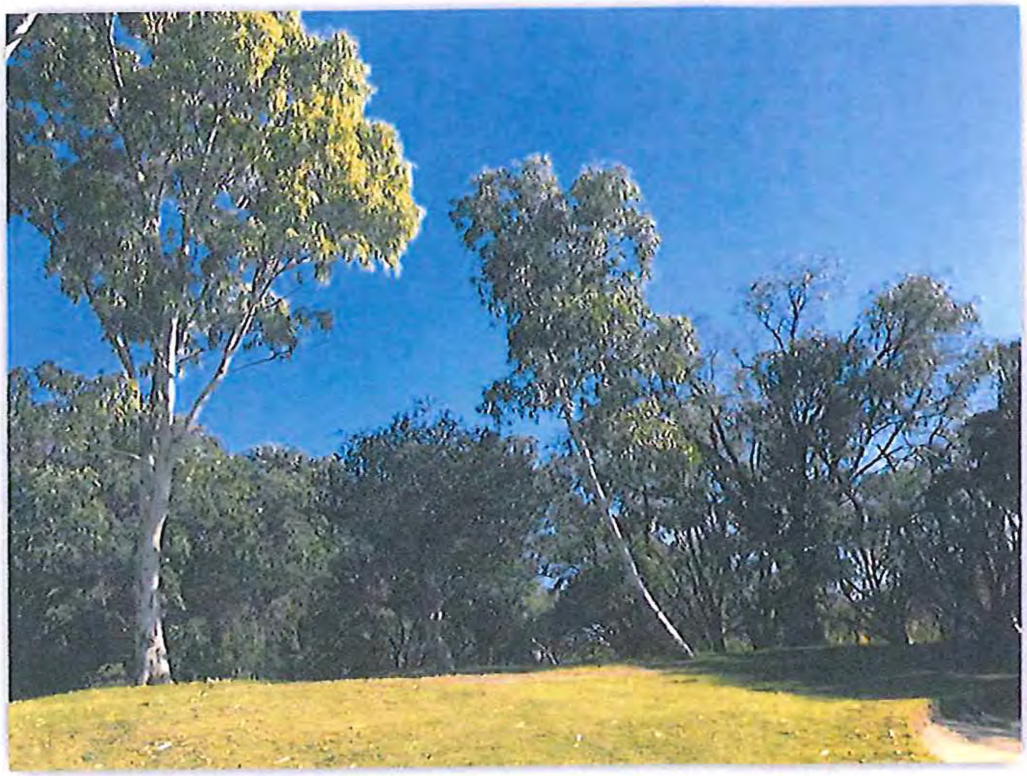
- Sixteen (16) x WA Peppermint
- Two (2) x Coastal Moort

Section 7

- One (1) x Spotted Gum
- Four (4) x Radiata Pine
- Two (2) x Coastal Moort

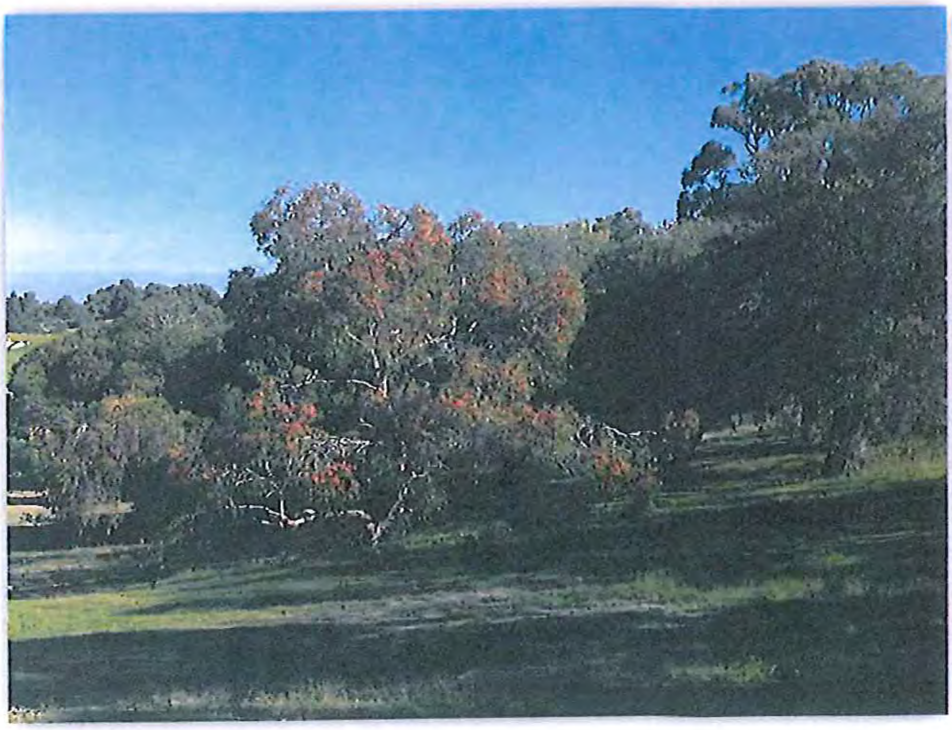
Section 8

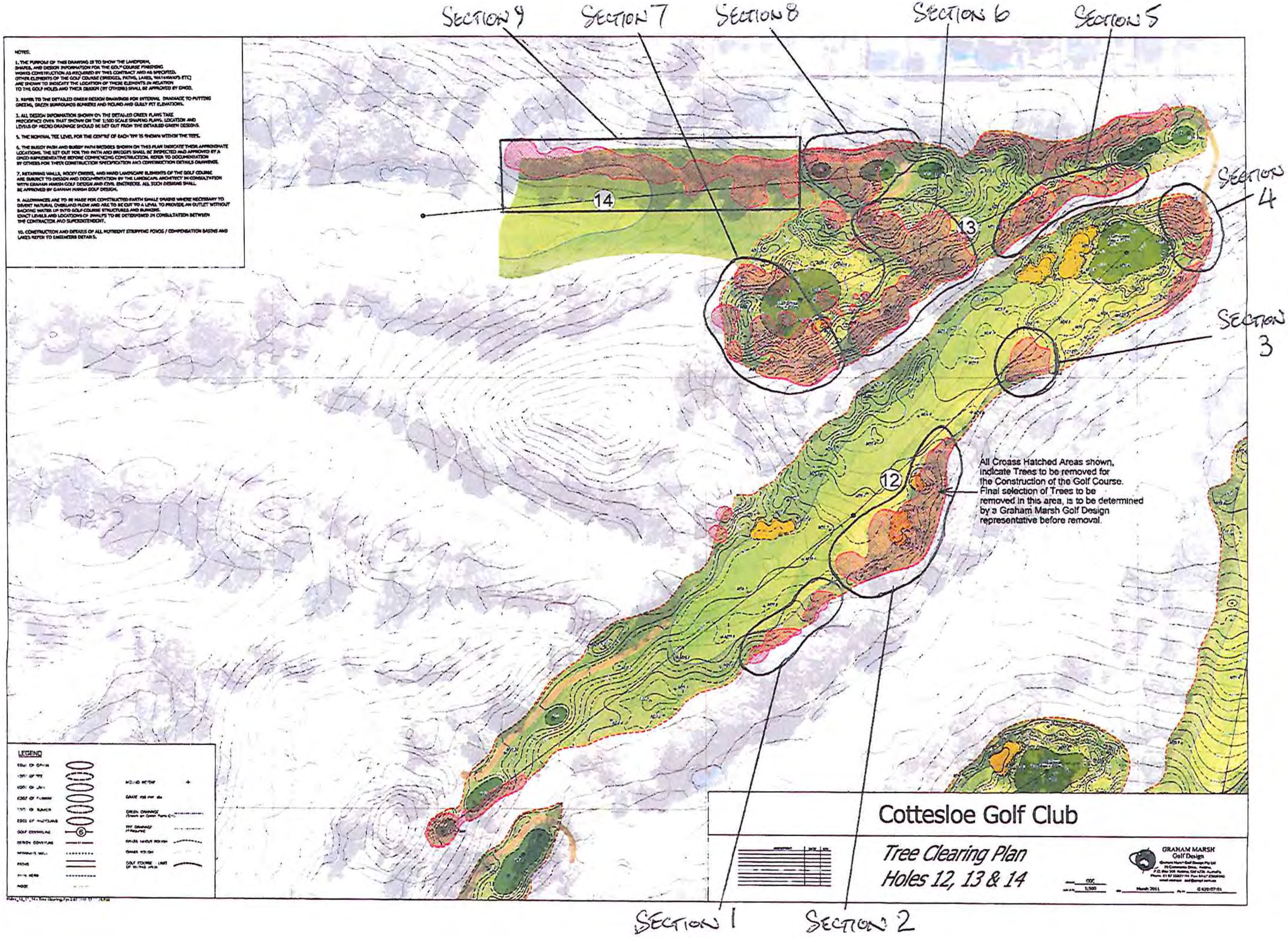
- Two (2) x Spotted Gum
- Two (2) x Sugar Gum
- Thirteen (13) x WA Peppermint

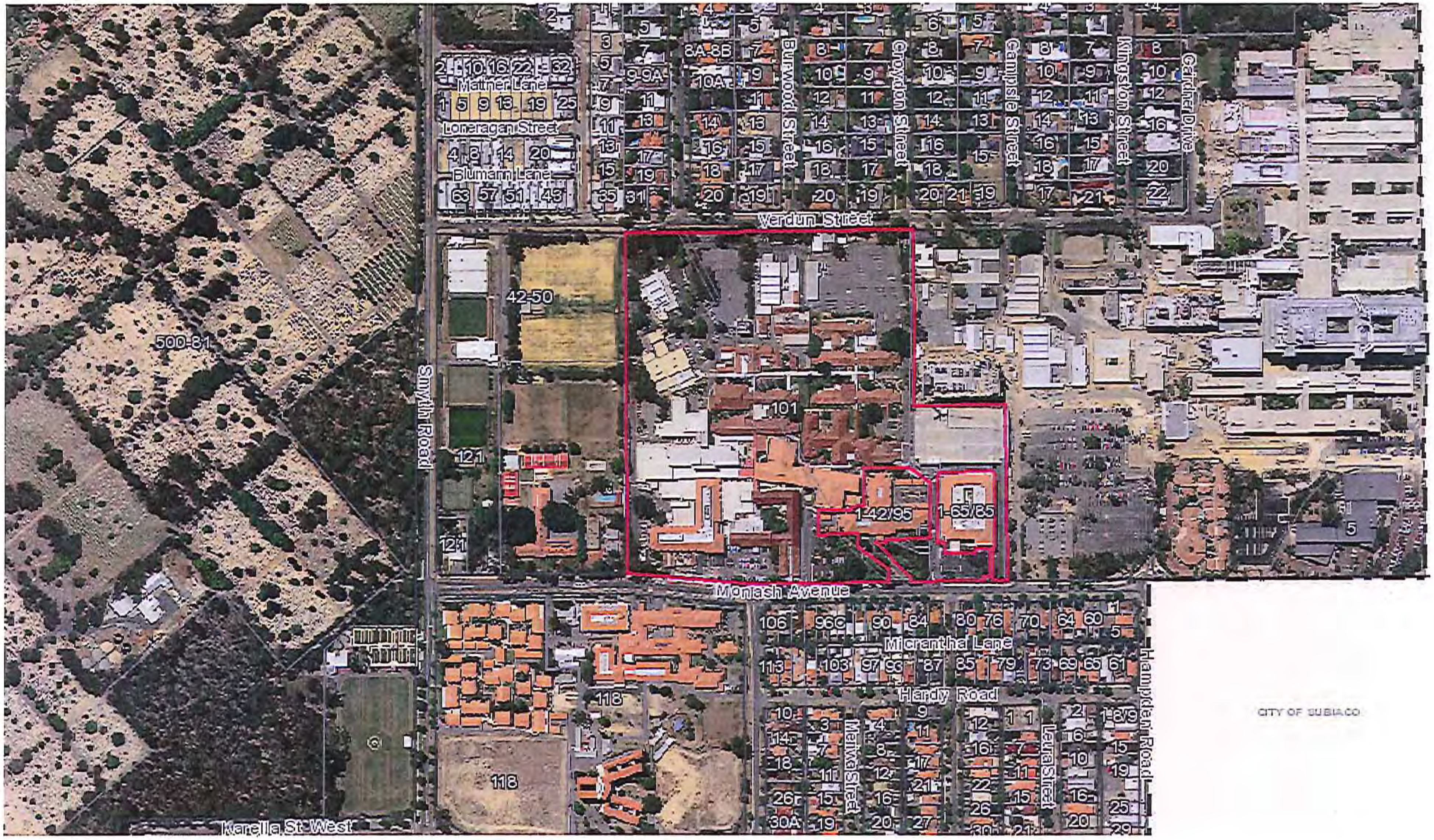


Section 9

- Seven (7) x WA Peppermint
- Five (5) x Coral Gum
- Two (2) x Coastal Moort
- One (1) x Rottnest Tea Tree




Section 9
Section 7
Section 8
Section 6
Section 5
Section 4
Section 3
Section 1
Section 2
14
13
12
All Croass Hatched Areas shown, indicate Trees to be removed for the Construction of the Golf Course. Final selection of Trees to be removed in this area, is to be determined by a Graham Marsh Golf Design representative before removal.
NOTES
LEGEND
Cottesloe Golf Club
Tree Clearing Plan
Holes 12, 13 & 14
GRAHAM MARSH
Golf Design
1:500
March 2011



City of Nedlands	The City of Nedlands accepts no responsibility for the accuracy of this image or the results of any actions taken when using this image	Subject Site **PD 34.13 – Attachment 1 Locality Plan**	1:5565	N

PD34.13 – Attachment 2
Draft Masterplan

Hollywood Private Hospital Masterplan

Part 1

Prepared for
Ramsay Health Care

By Landvision

LANDVISION

July 2013

Endorsement

The Hollywood Private Hospital Masterplan, July2013 has been endorsed by:

______________________ ______________________

Manager Project Development and Property Services Hollywood Private Hospital	Mayor, City of Nedlands

______________________ ______________________

Date	Date

Hollywood Private Hospital Masterplan has been prepared by:

Mr. Peter Driscoll – Principal Planner
Landvision Pty Ltd
Ph: (08) 9388 8181
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Address: Suite 5/16 Nicholson Road, Subiaco WA 6008

In association with

Silver, Thomas, Hanley (Aus) Pty Ltd
Health Architecture
Ph: (08) 6363 9444
Fax: N/A
Web: www.silverthomashanley.com
Address: Suite 89, City West Centre – 102 Railway Parade
West Perth WA 6005

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Table of Contents

List of Figures

Appendices

EXECUTIVE SUMMARY

In order to meet the health and wellbeing needs of the expanding population who use the Hospital's services, the Masterplan has been created with future expansion and development of services to aim to ensure Hollywood Private Hospital can continue to provide first – class health services to the community.

The Masterplan concentrates on several key factors including future development, access and parking, building height and appearance, neighbourhood amenity, landscaping outdoor spaces, parking and connectivity to public transport.

The Masterplan provides excellent access between the community and the hospital, between the buildings on the hospital grounds and within the buildings themselves. Access in and around the hospital is enhanced by good signage, pedestrian walkways between buildings and the provision of secure and weather-proof links.

Planning for the hospital has considered proposals for future improvements to the availability of public transport, primarily buses but also a potential light rail system. This will ensure that patients and visitors will have increased access to public transport while the existing approximately 1500 car parking bays (which can be expanded to be up to 1800 bays) will ensure both staff and the pubic have adequate onsite parking facilities together with improved "end of trip" facilities.

The Masterplan shows areas of proposed works which will be likely to be developed within the next 5 years and include:

- expansion of the Hollywood Clinic;
- expansion of the theatre, together with new kitchen and additional wards;
- a research facility;
- a multistorey carpark; and
- an additional floor of parking on the existing multistorey carpark.

In addition the Masterplan shows a number of Future Development Areas where buildings and facilities are likely to be renovated or replaced in the future over a period of more than 15 years. It is not proposed to specify what each Future Development Area will be developed for other than for hospital and allied services. Health operators must respond to the changing needs of the community and are not in a position to "lock in" the exact nature of the future use of Future Development areas but it must be consistent with the provisions and standards of the Masterplan.

The Hospital Masterplan delivers or provides guidance on:

- A planning and design framework regarding the principles and parameters for the future long-term use and development of the Hospital campus;
- The desired future character of the Hospital campus;
- Integration with surrounding land uses, infrastructure and street patterns;

- Entry and exit points to the site and analysis of the impacts on the existing road network;
- Management of stormwater and other infrastructure on the site;
- Guidance for developing a sustainable built form and open space setting;
- Background input into the development of statutory plan amendments for the assessment of detailed development applications regarding the site through the adoption of the Masterplan; and
- Ongoing management of infrastructure and public areas on the site.

HPH seeks the adoption of the Masterplan to guide future growth and development of the site and will continue to monitor the Masterplan and its implementation. From time to time HPH may seek to modify the Masterplan.

The Masterplan comprises:

- Hollywood Private Hospital Master Plan – Part 1 July, 2013 (which includes Appendix 2 – Report on Landscaping at HPH, Pullyblank Pty Ltd, June 2012); and
- Hollywood Private Hospital Masterplan, Part 2 Background Reports.

1.0 INTRODUCTION

Over the past years development has occurred at Hollywood Private Hospital (HPH) on an 'as needed' basis and in November 2009 the Council of the City of Nedlands determined that it is no longer willing to approve further development until an overall Masterplan has been approved. Prior to this the Council approved a Masterplan for the Hospital campus in 2005 which now requires updating and modification to meet the future development program for HPH.

A modified Masterplan submitted to Council with a proposed Scheme Amendment (the Amendment did not proceed) prepared by Ramsay Health Care was considered by Council in December 2009. The Council resolved that before any future development is approved a revised or new Masterplan was required with several matters needing to be satisfactorily addressed including the following:

- the Masterplan should in its presentation and detail eg. refer to height from an agreed datum or mean average base level in area;
- be accompanied by a base plan which shows only the existing building footprints, parking etc. without added data;
- produce a modified version of the proposed Masterplan together with an east – west, north – south profile to show and measure building heights in each of the Precincts to make it easy to get to show or determine the maximum height over the whole Precinct in future;
- show proposed development setbacks;
- a plan showing all existing areas of landscaping, its percentage of the site; and
- produce a simple Masterplan with no buildings shown dividing the site into simplified sub-precincts if there are common areas.

The above Masterplan will then establish the existing development standards for the whole site. This report presents a proposed Masterplan which illustrates the potential future development of the whole HPH site for consideration.

The Masterplan shows areas of proposed works which will be likely to be developed within the next 5 years and which include:

- expansion of the Hollywood Clinic;
- expansion of the theatre, together with new kitchen and additional wards;
- a research facility;
- a multistorey carpark; and
- an additional floor of parking on the existing multistorey carpark.

HPH seeks the adoption of the Masterplan to also guide future growth and development of the site beyond 15 years time and will continue to monitor the Masterplan and its implementation. From time to time HPH may seek to modify the Masterplan.

1.1 Background

HPH was constructed during World War II by the Commonwealth Government as a 500 bed hospital to care for service men and women and was first occupied in 1941. In 1947, control of the hospital was passed to the Repatriation Commission to provide acute care for veterans and war widows and it became the Repatriation General Hospital Hollywood.

Ramsay Health Care, an Australian owned company, became the owner – operator in 1994 and remains the current owner. From its modest beginnings the Hospital has emerged as an acknowledged Centre of Excellence in several medical specialities including orthopaedics, urology, cardiology, psychiatry and oncology. The hospital currently has a licence to treat 492 overnight patients and 167 day patients or a total of 659 patients in any one day providing care for private patients and entitled war veterans and war widows. The licence to treat a specified number of patients is issued annually by the Department of Health.

Over the past 5 years HPH has carried out a major redevelopment of its hospital facilities, access and parking which is reflected in Figure 6 – Masterplan.

The improvements include:

- upgrading theatre staff accommodation and the sterile supply department;
- construction of a new gastroenterology unit;
- construction of new operating theatres;
- construction of a new ward block;
- construction of a multi- storey car park;
- construction of an additional Day Surgery, Day Procedure Unit and Accommodation;
- construction of Hollywood Medical Centre (dedicated Specialist suites); and
- extensive landscaping of the Verdun Street verge in cooperation with the City of Nedlands.

Hollywood Private Hospital, Monash Avenue, Nedlands

LOCATION PLAN

Figure 1

2.0 MASTERPLAN, VISION, GOALS AND OBJECTIVES

2.1 What is a Masterplan?

A Masterplan is a high level plan designed to provide a coordinated approach to future development. Masterplans contain a series of illustrations and explanatory text to specify the planning principles and controls within a particular area as a whole. Their intent is to guide landowners, government and the community on how and where development should occur.

The Masterplanning process will determine how HPH can best be used in the future, considering heritage, setting, existing uses, future uses and sustainability. The HPH Masterplan is a long term vision for the site and will take many years to implement.

2.2 Vision

The vision for the HPH campus is to:

- Develop a distinctive and attractive campus that capitalises on its existing natural, building and heritage assets to uniquely position itself within the region;
- Take advantage of an ongoing improvement of the public transport system that is able to support the intensification of employment and patients numbers;
- Provide a Masterplan which requires that future facilities are flexible enough to adapt to continuous changes in the health care delivery system and to support rapid technological advances and to increase the efficiency of the hospital operations, help manage costs and improve service to patients.

2.3 Goals

The goals for the Masterplan include:

1. Prepare a Masterplan to guide growth and development through to the year 2030 and beyond:

   - Provide opportunities for public review and comment;
   - Prioritise future improvements and new development; and
   - Provide certainty to neighbouring property owners and the City of Nedlands.

2. Create an aesthetically pleasing and highly functional hospital campus environment.

   - Continue to enhance the main entry from Monash Avenue;
   - Create an integrated, internal circulation system for all vehicles (includes emergency vehicles) and pedestrians;

- Provide sufficient onsite parking for all users while creating initiatives to reduce the general reliance on private cars for access, increasing the use of pubic transport as the services are improved;
- Provide high quality, sustainable landscaped buffers and walkways;
- Support public transport services; and
- Minimise exhaust, light and noise relating from hospital operations.

3. Remain a good neighbour

- Control and manage vehicle access to the campus to reduce traffic in adjacent residential neighbourhoods;
- Provide landscaped buffers and visual screening where they would reduce the visual impact on neighbouring property owners;
- Consolidate the footprint of hospital buildings to maximise the amount of open space;
- Setback higher buildings to the centre of the campus and away from residential buildings;
- Build lower buildings at the perimeter that complement the architecture of and provide for transition to the adjacent neighbourhood (Note: this is more important along Verdun Street where the majority of adjacent homes are located); and
- Enhance portions of the campus edge with desirable and usable places benefitting patient care, caregivers and the surrounding neighbourhood.

2.4 Objectives

1. Prepare a Masterplan to inform Council and the public and other stakeholders of the future development of Hollywood Private Hospital;
2. To prepare a Masterplan consistent with the requirements of the Town Planning Scheme No. 2 and develop a set of conditions to be listed in the Masterplan which once approved by Council provides the development requirements of future development; and
3. Reflect the findings of the Traffic Impact Statement, the Drainage Management Plan, and the Masterplan and make any relevant recommendations in this respect.

The HPH Masterplan provides a framework for guiding the development of the hospital campus. In preparing this Masterplan the following was taken into consideration:

- Relevant State Planning policies;
- The City of Nedlands Local Planning Strategy and Scheme and Policies;
- The Traffic Impact Statement (See Part 2: Background Reports);
- The Drainage Management Plan (See Part 2: Background Reports);
- Health and medical research and education;
- The adjacent QEII Medical Centre Masterplan 2010 by Hassell;
- The general and urban environment;
- Traffic and access;
- The neighbouring urban form;
- Site functions such as stormwater and utility infrastructure; and
- Statutory Planning Context.

3.0 PLANNING CONTEXT

The subject land is private freehold land and zoned 'Special Use' in Town Planning Scheme No. 2 (TPS No. 2), City of Nedlands. 'Special Use' zones are listed in Schedule V – 'Special Use' Zone (see Figure 2) as follows:

Schedule V – Special Use Zone
AMD 97 GG 22/11/86

(A) DESCRIPTION OF SITE	(B) PERMITTED USES AND PROVISIONS APPLYING TO SPECIAL USE SITES
Pt. Loc 1715 and Pt. Loc 8697 Monash Avenue, Nedlands (Hollywood Repatriation Hospital) AMD 97 GG 22/11/96	i. Hospital and ancillary facilities; and ii. (ii) Aged persons housing and frail aged persons hotel, subject to being advertised in accordance with the provisions of Clause 6.3.3 and 6.3.4.

Clause 3.10 Special Use Zone states that:

> "No person shall use the land or any building or structure thereon in a Special Use zone, except for the purposes set against that land in Schedule 5 and subject to compliance with any conditions specified in the Schedule with respect to the land".

As the building footprints, shown within the Future Development Areas on Figure 6, are indicative only it is proposed that the only variation which would be accepted by Council without a formal amendment would be for a variation to the indicative building footprint when:

a) the modified building footprint remains within the Future Development Area; and
b) the area of the modified building footprint is equal to or less than the area shown on Figure 6.

All development is to align with the Masterplan except as otherwise provided for in the Masterplan.

Any proposed development and development standards which are inconsistent with TPS No. 2 or the approved Masterplan would require an amendment and modifications to Schedule V, column (B) or to the Masterplan. When there is a discrepancy between TPS No. 2 and the Masterplan, the Masterplan shall prevail.

As the Hospital is <u>not</u> on a Regional Reserve the development does not require approval of the Western Australian Planning Commission (WAPC). It is noted however, that at its meeting held on 19 June 2007 the Statutory Procedures Committee of the WAPC adopted in principle the Queen

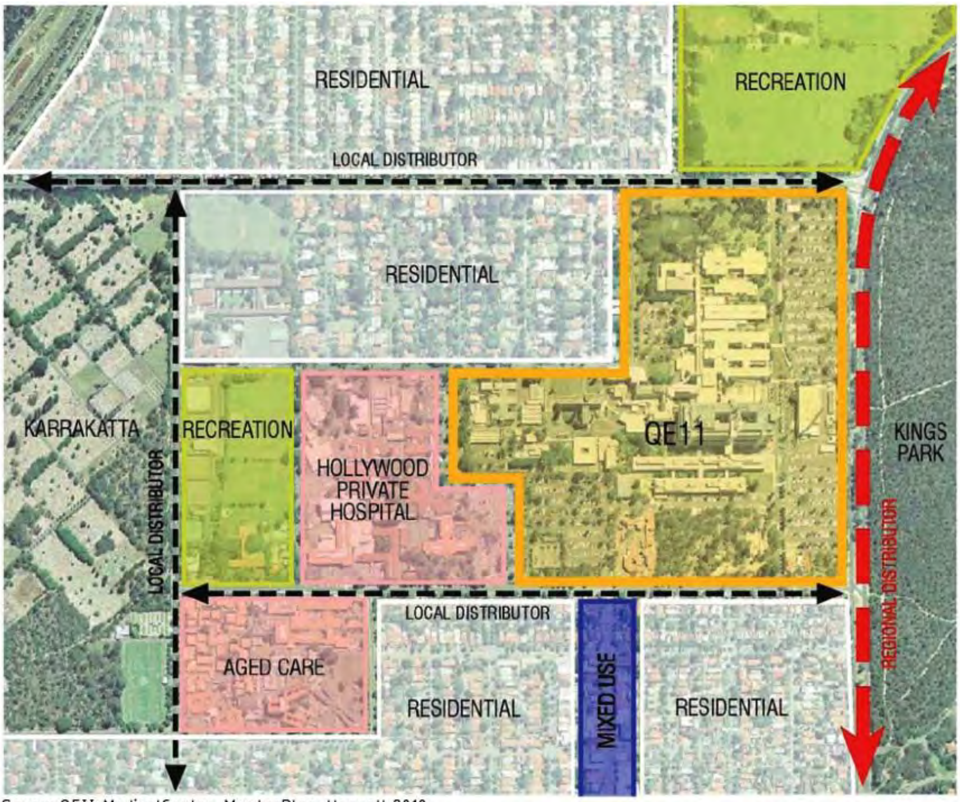
Elizabeth II Medical Centre Access and Structure Plan (9 February 2007) as a guide to the future planning and development of the Queen Elizabeth Medical Centre Precinct which includes HPH.

The WAPC stated in its decision that 'it considers without the required bus services the planned expansion of the QE II Medical Centre site would not be acceptable on planning, transport and sustainability grounds`.

Although the expansion of QE II is proceeding and this issue has been resolved the public transport available to staff and visitors to HPH still does not cater to the specific demands of both groups, in particular staff, which results in the ongoing demand for onsite parking.

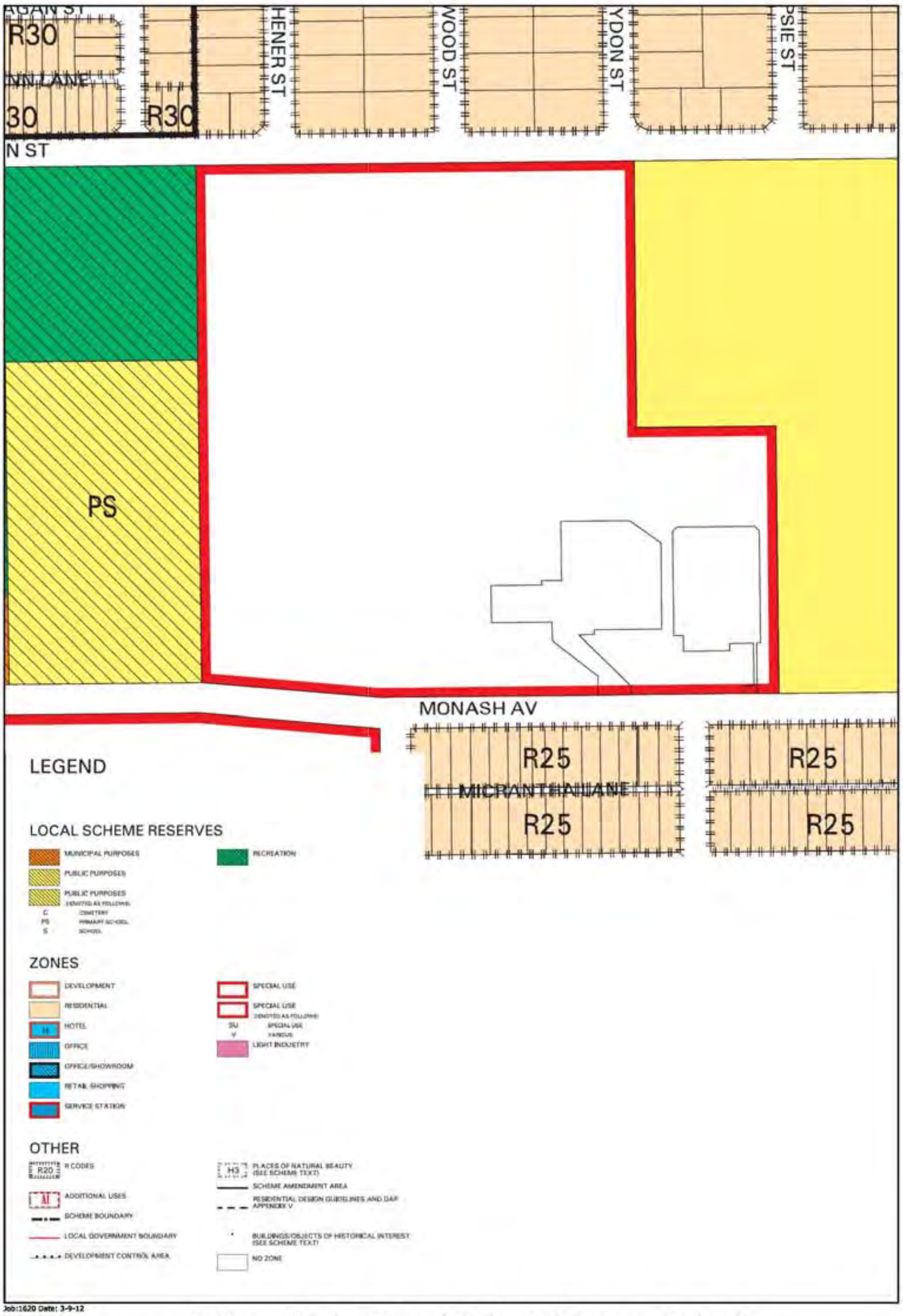
Of particular relevance to the forward planning of HPH the following condition was adopted as part of the WAPC resolution:

'8. *Advise the City of Nedlands and Hollywood Private Hospital that the Commission is aware of the maximum limit of 1,800 car parking spaces in the approved site structure plan. The Commission would wish to be consulted on any proposal which would lead to a total number of car parking spaces exceeding 1,800 bays. The Commission further would be minded to introduce a Clause 32 resolution requiring any development exceeding 1,800 bays to be referred to the Commission for its determination'*.



Source:QEII MedicalCentre MasterPlan-Hassell 2010

HOLLYWOOD PRIVATE HOSPITAL LOCAL PLANNING CONTEXT



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Landvision Pty. Ltd.

Hollywood Private Hospital, Monash Avenue, Nedlands

EXTRACT FROM LOCAL PLANNING SCHEME SHOWING CURRENT ZONING

Figure 2

A meeting with the relevant officers of the Department of Planning for the WAPC confirmed that:

i) the WACP can call in the proposal if necessary; and
ii) if the Masterplan proposed parking (together with existing parking) which in total does not exceed 1,800 car parking spaces the WAPC/DoP does not need to be consulted or involved in the formulation and assessment of the Masterplan.

Parking and access has emerged as significant issues to be addressed at Activity Centres. A discussion paper has been prepared by the DoP which seeks to use parking as a tool to help balance a variety of access demands for major activity centres.

The discussion paper “Activity Centres Parking” and the responses received when advertised is leading to a formalised policy that sets the new approach to parking supply and management and may formalise parking caps (maximums) for QEIIMC including HPH.

Appropriate parking supply and management, combined with increased access via alternative modes and mass transit allows a centre to grow beyond the levels that the physical capacity of the local and regional road network would otherwise allow.

Whilst the focus of the discussion paper is on major centres identified in SPP 4.2, namely Perth Capital City, Primary, Strategic Metropolitan and Specialised (eg. QEIIMC and HPH), the policy position described can also be applied to smaller centres and centres in regional areas.

The need for a SPP has arisen from policy gaps identified in preparation of parking and access strategies for a number of major centres including Stirling, Midland, UWA/QEII, Murdoch and Bentley/Curtin. The proposed SPP, together with Directions 2031 and SPP 4.2, would guide development of access and parking for major centres in the metropolitan area as part of a broad policy framework.

3.1 Property Description

The overall site comprises 3 titles with a total area of 11.7381 ha and which includes a number of easements.

Titles

A summary table of lot details is provided below and shown on Figure 3.

Lot	Diagram/Deposited Plan	Volume	Folio	Area (ha)	Owner Details
564	DP 63425	2735	137	10.6198	Ramsay Hospital Holdings Pty Ltd
563	DP 63425 Strata Plan 58316	-	-	0.6621	Hollywood Medical

					Centre
562	DP 66453 DIA 95434	2140	97	0.4600	Hollywood Specialist Centre

Easements and Rights of Carriageway

The following encumbrances being easements and rights of carriage are interests and notifications shown on the titles which impact the properties.

Purpose	Statutory Reference	Origin	Land Burdened	Benefit To	Comments
Easement	Sec 195 of the LAA	DOC H 505459	Lot 564	Water Corporation	
Right of Carriageway	Sec 136C of the ILA	This Plan	Lot 564	Lot 563	
Easement (Gas Supply)	Sec 136C of the ILA	This Plan	Lot 563	Lot 564	Limited in Height to 18m AHD
Easement (Sewerage)	Sec 167 of the P & D Act REG 33 (b)	This Plan	Lot 564	Water Corporation	
Easement (Electricity Supply)	Sec 167 of the P & D Act REG 33 (c)	This Plan	Lot 564	Electricity Networks Corporation	
Easement Gas Supply	Section 136 of the TLA	PD 63495	Common Property	Lot 564	
Easement (Waste Water Pipeline)	Section 195 of the LAA	DP 63495	Lot 562	Water Corporation	Right to Enter

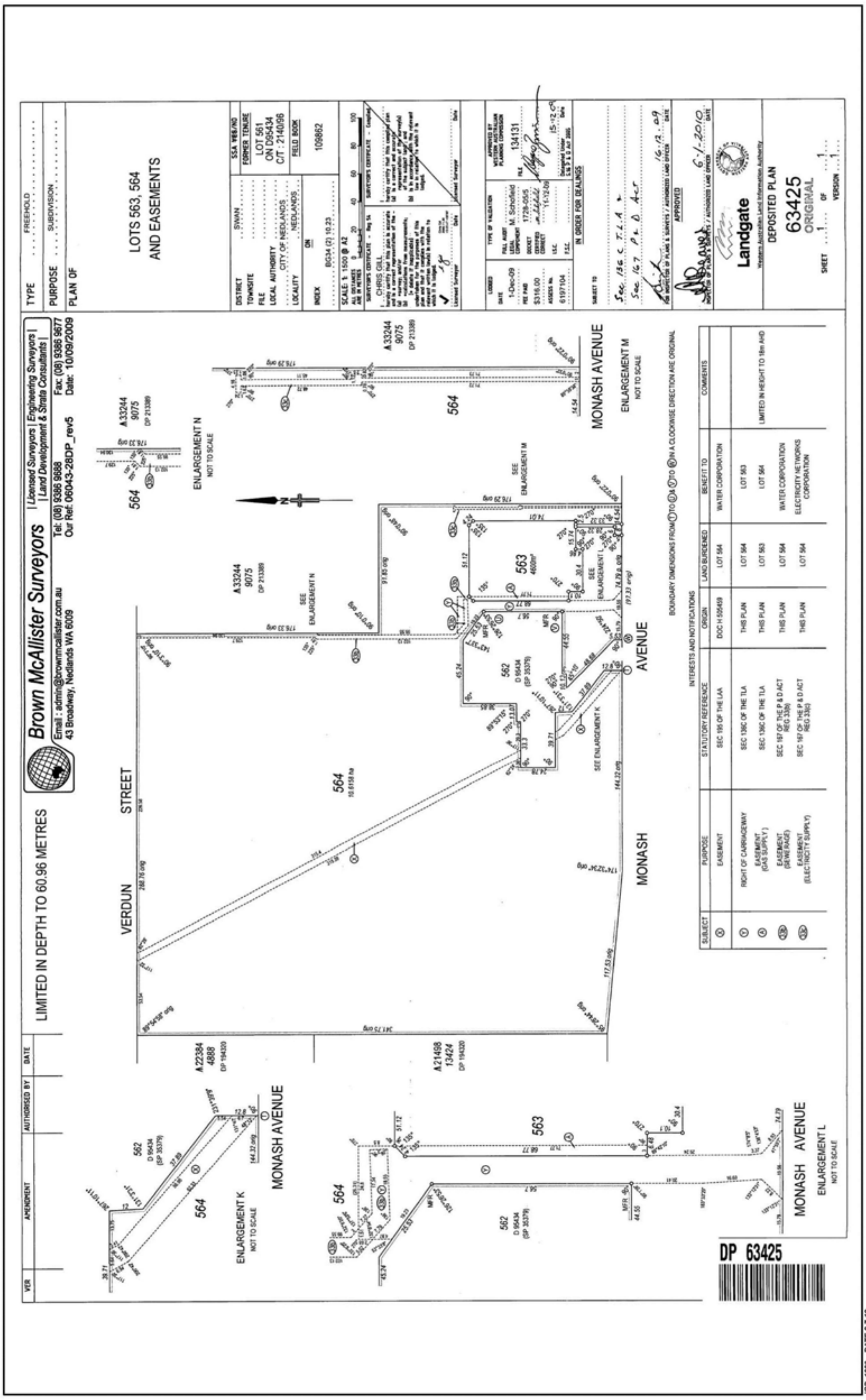


Figure 3

Hollywood Private Hospital, Monash Avenue, Nedlands
CADASTRAL - DEPOSITED PLAN 63425

4.0 EXISTING DEVELOPMENT AND SERVICES

Hollywood Private Hospital has been significantly renovated and refurbished over the past few years but still utilises a number of relatively old buildings lacking modern facilities and standards.

Ramsay Health Care plan to continue its ongoing upgrading program and has recently completed construction of new medical facilities ward block, multi - storey car park and a new medical centre on the HPH site.

HPH provides substantial services to the Perth Region and the wider State with a licence to treat patients, either as in-patients or in a wide range of day services.

There are more than 830 accredited specialists utilising or based at HPH in a wide range of disciplines together with a pharmacy, specialist centre, clinic, aged care and rehabilitation, palliative care and full surgery services.

In addition there are valuable specialists providing on site services which include:

- after hours GP service;
- Diagnostic Nuclear Imaging;
- Hollywood Fertility Centre
- Hollywood Functional Rehabilitation Clinic
- Perth Bone and Tissue Bank;
- Perth Cardiovascular Institute; SKG Radiology and
- Western Diagnostic Pathology

The HPH undertakes a number of community initiatives and has established an Environmental and Waste Management Committee and has a commitment to:

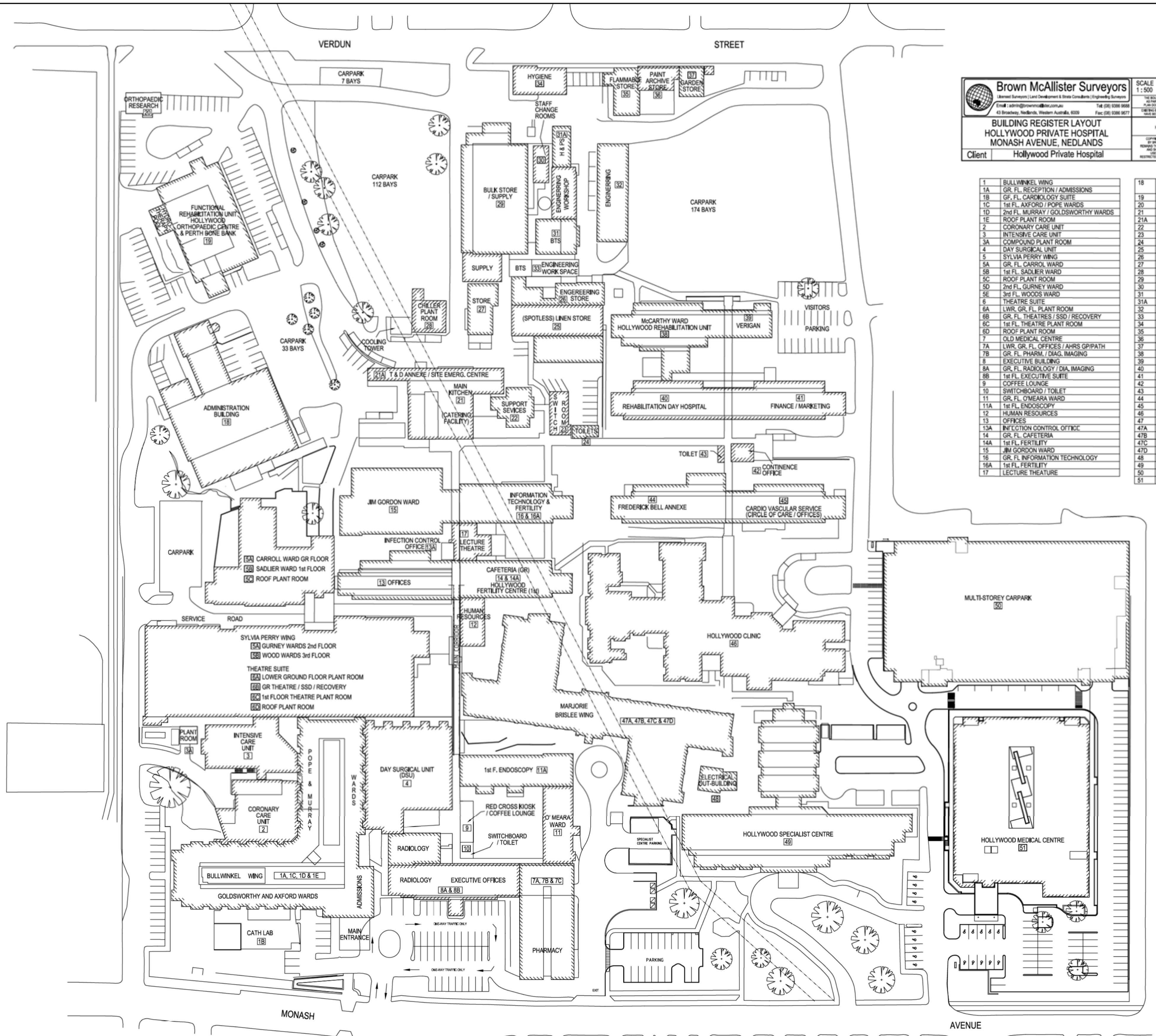
- eliminate unnecessary waste;
- provide responsive waste disposal eg. recycling, worm farm,;
- develop water efficiency management;
- the Greening Hollywood Program which has resulted in over 8,500 native trees, shrubs and grasses being planted onsite over the past decade;
- the installation of many bird boxes encouraging native bird activity;
- encourage staff to use alternative transport solutions (minimising single car drivers as the preferred travel method to get to work), the HPH has developed and introduced the Travel Smart program;
- aim to reduce all pollutants; and
- comply with all relevant standards and regulations.

HPH actively encourages and supports clinical research as part of its role as a private teaching hospital.

HPH has important research facilities on site for Alzheimer’s disease (The Sir James McCusker Alzheimer’s Disease Research Unit).

Significant medical research is also undertaken in many other areas such as cardiology, orthopaedics, urology, mental health, oncology, palliative care and respiratory medicine. This is conducted often in collaboration with the major teaching hospitals and universities.

The focus on research provides an environment in which HPH clinicians can maintain their knowledge and expertise at the forefront of clinical practice.



Brown McAllister Surveyors

BUILDING REGISTER LAYOUT
HOLLYWOOD PRIVATE HOSPITAL
MONASH AVENUE, NEDLANDS

Client: Hollywood Private Hospital

SCALE 1 : 500

DATUM
HORIZONTAL - LOCAL
VERTICAL - N/A

REFERENCE: 06043-36F

1	BULLWINKEL WING
1A	GR. FL. RECEPTION / ADMISSIONS
1B	GF. FL. CARDIOLOGY SUITE
1C	1st FL. AXFORD / POPE WARDS
1D	2nd FL. MURRAY / GOLDSWORTHY WARDS
1E	ROOF PLANT ROOM
2	CORONARY CARE UNIT
3	INTENSIVE CARE UNIT
3A	COMPOUND PLANT ROOM
4	DAY SURGICAL UNIT
5	SYLVIA PERRY WING
5A	GR. FL. CARROL WARD
5B	1st FL. SADLIER WARD
5C	ROOF PLANT ROOM
5D	2nd FL. GURNEY WARD
5E	3rd FL. WOODS WARD
6	THEATRE SUITE
6A	LWR. GR. FL. PLANT ROOM
6B	GR. FL. THEATRES / SSD / RECOVERY
6C	1st FL. THEATRE PLANT ROOM
6D	ROOF PLANT ROOM
7	OLD MEDICAL CENTRE
7A	LWR. GR. FL. OFFICES / AHRS GP/PATH
7B	GR. FL. PHARM. / DIAG. IMAGING
8	EXECUTIVE BUILDING
8A	GR. FL. RADIOLOGY / DIA. IMAGING
8B	1st FL. EXECUTIVE SUITE
9	COFFEE LOUNGE
10	SWITCHBOARD / TOILET
11	GR. FL. O'MEARA WARD
11A	1st FL. ENDOSCOPY
12	HUMAN RESOURCES
13	OFFICES
13A	INFECTION CONTROL OFFICE
14	GR. FL. CAFETERIA
14A	1st FL. FERTILITY
15	JIM GORDON WARD
16	GR. FL INFORMATION TECHNOLOGY
16A	1st FL. FERTILITY
17	LECTURE THEATURE

18	ADMINISTRATION BUILDING MED. RECORDS / OFFICES / ALLIED HEALTH / TPSU
19	BONE BANK / FUNCTIONAL REHAB
20	ORTHO. RESEARCH OFFICE
21	GR. FL. CATERING FACILITY
21A	LWR. GR. FL. T & D ANNEXE / SITE EMERG. CENTRE
22	SUPPORT SERVICES OFFICE
23	EMERG. GEN. / ELEC.SWITCHBOARD
24	TOILETS
25	LINEN / FURNITURE STORE
26	ENGINEERING STORE
27	OLD MORTUARY STORE
28	CHILLER PLANT ROOM
29	SUPPLY / BULK STORE
30	STAFF CHANGE ROOMS
31	GR. FL. BMS. WKSPS / STORES
31A	1st FL. STAFF ROOM / PROJECT OFFICE
32	ENG. OFFICE / WKSP / STORE / STAFF ROOM
33	ENG. STORE / BMS. WKSP
34	HYGIENE FACILITY
35	FLAMMABLE STORE
36	PAINT STORE / ARCHIVES
37	GARDENERS STORE
38	McCARTHY WARD
39	VERIGEN
40	REHAB DAY WARD
41	FINANCE / MARKETING
42	CONTINENCE OFFICES
43	TOILET
44	FRED. BELL OFFICES / ECT.SUITE
45	CIRCLE OF CARE / OFFICES
46	HOLLYWOOD CLINIC
47	BRISLEE
47A	LWR .GR. FL. EDWARDS WARDS (EAST & WEST)
47B	GR.FL. STARCEVICH / DONALDSON WARDS
47C	1st FL. GRATWICK / GOSSE WARDS
47D	ROOF PLANT ROOM
48	BRISLEE GENERATOR / TRANSFORMER
49	HOLLYWOOD SPECIALIST CENTRE
50	MULTI-STOREY CARPARK
51	HOLLYWOOD MEDICAL CENTRE

JOB. 1620 DATE 2-7-12

Landvision Pty. Ltd.
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Hollywood Private Hospital, Monash Avenue, Nedlands
EXISTING DEVELOPMENT PLAN

Figure 4

Job:1620 Date: 9-7-13

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Hollywood Private Hospital, Monash Avenue, Nedlands
AERIAL PHOTO SHOWING EXISTING DEVELOPMENT

Figure 5

5.0 STRATEGIC PLANNING CONTEXT

5.1 State Planning Policy

HPH is located immediately adjacent to the QEII Medical Centre that is currently being significantly expanded which is consistent with being identified as a "Specialised Centre". The planning for QE II MC has included strategic planning direction for HPH.

Specialised Centres are identified and addressed in State Planning Policy 4.2 Activity Centres for Perth and Peel (See Appendix 1 for more detail).

5.2 Nedlands 2023, 2013 – 2023 Strategic Community Plan

As part of the City of Nedlands fulfilment of the Integrated Planning and Reporting Framework the Council has engaged the community in setting a vision and priorities for the coming decade.

The City has formulated a Strategic Community Plan which highlights particular priorities which Council will focus on, chiefly:

- Protecting the special character of Nedlands and its distinctive place in the urban fabric of the Western Suburbs and metropolitan Perth; and
- Continuing to provide the community infrastructure (such as roads and community facilities) to a standard befitting a liveable and thriving City.

The Masterplan shows that the future growth and development of HPH will contribute to the Council's vision in a positive manner.

HPH has a responsible relationship with the community as illustrated in the Masterplan. It aims to support the communities vision and seeks to minimise any adverse impacts on the surrounding residential amenity by being a good neighbour.

5.3 Cultural and Indigenous Heritage

A desktop assessment indicated that there have been no sites of indigenous heritage significance identified on the site.

6.0PROPOSED HOLLYWOOD PRIVATE HOSPITAL MASTERPLAN

6.1 Description of Masterplan

Development currently under construction or planned for construction as soon as possible is:

- the redevelopment of the Acute Adult Voluntary Mental Health Unit (now completed); and
- a new theatre block including kitchen and 60 bed wards (currently in preliminary planning stage).

Although there is no current long term building program proposed Council requires the preparation of a Masterplan for the hospital campus to:

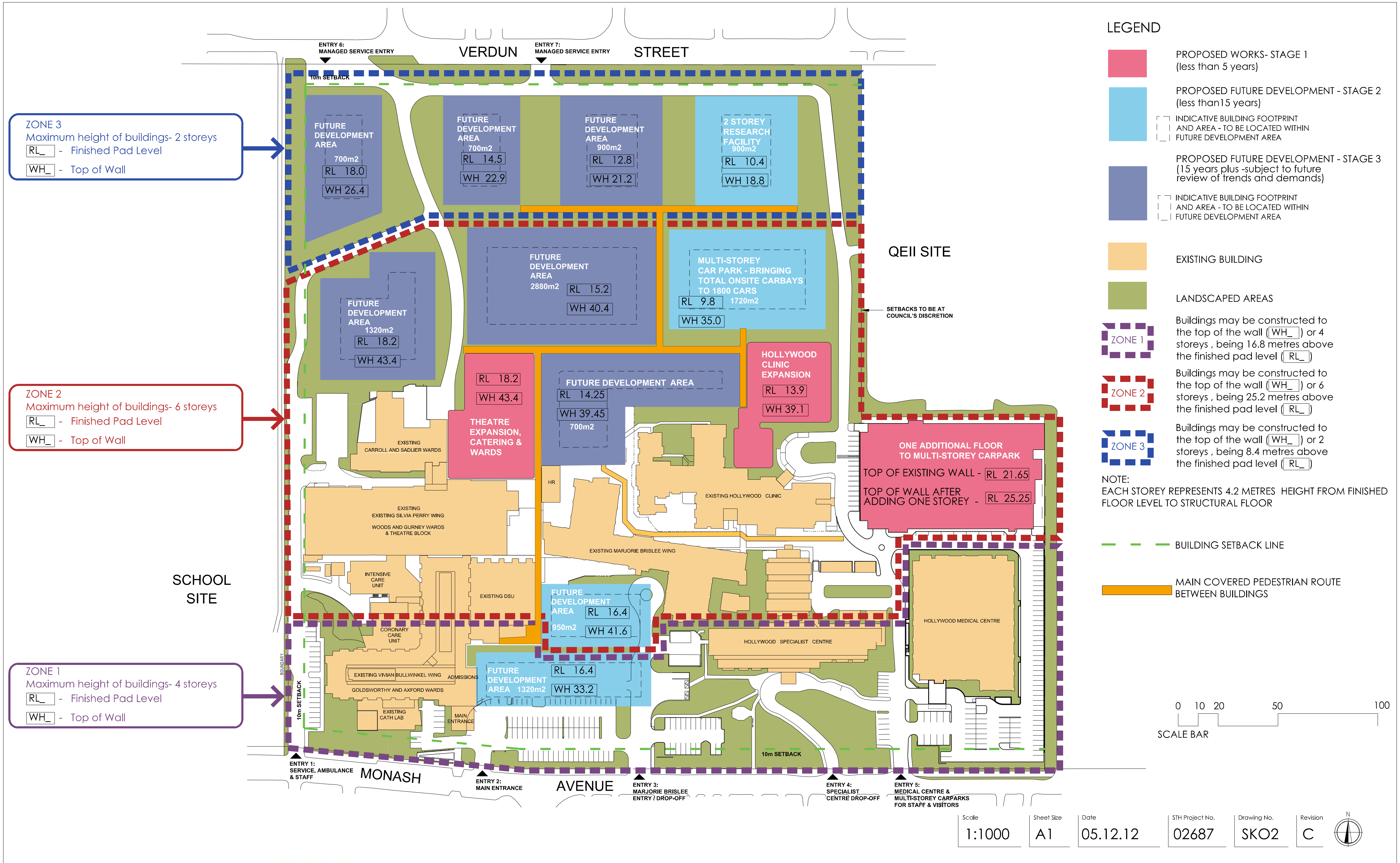
- show existing development and those areas where redevelopment and new development may occur;
- establish the maximum height of buildings which would be permitted which is shown on Figure 8 as three distinct precincts which confine taller buildings to the central portions of the subject land;
- identify access and egress points and show the vehicle and pedestrian movement throughout the site;
- identify parking areas and the parking management requirements for the site;
- show perimeter boundary setbacks; and show landscaping throughout the campus.

The Masterplan shows that there are 3 distinct zones where building height (refer to Section 6.5.6 for detail) is identified:

a) Zone 1 - An area adjacent to Monash Avenue extending into the site by between 60 metres on the western boundary to 80 metres on the eastern boundary where new buildings will be restricted to a maximum wall height of four storeys or 16.8 metres from an agreed structural floor level shown as RL _ on Figure 6 and so that any point does not exceed 18.3m above the RL;

b) Zone 2 - The balance of the subject lot is the central portion where much of the land is lower than areas adjacent to Verdun Street and Monash Avenue and where buildings will be hidden in most cases by buildings closer to the roads. In this area new buildings would be permitted to be constructed to a maximum wall height of 6 storeys or 25.2 metres above an agreed structural floor level shown as RL _ on Figure 6 and so that any point does not exceed 26.7m above the RL.

c) Zone 3 - An area adjacent to Verdun Street extending 80 metres into the subject site where new buildings would be restricted to a maximum height of two storeys or 8.5 metres high from an agreed structural floor level shown as RL _ on Figure 6 and so that any point does not exceed a height of 10.0m above the RL;



JOB :1620 DATE : 5-7-13

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silver thomas hanley HEALTH ARCHITECTURE

Hollywood Private Hospital, Monash Avenue, Nedlands

MASTERPLAN

Figure 6

In addition the Masterplan shows:

a) Setbacks

All buildings are to have a minimum setback of 10 metres from the southern, western and northern boundaries unless otherwise agreed by Council. It is noted that the building setback along the eastern boundary with QEII is not a significant issue and shall be determined by Council and the new multi storey car park has a reduced setback along its northern face. There are no privacy, overshadowing, overlooking or other amenity issues along the eastern boundary as the adjacent use is also a major hospital site on which buildings already exist which are significantly taller and in some cases closer to the shared boundary than the standards proposed for HPH;

b) Proposed Works

The next stages of building includes the four proposed new buildings shown on Figures 6 and 8 as:

- expansion of Hollywood Clinic – already in progress
- theatre expansion/new kitchen and wards – planned for construction in 2013;
- a new four storey research facility – planned for 1 - 5 year timeframe;
- a multi - storey car park adjacent to Verdun Street to be constructed; and
- to add an additional floor to the existing multi - storey carpark – planned within the next 5 years.

c) Future Development Area

HPH has recently completed a significant building and improvement programme and has only a limited future development programme to be reflected in the Masterplan. Future development currently in the planning stages is shown on the Masterplan and described in b) above.

The Future Development Areas (FDA) cover portions of the campus where existing buildings may be renovated or replaced in the future and which must be consistent with the standards for development (setback, building height etc) in the approved Masterplan. HPH is not currently in a position with its long term planning to specifically designate proposed uses for each FDA and so the Masterplan shows the area within which future buildings would be located. An indicative building footprint and area have also been shown to assist in determining compliance with parking, plot ratio and other development standards.

d) Existing development shown on the Masterplan includes the recent improvements. Any future building would need to comply with the Masterplan including the agreed maximum building heights.

6.2 Summary of Development Standards

As each new development or redevelopment of buildings on the campus is proposed it will be subject to a new Application for Planning Approval which shall be consistent with the approved Masterplan as follows:.

Development Standard Required	**Masterplan Response**	**Masterplan requirements**
Parking: The Hospital requires 1 bay per 4 beds – see Schedule 3, TPS No. 2. As the Scheme has no standard for day patients the proposed allocation to provide for day patients, staff, visitors and doctors is 1 bay per 4 patients. The Medical Centre and Specialist Centre were required to provide 416 bays (@ 4.75 bays per 100m² g.l.a) when approved. These bays were provided and licenced for those purposes (See Notes at the end of this table).	There are a total of 1492 currently constructed bays on site comprising ambulance, service vehicle, doctors, disabled, general public (1209)) drop off, loading goods and motorcycle bays. The hospital has 492 beds ÷ 4 = 123 bays for overnight patients, staff and visitors. Day patients = 167 ÷ 4 = 42 bays. The Medical Centre and Specialist Centre when approved provided 416 parking bays as required by the City of Nedlands. Therefore the existing developments require a total of 581 bays on site and there are currently 1492 bays on site which is a surplus of 911 bays to provide for future development.	Based on parking requirements of 1 bay/4 patients the current parking surplus on site is 911 bays. Maximum total number of bays permitted to be built on site:1800 All future car parking demand for new development provided for in the masterplan to be in accordance with the current town planning scheme.
Setbacks: 4.5 metres from all boundaries but greater if adjoining residential use. The site does not adjoin residential zones.	At proposed setbacks of Front: 10.0m Westside: 10.0m Verdun St: 10.0m Setbacks are equal to or greater than the minimum setbacks required East boundary: Adjoins QE II where no setback is	. Front: 10.0m Westside: 10.0m Verdun St: 10.0m East boundary: nil setback

	considered necessary and much taller buildings with small or no setbacks exist.	
Plot Ratio – Maximum plot ratio: 0.75 (Table 11 in TPS) for other than Residential development. There is no standard specified for a Hospital.	Due to large size of the site and the variety of existing buildings with different heights the plot ratio is not very relevant however the maximum plot ratio is 0.75 in TPS 2 which is inadequate for a hospital. The existing plot ratio is 0.72. Future development will result in replacement of existing buildings in many cases. The plot ratio proposed is 1.0.	• Max Plot Ratio for site = 1.0
Building Height As per Clause 5.11 Maximum Building Heights	See Part 6.5.6 in the Report	In accordance with Clause 6.5.6 and Figure 6..
Open Space and Landscaping (5.4.2). No minimum specified. Must landscape between street boundary and setback line.	The plan shows extensive areas of landscaped open space including the areas between the property boundaries and the setback line, which has been increased to 10.0m. The site in the Masterplan is estimated to show 25% as landscaped open space. See Appendix 2 for a full description and plan.	In accordance with Appendix 2 of the Masterplan with a minimum of 25% of the site.

Notes: Medical and Specialist Centre Parking

In 2009 a license was issued to establish the parking for the Hollywood Medical Centre and the Hollywood Specialist Centre. Although part of the HPH campus the centres are on separate strata lots. The licence states the following:

> ***Lot 562 Car Parking Requirements*** *means that the provision of adequate car parking for Lot 562, and any associated uses or development on Lot 562, in perpetuity for the approved use on Lot 562, such car parking to comprise not less than 100 car bays to be provided on Lot 564.*
>
> ***Lot 563 Car Parking Requirements*** *means the provision of adequate car parking for Lot 563, and any associated uses or development on Lot 563, in perpetuity for the approved use on Lot 563, such car parking to comprise no less than 316 bays*

to be provided on Lot 564, in accordance with Condition 3 and advice note 7 of the Subdivision Approval.

The Car Parking Licence Deed is a Deed made between:

- The Owners of Hollywood Specialist Centre (Lot 562);
- The Owners of Hollywood Medical Centre (Lot 563); and
- The City of Nedlands.

The deed formalised the requirement to provide and retain a minimum of 416 car parking bays on Lot 564 which is owned by Ramsey Hospital Holdings. Lot 564 comprises the whole of the hospital campus excluding the Medical Centre and Specialist Centre.

Ramsey Hospital Holdings granted a licence in favour of the owners of each Strata Company owning Lots 562 and 563 to ensure their individual parking requirements are met for the use of the proprietors and/or the occupiers of the Medical Centre and Specialist Centre.

6.3 Services Infrastructure

Ongoing upgrading of infrastructure will be required to accommodate future development. This will be a combination of both capacity and plant, in order to ensure that adequate electrical, hydraulic, communications services, chilled water and steam, waste collection and various other services will be available for future development.

Figure 3 shows there is an easement crossing the subject land from approximately the north – west to south – east corner which contains the sewer line and any development must ensure ongoing access to the sewer is retained. This easement is vested in the Water Corporation.

As part of the preparation of the Masterplan BPA Engineering provided a Local Water Management Strategy (LWMS) for the future development of the Hollywood Hospital located in Nedlands (See Part 2: Background Reports).

The Strategy outlines the quantity and quality measures for the proposed future development of Ramsay Hollywood Private Hospital to meet the design requirements of the Department of Water (DoW) and Better Urban Water Management (October 2008).

Water quantity management outcomes were based on design principles found in Australian Rainfall and Runoff (AR & R 1987). Peak flows were calculated using the rational method utilizing the latest rainfall data and catchment area for the proposed development. The design storms in accordance with the City of Nedlands requirements were the 100 year ARI (Average Recurrence Interval) for flood prevention of future buildings with the 1 in 20 ARI stored on site.

Water quality will be managed in accordance with DoW by providing Best Management Practices for the storm event (1 Yr 1 Hr ARI) that is expected to contain the highest concentration of pollutants.

It is proposed to best manage stormwater quantity and quality through the provision of stormwater retention systems.

In respect to stormwater drainage geotechnical investigations have been carried out as part of previous development on the site. The site is generally SP sand (Spearwood) with good drainage characteristics. Soakage via soak wells or underground stormwater retention systems are proposed to best manage stormwater quality and quantity.

Existing storm water drainage is via soak wells. The existing buildings on the site have local storage for 1:10 year storm with overland flow path for greater storm events. This is in line with the City of Nedlands Development Approval and building license conditions at the time of approval.

Any new structures will have as a minimum, local storage via soak wells for a 1:20 year storm event with overland flow for a greater storm event or to store the 1 in 100 year event. This is the current City of Nedlands requirement.

All overland flow resulting from storm events that exceed the designed on-site storage capacity shall be disposed of to the satisfaction of the City, with no discharge from the property being permitted to flood into the QEII site.

Additional underground storage using stormtech drainage cells or similar system can be provided at the boundary with Sir Charles Gardiner hospital if required.

6.4 Parking and Vehicle and Pedestrian Circulation

6.4.1 Existing Parking and Access

HPH is highly accessible due to its favourable location in terms of the regional transport network. However parts of the road network servicing the site already experience significant congestion during peak periods and any expansion of development at HPH that will generate additional traffic will impact on this congestion. Future development on the site will therefore be limited by the capacity of the transport network to provide access to the site. This is directly related to the amount of car parking provided for traffic arriving at (and leaving) the site during peak periods.

6.4.2 Future Access and Parking

There will be 1500 parking bays on site following construction of the Acute Adult Voluntary Mental Health Unit. The proposed Masterplan (Figure 6) shows that the majority of the parking will be provided in the existing multi – storey car park and a future 2 deck car park. A small percentage of the parking will be retained at grade, primarily along Monash Avenue. In addition it is proposed to construct one extra level of parking to the existing multi – storey car park.

Retaining 1500 parking bays as shown on the Masterplan is consistent with the resolution of the WAPC discussed in Part 2: Background Reports and which is as follows:

> *"Advise the City of Nedlands and Hollywood Private Hospital that the Commission is aware of the maximum limit of 1800 car parking spaces in the approved site structure plan. The Commission would wish to be consulted on any proposal which would lead to a total number of car parking spaces exceeding 1800 bays. The Commission further would be minded to introduce a Clause 32 resolution requiring any development exceeding 1800 bays to be referred to the Commission for its determination)".*

In addition a travel plan (incorporating a parking management plan) has been developed and occasionally reviewed which sets out the specifics of parking allocation, pricing, funding, staging and contributions and other relevant matters.

The QEIIMC Access and Structure Plan relevant to the strategy to manage parking at QEII and HPH is only going to be successful in reducing the reliance on private vehicles if the availability and frequency of public transport increases to cater for increased demand and a 24 hour service.

In the QEII/UWA/HPH Public Transport Masterplan, the following is stated:

> *"To achieve the mode share targets for public transport use to and from UWA, QEIIMC and HPH, it is essential that the whole plan be adopted. Bus priority is an integral part of the plan and should accompany the proposed service improvements. The bus priority projects should be seen as a complete package which will ensure consistency of running times throughout the day, add to the reliability of the services for passengers and afford the minimum ongoing operating costs to government"*

The primary access/egress points for the QEII Medical Centre are presently from Aberdare Road and Monash Avenue, with no direct vehicle access available from Winthrop Avenue. The proposed multi deck carpark is proposed to directly access Winthrop Avenue, with no through access to Hospital Avenue or the surrounding at-grate car park except for emergency vehicles.

As part of the QEII Medical Centre Masterplan, a traffic study was undertaken in order to assess the traffic impacts of an expansion of the Medical Centre site.

The studies were undertaken in 2007 and 2009, with further revisions undertaken in 2010. An overview of the results of the studies indicates that the road network has sufficient capacity to accommodate the increase in traffic resulting from the expanded Medical Centre site, and that the proposed entrance directly from Winthrop Avenue will not adversely affect traffic flow in this location.

Extrapolating these findings to the minor increase in traffic generated by any expansion of HPH can be accommodated with only minor impacts on surrounding roads. In assessing traffic studies for QEII, the City of Subiaco concluded that the roads and intersections which would be affected have sufficient capacity to accommodate the anticipated increase in traffic volumes.

Until public transport can provide an adequate 24 hour service HPH will continue to rely mainly on the use of private vehicles, albeit while seeking to increase the modal split and reduce reliance on the use of private vehicles.

To ensure that the future development of HPH would not adversely affect the surrounding road and cycle network Cardno prepared a transport assessment reproduced in full in Part 2: Background Reports. In summary the Hollywood Private Hospital Transport Assessment , Cardno June 2013 advised the following:

> *"The scope of this report was discussed with the City of Nedlands in May 2013 and agreement reached on the level of assessment for each of the scenario years and the critical intersections to be assessed.*
>
> *Three scenarios of committed and possible future development have been considered in this assessment, as follows:*
>
> \> *0-5 years (2018 assessment year) - Short term, committed development*
> \> *6-15 years (2028 assessment year) – Medium term, potential development under consideration but not finalised*
> \> *16+ years (beyond 2028) – Long term, possible future development*
>
> *The 2018 assessment year is considered in detail as all land uses are committed. The 2028 assessment year is also considered in detail, based on assumptions about the likely form and scale of development during this period. The purpose of this assessment is to demonstrate that the scale of potential future development in this time period will not have significant impacts upon the surrounding road network. Detailed assessment of possible future development beyond 2028 has not been undertaken as this future development is subject to future changes in trends in health care provision and commercial viability.*
>
> *As part of this report, an analysis was undertaken to determine the impact that each stage of the HPH Masterplan is likely to have on the surrounding road network. Background traffic growth was assumed to increase proportionally to the increase in the QEII parking cap as this is the only major traffic generator in the vicinity of the study area, while the increase in development traffic was estimated using traffic generation rates determined from surveys of existing site traffic during the AM and PM peak hours.*
>
> *The analysis found that the development traffic is not likely to have any significant impacts on the surrounding traffic network for the 2018 and 2028 assessment years. For the 2028 assessment year, it was found that delays for traffic turning right from Monash Avenue into Smyth Road during the PM Peak Hour increase to approximately 45 seconds, with an average queue length of approximately 9 vehicles. Construction of a small roundabout at this intersection would reduce the delays for right turning vehicles and improve the operation of the intersection. However, it must be noted that if background traffic growth is lower than the conservative estimate then any delays for right turning vehicles will be lower than stated above.*
>
> *Traffic generation at HPH beyond 2028 will generally be restricted by the availability of parking on site. As the 1800 space parking cap is reached by 2028, any further person trips generated by development at HPH will need to be*

> *accommodated either in off-peak times when parking is available on site or by alternative modes such as public transport, walking and cycling. To assist with mode shift, HPH has been operating with a Green Transport Plan since 2004 and it is proposed that this Plan will be reviewed and updated by Cardno in 2013 to reflect current conditions. Consistent with this plan, significant improvements to end of trip facilities are proposed as part of the Stage 1 (2018) development and further improvements will be provided as part of future development beyond 2018.*
>
> *An appraisal of public transport accessibility for workers and visitors to HPH has been undertaken. HPH has reasonable accessibility by public transport compared to most other locations in Perth, however it does suffer from longer walking distances from most bus routes compared to neighbouring Queen Elizabeth II Medical Centre (QEIIMC) which is the focal point for public transport in the area. Recommendations have been made for gradual improvements over time to ensure that an appropriate level of service is provided to encourage HPH visitors and employees to shift from driving to sustainable transport modes".*

The majority of arrivals by private transport will arrive at the entrances off Monash Avenue. Visitors and patients may park in designated areas on Monash Avenue or by direct access to the multi – deck carpark via Gate 5 on Monash Avenue. No change to the existing entry and exit driveway crossovers along Monash Av was considered necessary by Cardno in its Traffic Assessment, June 2013 reproduced in the Part 2: Background Reports.

Incremental increases of traffic volumes to and from the site onto Verdun Street require Council approval. The approval will be based on the principle that Verdun Street is a local access road and accordingly is restricted in its capacity to carry traffic volumes.

Major bus routes service the hospital and surrounding areas being Routes 23, 24 and 25 which operate 7 days per week with regular services from Perth and East Perth. The main gap in this service is from about 11:05pm to 5.27 am.

Accepting that HPH is a major trip generator, HPH has sought to reduce single occupancy car travel to and from the Hospital and to encourage 'green' alternative modes of travel. Key initiatives include preparing and implementing a "Green Transport Plan" (see 6.4.3) and monitoring activity to assist in the future planning and management of parking and access.

The current and ongoing redevelopment of the site has made managing travel and parking demand a pertinent issue. As the facilities continue to grow, so too will the number of people accessing the site on a day to day basis. Proactively dealing with the issue before it becomes critical is a priority for HPH. The ongoing work by HPH to manage parking and access is reflected in the Masterplan which anticipates a range of possibilities for a modal shift from car to more sustainable travel modes while providing sufficient parking in the short term to cater for the particular needs of HPH.

Apart from the multi-storey car park the balance of parking for visitors, patients, doctors, specialists and staff is provided at grade (ground level) (See Figure 7). There is a second multi – storey car park which will be developed when required and it will replace parking lost as redevelopment occurs.

To minimise the impact on adjacent residents the proposed two deck car park has been relocated to be setback approximately 80 metres from housing on Verdun Street. The proposed Research Facility has been located at least 10 metres back from Verdun Street and in front of the multi – storey car park.

As shown on the Masterplan the proposed developments would have a positive impact on the site by maximising the efficiency of land used for parking purposes, which increases the availability of land within the site for the expansion of medical facilities. It will also improve its operation and function.

Emergency vehicles, patients, visitors and staff primarily enter and leave the campus via one the of the 5 entries along Monash Avenue. These access points are well spread and signposted along the almost 400 metres frontage to Monash Avenue.

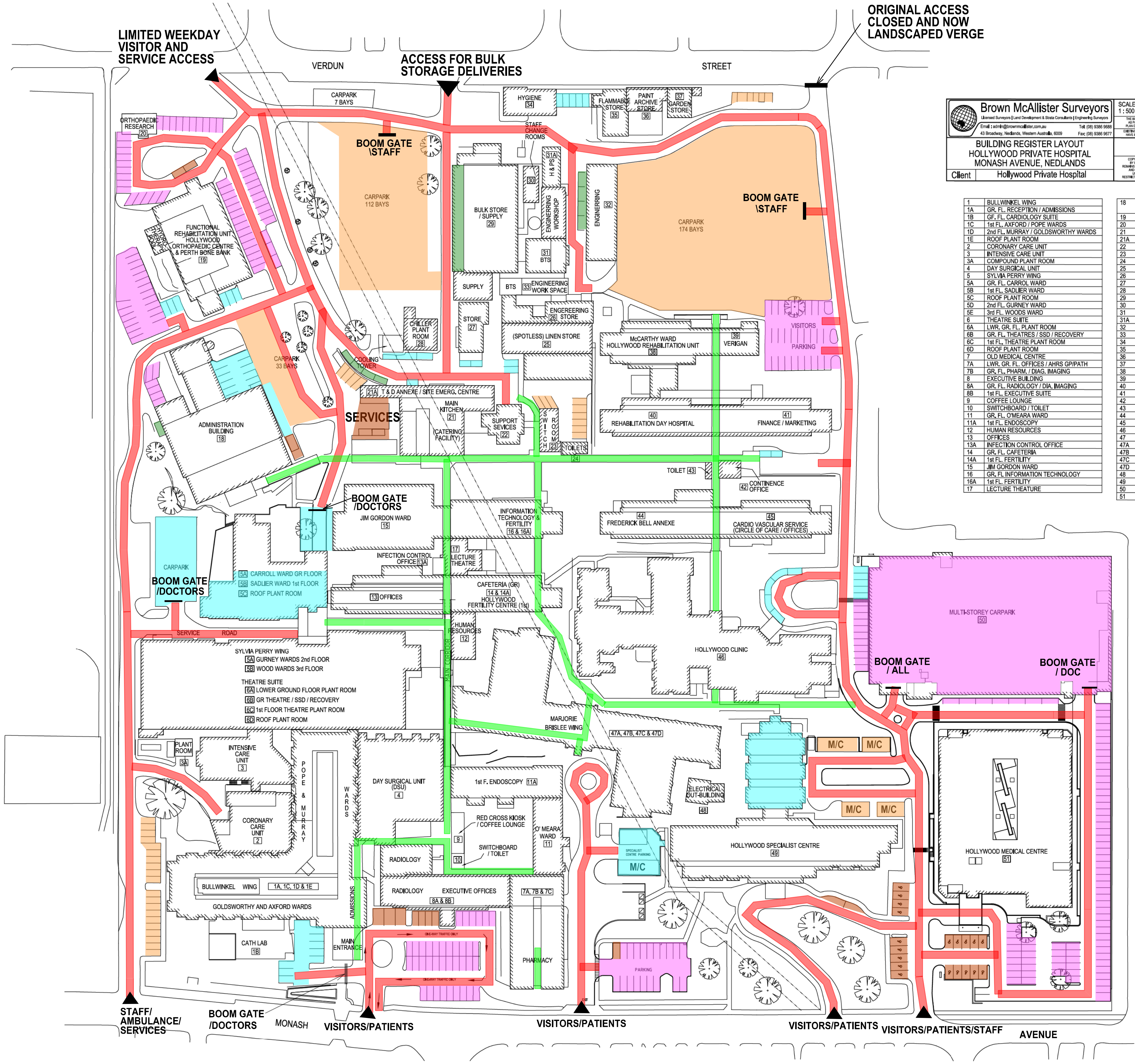
There are only two other entry/exit points which are located on Verdun Street and which are used by most of the service vehicles. As an initiative to reducing the impact on residences on Verdun Street these entries are only open during working hours for 5 days per week (excludes weekends).

The Masterplan would assist in ensuring that the objectives of the Western Australian State Government for HPH through the QEIIMC Masterplan and Access and Structure Plan could be achieved, and would ultimately assist in ensuring that the redevelopment of the overall site could be achieved. This is as without the development of up to 1800 car parking bays, the function and operation of HPH is likely to be greatly affected.

During the formulation of the Masterplan and consideration of parking and access, the publics' comments in respect to the forward plan for QEII and the proposed multi-deck car park have been considered. In light of the publics' comments above, the following has been the aim:

"to coordinate and ensure that development is of a high quality and is undertaken in an efficient and environmentally responsible manner which:

i. makes optimum use of the city's infrastructure and resources;
ii. promotes an energy – efficient environment; and
iii. respects the natural environment. ``



Brown McAllister Surveyors

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BUILDING REGISTER LAYOUT
HOLLYWOOD PRIVATE HOSPITAL
MONASH AVENUE, NEDLANDS

Client: Hollywood Private Hospital

EXISTING BOUNDARY DIMENSIONS AND LOT AREAS HAVE BEEN TAKEN FROM L.T.O. DIAGRAM 95434

AERIAL PHOTOGRAPHY 15/10/1998 RF 1 : 4000
DO NOT SCALE, VERIFY ON GROUND

DATUM
HORIZONTAL - LOCAL
VERTICAL - N/A

SHEET	A0
SURVEYED	-
FIELD NOTES	-
DRAWN	L.J. Pollis - 16/1/2007 M.J.MacDONALD - 14/11/2011
CHECKED	J.D.
REFERENCE	06043-36F

1	BULLWINKEL WING
1A	GR. FL. RECEPTION / ADMISSIONS
1B	GF. FL. CARDIOLOGY SUITE
1C	1st FL. AXFORD / POPE WARDS
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5C	ROOF PLANT ROOM
5D	2nd FL. GURNEY WARD
5E	3rd FL. WOODS WARD
6	THEATRE SUITE
6A	LWR. GR. FL. PLANT ROOM
6B	GR. FL. THEATRES / SSD / RECOVERY
6C	1st FL. THEATRE PLANT ROOM
6D	ROOF PLANT ROOM
7	OLD MEDICAL CENTRE
7A	LWR. GR. FL. OFFICES / AHRS GP/PATH
7B	GR. FL. PHARM. / DIAG. IMAGING
8	EXECUTIVE BUILDING
8A	GR. FL. RADIOLOGY / DIA. IMAGING
8B	1st FL. EXECUTIVE SUITE
9	COFFEE LOUNGE
10	SWITCHBOARD / TOILET
11	GR. FL. O'MEARA WARD
11A	1st FL. ENDOSCOPY
12	HUMAN RESOURCES
13	OFFICES
13A	INFECTION CONTROL OFFICE
14	GR. FL. CAFETERIA
14A	1st FL. FERTILITY
15	JIM GORDON WARD
16	GR. FL INFORMATION TECHNOLOGY
16A	1st FL. FERTILITY
17	LECTURE THEATURE

18	ADMINISTRATION BUILDING MED. RECORDS / OFFICES / ALLIED HEALTH / TPSU
19	BONE BANK / FUNCTIONAL REHAB
20	ORTHO. RESEARCH OFFICE
21	GR. FL. CATERING FACILITY
21A	LWR. GR. FL. T & D ANNEXE / SITE EMERG. CENTRE
22	SUPPORT SERVICES OFFICE
23	EMERG. GEN. / ELEC.SWITCHBOARD
24	TOILETS
25	LINEN / FURNITURE STORE
26	ENGINEERING STORE
27	OLD MORTUARY STORE
28	CHILLER PLANT ROOM
29	SUPPLY / BULK STORE
30	STAFF CHANGE ROOMS
31	GR. FL. BMS. WKSPS / STORES
31A	1st FL. STAFF ROOM / PROJECT OFFICE
32	ENG. OFFICE / WKSP / STORE / STAFF ROOM
33	ENG. STORE / BMS. WKSP
34	HYGIENE FACILITY
35	FLAMMABLE STORE
36	PAINT STORE / ARCHIVES
37	GARDENERS STORE
38	McCARTHY WARD
39	VERIGEN
40	REHAB DAY WARD
41	FINANCE / MARKETING
42	CONTINENCE OFFICES
43	TOILET
44	FRED. BELL OFFICES / ECT.SUITE
45	CIRCLE OF CARE / OFFICES
46	HOLLYWOOD CLINIC
47	BRISLEE
47A	LWR .GR. FL. EDWARDS WARDS (EAST & WEST)
47B	GR.FL. STARCEVICH / DONALDSON WARDS
47C	1st FL. GRATWICK / GOSSE WARDS
47D	ROOF PLANT ROOM
48	BRISLEE GENERATOR / TRANSFORMER
49	HOLLYWOOD SPECIALIST CENTRE
50	MULTI-STOREY CARPARK
51	HOLLYWOOD MEDICAL CENTRE

PARKING
GENERALISED ALLOCATION OF PARKING

- STAFF
- RESERVED/DOCTORS
- VISITORS
- DISABLED
- SERVICES & LOADING BAYS
- M/C MOTORCYCLE BAYS
- CONTROLLED ACCESS BOOM GATES

VEHICLE AND PEDESTRIAN CIRCULATION

- INTERNAL ROADWAYS- used by all public visitors, staff, services and doctors
- INTERNAL CORRIDOR- for pedestrian circulation

JOB. 1620 DATE 29-10-12

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Hollywood Private Hospital, Monash Avenue, Nedlands
VEHICLE AND PEDESTRIAN ACCESS AND CIRCULATION AND PARKING DISTRIBUTION

Figure 7

The provision of car parking to service HPH is intended to limit vehicle movements to a level which is based upon a significant reduction in employees travelling to work by private car. This will assist in ensuring that the traffic movements associated with the expanded facility do not result in negative impacts to the surrounding road network, and will also contribute to energy efficiencies and other environmental benefits through reduced car usage.

The dependence on private vehicles will be further reduced by the improvement and increased availability of public transport including the potential development and alignment of a light rail network close to HPH. If constructed, it would assist in reducing dependence on private vehicles by employees travelling to work.

It is therefore concluded that the increase in traffic to HPH will be insignificant when compared to that generated by the expansion of QEII Medical Centre.

6.4.3 Green Transport Plan

The Department of Health has developed the "Access and Parking Strategy for Health Campuses in the Perth Metropolitan Area" (APSHC), July 2010.

This Strategy provides a framework under which each public health campus in the metropolitan area can deliver consistent policies and practices towards access management. Although as a private hospital HPH is not listed, HPH has developed a "Green Transport Plan" which is consistent with the intent of the APSHC requirements for a Travel Plan.

The Green Transport plan has been discussed in Part 2: Background Reports and will be reviewed in 2013 to reflect current conditions. Significant improvements are planned for end of trip facilities up to completion of and beyond Stage 1 (2018).

HPH has had a green transport plan in operation since October 2004. The aim of the plan is to encourage and facilitate changes in their workers' transport practices to more healthy and environmentally friendly forms of transport to and from work, i.e. cycling, car-pooling, public transport and walking. The success of the plan relies on people making changes to their existing commuting travel arrangements. The hospital supports our workers in making the change easier by way of better information, facilities and incentives.

The following details the last five years of worker participation levels in the Travel Smart Program:

Year	Total participants	Total kms travelled	Total trips	Average km per trip
2012	173	151905	9852	15.42
2011	171	114796	7972	14.40

2010	121	80997	5453	14.85
2009	86	49545	3480	14.24
2008	101	70395	4856	14.50

The success of the program is demonstrated by the increased awareness and participation by employees in the program. HPH will continue to develop initiatives to increase the use of alternatives to private vehicle use for access to HPH.

Access to HPH via alternative forms of transport will be regularly subject to review as the public transport availability improves. The initiative of the State government to develop a light rail service along Thomas Street with a station close to Monash Avenue will result in further reduction in the reliance on private vehicles..

6.4.4 End of Trip Facilities

As part of encouraging modal shift to bicycles and walking HPH has providedand has plans to expand end of trip facilities.

Existing end of trip facilities at HPH include:

> Over 500 lockers, currently used mainly by theatre and ward staff who get changed and/or shower before or after a shift
> Approximately 25 showers, including a mixture of male, female and unisex facilities
> Approximately 50 u-rail bicycle parking spaces
> Hairdryers, irons and laundry service (for theatre staff)

Many of these facilities are provided in the course of enabling staff to fulfil their hygiene obligations, or enable to staff to change to/from uniforms at the start or end of shifts. However, these facilities are not restricted to only staff who need them for work, they can be used by any staff member as desired.

Future Provision

HPH recognises the importance of high quality end of trip facilities to encourage mode shift towards cycling. Therefore, as part of the Stage 1 (2018) development, the following improvements are proposed to the existing end of trip facilities:

> Approximately 100 secure undercover bicycle parking spaces – located within 3 'cage' facilities to be spread around the site. These will be intended for staff use.
> An additional 50 u-rail type bicycle parking spaces to be located near the entrances of each building to ensure high user convenience and passive surveillance. These will be intended for visitors, deliveries and other short term users who do not require secure parking.

> An increase in the number of lockers to over 600.
> An additional 5-10 showers.
> Investigate the provision of a dry cleaning or laundry service over the weekend, so that staff who cycle to/from work do not need to transport their clothes to/from work.

In addition to providing new facilities, existing facilities will be more widely publicised to ensure that staff are aware of their options for changing their travel behaviour. This is one of many strategies to be incorporated in the revised HPH Green Transport Plan.

The proposed end of trip facilities will be of significant benefit to staff who currently cycle to/from work and act as a large incentive for other staff to shift to cycling where possible.

As future development progresses beyond 2018, further end of trip facilities will be provided in existing and new buildings to cater for the increase in staff and expected increase in staff cycling to work. The details of these measures will be determined at the DA stage of future developments.

6.4.5 Pedestrian Way-finding and access

Pedestrian way finding is a key feature of the existing hospital design (as shown in Figure 8). The hospital is planned around a north-south corridor which links all major functions and vertical circulation nodes. This simplifies way-finding and allows patients and visitors to orientate themselves easily which reduces stress and improves the hospital experience. The simple and direct internal way-finding is mirrored externally where key public entrances and car parking provisions are linked to the main internal corridors via simple and obvious access pathways.

The proposed new expansion of the hospital builds on both the internal and external way-finding precepts already established.

Successful way-finding and access should be largely intuitive and self-explanatory but the hospital will complement the way-finding strategy with highly visible colour coded signage appropriately designed and located.

6.5 Urban Design Principles

6.5.1 Site Planning

The current Hollywood Clinic expansion proposal and future site redevelopment opportunities continue to respond to the Hospital's evolving clinical needs and address an aging building stock and consolidation of existing site facilities. Any future redevelopment identified as part of the Masterplan will explore opportunities to enhance the streetscape along Monash Avenue and Verdun Street within its boundaries and by agreement with the City of Nedlands to improve the adjacent street verges. Recently, the verge along Verdun Street was landscaped by HPH.

Opportunities to enhance the streetscape along Verdun Street and Monash Avenue include, but would not be limited to:

a) Maintaining and improving the landscaping in the front setback and other areas;
b) Maintain and improve all signage along both streets;

   - Note that the signage along Monash Avenue has been recently upgraded to a very high standard.

c) Continue to develop new buildings consistent with the Masterplan which requires buildings with a lower height closer to Monash Avenue and Verdun Street (2 Storey max and 4 Storey max respectively), taller buildings up to 6 storeys would be developed in the central lower portion of the site; and
d) Continue to develop all new buildings to have a high standard of visual amenity and presentation within the site.

6.5.2 Built Form

The proposed new developments within the HPH site will contribute to and support the established architectural language along Monash Avenue. A blend of contemporary and traditional materials such as masonry, glass, and facade panels binds the new and existing buildings on the site.

As an example, a peripheral building, the proposed Hollywood Clinic extension, offers the opportunity to continue with the aesthetic of the existing single storey clinic by the use of masonry, pitched tiled roof and punched windows.

6.5.3 Safety and Security

Numerous levels of security exist on the site and will be incorporated into any new development including:

- Maximise the opportunity for passive surveillance through building and open space design;
- Installation and monitoring of a CCTV security system site wide;
- Electronic control of all key access points;
- After hours lockdown of selected access points;
- Lighting to be designed to illuminate all pedestrian and vehicle paths, roads and corridors;
- Avoidance of obstacles and landscaping which may impede visual control of public areas through sensitive design cognisant of design to prevent crime and improve individual safety on the campus; and
- Vandal proof material selection and treatments.

At present no perimeter security fencing is being considered for the site.

6.5.4 Sustainable Design Features

Environmentally Sustainable Design (ESD) is a key priority for future developments on the HPH site. There are many opportunities being considered or which will be considered for all future development regarding ESD. Initiatives and design should aim to provide:

- Overall energy reduction and direct reduction in running costs;
- High performance facades which facilitate daylight penetration;
- Reduced lighting and small power loads;
- Improved indoor air quality through improved material selection and filtration;
- High efficiency HVAC systems;
- Renewable energy systems such as solar thermal and solar photovoltaic;
- Enhanced and effective commissioning and building tuning;
- Advanced technology vertical transportation;
- Metering and measuring outcomes;
- Interior design and procurement strategies which utilise green building products;
- Material selection and recycling; and
- Training staff on correct building operation.

6.5.5 Universal Access

As a hospital the principles of Universal Access for people of all abilities are implicitly relevant. All aspects of current and future developments will embody the aspirations of the Universal Access Policy as well as the regulatory requirements of the BCA and the Disability Standards on Access to Premises.

6.5.6 Building Height

The current TPS No. 2 includes provisions to limit the maximum height of vertical walls to 8.5m and the overall height of building to 10.00m. These provisions work for average sized lots however the HPH site is over 11.0ha.in area and has a significant fall from the western to the eastern boundary adjacent to QE11MC. The overall fall along Monash Avenue is 13.0 metres and along Verdun Street approximately 11.2 metres. There is an even greater fall across the site from 26m in the south-west corner to 7.8m in the north-east corner. To further complicate the slope analysis to determine maximum height of buildings and to establish a “relative level” from which it is measured the site undulates having highs and lows within its boundaries.

In addition when undertaking redevelopment new buildings must also be designed to connect to existing floor level services and other facilities. In view of these considerations and to avoid any future confusion the Masterplan divides the site into three zones to make it easier to determine a relative ground level more consistent with the existing and adjacent development.

As shown on Figure 6 the site is divided into three zones:

Zone 1: This zone is adjacent to Monash Ave and is limited in height to 4 storeys. To further clarify the maximum building height the RL (relative level) for each building footprint has been determined and is shown on the plan for each zone. In addition the maximum wall height is shown as "Top of the Wall" and has been measured from the finished pad level (shown as the RL) eg. based upon 4.2 metres per storey the maximum wall height or top of the wall is RL 16.4m + 16.8m (for 4 storeys) = WH 33.2m or 34.7 metres to the of the roof ridge line.

Zone 2: Comprises the middle portion of the site where the maximum building height or top of the wall is 6 storeys or 25.2 metres above the RL or 26.7 metres to the top of the roof ridge line eg. RL = 18.2m + 25.2 for 6 storeys = 43.4m to top of the wall or 44.9 metres to the roof ridge line.

Zone 3: Comprises the area closest to the houses along Verdun Street where a lower building height is proposed to be 2 storeys or 8.4 metres wall height or 10.0m to the roof ridge line eg. RL = 18.0m + 8.4m for 2 storeys = 26.4 metres to top of the wall or 27.9 metres to the roof ridge line.

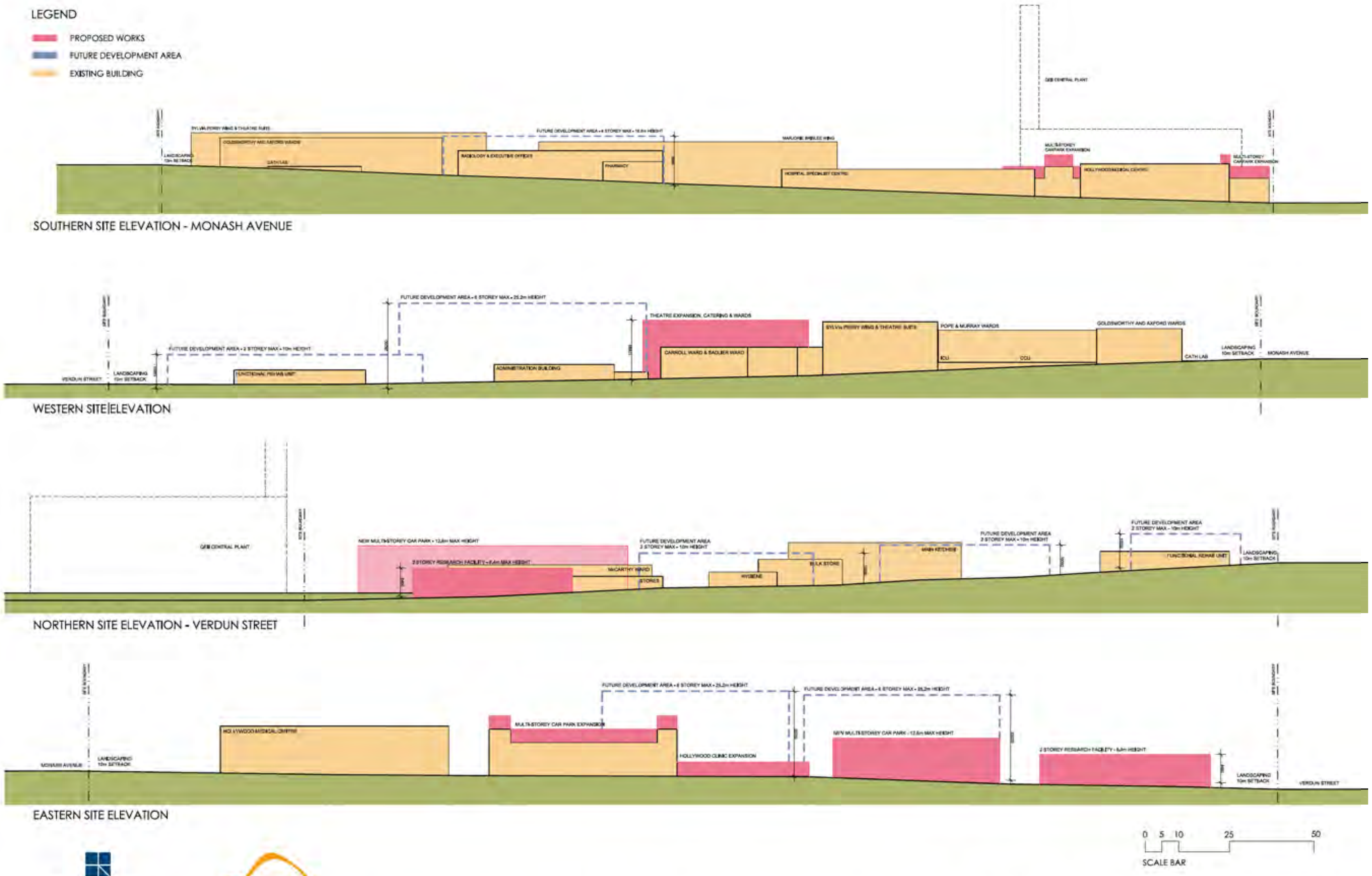
The planning and design of buildings and the proposed limitation to heights aims to prevent as much as possible any adverse impacts on the adjacent residential amenity on Verdun Street (see Figures 8 and 9). The western boundary is adjacent to Hollywood Primary School and recreation grounds, the southern boundary is opposite Monash Avenue and the Hollywood Village and QE 11 adjoins the eastern boundary where buildings are already significantly higher than proposed in this Masterplan. Accordingly it is reasonable to support the proposed maximum building heights shown on the Masterplan as with significant setbacks and the proposed limit on building heights there will be little impact, if any, on surrounding properties.

6.5.7 Landscaping

The existing landscape areas predominantly provide a landscaped garden edge with some screening hedges at pedestrian level around much of the site and discrete landscaped shelter areas for visitors, patients and staff, in court yards and between buildings. The Site Analysis in the HPH Landscape Plan in Appendix 2 shows existing features including landscaped areas and the many mature trees on the site.

The existing and ongoing landscaping will reflect the following principles:

- retention of existing mature trees wherever possible;
- providing attractive and usable garden areas;
- looped and shaded pathways;
- shading and shade trees including in tree planter boxes;
- water and other features;
- water wise planning;
- diverse and well maintained gardens
- areas to be enjoyed by patients and visitors for rest and contemplation;
- appropriate signage and lighting; and
- varied and interesting hard landscaping, paving design and texture.



RAMSAY HEALTH CARE

silver thomas hanley

HOLLYWOOD HOSPITAL

Drawing	Scale	Sheet Size	Date	STH Project No.	Drawing No.	Revision
MASTERPLAN - STREET ELEVATIONS	1:500	A1	10.12.12	02687	SK06	B

File:F:\Projects\2734 Hollywood Theatre Expansion\Presentation drawings\Site Massing Model\Hollywood Masterplan - Street Elevations.dwg

JOB. 1620 DATE 17-12-12

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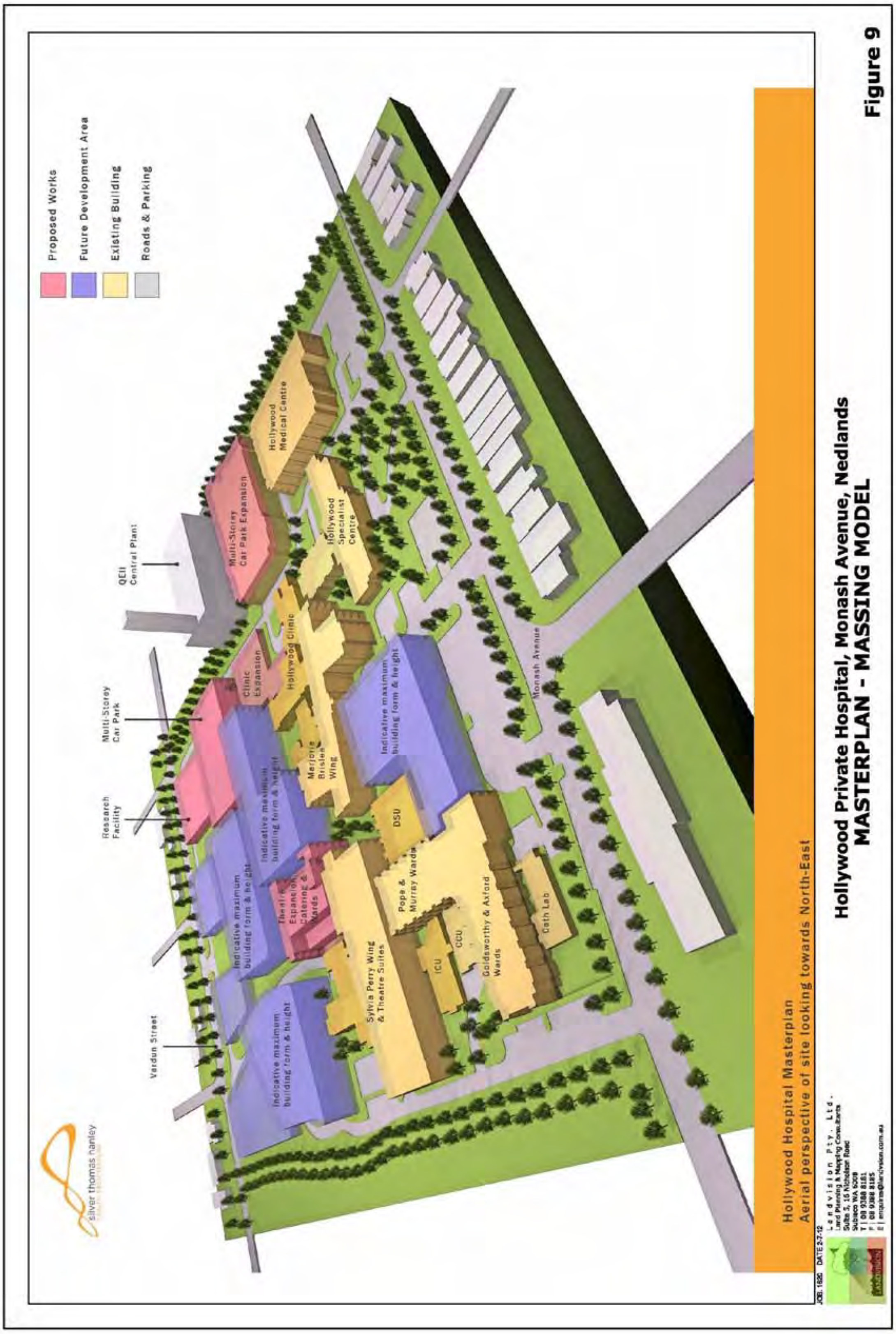
Hollywood Private Hospital, Monash Avenue, Nedlands
MASTERPLAN - STREET ELEVATIONS

Figure 8


Proposed Works
Future Development Area
Existing Building
Roads & Parking
QEII Central Plant
Multi-Storey Car Park
Research Facility
Vardun Street
Multi-Storey Car Park Expansion
Hollywood Medical Centre
Hollywood Specialist Centre
Clinic Expansion
Hollywood Clinic
Marjorie Bristen Wing
Indicative maximum building form & height
DSU
Theatre Expansion, Catering & Wards
Pope & Murray Wards
Sylvia Perry Wing & Theatre Suites
ICU
CCU
Goldsworthy & Axford Wards
Cath Lab
Monash Avenue
silver thomas hanley
Hollywood Hospital Masterplan
Aerial perspective of site looking towards North-East
Hollywood Private Hospital, Monash Avenue, Nedlands
MASTERPLAN - MASSING MODEL
Figure 9

The Masterplan shows that existing and future landscaped areas total 25% of the site.

The Masterplan shows that the landscaping, signage and bordering walls successfully integrate the campus with Monash Avenue. The existing landscaping on Monash Ave will be maintained in its current form, with clear sight-lines, lighting and signage for pedestrians and vehicles entering and leaving the property. The internal perimeter road on the western boundary is adjacent to a pedestrian access lane and does not have a negative impact on this area.

There is an internal perimeter road adjacent to Verdun Street which is set behind landscaping reducing any visibility from Verdun Street.

The perimeter road continues along the eastern boundary adjacent to QE11 and in this location has no impact on the surrounding residential area.

Appendix 2 includes the overall landscaping concept for the site based on maintaining the indigenous landscape to enhance and create habitat for the local fauna and flora. This particularly applies to the boundary landscapes which have been used as a link in the flight path between Kings Park and Bold Park on the Karaki Biirdi Trail. The landscape of the hospital is of even more significance as the new development on the adjoining hospital site have eliminated a significant amount of tree canopy which were previously an important part of the trail. With respect to the landscapes contained within the site most of these are small and localized sites relating to the function of the adjoining hospital. The landscape will use local West Australian plans to economise on water use and minimise maintenance programs whilst providing amenity for the hospital staff, patients and visitors.

Appendix 2 also includes an assessment of the landscaping along Verdun Street and makes recommendations for its improvement to revitalize the landscape.

7.0 MODIFYING THE MASTERPLAN

As future developments are progressed from planning to construction they shall be consistent with the approved Masterplan. If consistent with the Masterplan Council could support the Development Application without the need to advertise such an application. Any application which is not consistent with the approved Masterplan could be refused, approved with conditions or at Councils` discretion may require advertising for public comment and a modification to the Masterplan but would be assessed on its merits by Council. When Council requires that the approved Masterplan must be modified it should follow the procedures included in Section 8.3 Procedures for Making or Amending a Local Planning Policy in TPS No. 2.

Occasionally HPH may submit an application for development which varies from the approved Masterplan. For example a building may be proposed within a Future Development Area but which has a building footprint which varies the indicative building footprints shown on Figure 6.

It is Council's intention that the modifications to the Masterplan shall require amendment to the Masterplan with the exception for a variation to an indicative building footprint within the Future Development areas when;

- The modified building footprint is contained within the Future Development area; and
- The area of the modified building footprint is equal to or less than the area of the footprint shown on Figure 6.

8.0 CONCLUSION

The adoption of the proposed Masterplan is consistent with the Special Use zoning of Hollywood Private Hospital and the provision in Schedule V of TPS No. 2 allowing the Council to approve a new Masterplan from time to time. Adoption of the Masterplan is also consistent with the Councils` requirement that a new Masterplan shall be prepared before any further building approvals are issued.

The Masterplan will allow all future development to be assessed taking the wider parameters of the site and locality into consideration. It gives all decision – making authorities, service agencies and the community secure knowledge of what to expect from the future expansion and redevelopment of the HPH campus.

Ramsey Health Care, the operators of HPH seek to continue to provide a high standard of facilities and services while responding to the growing demands of the community.

The Masterplan presents the short, medium and long term building program and shows that this can be achieved without having any significant adverse impact on the locality. In particular, it demonstrates that the site has sufficient area to allow for growth without overshadowing residents and neighbours. It also concludes that there will be little noticeable impact on local traffic.

Appendix 1

Strategic Planning Context

Strategic Planning Context

State Planning Policy

HPH is located immediately adjacent to the QEII Medical Centre that is currently being significantly expanded which is consistent with being identified as a "Specialised Centre". The planning for QE II MC has included strategic planning direction for HPH.

Specialised Centres are identified and addressed in State Planning Policy 4.2 Activity Centres for Perth and Peel.

The Western Australian State Government, specifically the Department of Health, has investigated the future requirements of the Queen Elizabeth II Medical Centre (QEIIMC) and the possible redevelopment of the site. This has involved the preparation of documents including the State Government Health Reform (Reid Report), the QEIIMC Access and Structure Plan and the QEIIMC Masterplan. These documents have outlined among other things, the requirement for the construction of a new multi - deck car park (recently completed) on Winthrop Avenue, a new children's hospital (under construction), a new women's hospital and a new central energy plant on the western side of the QEIIMC site.

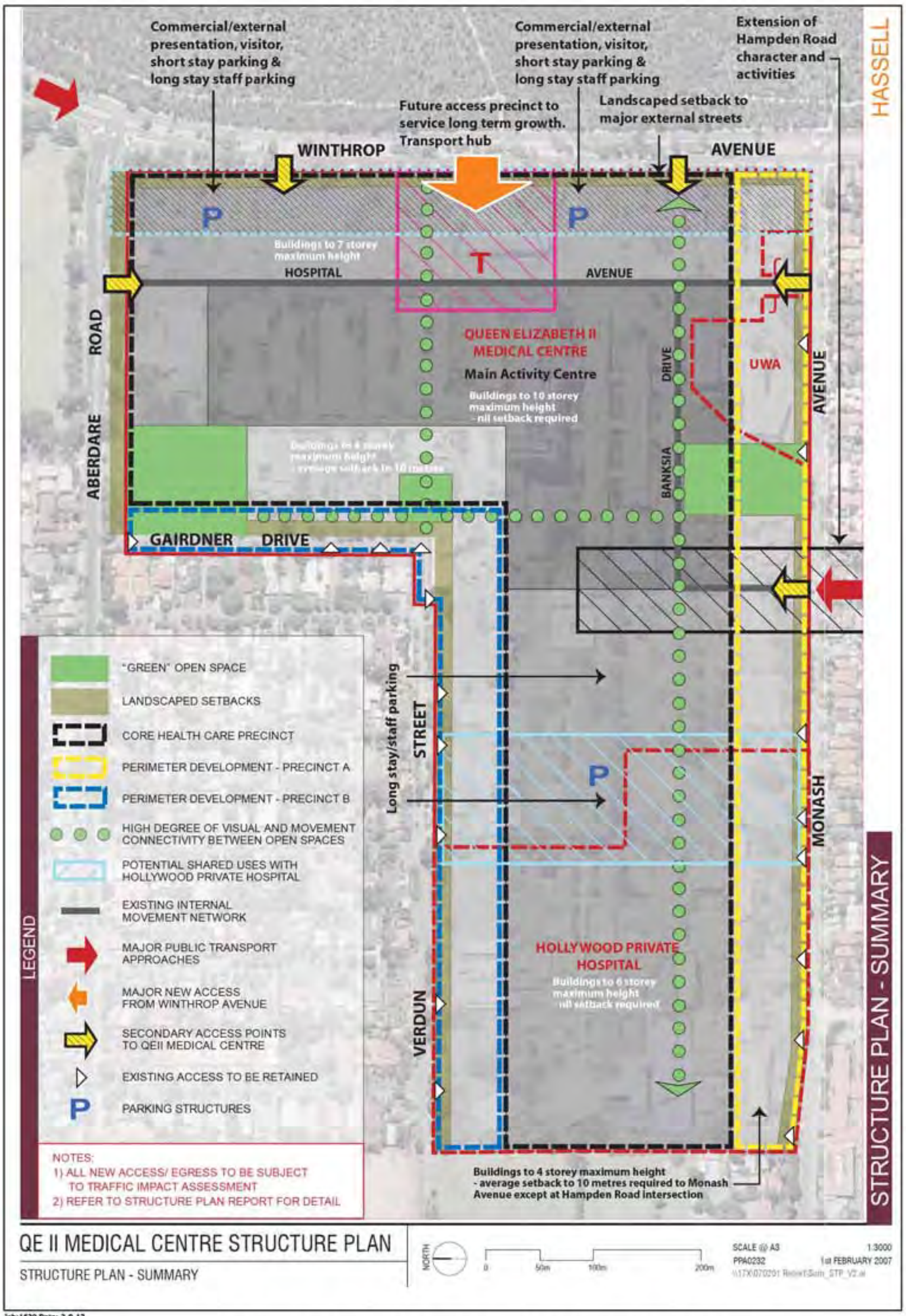
In November 2005, the Department of Housing and Works on behalf of the Department of Health (DoH) initiated an access and structure planning process to provide for the future development requirements of the QEIIMC.

The need for forward and strategic planning had arisen through work in two main areas:

1. Implementation of health reform initiatives identified in the "Reid Report". Redevelopment of the site is proposed that will accommodate the best of health care delivery services for Western Australians into the future; and
2. Agreement with the Western Australian Planning Commission (WAPC) that a structure plan incorporating a parking management and access plan would be prepared for the QEIIMC that could be used to determine the implications of future development.

Structure plans have been prepared for QEIIMC which also make recommendations for HPH(see Figures 6 & 7). A structure plan was therefore required that would test and provide for the new scale of development and associated infrastructure requirements (including traffic and transport), and for the detailed planning of a high quality built environment in the context of surrounding residential, recreation and commercial land uses.

Included in the health reform proposals was the possibility of King Edward Memorial Hospital (KEMH) being relocated from its current site in Subiaco to the QEIIMC. Not included in the proposals but remaining as a possibility as a result of further detailed clinical services planning, was the collocation of Princess Margaret Hospital (PMH) with KEMH.



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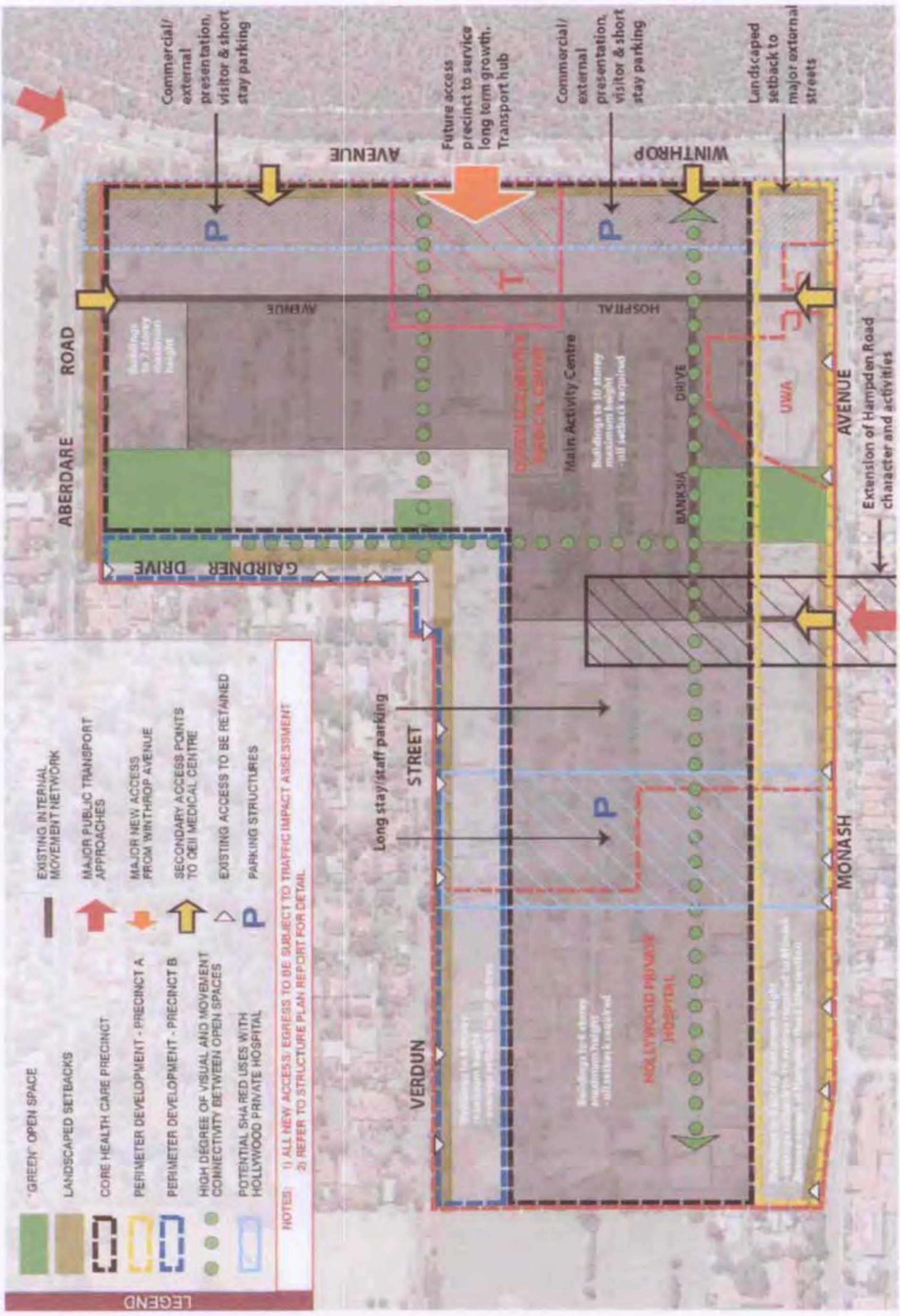
Hollywood Private Hospital, Monash Avenue, Nedlands
QE 11 MEDICAL CENTRE STRUCTURE PLAN
STRUCTURE PLAN- SUMMARY

A Figure 1

Figure 2-1 Structure Plan



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Hollywood Private Hospital, Monash Avenue, Nedlands

QE 11 MEDICAL CENTRE STRUCTURE PLAN

TRANSPORT ASSESSMENT

A Figure 2

While the core focus of the study area is the QEIIMC, the very close proximity of Hollywood Private Hospital is such that analysis and general structure planning has also addressed that site as part of the secondary study area. All access and structure planning has taken place in the context of proximity to the University of Western Australia (UWA) and the surrounding area.

The relationships and potential relationships between QEIIMC, HPH and UWA offer much potential, and planning cannot ignore them. Additionally, all three sites are major employers and generators of staff, visitor and service traffic that combine to have a major impact on the locality. The regional planning implications of the QEIIMC as an “Activity Centre” offer the opportunity for a review of the broader planning context between the Department of Planning and the affected local authorities.

Planning control over development on the QEIIMC site rests with the WAPC because it is development by a public authority and is on land reserved under the Metropolitan Region Scheme. In comparison, HPH is a privately owned development on zoned land and hence falls within the planning jurisdiction of the City of Nedlands. For this reason, the elements of this Structure Plan that relate to HPH can be recommendations only which have been considered in the formulation for the Masterplan for HPH.

As discussed elsewhere in the Amendment report Figures 1 and 7 are extracts from these plans and (ie. Queen Elizabeth Medical Centre Access and Structure Plan, prepared for the Department of Health, February 2007) and show key features reflected in the Masterplan for HPH including:

- maximum building heights with 4 storeys along Monash Avenue, 6 storeys in the centre of the site and 4 storeys along Verdun Street although HPH proposes only 2 storeys along Verdun Street to minimise visual impacts on residential areas opposite HPH;
- access from Verdun Street, which is restricted to day time use on week days during working hours only to minimise impacts on the nearby residents;
- areas with potential to share uses, such as parking in an area where QEII and HPH share a common boundary;
- a common axis parallel to Monash Avenue with a high degree of visual and movement connectivity between open spaces; and
- maintaining the existing vehicle and pedestrian access points to HPH along Monash Avenue and Verdun Street.

Appendix 2

Report on Landscaping at HPH

by

Pullyblank Pty Ltd

June 2012

Hollywood Hospital

Landscape

Introduction

The hospital is a dynamic, evolving and vibrant element of the community and the landscape needs to evolve and change to adapt to the ever fluctuating site usage. Buildings become outdated and health practices change, requiring the site to be flexible and ever changing.

The landscape of the hospital is diverse with landscapes dating from the Repatriation Hospital days of post WW1 to today with the emphasis changing from exotic water consumptive trees and shrubs to an indigenous landscape of frugal water demand. The main feature of the site is the presence of a large number of mature trees, the broad open grounds have resulted in an extensive tree planting and protection program now evident on site.

The hospital landscape has a number of benefits ranging from the presence of large trees giving the local community a view into a green treed site, to providing habitat to transient avifauna. It also provides aesthetic appeal for the visitors, patients and staff on site.

The benefit of gardens to health care is being recognized more and more. The cooling relaxing aspect of a garden with shady trees and colourful shrubs provides valuable supplement to the health care delivered on site.

Hollywood Hospital has the stated objective of providing dynamic evolving landscape tailored to the changing demands of a modern hospital. The new landscape on site has and will continue to be installed in all possible practical open spaces on site. Spaces whether they be small pockets in and around buildings or temporary spaces created by site demolition will be landscaped. This philosophy will allow the landscape and building opportunities to be maximised.

A key feature of great significance; the majority is Australian plants, including indigenous species which form a key link in the Karaki Biirdi Trail. The significant landscape areas are in the north-west of the site and along the boundaries, it plays an important role in providing a connecting landscape for the Karaki Biirdi Trail a stepping stone for Carnaby Cockatoos and other birds moving to and from Kings Park and Bold Park to the coast.

Over the last year the trail has been further fragmented with the new projects in Sir Charles Gairdner Hospital requiring significant tracts of trees to be removed. Most of these trees have been Australian trees and many indigenous specimens. The removal of these trees has placed even more pressure on the Hollywood landscape to retain the link.

The range of plant species in the hospital landscape is diverse and their health varies significantly, all forming a valuable environment for the local avifauna. Canopy trees dominate the site but there are significant areas of understory planting.

In addition to the Australian landscape there is a limited area of old exotic planting dating back to the Repatriation Hospital days, this is mainly on the Monash Avenue frontage. This landscape reflects the original Nedlands landscape of early to mid-20th century with large Ficus macrophylla – Morton Bay Figs, Lophostemon confertus – Queensland Brush Box and Erythrina indica - Flame Trees, with rolling lawns and under planting of shrubs. It is a feature of the site and valued by the hospital population and the local community.

The overall landscape is comprised of Australian plants most native to south Western Australia. This provides a great benefit as it provides habitat and is relatively easily established.

Landscape Philosophy

The landscape philosophy for the project matches the local natural system of constant change. New trees and understory will be constantly planted to ensure the landscape evolves, gaps will be filled in the understory and new trees will be planted alongside well established specimens to ensure that the impact of removing trees and or landscape is minimised.

Over mature trees seen as safety hazards will be removed when they are identified. Unfortunately older trees with hollow stems and branches are good habitat for birds, bats and insects but they are safety hazards and in many cases need to be removed for safety reasons. The hospital will continue its policy of providing nesting boxes which will help to overcome this unfortunate circumstance. The nesting boxes presently on site have been very effective and most are well used by the local fauna including Galahs, Parrots, and other birds and bats.

The landscape philosophy for the site is to retain the theme of Australian plants and continue to upgrade the landscape with local species. The only exception being the established old Nedlands exotic landscapes focused on Monash Avenue these will be retained and enhanced.

In a number of areas, phasing out inappropriate exotic trees where they are superfluous and intrusive, will be a key focus. Species such as Cupressus macrocarpa – Monterey Cyprus and similar are examples of inappropriate species that draw large volumes of water and restrict the establishment of landscape within close proximity.

A major landscape initiative is to keep planting vacant ground with new gardens thus allowing the site to be developed as appropriate to a hospital. By planting vacant ground on a yearly basis, any lost landscape or plant material is regularly replaced providing a semi natural environment that does not depend upon the old aging landscapes. This process allows development to occur at the appropriate time for the hospital whilst not compromising the landscape resource. All of the landscape areas will have a cross section of material ages and hence be a better landscape and habitat.

Each building project on site has its particular needs and where ever possible and practicable the theme will be West Australian. The landscape will be designed to meet the specific needs of the associated project.

Zones

There are a range of distinct landscape areas on the site, all possessing significant trees and most have areas of shrub planting and each will be addressed individually.

All of them contain mature or maturing trees that form the character of the zone.

Zone 1

Running along the north south boundary interface with Charlie Gardiner Hospital this relatively large area is a food and habitat sanctuary for local fauna particularly avifauna. The hospital has implemented a planting program for the area culling inappropriate species and using local species comprised of a mixture of trees and shrubs. This initiative will be continued building the habitat and sanctuary qualities. The rejuvenation of this area will make it a permanent feature of the site. Its location and the presence of the underground services mean that it is extremely unlikely to come under development pressure.

The present planting is comprised of a scattering of mature trees, Ficus hillii – Weeping Fig, Quercus subur – Cork Oak, Eucalyptus gomphocephala and a range of understory plants mostly indigenous species of varying maturity. The opportunity is to establish a succession of planting materials that will provide a food source for local birds particularly the cockatoos and small parrots.

The removal of sickly and vigor growing specimens has improved the quality of the habitat. Presently the area on the service alignment is only sparsely planted with the main focus being on the edge of the ring road the new planting will be extended to take in the whole of the space available and a regular program of planting is planned to ensure the best landscape results are achieved for the hospital and local fauna.

Zone 2

The feature trees of this area vary from Australian trees such as Cinnamomum camphora – Camphor Laurel, Eucalyptus marginata – Jarrah, Eucalyptus camaldulensis – Red River Gum, Lophostemon confertus – Queensland Brush Box to Cupressus macrocarpa – Monterey Pine all are robust trees but a number are at or beyond maturity and will be phased out.

The indigenous species such as the Jarrah will be retained and enhanced with supplementary planting of new Eucalyptus marginata. This will allow any old and over mature trees to be removed before they become a safety risk. Also the constant changes to the site with roads and structure have meant that some of the trees are now vulnerable and showing signs of stress, new trees will planted to minimise the risk of future site works impacting upon them.

The Cypress are difficult trees imposing trees but have the capacity to strip the nutrients from the site, they draw large volumes of precious water out of the subgrade and they do not match with the aesthetic of this zone. Located on Verdun Street the most significant tree impacts on the landscape of the street and will be removed and replaced with better habitat trees of local origin.

Other exotic Australian species will also be replaced over time trees such as Eucalyptus camaldulensis – Red River Gum and Lophostemon confertus – Queensland Brush Box will be replaced as they mature and the new planting gets to a size that it can replace the older trees. The Brush Box in particular does not thrive in Perth and needs significant supplementary water to survive our hot desiccating summers. A number have already died in this area the new plantings will allow the replacement of any that die in the future.

A significant part of landscape in this area has been upgraded with new planting of West Australian species. The planting varies with its success and the area has significant regeneration of intrusive species such as Eucalyptus cladocalyx, this material will be removed prior to any new planting being installed in the area.

The new planting to this area will further build the park environment and provide an appropriate landscape for the hospital and the residences fronting Verdun Street. Colourful shrub planting and trees will be installed providing a vibrant landscape to about 1m in height with a clear understory to 2m. Where plants do not fit this model they will be pruned where necessary to ensure a safe work environment. This planting philosophy will ensure clear and safe site lines for the secure perimeter of the hospital. Some ornamental trees species such as Eucalyptus macrocarpa and Eucalyptus rhodantha have been planted into the area these small trees will provide colour and interest and although they only do hold there foliage in the 2 to 4m range the transparent nature of the canopy offers no security problem but it does at significantly to the visual quality of the landscape and the habitat.

Within the hospital boundary the dominant understory plant is Scaevola crassifolia which has thrived in this harsh landscape of tree competition and shade. This plant will be used elsewhere on the site as it thrives in the location.

The main structure trees will be Acacia acuminata, Eucalyptus marginata, Eucalyptus foecunda, and Allocasuarina fraseriana all of these trees are indigenous to the area.

Zone 3

This area is most successful area for habitat and is used extensively as habitat for a range of cockatoos, parrots and native birds, the trees mostly Corymbia citriodora and Eucalyptus cladocalyx are regularly visited by Black Cockatoos, Galahs and other large cockatoos. These trees have also tended to regenerate with a proliferation of Eucalyptus cladocalyx crowding out some of the understory native planting.

Whilst the existing trees in this area are good habitat for nesting and feeding the trees have a reputation and history of being notoriously unstable and in order to allow landscape and project development in this area and in line with the landscape philosophy for the site supplementary planting using local tree will be implemented. Large trees species such as Corymbia calophylla and Eucalyptus marginata will be the main planted species.

The understory planting will comprised of colourful low growing species with a maximum height of 1m or less. The planting that thrives in this area includes Calothamnus quadrifidus – low growing selection, Acacia ashbyae, Acacia lasiocarpa and Anigozanthos sp. are examples of some of the understory planting. All of the low growing species add to the habitat and food sources for small birds.

Nesting Boxes are a feature of this area and they have been installed by the hospital to supplement the natural tree habitat. The Nest Boxes have been extremely successful and all are occupied by local indigenous bird species which offers the opportunity to remove some of these older trees in replacement of younger and more vigorous specimens.

Zone 4

This area is dominated by large trees Eucalyptus robusta - Mahogany and Ficus hillii – Hills Weeping Fig with an assortment of understory plants generally struggling to survive under these imposing trees. The landscape of this area is controlled by these trees and will continue to struggle but the trees are so imposing and important to the site they will be retained and the landscape modified to survive these particular site conditions.

Zone 5

The dominant species is Agonis flexuosa – Peppermint with a number of, Eucalyptus cladocalyx – Sugar Gum, Eucalyptus robusta – Swamp Mahogany, and Ficus rubiginosa. All of these trees present as healthy candidate for retention

In a number of areas the understory is dominated by regrowth from the Peppermint and Sugar Gum with very little presence of shrub or ground cover layer. The density of the regrowth will be gradually reduced and replaced with low growing plants such Scaevola crassifolia – Beach Fan Flower, Callistemon phoeniceus – Fiery Callistemon, Ricinocarpus tiberculatus – Wedding Bush.

Zone 6

This zone is dominated by lawn and old mature Jacaranda mimosifolia - Jacaranda is the dominant tree in the area but there are a number of Eucalyptus marginata – Jarrah trees which are important habitat. All of the trees in this area are stressed and suffering from lack of water and undergoing treatment to reinstate their vigour. This process will include increase in water application to the root zone of the Jacaranda and mulching of the surrounds for the Jarrah. In addition more Jarrah will be planted to ensure there is a succession in the planting to ensure habitat trees are present in this zone into the future.

Zone 7

The landscape in this zone is comprised of a mixture of types the frontage to Monash Avenue is a relatively new planting providing amenity for people using the shelter located in the centre of the garden. The garden is comprised of a mixture of native plants, this theme will be retained and regular planting will keep it fresh and vibrant.

Some established trees are a feature of this area including the statuesque Corymbia citriodora – Lemon Scented Gum which is a landmark at the entry to the hospital and a Eucalyptus cladocalyx nana – Dwarf Sugar Gum is also an outstanding specimen and will be protected to ensure it thrives.

Zone 8

This area is a remnant of the old Hollywood repatriation hospital garden with Cupressus macrocarpa – Monterey Cypress, Cupressus sempervirens – Pencil Pine, Lophostemon confertus – Queensland Brush Box, Eucalyptus gomphocephala – Tuart, Jacaranda mimosiifolia – Jacaranda this diverse range of trees are generally planted into lawns and provide a park like setting.

Zone 9

This landscape was recently planted incorporating some of the existing trees Eucalyptus torquata – Coral Gum, Eucalyptus caesia and Eucalyptus macrandra these trees are small growing specimens with attractive seasonal colour. They grow well in the area and provide valuable food source for the local small birds. There have been a number of trees that have died in this area and they will be replaced ensuring a strong tree planting along the Monash Avenue boundary.

The shrub planting is made of a range of plants including Olearia axillaris and Grevillea crithmifolia both of these plants have grown exceptionally well and the grey foliage adds another dimension to the landscape.

Regeneration

The species used in this regeneration will provide quality habitat to protect small birds and some mammals as well as providing a future food source for the passing parrot and cockatoo population. The list will be comprised of the following for the new planting.

Trees

- Acacia acuminata – Jam Wattle
- Agonis flexuosa – Peppermint
- Allocasuarina fraseriana -
- Banksia menziesii –
- Corymbia calophylla - Marri
- Eucalyptus caesia -
- Eucalyptus foecunda
- Eucalyptus gomphocephala – Tuart
- Eucalyptus macrocarpa – Mottlecah
- Eucalyptus marginata – Jarrah
- Eucalyptus rhodantha –
- Eucalyptus synandra –
- Eucalyptus torquata – Coral Gum
- Eucalyptus websteriana –
- Nuytsia floribunda – WA Christmas Tree

Shrubs and Ground Cover

- Acacia lasiocarpa – Glow Wattle
- Acacia pulchella –
- Anigozanthos var. – Kangaroo Paw
- Banksia blechnifolia -
- Banksia sessilis –
- Billardiera heterophylla – Bluebell Creeper
- Callistemon phoeniceus
- Calothamnus quadrifidus – One Sided Net Bush
- Conostylis candicans – Cotton Head
- Eremophila glabra – Tar Bush
- Grevillea crithmifolia
- Grevillea nudiflora
- Grevillea preissii
- Guichenotia ledifolia – Western Rose
- Guichenotia macrandra -
- Kennedia prostrate – Running Postman

Lepidosperma gladiatum – Coast Sword Sedge
Lomandra ordii –
Olearia axillaris
Patersonia occidentalis – Purple Flag Lily
Ricinocarpus tiberculatus – Wedding Bush
Scaevola crassifolia – Beach Fan Flower
Westringia dampieri
Xanthorrhoea preissii – Grass Tree

Note the following species are presently on site and will be maintained but will not be planted in the future.

Callistemon citrinus – Eastern Bottlebrush
Casuarina cunninghamiana – River She-oak
Corymbia citriodora – Lemon Scented Gum
Cupressus macrocarpa – Monterey Pine
Eucalyptus camaldulensis – Red River Gum
Eucalyptus cladocalyx – Sugar Gum
Eucalyptus robusta – Swamp Mahogany
Ficus hillii – Weeping Fig
Ficus rubiginosa – Port Jackson Fig
Quercus suber – Cork Oak

Conclusion

The overall concept for the site is based on maintaining the indigenous landscape to enhance and create habitat for the local fauna and flora. This particularly applies to the boundary landscapes which have been used as a link in the flight path between Kings Park and Bold Park on the Karaki Biirdi Trail. The landscape of the hospital is of even more significance as the new developments on the adjoining hospital site have eliminated a significant amount of tree canopy which were previously an important part of the trail. With respect to the landscapes contained within the site most of these are small and localized sites relating to the function of the adjoining hospital. The landscape will use local West Australian plants to economise on water use and to minimise maintenance programs whilst providing amenity for the hospital staff, patients and visitors.

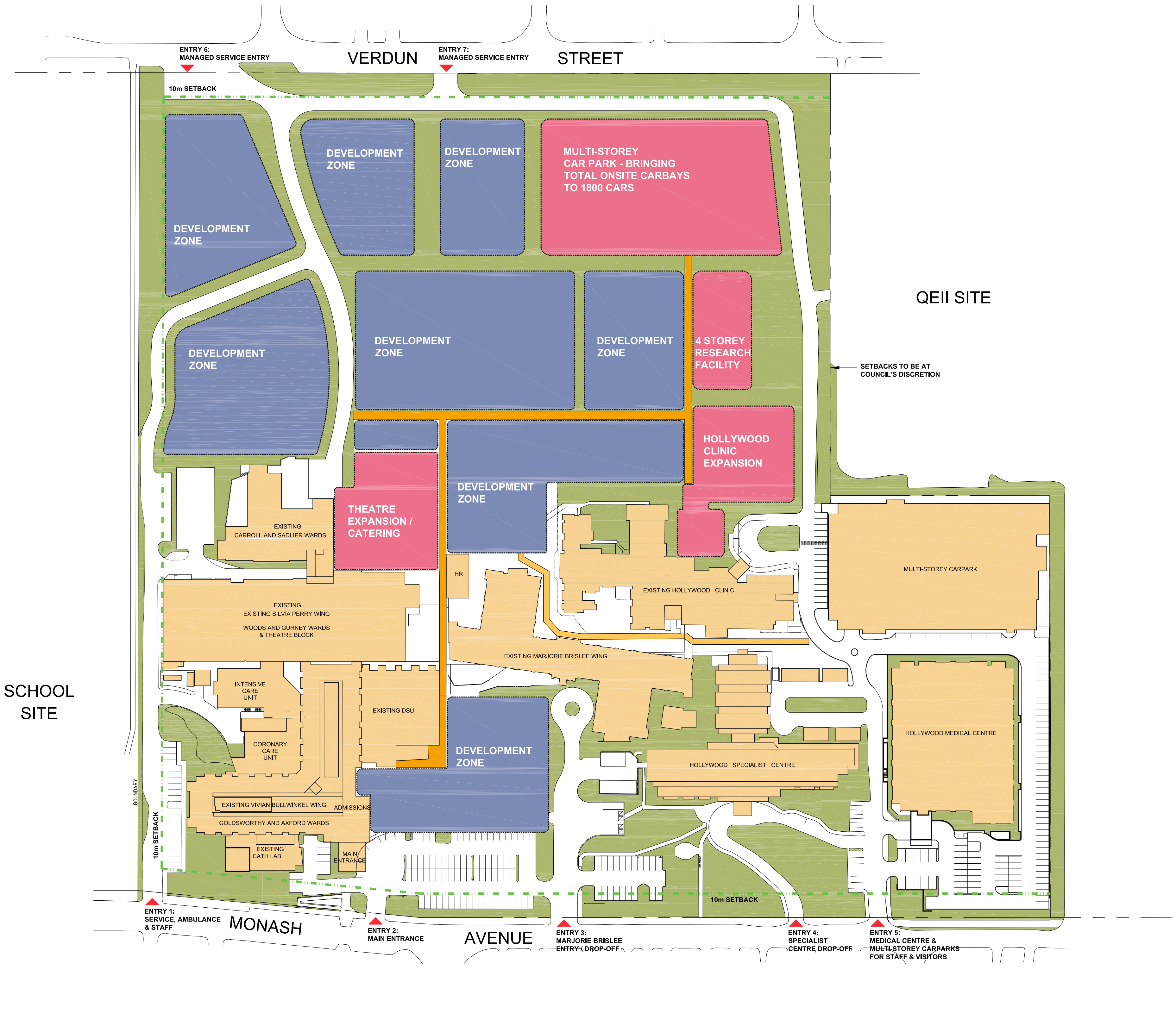
LEGEND

Proposed Development

Supporting Development

Existing Infrastructure

Landscape Provision



RAMSAY HEALTH CARE

silver thomas hanley HEALTH ARCHITECTURE

	Drawing	Scale	Sheet Size	Date	STH Project No.	Drawing No.	Revision
HOLLYWOOD HOSPITAL	MASTERPLAN - OPTION 02	1:1000	A1	20.06.12	02687	SKO2	-

File:F:\Projects\2687 Hollywood Proposed Emergency Dept\Working Set\STH\DWGSource\Plans\Hollywood Masterplan - Entrance Labels.dwg

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AUTHOR: MH QA: XX PROJECT NO: ####-##

SCALE 1:500@ A3

0 2 4 6 8 10 20m

HOLLYWOOD HOSPITAL

SITE PLAN

SK01-A

LEGEND

Proposed Development

Supporting Development

Existing Infrastructure

Significant Exisiting Trees

Karaki Biirdi Trail

PULLYBLANK PTY LTD

AUTHOR: MH QA: XX PROJECT NO: ####-##

SCALE 1:500@ A3

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HOLLYWOOD HOSPITAL

SITE ANALYSIS

SK01-A

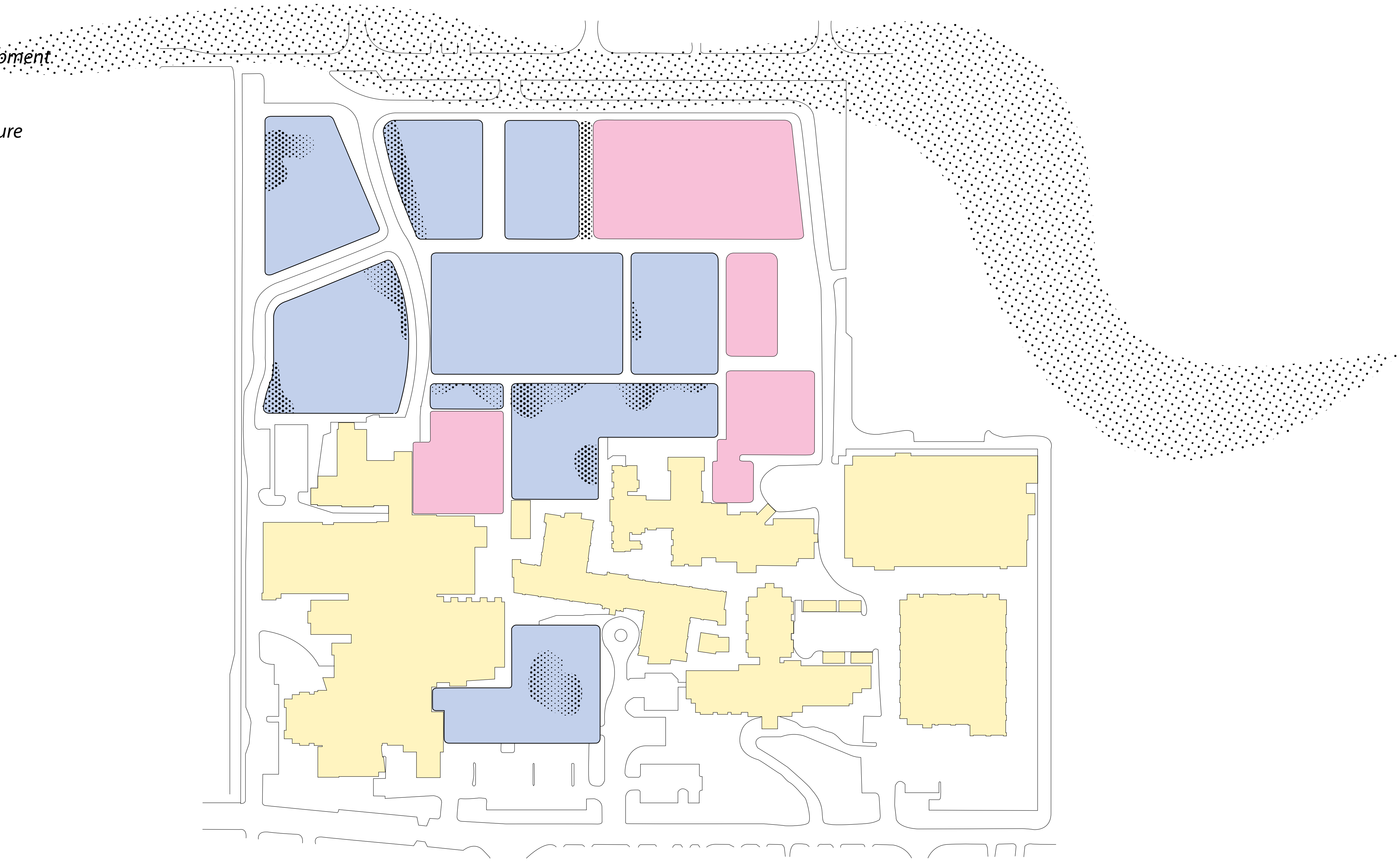
LEGEND

Proposed Development

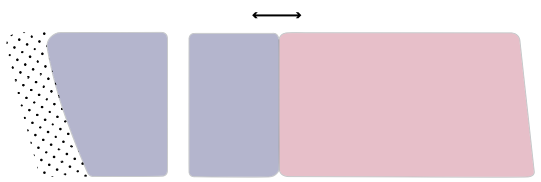
Supporting Development

Existing Infrastructure

Impact Zones



Consolidate blocks to maximise and enhance landscape site.



PULLYBLANK PTY LTD

AUTHOR: MH QA: XX PROJECT NO: ####-##

SCALE 1:500@ A3

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HOLLYWOOD HOSPITAL

SITE ANALYSIS

SK01-A

LEGEND

- Zone 1
- Zone 2
- Zone 3
- Zone 4
- Zone 5
- Zone 6
- Zone 7
- Zone 8
- Zone 9
- Significant Exisiting Trees
- Karaki Biirdi Trail

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AUTHOR: MH QA: XX PROJECT NO: ####-##

SCALE 1:500@ A3

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HOLLYWOOD HOSPITAL

SITE ANALYSIS

SK01-A

1.1

1.2

1.3

2.1

2.2

2.3

2.4

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AUTHOR: MH QA: XX PROJECT NO: ####-##

SCALE 1:500@ A3

0 2 4 6 8 10 20m

HOLLYWOOD HOSPITAL

SITE IMAGES

SK01-A


3.1

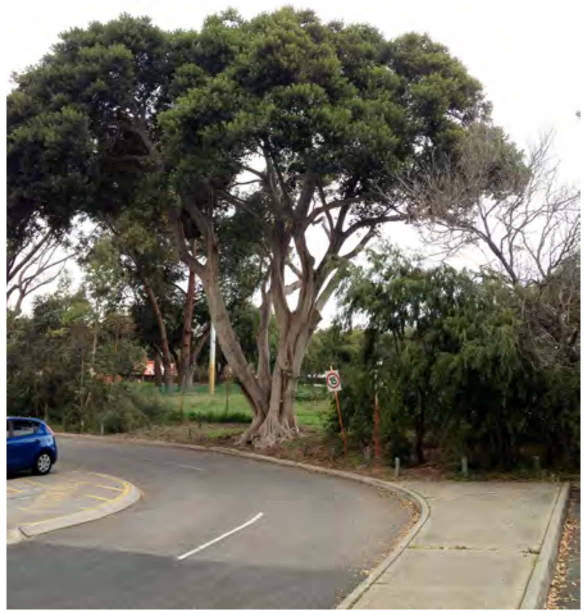

3.2


3.3


3.4


3.5


4.1



5.1

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AUTHOR: MH QA: XX PROJECT NO: ####-##

SCALE 1:500@ A3

0 2 4 6 8 10 20m

HOLLYWOOD HOSPITAL

SITE IMAGES

SK01-A


8.1


8.2


8.3


8.4


8.5


8.6

SHRUBS + GROUNDCOVERS

Billardiera heterophylla - Bluebell Creeper

Conostylis candicans - Silver Sunrise

Kennedia prostrata - Running Postman

Patersonia occidentalis - Violet native Iris

Acacia pulchella - Western Prickly Wattle

Conostylis aculeata - Cotton Head

Acacia ashbyae -

Banksia blechnifolia -

Eremophila glabra -

Grevillea preissii -

Callistomen phoeniceus -

Xanthorrhoea preissii -

Billardiera heterophylla

Conostylis candicans

Kennedia prostrata

Patersonia occidentalis

Acacia pulchella

Conostylis aculeata

Acacia ashbyae

Banksia blechnifolia

Eremophila glabra

Grevillea preissi

Callistomen phoeniceus

Xanthorrhoea preissii

TREES

Banksia menziesii - Firewood Banksia

Allocasuarina fraseriana - Western Sheoak

Corymbia calophylla - Marri

Eucalyptus gomphocephala - Tuart

Eucalyptus marginata - Jarrah

Eucalyptus rhodantha -

Eucalyptus macrocarpa -

Eucalyptus synandra -

Nuytsia floribunda -

Eucalyptus caesia -

Agonis flexuosa -

Eucalyptus citriodora -

Banksia menziesii

Allocasuarina fraseriana

Corymbia calophylla

Agonis flexuosa

Eucalyptus gomphocephala

Eucalyptus marginata

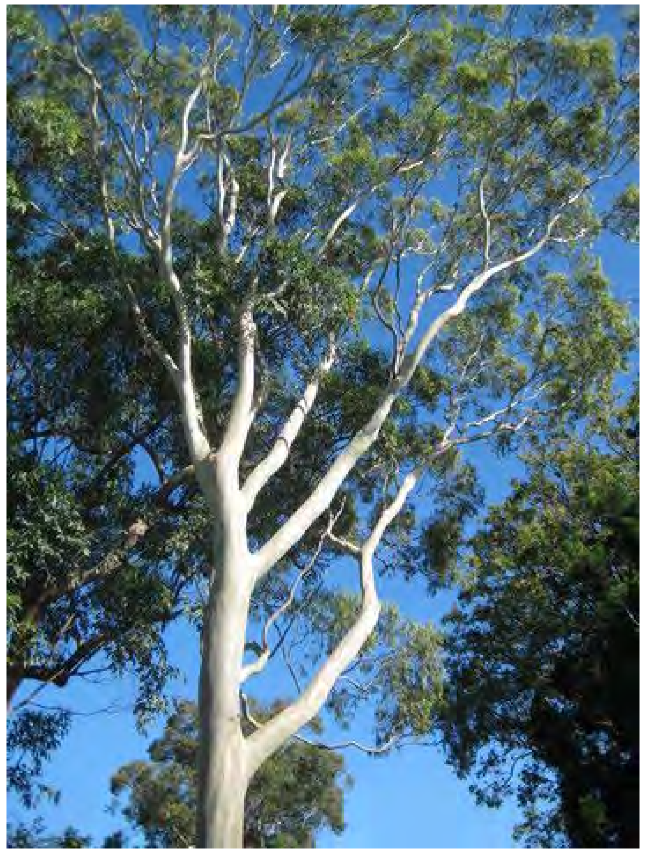

Eucalyptus rhodantha


Eucalyptus macrocarpa


Eucalyptus synandra


Nuytsia floribunda


Eucalyptus caesia


Eucalyptus citriodora

PULLYBLANK PTY LTD

22nd May 2012

Hollywood Hospital Landscape

Verdun St

Overview

Verdun Street landscape requires some attention in order to enhance the existing condition which will develop a more unified landscape connection for native wildlife and residents. Previous work in this area specified the use of a range of local vegetation which is suited to the Northern exposure and provides a habitat buffer between the Hospital and the residences on Verdun Street. Over time this area has become overgrown, with self-seeding Eucalypts, weeds and exotic plant material. Several species have thrived but many have been lost as a result of the above. The approach for this landscape is to offer advice on how to improve the existing asset.

Trees

The landscape on Verdun St verge is dominated by invasive adventitious Acacias, Eucalyptus species, ranging from seedlings to trees 3-4m high. The established Eucalypts within Hollywood Hospital have self-seeded and proliferated throughout the verge of Verdun. There are additional incidental exotic species that have infiltrated this area, such as Jacaranda mimosifolia, Nerium oleander - Oleander, Washingtonia robusta – Cotton Palm and Ulmus parvifolius – Chinese Elm all of which detract from the intended theme using Western Australian species in the plant pallet.

There are also a number of dead trees which detract from the landscape and need to be removed.

Two trees, in particular, which currently have a major and detrimental impact on the landscape Verdun St landscape, are the Cypress macrocarpa – Monterey Cyprus. Due to the scale of each tree, the extensive canopy and root system they are preventing the establishment of the desired landscape.

Existing Shrubs

Throughout this area the plants are struggling when they should be thriving. They present a disjointed, stressed and fragmented landscape for both the hospital and the residents fronting Verdun Street. There are examples of plants which have established well including Grevillea thelemanniana, Ricinocarpus tuberculosis – Wedding Bush, Acacia ashbyae, Callistemon phoeniceus Scaevola crassifolia along Verdun, however in general, landscape is in a poor condition. The larger shrubs, which have run rampant in some instances, are preventing the development of other species surrounding them. A significant amount of existing shrub material needs to be removed and replaced by species which are in line with the landscape concept, West Australian species.

Recommendations

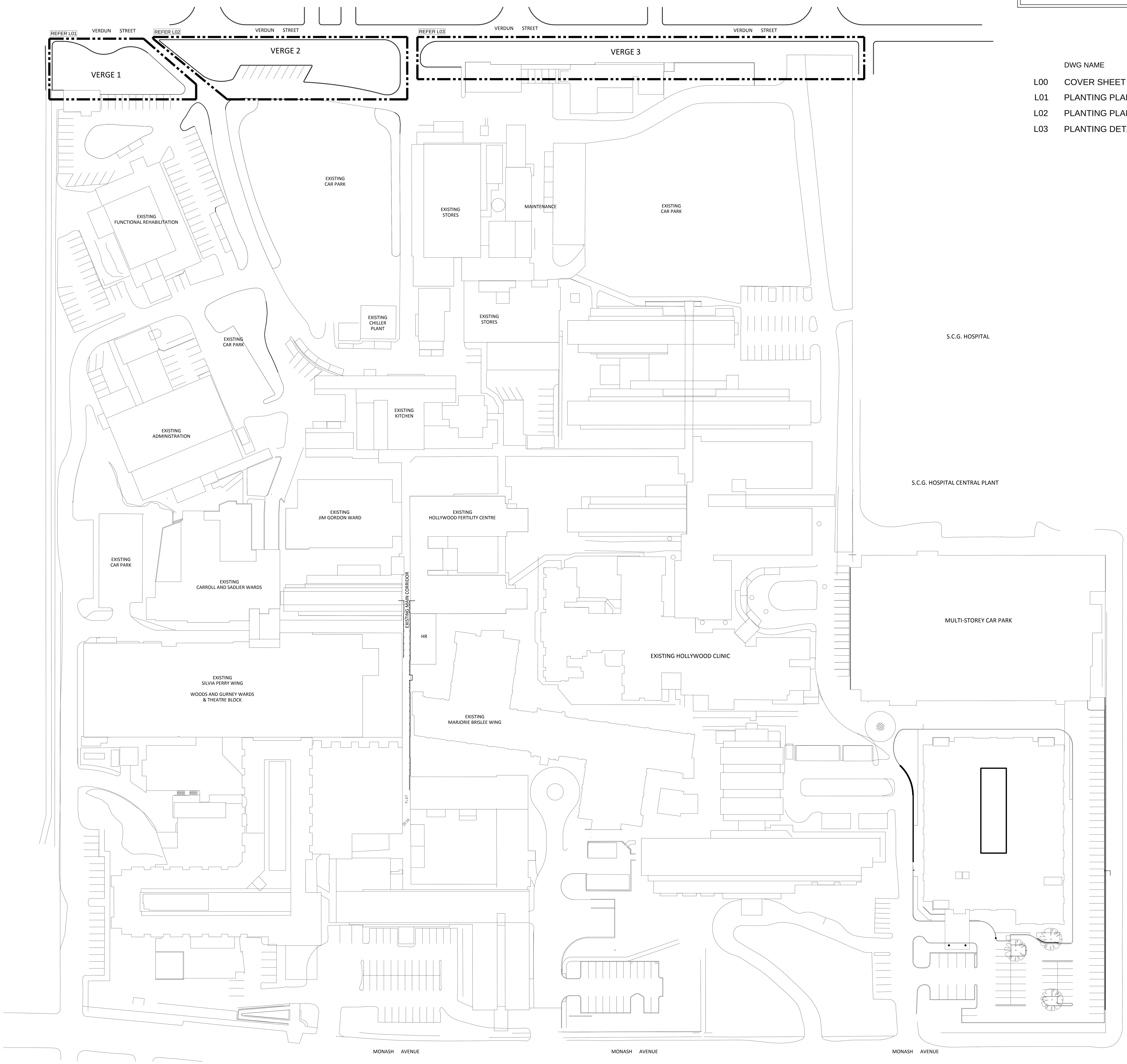
Further to the review of the Verdun Street landscape, please find below the recommendations for the revitalizing of the Landscape.

- Remove all intrusive, dead and over mature vegetation identified
- Remove the two Cypress macrocarpa. If necessary approach the council to get approval to remove the trees. Pullyblank can assist if necessary.
- Remove unwanted vegetation
- Prepare the site – weed, cultivate – if necessary, and re-mulch. It should not be necessary to cultivate except in the areas vegetation is removed.
- Prune the retained vegetation to improve the aesthetics and health of the plants.
- Review and repair the irrigation
- Install the planting and fertilise as per Pullyblank Plan and recommendations – yet to be prepared.
- Implement planting plan.
- Implement management strategy.

HOLLYWOOD HOSPITAL

LANDSCAPE ARCHITECTURAL DRAWINGS

FOR INFORMATION



	DWG NAME	SCALE @ A1	REV
L00	COVER SHEET	1:750	A
L01	PLANTING PLAN	1:200	A
L02	PLANTING PLAN	1:200	A
L03	PLANTING DETAILS	1:10	A

NOTES

ALL COMPLETED WORKS TO BE PROTECTED AND MAKE GOOD ANY DAMAGE TO EXISTING WORKS CAUSED AS PART OF THIS CONTRACT. ALL WORK WITHIN DRIP LINES OF EXISTING TREES IS TO BE DONE BY HAND.

ALL SET OUT IS TO BE DONE BY A LICENSED SURVEYOR. THESE DRAWINGS WILL BE MADE AVAILABLE DIGITALLY UPON REQUEST.

FIGURED DIMENSIONS SHALL TAKE PRECEDENCE OVER SCALED DIMENSIONS. INSETS AND DETAIL DRAWINGS TAKE PRECEDENCE & NOTIFY THE SUPERINTENDENT OF ANY IDENTIFIED DISCREPANCIES PRIOR TO UNDERTAKING WORK.

WRITTEN NOTIFICATION TO THE SUPERINTENDENT IS REQUIRED WITHIN TEN (10) WORKING DAYS OF TENDER ACCEPTANCE TO CONFIRM PLANT STOCK AVAILABILITY IN SPECIFIED SIZES AND NUMBERS AND DEPOSIT PAID. AFTER THIS TIME NOT PLANT SUBSTITUTIONS WILL BE ACCEPTED. AFTER TEN (10) WORKING DAYS, THE SUPERINTENDENT RESERVES THE RIGHT TO CHARGE THE CONTRACTOR $110.00/HR FOR SOURCING PLANT SUBSTITUTIONS, AND / OR REDESIGN.

LEGEND

WORKS BOUNDARY

LOCATION PLAN

REV	DATE	ISSUE
A	22.05.2013	FOR INFORMATION

4/61 Hampden Rd
Nedlands, WA 6009
ph: (08) 94667933
web: www.pullyblank.com

PULLYBLANK PTY LTD

AUTHOR: MH CHECKED: TL PROJECT NO: PLA1304

HOLLYWOOD HOSPITAL

CLIENT: HOLLYWOOD HOSPITAL

COVER PAGE

L00

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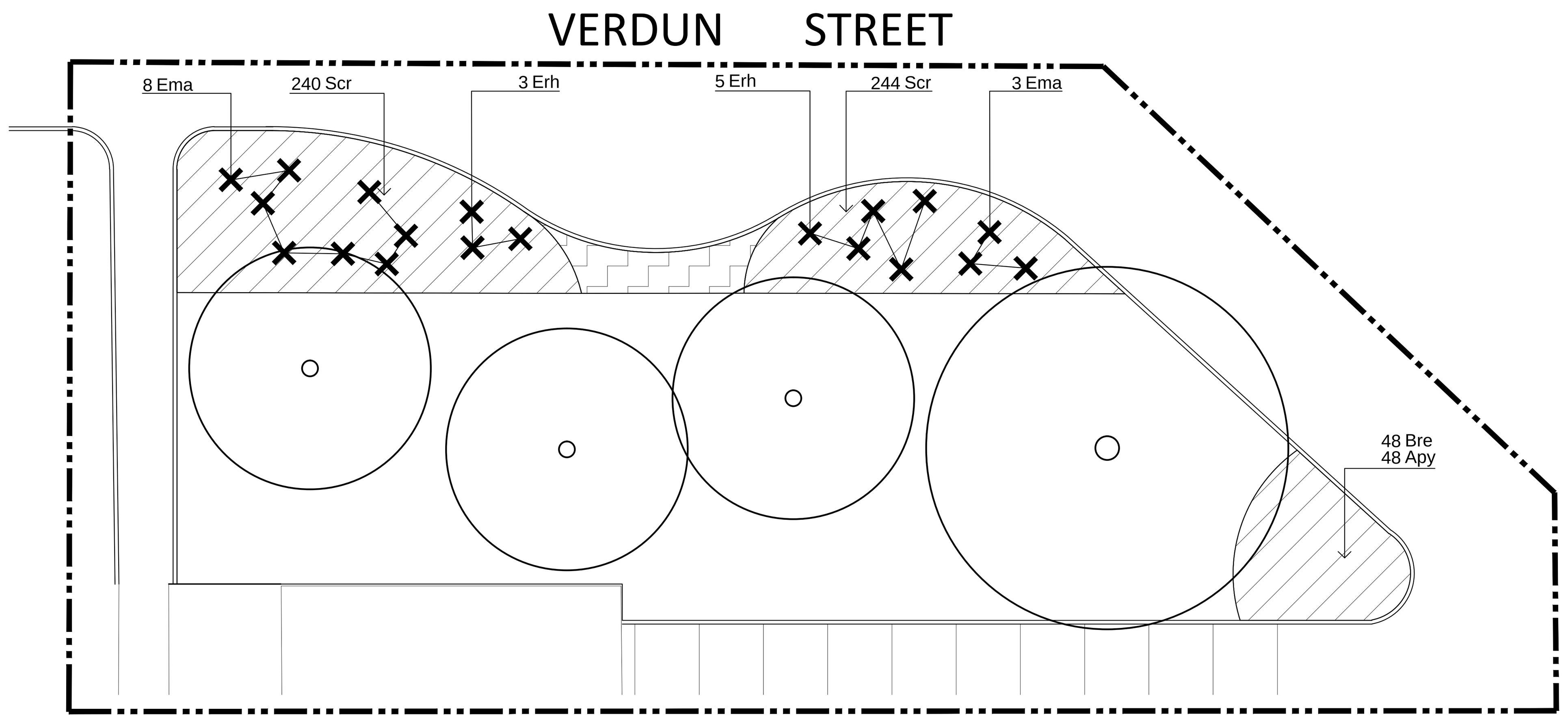
SCALE @ A1: 1:750

TREES

Symbol	Species	Pot Size	As Shown	Total
Ema	Eucalyptus macrocarpa	15ltr		68
Erh	Eucalyptus rhodantha	15ltr		65

SHRUBS

Symbol	Species	Size	C/S Sqm	Total
Aas	Acacia ashbyae	140mm	3	195
Apy	Anagozanthos pulcherrimus x flavidus (Yellow Gem)	140mm	3	171
Bre	Banksia repens	140mm	3	171
Gth	Grevillea thelemanniana	140mm	3	686
Scr	Scaevola crassifolia 'Flat Freddy'	140mm	3	1217



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VERDUN STREET PLANTING
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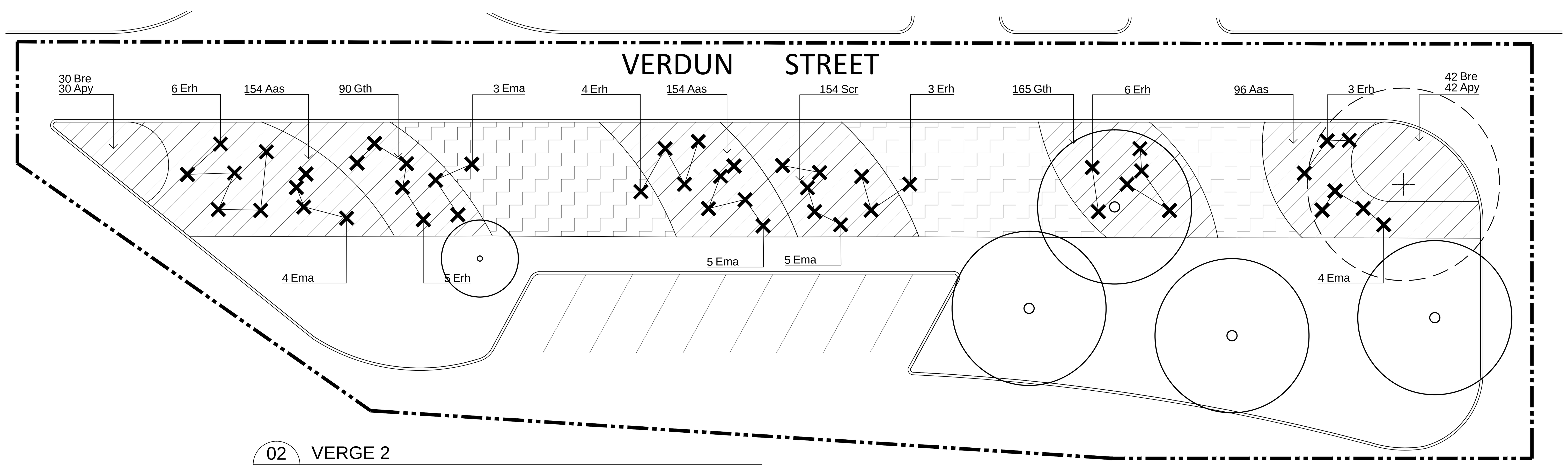

02 L01 VERGE 2
VERDUN STREET PLANTING
SCALE @ A1: 1:200

NOTES

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LEGEND

WORKS BOUNDARY

TREE EXISTING

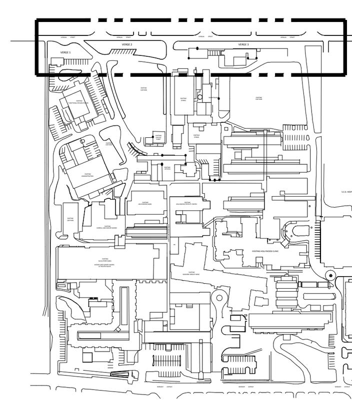
TREE PROPOSED

TREE TO BE REMOVED

MASS PLANTING WITH MULCH

EXISTING VERGE PLANTING

LOCATION PLAN



REV	DATE	ISSUE
A	22.05.2013	FOR INFORMATION

4/61 Hampden Rd
Nedlands, WA 6009
ph: (08) 94667933
web: www.pullyblank.com

PULLYBLANK PTY LTD

AUTHOR: MH CHECKED: TL PROJECT NO: PLA1304

HOLLYWOOD HOSPITAL

CLIENT: HOLLYWOOD HOSPITAL

PLANTING PLAN L01

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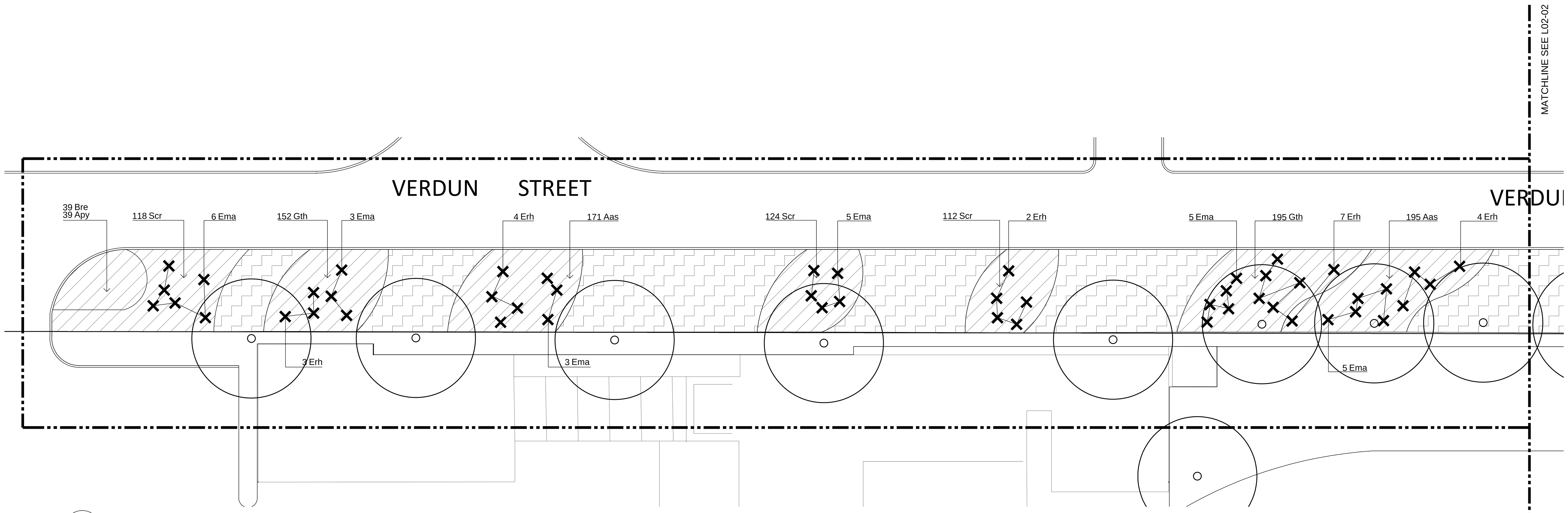

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VERDUN STREET PLANTING
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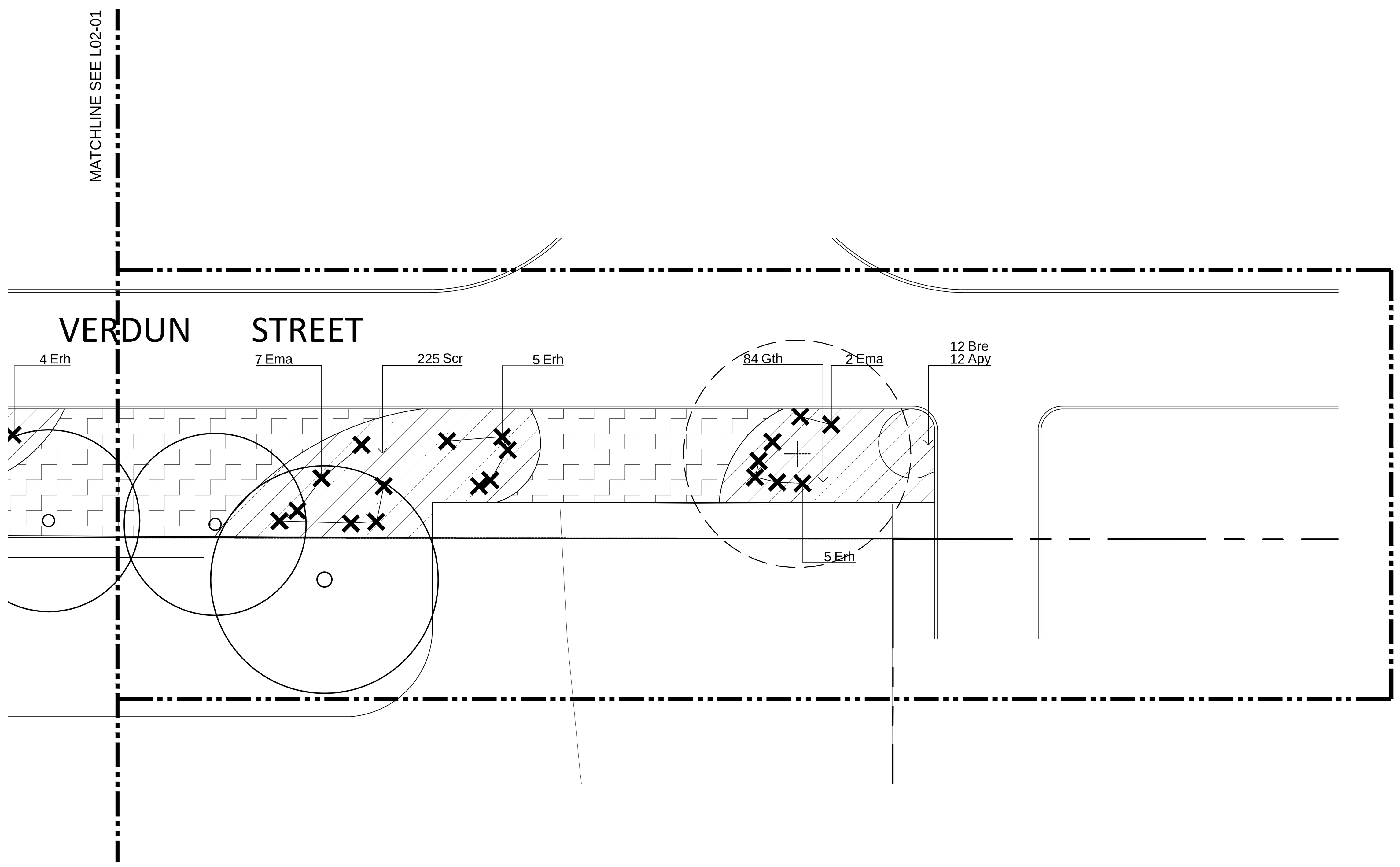


02 L02 VERGE 3
VERDUN STREET PLANTING
SCALE @ A1: 1:200

TREES

Symbol	Species	Pot Size	As Shown	Total
Ema	Eucalyptus macrocarpa	15ltr		68
Erh	Eucalyptus rhodantha	15ltr		65

SHRUBS

Symbol	Species	Size	C/S Sqm	Total
Aas	Acacia ashbyae	140mm	3	195
Apy	Anagozanthos pulcherrimus x flavidus (Yellow Gem)	140mm	3	171
Bre	Banksia repens	140mm	3	171
Gth	Grevillea thelemanniana	140mm	3	686
Scr	Scaevola crassifolia 'Flat Freddy'	140mm	3	1217

NOTES

ALL COMPLETED WORKS TO BE PROTECTED AND MAKE GOOD ANY DAMAGE TO EXISTING WORKS CAUSED AS PART OF THIS CONTRACT. ALL WORK WITHIN DRIP LINES OF EXISTING TREES IS TO BE DONE BY HAND.

ALL SET OUT IS TO BE DONE BY A LICENSED SURVEYOR. THESE DRAWINGS WILL BE MADE AVAILABLE DIGITALLY UPON REQUEST.

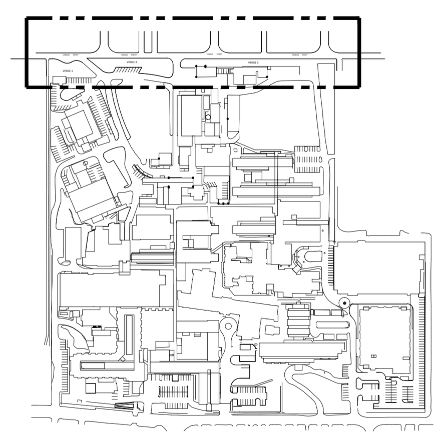
FIGURED DIMENSIONS SHALL TAKE PRECEDENCE OVER SCALED DIMENSIONS. INSETS AND DETAIL DRAWINGS TAKE PRECEDENCE & NOTIFY THE SUPERINTENDENT OF ANY IDENTIFIED DISCREPANCIES PRIOR TO UNDERTAKING WORK.

WRITTEN NOTIFICATION TO THE SUPERINTENDENT IS REQUIRED WITHIN TEN (10) WORKING DAYS OF TENDER ACCEPTANCE TO CONFIRM PLANT STOCK AVAILABILITY IN SPECIFIED SIZES AND NUMBERS AND DEPOSIT PAID. AFTER THIS TIME NOT PLANT SUBSTITUTIONS WILL BE ACCEPTED. AFTER TEN (10) WORKING DAYS, THE SUPERINTENDENT RESERVES THE RIGHT TO CHARGE THE CONTRACTOR $110.00/HR FOR SOURCING PLANT SUBSTITUTIONS, AND / OR REDESIGN.

LEGEND

- WORKS BOUNDARY
- TREE EXISTING
- TREE PROPOSED
- TREE TO BE REMOVED
- MASS PLANTING WITH MULCH
- EXISTING VERGE PLANTING

LOCATION PLAN



REV	DATE	ISSUE
A	22.05.2013	FOR INFORMATION

4/61 Hampden Rd
Nedlands, WA 6009
ph: (08) 94667933
web: www.pullyblank.com

PULLYBLANK PTY LTD

AUTHOR: MH CHECKED: TL PROJECT NO: PLA1304

HOLLYWOOD HOSPITAL

CLIENT: HOLLYWOOD HOSPITAL

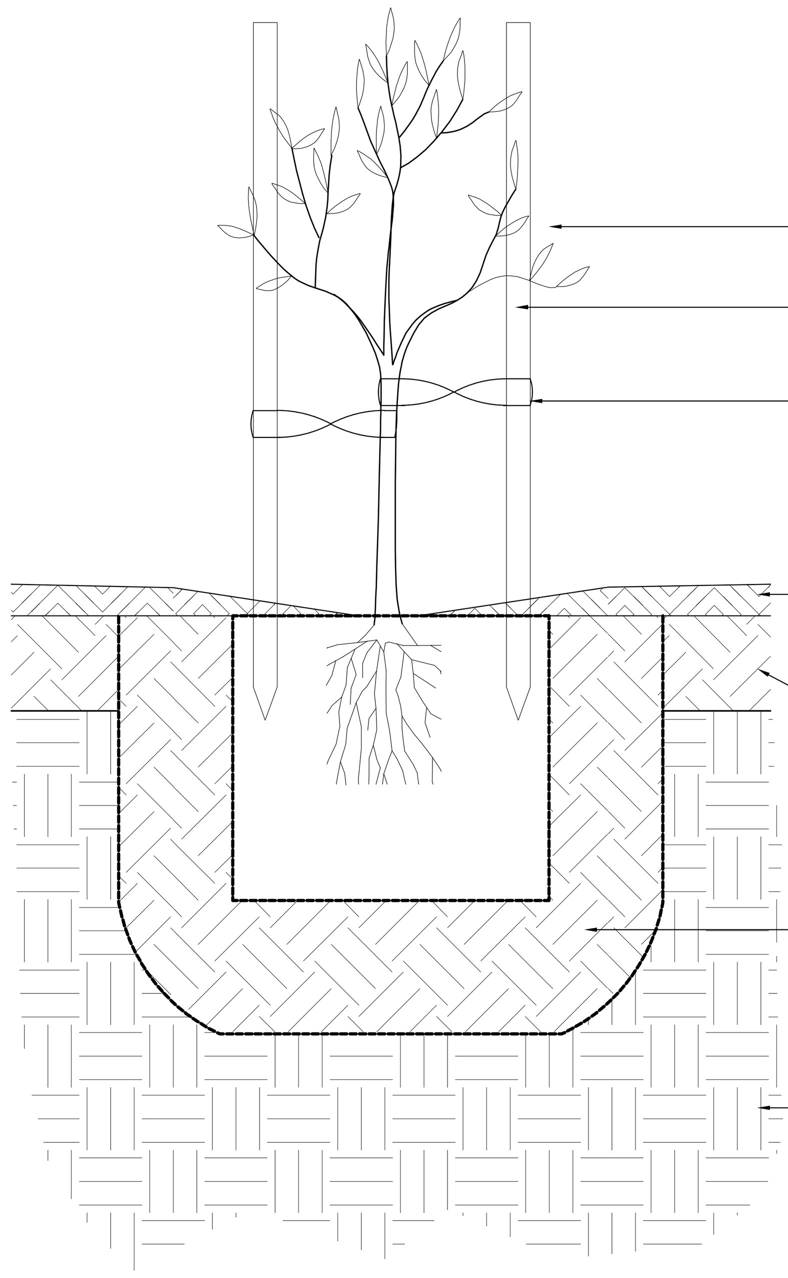
PLANTING PLAN

L02

N

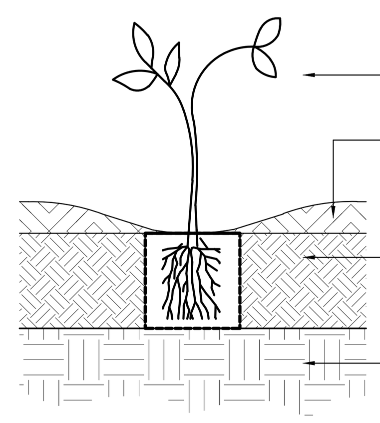
0 1 5m

SCALE @ A1: 1:200



01 L03 **TREE DETAIL**

TYPICAL TREE IN MULCH SCALE @ A1: 1:10



02 L03 **SHRUB DETAIL**

TYPICAL SHRUB IN MULCH SCALE @ A1: 1:10

NOTES

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LEGEND

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HOLLYWOOD HOSPITAL

CLIENT: HOLLYWOOD HOSPITAL

DETAILS
L03

N

SCALE @ A1: 1:10

1 Western end of Verdun Street - generally overgrown and unkempt.

2 Generally poor quality with many larger shrubs dying back and past their peak.

3 Dead trees existing within the area should be removed.

4 Eucalyptus macrocarpa should be preserved and surrounding area should be planted out.

5 Damaged Eucalypt compromised by Washingtonia robusta.The palm should be removed to protect the Eucalyptus.

6 Existing Cypress currently impacts the landscape and should be removed and replaced with a variety of local flora.

7 Self-seeded Eucalyptus should be removed as they will eventually impact on the richer landscape below.

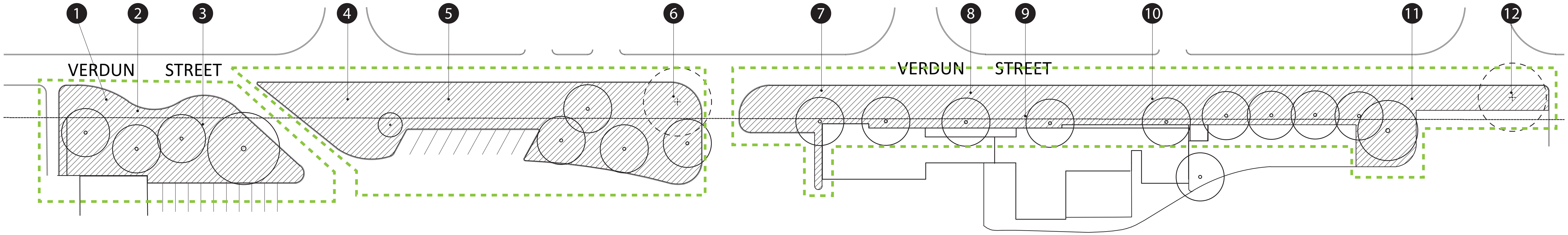
8 Grape vine which is impeding on the local flora. This is to be removed. As with all exotics.

9 Existing Oleander along boundary should be removed. Sparse area adjacent should be planted out.

10 Jacaranda to be removed to maintain native theme. Potential for this tree to be relocated to another area on site.

11 Hibiscus to be removed and bare ground to be planted out with new material. Surrounding shrubs to be pruned and managed appropriately.

12 Existing Cypress at the eastern end of Verdun street needs to be removed to strengthen the native planting which will be established through the rest of Verdun.



PULLYBLANK PTY LTD

AUTHOR: MH QA: SP PROJECT NO: PLA1304

1-750 @ A3

0 2 4 6 8 10 20m

Tree to be removed

Tree to be retained

Mass Shrub Planting

HOLLYWOOD HOSPITAL

VERDUN STREET LANDSCAPE

SK01

Acacia ashbyae

Dense, spreading, rounded shrub. Grows to 1.5-2m high, yellow flower, bird attracting, endemic species.

Eucalyptus rhodantha

Low spreading tree up to 4m, impressive flower, bird attracting, silver foliage.

Scaevola crassifolia 'Fat Freddie'

Ground cover, to 0.2m high, small blue flowers, this has thrived on site.

Grevillea thelemaniana

Grows to 1.5m high, endemic to Western Australia, bird attracting, red/pink flower.

Banksia repens

Small shrub, to 1m high, orange and yellow flower, bird attracting, endemic specie.

Eucalyptus macrocarpa

Spreading/sprawling mallee, 0.8-5m high, smooth bark, red-pink flower, bird attracting.

Anigozanthus flavidus

West Australian native, perenial flower, to 0.5-3m high, yellow flower, bird attracting.

1 Western end of Verdun Street - generally overgrown and unkempt.

2 Generally poor quality with many larger shrubs dying back and past their peak.

3 Dead trees existing within the area should be removed.

4 Eucalyptus macrocarpa should be preserved and surrounding area should be planted out.

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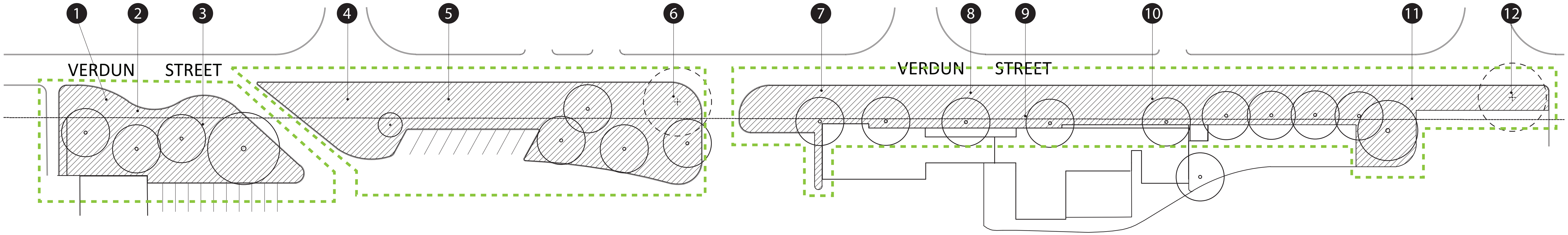

PULLYBLANK PTY LTD

AUTHOR: MH QA: SP PROJECT NO: PLA1304

1-750 @ A3

0 2 4 6 8 10 20m

Tree to be removed

Tree to be retained

Mass Shrub Planting

HOLLYWOOD HOSPITAL

VERDUN STREET LANDSCAPE

SK01

Hollywood Private Hospital Masterplan

Part 2

Background Reports

Background Report 1

Hollywood Private Hospital Transport Assessment, Cardno, June 2013

Hollywood Private Hospital

Transport Assessment

CEP02211

Prepared for
Ramsay Health Care Ltd

June 2013

Cardno
Shaping the Future

Document Information

Prepared for	Ramsay Health Care Ltd
Project Name	Transport Assessment
File Reference	CEP02211_Hollywood Hospital Traffic Study_DRAFT.docx
Job Reference	CEP02211
Date	June 2013

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Document Control

Version	Date	Author	Author Initials	Reviewer	Reviewer Initials
1	7 June 2013	Elaine Chan Sam Laybutt Andreas Wang	EC SL AW	Ray Cook	RC

Contents

Tables

Figures

Appendices

Executive Summary

Cardno was commissioned by Ramsay Health Care Ltd to prepare a transport assessment to accompany the *Hollywood Private Hospital (HPH) Master Plan 2013*.

Although there is no current long term building program proposed for HPH, the City requires the preparation of a transport assessment in order to identify the cumulative impacts of committed and possible future development.

The scope of this report was discussed with the City of Nedlands in May 2013 and agreement reached on the level of assessment for each of the scenario years and the critical intersections to be assessed.

Three scenarios of committed and possible future development have been considered in this assessment, as follows:

> 0-5 years (2018 assessment year) - Short term, committed development
> 6-15 years (2028 assessment year) – Medium term, potential development under consideration but not finalised
> 16+ years (beyond 2028) – Long term, possible future development

The 2018 assessment year is considered in detail as all land uses are committed. The 2028 assessment year is also considered in detail, based on assumptions about the likely form and scale of development during this period. The purpose of this assessment is to demonstrate that the scale of potential future development in this time period will not have significant impacts upon the surrounding road network. Detailed assessment of possible future development beyond 2028 has not been undertaken as this future development is subject to future changes in trends in health care provision and commercial viability.

As part of this report, an analysis was undertaken to determine the impact that each stage of the HPH Master Plan is likely to have on the surrounding road network. Background traffic growth was assumed to increase proportionally to the increase in the QEII parking cap as this is the only major traffic generator in the vicinity of the study area, while the increase in development traffic was estimated using traffic generation rates determined from surveys of existing site traffic during the AM and PM peak hours.

The analysis found that the development traffic is not likely to have any significant impacts on the surrounding traffic network for the 2018 and 2028 assessment years. For the 2028 assessment year, it was found that delays for traffic turning right from Monash Avenue into Smyth Road during the PM Peak Hour increase to approximately 45 seconds, with an average queue length of approximately 9 vehicles. Construction of a small roundabout at this intersection would reduce the delays for right turning vehicles and improve the operation of the intersection. However, it must be noted that if background traffic growth is lower than the conservative estimate then any delays for right turning vehicles will be lower than stated above.

Traffic generation at HPH beyond 2028 will generally be restricted by the availability of parking on site. As the 1800 space parking cap is reached by 2028, any further person trips generated by development at HPH will need to be accommodated either in off-peak times when parking is available on site or by alternative modes such as public transport, walking and cycling.

To assist with mode shift, HPH has been operating with a Green Transport Plan since 2004 and it is proposed that this Plan will be reviewed and updated by Cardno in 2013 to reflect current conditions. Consistent with this plan, significant improvements to end of trip facilities are proposed as part of the Stage 1 (2018) development and further improvements will be provided as part of future development beyond 2018.

An appraisal of public transport accessibility for workers and visitors to HPH has been undertaken. HPH has reasonable accessibility by public transport compared to most other locations in Perth, however it does suffer from longer walking distances from most bus routes compared to neighbouring Queen Elizabeth II Medical Centre (QEIIMC) which is the focal point for public transport in the area. Recommendations have been made for gradual improvements over time to ensure that an appropriate level of service is provided to encourage HPH visitors and employees to shift from driving to sustainable transport modes.

1 Introduction

1.1 Background

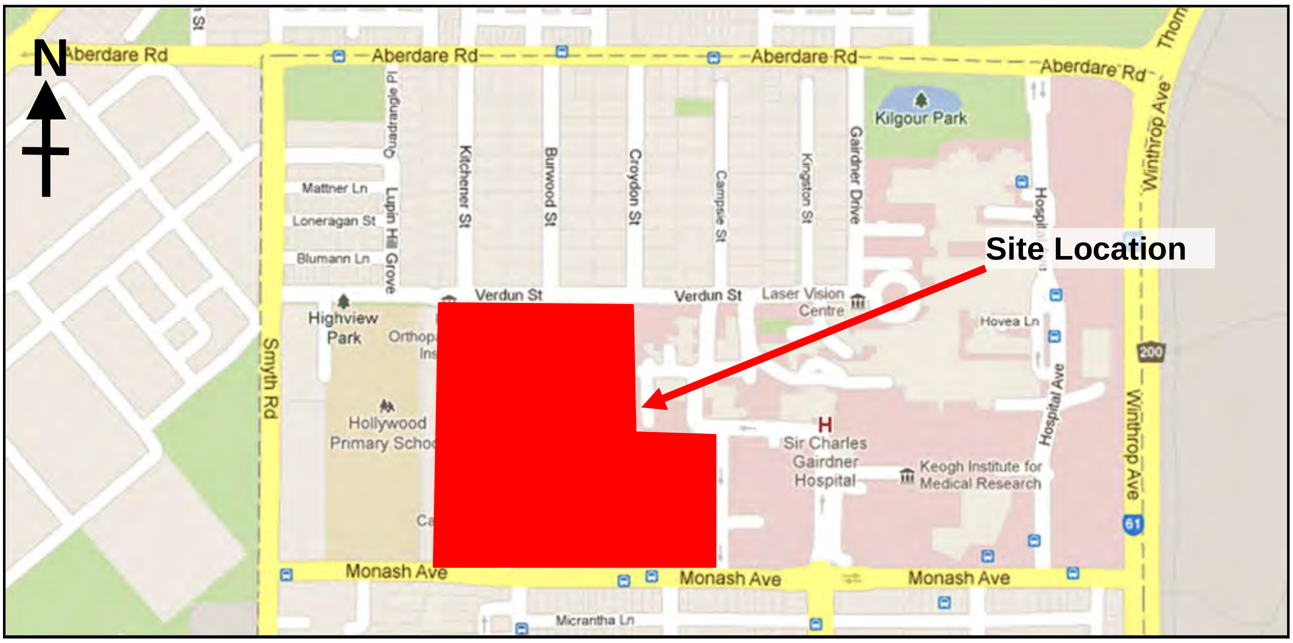
Cardno was commissioned by Ramsay Health Care Ltd to undertake a Traffic Assessment of the Master Plan for the future development of Hollywood Private Hospital (HPH), located at Monash Avenue, Nedlands, WA 6009.

This report has been prepared in accordance with the Western Australian Planning Commission (WAPC) *Transport Assessment Guidelines for Developments: Volume 4 – Individual Developments (2006)* and the checklist is included at Appendix A. Specifically, this report aims to assess the impacts of the proposed development upon the adjacent road network, with a focus on traffic operations, access and circulation, and car parking provision. This report also assesses the existing and future public, cycle and walking transport infrastructure, as well as the road geometries and functional road classifications.

1.2 Site Location

The site is located at Monash Avenue, Nedlands, as indicated on **Figure 1-1**. The site is bounded by Monash Avenue to the south and Verdun Street to the north.

Figure 1-1 Site Location



(Source: Google Maps, May 2013)

1.3 Previous Reports

Significant development has occurred at neighbouring Queen Elizabeth II Medical Centre (QEIIMC) over the past 5-10 years which has been the subject of several traffic and transport assessments.

As part of the 2007 QEII Medical Centre Masterplan, a traffic study was undertaken in order to assess the traffic impacts of an expansion of the Medical Centre site, with further revisions undertaken in 2009 and 2010. An overview of the results of the studies indicates that the road network has sufficient capacity to accommodate the relatively small increase in traffic from any expansion of HPH. In assessing the traffic studies for QEII, the City of Subiaco similarly concluded that the roads and intersections which would be affected have sufficient capacity to accommodate the anticipated increase in traffic volumes.

The base traffic data used within these studies is now over 5 years old and does not reflect the significant subsequent changes in traffic flows around QEIIMC. The City of Nedlands has therefore requested an up to date transport assessment to accompany the HPH Master Plan.

1.4 Report Purpose & Scope

This transport assessment has been prepared to accompany the Hollywood Private Hospital Master Plan 2013, prepared by Landvision Pty Ltd and to meet the requirements of the City of Nedlands.

Although there is no current long term building program proposed for HPH, the City requires the preparation of a transport assessment in order to identify the cumulative impacts of committed and possible future development.

The scope of this report was discussed with the City of Nedlands in May 2013 and agreement reached on the level of assessment for each of the scenario years and the critical intersections to be assessed.

Three scenarios of committed and possible future development have been considered in this assessment, as follows:

- 0-5 years (2018 assessment year) - Short term, committed development
- 6-15 years (2028 assessment year) – Medium term, potential development under consideration but not finalised
- 16+ years (beyond 2028) – Long term, possible future development

The 2018 assessment year is considered in detail as all land uses are committed. The 2028 assessment year is also considered in detail, based on assumptions about the likely form and scale of development during this period. The purpose of this assessment is to demonstrate that the scale of potential future development in this time period will not have significant impacts upon the surrounding road network.

It is not possible at this stage to consider development beyond 2028 in any great detail. The Master Plan indicates the location and scale of future possible building sites (i.e. 'Future Development Zones') only; no details are available in regard to the type and intensity, and therefore traffic generation, of this possible future development. Further, it is understood from HPH that commercial considerations mean that future development beyond 2028 may never eventuate. Nonetheless, some commentary on the transport impacts and requirements for possible development beyond 2028 is provided.

2 Existing Situation

2.1 Site History

HPH was constructed during World War II by the Commonwealth Government as a 500 bed hospital to care for service men and women and was first occupied in 1941. In 1947, control of the hospital was passed to the Repatriation Commission to provide acute care for veterans and war widows and it became the Repatriation General Hospital Hollywood.

Ramsay Health Care, an Australian owned company, became the owner/operator in 1994 and remains the current owner. From its modest beginnings the Hospital has emerged as an acknowledged Centre of Excellence in several medical specialities including orthopaedics, urology, cardiology, psychiatry and oncology. The hospital currently has a licence to treat 726 patients and for 492 beds in any one day providing care for private patients and entitled war veterans and war widows.

Over the past 5 years HPH has carried out a major redevelopment of its hospital facilities, access and parking which is reflected in the Master Plan included at Appendix B.

The improvements include:

> upgrading theatre staff accommodation and the sterile supply department;
> construction of a new gastroenterology unit;
> construction of new operating theatres;
> construction of a new ward block;
> construction of a multi storey car park;
> construction of an additional Day Surgery, Day Procedure Unit and Accommodation;
> construction of Hollywood Medical Centre (dedicated Specialist suites); and
> extensive landscaping of the Verdun Street verge in cooperation with the City of Nedlands.

2.2 Site Context

The site is currently occupied by the Hollywood Private Hospital. The existing surrounding land uses consist of the following, as indicated on **Figure 2-1**.

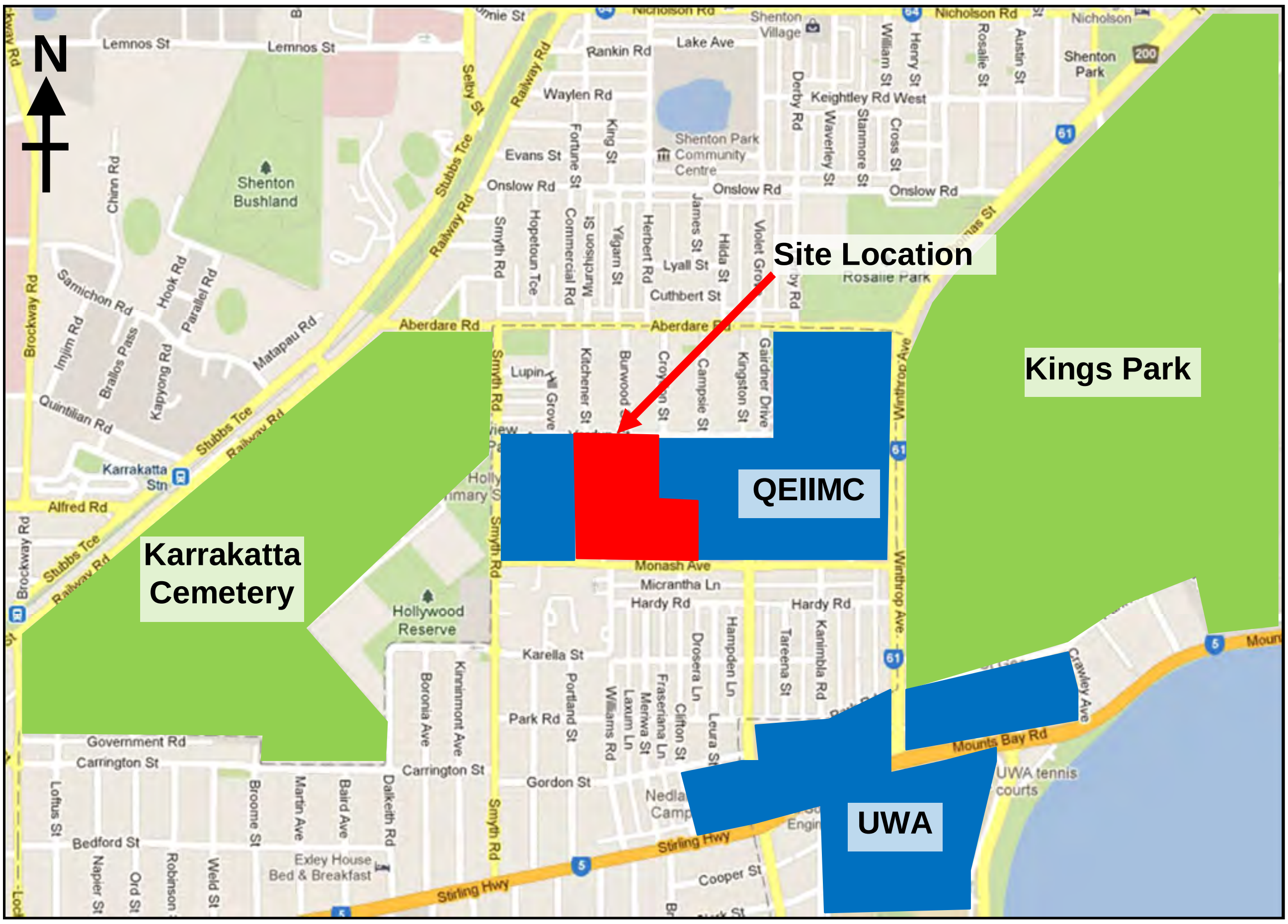
> Parks and recreation uses (in green)
> Residential uses (in grey)
> QEIIMC, UWA and Hollywood Primary School (in dark blue)
> Hollywood Private Hospital (in red)

2.3 Existing Road network

The following discusses the characteristics of the surrounding road network:

> **Monash Avenue** is classified as a *Distributor B* according to the MRWA *Metropolitan Functional Road Hierarchy* with a posted speed of 50km/h. It is a two-lane single carriageway with a sealed width of approximately 7.2m. The section between Smyth Road and Williams Road North has a school zone speed limit of 40km/h during the two periods 7:30am to 9:00am and 2:30pm to 4:00pm on school days. On-street indented parking is provided on both sides of the road between Smyth Road and Williams Road North and on the northern side of the road only between Williams Road North and Clifton Street.
> **Smyth Road** is classified as a *Distributor B* according to the MRWA *Metropolitan Functional Road Hierarchy* with a posted speed of 50km/h. It is a two-lane single carriageway with a sealed width of approximately 7.2m. Sealed shoulders are provided on both sides of the road, with a width of approximately 2.0m. The section of road approximately 160m to the north and 70m to the south of the Monash Avenue/Smyth Road intersection has a school zone speed limit of 40km/h during the two periods 7:30am to 9:00am and 2:30pm to 4:00pm on school days. A blister island has been installed at approximately 170m north of the Monash Avenue/Smyth Road intersection.

Figure 2-1 Existing Surrounding Land Uses



(Source: Google Maps, May 2013)

> **Verdun Street** is classified as an *Access Road* according to the MRWA *Metropolitan Functional Road Hierarchy* with a posted speed of 50km/h. It is a two-lane single carriageway with a sealed width of approximately 6.2m. On-street indented parking is provided on the northern side at the western end of the road before the corner of Verdun Street/Lupin Hill Grove intersection. No parking is allowed along the remainder of the road. A slow point treatment has been installed between Lupin Hill Grove and Kitchener Street.

2.4 Existing Intersections

The following intersections are located within the immediate locality of the site:

> **Monash Avenue/Hampden Road intersection** is located at approximately 140m south-east of the site. The intersection is a four-way roundabout controlled intersection comprising single approach and departure lanes on both roads, with the exception of the north approach which is restricted to one-way entry only.

> **Monash Avenue/Smyth Road intersection** is located at approximately 200m south-west of the site. The intersection is a three-way Stop controlled intersection comprising single approach and departure lanes on both roads.

> **Smyth Road/Verdun Street intersection** is located at approximately 200m north-west of the site. The intersection is a three-way uncontrolled intersection comprising single approach and departure lanes on both roads.

2.5 Existing Traffic Volumes

Existing traffic volumes (collected in November 2012) were obtained from Main Roads for key road sections in the vicinity of the site and these are summarised in **Table 2-1**.

Table 2-1 Existing Traffic Volumes

Location	Average Weekday Traffic Volumes (two-way) (vehicles per hour)		
	Daily	AM Peak (8:00am-9:00am)	PM Peak (5:00pm-6:00pm)
Monash Avenue, west of Hampden Road	8,919	654	543
Smyth Road, north of Monash Avenue	12,008	1,143	1,045
Hampden Road, south of Monash Avenue	7,295	584	598

2.6 Existing Intersection Operational Performance

In order to analyse the existing performance of the intersections within the study area, traffic counts were conducted in May 2013 during the AM and PM peak hours at the following intersections:

> Monash Avenue/Hampden Road
> Monash Avenue/Smyth Road
> Smyth Road/Verdun Street
> Monash Avenue/ Site Access Entry 1
> Monash Avenue/ Site Access Entry 2
> Monash Avenue/ Site Access Entry 3
> Monash Avenue/ Site Access Entry 5
> Verdun Street/Site Access Entry 6
> Verdun Street/Site Access Entry 7

The Monash Avenue/Site Access Entry 4 intersection has not been assessed as operates in an 'in only' configuration and therefore the conflicts between traffic streams are minimal.

The Intersections have been analysed using SIDRA Intersection v5.1. SIDRA calculates the performance of intersection based on input parameters, including geometry and traffic volumes. As an output SIDRA provides values for Degree of Saturation (DOS), queue lengths and delays. The generally accepted upper limits for the DOS (where it is considered that the operation of the intersection is constrained) are:

> 0.80 for unsignalised intersections
> 0.85 for roundabouts
> 0.95 for signalised intersections

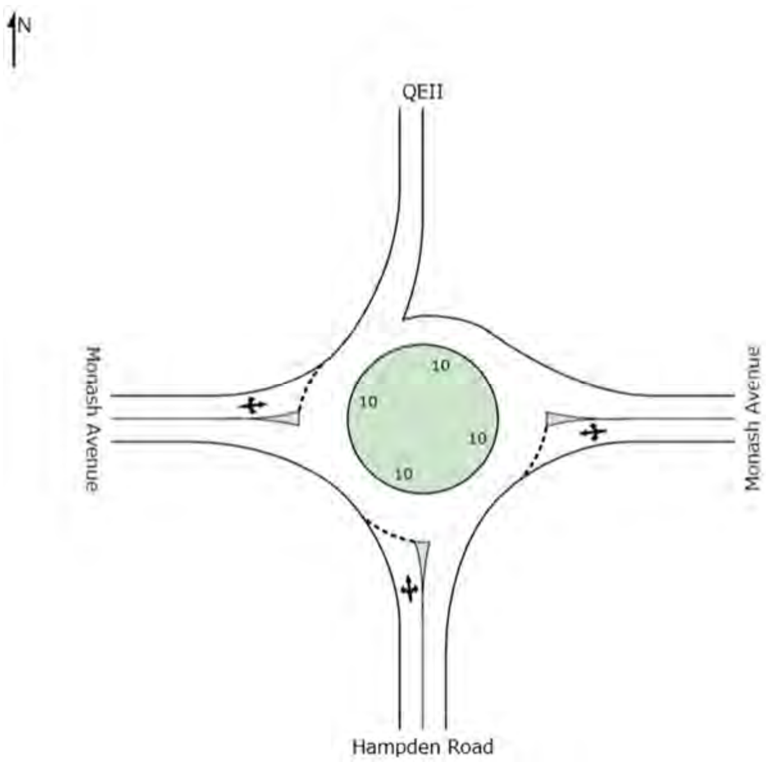
A DOS exceeding these values indicates that the intersection is exceeding its practical capacity. Above these values, users of the intersection are likely to experience unsatisfactory queuing and delays during peak periods.

The results of the existing intersection performance assessment are summarised in the following sections. SIDRA outputs have not been provided, however these are available upon request.

2.6.1 Monash Avenue/Hampden Road Intersection

This assessment analyses the Monash Avenue/Hampden Road intersection for the existing traffic. The existing intersection configuration is a 4-way roundabout with the northern leg as one-way entry only, as shown on **Figure 2-2**.

Figure 2-2 Monash Avenue/Hampden Road Intersection Existing Layout



The results from the assessment of this intersection are summarised in **Table 2-2** below.

Table 2-2 Monash Avenue/Hampden Road Intersection Performance - 2013

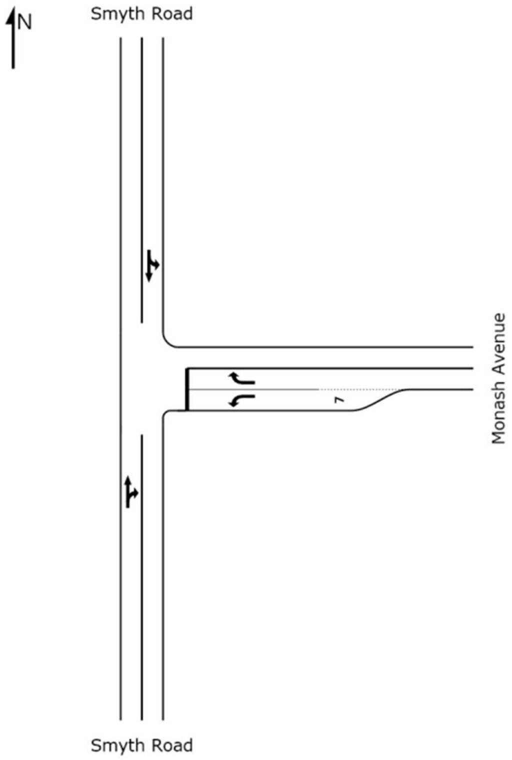
Intersection Approach		Weekday AM Peak Hour				Weekday PM Peak Hour			
		DOS	Delay (s)	LOS	95% Queue (m)	DOS	Delay (s)	LOS	95% Queue (m)
Hampden Road (S)	L	0.350	9.5	A	16.5	0.293	8.7	A	13.1
	T	0.350	8.5	A	16.5	0.293	7.6	A	13.1
	R	0.350	12.9	B	16.5	0.293	12.1	B	13.1
Monash Avenue (E)	L	0.388	8.7	A	20.0	0.268	8.1	A	12.3
	T	0.388	7.9	A	20.0	0.268	7.2	A	12.3
	R	0.388	12.0	B	20.0	0.268	11.4	B	12.3
Monash Avenue (W)	L	0.379	9.9	A	17.9	0.296	9.2	A	13.0
	T	0.379	9.2	A	17.9	0.296	8.6	A	13.0
	R	0.379	13.4	B	17.9	0.296	12.8	B	13.0

From above it is noted that the intersection currently operates well within acceptable capacity limits during both peak hour periods. Weekday AM peak period operates slightly busier than PM peak period however the maximum queuing length is 20.0m with an average delay of 8.7 seconds on Monash Avenue which is approximately the length of 3 cars. Therefore, no modification to the intersection geometry is required at this location.

2.6.2 Monash Avenue/Smyth Road Intersection

This assessment analyses the Monash Avenue/Smyth Road intersection for the existing traffic. The existing intersection configuration is a 3-way Stop controlled T-intersection, as shown on **Figure 2-3**.

Figure 2-3 Monash Avenue/Smyth Road Intersection Existing Layout



The results from the assessment of this intersection are summarised in **Table 2-3** below.

Table 2-3 Monash Avenue/Smyth Road Intersection Performance - 2013

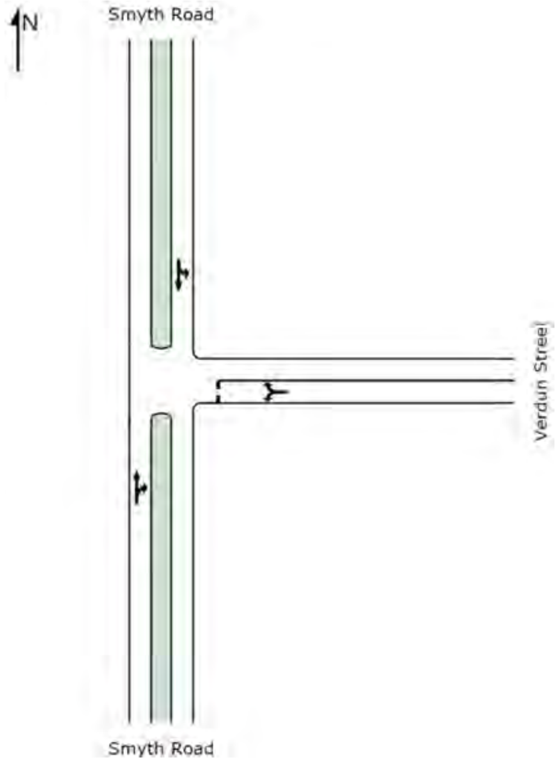
Intersection Approach		Weekday AM Peak Hour				Weekday PM Peak Hour			
		DOS	Delay (s)	LOS	95% Queue (m)	DOS	Delay (s)	LOS	95% Queue (m)
Smyth Road (S)	T	0.273	2.4	A	14.8	0.227	2.1	A	13.0
	R	0.273	10.8	B	14.8	0.227	10.5	B	13.0
Monash Avenue (E)	L	0.079	11.9	B	0.9	0.172	12.2	B	2.2
	R	0.060	16.6	C	1.4	0.520	21.7	C	19.1
Smyth Road (N)	L	0.248	8.3	A	0.0	0.216	8.3	A	0.0
	T	0.248	0.0	A	0.0	0.216	0.0	A	0.0

From the above it is noted that the intersection currently operates well within acceptable capacity limits during both peak hour periods. The maximum queuing distance is 19.1m with an average delay of 21.7 seconds on Monash Avenue during the PM peak period which is approximately the length of 3 cars. Therefore, no modification to the intersection geometry is required at this location.

2.6.3 Smyth Road/Verdun Street Intersection

This assessment analyses the Smyth Road/Verdun Street intersection for the existing traffic. The existing intersection configuration is a 3-way uncontrolled T-intersection, as shown on **Figure 2-4**.

Figure 2-4 Smyth Road/Verdun Street Intersection Existing Layout



The results from the assessment of this intersection are summarised in **Table 2-4** below.

Table 2-4 Smyth Road/Verdun Street Intersection Performance - 2013

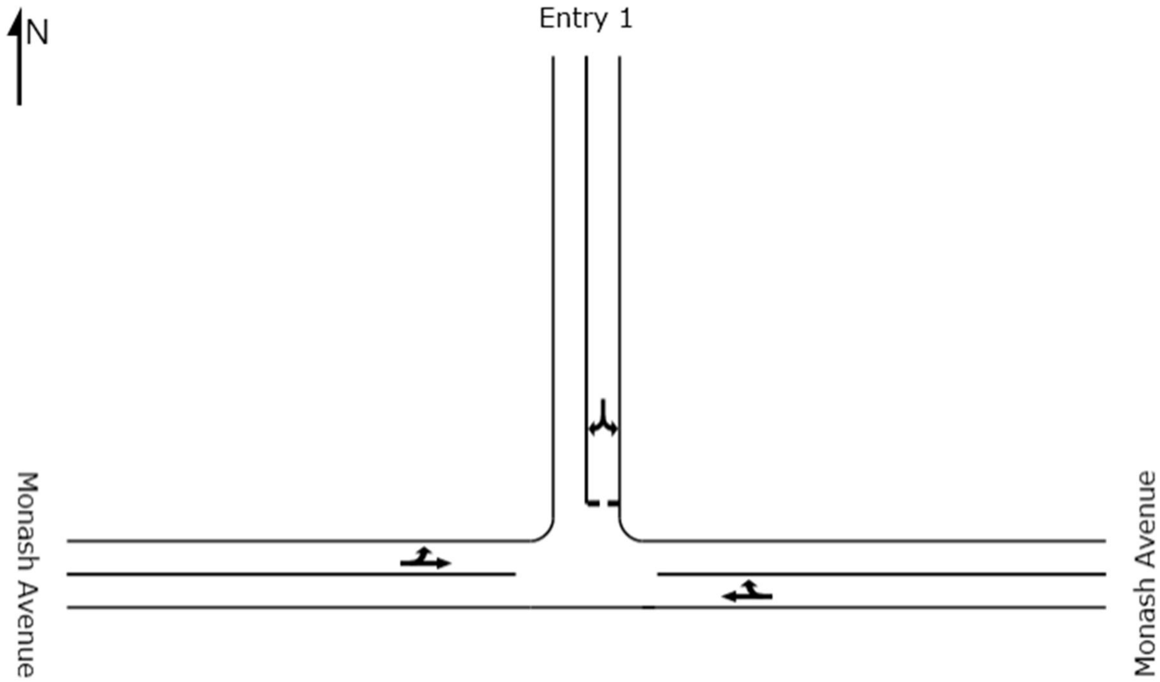
Intersection Approach		Weekday AM Peak Hour				Weekday PM Peak Hour			
		DOS	Delay (s)	LOS	95% Queue (m)	DOS	Delay (s)	LOS	95% Queue (m)
Smyth Road (S)	T	0.273	2.4	A	14.8	0.227	2.1	A	13.0
	R	0.273	10.8	B	14.8	0.227	10.5	B	13.0
Verdun Street (E)	L	0.079	11.9	B	0.9	0.172	12.2	B	2.2
	R	0.048	15.3	C	1.2	0.414	18.4	C	14.5
Smyth Road (N)	L	0.248	8.3	A	0.0	0.216	8.3	A	0.0
	T	0.248	0.0	A	0.0	0.216	0.0	A	0.0

From above it is noted that the intersection currently operates well within acceptable capacity limits during both peak hour periods. The maximum queuing distance is 22.7m with an average delay of 10.7 seconds on Smyth Road during the PM peak period which is approximately the length of 3 cars. Therefore, no modification to the intersection geometry is required at this location.

2.6.4 Monash Avenue/ Site Access Entry 1 Intersection

This assessment analyses the Monash Avenue/ Site Access Entry 1 intersection for the existing traffic. The existing intersection configuration is a 3-way uncontrolled T-intersection, as shown on **Figure 2-5**.

Figure 2-5 Monash Avenue/ Site Access Entry 1 Intersection Existing Layout



The results from the assessment of this intersection are summarised in **Table 2-5** below.

Table 2-5 Monash Avenue/ Site Access Entry 1 Intersection Performance - 2013

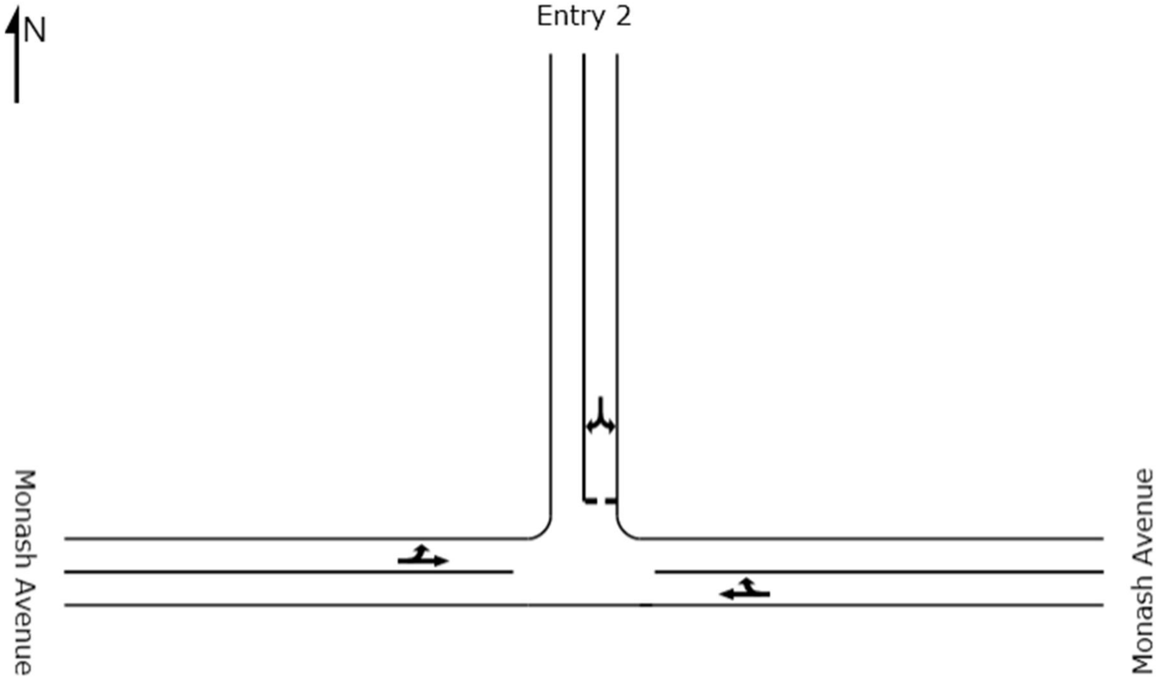
Intersection Approach		Weekday AM Peak Hour				Weekday PM Peak Hour			
		DOS	Delay (s)	LOS	95% Queue (m)	DOS	Delay (s)	LOS	95% Queue (m)
Monash Avenue (E)	T	0.069	1.2	A	3.2	0.163	0.8	A	7.4
	R	0.069	9.6	A	3.2	0.163	9.2	A	7.4
Entry 1 (N)	L	0.021	9.7	A	0.5	0.025	10.1	B	0.6
	R	0.021	10.0	A	0.5	0.025	10.4	B	0.6
Monash Avenue (W)	L	0.175	8.2	A	0.0	0.108	8.2	A	0.0
	T	0.175	0.0	A	0.0	0.108	0.0	A	0.0

From above it is noted that the intersection currently operates well within acceptable capacity limits during both peak hour periods, with queuing and long delays are unlikely to occur. Therefore, no modification to the intersection geometry is required at this access location.

2.6.5 Monash Avenue/ Site Access Entry 2 Intersection

This assessment analyses the Monash Avenue/ Site Access Entry 2 intersection for the existing traffic. The existing intersection configuration is a 3-way uncontrolled T-intersection, as shown on **Figure 2-6**.

Figure 2-6 Monash Avenue/ Site Access Entry 2 Intersection Existing Layout



The results from the assessment of this intersection are summarised in **Table 2-6** below.

Table 2-6 Monash Avenue/ Site Access Entry 2 Intersection Performance - 2013

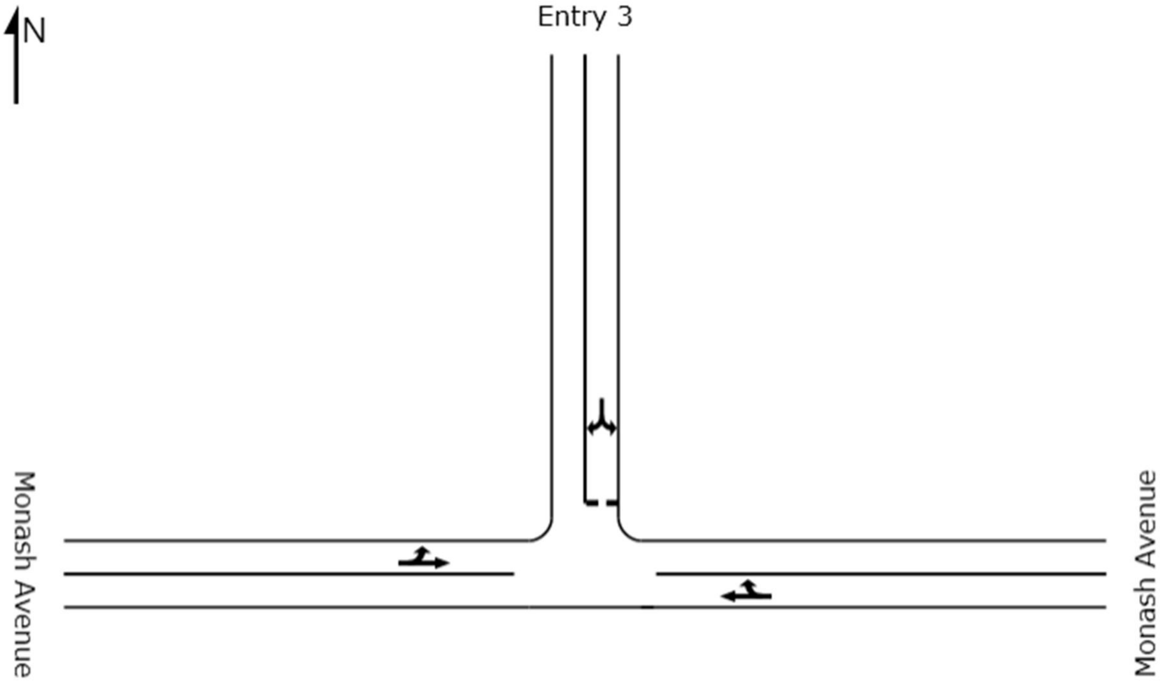
Intersection Approach		Weekday AM Peak Hour				Weekday PM Peak Hour			
		DOS	Delay (s)	LOS	95% Queue (m)	DOS	Delay (s)	LOS	95% Queue (m)
Monash Avenue (E)	T	0.116	1.4	A	5.2	0.190	0.8	A	8.8
	R	0.116	9.9	A	5.2	0.190	9.3	A	8.8
Entry 2 (N)	L	0.069	10.4	B	1.8	0.068	10.6	B	1.7
	R	0.069	10.6	B	1.8	0.068	10.8	B	1.7
Monash Avenue (W)	L	0.194	8.2	A	0.0	0.113	8.2	A	0.0
	T	0.194	0.0	A	0.0	0.113	0.0	A	0.0

From above it is noted that the intersection currently operates well within acceptable capacity limits during both peak hour periods, with queuing and long delays are unlikely to occur. Therefore, no modification to the intersection geometry is required at this access location.

2.6.6 Monash Avenue/ Site Access Entry 3 Intersection

This assessment analyses the Monash Avenue/ Site Access Entry 3 intersection for the existing traffic. The existing intersection configuration is a 3-way uncontrolled T-intersection, as shown on **Figure 2-7**.

Figure 2-7 Monash Avenue/ Site Access Entry 3 Intersection Existing Layout



The results from the assessment of this intersection are summarised in **Table 2-7** below.

Table 2-7 Monash Avenue/ Site Access Entry 3 Intersection Performance - 2013

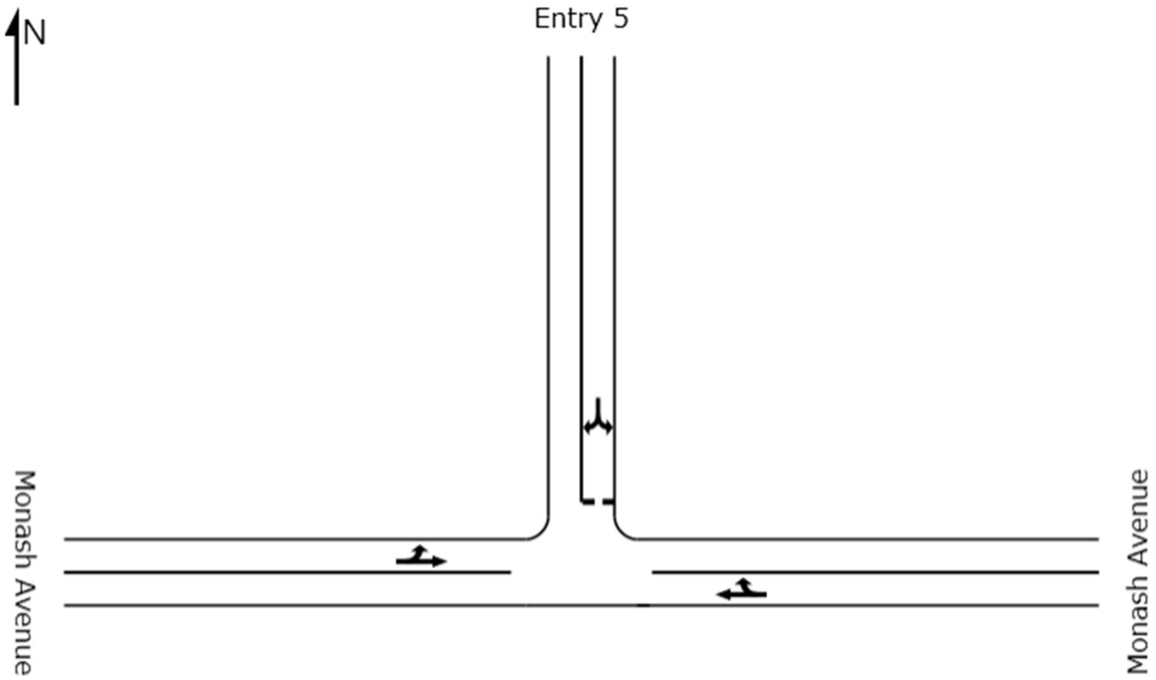
Intersection Approach		Weekday AM Peak Hour				Weekday PM Peak Hour			
		DOS	Delay (s)	LOS	95% Queue (m)	DOS	Delay (s)	LOS	95% Queue (m)
Monash Avenue (E)	T	0.100	1.4	A	4.6	0.174	0.9	A	8.1
	R	0.100	9.8	A	4.6	0.174	9.4	A	8.1
Entry 3 (N)	L	0.038	10.8	B	0.9	0.055	11.2	B	1.3
	R	0.038	11.0	B	0.9	0.055	11.5	B	1.3
Monash Avenue (W)	L	0.192	8.2	A	0.0	0.125	8.2	A	0.0
	T	0.192	0.0	A	0.0	0.125	0.0	A	0.0

From above it is noted that the intersection currently operates well within acceptable capacity limits during both peak hour periods, with queuing and long delays are unlikely to occur. Therefore, no modification to the intersection geometry is required at this access location.

2.6.7 Monash Avenue/ Site Access Entry 5 Intersection

This assessment analyses the Monash Avenue/ Site Access Entry 5 intersection for the existing traffic. The existing intersection configuration is a 3-way uncontrolled T-intersection, as shown on **Figure 2-8**.

Figure 2-8 Monash Avenue/ Site Access Entry 5 Intersection Existing Layout



The results from the assessment of this intersection are summarised in **Table 2-8** below.

Table 2-8 Monash Avenue/ Site Access Entry 5 Intersection Performance - 2013

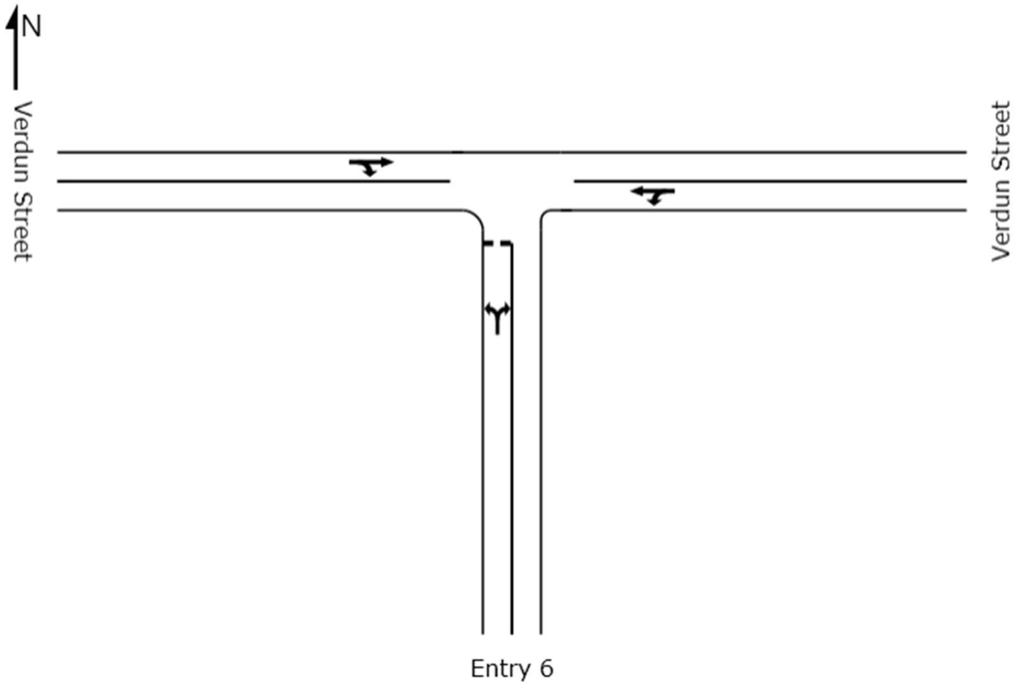
Intersection Approach		Weekday AM Peak Hour				Weekday PM Peak Hour			
		DOS	Delay (s)	LOS	95% Queue (m)	DOS	Delay (s)	LOS	95% Queue (m)
Monash Avenue (E)	T	0.204	1.6	A	8.5	0.145	0.7	A	6.5
	R	0.204	10.0	B	8.5	0.145	9.2	A	6.5
Entry 5 (N)	L	0.024	9.9	A	0.6	0.293	11.2	B	8.6
	R	0.024	10.1	B	0.6	0.293	11.5	B	8.6
Monash Avenue (W)	L	0.191	8.2	A	0.0	0.109	8.2	A	0.0
	T	0.191	0.0	A	0.0	0.109	0.0	A	0.0

From above it is noted that the intersection currently operates well within acceptable capacity limits during both peak hour periods, with queuing and long delays are unlikely to occur. Therefore, no modification to the intersection geometry is required at this access location.

2.6.8 Verdun Street/Site Access Entry 6 Intersection

This assessment analyses the Verdun Street/Site Access Entry 6 intersection for the existing traffic. The existing intersection configuration is a 3-way uncontrolled T-intersection, as shown on **Figure 2-9**.

Figure 2-9 Verdun Street/Site Access Entry 6 Intersection Existing Layout



The results from the assessment of this intersection are summarised in **Table 2-9** below.

Table 2-9 Verdun Street/Site Access Entry 6 Intersection Performance - 2013

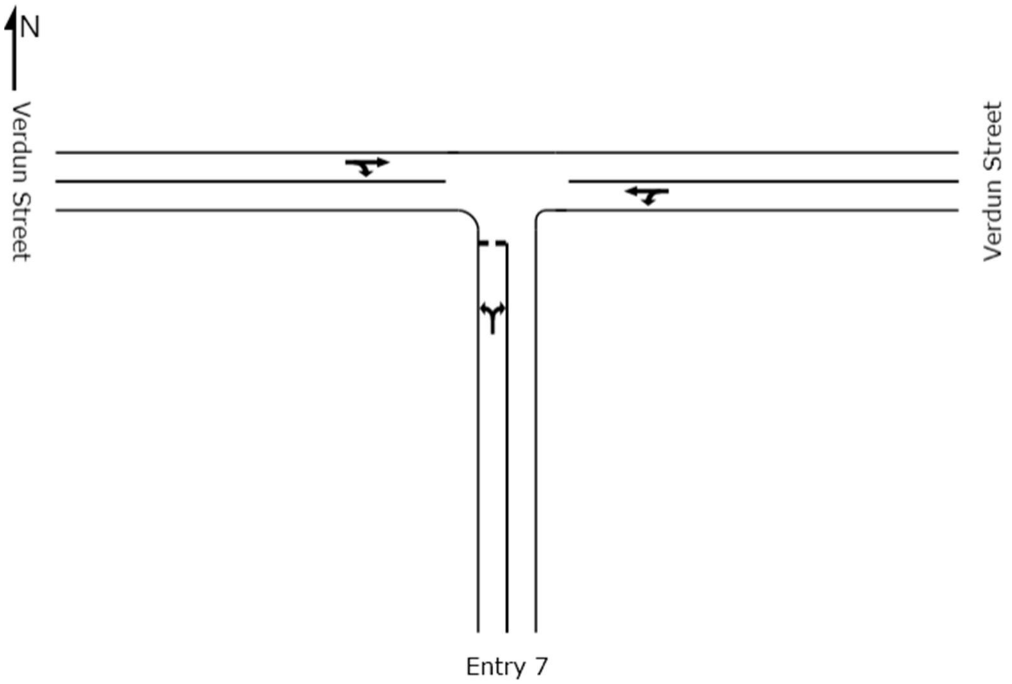
Intersection Approach		Weekday AM Peak Hour				Weekday PM Peak Hour			
		DOS	Delay (s)	LOS	95% Queue (m)	DOS	Delay (s)	LOS	95% Queue (m)
Entry 6 (S)	T	0.011	8.5	A	0.3	0.026	8.5	A	0.7
	R	0.011	8.7	A	0.3	0.026	8.8	A	0.7
Verdun Street (E)	L	0.036	8.2	A	0.0	0.047	8.2	A	0.0
	R	0.036	0.0	A	0.0	0.047	0.0	A	0.0
Verdun Street (W)	L	0.043	0.2	A	1.6	0.023	0.3	A	0.8
	T	0.043	8.6	A	1.6	0.023	8.7	A	0.8

From above it is noted that the intersection currently operates well within acceptable capacity limits during both peak hour periods, with queuing and long delays are unlikely to occur. Therefore, no modification to the intersection geometry is required at this access location.

2.6.9 Verdun Street/Site Access Entry 7 Intersection

This assessment analyses the Verdun Street/Site Access Entry 7 intersection for the existing traffic. The existing intersection configuration is a 3-way uncontrolled T-intersection, as shown on **Figure 2-10**.

Figure 2-10 Verdun Street/Site Access Entry 7 Intersection Existing Layout



The results from the assessment of this intersection are summarised in **Table 2-10** below.

Table 2-10 Verdun Street/Site Access Entry 7 Intersection Performance - 2013

Intersection Approach		Weekday AM Peak Hour				Weekday PM Peak Hour			
		DOS	Delay (s)	LOS	95% Queue (m)	DOS	Delay (s)	LOS	95% Queue (m)
Entry 7 (S)	T	0.004	8.7	A	0.1	0.021	8.7	A	0.5
	R	0.004	8.9	A	0.1	0.021	9.0	A	0.5
Verdun Street (E)	L	0.043	8.2	A	0.0	0.038	8.2	A	0.0
	R	0.043	0.0	A	0.0	0.038	0.0	A	0.0
Verdun Street (W)	L	0.038	0.2	A	1.4	0.026	0.2	A	0.9
	T	0.038	8.7	A	1.4	0.026	8.6	A	0.9

From above it is noted that the intersection currently operates well within acceptable capacity limits during both peak hour periods, with queuing and long delays are unlikely to occur. Therefore, no modification to the intersection geometry is required at this access location.

2.7 Existing Pedestrian/Cycle Networks

The existing external pedestrian/cycle network is summarised as follows:

> Footpaths (approximately 2.0m wide) provided along both sides of Monash Avenue
> Footpaths (approximately 2.0m wide) provided along both sides of Smyth Road
> Footpaths (approximately 1.5m wide) provided along the northern side of Verdun Street
> Footpaths (approximately 1.5m wide) provided along Burwood and Croydon Streets
> Shared paths (approximately 2.5m wide) provided along both sides of Hampden Road
> A low speed, low volume cycling environment along Burwood, Croydon and Verdun Streets
> A low speed but medium volume road cycling environment along Monash Avenue and Aberdare, Smyth and Hampden Roads
> Internal footpaths within the site, connecting key site access points with building entrances.

It is considered from the above that HPH is adequately served by pedestrian and cycle approach routes, particularly for staff commuting to work by foot or bicycle.

2.8 Crash Assessment

Assessment of the crash data for the five year period between 2008 and 2012 has been undertaken for Monash Avenue (between Smyth Road and Hampden Road) and Verdun Street (between Smyth Road and Burwood Street). Thirty-six crashes were recorded for the Monash Avenue section and one crash was recorded for the Verdun Street section. Summaries of the crash data analysis are presented in **Table 2-11** and **Table 2-12**.

Table 2-11 Monash Avenue (between Smyth Road and Hampden Road) Crash Statistics 2008-2012

Type of Crash	Fatal	Hospital	Medical	Major Property Damage	Minor Property Damage	Total Crashes
Rear End	0	0	3	5	4	12
Right Angle	0	0	2	5	2	9
Right Turn Thru	0	0	0	2	3	5
Sideswipe Same Direction	0	0	1	1	0	2
Hit Pedestrian	0	2	0	0	2	4
Hit Object	0	0	0	1	0	1
Other Crashes	0	0	0	1	2	3
Total	**0**	**2**	**6**	**14**	**11**	**36**

In summary,

> No fatalities were recorded.
> Two crashes that required hospital admittance were recorded:
  - Both crashes involved conflict with a pedestrian from the near side (RUM Codes: 01 – Near Side and 02: Emerging from Near Side).
> Six crashes that required medical treatment but not hospital admittance were recorded:
  - Three crashes were classified as "Rear End" crashes, which involved one through vehicle colliding with a through vehicle in front (RUM Code: 31 – Same Lane Rear End).
  - Two crashes were classified as "Right Angle" crashes with one crash involving a vehicle travelling from the east to the north colliding with a vehicle travelling from the south to the east (RUM Code: 15 – Right-Right). The other crash involved a vehicle colliding with a vehicle from an adjacent approach.
  - One crash was classified as a "Sideswipe Same Direction" crash with one vehicle from the east to the west conflicting with a vehicle leaving the on-street parking bay (RUM Code: 42 – Leaving Parking).
> Fourteen major property damage crashes were recorded.
  - Five crashes were classified as "Rear End" crashes (RUM Codes: 31 – Rear End, 32 – Left Rear and 61 – Parked).

- Five crashes were classified as “Right Angle” crashes (RUM Codes: 11 – Thru-Thru, 12 – Right-Thru, 14 – Thru-Right and 17 – Thru-Left).

> Eleven minor property damage crashes were recorded.
- Four crashes were classified as “Rear End” crashes (RUM Codes: 31 – Rear End, 32 – Left Rear and 33 – Right-Rear).
- Three crashes were classified as “Right Turn Thru” crashes (RUM Code: 22 – Thru-Right).

> It is noted that crashes classified as either “Rear End” and “Hit Pedestrian” appear over-represented compared to the network average along this section of road. The crash numbers indicate that a road safety investigation of this section of road may be justified.

> Future hospital developments are expected to increase the pedestrian and vehicle movements along Monash Avenue, therefore it is recommended that a Road Safety Audit be undertaken in the future to ensure any safety concerns have been identified and mitigated, and to ensure the risk of crash occurrence is reduced.

Table 2-12 Verdun Street (between Smyth Road and Burwood Street) Crash Statistics 2008-2012

Type of Crash	Fatal	Hospital	Medical	Major Property Damage	Minor Property Damage	Total Crashes
Rear End	0	0	0	0	1	1
Total	**0**	**0**	**0**	**0**	**1**	**1**

In summary,

> Only one crash was recorded for the five-year record period and resulted in minor property damage. The crash was a Rear End crash which involved a vehicle travelling from the east to the west along Verdun Street colliding with a parked vehicle in front (RUM Code: 61 – Parked).

3 Proposed Development

3.1 Hollywood Private Hospital Master Plan

The *HPH Master Plan 2013,* included in Appendix B, outlines three development stages or scenarios to service the expected growth in population and demand within the area for medical services and research. The timeframe of each stage is as below:

> 0-5 years (2018 assessment year) - Short term, committed development
> 6-15 years (2028 assessment year) – Medium term, potential development under consideration but not finalised
> 16+ years (beyond 2028) – Long term, possible future development subject to future review of health care trends and commercial viability

3.2 Proposed Development Scenarios

3.2.1 Stage 1: 2018 Assessment Year

Based on the Master Plan provided by HPH, the Stage 1 proposal entails the development of the following elements over the next five years:

> Expansion of the Hollywood Clinic
> Demolition of existing 30 bed ward facility
> Construction of a new theatre block including kitchen and 60 bed ward facility (i.e. a net gain of 30 beds)
> Construction of an additional floor on the existing multi-storey car park (approximately 187 additional parking bays, to be confirmed in detailed design phase)

It is estimated that the Stage 1 development will generate an additional 100 Full Time Equivalent (FTE) employees within the HPH.

3.2.2 Stage 2: 2028 Assessment Year

Although there is no current long term building plan at HPH, the Master Plan has been developed based on potential future development between 2018 and 2028 (Stage 2). In order to provide an appropriate scenario for assessment of the transport network impacts, an indicative development scheme has been adopted which consists of:

> Removal of existing at-grade parking (approximately 410 spaces) near the rear of the site
> Construction of a new 3-level multi-storey car park of approximately 540 spaces (i.e. a net gain of 130 spaces, bringing the site total to 1800 spaces)
> Construction of a 2-storey medical research facility
> Construction of 2 x 50-bed ward facilities
> Approximately 150 additional FTE employees

It must be noted that there is no current long term building plan at HPH and these proposals represent an indicative development scheme only, for the purposes of assessing the future operation of the transport network.

3.2.3 Stage 3: Beyond 2028

Although there is no current long term building plan at HPH, the City of Nedlands has required HPH to provide a Master Plan showing future development zones to ensure that future building footprints, heights, setbacks and accessibility are adequate and that any future development is consistent with an overall Master Plan.

These future development zones do not necessarily indicate an increase in size of the facilities at HPH but include locations where buildings may be renovated or replaced to replace ageing building stock.

The HPH Master Plan, included in Appendix B, identifies the following Future Development Zones:

> Future development area (approximately 700m^2 footprint)
> Future development area (approximately 700m^2 footprint)
> Future development area (approximately 900m^2 footprint)
> Future development area (approximately 1,320m^2 footprint)
> Future development area (approximately 2,880m^2 footprint)
> Future development area (approximately 700m^2 footprint)
> Approximately 400 additional FTE employees

HPH has advised that the type, scale and form of development on these sites will not be determined for many years, if ever, due to the difficulty in forecasting future trends and changes in health care research and provision. Possible land uses include a mixture of clinical/ward facilities and office/research facilities.

Due to this uncertainty about possible long term future development, it is not possible to develop an indicative scenario for the purposes of assessing the impacts on the transport network. However, it is noted that due to the WAPC-imposed parking cap of 1800 spaces being reached by 2028, any future development beyond 2028 is not likely to significantly increase the number of vehicle trips to/from the site. Instead, the person trips generated by future development will be accommodated within a general shift towards sustainable transport modes, i.e. public transport, walking and cycling.

3.3 Access arrangements

Current access arrangements will remain generally unchanged in all future scenarios, with the bulk of the vehicle traffic generated by HPH entering and exiting via Monash Avenue.

In order to minimise the impacts on residents to the north of the site, it is proposed to continue to restrict vehicle access to/from the site via Verdun Street, thereby maintaining traffic volumes at or around current levels on the Verdun Street access points. These access points will continue to remain available for use by pedestrians and cyclists.

3.4 Development Traffic Generation

3.4.1 Traffic Generation Rates

Using the traffic counts conducted during the AM and PM peak hours, peak hour traffic generation rates were determined as a function of the number of FTE employees within the HPH. The resulting traffic generation rates are summarised in **Table 3-1** below.

Table 3-1 Number of Vehicle Trips Generated per HPH Full Time Equivalent Employee

AM Peak Hour		PM Peak Hour	
Incoming	Outgoing	Incoming	Outgoing
0.375	0.135	0.099	0.351

The total volume of trips quoted above includes staff, patients, visitors and delivery vehicles.

3.4.1 Stage 1: 2018 Assessment Year

Based on the information provided by HPH, Stage 1 of the proposed development is anticipated to result in an additional 100 FTE employees within the HPH – representing an increase from approximately 1,100 FTE employees to 1,200 FTE employees. The resulting traffic generation of the Stage 1 development is summarised in **Table 3-2** below.

Table 3-2 Vehicle Trip Generation for Stage 1 Development (2018)

AM Peak Hour		PM Peak Hour	
Incoming	Outgoing	Incoming	Outgoing
464	159	120	414

3.4.2 Stage 2: 2028 Assessment Year

Based on the information provided by HPH, Stage 2 of the proposed development is anticipated to result in an additional 150 FTE employees within the HPH – representing an increase from approximately 1,200 FTE employees to 1,350 FTE employees. The resulting traffic generation of the Stage 2 development is summarised in **Table 3-3** below.

Table 3-3 Vehicle Trip Generation for Stage 2 Development (2028)

AM Peak Hour		PM Peak Hour	
Incoming	**Outgoing**	**Incoming**	**Outgoing**
514	176	133	458

During this period, the WAPC-imposed parking cap of 1800 spaces will be reached and therefore maximum parking supply will be reached. A combination of gradually increasing parking constraint, improvements in public transport and HPH TravelSmart incentives is expected to reduce the rate of vehicle trip generation by 2028. However, in order to present a conservative, worst case, scenario for the intersection analysis it has been assumed that no significant reduction in this rate has occurred.

3.4.3 Stage 3: Post-2028

Based on the information provided by HPH, Stage 3 of the proposed development may result in an additional 400 FTE employees within the HPH – representing an increase from approximately 1,350 FTE employees to 1,700 FTE employees.

In the absence of any further details regarding the type, form and intensity of future development beyond 2028, it is not possible to estimate with any accuracy the potential traffic generation. However, it must be noted that as the parking cap has been reached by 2028, there will be a much lower rate of traffic generation in future developments and this traffic will mainly occur during off-peak periods when parking availability is higher. Additional peak hour demands for person trips to/from the HPH will be accommodated through modal shift towards public transport, walking and cycling.

3.5 Development Traffic Distribution

A simple gravity model related to existing turning proportions has been used to estimate the likely traffic distribution to/from the site and the assumed distribution is presented in **Figure 3-1**. The distribution of development traffic to/from each site access is shown in red and the distribution of development traffic at each critical intersection is shown in black.

Figure 3-1 Development Traffic Distribution Proportions

Note: 5% of traffic enters the site via ‘Entry 4’ which is not shown on the above figure.

The estimated distribution is based on:

> The likely location of car parking relative to the location of proposed developments on site
> Limiting access via Verdun Street to similar vehicle volumes as currently exists
> The location of residential areas which are likely to form part of the catchment
> Approach routes to the site

3.6 Vehicle Parking Provision

Car parking at HPH is restricted by the WAPC-imposed cap of 1800 parking spaces. It is understood that once this cap is reached, no additional parking spaces will be approved.

Currently, approximately 1,450 parking spaces are provided at HPH. Future increases in parking provision by development stage are outlined in Table 3-4.

Table 3-4 Car Parking Provisions

Stage	Number of Bays	Proposed Net Increase in Bays	Total Number of Bays at end of Stage
1 (2018)	1450	Approx 187 (to be finalised in detailed design phase)	Approx 1670
2 (2028)	Approx 1670	Approx 130 (to be finalised in detailed design phase)	1800
3 (beyond 2028)	1800	Nil	1800

As shown above, the parking cap is reached by the end of Stage 2 (2028).

3.7 Pedestrian and Cycling Facilities

The pedestrian and cycling facilities described in Chapter 2.7 of this report are generally adequate for present demand for walking and cycling, and no short term changes are therefore proposed. In future years, as demand for cycling grows, improvements to the on-street cycling environment may be desirable to encourage cyclists to use the road and reduce the potential for conflicts with pedestrians on the path network. However, this should form part of a new Council-wide Local Bike Plan.

Within the site, a covered pedestrian route is presently provided which links the main buildings. As future development occurs in the northern section of the site, the covered pedestrian route will be extended to provide access to/from the new buildings.

Cyclists will continue to be able to use the internal road network to circulate around the site and reach their individual building, as well as using the path network.

3.8 Internal road layout

The proposed internal road layout is shown in the HPH Master Plan 2013, located at Appendix B.

There are no significant changes proposed, with only some minor alterations in the road network proposed in the northern section of the site to suit the proposed building footprints. These changes will have no noticeable impact on the functioning or capacity of the internal road network.

3.9 Other Committed Development

Significant development of the QEIIMC has been undertaken over the past 5 years and is ongoing. Key recent and ongoing developments at QEIIMC include:

> New multi-deck car park on Winthrop Avenue (opened October 2012)
> New Comprehensive Cancer Centre (completed January 2013)
> Redevelopment of WA Institute of Medical Research (WAIMR)
> Redevelopment of PathWest building (completion expected 2013)
> New adult Mental Health unit (completion expected 2015)
> New Childrens Hospital (completion expected late 2015)
> Neuroscience Research Facility (pending development approval)

The transport network impacts of these developments are significant, particularly in comparison to the much smaller developments planned for HPH.

The WAPC has imposed a cap of 3,850 staff parking spaces and 1,150 visitor parking spaces (total 5,000 spaces) at QEIIMC in order to limit the impact of developments on the surrounding road network. It is anticipated, based on current development and delivery schedules, that the parking cap will be reached by the end of 2016 and that no further significant volumes of parking will be provided at QEIIMC beyond this time.

The result of this is that vehicular traffic generated by QEIIMC will increase substantially in the short term as additional parking supply becomes available but the growth in vehicle trips will slow to near zero beyond this point as no additional parking is provided. This has been accounted for as part of the traffic analysis included in Chapter 4.

4 Traffic Analysis

4.1 Intersection Assessment

Analysis of the current performance of critical intersections was provided in Section 2.6 for comparison purposes with the future intersection performance analysis within this chapter.

Analysis of future performance has been carried out for the following intersections under the three stages, Stage 1 (2018 assessment year), Stage 2 (2028 assessment year) and Stage 3 (beyond 2028):

> Monash Avenue/Hampden Road
> Monash Avenue/Smyth Road
> Smyth Road/Verdun Street
> Monash Avenue/ Site Access Entry 1
> Monash Avenue/ Site Access Entry 2
> Monash Avenue/ Site Access Entry 3
> Monash Avenue/ Site Access Entry 5
> Verdun Street/Site Access Entry 6
> Verdun Street/Site Access Entry 7

The Intersections have been analysed using SIDRA Intersection v5.1. For the location of Site Access Entries 1-7, refer to Figure 3-1.

4.2 Background Traffic Growth

It is assumed that the growth in background traffic within the study area will be directly proportional to the 43% increase in the QEIIMC parking cap, which takes effect in 2016. Based on existing information, no further significant growth in background traffic is assumed to take place within the assessment period due to there being no real increase in car parking or major development potential within the catchment area.

4.3 Intersection Performance Stage 1 (2018) without development

The performance of the critical intersections adjacent to the HPH for the 2018 scenario excluding any development generated traffic, is shown in **Tables 4-1** to **4-3.**

Table 4-1 Monash Avenue/Hampden Road Intersection Performance – 2018 (Without Development Traffic)

Intersection Approach		Weekday AM Peak Hour				Weekday PM Peak Hour			
		DOS	Delay (s)	LOS	95% Queue (m)	DOS	Delay (s)	LOS	95% Queue (m)
Hampden Road (S)	L	0.371	8.7	A	18.6	0.372	8.7	A	18.0
	T	0.371	7.7	A	18.6	0.372	7.7	A	18.0
	R	0.371	12.1	B	18.6	0.372	12.1	B	18.0
Monash Avenue (E)	L	0.366	8.8	A	18.7	0.314	8.0	A	15.6
	T	0.366	7.9	A	18.7	0.314	7.2	A	15.6
	R	0.366	12.0	B	18.7	0.314	11.3	B	15.6
Monash Avenue (W)	L	0.447	11.0	B	22.0	0.257	9.7	A	11.0
	T	0.447	10.3	B	22.0	0.257	9.0	A	11.0
	R	0.447	14.6	B	22.0	0.257	13.3	B	11.0

From above it is noted that the intersection operates well within acceptable capacity limits during both peak hour periods. Therefore, no modification to the intersection geometry is required at this location.

Table 4-2 Monash Avenue/Smyth Road Intersection Performance – 2018 (Without Development Traffic)

Intersection Approach		Weekday AM Peak Hour				Weekday PM Peak Hour			
		DOS	Delay (s)	LOS	95% Queue (m)	DOS	Delay (s)	LOS	95% Queue (m)
Smyth Road (S)	T	0.330	3.3	A	23.2	0.316	3.4	A	24.4
	R	0.330	11.7	B	23.2	0.316	11.8	B	24.4
Monash Avenue (E)	L	0.075	12.3	B	0.9	0.116	13.0	B	1.5
	R	0.056	17.7	C	1.3	0.397	23.7	C	11.8
Smyth Road (N)	L	0.284	8.3	A	8.3	0.288	8.3	A	0.0
	T	0.284	0.0	A	0.0	0.288	0.0	A	0.0

From above it is noted that the intersection operates well within acceptable capacity limits during both peak hour periods. Therefore, no modification to the intersection geometry is required at this location.

Table 4-3 Verdun Street/Smyth Road Intersection Performance – 2018 (Without Development Traffic)

Intersection Approach		Weekday AM Peak Hour				Weekday PM Peak Hour			
		DOS	Delay (s)	LOS	95% Queue (m)	DOS	Delay (s)	LOS	95% Queue (m)
Smyth Road (S)	T	0.318	4.0	A	26.0	0.467	4.3	A	36.8
	R	0.318	12.3	B	26.0	0.467	12.6	B	36.8
Verdun Street (E)	L	0.167	16.4	C	3.8	0.248	11.8	B	6.9
	R	0.167	16.5	C	3.8	0.248	12.0	B	6.9
Smyth Road (N)	L	0.306	8.2	A	0.0	0.266	8.2	A	0.0
	T	0.306	0.0	A	0.0	0.266	0.0	A	0.0

From above it is noted that the intersection operates well within acceptable capacity limits during both peak hour periods. Therefore, no modification to the intersection geometry is required at this location.

As there is no growth in development traffic in this scenario, it was considered unnecessary to assess Site Access Entries 1-7 as operation will be generally similar to the ‘existing’ scenario outlined in Section 2.6.

4.4 Intersection Performance Stage 1 (2018) with development

The performance of the critical intersections adjacent to the HPH for the 2018 scenario with development traffic is shown in **Tables 4-4** to **Table 4-6**, while the performance of all entries/exits to HPH is shown in **Tables 4-7** to **Table 4-12** below.

Table 4-4 Monash Avenue/Hampden Road Intersection Performance – 2018 (With Development Traffic)

Intersection Approach		Weekday AM Peak Hour				Weekday PM Peak Hour			
		DOS	Delay (s)	LOS	95% Queue (m)	DOS	Delay (s)	LOS	95% Queue (m)
Hampden Road (S)	L	0.503	10.2	B	27.8	0.429	9.2	A	22.1
	T	0.503	9.1	A	27.8	0.429	8.2	A	22.1
	R	0.503	13.5	B	27.8	0.429	12.6	B	22.1
Monash Avenue (E)	L	0.524	9.4	A	31.6	0.379	8.3	A	20.1
	T	0.524	8.5	A	31.6	0.379	7.5	A	20.1
	R	0.524	12.6	B	31.6	0.379	11.6	B	20.1
Monash Avenue (W)	L	0.562	12.5	B	35.7	0.423	10.3	B	20.8
	T	0.562	11.8	B	35.7	0.423	9.6	A	20.8
	R	0.562	16.1	B	35.7	0.423	13.9	B	20.8

From above it is noted that the intersection continues to operate well within acceptable capacity limits during both peak hour periods. Therefore, no modification to the intersection geometry is required at this location.

Table 4-5 Monash Avenue/Smyth Road Intersection Performance – 2018 (With Development Traffic)

Intersection Approach		Weekday AM Peak Hour				Weekday PM Peak Hour			
		DOS	Delay (s)	LOS	95% Queue (m)	DOS	Delay (s)	LOS	95% Queue (m)
Smyth Road (S)	T	0.406	5.0	A	34.5	0.330	4.0	A	27.7
	R	0.406	13.4	B	34.5	0.330	12.5	B	27.7
Monash Avenue (E)	L	0.111	12.4	B	1.4	0.234	13.1	B	3.1
	R	0.094	19.2	C	2.8	0.822	38.8	E	44.2
Smyth Road (N)	L	0.338	8.3	A	0.0	0.304	8.3	A	0.0
	T	0.338	0.0	A	0.0	0.304	0.0	A	0.0

It is noted that the right turn out from Monash Avenue to Smyth Road is anticipated to operate at Level of Service E during the Weekday PM Peak Hour, in comparison to Level of Service C without development traffic as shown in Table 4-2. However, the average delay for this movement is less than 40 seconds and the average queue length is only approximately 7 vehicles (increasing from approximately 24 seconds delay and queue length of 3 vehicles without development traffic). It is considered that this relatively low level of delay is acceptable in the Peak Hour and no modification to the intersection geometry is recommended at this stage. It must also be noted that if background traffic growth is slower or lower than estimated, the operation of this intersection will improve compared to the above analysis.

Table 4-6 Verdun Street/Smyth Road Intersection Performance – 2018 (With Development Traffic)

Intersection Approach		Weekday AM Peak Hour				Weekday PM Peak Hour			
		DOS	Delay (s)	LOS	95% Queue (m)	DOS	Delay (s)	LOS	95% Queue (m)
Smyth Road (S)	T	0.349	5.5	A	33.4	0.550	5.6	A	55.5
	R	0.349	13.9	B	33.4	0.550	14.0	B	55.5
Verdun Street (E)	L	0.256	20.0	C	6.2	0.340	13.3	B	11.1
	R	0.256	20.1	C	6.2	0.340	13.4	B	11.1
Smyth Road (N)	L	0.358	8.2	A	0.0	0.280	8.2	A	0.0
	T	0.358	0.0	A	0.0	0.280	0.0	A	0.0

From above it is noted that the intersection continues to operate well within acceptable capacity limits during both peak hour periods, with queuing and long delays are unlikely to occur. Therefore, no modification to the intersection geometry is required at this access location.

Table 4-7 Monash Avenue/ Site Access Entry 1 Intersection Performance - 2018 (With Development Traffic)

Intersection Approach		Weekday AM Peak Hour				Weekday PM Peak Hour			
		DOS	Delay (s)	LOS	95% Queue (m)	DOS	Delay (s)	LOS	95% Queue (m)
Monash Avenue (E)	T	0.094	1.7	A	4.8	0.202	1.2	A	10.1
	R	0.094	10.2	B	4.8	0.202	9.6	A	10.1
Entry 1 (N)	L	0.026	10.4	B	0.7	0.032	11.1	B	0.8
	R	0.026	10.7	B	0.7	0.032	11.4	B	0.8
Monash Avenue (W)	L	0.228	8.2	A	0.0	0.148	8.2	A	0.0
	T	0.228	0.0	A	0.0	0.148	0.0	A	0.0

From above it is noted that the intersection continues to operate well within acceptable capacity limits during both peak hour periods, with queuing and long delays are unlikely to occur. Therefore, no modification to the intersection geometry is required at this access location.

Table 4-8 Monash Avenue/ Site Access Entry 2 Intersection Performance – 2018 (With Development Traffic)

Intersection Approach		Weekday AM Peak Hour				Weekday PM Peak Hour			
		DOS	Delay (s)	LOS	95% Queue (m)	DOS	Delay (s)	LOS	95% Queue (m)
Monash Avenue (E)	T	0.158	2.2	A	8.1	0.242	1.3	A	12.6
	R	0.158	10.6	B	8.1	0.242	9.7	A	12.6
Entry 2 (N)	L	0.091	11.5	B	2.3	0.091	11.8	B	2.2
	R	0.091	11.8	B	2.3	0.091	12.1	B	2.2
Monash Avenue (W)	L	0.253	8.2	A	0.0	0.153	8.2	A	0.0
	T	0.253	0.0	A	0.0	0.153	0.0	A	0.0

From above it is noted that the intersection continues to operate well within acceptable capacity limits during both peak hour periods, with queuing and long delays are unlikely to occur. Therefore, no modification to the intersection geometry is required at this access location.

Table 4-9 Monash Avenue/ Site Access Entry 3 Intersection Performance – 2018 (With Development Traffic)

Intersection Approach		Weekday AM Peak Hour				Weekday PM Peak Hour			
		DOS	Delay (s)	LOS	95% Queue (m)	DOS	Delay (s)	LOS	95% Queue (m)
Monash Avenue (E)	T	0.132	2.0	A	6.9	0.216	1.4	A	11.2
	R	0.132	10.5	B	6.9	0.216	9.9	A	11.2
Entry 3 (N)	L	0.050	12.0	B	1.2	0.074	12.8	B	1.7
	R	0.050	13.0	B	1.2	0.074	13.1	B	1.7
Monash Avenue (W)	L	0.246	8.2	A	0.0	0.170	8.2	A	0.0
	T	0.246	0.0	A	0.0	0.170	0.0	A	0.0

From above it is noted that the intersection continues to operate well within acceptable capacity limits during both peak hour periods, with queuing and long delays are unlikely to occur. Therefore, no modification to the intersection geometry is required at this access location.

Table 4-10 Monash Avenue/ Site Access Entry 5 Intersection Performance – 2018 (With Development Traffic)

Intersection Approach		Weekday AM Peak Hour				Weekday PM Peak Hour			
		DOS	Delay (s)	LOS	95% Queue (m)	DOS	Delay (s)	LOS	95% Queue (m)
Monash Avenue (E)	T	0.254	2.3	A	11.6	0.195	1.1	A	9.6
	R	0.254	10.8	B	11.6	0.195	9.6	A	9.6
Entry 5 (N)	L	0.030	10.6	B	0.7	0.388	13.7	B	13.5
	R	0.030	10.9	B	0.7	0.388	14.0	B	13.5
Monash Avenue (W)	L	0.247	8.2	A	0.0	0.146	8.2	A	0.0
	T	0.247	0.0	A	0.0	0.146	0.0	A	0.0

From above it is noted that the intersection continues to operate well within acceptable capacity limits during both peak hour periods, with queuing and long delays are unlikely to occur. Therefore, no modification to the intersection geometry is required at this access location.

Table 4-11 Verdun Street/Site Access Entry 6 Intersection Performance – 2018 (With Development Traffic)

Intersection Approach		Weekday AM Peak Hour				Weekday PM Peak Hour			
		DOS	Delay (s)	LOS	95% Queue (m)	DOS	Delay (s)	LOS	95% Queue (m)
Entry 6 (S)	T	0.012	8.5	A	0.3	0.030	8.7	A	0.8
	R	0.012	8.8	A	0.3	0.030	8.9	A	0.8
Verdun Street (E)	L	0.037	8.2	A	0.0	0.065	8.2	A	0.0
	R	0.037	0.0	A	0.0	0.065	0.0	A	0.0
Verdun Street (W)	L	0.056	0.2	A	2.1	0.031	0.4	A	1.2
	T	0.056	8.7	A	2.1	0.031	8.8	A	1.2

From above it is noted that the intersection continues to operate well within acceptable capacity limits during both peak hour periods, with queuing and long delays are unlikely to occur. Therefore, no modification to the intersection geometry is required at this access location.

Table 4-12 Verdun Street/Site Access Entry 7 Intersection Performance – 2018 (With Development Traffic)

Intersection Approach		Weekday AM Peak Hour				Weekday PM Peak Hour			
		DOS	Delay (s)	LOS	95% Queue (m)	DOS	Delay (s)	LOS	95% Queue (m)
Entry 7 (S)	T	0.004	8.9	A	0.1	0.025	8.9	A	0.6
	R	0.004	9.1	A	0.1	0.025	9.2	A	0.6
Verdun Street (E)	L	0.056	8.2	A	0.0	0.054	8.2	A	0.0
	R	0.056	0.0	A	0.0	0.054	0.0	A	0.0
Verdun Street (W)	L	0.051	0.3	A	0.3	0.036	0.3	A	1.3
	T	0.051	8.8	A	0.3	0.036	8.7	A	1.3

From above it is noted that the intersection continues to operate well within acceptable capacity limits during both peak hour periods, with queuing and long delays are unlikely to occur. Therefore, no modification to the intersection geometry is required at this access location.

4.5 Intersection Performance Stage 2 (2028) without development

As outlined in Section 4.2, no further traffic background growth is assumed to take place after the 2018 assessment scenario due to the parking cap at QEIIMC being reached and no prospect of further high traffic generating developments. Therefore, the intersection performance for the 2028 assessment scenario will be identical to the 2018 scenario, which was summarised in **Tables 4-1** to **Table 4-3**.

4.6 Intersection Performance Stage 2 (2028) with development

The performance of the critical intersections adjacent to the HPH for the 2028 scenario with development traffic is shown in **Tables 4-13** to **Table 4-16**, while the performance of all entries/exits to HPH is shown in **Tables 4-17** to **Table 4-22**.

Table 4-13 Monash Ave/Hampden Road Intersection Performance – 2028 (With Development Traffic)

Intersection Approach		Weekday AM Peak Hour				Weekday PM Peak Hour			
		DOS	Delay (s)	LOS	95% Queue (m)	DOS	Delay (s)	LOS	95% Queue (m)
Hampden Road (S)	L	0.519	10.4	B	29.6	0.436	9.3	A	22.6
	T	0.519	9.4	A	29.6	0.436	8.2	A	22.6
	R	0.519	13.8	B	29.6	0.436	12.7	B	22.6
Monash Avenue (E)	L	0.542	9.4	A	33.3	0.385	8.4	A	20.6
	T	0.542	8.6	A	33.3	0.385	7.5	A	20.6
	R	0.542	12.7	B	33.3	0.385	11.6	B	20.6
Monash Avenue (W)	L	0.573	12.7	B	37.2	0.441	10.4	B	22.1
	T	0.573	12.0	B	37.2	0.441	9.7	A	22.1
	R	0.573	16.2	B	37.2	0.441	13.9	B	22.1

From above it is noted that the intersection continues to operate well within acceptable capacity limits during both peak hour periods. Therefore, no modification to the intersection geometry is required at this location.

Table 4-14 Monash Avenue/Smyth Road Intersection Performance – 2028 (With Development Traffic)

Intersection Approach		Weekday AM Peak Hour				Weekday PM Peak Hour			
		DOS	Delay (s)	LOS	95% Queue (m)	DOS	Delay (s)	LOS	95% Queue (m)
Smyth Road (S)	T	0.415	5.2	A	35.8	0.331	4.1	A	28.1
	R	0.415	13.7	B	35.8	0.331	12.5	B	28.1
Monash Avenue (E)	L	0.115	12.4	B	1.4	0.246	13.1	B	3.3
	R	0.099	19.4	C	2.3	0.868	44.7	E	54.8
Smyth Road (N)	L	0.344	8.3	A	0.0	0.306	8.3	A	0.0
	T	0.344	0.0	A	0.0	0.306	0.0	A	0.0

It is noted that the right turn out from Monash Avenue to Smyth Road is anticipated to operate at Level of Service E during the Weekday PM Peak Hour. In comparison to the 2018 'With Development' scenario, the average delay for this movement increases from approximately 38 to 45 seconds and the queue length from 7 vehicles to 9 vehicles. In order to reduce the delay for this right turn movement, a small roundabout could be constructed, generally within the existing road reserve. The operation of this intersection as a single lane roundabout is summarised in Table 4-15.

Table 4-15 Monash Avenue/Smyth Road Intersection Performance – 2028 (With Development Traffic) and potential single lane roundabout

Intersection Approach		Weekday AM Peak Hour				Weekday PM Peak Hour			
		DOS	Delay (s)	LOS	95% Queue (m)	DOS	Delay (s)	LOS	95% Queue (m)
Smyth Road (S)	T	0.604	6.3	A	26.1	0.580	9.1	A	39.8
	R	0.604	11.3	B	26.1	0.580	14.1	B	39.8
Monash Avenue (E)	L	0.096	9.2	A	4.2	0.442	10.9	B	23.2
	R	0.096	13.3	B	4.2	0.442	15.0	B	23.2
Smyth Road (N)	L	0.544	8.7	A	34.9	0.406	7.3	A	26.7
	T	0.544	7.9	A	34.9	0.406	6.5	A	26.7

The analysis above shows that, as a single lane roundabout, the intersection operates acceptably within both peak periods.

Table 4-16 Verdun Street/Smyth Road Intersection Performance – 2028

Intersection Approach		Weekday AM Peak Hour				Weekday PM Peak Hour			
		DOS	Delay (s)	LOS	95% Queue (m)	DOS	Delay (s)	LOS	95% Queue (m)
Smyth Road (S)	T	0.352	5.7	A	34.1	0.558	5.8	A	57.8
	R	0.352	14.1	B	34.1	0.558	14.2	B	57.8
Verdun Street (E)	L	0.264	20.3	C	6.4	0.350	13.5	B	11.6
	R	0.264	20.4	C	6.4	0.350	13.6	B	11.6
Smyth Road (N)	L	0.363	8.2	A	0.0	0.282	8.2	A	0.0
	T	0.363	0.0	A	0.0	0.282	0.0	A	0.0

From above it is noted that the intersection continues to operate well within acceptable capacity limits during both peak hour periods. Therefore, no modification to the intersection geometry is required at this location.

Table 4-17 Monash Avenue/ Site Access Entry 1 Intersection Performance - 2028

Intersection Approach		Weekday AM Peak Hour				Weekday PM Peak Hour			
		DOS	Delay (s)	LOS	95% Queue (m)	DOS	Delay (s)	LOS	95% Queue (m)
Monash Avenue (E)	T	0.096	1.8	A	5.0	0.213	1.2	A	10.8
	R	0.096	10.3	B	5.0	0.213	9.6	A	10.8
Entry 1 (N)	L	0.029	10.5	B	0.7	0.036	11.3	B	0.9
	R	0.029	10.8	B	0.7	0.036	11.6	B	0.9
Monash Avenue (W)	L	0.236	8.2	A	0.0	0.150	8.2	A	0.0
	T	0.236	0.0	A	0.0	0.150	0.0	A	0.0

From above it is noted that the intersection continues to operate well within acceptable capacity limits during both peak hour periods. Therefore, no modification to the intersection geometry is required at this location.

Table 4-18 Monash Avenue/ Site Access Entry 2 Intersection Performance - 2028

Intersection Approach		Weekday AM Peak Hour				Weekday PM Peak Hour			
		DOS	Delay (s)	LOS	95% Queue (m)	DOS	Delay (s)	LOS	95% Queue (m)
Monash Avenue (E)	T	0.165	2.3	A	8.5	0.253	1.3	A	13.4
	R	0.165	10.8	B	8.5	0.253	9.8	A	13.4
Entry 2 (N)	L	0.102	11.7	B	2.6	0.104	12.1	B	2.5
	R	0.102	11.9	B	2.6	0.104	12.4	B	2.5
Monash Avenue (W)	L	0.262	8.2	A	0.0	0.156	8.2	A	0.0
	T	0.262	0.0	A	0.0	0.156	0.0	A	0.0

From above it is noted that the intersection continues to operate well within acceptable capacity limits during both peak hour periods. Therefore, no modification to the intersection geometry is required at this location.

Table 4-19 Monash Avenue/ Site Access Entry 3 Intersection Performance - 2028

Intersection Approach		Weekday AM Peak Hour				Weekday PM Peak Hour			
		DOS	Delay (s)	LOS	95% Queue (m)	DOS	Delay (s)	LOS	95% Queue (m)
Monash Avenue (E)	T	0.138	2.2	A	7.3	0.229	1.5	A	12.1
	R	0.138	10.6	B	7.3	0.229	9.9	A	12.1
Entry 3 (N)	L	0.056	12.3	B	1.3	0.086	13.1	B	2.0
	R	0.056	12.5	B	1.3	0.086	13.4	B	2.0
Monash Avenue (W)	L	0.256	8.2	A	0.0	0.173	8.2	A	0.0
	T	0.256	0.0	A	0.0	0.173	0.0	A	0.0

From above it is noted that the intersection continues to operate well within acceptable capacity limits during both peak hour periods. Therefore, no modification to the intersection geometry is required at this location.

Table 4-20 Monash Avenue/ Site Access Entry 5 Intersection Performance - 2028

Intersection Approach		Weekday AM Peak Hour				Weekday PM Peak Hour			
		DOS	Delay (s)	LOS	95% Queue (m)	DOS	Delay (s)	LOS	95% Queue (m)
Monash Avenue (E)	T	0.279	2.6	A	13.4	0.200	1.2	A	9.9
	R	0.279	11.1	B	13.4	0.200	9.6	A	9.9
Entry 5 (N)	L	0.033	10.7	B	0.8	0.439	14.4	B	16.5
	R	0.033	11.0	B	0.8	0.439	14.7	B	16.5
Monash Avenue (W)	L	0.257	8.2	A	0.0	0.150	8.2	A	0.0
	T	0.257	0.0	A	0.0	0.150	0.0	A	0.0

From above it is noted that the intersection continues to operate well within acceptable capacity limits during both peak hour periods. Therefore, no modification to the intersection geometry is required at this location.

Table 4-21 Verdun Street/Site Access Entry 6 Intersection Performance - 2028

Intersection Approach		Weekday AM Peak Hour				Weekday PM Peak Hour			
		DOS	Delay (s)	LOS	95% Queue (m)	DOS	Delay (s)	LOS	95% Queue (m)
Entry 6 (S)	T	0.013	8.5	A	0.3	0.033	8.7	A	0.9
	R	0.013	8.8	A	0.3	0.033	8.9	A	0.9
Verdun Street (E)	L	0.037	8.2	A	0.0	0.066	8.2	A	0.0
	R	0.037	0.0	A	0.0	0.066	0.0	A	0.0
Verdun Street (W)	L	0.058	0.2	A	0.3	0.032	0.4	A	1.2
	T	0.058	8.7	A	0.3	0.032	8.8	A	1.2

From above it is noted that the intersection continues to operate well within acceptable capacity limits during both peak hour periods. Therefore, no modification to the intersection geometry is required at this location.

Table 4-22 Verdun Street/Site Access Entry 7 Intersection Performance - 2028

Intersection Approach		Weekday AM Peak Hour				Weekday PM Peak Hour			
		DOS	Delay (s)	LOS	95% Queue (m)	DOS	Delay (s)	LOS	95% Queue (m)
Entry 7 (S)	T	0.004	8.9	A	0.1	0.028	8.9	A	0.7
	R	0.004	9.1	A	0.1	0.028	9.2	A	0.7
Verdun Street (E)	L	0.058	8.2	A	0.0	0.054	8.2	A	0.0
	R	0.058	0.0	A	0.0	0.054	0.0	A	0.0
Verdun Street (W)	L	0.052	0.3	A	1.9	0.036	0.3	A	1.3
	T	0.052	8.8	A	1.9	0.036	8.7	A	1.3

From above it is noted that the intersection continues to operate well within acceptable capacity limits during both peak hour periods. Therefore, no modification to the intersection geometry is required at this location.

4.7 Intersection Performance Stage 3, beyond 2028

It is not possible to estimate intersection performance for development scenarios beyond 2028, due to the absence of detailed plans for the future development zones.

However, it is noted that the WAPC-imposed parking cap of 1800 spaces for HPH is reached by 2018 and therefore, assuming that this cap is retained, future growth in traffic generated by HPH will be severely curtailed due to the absence of vehicle parking.

Whilst future development at HPH may increase the number of person trips generated, the number of vehicle trips is expected to remain constant or fall gradually as mode shift occurs. This mode shift will occur naturally as a result of factors such as:

> Restricted parking supply
> Improvement in public transport services (e.g. bus or light rail rapid transit)
> Improvement in end of trip facilities
> Greater uptake of cycling by staff as a mode of transport
> Other TravelSmart incentives implemented by HPH

Once development plans have been finalised for the future development zones, a full transport assessment would be undertaken to identify and mitigate any impacts on the transport network.

5 Public Transport

5.1 Summary of Existing Services

The current bus services available around the area include the following routes:

> Route 24 (Claremont Station to East Perth);
> Route 25 (Claremont Station to East Perth);
> Route 79 (Esplanade Busport to QEII Medical Centre);
> Route 97 (UWA to Subiaco via QEII Medical Centre) with train connection at Subiaco Train Station;
> Route 98/99 (Circle Routes);
> Route 103 (East Perth to Fremantle);

Bus stops for the above services are located in various locations along Aberdare Road, Hospital Avenue, Hampden Road and Monash Avenue, as shown in Figure 5-1. The frequency of services is described in **Table 5-1**.

Table 5-1 Bus Services Outline

	Monday-Friday	Saturday	Sunday/Public Holidays
Route 24 (Claremont Station to East Perth)			
First Service	6:00am (to Claremont Station) 5:10am (to Nelson Crescent/Hale Street)	7:45am (to Claremont Station) 6:57am (to Nelson Crescent/Hale Street)	9:05am (to Claremont Station) 8:50am (to Nelson Crescent/Hale Street)
Peak Hours Frequency	15-30 minutes	30 minutes	60 minutes
Off-Peak Hours Frequency	20-60 minutes	30-60 minutes	60 minutes
Last Service	11:30pm (to Claremont Station) 10:48pm (to Nelson Crescent/Hale Street)	11:30pm (to Claremont Station) 10:48pm (to Nelson Crescent/Hale Street)	8:05pm (to Claremont Station) 7:48pm (to Nelson Crescent/Hale Street)
Route 25 (Claremont Station to East Perth)			
First Service	7:30am (to Claremont Station) 6:08am (to Nelson Crescent/Hale Street)	8:15am (to Claremont Station) 7:27am (to Nelson Crescent/Hale Street)	No Service
Peak Hours Frequency	20-60 minutes	30-60 minutes	
Off-Peak Hours Frequency	30-75 minutes	30-85 minutes	
Last Service	11:30pm (to Claremont Station) 6:18pm (to Nelson Crescent/Hale Street)	11:30pm (to Claremont Station) 3:29pm (to Nelson Crescent/Hale Street)	
Route 79 (Perth to QEII Medical Centre)			
First Service	6:08am (to QEIIMC) 9:53am (to Esplanade Busport)	No Service	No Service
Peak Hours Frequency	5-15 minutes		
Off-Peak Hours Frequency	5-30 minutes		
Last Service	2:46pm (to QEIIMC) 6:50pm (to Esplanade Busport)		

	Monday-Friday	Saturday	Sunday/Public Holidays
Route 97 (UWA to Subiaco via QEII Medical Centre)			
First Service	6:43am (to Hackett Drive/Parkway) 7:10am (to Subiaco Station)	8:55am (to Hackett Drive/Parkway) 8:51am (to Subiaco Station)	8:55am (to Hackett Drive/Parkway) 9:21am (to Subiaco Station)
Peak Hours Frequency	15 minutes	30 minutes	60 minutes
Off-Peak Hours Frequency	15 minutes	30 minutes	60 minutes
Last Service	6:30pm (to Hackett Drive/Parkway) 6:40pm (to Subiaco Station)	5:55pm (to Hackett Drive/Parkway) 5:21pm (to Subiaco Station)	5:55pm (to Hackett Drive/Parkway) 5:21pm (to Subiaco Station)
Route 98/99 (Circle Routes)			
First Service	5:44am (Clockwise to Fremantle Station) 6:08am (Anticlockwise to Fremantle Station)	6:38am (Clockwise to Fremantle Station) 7:27am (to Nelson Crescent/Hale Street)	7:23am (Clockwise to Fremantle Station) 7:57am (Anticlockwise to Fremantle Station)
Peak Hours Frequency	7-15 minutes	15 minutes	15 minutes
Off-Peak Hours Frequency	15-30 minutes	15-30 minutes	15-30 minutes
Last Service	9:00pm (Clockwise to Fremantle Station) 12:00am (Anticlockwise to Fremantle Station)	6:40pm (Clockwise to Fremantle Station) 12:01am (Anticlockwise to Fremantle Station)	6:40pm (Clockwise to Fremantle Station) 10:01pm (Anticlockwise to Fremantle Station)
Route 103 (East Perth to Fremantle)			
First Service	5:56am (to Fremantle Station) 5:50am (to Nelson Crescent/Hale Street)	6:55am (to Fremantle Station) 6:35am (to Nelson Crescent/Hale Street)	9:25am (to Fremantle Station) 8:05am (to Nelson Crescent/Hale Street)
Peak Hours Frequency	10-15 minutes	30 minutes	60 minutes
Off-Peak Hours Frequency	20-60 minutes	30-60 minutes	60 minutes
Last Service	11:35pm (to Fremantle Station) 11:35pm (to Nelson Crescent/Hale Street)	11:35pm (to Fremantle Station) 11:35pm (to Nelson Crescent/Hale Street)	9:35pm (to Fremantle Station) 8:35pm (to Nelson Crescent/Hale Street)

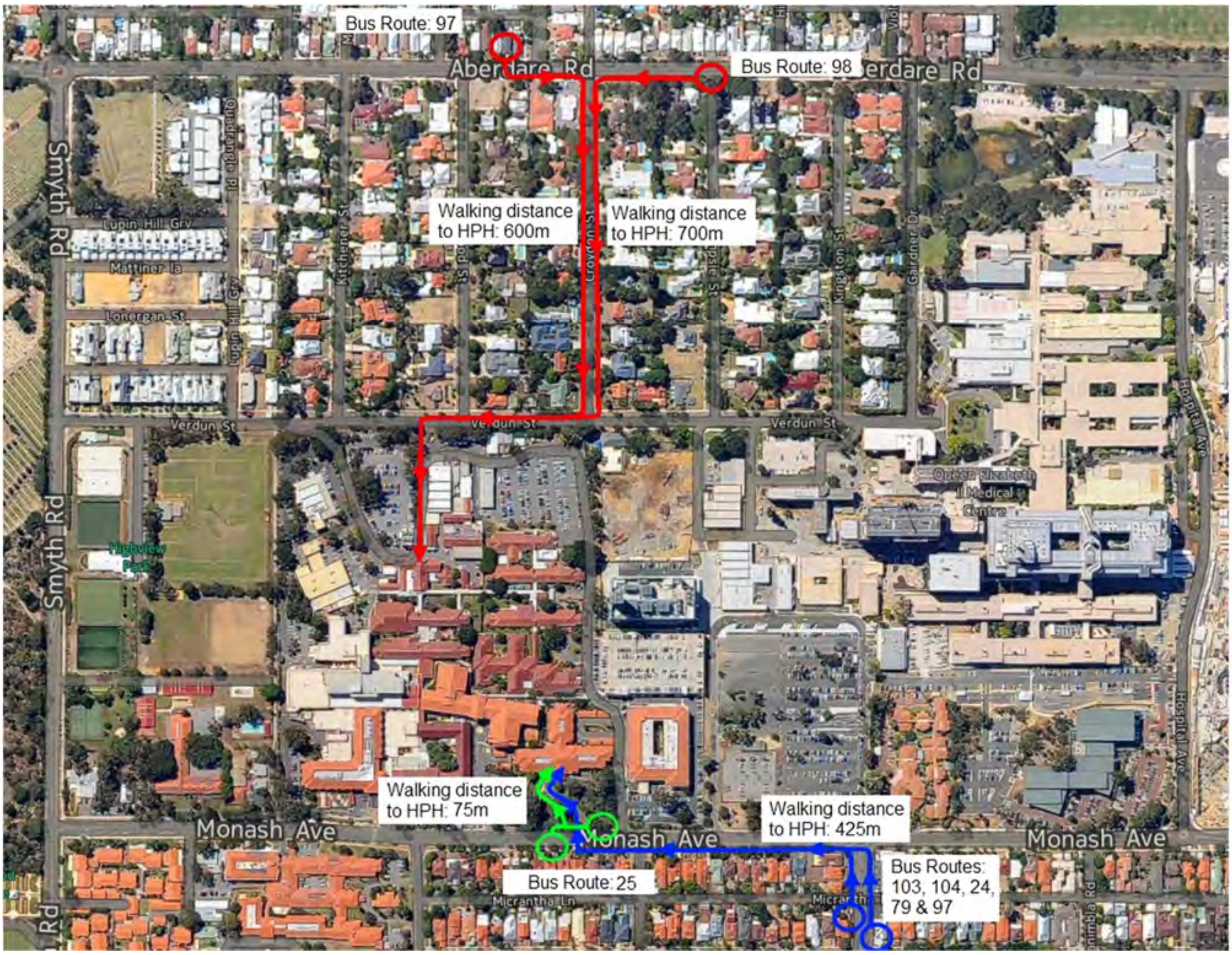
As seen in the above table, routes 79, 97, 98/99 and 103 provide a reasonably frequent service in the commuter peak periods with some reductions in service levels through the middle of the day.

Routes 24 and 25 are mainly low frequency; low patronage ‘coverage’ routes which cease operating during in the early evening and are therefore generally unattractive to discretionary public transport users.

5.2 Service Deficiencies

Current public transport services in the vicinity of HPH focus mainly on serving QEIIMC along the Hospital Avenue spine, with a secondary focus on UWA. This is understandable as these two institutions are the very large trip generating land uses. However, HPH suffers by being located off the main north-south spine between QEIIMC and UWA, resulting in longer walking distances for staff and visitors, as well as less choice in services. The focus on Hospital Avenue for serving QEIIMC also makes it difficult for many services to serve both HPH and QEIIMC with significant route deviations which would severely delay the majority of passengers.

Figure 5-1 Bus stop locations and walking distances



The locations of key bus stops and the routes served by them, as well as walking distances to a notional point on the HPH site, are shown in Figure 5-1. The most important bus stops for HPH commuters are those located on Hampden Road between Monash Avenue and Hardy Road, located approximately 425m from the site. From these stops, HPH commuters are able to access the frequent routes 79 (to Esplanade Busport), 97 (to Subiaco/UWA) and 103 (Perth CBD/Claremont/Fremantle).

Route 25 services stop on Monash Avenue near the front of HPH which results in a very short walking distance (approximately 75m), however the infrequent service makes it unattractive and difficult to use for commuters. This service is more targeted towards less mobile passengers who are unable to or prefer not to walk any significant distance between the bus stop and their destination.

The Circle Route (routes 98 and 99) connects QEIIMC with Shenton Park Train Station, UWA and runs along Stirling Highway to Fremantle. A reasonably frequent, clockface timetable is provided throughout the day, however the closest stops to HPH are located between 600m and 800m from the site – either on Aberdare Road near Croydon Street or at the southern end of Hospital Avenue. As the Circle Route is the only north-south public transport connection west of Perth CBD, this is a significant disadvantage for HPH workers and visitors travelling from the Wembley, Floreat and Innaloo areas. For commuters, who are focused more on door-to-door travel time, the 600m-700m walk to access the Circle Route is somewhat inconvenient but tolerable. Other passengers, who would prefer to reduce their walking distance at the expense of longer travel time, have the option of transferring between the Circle Route and other services at QEIIMC.

Compared to most other locations in Perth, HPH is relatively well served by public transport and will continue to be if planned improvements such as those outlined in Section 5.3 are implemented in future years.

For many staff and visitors to HPH, it is not the public transport in the immediate vicinity of the site which is an obstacle to travel but often it is the ‘first leg’ of the journey – i.e. getting from home to the bus stop or train station. State Government initiatives such as providing over 3,000 additional car parking bays at train stations, and improving feeder bus services to the rail network will assist in improving accessibility over time, complementing the reasonable quality links between HPH and the rail network.

5.3 Planned Future Improvements

5.3.1 QEIIMC Planning

At its meeting held on 19 June 2007 the Statutory Procedures Committee of the WAPC adopted in principle the QEIIMC Access and Structure Plan (9 February 2007) as a guide to the future planning and development of the QEIIMC Precinct which includes HPH. The WAPC stated in its decision that 'it considers without the required bus services the planned expansion of the QEIIMC site would not be acceptable on planning, transport and sustainability grounds`.

Subsequent to this, the QEIIMC/UWA/HPH Public Transport Master Plan was prepared in August 2007, setting out the required level of public transport services and infrastructure to meet existing and future demand for development at the three sites. In particular, the report stated that:

> *"To achieve the mode share targets for public transport use to and from UWA, QEIIMC and HPH, it is essential that the whole plan be adopted. Bus priority is an integral part of the plan and should accompany the proposed service improvements. The bus priority projects should be seen as a complete package which will ensure consistency of running times throughout the day, add to the reliability of the services for passengers and afford the minimum ongoing operating costs to government"*

The disconnect between planning approval agencies (WAPC), land owners/tenants (QEIIMC Trust, Department of Health) and public transport service providers (Public Transport Authority - PTA) has meant that despite these recommendations, and further lobbying by the QEIIMC Trust, public transport supply at QEIIMC (Hospital Avenue precinct) is still below the required standard to achieve significant mode shift away from private vehicle use. Some improvements – such as a moderate increase in frequency for route 103 and the provision of route 79 services (paid for by the QEIIMC Trust and UWA) have resulted in some improvement, however the large scale improvement of public transport services has still not eventuated.

The ramifications of this for HPH are that public transport accessibility is still lower than is required for it to be an attractive alternative to driving for most staff and visitors. Likewise, as the required public transport improvements to QEIIMC are implemented, public transport accessibility will increase to/from HPH.

5.3.2 Public Transport for Perth 2031 (Draft)

The *Draft Public Transport for Perth 2031* plan was released by the Department of Transport in 2011, setting out the future investment in high quality public transport services and infrastructure. Key relevant projects included in the draft plan include:

> MAX Light Rail between Perth CBD, QEIIMC and UWA (by 2020)
> Bus Rapid Transit along Mounts Bay Road between the Esplanade Busport and UWA (by 2020)
> Light Rail between Glendalough, Subiaco and QEIIMC (by 2031)

It is noted that the State Government has subsequently reduced the scope of the MAX Light Rail project to terminate at QEIIMC and not UWA in the first stage.

Provided that the light rail and bus rapid transit projects include public transport priority facilities (e.g. segregated lanes, signal priority etc.), they will result in a reduction in travel time between Perth CBD and QEIIMC (and therefore HPH). More importantly, the reliability of services will be significantly improved by reducing the potential for traffic delays to affect public transport services which is currently a major problem on Thomas Street and Mounts Bay Road.

The proposed light rail from QEIIMC to Subiaco and then Glendalough will provide an alternative north-south public transport connection to the west of Perth CBD which currently does not exist. Due to the likely travel time of this route, it is not expected to provide a significant reduction in travel time for journeys between HPH and the middle/outer northern suburbs; however it will significantly improve accessibility between HPH and suburbs such as Wembley, West Leederville and Osborne Park.

5.4 Future Requirements

As modal shift towards public transport is a key target of HPH, regardless of development plans, consideration has been given to desirable future public transport improvements to make travel to/from the HPH by this mode more attractive.

The 24 hour operation of the site, and the nature of travel to/from health care facilities, mean that many vehicle trips will never be realistically replaced with public transport trips. However there are several key target groups which could be encouraged to use public transport, e.g.

> Office/administration staff who generally work core hours
> Shift workers starting after 6am and finishing before 8pm, subject to public transport availability at their residential location
> Visitors travelling during daytime/early evening

The key public transport connections required for HPH are:

1. HPH to Claremont – provides access to nearby centre, connections to Fremantle Line trains (in lieu of Circle Route via Shenton Park)
2. HPH to Subiaco – provides access to nearby centre, connections to Midland Line trains
3. HPH to Esplanade Busport – fast journey to/from Mandurah and Joondalup Line trains
4. HPH to Perth CBD (St Georges Terrace or Wellington Street Bus Station) – provides access to Perth CBD and facilitates interchange with Armadale/Thornlie trains and the numerous bus services terminating in the CBD
5. Circle Route – provides access to Fremantle and South of the River catchment areas, also provides north-south link west of the Joondalup Train Line

Connection #1 is currently fulfilled partially by routes 24 and 25 and route 103. Routes 24 and 25 are too infrequent and indirect to adequately fulfil this function; however they are required to provide 'coverage' services to portions of Nedlands and Dalkeith. Route 103 operates via a direct route and is reasonably frequent; however it does not connect directly with train services at Claremont, instead remaining on Stirling Highway. Alternatively, passengers from the Fremantle Line trains have the option of joining route 103 services further along the route; however many trips terminate at Mosman Park and do not extend to Fremantle. In the future it is recommended to retain route 103 and continue to increase the service frequency throughout the morning, daytime and evening.

Connection #2 is provided by route 97 currently and, in the future, by a light rail service. This service should be retained and gradually increased in frequency throughout the morning, daytime and evening.

Connection #3 is currently provided by route 79 services which are funded by QEIIMC. These services are provided all day; however frequency drops off during the day as the route is tailored towards commuters. This service should be retained and gradually increased in frequency throughout the morning, daytime and evening.

Connection #4 is also provided by route 103 and the same comments apply as above.

The Circle Route (routes 98/99) provide Connection #5, however access is difficult from HPH due to the length of walking required to reach the stops either on Aberdare Road or at the southern end of Hospital Avenue. It is difficult to justify either re-routing 98/99 to pass closer by HPH – as this would result in bypassing either QEIIMC or UWA – or providing an alternative service connecting UWA with Shenton Park via Smyth Road as this would duplicate the Circle Route too closely. Accordingly, the Circle Route should gradually be increased in frequency throughout the morning, daytime and evening, which will reduce waiting time and HPH should ensure that the walking environment between HPH and the Circle Route stops is as attractive as possible. This may include improving lighting and shelter for pedestrians through the northern portion of the site to reach Verdun Street or providing the option of security escorts for staff who work late and need to reach the Circle Route.

Future improvements to public transport services to/from QEIIMC will also benefit HPH, the extent of which will be determined by the routing for the light rail and bus rapid transit facilities between QEIIMC and UWA. If these facilities are provided via Hampden Road, and stops located near the junction of Hampden Road and Monash Avenue, then this will bring HPH within 450m of these services.

6 Pedestrians and Cyclists

6.1 Approach Routes

The pedestrian and cycling facilities described in Chapter 2.7 of this report are generally adequate for present demand for walking and cycling, and no short term changes are therefore proposed. In future years, as demand for cycling grows, improvements to the on-street cycling environment may be desirable to encourage cyclists to use the road and reduce the potential for conflicts with pedestrians on the path network. This should be considered as part of a future City-wide Local Bike Plan.

In Section 2.8, a Road Safety Audit of Monash Avenue between Hampden and Smyth Roads has been recommended to identify improvements which may mitigate the higher than average crash rate on this section of road. As part of this Road Safety Audit, the needs of vulnerable road users including pedestrians, off-street cyclists and on-street cyclists, will be considered and any recommended improvements designed to improve safety for these users.

6.2 Internal Facilities

Generally safe pedestrian access is, and will continue to be, provided at all site entries/exits, particularly on the Verdun Street frontage, with paths linking to existing and future buildings and the main pedestrian spine.

Within the site, a covered pedestrian spine route is presently provided (refer to Appendix B) which links the main buildings. As future development occurs in the northern portion of the site, this covered pedestrian spine route will be extended to provide access to/from the new buildings.

Cyclists will continue to be able to use the internal road network to circulate around the site and reach their individual building, as well as using the path network. The low speed and low traffic nature of the internal road network provides a safe environment for cyclists.

6.3 Internal Wayfinding

Pedestrian wayfinding is a key feature of the existing hospital design. The hospital is planned around a north-south corridor which links all major functions and vertical circulation nodes. This simplifies way-finding and allows patients and visitors to orientate themselves easily which reduces stress and improves the hospital experience. The simple and direct internal wayfinding is mirrored externally where key public entrances and car parking provisions are linked to the main internal corridors via simple and obvious access pathways. The proposed new expansion of the hospital builds on both the internal and external way-finding principals already established.

6.4 End of Trip Facilities

6.4.1 Existing

Existing end of trip facilities at HPH include:

- Over 500 lockers, currently used mainly by theatre and ward staff who get changed and/or shower before or after a shift
- Approximately 25 showers, including a mixture of male, female and unisex facilities
- Approximately 50 u-rail bicycle parking spaces
- Hairdryers, irons and laundry service (for theatre staff)

Many of these facilities are provided in the course of enabling staff to fulfil their hygiene obligations, or enable to staff to change to/from uniforms at the start or end of shifts. However, these facilities are not restricted to only staff who need them for work, they can be used by any staff member as desired.

6.4.2 Future Provision

HPH recognises the importance of high quality end of trip facilities to encourage mode shift towards cycling. Therefore, as part of the Stage 1 (2018) development, the following improvements are proposed to the existing end of trip facilities:

- Approximately 100 secure undercover bicycle parking spaces – located within 3 'cage' facilities to be spread around the site. These will be intended for staff use.
- An additional 50 u-rail type bicycle parking spaces to be located near the entrances of each building to ensure high user convenience and passive surveillance. These will be intended for visitors, deliveries and other short term users who do not require secure parking.
- An increase in the number of lockers to over 600
- An additional 5-10 showers
- Investigate the provision of a dry cleaning or laundry service over the weekend, so that staff who cycle to/from work do not need to transport their clothes to/from work.

In addition to providing new facilities, existing facilities will be more widely publicised to ensure that staff are aware of their options for changing their travel behaviour. This is one of many strategies to be incorporated in the revised HPH Green Transport Plan.

The proposed end of trip facilities will be of significant benefit to staff who currently cycle to/from work and act as a large incentive for other staff to shift to cycling where possible.

As future development progresses beyond 2018, further end of trip facilities will be provided in existing and new buildings to cater for the increase in staff and expected increase in staff cycling to work. The details of these measures will be determined at the DA stage of future developments.

7 Travel Behaviour Change

In 2010, the Department of Health developed the “Access and Parking Strategy for Health Campuses in the Perth Metropolitan Area” (APSHC). This Strategy provides a framework under which each public health campus in the metropolitan area can deliver consistent policies and practices towards travel demand management. Although as a private hospital HPH is not listed, HPH developed a “Green Transport Plan” which is consistent with the intent of the APSHC requirements for a Travel Plan. The Green Transport Plan for HPH has been in operation since October 2004 and will be revised and updated by Cardno, for HPH, later in 2013 to reflect the latest TravelSmart initiatives and opportunities.

The aim of the plan is to encourage and facilitate changes in their workers’ transport practices to healthier and more environmentally friendly forms of transport to and from work, i.e. cycling, car-pooling, public transport and walking. The success of the plan relies on people making changes to their existing commuting travel arrangements. HPH supports its employees in making the change easier by way of better information, facilities and incentives.

The Plan recognises the role of both ‘carrot’ and ‘stick’ approaches to travel behaviour change and aims to use ‘carrot’ approaches wherever possible to drive positive changes. This ‘carrot’ approach will, in future years, lead into greater use of ‘stick’ approaches, particularly the restriction on further car parking supply at HPH once the 1800 space parking cap is reached.

In conjunction with Stage 1 of the HPH Master Plan, HPH proposes to provide significantly improve secure bicycle parking facilities and provide high quality end of trip facilities, including showers, lockers and other services to encourage cycling. Other ‘carrot’ initiatives will be more fully described in the forthcoming revised Green Transport Plan.

However, it must be recognised that HPH is restricted in what it is able to do to encourage modal shift, particularly in terms of public transport which is provided by the State Government throughout the PTA. If the PTA does not deliver an attractive level of public transport service then it is difficult to encourage staff to choose to use it of their own free will (i.e. a ‘carrot’ approach). In such cases, HPH is forced to use a ‘stick’ approach to encourage modal shift by increasing the price and/or restricting supply of parking to make driving less attractive. This ‘stick’ approach has been very successful, through necessity, at QEIIMC however it has been achieved at the expense of a very vocally dissatisfied workforce.

Ultimately, the success of travel behaviour change strategies and initiatives at HPH hinge largely on the provision of suitable public transport services in future years. Until public transport can provide a convenient and flexible alternative to cater for changing start/finish times and shift workers, HPH will continue to rely heavily on private vehicle commuting.

Additionally, increased use of cycling is dependent on Local Governments having up to date Local Bike Plans and investing in improving the cycling networks at the residential trip ends.

8 Conclusions and Summary

Cardno was commissioned by Ramsay Health Care Ltd to prepare a transport assessment to accompany the *Hollywood Private Hospital (HPH) Master Plan 2013*.

Although there is no current long term building program proposed for HPH, the City requires the preparation of a transport assessment in order to identify the cumulative impacts of committed and possible future development.

The scope of this report was discussed with the City of Nedlands in May 2013 and agreement reached on the level of assessment for each of the scenario years and the critical intersections to be assessed.

Three scenarios of committed and possible future development have been considered in this assessment, as follows:

- 0-5 years (2018 assessment year) - Short term, committed development
- 6-15 years (2028 assessment year) – Medium term, potential development under consideration but not finalised
- 16+ years (beyond 2028) – Long term, possible future development

The 2018 assessment year is considered in detail as all land uses are committed. The 2028 assessment year is also considered in detail, based on assumptions about the likely form and scale of development during this period. The purpose of this assessment is to demonstrate that the scale of potential future development in this time period will not have significant impacts upon the surrounding road network. Detailed assessment of possible future development beyond 2028 has not been undertaken as this future development is subject to future changes in trends in health care provision and commercial viability.

As part of this report, an analysis was undertaken to determine the impact that each stage of the HPH Master Plan is likely to have on the surrounding road network. Background traffic growth was assumed to increase proportionally to the increase in the QEII parking cap as this is the only major traffic generator in the vicinity of the study area, while the increase in development traffic was estimated using traffic generation rates determined from surveys of existing site traffic during the AM and PM peak hours.

The analysis found that the development traffic is not likely to have any significant impacts on the surrounding traffic network for the 2018 and 2028 assessment years. For the 2028 assessment year, it was found that delays for traffic turning right from Monash Avenue into Smyth Road during the PM Peak Hour increase to approximately 45 seconds, with an average queue length of approximately 9 vehicles. Construction of a small roundabout at this intersection would reduce the delays for right turning vehicles and improve the operation of the intersection. However, it must be noted that if background traffic growth is lower than the conservative estimate then any delays for right turning vehicles will be lower than stated above.

Traffic generation at HPH beyond 2028 will generally be restricted by the availability of parking on site. As the 1800 space parking cap is reached by 2028, any further person trips generated by development at HPH will need to be accommodated either in off-peak times when parking is available on site or by alternative modes such as public transport, walking and cycling.

To assist with mode shift, HPH has been operating with a Green Transport Plan since 2004 and it is proposed that this Plan will be reviewed and updated by Cardno in 2013 to reflect current conditions. Consistent with this plan, significant improvements to end of trip facilities are proposed as part of the Stage 1 (2018) development and further improvements will be provided as part of future development beyond 2018.

An appraisal of public transport accessibility for workers and visitors to HPH has been undertaken. HPH has reasonable accessibility by public transport compared to most other locations in Perth, however it does suffer from longer walking distances from most bus routes in comparison to neighbouring Queen Elizabeth II Medical Centre (QEIIMC) which is the focal point for public transport in the area. Recommendations have been made for gradual improvements over time to ensure that an appropriate level of service is provided to encourage HPH visitors and employees to shift from driving to sustainable transport modes.

APPENDIX A
WAPC TRANSPORT ASSESSMENT CHECKLIST FOR DEVELOPMENT

Cardno
Shaping the Future

Checklist for a Transport Assessment

Item	Status	Comments/Proposals
Summary	Included	
Introduction/Background		
name of applicant and consultant	Included	
development location and context	Included	
brief description of development proposal	Included	
key issues	Included	
Background information	Included	
Development proposal		
regional context	Included	
proposed land uses	Included	
table of land uses and quantities	Included	
access arrangements	Included	
parking provision	Included	
end of trip facilities	Included	
any specific issues	N/A	
Existing situation		
existing site uses (if any)	Included	
existing parking and demand (if appropriate)	N/A	
existing access arrangements	Included	
existing site traffic	Included	
surrounding land uses	Included	
surrounding road network	Included	
traffic management on frontage roads	Included	
traffic flows on surrounding roads (usually AM and PM peak hours)	Included	
traffic flows at major intersections (usually AM and PM peak hours)	Included	
operation of surrounding intersections	N/A	
existing pedestrian / cycle networks	Included	
existing public transport services	Included	
crash data	Included	
Changes to surrounding transport networks		
road network	Included	
intersection layouts and controls	Included	
pedestrian/cycle networks and crossing facilities	Included	
public transport services	Included	

Integration with surrounding area		
surrounding major attractors/generators	Included	
proposed changes to land uses within 1200 metres	Included	
travel desire lines from development to these attractors/generators	Included	
adequacy of existing transport networks	Included	
deficiencies in existing transport networks	Included	
remedial measures to address deficiencies	Included	
Analysis of transport networks		
assessment years	Included	
time periods	Included	
development generated traffic	Included	
distribution of generated traffic	Included	
parking supply & demand	Included	
committed developments and transport proposals	Included	
base and "with development" traffic flows	Included	
analysis of development accesses	Included	
impact on surrounding roads	Included	
impact on intersections	Included	
impact on neighbouring areas	Included	
traffic noise and vibration	N/A	
road safety	Included	
public transport access	N/A	
pedestrian access / amenity	Included	
cycle access / amenity	Included	
analysis of pedestrian / cycle networks	Included	
safe walk/cycle to school (for residential and school site developments only)	Included	
traffic management plan (where appropriate)	N/A	
Conclusions	Included	

Proponent's name	Company	Signature	Date
Transport assessor's name	**Company**	**Signature**	**Date**

APPENDIX B
HOLLYWOOD PRIVATE HOSPITAL MASTER PLAN

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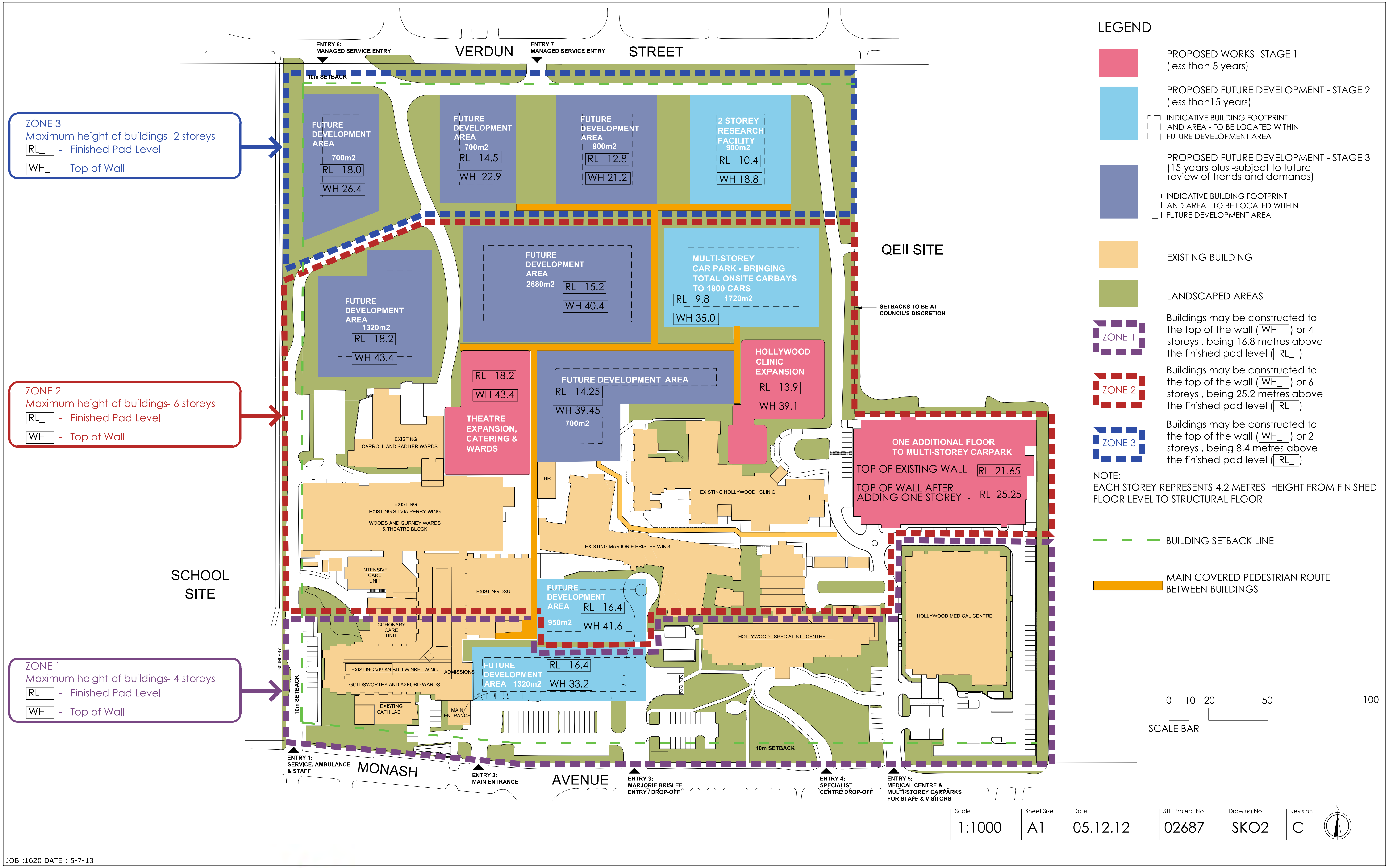
Shaping the Future



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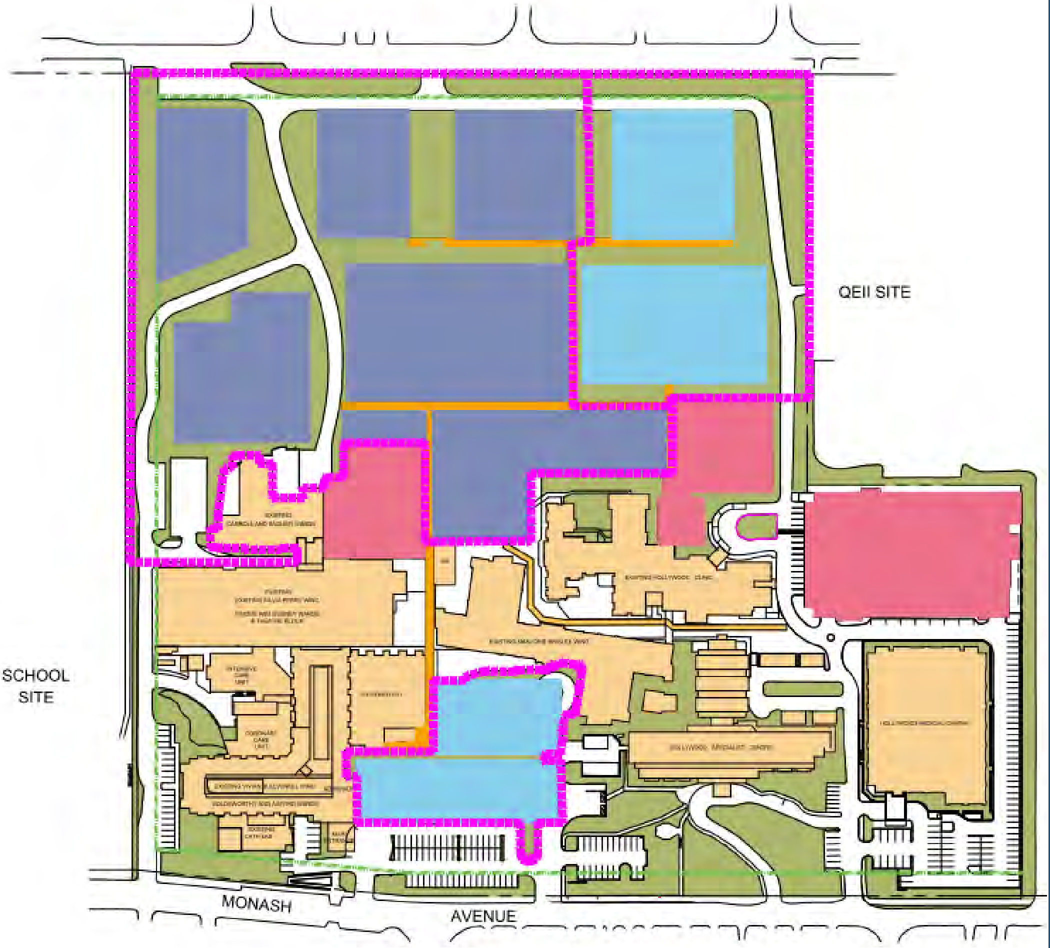
silver thomas hanley HEALTH ARCHITECTURE

Hollywood Private Hospital, Monash Avenue, Nedlands
MASTERPLAN

Figure 6

Background Report 2

Local Water Management Strategy – Hollywood Hospital, BPA Engineering, June 2013



PROPOSED RAMSAY HEALTH CARE

HOLLYWOOD HOSPITAL

RE-DEVELOPMENT

NEDLANDS, WESTERN AUSTRALIA

LOCAL WATER MANAGEMENT STRATEGY

PREPARED FOR RAMSAY CARE PTY LTD

Document Control

Title:	Ramsay Hollywood Hospital Local Water Management Strategy
Author(s):	Earl Aguiar
File Name:	RHH Local Water Management Strategy.docx
Phone:	08 9382 8008
Email:	eaguiar@bpaeng.com.au
Client:	Ramsay Hollywood Hospital, Nedlands WA
Synopsis:	This document details the management of stormwater quality and quantity of the proposed future development of Ramsay Hollywood Hospital, Nedlands to fulfil the requirements of the Development Application.

Revision	Description	Date	By	Approved
1	Issued for Development Application	08.06.13	EA	P.S
2	Updated cover page title	10.06.13	EA	P.S

Issue	Date	Author	Reviewer	Approved
1	10.06.13	Earl Aguiar Civil Engineer	Peter Scott Director, Civil Engineer	Peter Scott Director, Civil Engineer

Contents

BPA Engineering
Civil & Structural Consultants

Executive Summary

BPA Engineering has been commissioned by Ramsay Hollywood Care to provide a Local Water Management Strategy (LWMS) for the future development of the Hollywood Hospital located in Nedlands. The LWMS is a condition of the DA Application.

The site is bounded by Monash Avenue and Verdun Street within the City of Nedlands. It will be subject to future development works encompassing a research facility, multi-storey car park and expansion to existing building infrastructure. The future works 5.5 hectares in size will take place over three stages and lasting a duration in excess of 15 years.

This plan outlines the quantity and quality measures for the proposed future development of Ramsay Hollywood Private Hospital to meet the design requirements of the Department of Water (DoW) and Better Urban Water Management (October 2008),

Water quantity management outcomes were based on design principles found in Australian Rainfall and Runoff (AR & R 1987). Peak flows were calculated using the rational method utilizing the latest rainfall data and catchment area for the proposed development. The design storms in accordance with the City of Nedlands requirements were the 100 year ARI for flood prevention of future buildings with the 1 in 20 ARI stored on site.

Water quality will be managed in accordance with DoW by providing Best Management Practices for the storm event (1 Yr 1 Hr ARI) that is expected to contain the highest concentration of pollutants.

It is proposed to best manage stormwater quantity and quality through the provision of stormwater retention systems.

Two options are available for major storm management, (1) to have a conventional overland flow path and (2) to store the 1 in 100 as it is not an onerous solution over the 1 in 20yr event.

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Introduction

BPA Engineering has been commissioned by Ramsay Health Care Pty Ltd to provide a Local Water Management Strategy (LWMS) for the future development of the hospital located in Nedlands. The LWMS is a requirement of the development application and follows guidelines contained in the Department of Water's: Stormwater Management Manual and Better Urban Water Management (October 2008), by promoting soakage in stormwater retention systems. This LWMS should be read in conjunction with previously approved drainage management plans.

This plan outlines the water quantity and quality management measurers required to satisfy relevant Government bodies, namely:

- Department of Water
- City of Nedlands

Site description and development proposal

The site is located off Monash Avenue within the City of Nedlands. It will be subject to future development works encompassing a research facility, multi-storey car park and expansion to existing building infrastructure. The future works, 5.5 hectares in size will take place over three stages and last a duration in excess of 15 years.

Vegetation

The site has no vegetation with the exception of hard and soft landscaped areas.

Climate Data

Climate data pertinent to this plan is rainfall intensity duration frequencies (IFD) obtained from the Bureau of Meteorology (BoM).

The average rainfall for the area is 708 mm per annum, with the wettest months occurring from May to September, accounting for 80% of the total annual rainfall (Bureau of Meteorology, 2013).

Existing Hydrology

Groundwater

With reference to the Perth Groundwater Atlas (2nd Edition), seasonal minimum groundwater levels for the site are approximately at 2.0m AHD. Previous geotechnical investigation on site indicated ground water levels 6m below natural ground level. Further geotechnical investigations as part of future development will confirm the current groundwater level.

Existing Drainage Infrastructure

The current site drainage infrastructure is a combination of piped drainage with a connection to council infrastructure and in ground soakwell systems. The new development will not increase the existing flow levels to council drainage infrastructure.

Proposed Development and catchment area summary

Catchment areas have been determined based on the proposed works staging. These areas consist of expansions to existing infrastructure, a research facility, a multi-storey car park and other future development areas. Equivalent impervious areas were calculated using coefficients of runoff of 0.3 and 1 for landscape and pavement/ building footprint areas respectively. The equivalent impervious catchment areas are summarised in the table below.

Development Staging	Total Landscape Area	Total Pavement Area	Building Footprint Area	Total Equivalent Impervious Area
Proposed Works - Stage 1 (0-5 years)	**-**	**-**	**8837**	**8837**
Proposed Future Development - Stage 2 (5-15 years)	6087	5827	4876	13686
Proposed Future Development - Stage 3 (15 years+)	10201	13216	7880	29936
			Overall Equivalent Impervious Area	52459

Table 1: Summary of catchment areas for the future development of Ramsay Health Hollywood Hospital Future Development

A detailed breakdown of sub-catchment areas with corresponding site plan is shown in Appendix A.

Quantity Management

A hydrological assessment was carried out to calculate peak flows generated from the site for all ARI's, particularly the critical event such as the 1year 1hour storm. Further details as to the importance of this storm are explained in the Quality Management section.

Calculations were carried out based on advice from AR & R using the rational method; the following assumptions were made with regard to this model:

- Coefficient of runoff taken as 1.0 for building footprint and hardstand areas.
- Coefficient of runoff taken as 0.3 for building landscape areas.
- The peak rainfall intensity is sustained for the entire duration of the storm from the time of concentration.
- Catchment and sub-catchment areas were calculated using CAD tools.
- Soil permeability is based on a rate of 360mm/h (sand). Testing of the insitu soils will be carried out to confirm the infiltration rate used.
- Design rainfalls were obtained from Bureau of Meteorology (BoM) website: http://www.bom.gov.au/water/designRainfalls/index.shtml, see Table 2.

	Average Recurrence Interval (years)						
DURATION	1	2	5	10	20	50	100
5Mins	59.7	78.8	104	122	147	184	216
6Mins	55.7	73.4	96.5	113	136	171	200
10Mins	44.5	58.5	76.1	88.7	106	132	154
20Mins	31	40.6	51.9	59.8	71	87.4	101
30Mins	24.6	32	40.6	46.5	55	67.3	77.6
1Hr	16.1	20.9	26.1	29.7	34.8	42.2	48.4
2Hrs	10.4	13.4	16.5	18.6	21.7	26.1	29.8
3Hrs	8.02	10.3	12.6	14.2	16.4	19.7	22.3
6Hrs	5.14	6.56	7.96	8.89	10.3	12.2	13.8
12Hrs	3.3	4.21	5.08	5.67	6.51	7.72	8.71
24Hrs	2.11	2.7	3.28	3.67	4.23	5.03	5.69
48Hrs	1.32	1.69	2.09	2.35	2.73	3.28	3.74
72Hrs	0.97	1.25	1.56	1.76	2.06	2.48	2.83

Table 2: Rainfall intensities (mm/hr) from the Bureau of Meterology Rainfall IFD Data System (location 31.975S and 115.800E)

Council Design Criteria

The City of Nedlands requires that stormwater retention systems have sufficient capacity for the 1 in 20 ARI with a 1 in 100 ARI overland flow path.

Stormwater retention systems

There are a range of stormwater retention chambers that can be employed to manage stormwater on-site however are dependent on hydrological, geometrical, geotechnical and cost constraints. A summary of the number of units and volumetric requirement are given in appendix B.

Figure 1: Common stormwater retention systems used in Western Australia (top left in a clockwise direction, StormTech SC-740, Soakwell, Atlantis Flo-Tank, StormTrap)

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Drainage Design

The site is generally underlain with sandy soils (a geotechnical investigation will be carried out to confirm the ground conditions) and as such it is practical to dispose of the 20yr ARI stormwater on site utilizing stormwater retention chambers or soakwells.

Another option is to store the 100yr Average Recurrence Interval (ARI) therefore an overland flow path is not required. The following table summarises the volumetric requirement for each ARI.

Average Recurrence Interval	Atlantis Cells	SC-740	MC-3500	1.8 diameter x 1.8 deep soakwells
1 in 1 yr	680	561.7	650.6	590.3
1 in 20 yr	1412.3	1183.1	1327.2	1232.1
1 in 100 yr	1836	1635.4	1830.6	1691.9

Table 3: Volumetric Requirements based on Storm Average Recurrence Intervals

100 Year Flood Management

BPA have reviewed the feature survey and have determined that there is not a defined 100 year overland flow path in some areas as the ground is below the level of Monash Avenue.

Where stormwater does not have a clear overland flow path the 100 year ARI will be fully catered for by utilizing stormwater retention systems.

Overland flow paths will be investigated further to ensure that post development flows and the pre development flows are equal and that there is immunity from flooding of buildings.

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Quality Management

The following water quantity and quality measures have been adopted from *Decision Process for Stormwater Management in WA* (DoW, 2009).

Design storm for effective water quality management

Figure 1 shows how most hydraulic structures can be expected to treat over 99% of the expected annual runoff volume when designed for a 1 year ARI peak discharge. Therefore stormwater quality treatment devices do not need to be designed for rainfall events of high ARI to achieve hydrologic effectiveness, this design philosophy will be adopted for the Ramsay Hollywood re-development site.

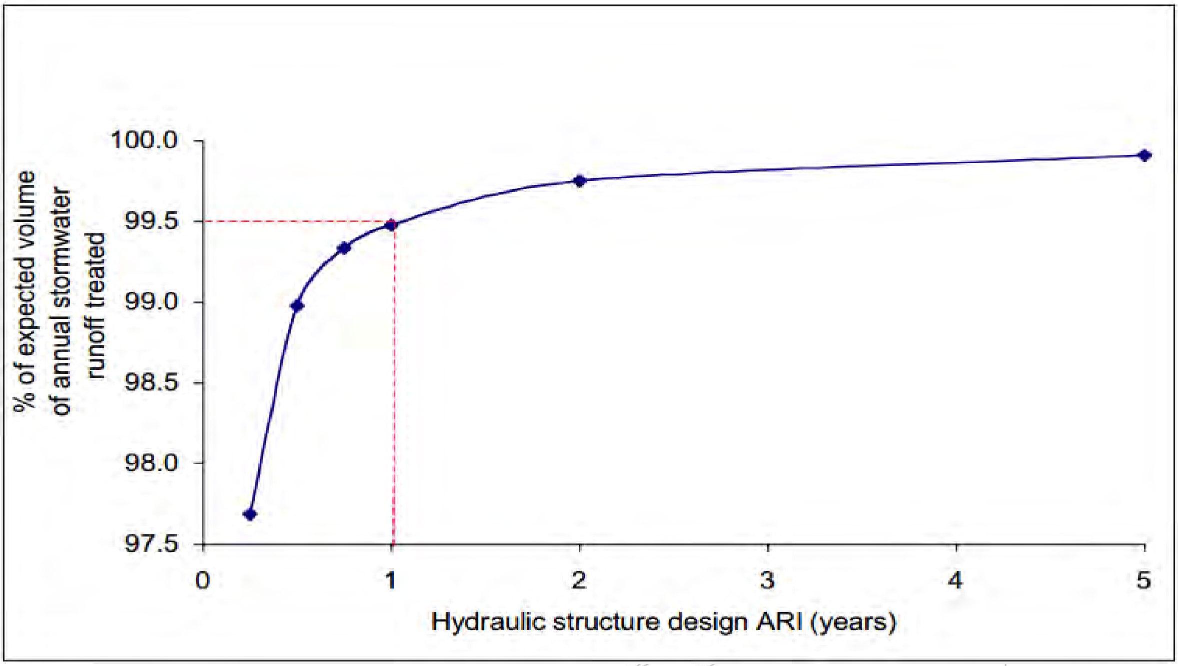

Table 4: Treatment efficiency of stormwater structures for Perth, Western Australia (adapted from studies conducted by Wong, 1999)

At source treatment

Stormwater retention systems will be designed for rainfall intensities greater than the 20 year ARI to manage quantity however this also means:

- The 1yr 1hour storm is included in the capture flow rate and consequent volume. Provided periodic maintenance is conducted;
- Pollutants (if present) will be removed from the system prior to disposal into groundwater.

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Preliminary Ongoing Maintenance Plan

In order for treatment devices to function efficiently they must be maintained, monitored and reviewed throughout the design life of the drainage infrastructure. Ramsay Health Care maintenance personnel will adhere to the maintenance plan for non-structural and structural controls.

The following maintenance and inspection requirements will be performed for the identified BMP's used within the proposed development.

Non-Structural controls

Litter Control

Ramsay Health will be responsible for maintaining any litter filters/ traps that are needed for management of gross pollutants. The waste will be picked up on a regular basis.

Structural controls

Soakwells

Maintenance personnel will be responsible for inspecting and cleaning the base of soakwells to ensure maximum soakage capacity. Inlets will also we maintained to minimise clogging.

Sub-surface infiltration cells (SC-740, MC-3500 & Atlantis Flo-Tank)

The isolator/ cleansing row will be inspected every 6 months for the first year of operation. For subsequent years, the inspection should be adjusted based upon previous observation of sediment deposition. Further details will be provided at the design stage.

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References

Department of Water (DoW), Decision Process for Stormwater Management in WA

Department of Water (DoW), 2007,Stormwater Management Manual for Western Australia, Perth.

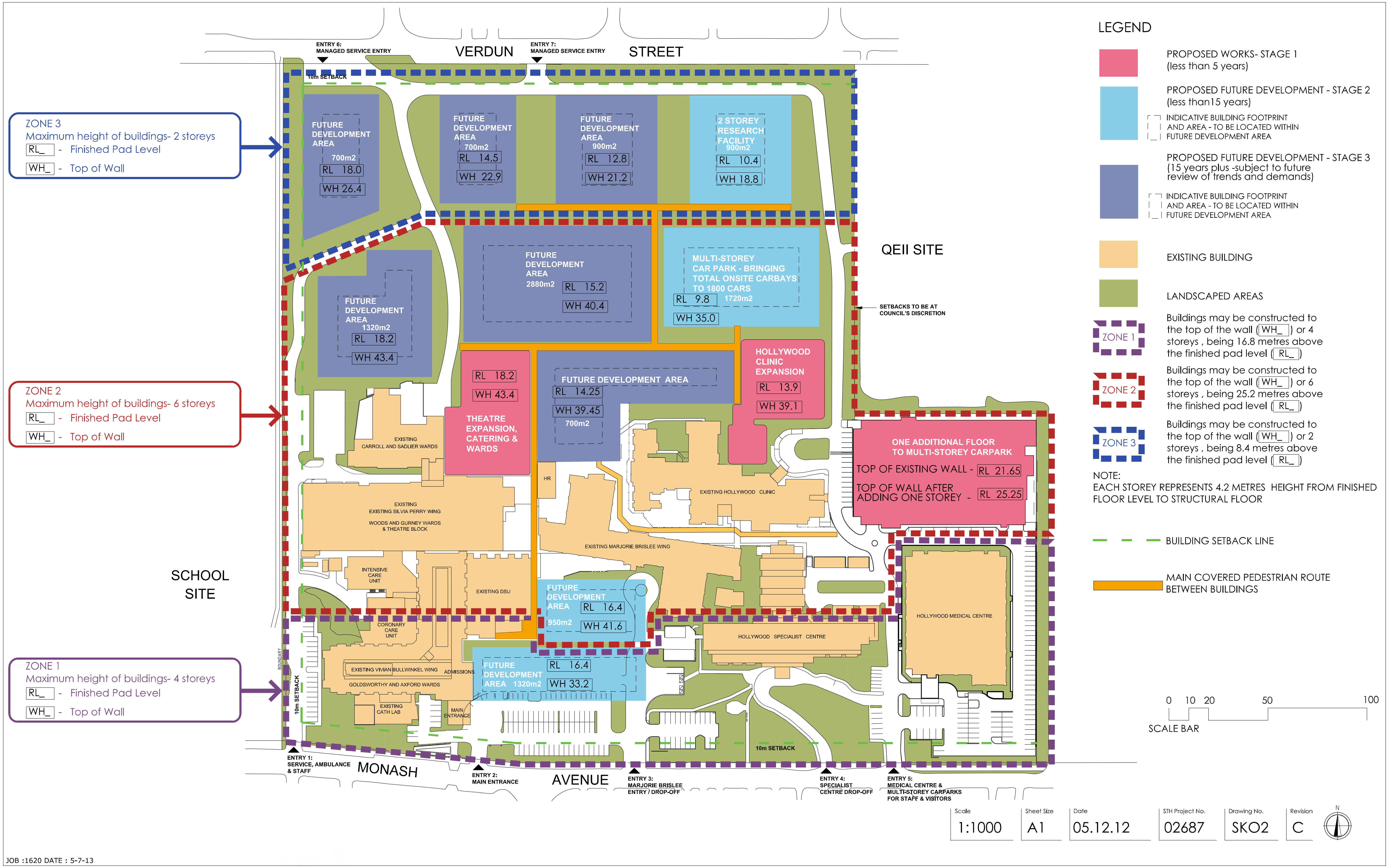
Department of Water (DoW), 2012, Perth Groundwater Atlas

Pilgrim, DH, (ed)., *Australian Rainfall & Runoff - A Guide to Flood Estimation*, Institution of Engineers, Australia, Barton, ACT, 1987

Western Australian Planning Commission (WAPC), 2008, Better Urban Water Management, Perth.

APPENDICES

APPENDIX A1 – SITE PLAN



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silver thomas hanley HEALTH ARCHITECTURE

Hollywood Private Hospital, Monash Avenue, Nedlands
MASTERPLAN

Figure 6

APPENDIX A2 – DETAILED BREAKDOWN OF SUBCATCHMENT AREAS

Sub-Catchment ID	Building Description	Landscape Area	Pavement Area	Building Footprint Area	Total Impervious Area
	Coefficient of Runoff	**0.3**	**1**	**1**	
	Proposed Works - Stage 1 (0-5 years)				
A	One Additional Floor To Multi-Storey Carpark	0	0	4705	4705
B	Hollywood Clinic Expansion	0	0	2140	2140
C	Theatre Expansion, Catering & Wards	0	0	1992	1992
	Proposed Future Development - Stage 2 (5-15 years)				
D	2 Storey Research Facility	1510	1910	885	3248
E	Multi-Storey Car Park - Bringing Total Onsite Carbays to 1800 Cars	1925	2153	1718	4449
F	Future Development Area Stage 2	220	769	943	1778
G	Future Development Area Stage 2	407	995	1330	2447
	Stage 2 - Road				1156
	Additional Landscaped Areas	2025			608
	Proposed Future Development - Stage 3 (15 years+)				
H	Future Development Area Stage 3	1329	1837	715	2951
I	Future Development Area Stage 3	1437	1437	665	2533
J	Future Development Area Stage 3	1411	1910	885	3218
K	Future Development Area Stage 3	2086	2009	1316	3951
L	Future Development Area Stage 3	1175	2667	2883	5903
M	Future Development Area Stage 3		567		567
N	Future Development Area Stage 3		2789	1416	4205
	Stage 3 - Road				5779
	Additional Landscaped Areas	2763			829
				Total	52457

APPENDIX B1 – DRAINAGE DESIGN CALCULATIONS

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Design Parameters for Ramsay Health Care – Hollywood Hospital, Nedlands

Catchment Areas:

<See Appendix A – Catchment Areas>

Design Parameters:

Average Recurrence Interval (years/ (probability = 1/20years): 20 (5%)
(years/ (probability = 1/100years): 100 (1%)

<Design ARI>

Intensity (mm/hr): Obtained from BOM (IFD DATA)
<http://www.bom.gov.au/hydro/has/cdirswebx/cdirswebx.shtml>

Volumetric Runoff Coefficient (unitless): 1

<For Equivalent Impervious Area>

Soil K_h (mm/hr): 360mm/hr
< Soil permeability is based on a rate of 360mm/hr. Testing of the insitu soils will be carried out to confirm the infiltration to be used >

Moderating Factor (unitless): 1.0
< Moderation factors to convert point to areal conductivities (after Engineers Australia, 2003 – taken as 1.0 for Sandy Clay)

Perimeter of Infiltrating Area (m): 2*(2.17m + 1.295m) = 6.93m
< From StormTech information sheet
http://www.stormtech.com/download_files/pdf/cut_sheet_740.pdf>

Depth of Storage (m): 0.762m
< From StormTech information sheet
http://www.stormtech.com/download_files/pdf/cut_sheet_740.pdf>

Porosity of Storage (unitless): 1 (100%):
<Potential Volume available in one chamber>

Clogged Layer K_h (mm/hr): 6.25mm/hr
< Assumed Hydraulic Conductivity of Clogged Layer>

Clogged Layer Thickness (mm): 200mm
<Assumed Thickness of Clogged Layer>

Our Ref: S14512
Date: 8 June 2013

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Soakage Rates

Shallow Water Table Log Model

The design method is based on the basic concept that retention basins function by providing temporary storage while inflow (stormwater runoff) arrives at a high rate and outflow (soakage) occurs at a slower rate as a result of close proximity to ground water.

Clogged Base Model

The design method is based on the basic concept that retention basins function by providing temporary storage while inflow (stormwater runoff) arrives at a high rate and outflow (soakage) occurs at a slower rate due to a clogged layer over the infiltration footprint area.

Deep Water Table Model

The design method is based on the basic concept that retention basins function by providing temporary storage while both inflow (stormwater runoff) outflow (soakage) occur at rapid rates. This model gives the least storage volume required.

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Example Calculation

SC-740					
Storm Duration **[1]**	Storm Mean Intensity **[2]**	Storage Volume Provided **[3]**	Volume out (during storm duration period) **[4]**	Allowable Volume in **[5]**	Allowable Catchment Area **[6]**
(minutes)	(mm/hr)	(m^3)	(m^3)	(m^3)	(m^2)
6	113.2	2.120	0.004	2.124	188

[1] Storm Duration (mins): 6 minutes

<Obtained from BOM (IFD DATA)>

[2] Storm Mean Intensity (mm/hr): 113.2mm/hr

<Obtained from BOM (IFD DATA)>

[3] Volume (out during storm duration) (m^3) = Infiltration rate x duration of storm event: $0.040m^3$/hr x (6 mins/60) [hr] = 0.004 m^3

<Infiltration Rate = L x W x K_h: 2.17m x 1.295m x 14.4 x 10^{-3}m/hr = $0.04m^3$/hr

[4] Allowable Volume in (m^3): $2.12m^3 + 0.004m^3 = 2.124m^3$

<[3] + [4]>

[5] Allowable Catchment Area: Calculated from transposition of Rational Method equation. $<Area = \frac{Volume\ (in) x\ 1000}{C\ x\ i\ x\ D}>$

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Summary:

The critical model for the site was the clogged base model as a result of a low hydraulic conductivity playing a prominent role throughout the design storm. The following table shows the minimum catchment areas that are required for the optional retention system.

	Allowable Drainage Areas (m^2) - Deep Water Table, Clogged Base		
	1 in 1 yr ARI	**1 in 20 yr ARI**	**1 in 100 yr ARI**
Atlantis Tripple Mod	27	13	10
SC-740	198	94	68
Chamber Maxx	207	97	71
MC-3500	408	200	145
Ø1.8m x 1.8 deep Soakwells	407	195	142

	Allowable Drainage Areas (m^2) - Shallow Water Table Model		
	1 in 1 yr ARI	**1 in 20 yr ARI**	**1 in 100 yr ARI**
Atlantis Tripple Mod	235	52	61
SC-740	416	178	129
Chamber Maxx	419	180	131
MC-3500	686	327	234
Ø1.8m x 1.8 deep Soakwells	666	310	222

Our Ref: S14512
Date: 8 June 2013

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Shallow Water Table Log Model

Infiltration and Detention Calculation

Enter values in the cells marked yellow.
Date: 8/06/2013

Location S08813 STORMWATER RAMSAY HOLLYWOOD HOSPITAL

Soakwell

Average Recurrence Interval	100	Years	Plan Area	2.54	m^2
Volumetric Runoff Coefficient	1		Perimeter of Plan Area	5.65	m
Soil K_h	360	mm/hr	Average Infiltration Rate Base	0.087	m^3/hr
Moderating Factor	1		Average Infiltration Rate Sides	1.832	m^3/hr
Diameter of Infiltration Area	1.8	m	Average Infiltration Rate Total	1.920	m^3/hr
Depth of Storage	1.8	m	Storage Volume Provided	4.58	m^3
Porosity of Storage	1		Catchment Area Served	222	m^2
Clogged Layer K_h	6.25	mm/hr	Emptying Time	2.39	hours
Clogged Layer Thickness	200	mm			

IFD Coefficients

http://www.bom.gov.au/hydro/has/cdirswebx/cdirswebx.shtml
Click 'Copy Table', paste to a plain text file, follow instructions
Open .csv file, copy coefficients only, paste as text into highlighted fields

Current IFD Data for: Nedlands

ARI (years)	A	B	C	D	E	F	G
1	2.762644	-6.27E-01	-1.85E-02	7.73E-03	-6.67E-04	-1.16E-04	-3.43E-06
2	3.007657	-6.36E-01	-1.64E-02	6.92E-03	-6.40E-04	2.84E-05	-2.77E-05
5	3.203898	-6.60E-01	-1.11E-02	5.95E-03	-7.14E-04	2.45E-04	-6.13E-05
10	3.315007	-6.74E-01	-8.28E-03	5.20E-03	-6.99E-04	3.89E-04	-8.51E-05
20	3.457548	-6.86E-01	-5.56E-03	4.44E-03	-6.95E-04	5.38E-04	-1.10E-04
50	3.629022	-7.01E-01	-2.10E-03	3.83E-03	-7.47E-04	6.75E-04	-1.31E-04
100	3.750722	-7.12E-01	-1.19E-04	3.09E-03	-6.97E-04	8.06E-04	-1.54E-04
Chosen	3.75E+00	-7.12E-01	-1.19E-04	3.09E-03	-6.97E-04	8.06E-04	-1.54E-04

Stormtech Cells

Cell Type :hamber Maxx

Chamber Dimensions			Cube Dimensions		
Length	2.31	m	Length	2.31	m
Width	1.31	m	Width	1.46	m
Height	0.77	m	Height	1.07	m
Volume of chamber	1.4	m^3	Volumetric Capactiy of Blue Metal	0.8834728	m^3
Infiltration Rate Base	1.089396	m^3/hr	Catchment Area Served	127	m^2

SOAKWELLS

Storm Duration	Storm Mean Intensity	Storage Volume Provided	Volume out (during storm duration period)	Allowable Volume in	Allowable Catchment Area
(minutes)	(mm/hr)	(m^3)	(m^3)	(m^3)	(m^2)
5	206.8	4.580	0.523	5.103	296
12	129.9	4.580	1.326	5.906	227
18	99.3	4.580	2.038	6.619	222
30	69.6	4.580	3.510	8.091	233
45	52.2	4.580	5.414	9.995	255
60	42.6	4.580	7.373	11.953	281
90	31.9	4.580	11.417	15.997	334
120	26.0	4.580	15.597	20.178	388
180	19.5	4.580	24.288	28.869	492
240	16.0	4.580	33.350	37.931	593
300	13.7	4.580	42.738	47.318	690
360	12.1	4.580	52.424	57.004	783
480	10.0	4.580	72.621	77.202	964
600	8.7	4.580	93.841	98.421	1137
720	7.7	4.580	116.013	120.593	1304
840	7.0	4.580	139.083	143.664	1466
960	6.4	4.580	163.005	167.586	1625
1080	6.0	4.580	187.736	192.317	1781
1200	5.6	4.580	213.237	217.818	1935
1320	5.3	4.580	239.471	244.051	2087
1440	5.0	4.580	266.400	270.980	2238
2160	4.0	4.580	440.653	445.234	3122
2880	3.3	4.580	631.532	636.113	3992
3600	2.9	4.580	832.483	837.063	4862
4320	2.5	4.580	1037.707	1042.288	5736

Chamber Maxx

Storm Duration	Storm Mean Intensity	Storage Volume Provided	Volume out (during storm duration period)	Allowable Volume in	Allowable Catchment Area
(minutes)	(mm/hr)	(m^3)	(m^3)	(m^3)	(m^2)
6	191.8	2.160	0.464	2.624	127
12	129.9	2.160	1.140	3.300	127
18	99.3	2.160	1.728	3.888	131
30	69.6	2.160	2.923	5.083	146
45	52.2	2.160	4.441	6.601	169
60	42.6	2.160	5.979	8.139	191
90	31.9	2.160	9.100	11.260	235
120	26.0	2.160	12.272	14.432	277
180	19.5	2.160	18.734	20.894	356
240	16.0	2.160	25.328	27.488	430
300	13.7	2.160	32.038	34.198	498
360	12.1	2.160	38.854	41.014	564
480	10.0	2.160	52.773	54.933	686
600	8.7	2.160	67.046	69.206	799
720	7.7	2.160	81.646	83.806	906
840	7.0	2.160	96.552	98.712	1007
960	6.4	2.160	111.745	113.905	1104
1080	6.0	2.160	127.209	129.369	1198
1200	5.6	2.160	142.930	145.090	1289
1320	5.3	2.160	158.893	161.053	1377
1440	5.0	2.160	175.085	177.245	1464
2160	4.0	2.160	276.348	278.508	1953
2880	3.3	2.160	382.898	385.058	2417
3600	2.9	2.160	492.565	494.725	2874
4320	2.5	2.160	603.498	605.658	3333

Our Ref: S14512
Date: 8 June 2013

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Clogged Base Model

Infiltration and Detention Calculation

Enter values in the cells marked yellow.
Date: 8/06/2013

Location S08813 STORMWATER RAMSAY HOLLYWOOD HOSPITAL

Soakwell

Average Recurrence Interval	100	Years	Plan Area	2.54	m^2
Volumetric Runoff Coefficient	1		Perimeter of Plan Area	5.65	m
Soil K_h	360	mm/hr	Average Infiltration Rate (Base)	0.087	m^3/hr
Moderating Factor	1		Average Infiltration Rate (Sides)	1.832	m^3/hr
Diameter of Infiltration Area	1.8	m	Average Infiltration Rate (Total)	1.920	m^3/hr
Depth of Storage	1.8	m	Storage Volume Provided	4.58	m^3
Porosity of Storage	1		Catchment Area Served	142	m^2
Clogged Layer K_h	6.25	mm/hr	Emptying Time	2.39	hours
Clogged Layer Thickness	200	mm			

Storage Chamber Chamber Maxx

Chamber Dimensions			Cube Dimensions		
Length	2.31	m	Length	2.31	m
Width	1.31	m	Width	1.46	m
Height	0.77	m	Height	1.07	m
Volume of Chamber	1.4	m^3	Volumetric Capactiy of Blue Metal	0.8834728	m^3
Infiltration Rate (Base)	1.089396	m^3/hr	Catchment Area Served	71	m^2
Minimum Installed Storage	2.16	m^3			

IFD Coefficients

http://www.bom.gov.au/hydro/has/cdirswebx/cdirswebx.shtml
Click 'Copy Table', paste to a plain text file, follow instructions
Open .csv file, copy coefficients only, paste as text into highlighted fields

Current IFD Data for: Nedlands

ARI (years)	A	B	C	D	E	F	G
1	2.760432	-6.30E-01	-2.02E-02	7.75E-03	-6.45E-04	-1.27E-04	-1.14E-06
2	3.014252	-6.38E-01	-1.92E-02	7.46E-03	-5.57E-04	-5.76E-05	-1.45E-05
5	3.23013	-6.57E-01	-1.65E-02	6.33E-03	-3.55E-04	1.55E-04	-5.54E-05
10	3.353414	-6.68E-01	-1.45E-02	5.91E-03	-3.32E-04	2.62E-04	-7.32E-05
20	3.507452	-6.78E-01	-1.28E-02	5.39E-03	-2.63E-04	3.68E-04	-9.22E-05
50	3.693497	-6.90E-01	-1.08E-02	4.44E-03	-1.51E-04	5.36E-04	-1.23E-04
100	3.82589	-6.98E-01	-9.69E-03	3.63E-03	7.74E-06	6.73E-04	-1.50E-04
Chosen	3.83E+00	-6.98E-01	-9.69E-03	3.63E-03	7.74E-06	6.73E-04	-1.50E-04

SOAKWELLS

Storm Duration	Storm Mean Intensity	Storage Volume Provided	Volume out (during storm duration period)	Allowable Volume in	Allowable Catchment Area
(minutes)	(mm/hr)	(m^3)	(m^3)	(m^3)	(m^2)
5	209.8	4.580	0.160	4.740	271
12	134.2	4.580	0.384	4.964	185
18	103.9	4.580	0.576	5.156	165
30	74.0	4.580	0.960	5.540	150
45	56.0	4.580	1.440	6.020	143
60	45.9	4.580	1.920	6.500	142
90	34.5	4.580	2.879	7.460	144
120	28.2	4.580	3.839	8.420	149
180	21.2	4.580	5.759	10.339	163
240	17.3	4.580	7.679	12.259	177
300	14.8	4.580	9.598	14.179	191
360	13.1	4.580	11.518	16.098	205
480	10.8	4.580	15.357	19.938	231
600	9.3	4.580	19.197	23.777	255
720	8.3	4.580	23.036	27.616	277
840	7.5	4.580	26.875	31.456	298
960	6.9	4.580	30.714	35.295	318
1080	6.4	4.580	34.554	39.134	337
1200	6.0	4.580	38.393	42.973	355
1320	5.7	4.580	42.232	46.813	373
1440	5.4	4.580	46.072	50.652	389
2160	4.3	4.580	69.107	73.688	481
2880	3.6	4.580	92.143	96.724	566
3600	3.1	4.580	115.179	119.759	649
4320	2.7	4.580	138.215	142.795	734

Chamber Maxx

Storm Duration	Storm Mean Intensity	Storage Volume Provided	Volume out (during storm duration period)	Allowable Volume in	Allowable Catchment Area
(minutes)	(mm/hr)	(m^3)	(m^3)	(m^3)	(m^2)
6	194.8	2.160	0.109	2.269	117
12	134.2	2.160	0.218	2.378	89
18	103.9	2.160	0.327	2.487	80
30	74.0	2.160	0.545	2.705	73
45	56.0	2.160	0.817	2.977	71
60	45.9	2.160	1.089	3.249	71
90	34.5	2.160	1.634	3.794	73
120	28.2	2.160	2.179	4.339	77
180	21.2	2.160	3.268	5.428	85
240	17.3	2.160	4.358	6.518	94
300	14.8	2.160	5.447	7.607	103
360	13.1	2.160	6.536	8.696	111
480	10.8	2.160	8.715	10.875	126
600	9.3	2.160	10.894	13.054	140
720	8.3	2.160	13.073	15.233	153
840	7.5	2.160	15.252	17.412	165
960	6.9	2.160	17.430	19.590	177
1080	6.4	2.160	19.609	21.769	188
1200	6.0	2.160	21.788	23.948	198
1320	5.7	2.160	23.967	26.127	208
1440	5.4	2.160	26.146	28.306	218
2160	4.3	2.160	39.218	41.378	270
2880	3.6	2.160	52.291	54.451	318
3600	3.1	2.160	65.364	67.524	366
4320	2.7	2.160	78.437	80.597	414

Clogged Base Results - 1 in 1 yr ARI

New ID	Building Description	Landscape Area	Pavement Area	Building Footprint Area	Total Impervious Area		Atlantil Cell - Tripple Module	SC-740	Chamber Maxx	MC-3500	Ø1.8m x 1.8 deep Soakwells
	Coefficient of Runoff	**0.3**	**1**	**1**							
	Proposed Works - Stage 1 (0-5 years)										
A	One Additional Floor To Multi-Storey Carpark	0	0	4705	4705		174.3	23.8	22.7	11.5	11.6
B	Hollywood Clinic Expansion	0	0	2140	2140		79.3	10.8	10.3	5.2	5.3
C	Theatre Expansion, Catering & Wards	0	0	1992	1992		73.8	10.1	9.6	4.9	4.9
	Proposed Future Development - Stage 2 (5-15 years)										
D	2 Storey Research Facility	1510	1910	885	3248		120.3	16.4	15.7	8.0	8.0
E	Multi-Storey Car Park - Bringing Total Onsite Carbays to 1800 Cars	1925	2153	1718	4449		164.8	22.5	21.5	10.9	10.9
F	Future Development Area Stage 2	220	769	943	1778		65.9	9.0	8.6	4.4	4.4
G	Future Development Area Stage 2	407	995	1330	2447		90.6	12.4	11.8	6.0	6.0
	Stage 2 - Road				1156		42.8	5.8	5.6	2.8	2.8
	Additional Landscaped Areas	2025			608		22.5	3.1	2.9	1.5	1.5
	Proposed Future Development - Stage 3 (15 years+)										
H	Future Development Area Stage 3	1329	1837	715	2951		109.3	14.9	14.3	7.2	7.2
I	Future Development Area Stage 3	1437	1437	665	2533		93.8	12.8	12.2	6.2	6.2
J	Future Development Area Stage 3	1411	1910	885	3218		119.2	16.3	15.5	7.9	7.9
K	Future Development Area Stage 3	2086	2009	1316	3951		146.3	20.0	19.1	9.7	9.7
L	Future Development Area Stage 3	1175	2667	2883	5903		218.6	29.8	28.5	14.5	14.5
M	Future Development Area Stage 3		567		567		21.0	2.9	2.7	1.4	1.4
N	Future Development Area Stage 3		2789	1416	4205		155.7	21.2	20.3	10.3	10.3
	Stage 3 - Road				5779		214.0	29.2	27.9	14.2	14.2
	Additional Landscaped Areas	2763			829		30.7	4.2	4.0	2.0	2.0
				Total	45850	Total No. of units	**1943**	**265**	**253**	**129**	**129**
				Total Volume		Total Storage	**680.0**	**561.7**	**547.4**	**650.6**	**590.3**

	Allowable Drainage Areas - Deep Water Table, Clogged Base		
	1 in 1 yr ARI	**1 in 20 yr ARI**	**1 in 100 yr ARI**
Atlantis Tripple Mod	27	13	10
SC-740	198	94	68
Chamber Maxx	207	97	71
MC-3500	408	200	145
Ø1.8m x 1.8 deep Soakwe	407	195	142

Clogged Base Results - 1 in 20 yr ARI

New ID	Building Description	Landscape Area	Pavement Area	Building Footprint Area	Total Impervious Area		Atlantil Cell - Tripple Module	SC-740	Chamber Maxx	MC-3500	Ø1.8m x 1.8 deep Soakwells
	Coefficient of Runoff	**0.3**	**1**	**1**							
	Proposed Works - Stage 1 (0-5 years)										
A	One Additional Floor To Multi-Storey Carpark	0	0	4705	4705		361.9	50.1	48.5	23.5	24.1
B	Hollywood Clinic Expansion	0	0	2140	2140		164.6	22.8	22.1	10.7	11.0
C	Theatre Expansion, Catering & Wards	0	0	1992	1992		153.2	21.2	20.5	10.0	10.2
	Proposed Future Development - Stage 2 (5-15 years)										
D	2 Storey Research Facility	1510	1910	885	3248		249.8	34.6	33.5	16.2	16.7
E	Multi-Storey Car Park - Bringing Total Onsite Carbays to 1800 Cars	1925	2153	1718	4449		342.2	47.3	45.9	22.2	22.8
F	Future Development Area Stage 2	220	769	943	1778		136.8	18.9	18.3	8.9	9.1
G	Future Development Area Stage 2	407	995	1330	2447		188.2	26.0	25.2	12.2	12.5
	Stage 2 - Road				1156		88.9	12.3	11.9	5.8	5.9
	Additional Landscaped Areas	2025			608		46.7	6.5	6.3	3.0	3.1
	Proposed Future Development - Stage 3 (15 years+)										
H	Future Development Area Stage 3	1329	1837	715	2951		227.0	31.4	30.4	14.8	15.1
I	Future Development Area Stage 3	1437	1437	665	2533		194.9	26.9	26.1	12.7	13.0
J	Future Development Area Stage 3	1411	1910	885	3218		247.6	34.2	33.2	16.1	16.5
K	Future Development Area Stage 3	2086	2009	1316	3951		303.9	42.0	40.7	19.8	20.3
L	Future Development Area Stage 3	1175	2667	2883	5903		454.0	62.8	60.9	29.5	30.3
M	Future Development Area Stage 3		567		567		43.6	6.0	5.8	2.8	2.9
N	Future Development Area Stage 3		2789	1416	4205		323.5	44.7	43.4	21.0	21.6
	Stage 3 - Road				5779		444.5	61.5	59.6	28.9	29.6
	Additional Landscaped Areas	2763			829		63.8	8.8	8.5	4.1	4.3
				Total	45850	Total No. of units	**4035**	**558**	**541**	**262**	**269**
				Total Volume		Total Storage	**1412.3**	**1183.1**	**1168.1**	**1327.2**	**1232.1**

	Allowable Drainage Areas - Deep Water Table, Clogged Base		
	1 in 1 yr ARI	**1 in 20 yr ARI**	**1 in 100 yr ARI**
Atlantis Tripple Mod	27	13	10
SC-740	198	94	68
Chamber Maxx	207	97	71
MC-3500	408	200	145
Ø1.8m x 1.8 deep Soakwe	407	195	142

Clogged Base Results - 1 in 100 yr ARI

New ID	Building Description	Landscape Area	Pavement Area	Building Footprint Area	Total Impervious Area		Atlantil Cell - Tripple Module	SC-740	Chamber Maxx	MC-3500	Ø1.8m x 1.8 deep Soakwells
	Coefficient of Runoff	**0.3**	**1**	**1**							
	Proposed Works - Stage 1 (0-5 years)										
A	One Additional Floor To Multi-Storey Carpark	0	0	4705	4705		470.5	69.2	66.3	32.4	33.1
B	Hollywood Clinic Expansion	0	0	2140	2140		214.0	31.5	30.1	14.8	15.1
C	Theatre Expansion, Catering & Wards	0	0	1992	1992		199.2	29.3	28.1	13.7	14.0
	Proposed Future Development - Stage 2 (5-15 years)										
D	2 Storey Research Facility	1510	1910	885	3248		324.8	47.8	45.7	22.4	22.9
E	Multi-Storey Car Park - Bringing Total Onsite Carbays to 1800 Cars	1925	2153	1718	4449		444.9	65.4	62.7	30.7	31.3
F	Future Development Area Stage 2	220	769	943	1778		177.8	26.1	25.0	12.3	12.5
G	Future Development Area Stage 2	407	995	1330	2447		244.7	36.0	34.5	16.9	17.2
	Stage 2 - Road				1156		115.6	17.0	16.3	8.0	8.1
	Additional Landscaped Areas	2025			608		60.8	8.9	8.6	4.2	4.3
	Proposed Future Development - Stage 3 (15 years+)										
H	Future Development Area Stage 3	1329	1837	715	2951		295.1	43.4	41.6	20.3	20.8
I	Future Development Area Stage 3	1437	1437	665	2533		253.3	37.3	35.7	17.5	17.8
J	Future Development Area Stage 3	1411	1910	885	3218		321.8	47.3	45.3	22.2	22.7
K	Future Development Area Stage 3	2086	2009	1316	3951		395.1	58.1	55.6	27.2	27.8
L	Future Development Area Stage 3	1175	2667	2883	5903		590.3	86.8	83.1	40.7	41.6
M	Future Development Area Stage 3		567		567		56.7	8.3	8.0	3.9	4.0
N	Future Development Area Stage 3		2789	1416	4205		420.5	61.8	59.2	29.0	29.6
	Stage 3 - Road				5779		577.9	85.0	81.4	39.9	40.7
	Additional Landscaped Areas	2763			829		82.9	12.2	11.7	5.7	5.8
				Total	45850	Total No. of units	**5246**	**771**	**739**	**362**	**369**
				Total Volume		Total Storage	**1836.0**	**1635.4**	**1595.9**	**1830.6**	**1691.9**

	Allowable Drainage Areas - Deep Water Table, Clogged Base		
	1 in 1 yr ARI	**1 in 20 yr ARI**	**1 in 100 yr ARI**
Atlantis Tripple Mod	27	13	10
SC-740	198	94	68
Chamber Maxx	207	97	71
MC-3500	408	200	145
Ø1.8m x 1.8 deep Soakwells	407	195	142

Deep water table results 1 in 1yr ARI

Building Description	Landscape Area	Pavement Area	Building Footprint Area	Total Impervious Area		Atlantil Cell - Tripple Module	SC-740	Chamber Maxx	MC-3500	Ø1.8m x 1.8 deep Soakwells
Coefficient of Runoff	**0.3**	**1**	**1**							
Proposed Works - Stage 1 (0-5 years)										
One Additional Floor To Multi-Storey Carpark	0	0	4705	4705		162.2	23.8	22.8	10.6	10.1
Hollywood Clinic Expansion	0	0	2140	2140		73.8	10.8	10.4	4.8	4.6
Theatre Expansion, Catering & Wards	0	0	1992	1992		68.7	10.1	9.7	4.5	4.3
Proposed Future Development - Stage 2 (5-15 years)										
2 Storey Research Facility	1510	1910	885	3248		112.0	16.4	15.8	7.3	7.0
Multi-Storey Car Park - Bringing Total Onsite Carbays to 1800 Cars	1925	2153	1718	4449		153.4	22.5	21.6	10.1	9.6
Future Development Area Stage 2	220	769	943	1778		61.3	9.0	8.6	4.0	3.8
Future Development Area Stage 2	407	995	1330	2447		84.4	12.4	11.9	5.5	5.3
Stage 2 - Road				1156		39.9	5.8	5.6	2.6	2.5
Additional Landscaped Areas	2025			608		20.9	3.1	2.9	1.4	1.3
Proposed Future Development - Stage 3 (15 years+)										
Future Development Area Stage 3	1329	1837	715	2951		101.7	14.9	14.3	6.7	6.4
Future Development Area Stage 3	1437	1437	665	2533		87.3	12.8	12.3	5.7	5.5
Future Development Area Stage 3	1411	1910	885	3218		111.0	16.3	15.6	7.3	6.9
Future Development Area Stage 3	2086	2009	1316	3951		136.2	20.0	19.2	8.9	8.5
Future Development Area Stage 3	1175	2667	2883	5903		203.5	29.8	28.7	13.4	12.7
Future Development Area Stage 3		567		567		19.6	2.9	2.8	1.3	1.2
Future Development Area Stage 3		2789	1416	4205		145.0	21.2	20.4	9.5	9.1
Stage 3 - Road				5779		199.3	29.2	28.1	13.1	12.5
Additional Landscaped Areas	2763			829		28.6	4.2	4.0	1.9	1.8
			Total	45850	Total No. of units	**1809**	**265**	**255**	**119**	**113**
			Total Volume		Total Storage	**633.1**	**561.7**	**550.0**	**600.5**	**517.8**

	Allowable Drainage Areas - Deep Water Table, Clogged Base		
	1 in 1 yr ARI	**1 in 20 yr ARI**	**1 in 100 yr ARI**
Atlantis Tripple Mod	29	14	10
SC-740	198	95	69
Chamber Maxx	206	98	71
MC-3500	442	197	144
Ø1.8m x 1.8 deep Soakwel	464	219	158

Deep water table results 1 in 20yr ARI

New ID	Building Description	Landscape Area	Pavement Area	Building Footprint Area	Total Impervious Area		Atlantil Cell - Tripple Module	SC-740	Chamber Maxx	MC-3500	Ø1.8m x 1.8 deep Soakwells
	Coefficient of Runoff	**0.3**	**1**	**1**							
	Proposed Works - Stage 1 (0-5 years)										
A	One Additional Floor To Multi-Storey Carpark	0	0	4705	4705		361.9	50.1	48.5	23.5	24.1
B	Hollywood Clinic Expansion	0	0	2140	2140		164.6	22.8	22.1	10.7	11.0
C	Theatre Expansion, Catering & Wards	0	0	1992	1992		153.2	21.2	20.5	10.0	10.2
	Proposed Future Development - Stage 2 (5-15 years)										
D	2 Storey Research Facility	1510	1910	885	3248		249.8	34.6	33.5	16.2	16.7
E	Multi-Storey Car Park - Bringing Total Onsite Carbays to 1800 Cars	1925	2153	1718	4449		342.2	47.3	45.9	22.2	22.8
F	Future Development Area Stage 2	220	769	943	1778		136.8	18.9	18.3	8.9	9.1
G	Future Development Area Stage 2	407	995	1330	2447		188.2	26.0	25.2	12.2	12.5
	Stage 2 - Road				1156		88.9	12.3	11.9	5.8	5.9
	Additional Landscaped Areas	2025			608		46.7	6.5	6.3	3.0	3.1
	Proposed Future Development - Stage 3 (15 years+)										
H	Future Development Area Stage 3	1329	1837	715	2951		227.0	31.4	30.4	14.8	15.1
I	Future Development Area Stage 3	1437	1437	665	2533		194.9	26.9	26.1	12.7	13.0
J	Future Development Area Stage 3	1411	1910	885	3218		247.6	34.2	33.2	16.1	16.5
K	Future Development Area Stage 3	2086	2009	1316	3951		303.9	42.0	40.7	19.8	20.3
L	Future Development Area Stage 3	1175	2667	2883	5903		454.0	62.8	60.9	29.5	30.3
M	Future Development Area Stage 3		567		567		43.6	6.0	5.8	2.8	2.9
N	Future Development Area Stage 3		2789	1416	4205		323.5	44.7	43.4	21.0	21.6
	Stage 3 - Road				5779		444.5	61.5	59.6	28.9	29.6
	Additional Landscaped Areas	2763			829		63.8	8.8	8.5	4.1	4.3
				Total	45850	Total No. of units	**3527**	**488**	**473**	**229**	**235**
				Total Volume		Total Storage	**1234.4**	**1034.1**	**1021.0**	**1160.0**	**1076.9**

	Allowable Drainage Areas - Deep Water Table, Clogged Base		
	1 in 1 yr ARI	**1 in 20 yr ARI**	**1 in 100 yr ARI**
Atlantis Tripple Mod	27	13	10
SC-740	198	94	68
Chamber Maxx	207	97	71
MC-3500	408	200	145
Ø1.8m x 1.8 deep Soakwe	407	195	142

Deep water table results 1 in 100yr ARI

New ID	Building Description	Landscape Area	Pavement Area	Building Footprint Area	Total Impervious Area		Atlantil Cell - Tripple Module	SC-740	Chamber Maxx	MC-3500	Ø1.8m x 1.8 deep Soakwells
	Coefficient of Runoff	**0.3**	**1**	**1**							
	Proposed Works - Stage 1 (0-5 years)										
A	One Additional Floor To Multi-Storey Carpark	0	0	4705	4705		470.5	69.2	66.3	32.4	33.1
B	Hollywood Clinic Expansion	0	0	2140	2140		214.0	31.5	30.1	14.8	15.1
C	Theatre Expansion, Catering & Wards	0	0	1992	1992		199.2	29.3	28.1	13.7	14.0
	Proposed Future Development - Stage 2 (5-15 years)										
D	2 Storey Research Facility	1510	1910	885	3248		324.8	47.8	45.7	22.4	22.9
E	Multi-Storey Car Park - Bringing Total Onsite Carbays to 1800 Cars	1925	2153	1718	4449		444.9	65.4	62.7	30.7	31.3
F	Future Development Area Stage 2	220	769	943	1778		177.8	26.1	25.0	12.3	12.5
G	Future Development Area Stage 2	407	995	1330	2447		244.7	36.0	34.5	16.9	17.2
	Stage 2 - Road				1156		115.6	17.0	16.3	8.0	8.1
	Additional Landscaped Areas	2025			608		60.8	8.9	8.6	4.2	4.3
	Proposed Future Development - Stage 3 (15 years+)										
H	Future Development Area Stage 3	1329	1837	715	2951		295.1	43.4	41.6	20.3	20.8
I	Future Development Area Stage 3	1437	1437	665	2533		253.3	37.3	35.7	17.5	17.8
J	Future Development Area Stage 3	1411	1910	885	3218		321.8	47.3	45.3	22.2	22.7
K	Future Development Area Stage 3	2086	2009	1316	3951		395.1	58.1	55.6	27.2	27.8
L	Future Development Area Stage 3	1175	2667	2883	5903		590.3	86.8	83.1	40.7	41.6
M	Future Development Area Stage 3		567		567		56.7	8.3	8.0	3.9	4.0
N	Future Development Area Stage 3		2789	1416	4205		420.5	61.8	59.2	29.0	29.6
	Stage 3 - Road				5779		577.9	85.0	81.4	39.9	40.7
	Additional Landscaped Areas	2763			829		82.9	12.2	11.7	5.7	5.8
				Total	45850	Total No. of units	**5246**	**771**	**739**	**362**	**369**
				Total Volume		Total Storage	**1836.0**	**1635.4**	**1595.9**	**1830.6**	**1691.9**

	Allowable Drainage Areas - Deep Water Table, Clogged Base		
	1 in 1 yr ARI	**1 in 20 yr ARI**	**1 in 100 yr ARI**
Atlantis Tripple Mod	27	13	10
SC-740	198	94	68
Chamber Maxx	207	97	71
MC-3500	408	200	145
Ø1.8m x 1.8 deep Soakwells	407	195	142

Shallow water table results 1 in 1yr ARI

New ID	Building Description	Landscape Area	Pavement Area	Building Footprint Area	Total Impervious Area		Atlantil Cell - Tripple Module	SC-740	Chamber Maxx	MC-3500	Ø1.8m x 1.8 deep Soakwells
	Coefficient of Runoff	**0.3**	**1**	**1**							
	Proposed Works - Stage 1 (0-5 years)										
A	One Additional Floor To Multi-Storey Carpark	0	0	4705	4705		20.0	11.3	11.2	6.9	7.1
B	Hollywood Clinic Expansion	0	0	2140	2140		9.1	5.1	5.1	3.1	3.2
C	Theatre Expansion, Catering & Wards	0	0	1992	1992		8.5	4.8	4.8	2.9	3.0
	Proposed Future Development - Stage 2 (5-15 years)										
D	2 Storey Research Facility	1510	1910	885	3248		13.8	7.8	7.8	4.7	4.9
E	Multi-Storey Car Park - Bringing Total Onsite Carbays to 1800 Cars	1925	2153	1718	4449		18.9	10.7	10.6	6.5	6.7
F	Future Development Area Stage 2	220	769	943	1778		7.6	4.3	4.2	2.6	2.7
G	Future Development Area Stage 2	407	995	1330	2447		10.4	5.9	5.8	3.6	3.7
	Stage 2 - Road				1156		4.9	2.8	2.8	1.7	1.7
	Additional Landscaped Areas	2025			608		2.6	1.5	1.4	0.9	0.9
	Proposed Future Development - Stage 3 (15 years+)										
H	Future Development Area Stage 3	1329	1837	715	2951		12.6	7.1	7.0	4.3	4.4
I	Future Development Area Stage 3	1437	1437	665	2533		10.8	6.1	6.0	3.7	3.8
J	Future Development Area Stage 3	1411	1910	885	3218		13.7	7.7	7.7	4.7	4.8
K	Future Development Area Stage 3	2086	2009	1316	3951		16.8	9.5	9.4	5.8	5.9
L	Future Development Area Stage 3	1175	2667	2883	5903		25.1	14.2	14.1	8.6	8.9
M	Future Development Area Stage 3		567		567		2.4	1.4	1.4	0.8	0.9
N	Future Development Area Stage 3		2789	1416	4205		17.9	10.1	10.0	6.1	6.3
	Stage 3 - Road				5779		24.6	13.9	13.8	8.4	8.7
	Additional Landscaped Areas	2763			829		3.5	2.0	2.0	1.2	1.2
				Total	45850	Total No. of units	**223**	**126**	**125**	**76**	**79**
				Total Volume		Total Storage	**78.1**	**267.3**	**270.4**	**386.9**	**360.7**

	Allowable Drainage Areas - Deep Water Table, Clogged Base		
	1 in 1 yr ARI	**1 in 20 yr ARI**	**1 in 100 yr ARI**
Atlantis Tripple Mod	235	52	61
SC-740	416	178	129
Chamber Maxx	419	180	131
MC-3500	686	327	234
Ø1.8m x 1.8 deep Soakwe	666	310	222

Shallow water table results 1 in 20yr ARI

New ID	Building Description	Landscape Area	Pavement Area	Building Footprint Area	Total Impervious Area		Atlantil Cell - Tripple Module	SC-740	Chamber Maxx	MC-3500	Ø1.8m x 1.8 deep Soakwells
	Coefficient of Runoff	**0.3**	**1**	**1**							
	Proposed Works - Stage 1 (0-5 years)										
A	One Additional Floor To Multi-Storey Carpark	0	0	4705	4705		90.5	26.4	26.1	14.4	15.2
B	Hollywood Clinic Expansion	0	0	2140	2140		41.2	12.0	11.9	6.5	6.9
C	Theatre Expansion, Catering & Wards	0	0	1992	1992		38.3	11.2	11.1	6.1	6.4
	Proposed Future Development - Stage 2 (5-15 years)										
D	2 Storey Research Facility	1510	1910	885	3248		62.5	18.2	18.0	9.9	10.5
E	Multi-Storey Car Park - Bringing Total Onsite Carbays to 1800 Cars	1925	2153	1718	4449		85.5	25.0	24.7	13.6	14.4
F	Future Development Area Stage 2	220	769	943	1778		34.2	10.0	9.9	5.4	5.7
G	Future Development Area Stage 2	407	995	1330	2447		47.1	13.7	13.6	7.5	7.9
	Stage 2 - Road				1156		22.2	6.5	6.4	3.5	3.7
	Additional Landscaped Areas	2025			608		11.7	3.4	3.4	1.9	2.0
	Proposed Future Development - Stage 3 (15 years+)										
H	Future Development Area Stage 3	1329	1837	715	2951		56.7	16.6	16.4	9.0	9.5
I	Future Development Area Stage 3	1437	1437	665	2533		48.7	14.2	14.1	7.7	8.2
J	Future Development Area Stage 3	1411	1910	885	3218		61.9	18.1	17.9	9.8	10.4
K	Future Development Area Stage 3	2086	2009	1316	3951		76.0	22.2	21.9	12.1	12.7
L	Future Development Area Stage 3	1175	2667	2883	5903		113.5	33.2	32.8	18.1	19.0
M	Future Development Area Stage 3		567		567		10.9	3.2	3.2	1.7	1.8
N	Future Development Area Stage 3		2789	1416	4205		80.9	23.6	23.4	12.9	13.6
	Stage 3 - Road				5779		111.1	32.5	32.1	17.7	18.6
	Additional Landscaped Areas	2763			829		15.9	4.7	4.6	2.5	2.7
				Total	45850	Total No. of units	**882**	**258**	**255**	**140**	**148**
				Total Volume		Total Storage	**308.6**	**546.1**	**550.2**	**709.5**	**677.4**

	Allowable Drainage Areas - Deep Water Table, Clogged Base		
	1 in 1 yr ARI	**1 in 20 yr ARI**	**1 in 100 yr ARI**
Atlantis Tripple Mod	235	52	61
SC-740	416	178	129
Chamber Maxx	419	180	131
MC-3500	686	327	234
Ø1.8m x 1.8 deep Soakwe	666	310	222

Shallow water table results 1 in 100yr ARI

New ID	Building Description	Landscape Area	Pavement Area	Building Footprint Area	Total Impervious Area		Atlantil Cell - Tripple Module	SC-740	Chamber Maxx	MC-3500	Ø1.8m x 1.8 deep Soakwells
	Coefficient of Runoff	**0.3**	**1**	**1**							
	Proposed Works - Stage 1 (0-5 years)										
A	One Additional Floor To Multi-Storey Carpark	0	0	4705	4705		77.1	36.5	35.9	20.1	21.2
B	Hollywood Clinic Expansion	0	0	2140	2140		35.1	16.6	16.3	9.1	9.6
C	Theatre Expansion, Catering & Wards	0	0	1992	1992		32.7	15.4	15.2	8.5	9.0
	Proposed Future Development - Stage 2 (5-15 years)										
D	2 Storey Research Facility	1510	1910	885	3248		53.2	25.2	24.8	13.9	14.6
E	Multi-Storey Car Park - Bringing Total Onsite Carbays to 1800 Cars	1925	2153	1718	4449		72.9	34.5	34.0	19.0	20.0
F	Future Development Area Stage 2	220	769	943	1778		29.1	13.8	13.6	7.6	8.0
G	Future Development Area Stage 2	407	995	1330	2447		40.1	19.0	18.7	10.5	11.0
	Stage 2 - Road				1156		19.0	9.0	8.8	4.9	5.2
	Additional Landscaped Areas	2025			608		10.0	4.7	4.6	2.6	2.7
	Proposed Future Development - Stage 3 (15 years+)										
H	Future Development Area Stage 3	1329	1837	715	2951		48.4	22.9	22.5	12.6	13.3
I	Future Development Area Stage 3	1437	1437	665	2533		41.5	19.6	19.3	10.8	11.4
J	Future Development Area Stage 3	1411	1910	885	3218		52.8	24.9	24.6	13.8	14.5
K	Future Development Area Stage 3	2086	2009	1316	3951		64.8	30.6	30.2	16.9	17.8
L	Future Development Area Stage 3	1175	2667	2883	5903		96.8	45.8	45.1	25.2	26.6
M	Future Development Area Stage 3		567		567		9.3	4.4	4.3	2.4	2.6
N	Future Development Area Stage 3		2789	1416	4205		68.9	32.6	32.1	18.0	18.9
	Stage 3 - Road				5779		94.7	44.8	44.1	24.7	26.0
	Additional Landscaped Areas	2763			829		13.6	6.4	6.3	3.5	3.7
				Total	45850	Total No. of units	**860**	**407**	**400**	**224**	**236**
				Total Volume		Total Storage	**301.0**	**862.1**	**864.9**	**1134.3**	**1082.2**

	Allowable Drainage Areas - Deep Water Table, Clogged Base		
	1 in 1 yr ARI	**1 in 20 yr ARI**	**1 in 100 yr ARI**
Atlantis Tripple Mod	235	52	61
SC-740	416	178	129
Chamber Maxx	419	180	131
MC-3500	686	327	234
Ø1.8m x 1.8 deep Soakwells	666	310	222

PD 35.13 – Attachment 1
Outlined Development Plan

Christ Church
Grammar School
PERTH, WESTERN AUSTRALIA

CHRIST CHURCH GRAMMAR PLAYING FIELDS OUTLINE DEVELOPMENT PLAN

Lot 816 (68) Stephenson Avenue, Mount Claremont

robertsday

Title:	Christ Church Grammar Playing Fields Development Application Lot 816 (68) Stephenson Avenue, Mount Claremont
Project:	Christ Church Grammar Playing Fields Development Application
Prepared for:	Christ Church Grammar
Reference:	CCG CPF
Status:	Draft
Version:	H
Date of Release:	July 2013
Author:	D. Doy
Graphic Design:	R.Huynh
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TABLE OF CONTENTS

1.0 Introduction

CCGS Playing Fields Pty Ltd (CCGS PF) owns a 8.6 hectare site forming part of the former Brockway Road landfill site. CCGS PF purchased the land from LandCorp with the aim of developing the site for playing fields.

CCGS PF is the trustee company of the CCGS Playing Fields Trust (the property owner) that has as its sole beneficiary the Christ Church Grammar School Foundation Inc ('CCGSF'). Effectively this entity was set up to hold the land on trust for the benefit of the boys of Christ Church Grammar School (CCGS).

Following a review of its medium to longer term sporting facilities requirements, CCGS PF determined that it was appropriate to seek the relevant approvals to develop the land for playing fields.

An Outline Development Plan (ODP) has been previously approved by the City of Nedlands and the Western Australian Planning Commission.

An application for planning approval was previously lodged and approved for development of the site for playing fields in 2007.

This report is prepared in support of a second ODP that outlines the placement of additional fill for the eastern playing fields, a future pavilion, changerooms, an access road, car parking, and a grounds building.

2.0 Background

2.1 Land procurement

During the early nineties CCGS PF identified a need for additional land for playing fields. At this time almost as many activities were being staged on hire facilities at the University of Western Australis's McGillivray playing fields as at Christ Church Grammar's own facilities. Furthermore, the lack of space was limiting a number of the programs that Christ Church Grammar wished to run.

CCGS PF explored a variety of options in the search for additional land in or near the CCGS in Claremont. Over the years CCGS PF has been involved in many discussions, land use reviews, and negotiations, with a view to satisfying a pressing need to secure access to sufficient land to ensure the long-term viability of CCGS and its programs.

Between 1974 and 1991, the Western Refuse Disposal Zone used the site as a municipal waste disposal site where it was commonly referred to as the Brockway Road Landfill site. In October 1997 Landcorp publicly called for expressions of interest for the purchase of 7.95 hectare's of freehold land close to Stephenson Avenue, Mt Claremont, and between Challenge Stadium and the St John's Wood estate. The site is similar in size to the existing playing fields Christ Church Grammar owns at McClemans Road in Mt Claremont.

On 19 April 1999 the School announced to its community that a conditional contract for the purchase of this parcel of land had now been signed between Landcorp and CCGS PF.

On 10 May 1999 following further negotiation the original contract of sale of the 7.95 hectares was varied, to include a portion described as Lot 1, which increased the size of the parcel to 8.7097 hectares (later amended to be 8.6317 hectares). The land was highly sought after by CCGS PF because it provided both clear access to Stephenson Avenue and was not encumbered by the sites previous use as a waste disposal site making it suitable for the development of car and bus parking, changerooms, ablutions and a pavilion.

2.2 Planning background

In July 2005, an ODP was prepared and lodged that detailed the proposed use of the site.

Concurrent with the planning being undertaken by CCGS PF for their site the Department of Sport and Recreation (DSR) and UWA were developing an overall master plan for the Mt Claremont Sporting Precinct. As a consequence of this, the then Department for Planning and Infrastructure resolved on 17 July 2006 not to support the advertising of the ODP as it was considered to be premature and would prejudice overall planning for the area.

In order to facilitate preliminary site works while at the same time not prejudicing the overall planning for the area a scaled back ODP was prepared for the site. The ODP outlined the preliminary site works for the site and interim access arrangements in order to enable planning approval to be issued for the site works. On 14 May 2007 the Commission adopted the ODP. A copy of the approved ODP appears at Appendix 1.

Subsequent to the adoption of the ODP, a Development Application was lodged with the City of Nedlands (approved in 2007) to gain approval for preliminary site works necessary to prepare the site for development.

CCGS PF lodged a second Development Application with the City of Nedlands in December of 2012 that outlined the placement of additional fill, changerooms, a future pavilion, an access road, car parking and a grounds building. Following a preliminary assessment of the Development Application and advice from the Western Australian Planning Commission, the City advised that a second ODP would be required to guide development on the site.

This report represents the second ODP, which is contained in Appendix 2 and outlines the placement of additional fill, changerooms, a future pavilion, an access road, car parking and a grounds building. A rationale for the required site-works and proposed layout of the playing fields is provided in Section 5.1.1.

2.3 Community consultation

CCGS PF is aware that the development of the site for playing fields is of interest to the surrounding community. As such, over the years CCGS PF has responded to resident enquiries and has on several occasions conducted letter drops informing adjacent residents on the progress of the playing fields development.

Representatives from CCGS PF also attended a meeting with local residents on 25 January 2007 where residents expressed a concern about the delay of the development. At the meeting residents express support for the future development and were eager for works to commence.

In addition to facilitating the statutory requirements for advertising the proposed ODP, CCGS PF will continue to be proactive in its dealings with the community and sensitive to resident concerns.

3.0 Site Details

3.1 Land Description

The land is described as being Lot 816 of Swan Location 10780 contained within Certificate of Title – Volume 2208 Folio 413.

3.2 Location

The subject land comprises 8.6317 hectares located on Stephenson Avenue in Mt Claremont. The site is located south of Challenge Stadium and north of the St John's Wood residential area (as illustrated in Figure 1).

3.3 Site Description

Upon completion of refuse disposal operations in 1991 a sand cap was placed over the site. The site generally varies in elevations from approximately 22m AHD on the western boundary to approximately 18m AHD on the eastern boundary. The cross fall represents an average grade of 1% across the site although steeper localized buffer slopes exist along the northern and southern boundaries.

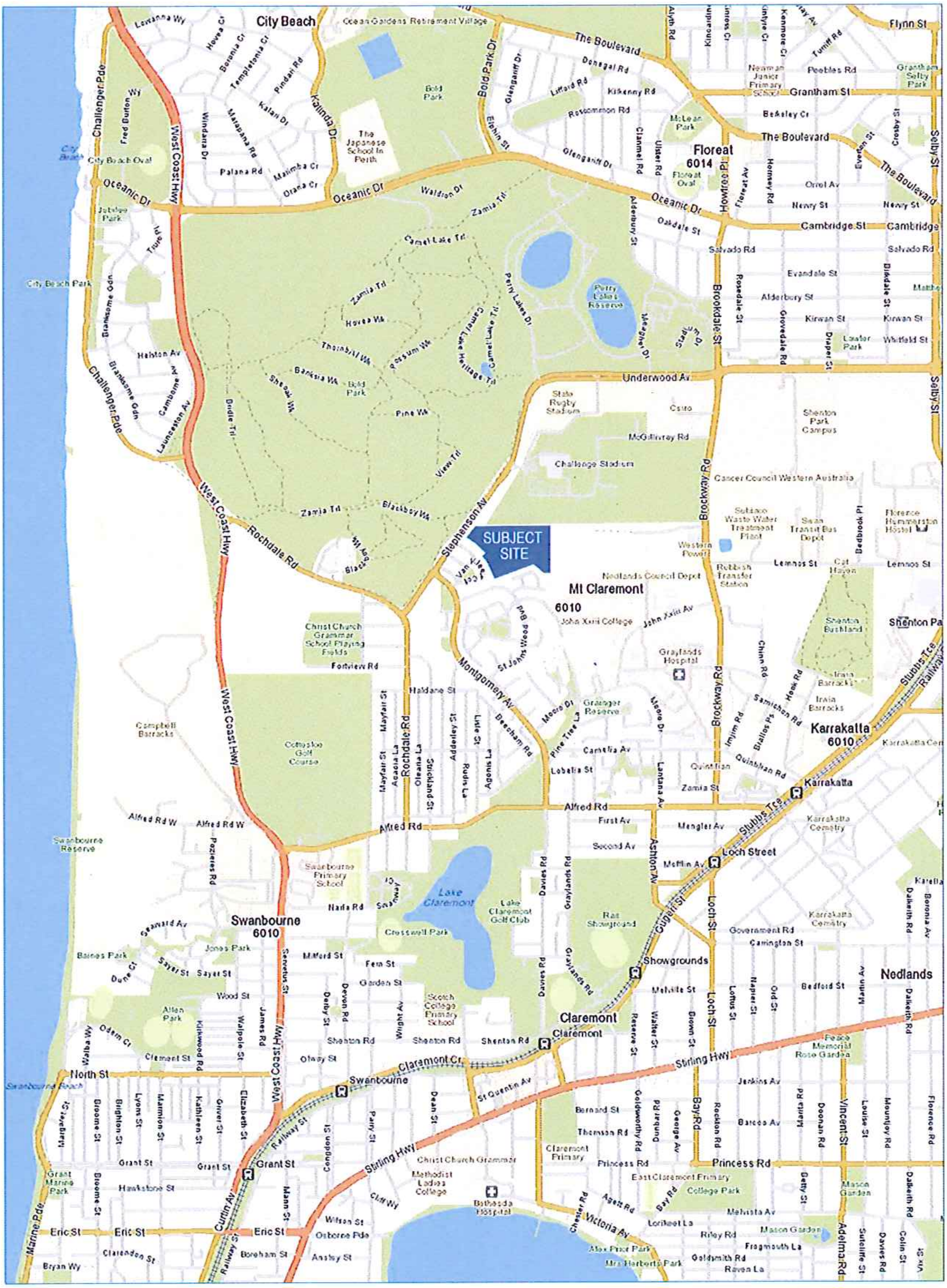
3.4 Vegetation

The site has historically been used as a landfill site and as such has been completely cleared. There is no significant or native vegetation on the site.

3.5 Servicing

There are no existing services to the subject site. Detail relating to future service infrastructure is contained in Section 5.6.

Figure 1: Location Plan

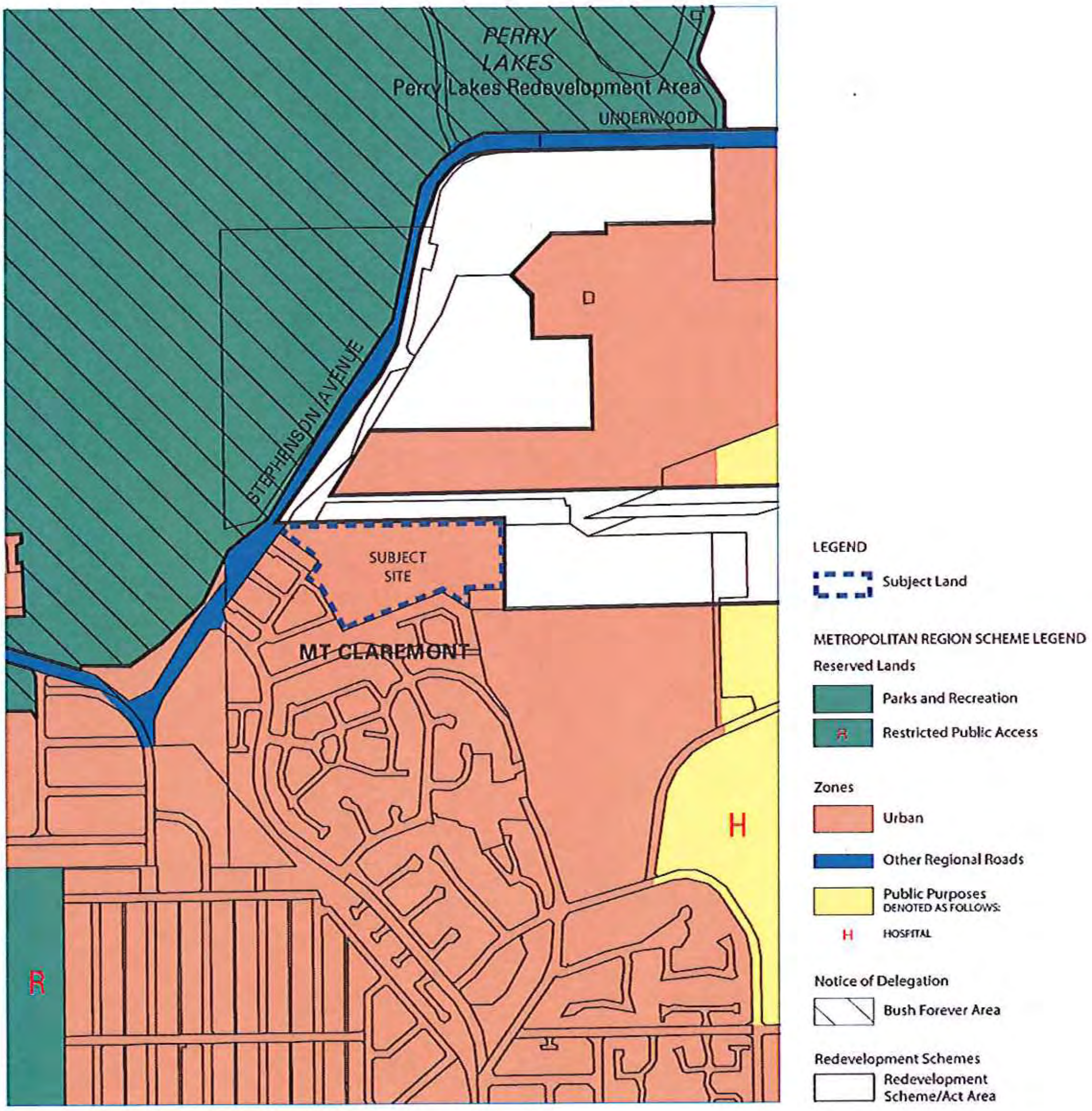


4.0 Planning Considerations

4.1 Metropolitan Region Scheme

The subject land is zoned 'Urban' under the provisions of the Metropolitan Region Scheme (MRS). To the west of the site, Bold Park is recognised in the MRS as being reserved for 'Parks and Recreation' whilst to the east the land is reserved 'Public Purposes' comprising an assortment of government and institutional uses.

Figure 2: MRS Zoning Plan

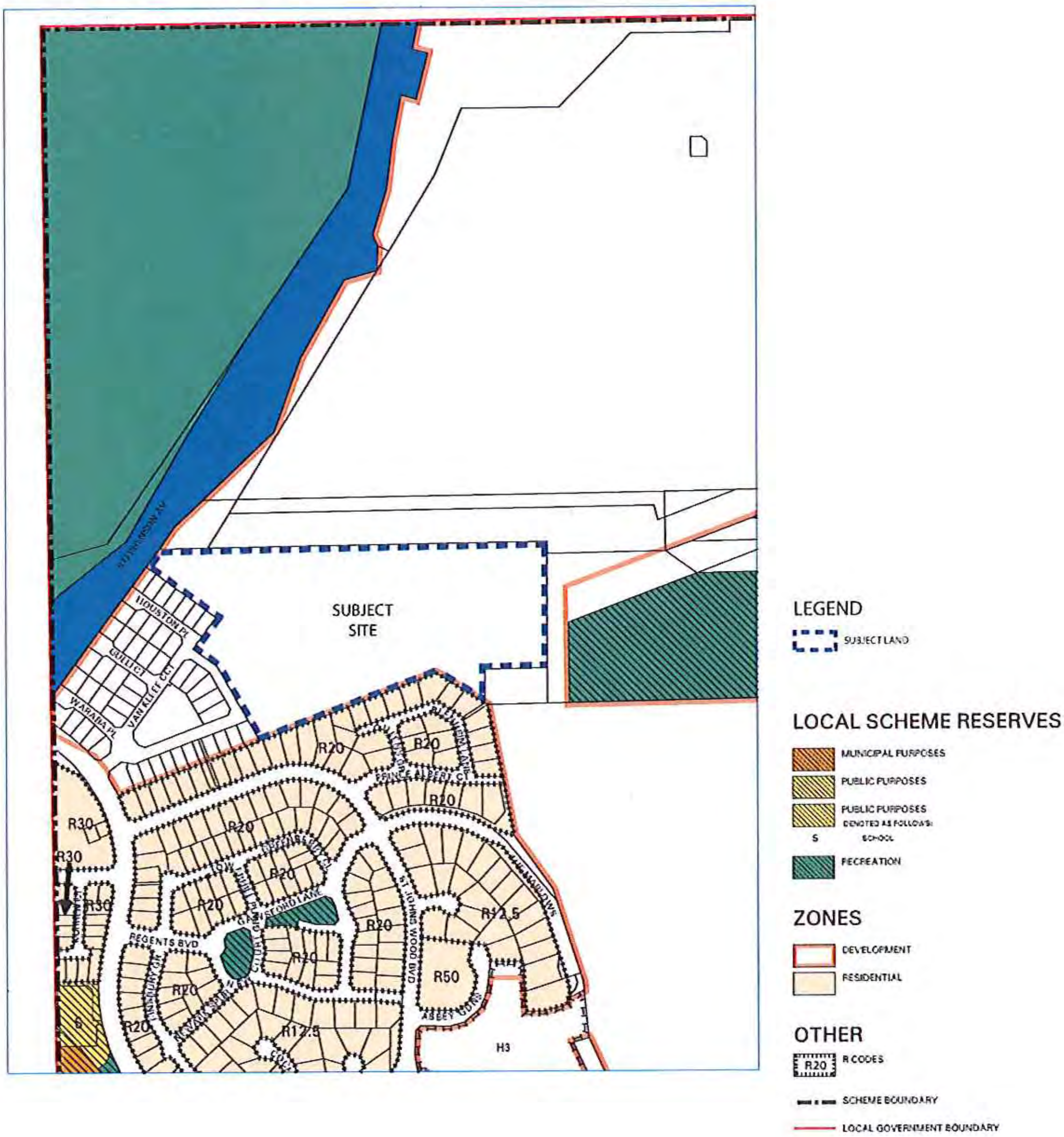


4.2 City of Nedlands Town Planning Scheme No.2

The subject land is zoned 'Development Zone' under the provisions of the City of Nedlands Town Planning Scheme No.2 (TPS2). It is a standard requirement for land zoned Development Zone to be subject of an ODP prior to development.

As stated in Section 2.0, an ODP (appendix 1) has been prepared and was endorsed by the City of Nedlands on 13 March 2007 and by the WAPC on 14 May 2007. This secondary ODP represents an evolution of the approved ODP, which identified preliminary site works on the site only.

Figure 3: TPS Zoning Plan



4.3 Mt Claremont Regional Sport Centre Structure Plan (AK Reserve Plan)

The Mt Claremont Regional Sport Centre Structure Plan relates to the "sporting precinct" generally comprising Challenge Stadium, the AK Reserve owned by the Town of Cambridge, the UWA Sports Park on McGillivray Road and the CPF land.

The Structure Plan was steered by a working party comprising officers from the Department of Sport and Recreation, Department of Planning, the City of Nedlands and the Town of Cambridge. The proposed development is consistent with the draft Structure Plan, which identifies the CPF land as future playing fields.

4.4 AK Reserve/UWA Sports Park Master Plan

The AK Reserve/UWA Sports Park Master Plan was adopted by the WAPC pursuant to the Perry Lakes Redevelopment Act in 2006. It followed an exhaustive consultation process including stakeholder workshops. The document was a legal requirement of the Perry Lakes Redevelopment Act. The proposed ODP is consistent with this Master plan, which identified the subject site as 'Christ Church Grammar School Playing Fields'.

5.0 Proposed Development

This ODP outlines the placement of additional fill for the eastern playing fields, a future pavilion, changerooms, an access road, car parking, and a grounds building. Preliminary site works to allow for the development of the playing fields to occur have been completed in accordance with the development approval issued by the City of Nedlands in 2007. Future development on the subject site as proposed in this ODP is contained within Appendix 2.

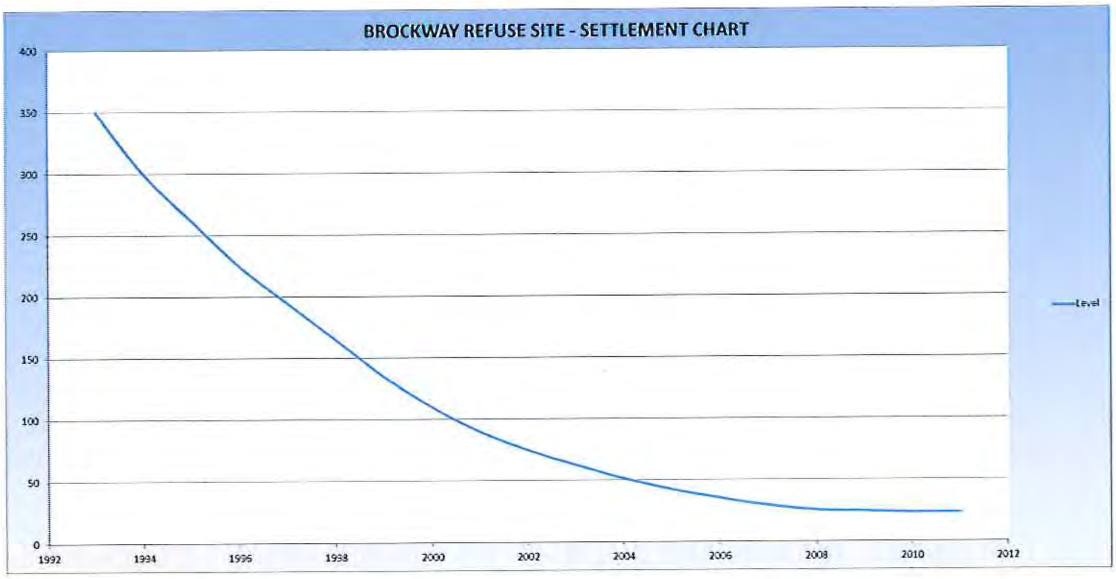
5.1.1 Geotechnical History and Rationale for Site Layout

Of the total site area of 8.6 hectares, approximately 7.6 hectares (88% of site) contains rubbish placed at depths up to 17 metres deep, topped off with a minimum of 1 metre of sand cover. The only area that has not been utilised for the placement of refuse is a 1 hectare area immediately adjacent to Stephenson Avenue at the western end of the site. Consequently, this unencumbered 1 hectare portion of the site is proposed to accommodate car and bus parking, changerooms, ablutions and a future pavilion.

The area of refuse is subject to ongoing consolidation and settlement, having settled approximately 3 metres over the last 20 years since the rubbish tip closed. A graphical plot of the typical settlement rates over the site (Table 1) indicates initial settlement rates in excess of 0.4 metres per year, and reducing in recent years to an average of 20mm–30mm per year with a long term settlement rate continuing on at about 20mm per year. To further complicate the issue, differential settlement is occurring over the site with some areas settling faster than others.

Table 1: Brockway Refuse Site - Settlement Chart

Year	Level
1993	350
1994	300
1995	262
1996	225
1997	195
1998	165
1999	135
2000	110
2001	90
2002	75
2003	63
2004	52
2005	43
2006	36
2007	30
2008	26
2009	25
2010	24
2011	24



Geotechnically, sites are classified analogously in the context of long-term settlement. Most development sites within Western Australia target an 'A' site classification for building and foundation purposes, with little or no long term settlements. Other classifications range through to an 'E' site classification which is categorised extreme long term settlement in excess of 75mm. The area of the refuse is beyond the 'E' site limit and typically classified as a 'P – problem' site.

The area of refuse burial and settlement has been interpreted from earlier surveys and is shown in Figure 4. The specifics of the edge treatment and exact location are approximate only and will need to be confirmed with some future geotechnical investigations of that area of the site.

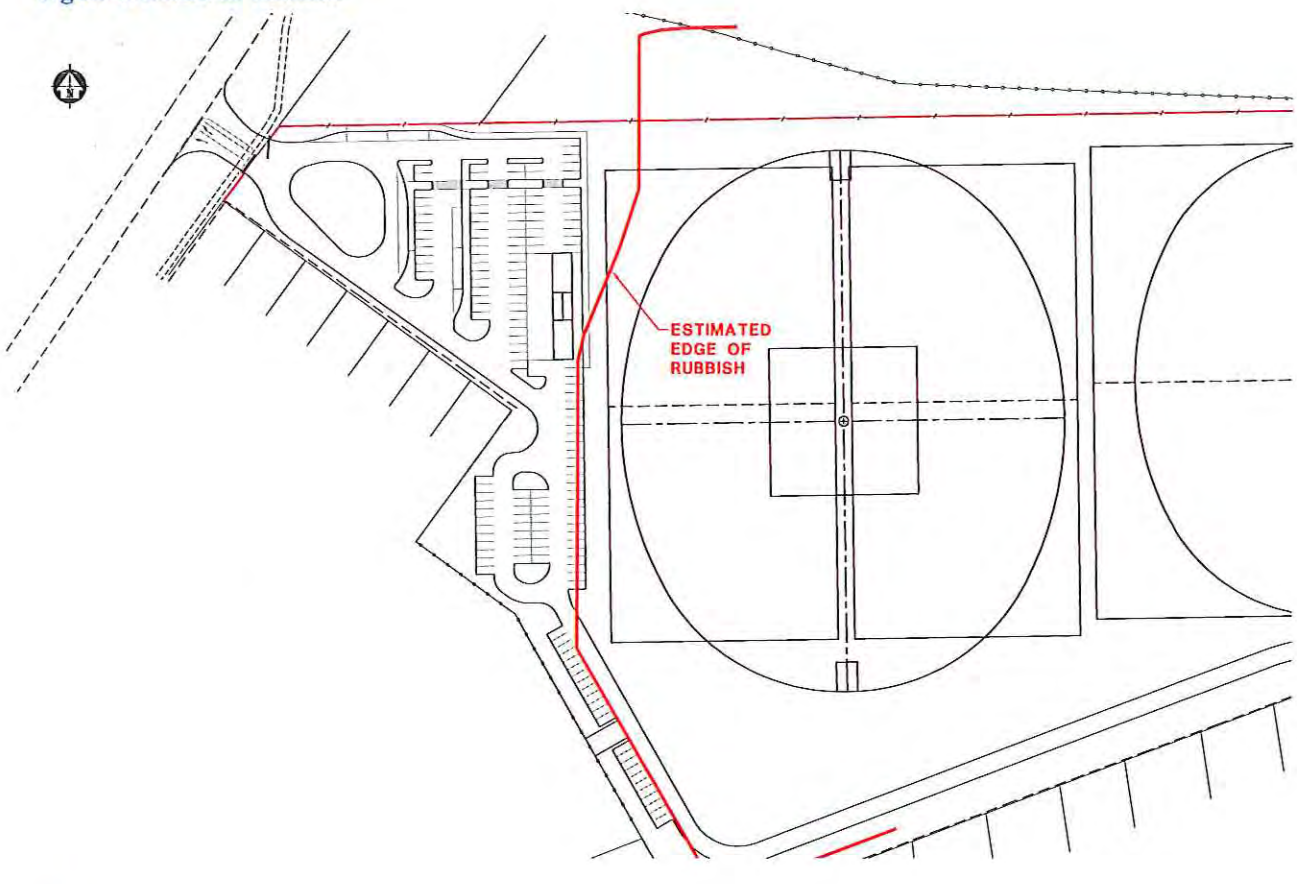
The playing fields, which can withstand some differential settlement, will require long term, yearly maintenance with minor filling and leveling for the foreseeable future. However, standard building structures and rigid pavements for car parks cannot tolerate any significant settlement, particularly differential settlement, without damage and potential failure.

The proposed layout of the playing fields and the car park and facilities area has therefore been planned over the only area that can accommodate buildings and hard car park areas. Notwithstanding that the western area is too small to accommodate a playing field, the layout has maximised the development potential of the site, recognising that the car park and facilities cannot practically be located east of the nominal refuse line shown in Figure 4.

Although piling through the refuse layer for the construction of building foundations is possible, the prohibitive cost would make the building option economically unviable, as was found when planning for a rugby stadium to the east near Brockway Avenue, where costs stalled the stadium development.

The car parking areas and site facilities, including the south eastern grounds building adjacent to the council drainage reserve, have been located to capitalise on areas with minimum settlement, where the long term durability of the construction is not compromised and to maximise the area of playing fields.

Figure 4: Extent of Rubbish



5.1.2 Access and Car Parking

The proposed development comprises a maximum of five playing fields, dependent upon the season and the sports being played. The ODP proposes a generous car park of 167 parking bays which is based upon the maximum number of playing fields (5), making allowance for 33 bays for each rectangular field, or 16 bays per field per team.

Provision is also made for bus transport with a bus turn-around proposed that will allow six buses to enter the site and turn around to exit in a forward gear.

Access to Stephenson Avenue which provides the exit from the playing fields will have a right turn and a left turn lane.

The current design of the crossover from Stephenson Avenue into the site is proposed to be retained. Under this design subject to minor widening of Stephenson Avenue, there is room for a stopped car turning right into the crossover to be passed by a car. The crossover will generally operate at a good level of service with acceptable queues and delays throughout its use during weekdays. For three to five Saturdays of the year the crossover may experience increased volumes of traffic with the car park close to capacity. In these instances the crossover is still anticipated to operate in a satisfactory manner, although longer delays are expected at the end of sport with the higher traffic flow exiting the grounds and turning onto Stephenson Avenue.

A traffic note outlining the performance of the crossover at three separate times of the week is provided in Appendix 3. The report prepared by traffic engineering consultant Tarsc, is the result of traffic modeling undertaken for three scenarios, which represent the use patterns for the playing fields. The three scenarios are based upon existing sports arrangements and patterns of use by the School at the existing playing fields in Mt Claremont and cover three training afternoons, Friday afternoon sports and Saturday morning sports:

1. *Scenario 1: Tuesday, Wednesday and Thursday afternoon sports training (between 3.30pm and 5.30pm):* In this scenario the maximum amount of traffic anticipated to be generated is 6 buses and 10 cars. The exit time for these vehicles is staggered in accordance with the finishing of sports training at 4.45pm, 5.00pm and 5.15pm. These times are fixed and managed to align with the current restrictions existing at the School where the capacity of Queenslea Drive and the car parks at the school can only accommodate the staggered arrivals of the buses;

2. *Scenario 2: Friday sports between 1.30pm and 3.30pm:* In accordance with current experience this scenario is based on 6 buses and 30 cars departing the site between 2.30pm and 3.30pm on Friday afternoons following the conclusion of school sport fixtures.

3. *Scenario 3: Saturday morning sport (between 8.00pm and 12 noon):* Based upon current evidence of Saturday morning sport this scenario assumes that 6 buses and 60-80 cars will be parked on site with departures staggered between 11am and 12.30pm dependent on the sport being played (eg AFL football has a longer playing time than soccer or rugby).

The only other access road involves an internal service road along the southern boundary of the subject site. This road provides a vehicular connection to the eastern playing fields and the grounds building. It is intended that this road will be used sparingly by ground staff during the day (average of three times a week), with access restricted through the provision of a locked gate.

Emergency access is also provided via a connection to Van Kleef Circuit. During all other times access is restricted through the provision of a locked gate.

5.1.3 Grounds Building

A grounds building is proposed for the south east corner of the subject site. The grounds building will be accessed via a service road that extends from the parking area and along the southern boundary of the site. This building will be used to store grounds maintenance and sports equipment.

An indicative building elevation plan appears at Appendix 4 depicting approximate setback distance and building dimensions.

5.1.4 Landscaping

The landscape strategy for the CCGS Playing Field site and its associated infrastructure will be aimed at providing an instantly attractive, amenable landscape response from commencement of operations, that is both of benefit to the adjacent existing community, but also serves the utilitarian purposes of the site as a playing field. A Landscaping Concept is contained in Appendix 5.

Stephenson Avenue Verge / Entry Statement

It is proposed that the verge interface to the site will be landscaped to create an attractive entry and promote a legible identification marker to patrons making their first visit to the site. Landscaping will consist predominantly of low native groundcovers, no greater than 600mm in height to ensure sightlines are retained for vehicles turning into and out of the site. Some areas of turf may exist in the verge area as well.

Trees located in the verge will be installed to ensure clear trunk views to a minimum 2.7m in clearance so as not to obstruct vehicular sightlines. Tree placement setback from the Stephenson Avenue carriageway will be in accordance with Main Roads WA requirements.

The existing dual use path that runs adjacent to Stephenson Ave in a north south direction, will be retained and protected. It is proposed that the site's western boundary adjacent to the existing dual use path will be fully fenced with a gate across the driveway for vehicular access. The fence will be visually permeable, black painted mesh to a minimum of 1.8m tall with concrete piers to match Christ Church Grammar School's boundary fencing on the main campus along Stirling Highway, Claremont.

Small entry statement signage will be provided on a boundary fencing pier to assist with legible identification of the site. Refer to the Landscape Concept in Appendix 5 and Appendix 6 for more detail relating to the boundary fencing and entry landscaping.

Existing Residential Interface – Houston Place

Existing two storey residences are located on Houston Place. All properties have a uniform 1.8m high solid brick and limestone boundary fence to their rear boundaries at the interface to the site. Existing sightlines from the rear yards of these properties is into the rear boundary fence. Sightlines from the second storey of these residences include background views of the Perth CBD skyline and foreground views of the proposed grassed playing fields.

A 3m wide landscaped planting bed is to be provided at the base of the boundary wall at the back of kerb of the carpark in the playing fields site. This planting bed is to be planted with predominantly native shrubs that grow no higher than 1.2m in height. The plant species selection will ensure that the existing boundary wall is adequately softened whilst ensuring plants do not grow above the wall and impact on the residents existing city views.

Tree placement will occur at strategic locations along this garden bed with a consideration of the existing residences' second storey windows and to ensure their sightlines towards the city are not interrupted. Tree species selection will ensure that all trees grow with clear trunks, maintaining transparency at the lower heights, whilst also maintaining a level of transparency through the canopy.

The width of the proposed garden bed at 3m's wide allows for sufficient shrub and tree establishment and considers Crime Protection Through Environmental Design (CPTED) principles by ensuring plant species do not screen anti-social behaviour.

Existing Residential Interface – St Johns Wood Boulevard, Queens Grange and Blenheim Lane

The existing residential rear boundary interface for the houses at St Johns Wood Boulevard, Queens Grange and Blenheim Lane constitutes large limestone lot retaining walls up to 2–3m in height, affording residences commanding views over the site toward the Perth CBD skyline.

Interface landscaping is proposed to soften the visual impact of the large limestone retaining walls through predominantly native shrub planting and groundcovers that do not grow above the height of the existing retaining walls. It is important that the existing views over the site from the adjacent residents be retained for passive surveillance purposes. Some tree plantings will occur along this interface to assist in shading the service driveway that is located along the south of the site. Clear trunk trees species will be utilised and positioned in order to protect existing views.

The existing vegetation along Van Kleef Circuit will be rationalised and consolidated with low native groundcovers and clear trunk trees on the existing bollard alignment to provide spatial definition and promote passive surveillance into the site from the existing residential area.

Carpark / Bus Bay Surrounds

The internal carpark site will have deciduous shade trees provided at 1 tree per 6 bays shading the large expanse of asphalt and providing a cooler micro climate while softening the bituminous area. Carpark trees will be provided in barrier kerb tree wells (1.5m2) to ensure adequate protection from vehicles.

Carpark nibs will be landscaped with predominantly native species to ensure waterwise principles can be achieved with maintenance minimisation an ongoing consideration. Landscape nibs will be protected with barrier kerbs to ensure vehicles do not accidently access landscape areas.

A large bus turnaround nib is to be provided which will be fully landscaped with low predominantly native groundcovers with an overstorey of clear trunked canopy trees. This landscape nib will serve a dual function, catering for the stormwater runoff from the carpark in an attractive landscaped swale arrangement. The kerbing surrounding this nib will be flush kerbed to allow for overland stormwater flows on the carpark to be directed into this area.

Playing Fields Surrounds

Broad canopy deciduous trees will define space around the perimeter of the site as well in the areas that spill out from playing surfaces. These feature trees will provide informal sitting opportunities for spectators to gather under during sporting events. On the alternate days when the playing fields are not being used for organised sport, the trees and turf areas will provide an attractive parkland setting and accessible recreation space for the surrounding community.

5.1.5 Future Pavilion

An area in the north western portion of the site has been identified on the ODP for a future pavilion which would provide permanent changing rooms, ablutions and a formal viewing space for spectators. When constructed the pavilion would replace the temporary changerooms which would revert to car parking. The final location of the pavilion will be confirmed as part of a future development application.

An indicative set of plans for the Pavilion appears at Appendix 7 to provide an indication of size, location and layout.

The pavilion will be designed to facilitate permanent change rooms at ground level with the pavilion and spectator areas located on the first floor. The pavilion is sized sufficiently to meet the requirements of Saturday morning sports. Typically morning tea is provided at Saturday morning sports, where spectators would move through the pavilion at different times during the approximate one hour period. The pavilion does however have the capacity to cater for a typical morning crowd of approximately 100 spectators. Whilst the pavilion is not intended for use for private functions and will generally be utilised during daylight hours associated with the use of the sports ground, there may be occasions (less than 10 times per year) where the pavilion is used for school related functions.

5.1.6 Changerooms and Storeroom

Temporary changerooms, public toilets and a storeroom are proposed adjacent to the western boundary of the western-most playing field. The changerooms have been located to ensure ease of access for participants and spectators alike.

An indicative building elevation plan appears at Appendix 8 depicting approximate building dimensions.

5.2 Earthworking and Servicing Requirements

The playing fields have been earth worked to the nominal finished level except for the eastern most playing field and the western end of the site, which is expected to be addressed over time as settlement occurs. Construction will commence shortly on the water supply main and the irrigation for the playing fields in accordance with the 2007 Development Approval and followed by the establishment of grass to the playing areas. A bore will also be established in the north western corner for the supply of water for maintenance purposes.

The following works will be required to be undertaken as part of development works associated with a future Development Application:

- Import and placement of fill on the eastern playing field to maintain the minimum 1m of sand cap thickness to the underlying rubbish;
- Import and placement of fill to the western end of the site to bring the area back to its original level for the purpose of car parking and change rooms and to achieve the minimum sewer servicing level for the change rooms;
- Establishment of access from Stephenson Ave and provision of asphalt car parking, bus turnaround and parking areas and access track to the grounds shed;
- Construction of change rooms / storage and grounds building;
- Establishment of all services; sewer, water and power to the change rooms and grounds building; and
- Construction of entry statement, gates and erection of a 1.8m black mesh fence around the site, including emergency gate access on the south western boundary.

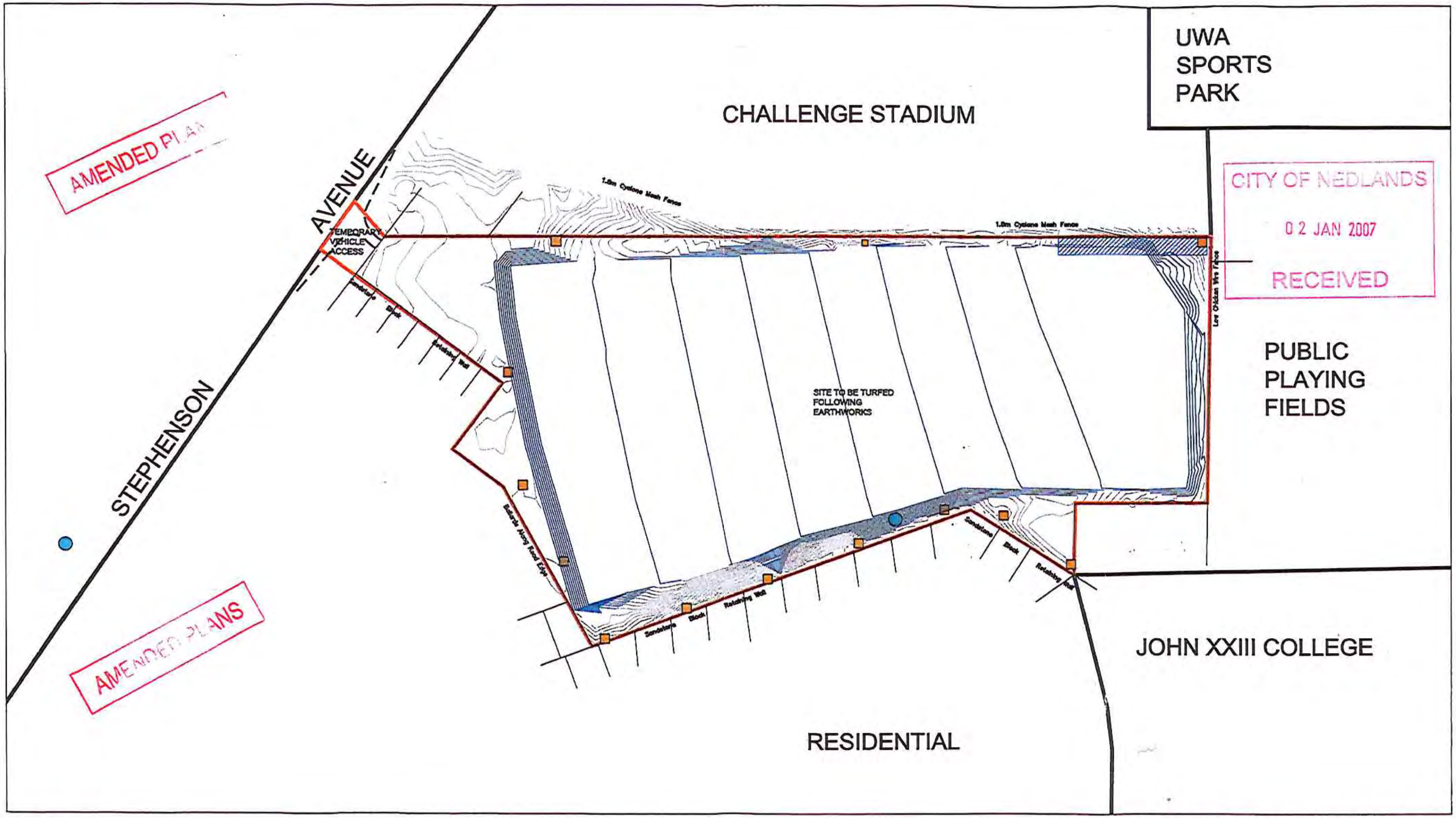
5.3 Anticipated Timing and Staging of Development

Subject to planning approval timeframes it is anticipated that the playing fields (except the future pavilion) would be completed by December 2013.

6.0 Conclusion

The purpose of this ODP is to outline the placement of additional fill for the eastern playing fields, a future pavilion, associated parking and access, changerooms and a grounds building at the subject site.

APPENDIX 1:
Approved Outline Development Plan



LEGEND

- SUBJECT SITE
- PROPOSED GROUNWATER ABSTRACTION AREA
- PROPOSED GROUNDWATER BORE LOCATION
- PROPOSED GAS MONITOR BORE
- PROPOSED EARTHWORKED CONTOURS
- EXISTING CONTOURS (TO BE RETAINED)

This Outline Development Plan does not represent approval by the Western Australian Planning Commission for the carparking or access arrangements for the future playing fields proposed to be accommodated on the subject site. Future consideration will be required as part of the overall Mt Claremont Sports Precinct Structure Plan Study and future development proposals for the subject site.

OUTLINE DEVELOPMENT PLAN

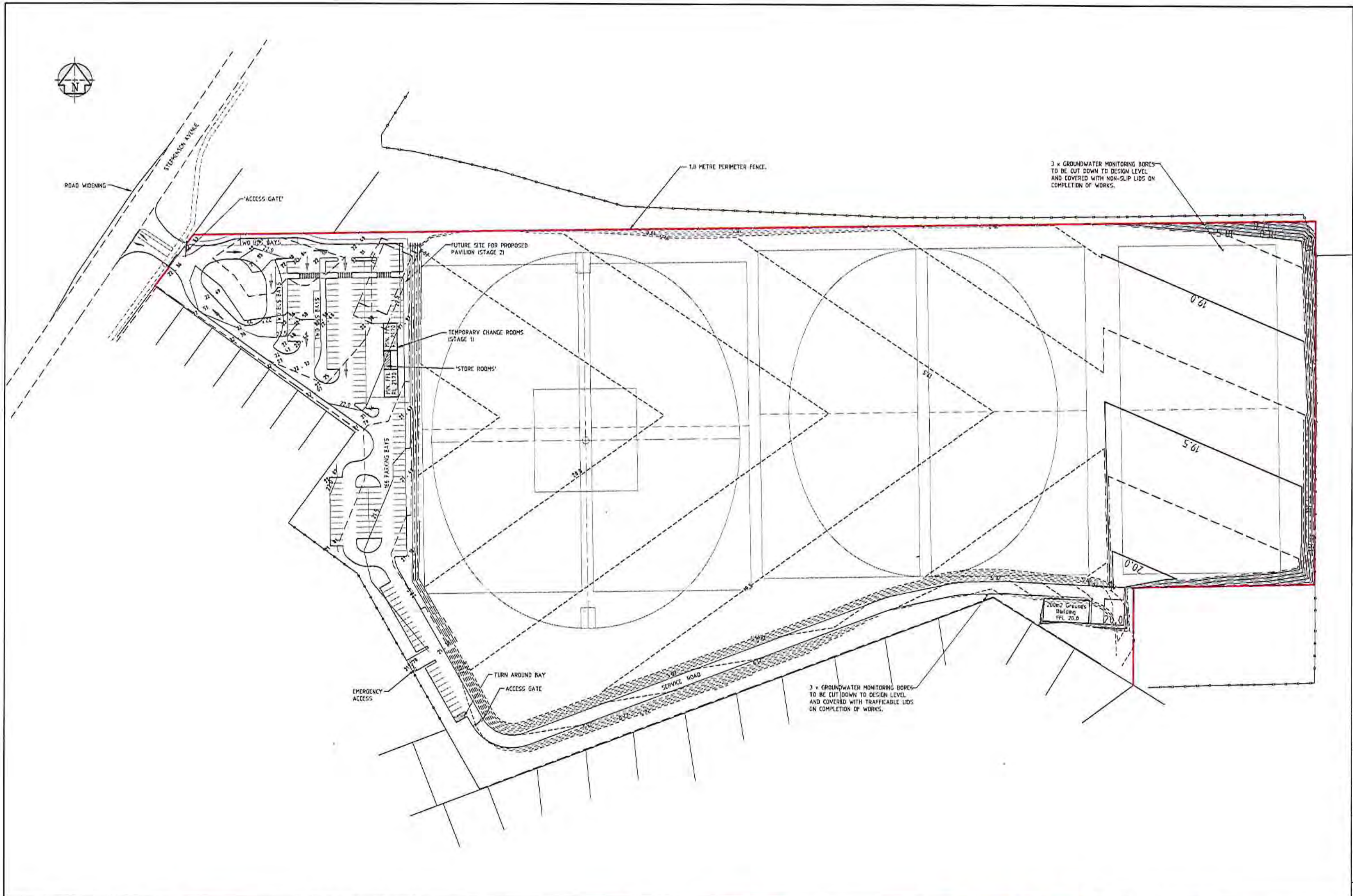
PRELIMINARY SITEWORKS: FUTURE PLAYING FIELDS

CCG - MT CLAREMONT

day

CCG CPF ODP 02 rev B

APPENDIX 2:
Proposed Outline Development Plan



No.	DATE	DRAWN	APPROVED	AMENDMENT
J	20.12.12	P.K.		FUTURE PAVILION ANNOTATED
I	18.12.12	D.P.	BS	STEPHENSON AVENUE ROADWORKS AMENDED.
H	26.11.12	P.K.	BS	ACCESS GATE ADDED AND FURTHER NOTATION
G	22.11.12	P.K.	BS	GROUNDS FACILITY BUILDING AREA AMENDED
F	14.11.12	A.R.H.	BS	GROUNDWATER MONITORING BORES ADDED

No.	DATE	DRAWN	APPROVED	AMENDMENT
L	9.07.13	ARH		MINOR AMMENDMENTS MADE AND FUTURE PAVILLION LOCATION ADDDED
K	26.04.13	ARH		FUTURE PAVILION BOUNDARY RE-LOCATED

This plan shall not to be used for construction unless issued as rev 0 and signed as approved.

CLIENT: CCGS PLAYING FIELDS PTY. LTD.

DESIGNED	CHECKED	APPROVED
DRAWN A.R.H.	CHECKED	DATE

TABEC
Civil Engineering Consultants
TABEC Pty Ltd ACN 090 796 304
14 Wickham Street, East Perth WA 6004
Telephone 9225 4100, Fax 9225 4168
Email info@tabec.com.au

PROJECT: CCGS PLAYING FIELDS, BROCKWAY

TITLE: PLAYING FIELD
OUTLINE DEVELOPMENT PLAN

DRAWING NUMBER: 2087-SK26

ISSUE: L

APPENDIX 3:
Traffic Modeling Results

TRAFFIC STATEMENT

Lot 816 (68) Stephenson Avenue, Mount Claremont

Prepared by Rodney Ding of TARSC Transport Engineering

There are three (3) traffic scenarios that accurately reflect the use patterns of the proposed playing fields site and these have been examined (see below) with regard to their affect on vehicles to exit and enter the site to and from Stephenson Avenue. The three scenarios are based upon existing sports arrangements and patterns of use by the School at the existing playing fields in Mt Claremont and cover three training afternoons, Friday afternoon sports and Saturday morning sports.

Scenario 1: Tuesday, Wednesday and Thursday afternoon sports training (between 3.30pm and 5.30pm): In this scenario the maximum amount of traffic anticipated to be generated is 6 buses and 10 cars. The exit time for these vehicles is staggered in accordance with the finishing of sports training at 4.45pm, 5.00pm and 5.15pm. These times are fixed and managed to align with the current restrictions existing at the School where the capacity of Queenslea Drive and the car parks at the school can only accommodate the staggered arrivals of the buses;

Scenario 2: Friday sports between 1.30pm and 3.30pm: In accordance with current experience this scenario is based on 6 buses and 30 cars departing the site between 2.30pm and 3.30pm on Friday afternoons following the conclusion of school sport fixtures.

Scenario 3: Saturday morning sport (between 8.00pm and 12 noon): Based upon current evidence of Saturday morning sport this scenario assumes that 6 buses and 60-80 cars will be parked on site with departures staggered between 11am and 12.30pm dependent on the sport being played (eg AFL football has a longer playing time than soccer or rugby).

Geometry

The present geometry of Stephenson Ave at the location of the proposed crossover is a 9.6m wide sealed pavement with a 3.7m wide traffic lane and a 1.1m wide sealed bike lane in each direction providing a total of approximately 4.8m wide sealed pavement.

Sidra Intersection Technical Assessments

Table 1 – Scenario 1 - Tues/Wed/Thurs

Lane Use and Performance

	Demand Flows L	Demand Flows T	Demand Flows R	Total	HV	Cap.	Deg. Satn	Lane Util.	Average Delay	Level of Service	95% Back of Queue Vehicles	95% Back of Queue Distance	Lane Length	SL Type	Cap. Adj.	Prob. Block
	veh/h	veh/h	veh/h	veh/h	%	veh/h	v/c	%	sec		veh	m	m		%	%
South: Stephenson Ave																
Lane 1	0	470	10	480	4.9	1816	0.264	100	6.1	LOS A	3.5	25.6	500	–	0.0	0.0
Approach	0	470	10	480	4.9		0.264		6.1	NA	3.5	25.6				
East: Playing Fields																
Lane 1	32	0	0	32	38.0	273	0.117	100	13.4	LOS B	0.4	3.5	500	–	0.0	0.0
Lane 2	0	0	5	5	0.0	97	0.052	100	37.7	LOS E	0.2	1.1	500	–	0.0	0.0
Approach	32	0	5	37	32.9		0.117		16.7	LOS C	0.4	3.5				
North: Stephenson Ave																

Lane 1	2	652	0	654	5.0	1889	0.346	100	0.0	LOS A	0.0	0.0	500	–	0.0	0.0
Approach	2	652	0	654	5.0		0.346		0.0	NA	0.0	0.0				
Intersection				1171	5.8		0.346		3.0	NA	3.5	25.6				

Table 2 – Scenario 2 - Friday

Lane Use and Performance	Demand Flows L	Demand Flows T	Demand Flows R	Total	HV	Cap.	Deg. Satn	Lane Util.	Average Delay	Level of Service	95% Back of Queue Vehicles	95% Back of Queue Distance	Lane Length	SL Type	Cap. Adj.	Prob. Block.
	veh/h	veh/h	veh/h	veh/h	%	veh/h	v/c	%	sec		veh	m	m		%	%
South: Stephenson Ave																
Lane 1	0	455	26	481	4.7	1771	0.272	100	4.2	LOS A	2.7	19.4	500	–	0.0	0.0
Approach	0	455	26	481	4.7		0.272		4.2	NA	2.7	19.4				
East: Playing Fields																
Lane 1	69	0	0	69	24.0	514	0.135	100	6.8	LOS A	0.5	4.0	500	–	0.0	0.0
Lane 2	0	0	35	35	10.0	136	0.256	100	31.7	LOS D	0.9	6.6	500	–	0.0	0.0
Approach	69	0	35	104	19.3		0.256		15.1	LOS C	0.9	6.6				
North: Stephenson Ave																
Lane 1	16	455	0	471	4.8	1888	0.249	100	0.5	LOS A	0.0	0.0	500	–	0.0	0.0
Approach	16	455	0	471	4.8		0.249		0.5	NA	0.0	0.0				
Intersection				1056	6.2		0.272		3.6	NA	2.7	19.4				

Table 3 – Scenario 3 - Saturday

Lane Use and Performance	Demand Flows L	Demand Flows T	Demand Flows R	Total	HV	Cap.	Deg. Satn	Lane Util.	Average Delay	Level of Service	95% Back of Queue Vehicles	95% Back of Queue Distance	Lane Length	SL Type	Cap. Adj.	Prob. Block.
	veh/h	veh/h	veh/h	veh/h	%	veh/h	v/c	%	sec		veh	m	m		%	%
South: Stephenson Ave																
Lane 1	0	521	26	547	4.8	1767	0.310	100	5.3	LOS A	3.8	27.8	500	–	0.0	0.0
Approach	0	521	26	547	4.8		0.310		5.3	NA	3.8	27.8				
East: Playing Fields																
Lane 1	58	0	0	58	9.0	581	0.100	100	6.1	LOS A	0.3	2.6	500	–	0.0	0.0
Lane 2	0	0	58	58	9.0	99	0.583	100	59.7	LOS F	2.3	17.1	500	–	0.0	0.0
Approach	58	0	58	116	9.0		0.583		32.9	LOS D	2.3	17.1				
North: Stephenson Ave																
Lane 1	26	514	0	540	4.8	1887	0.286	100	0.7	LOS A	0.0	0.0	500	–	0.0	0.0
Approach	26	514	0	540	4.8		0.286		0.7	NA	0.0	0.0				
Intersection				1203	5.2		0.583		5.9	NA	3.8	27.8				

Scenario 1 and Scenario 2 assessments are very similar. There is minimal queuing on Stephenson Ave with some queuing for right turn vehicles exiting the playing fields, albeit contained wholly within the crossover. The crossover should operate in an acceptable manner in Scenario 3, as more traffic turns right from the playing fields due to additional spectators and different approach and departure patterns.

For all scenarios there is expected to be queues of an acceptable length on Stephenson Avenue as cars turn right into the proposed playing fields. There is expected to be longer queues for vehicles turning right from the playing fields into Stephenson Avenue with queues extending into the playing fields car park.

Performance Assessment Concept Parameters

The level of service concept describes the quality of traffic service over six levels. Level of service A (LOS A) represents the best operating condition (i.e. at or close to free flow), and level of service F (LOS F) the worst (i.e. forced flow). More specifically:

- *LOS A*: Individual drivers are virtually unaffected by others in the traffic stream. Their freedom to select their own desired speed and to manoeuvre in the traffic stream is extremely high, and the general level of comfort and convenience is excellent;
- *LOS B*: Individual drivers still have reasonable freedom to select their desired speed and to manoeuvre in the traffic stream, although the general level of comfort and convenience is less than at LOS A;
- *LOS C*: Most drivers are restricted to some extent in their freedom to select their desired speed and to manoeuvre in the traffic stream;
- *LOS D*: All drivers are severely restricted in their freedom to select their desired speed and to manoeuvre in the traffic stream. Traffic is close to the upper limit of stable flow, the general level of comfort and convenience is poor, and small increases in traffic flow will usually cause operational problems;
- *LOS E:* Traffic volumes are at, or close to capacity, and drivers have virtually no freedom to select their desired speed or to manoeuvre. Traffic flow is unstable and minor disturbances will result in stop-start conditions; and,
- *LOS F*: Flow is forced and the amount of traffic approaching the point under consideration exceeds that which it can handle. Stop-start conditions apply and queuing and delays result.

In addition to the above:

- Average Delay: is the average of all travel time delays for vehicles through the intersection; and,
- Queue: is the queue length below which 95% of all observed queue lengths fall.

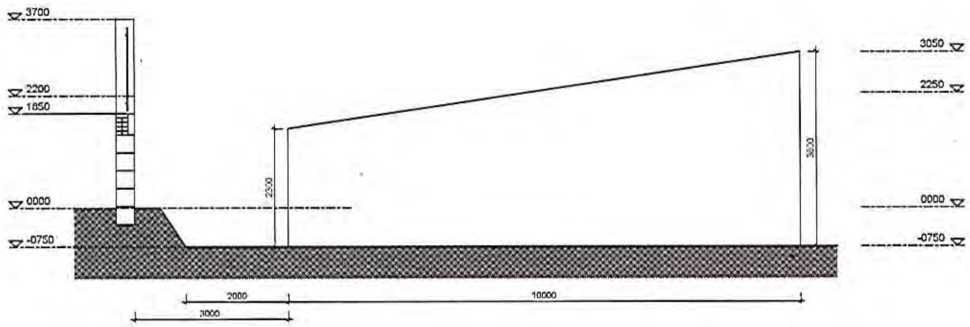
Summary

In summary, the crossover will generally operate at a good level of service with acceptable queues and delays throughout its use during weekdays (Scenario 1 and 2). On Saturdays (Scenario 3) the crossover will experience its heaviest due to the increased number of vehicles. In these instances the crossover is still anticipated to operate in a satisfactory manner, although longer delays are expected at the end of sport with the higher traffic flow exiting the grounds and turning onto Stephenson Avenue.

The same comments apply for the traffic flow along Stephenson Avenue. There may be queues, but these are acceptable and delays should be minimal and clear relatively quickly.

Across an entire week, the crossover is expected to be used by general traffic (parents/buses on sports days) for approximately 12 hours out of 168 hours and outside those times only by maintenance vehicles. This further supports the entry treatment recommended, being a minimal treatment, sufficient to meet the needs of occasional use.

APPENDIX 4:
Grounds Building Plans



EAST ELEVATION

donaldson+warn	Title:	BROCKWAY - GROUNDS SHED	Job No:	1232A	Client Name:	CCGS	donaldson+warn
			Dwg No:	XXXX			38 Roe Street
	Date:	09/11/2012	Scale:	1:100@A3	Project Location:	BROCKWAY	Perth WA 6000

Tel 08 9328 4475 Fax 08 9227 6558
admin@donaldsonandwarn.com.au
www.donaldsonandwarn.com.au

APPENDIX 5:
Landscaping Concept

LANDSCAPE MASTERPLAN
1:1500 @A2

PLANT SCHEDULE

TREES

Species	Common Name
Agonis flexuosa	'WA Peppermint'
Eucalyptus victrix	'Little Ghost Gum'
Melaleuca rhaphiophylla	'Swamp Paperbark'
Platanus acerifolia	'London Plane Tree'

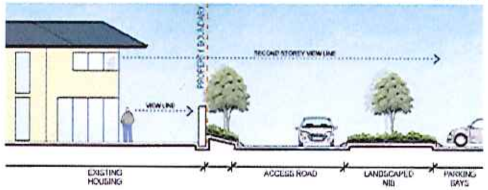
SHRUBS

Species	Common Name
Adenanthos sericea	'Dwarf Woolly Bush'
Agonis flexuosa	'Nana'
Anigozanthus bicolour	'Little kangaroo paw'
Anigozanthus viridis	'Green kangaroo paw'
Dianella sp	
Grevillea sp	
Grevillea fireworks	'Fireworks'
Lomandra longifolia	'Tanika'
Lomandra longifolia	'Cassica'
Lomandra confertifolia	'Wingarra'
Phormium tenax	'Purpurea Red Flax'
Westringia fruticosa	'Coastal Rosemary'

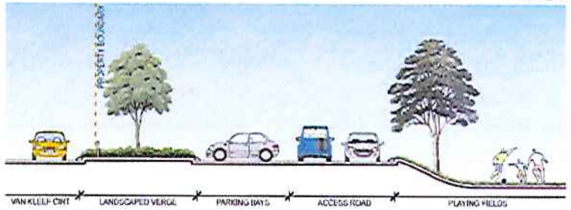
GROUND COVERS

Species	Common Name
Adenanthos cuneatus	'Coral Drift'
Eremophila glabra	'Kalbarri Carpet'
Grevillea preissii	'Gilt Dragon'
Grevillea obtusifolia	'Gin Gin Gem'
Juniperus conferta	'Shore Juniper'
Scaevola sp	

SECTION A
1:200 @A2

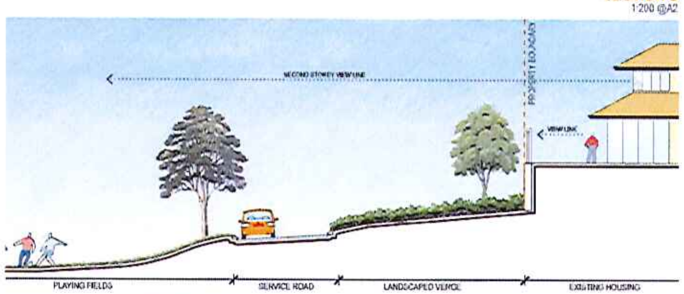


SECTION B
1:200 @A2



ENTRY FENCE CONCEPT
PERSPECTIVE FROM STEPHENSON AVE

SECTION C
1:200 @A2



CCGS PLAYING FIELDS - PRELIMINARY LANDSCAPE CONCEPT

LANDSCAPE JOB NUMBER : CCGS-01 : APRIL 2013 : REV D

emerge ASSOCIATES Integrated Science & Design

THIS DRAWING IS INDICATIVE ONLY AND MAY NOT REPRESENT THE FINAL SCOPE OF LANDSCAPE WORKS

APPENDIX 6:
Visual Representation of Front Fencing

donaldson+warn	Title: CHRIST CHURCH GRAMMAR SCHOOL PLAYING FIELDS FENCE SIGNAGE Date: 23/10/2012	Job No: 1232 Dwg No: 02	Client Name: CCGS Project Location: BROCKWAY	donaldson+warn 38 Roe Street Perth WA 6000	Tel 08 9328 4475 Fax 08 9227 6558 admin@donaldsonandwarn.com.au www.donaldsonandwarn.com.au

donaldson+warn

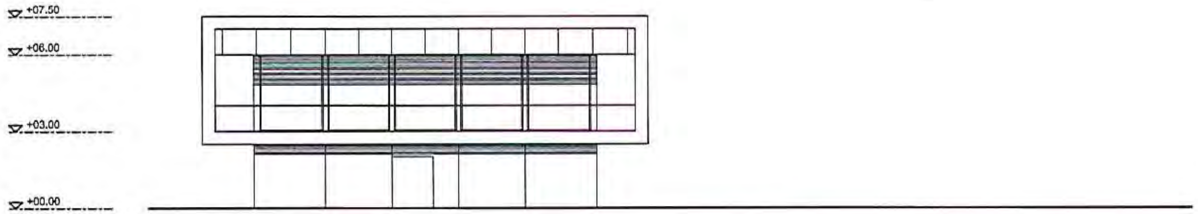
Title:	CHRIST CHURCH GRAMMAR SCHOOL PLAYING FIELDS FENCE SIGNAGE	Job No:	1232	Client Name:	CCGS
Date:	23/10/2012	Dwg No:	01	Project Location:	BROCKWAY

donaldson+warn
38 Roe Street
Perth WA 6000

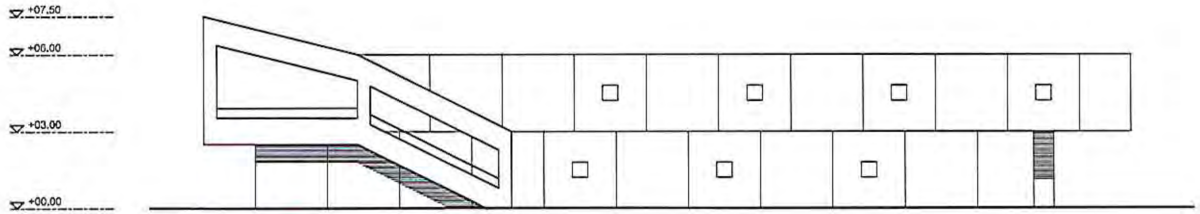
Tel 08 9328 4475 Fax 08 9227 6558
admin@donaldsonandwarn.com.au
www.donaldsonandwarn.com.au

APPENDIX 7:
Concept plans for Future Pavilion

EAST



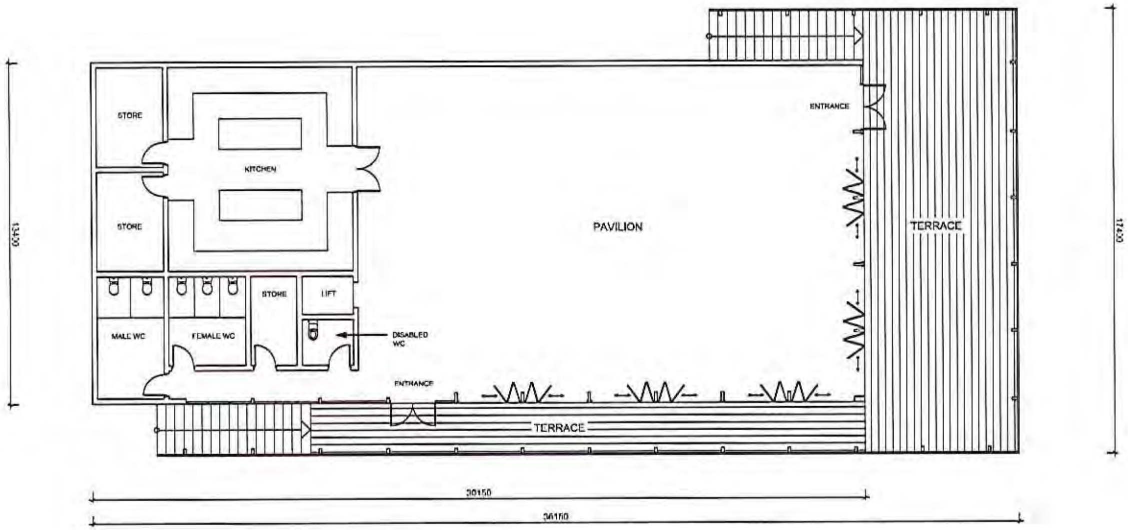
NORTH



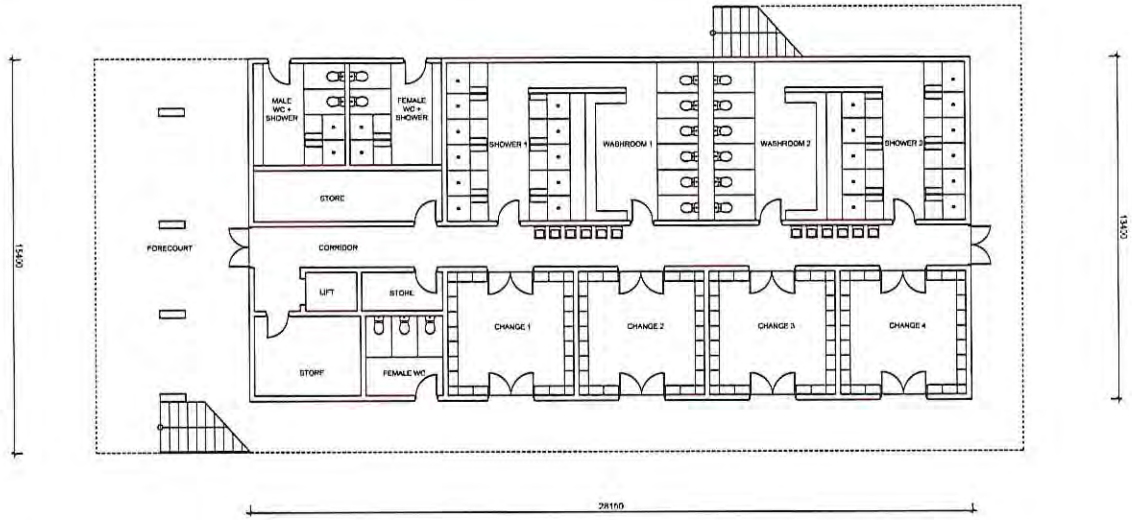
WEST

SOUTH

donaldson+warn	Title:	BROCKWAY SPORT PAVILION - ELEVATIONS	Job No: 1232	0 2m 4m 6m	Client Name: CHRIST CHURCH GRAMMAR SCHOOL	donaldson+warn	Tel 08 9328 4475 Fax 08 9227 6558
			Dwg No: DA03			38 Roe Street	admin@donaldsonandwarn.com.au
	Date:	05/07/2013	Scale: 1:200 @A3		Project Location: 1232-09-03	Perth WA 6000	www.donaldsonandwarn.com.au



FIRST FLOOR



GROUND FLOOR

NORTH

donaldson+warn	Title: BROCKWAY SPORT PAVILION - FLOOR PLANS Date: 05/07/2013	Job No: 1232 Dwg No: DA02 Scale: 1:200 @A3	0 2m 4m 6m	Client Name: CHRIST CHURCH GRAMMAR SCHOOL Project Location: 1232-09-03	donaldson+warn 38 Roe Street Perth WA 6000

Tel 08 9328 4475 Fax 08 9227 6558
admin@donaldsonandwarn.com.au
www.donaldsonandwarn.com.au

APPENDIX 8:
Temporary Changerooms Development Plan

BUILDING DESIGN CRITERIA Wind Load - in accordance with AS.1170.2-2011
REGION A, TERRAIN CATEGORY 2, IMPORTANCE 2:
Vu = V500 = 45m/s Ms = 1.0 Mt = 1.0
Mzcat = 0.91 V Servicebility = 37m/s

DESIGN CRITERIA IN ACCORDANCE WITH AS1170.4-2007:
Probability P= 1/500 (Table 3.1)
Kp = 1.0 (Table 3.1)
Site hazard factor Z allowed = 0.12 (Figure 3.2(C)
Earthquake design category = Domestic as per appendix A2

ALL METAL ROOF ASSEMBLIES, THEIR CONNECTIONS & IMMEDIATE SUPPORTING MEMBERS HAVE BEEN DESIGNED SO AS TO BE CAPABLE OF REMAINING IN POSITION NOTWITHSTANDING ANY PERMANENT DISTORTION, FRACTURE OR DAMANGE THAT MIGHT OCCUR IN ACCORDANCE WITH BCA VOLUME 1, SPECIFICATION B1.2
Built To: NCC CLASS ?? BUILDING

CLIMATE ZONE 5

CEILING HEIGHT = 2400

ROOM SCHEDULE	
NAME	AREA
MALE	9.48 m²
UNISEX ACCESSIBLE	5.78 m²
FEMALE	7.22 m²

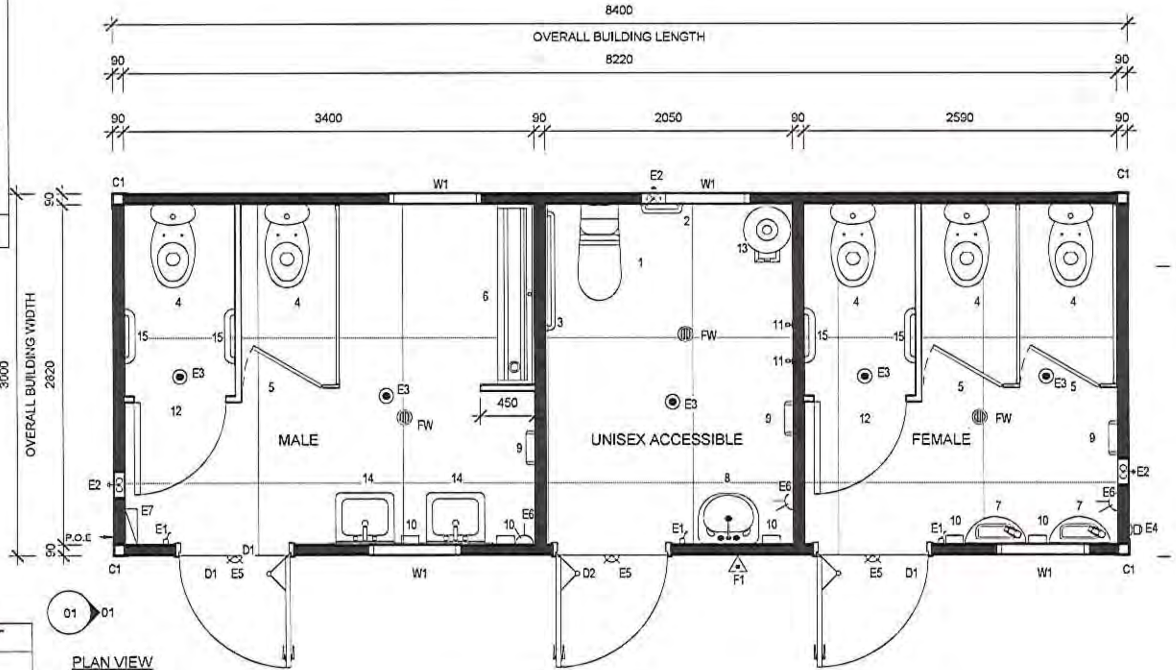
COLUR SCHEDULE

ROOF DECKING	-ZINCALUME
ROOF FLASHING	-DEEP OCEAN
EXTERNAL WALLS	-PAPERBACK
INTERNAL WALLS	-SURFIMIST
CEILING	-MIRAGE PEARL
WINDOWS	-DEEP OCEAN
VINYL	-SLATE GREY
LOGOS	-YES
PERIMETER/BASE CHANNEL	-BLACK

STUD WALL BUILDING SHORT SPECIFICATION - REGION A/B - 2011 BCA

- CHASSIS - STEEL BEAMS c/w GALV. JOISTS 75 x 40 x 1.6 CEE SECTIONS @ MAX 400 CTRS
- CHASSIS PAINT SPEC. - 425 ZINC PHOSPHATE PRIMER, 2 COATS ALKYD PRIMER WET ON WET - BLACK - FOR CORROSION INHIBITION
- FLOORING - 22mm T&G AQUATITE TERMITE TREATED PARTICLE BOARD
- FLOOR COVERING - 2.0mm SLIP RESISTANT VINYL FLOOR FINISH TO WET AREAS c/w 100mm HIGH COVING-refer colour schedule
- WALLS - 90mm STEEL STUD FRAMING
- EXTERNAL CLADDING - RUSTICATED CLADDING - refer colour schedule
- INTERNAL LINING - POLYPLY - refer colour schedule,
- WALL INSULATION - R2.5 HD POLYESTER BATTS to all walls & 8mm E THERM under external cladding
- ROOF INSULATION - R2.5 POLYESTER IST60 ANTICON BLANKET between ceiling joists with 8mm E-THERM under roof sheets
- ROOF & CEILING FRAME - GALV. STEEL FRAMEWORK
- ROOF CLADDING - SMARTSPAN SHEETING W/- 18mm PLY UNDER - refer colour schedule
- PRE-FINISHED PLYWOOD c/w ALUMINIUM CORNICE - refer to colour schedule
- ROOF FLASHINGS & CORNER TRIMS - COLORBOND - refer colour schedule
- DOOR FRAMES - METAL PAINTED FINISH - refer colour schedule

EQUIPMENT LIST		
No.	DESCRIPTION	QTY
1	DISABLED PAN c/w DUAL FLUSH CISTERN and PAPER HOLDER	1
2	300 LONG S/S DISABLED GRABRAIL	1
3	600 x 950 S.S. DISABLED GRABRAIL	1
4	TOILET PAN c/w DUAL FLUSH CISTERN & PAPER HOLDER	5
5	TOILET CUBICLE 800 WIDE c/w 600 DOOR & INDICATOR BOLT + W.C. PAN w/ DUAL FLUSH CISTERN & LIFT-OFF HINGES	3
6	1500w S.S. WALL MOUNTED URINAL	1
7	CAROMA COMPACT WALL BASIN w/ MIRROR & PVC SHELF OVER	2
8	CERAMIC DISABLED HAND BASIN c/w LEVER MIXER & MIRROR OVER - H&C ONLY	1
9	PAPER TOWEL DISPENSER	3
10	LIQUID SOAP DISPENSER	5
11	COAT HOOK	2
12	AMBULANT CUBICLES TO AS1428.1 COMPLIANT	2
13	50 LITRE ELECTRIC HWS	1
14	S.S. HAND BASIN c/w MIRROR & SHELF OVER	2
15	S.S WALL MOUNTED GRAB RAIL 450 x 450 AS1428.1 COMPLIANT	4
C1	89 x 89 x 3 SHS COLUMN w/ STRAP FIXING	4
D1	2040h x 920w EXTERNAL PANEL DOOR	2
D2	2040h x 920w EXTERNAL PANEL DOOR c/w SELF CLOSER & INDICATOR BOLT	1
W1	350h x 750w FIXED VENT WINDOW	4

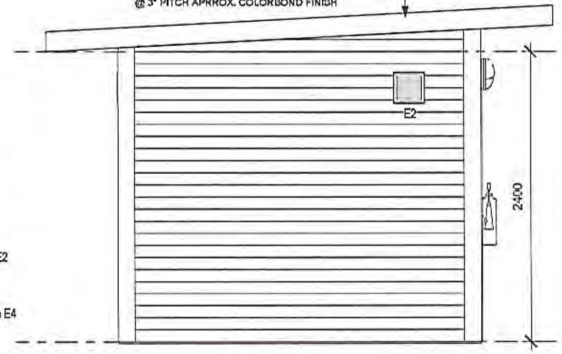


PLAN VIEW
SCALE 1 : 30

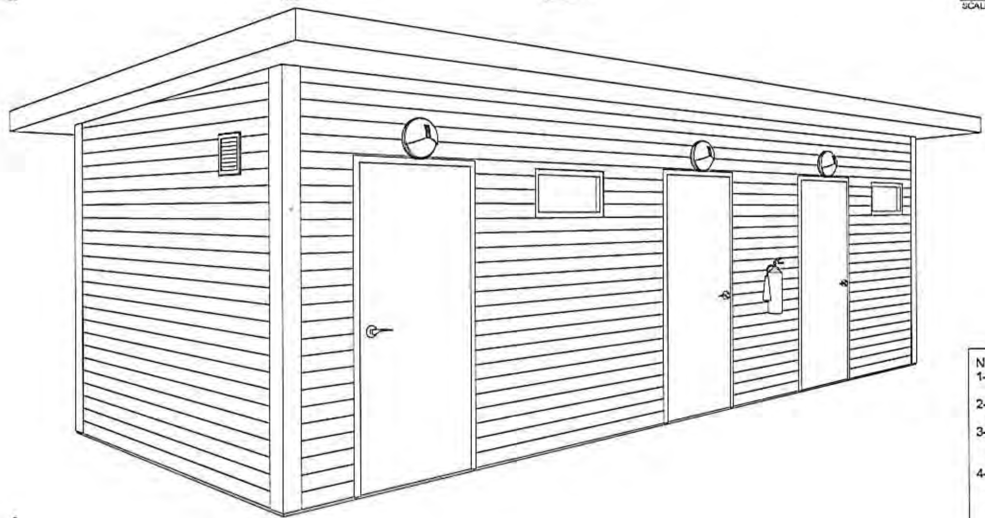
ELECTRICAL LEGEND		
TAG	DESCRIPTION	QTY
E1	LIGHT SWITCH: CLIPSAL 2000 SERIES 2031 WE ONE WAY SWITCHES. MOUNTED @ 1000 A.F.F.L.	3
E2	EXTRACTOR FAN : FANTECH HCM -225N OR APPROVED EQUIVALENT	3
E3	LIGHT: OYSTER FITTING	5
E4	SWITCH : PHOTO-ELECTRIC : (PE CELL)	1
E5	LIGHT : EXTERNAL BULKHEAD : W/PROOF	3
E6	GPO : 10 AMP DOUBLE	3
E7	CIRCUIT BREAKER BOARD : (POINT OF ENTRY)	1

FIRE LEGEND		
TAG	DESCRIPTION	QTY
F1	ABE TYPE FIRE EXTINGUISHER 4.5kg	1

ROOF CLADDING
SMARTSPAN or
EQUIVALENT SHEETS
@ 3° PITCH APPROX. COLORBOND FINISH



ELEVATION 01
SCALE 1 : 30



3D VIEW

NOTE:
1- BUILDING FINISHED FLOOR LEVEL (FFL) NOMINALLY 500 mm ABOVE FINISHED GROUND LEVEL (FGL).
2- STEPS TO BCA VOLUME 2 PART 3.9.1, OR VOLUME 1 PART D2, BY OTHERS.
3- WHERE REQUIRED, ACCESSIBLE RAMP, HANDRAILS AND LANDING TO AS 1428.1-2009 BY OTHERS. SIGNAGE INDICATING ACCESS AS PER BCA VOLUME 1 PART D3.6 AND AS 1428.1-2009 BY OTHERS.
4- WHERE REQUIRED, BRAILLE & TACTILE SIGNAGE INDICATING ACCESSIBLE SANITRY FACILITIES AS PER BCA VOLUME 1 PART D3.6 AND AS 1428.1-2009.

PRELIMINARY

CLIENT APPROVAL
CLIENT SIGNATURE DATE
NOTE: These drawings have been approved for manufacturing. Should any changes be made after the approved date, the Contract will need to be reviewed
BUILDERS SIGNATURE DATE

REV	DESCRIPTION	INI	DATE
A	ISSUED FOR INTERNAL REVIEW		25/10/12

PAGE SIZE	PAGE	SCALE	
A2	SHEET 1	As indicated	
DRAWN BY	DATE	CHECKED BY	DATE
JN	22/10/12	??	??

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FLEETWOOD INTERSTATE BRANCHES
555 WATERLOO CNR RD, BURTON S.A. 5110 PH 8280 5500 FAX 8280 5511
59 McKINNON RD, BERRIMAH, DARWIN

CLIENT: CHRIST CHURCH GRAMMAR SCHOOL
LOCATION: CLAREMONT, WA
PROJECT: ABLUTION M/F/D 8.4m x 3.0m
TITLE: PLAN & 3D VIEWS
FLEETWOOD DWG No.: SQ09223-B01-01
FLEETWOOD JOB No.:
REVISION: A

O:\SQ09223 - Christ Church Grammar School - Changerooms\Drafting\Drawings DWG\SQ09223-B01-M_F_D.rvt

BUILDING DESIGN CRITERIA Wind Load - in accordance with AS.1170.2-2011
REGION A, TERRAIN CATEGORY 2, IMPORTANCE 2:
Vu = V500 = 45m/s   Ms = 1.0 Mt = 1.0
Mzcat = 0.91   V Serviceability = 37m/s

DESIGN CRITERIA IN ACCORDANCE WITH AS1170.4-2007:
Probability P= 1/500 (Table 3.1)
Kp = 1.0 (Table 3.1)
Site hazard factor Z allowed = 0.12 (Figure 3.2(C)
Earthquake design category = Domestic as per appendix A2

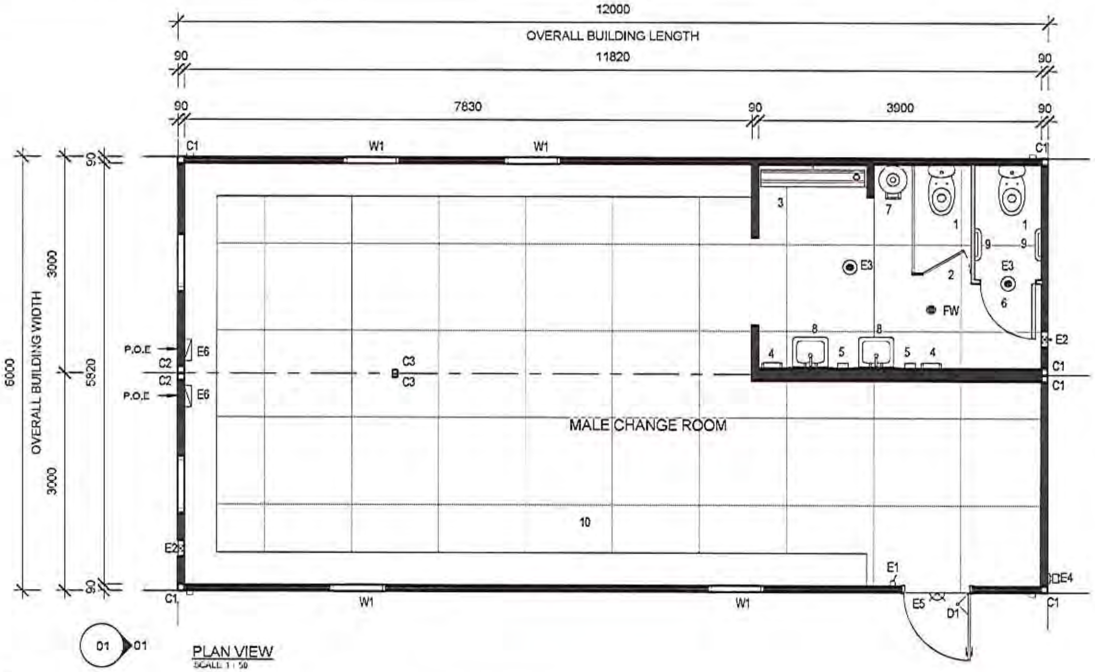
ALL METAL ROOF ASSEMBLIES, THEIR CONNECTIONS & IMMEDIATE SUPPORTING MEMBERS HAVE BEEN DESIGNED SO AS TO BE CAPABLE OF REMAINING IN POSITION NOTWITHSTANDING ANY PERMANENT DISTORTION, FRACTURE OR DAMANGE THAT MIGHT OCCUR IN ACCORDANCE WITH BCA VOLUME 1, SPECIFICATION B1.2
Built To: NCC CLASS ?? BUILDING

CLIMATE ZONE 5

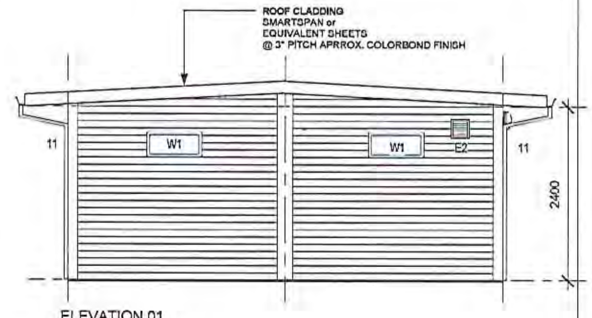
CEILING HEIGHT = 2400

COLUR SCHEDULE	
ROOF DECKING	-ZINCALUME
ROOF FLASHING	-DEEP OCEAN
EXTERNAL WALLS	-PAPERBACK
INTERNAL WALLS	-SURFMIST
CEILING	-MIRAGE PEARL
WINDOWS	-DEEP OCEAN
VINYL	-SLATE GREY
LOGOS	-YES
PERIMETER/BASE CHANNEL	-BLACK

ROOM SCHEDULE	
NAME	AREA
MALE CHANGE ROOM	67.82 m²



PLAN VIEW
SCALE 1 : 50



ELEVATION 01
SCALE 1 : 50

ELECTRICAL LEGEND		
TAG	DESCRIPTION	QTY
E1	LIGHT SWITCH: CLIPSAL 2000 SERIES 2031 WE ONE WAY SWITCHES. MOUNTED @ 1000 A.F.F.L.	1
E2	EXTRACTOR FAN : FANTECH HCM -225N OR APPROVED EQUIVALENT	2
E3	LIGHT: OYSTER FITTING	2
E4	SWITCH : PHOTO-ELECTRIC : (PE CELL)	1
E5	LIGHT : EXTERNAL BULKHEAD : W/PROOF	1
E6	CIRCUIT BREAKER BOARD : (POINT OF ENTRY)	2

STUD WALL BUILDING SHORT SPECIFICATION - REGION A/B -	
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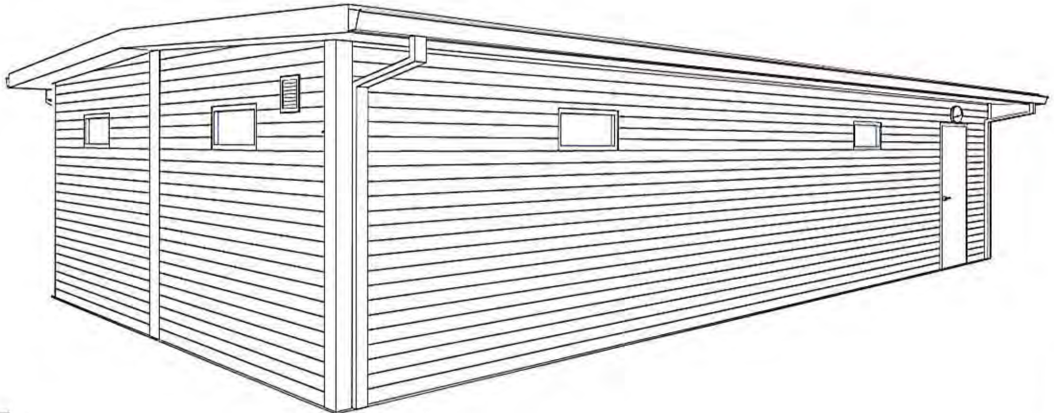

3D VIEW

EQUIPMENT LIST		
No.	DESCRIPTION	QTY
1	TOILET PAN c/w DUAL FLUSH CISTERN & PAPER HOLDER	2
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3	1500w S.S. WALL MOUNTED URINAL	1
4	PAPER TOWEL DISPENSER	2
5	LIQUID SOAP DISPENSER	2
6	AMBULANT CUBICLES TO AS1428.1 COMPLIANT	1
7	50 LITRE ELECTRIC HWS	1
8	S.S. HAND BASIN c/w MIRROR & SHELF OVER	2
9	S.S WALL MOUNTED GRAB RAIL 450 x 450 AS1428.1 COMPLIANT	2
10	BENCH	1
11	DOWNPIPE	4
C1	89 x 89 x 3 SHS COLUMN w/ STRAP FIXING	6
C2	89 x 89 x 3 SHS COLUMN	2
C3	75 x 50 x 3 SHS	2
D1	2040h x 920w EXTERNAL PANEL DOOR	1
W1	350h x 750w FIXED VENT WINDOW	6

NOTE:
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PH: 8280 5500 FAX: 8280 5511
58 McKINNON RD, BERRIMAH, DARWIN

CLIENT: CHRIST CHURCH GRAMMAR SCHOOL
LOCATION: CLAREMONT, WA
PROJECT: CHANGE ROOM 12.0m x 6.0m
TITLE: PLAN & 3D VIEWS
FLEETWOOD DWG No.: SQ09223-B02-01
FLEETWOOD JOB No.:
REVISION: A

O:\SQ09223 - Christ Church Grammar School - Changerooms\Drafting\Drawings DWG\SQ09223-B02-CHANGE ROOM.rvt robertsday

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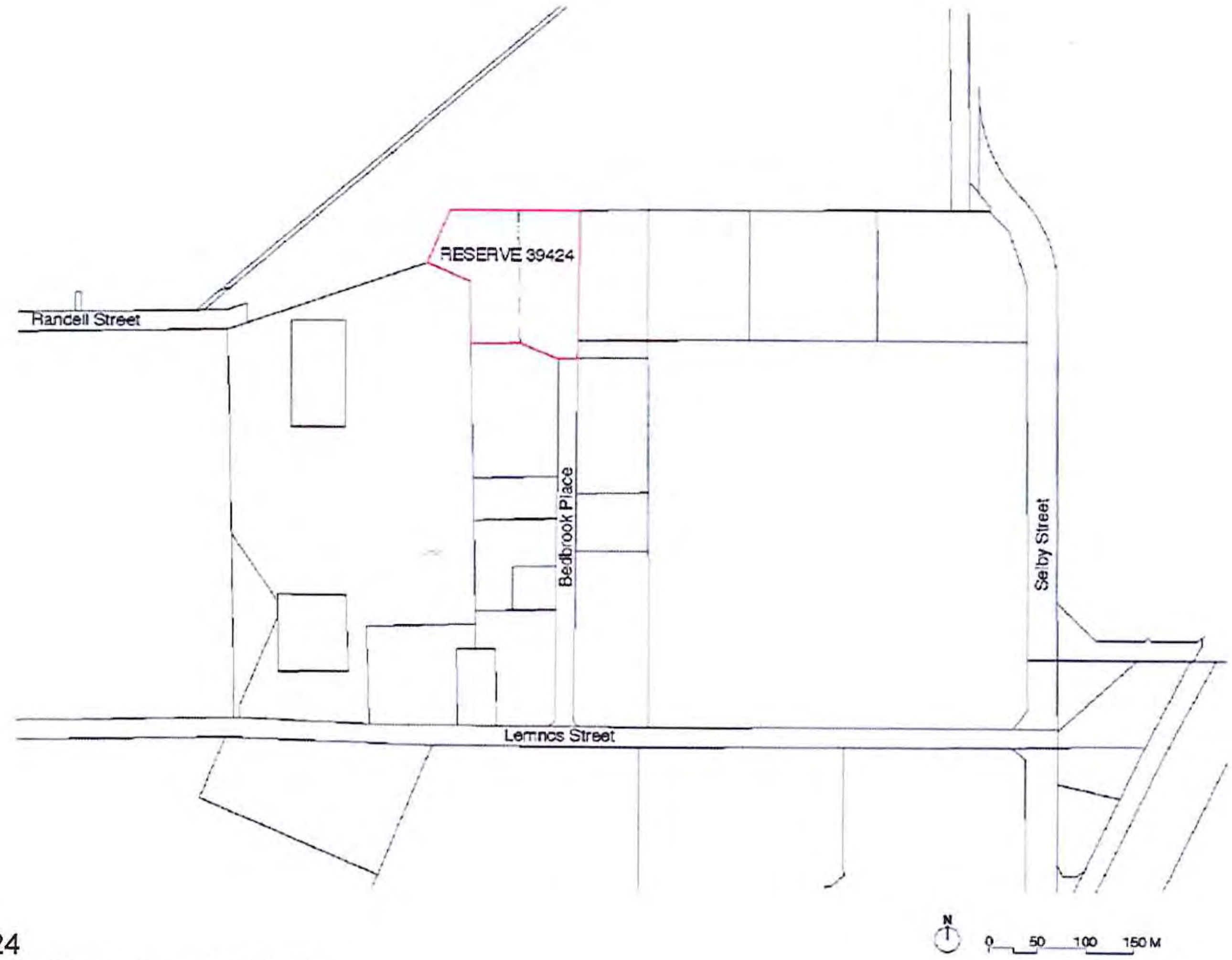

Reserve 39424
No. 15 Bedbrook Place, Shenton Park

Cancer Council
Western Australia

RESERVE 39424 BEDBROOK PLACE SHENTON PARK OUTLINE DEVELOPMENT PLAN

ISSUE 130718

BERNARD SEEBER.COM

1 FOREWORD

This document is an 'Outline Development Plan' submission made by the Cancer Council Western Australia to the City of Nedlands.

The submission is made in the terms of the City of Nedlands Town Planning Scheme No 2 Part 6 including primary reference to Clause 3.8.

BERNARD SEEBER PTY LTD

152 High Street Fremantle WA
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Facsimile (08) 9335 4940
Email mail@bernardseeber.com.au

CONTENTS

3 PRELIMINARIES

3.1 DOCUMENT ISSUE RECORD

The following issues of this document have been made:

Issue 130718	30 June 2013	Issue to City of Nedlands
Issue 130510	20 June 2013	Issue to City of Nedlands
Issue 130510	10 May 2013	Issue to City of Nedlands
Issue 130509	09 April 2013	Draft for Review
Issue 130508	08 April 2013	Draft for Review
Issue 130506	06 April 2013	Draft for Review
Issue 130429	29 May 2013	Draft for Review

3.2 ACCOMPANYING DOCUMENTS

The following documents accompany this document:

Attachment A	Submission Support	Bernard Seeber Pty Ltd background and explanatory information
Attachment B	Environmental Surveys	Eco Logical Survey Report: Graceful Sun Moth Survey Final Version D_May 2013
		Eco Logical Survey Report: Habitat Assessment for Carnaby's Black Cockatoo & Graceful Sun Moth Final Version D_January 2013

3.3 IDENTIFICATIONS

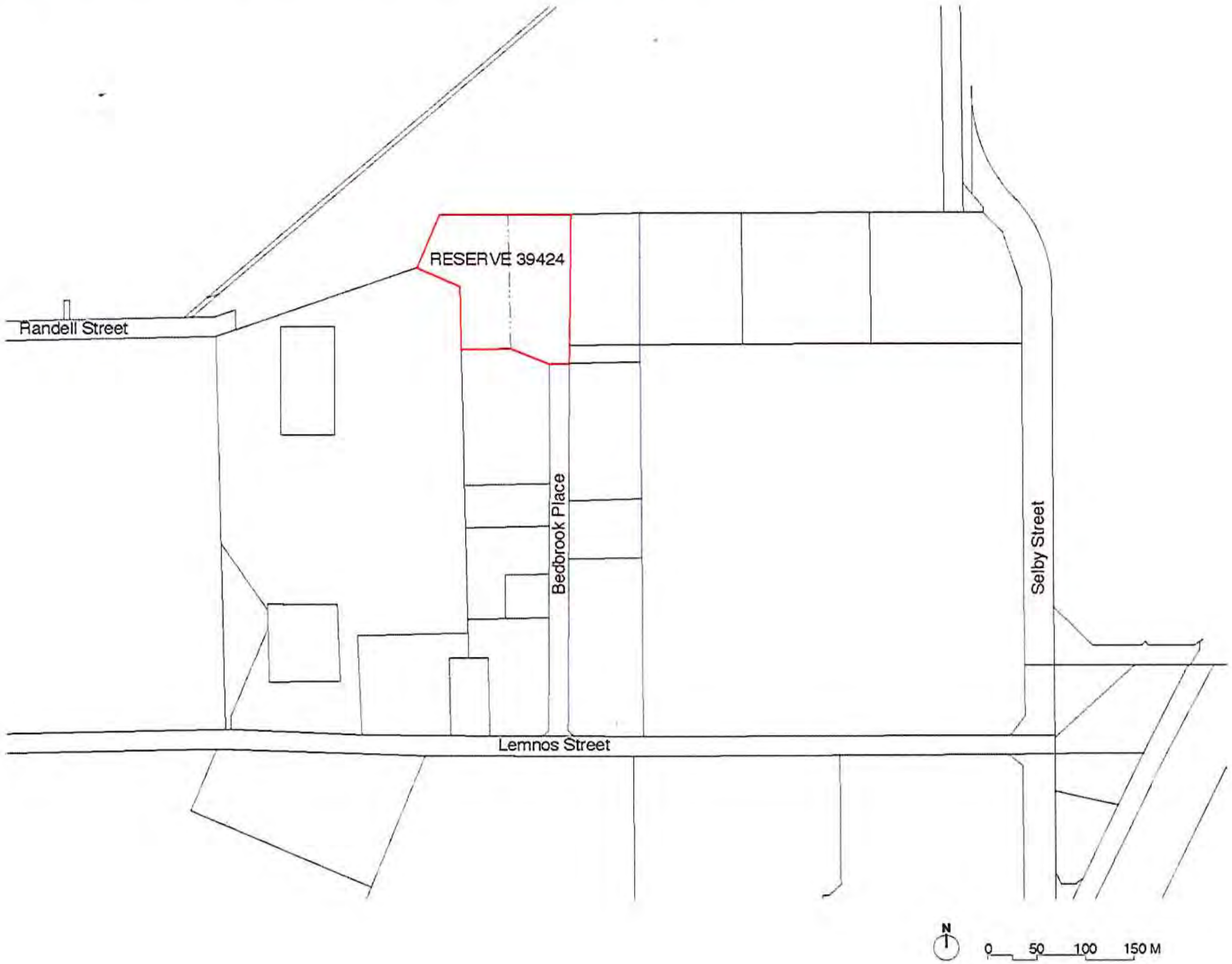
The following identities appear in this document:

Owner	Cancer Council Western Australia
Site	Lot 9970 on DP182896 and Lot 10754 on DP187262 Crown Reserve 39424
Applicant	Bernard Seeber Pty Ltd

4 SITE

4.1 LOCATION

The Site is located at the northern termination of Bedbrook Place Shenton Park:



4.2 OUTLINE DEVELOPMENT PLAN DIAGRAM

This diagram shows the extent of the Outline Development Plan:

5 EXISTING DEVELOPMENT

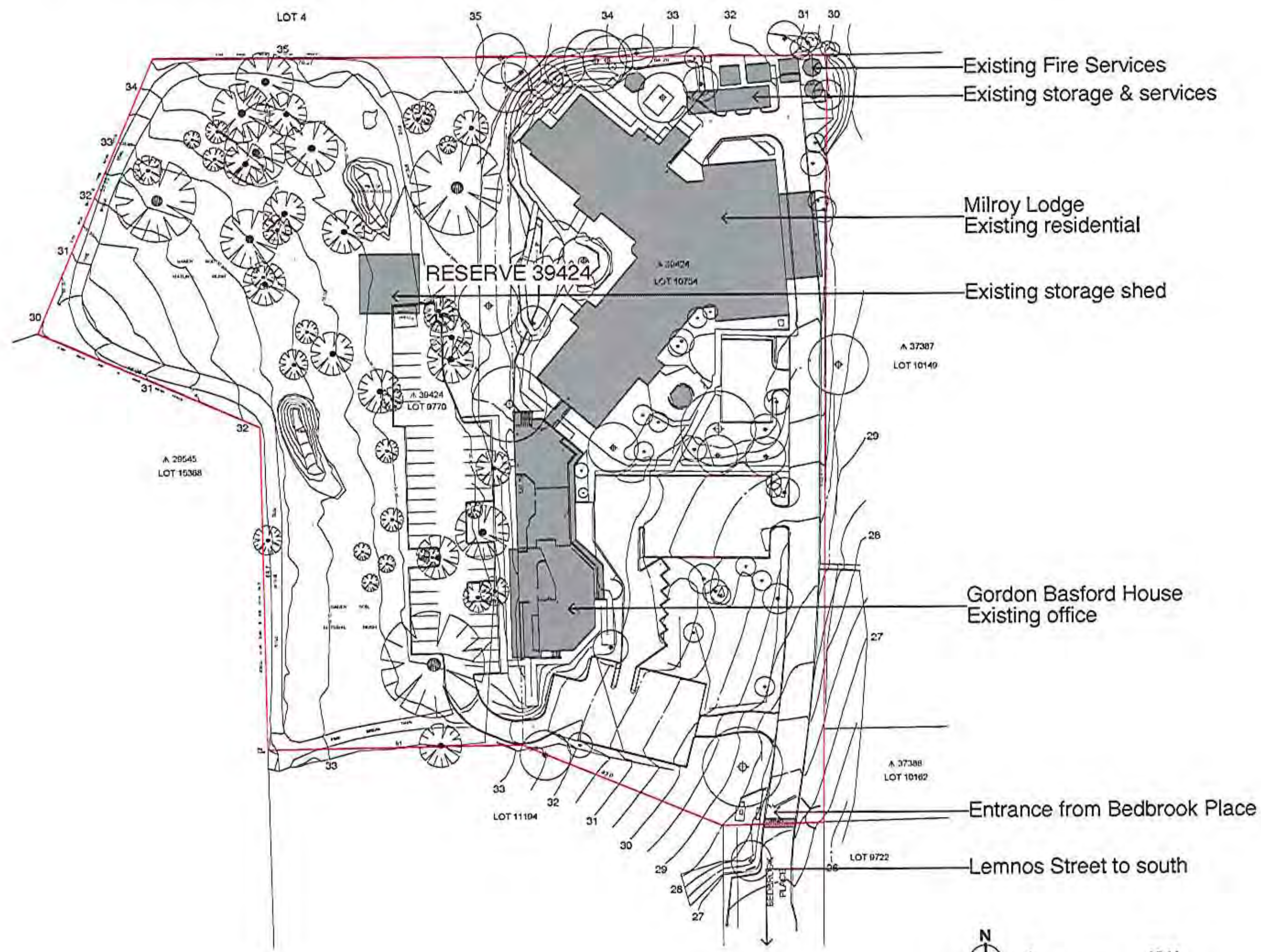
5.1 GENERALLY

CCWA current use of the Site is accommodated in development including:

- an integrated indigenous and exotic planted landscape
- civil works including access and car-parking
- two and single storey built residential accommodation
- two and single storey built office accommodation
- support services

5.2 EXISTING DEVELOPMENT DIAGRAM

This diagram illustrates existing Site development:



6 PLANNED DEVELOPMENT

6.1 GENERALLY

Further development of the Site will maintain the integration of native bushland landscape and building/civil works.

The ODP identifies Building and Landscape zones as an integrated, interdependent landscape.

Building development is to be staged in association with Landscape development staging to ensure that bushland is maintained and enhanced.

6.2 USE

Further development of the site is in the form of facilities in keeping with the Management Order for the Reserve.

6.3 LANDSCAPE AND BUSHLAND MAINTENANCE

The maintenance and augmentation of bushland is fundamental to the ODP form.

Building and Landscape zones are to proceed in association.

Where bushland is affected by building and civil development it will be balanced by the augmentation of retained unaffected areas and the development of new areas in association. Landscape development will protect, maintain and improve the viability of these habitats and the ecological communities of flora and fauna.

Where habitat identified in the Eco Logical Environmental Assessment (Attachment B) is affected by development, it will be replaced through planting in retained and new areas of landscape. The detailed management of identified tree replacement is included in the Development Schedule included in this ODP.

6.4 LANDSCAPE AND DEVELOPMENT FOOTPRINT

The landscape strategy for the Site manages building and civil footprints and the retention of bushland and open space generally through:

- The placement of built works at existing building/civil developed locations where practical
- The containment of built works through low rise multilevel development in lieu of single storey development

6.5 CITY OF NEDLANDS TOWN PLANNING SCHEME

Further development of the Site will be in accordance with the current TPS with the inclusion of a Maximum Building Height (excluding plant and equipment) for built development of 50.5m AHD

6.6 SITE DEVELOPMENT DIAGRAM

This diagram presents a notional concept plan and overall master planning for the long-term development of the Site:

LEGEND

Building Zone Key
Zone 1
Zone 2
Zone 3
Zone 4
Zone 5

Landscape Zone Key
Zone A
Zone B
Zone C
Zone D
Zone E
Zone F
Zone G
Zone H

Existing Trees
Refer to Habitat Assessment:
Jarrah >50cm DBH
Tuart >50cm DBH

N

0 25 M

7 DEVELOPMENT SCHEDULE

7.1 LANDSCAPE

Referring to the Site Development Plan the description of existing and future development is s follows:

	Existing	ODP development
Zone A	The broadest expanse of existing remnant bushland. Requires restoration to address sparse understory and localized clearing.	To be restored and enhanced as bushland indigenous to the place. To undergo localized ground restoration and foreign object removal, seeding, and planting as a base for restoration. Understory to be re-established. Tree Planting to include: _ 50 minimum to 100 Jarrah (Eucalyptus marginata) _ 50 minimum to 100 Tuart (Eucalyptus gomphocephala) Provision of dedicated, restricted, pathways to facilitate bushwalking and appreciation.
Zone B	Integrated planting with civil works. (Retaining walls, access, and pathways)	Additional indigenous planting including trees in association with Building and Civil Works
Zone C	Integrated planting with civil works. (Courtyard and Services)	Additional indigenous planting including trees in association with Building and Civil Works
Zone D	Integrated planting with civil works. (Road access)	Additional indigenous planting including trees in association with Building and Civil Works
Zone E	Integrated planting with civil works. (Recreational and parking)	Additional indigenous planting including trees in association with Building and Civil Works
Zone F	Integrated planting with civil works. (Entrance and road access)	Additional indigenous planting including trees in association with Building and Civil Works
Zone G	Integrated planting with civil works. (Access and parking)	Additional indigenous planting including trees in association with Building and Civil Works
Zone H	Remnant bushland. Requires restoration to address sparse understory and localized clearing.	To be restored and enhanced as bushland indigenous to the place. Tree Planting to include: _ 10 Jarrah (Eucalyptus marginata) _ 10 Tuart (Eucalyptus gomphocephala)

7.2 BUILDING AND CIVIL

Referring to the Site Development Plan the description of existing and future development is s follows:

	Existing	ODP development
Zone 1	Building	Building
Zone 2	Building and Civil	Building and Civil
Zone 3	Civil and Landscape	Building and Civil
Zone 4	Civil and Landscape	Building and Civil
Zone 5	Minor Building, Civil and Landscape	Building and Civil
Zone 6	Minor Building, Civil and Landscape	Minor Building, Civil and Landscape

7.3 STAGED PROGRESS

Initial Progress is sequenced to ensure that Landscaped Zones and Built Zones proceed as interdependent development.

	Landscape Zones	Building Zone
Stage 1	Zone A Carryout restoration of ground and establish understory. Plant and establish trees.	none
Stage 2	Zone B Carryout restoration of ground and establish understory. Plant and establish trees.	none
Stage 3	Zone H Carryout restoration of ground and establish understory. Plant and establish trees.	none
Stage 4	Associated Zone Carryout additional indigenous planting including trees in association with Building and Civil Works	Building Zone 3 or Building Zone 4 or Building Zone 5
Stage 5	to be determined	to be determined

Document End

Cancer Council
Western Australia

RESERVE 39424 BEDBROOK PLACE SHENTON PARK OUTLINE DEVELOPMENT PLAN

ISSUE 130510

ATTACHMENT A

BACKGROUND AND SUPPORT INFORMATION

BERNARD SEEBER.COM

1 FOREWORD

This document supports the 'Outline Development Plan' submission made by the Cancer Council Western Australia to the City of Nedlands.

It provides background and explanation to the ODP Submission.

The Cancer Council Western Australia is a non-government, not-for-profit organisation with the vision to:

"achieve a cancer-free future for the people of Western Australia" and a mission statement aiming: *"to minimise the incidence and impact of cancer on our community through advocacy, research, education and by providing people affected by cancer with support to enhance their quality of life."*

The Cancer Council has Perth Metropolitan premises in Nedlands, Shenton Park and West Perth along with a retail outlet in Subiaco.

This submission is made in relation to the Shenton Park premises which are located at 15 Bedbrook Place Shenton Park. It houses Milroy Lodge for country patient residential accommodation and Gordon Basford House facility for Research, Education and Support programmes.

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Facsimile (08) 9335 4940
Email mail@bernardseeber.com.au

CONTENTS

3 PRELIMINARIES

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Issue 130506	06 April 2013	Draft for Review
Issue 130429	29 May 2013	Draft for Review

3.2 ABBREVIATIONS

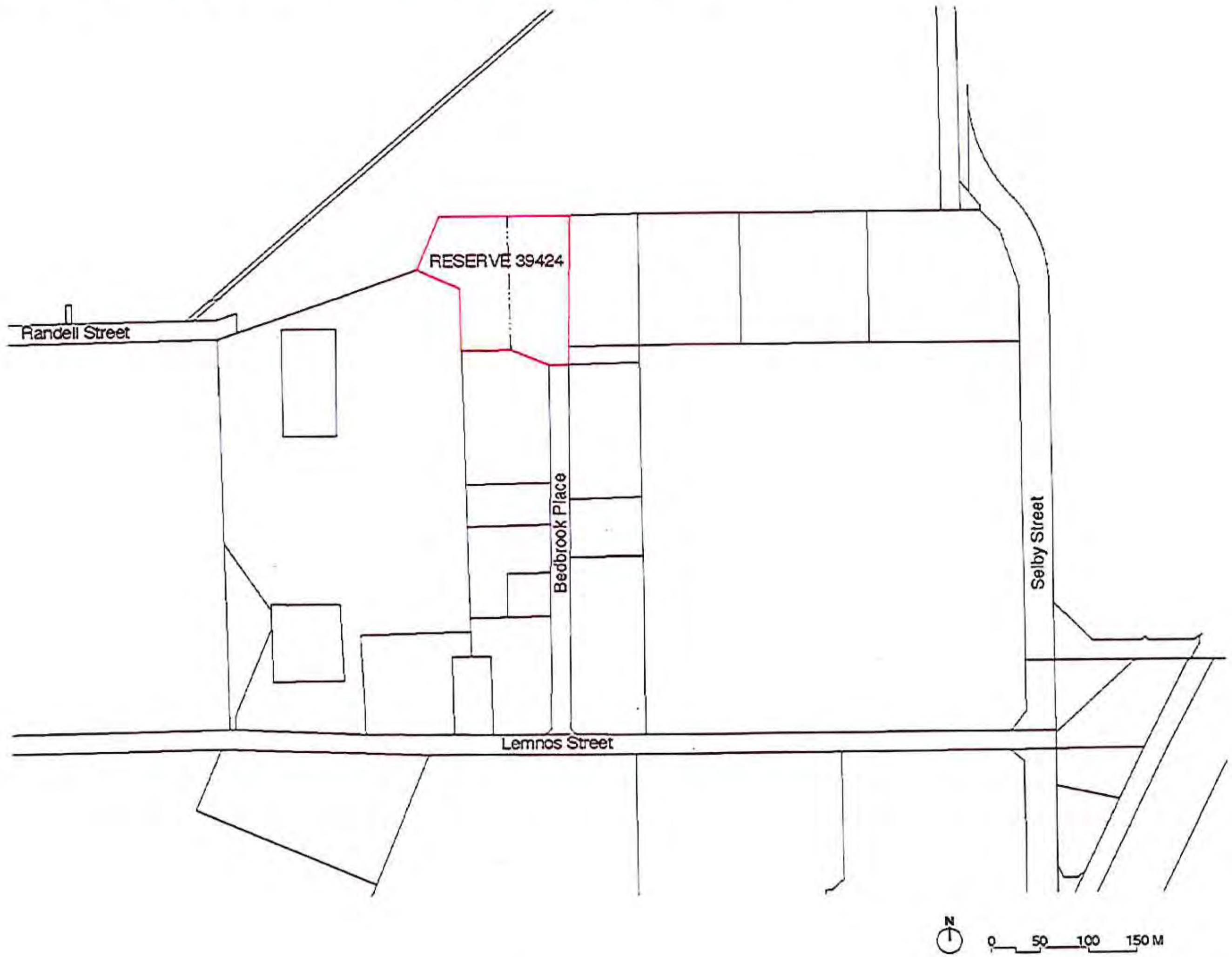
The following abbreviations appear in this document:

AHD	Australian Height Datum
BSPL	Bernard Seeber Proprietary Limited
CBC	Carnaby's Black Cockatoo
CBD	Central Business District (Perth)
CCWA	Cancer Council Western Australia
DA	Development (Planning) Application
GSM	Graceful Sun Moth
LPP	Local Planning Policy
MRS	Metropolitan Region Scheme
ODP	Outline Development Plan
R-Codes	Residential Codes
RL	Reduced Level
SEWPaC	Australian Government Department of Sustainability, Environment, Water, Population and Communities
TPS2	City of Nedlands Town Planning Scheme Number 2

4 SITE

4.1 LOCATION

The Site is located at the northern termination of Bedbrook Place Shenton Park:



4.2 PROPERTY DESCRIPTION

Reserve 39424 consists of two Lot 9770 to the west and Lot 10754 is located at 15 Bedbrook Place Shenton Park WA 6008 within the Hollywood Ward of the City of Nedlands.

It covers an area of 1.8392 hectares, and forms the northern termination of Bedbrook Place and is approximately 420m north of Lemnos Street and the Shenton Bushland reserve, and 5km west of the Perth Central Business District.

The Reserve, the Site, is under are under Crown ownership and the Crown Land Title indicates that the Primary Interest Holder is The CCWA. The occupancy is subject to a conditional Management Order, which notes that the Reserve is to be utilised for the designated purpose of "Accommodation for Country Cancer and Leukaemia Patients, Cancer Related Programs and Services, and Cancer Council of Western Australia Administrative Staff".

4.3 CONTEXT

The Site context includes:

Locality	The locality is characterised by bushland of the UWA site to the north with proposed residential development and nature reserves, Water Corporation and light industrial uses to the west and south, and hospital / medical uses and bushland to the south and east.
Topography	There is an approximately 8.5m natural rise across the site, with the south-eastern corner at the entrance from Bedbrook Place being at the lowest point 26.5m AHD rising to approximately 35m AHD at the western side of the northern boundary.
Road Systems	The location is well served by a developed public carriageway system. Bedbrook Place is a Cul-de-Sac terminating at the Site.
Amenity	The Site is located in a suburban context and in close proximity to retail and other commercial services. Adjacent development varies without any conflict in use.
Public Transport	The Site is served by the Transperth bus service.

5 PLANNING SCHEME CONTEXT

5.1 MRS AND TPS2

The Site is zoned Urban within the Metropolitan Region Scheme and is zoned Development under the City of Nedlands Town Planning Scheme No.2 and Scheme Map.

Permissible uses for the Site are set down in TPS2 'Use Class Table'.

5.2 PLANNING APPROVAL PROCEDURE

Within the City of Nedlands, Submissions relating to the development of land within a 'Development' zone are required to address the TPS2 requirements Part 6 and include information set down in Clause 3.8.

6 EXISTING DEVELOPMENT

6.1 GENERALLY

CCWA current use of the Site is accommodated in development including:

- an integrated indigenous bushland and exotic planted landscape
- civil works including access and car-parking
- two and single storey built residential accommodation
- two and single storey built office accommodation
- support services

6.2 LANDSCAPE

The Site is characterised by the presence of remnant indigenous vegetation and complementary developed landscape.

A ridge runs north-south through the Site setting up a lower eastern plateau and upper western plateau with an approximately 8.5m natural rise from the Bedbrook Place access to the northwest boundary.

Civil and building works are integrated into the landscape achieving an association with the Site that supports the CCWA mission of education through health and wellness.

6.3 CIVIL

Vehicular access and parking has been developed across both the eastern and western portions of the Site.

Service facilities including Fire Preventive installations are strategically placed in association with building development.

6.4 BUILDING

Residential accommodation is short-term provided for CCWA country clients and patients in the two storey Milroy Lodge, which has 24 single rooms and two double rooms accommodating a maximum of 28 people; being nominal $1700m^2$ ground floor footprint.

Office space is used for coordinating a range of cancer related prevention campaigns, seminars, education, support programs, cancer research funding and associated services. These are undertaken in the existing two-storey office and seminar building, Gordon Basford House, which contains a variety of office space, meeting rooms, utility space and storage for administrative and educational staff; being nominal $456m^2$ ground floor footprint.

Storage facilities are provided in a shed on Lot 9770 to the north of the largest parking court; being nominal $130m^2$ footprint.

The built forms on the site have been developed incrementally, and adaptively over time. The intention has been to maintain contact with the landscape while adapting to the 'steep' topography and the central ridge. This, along with the buildings being two levels only, has lead to some occupation of the pitched roof spaces and less than ideal accommodation.

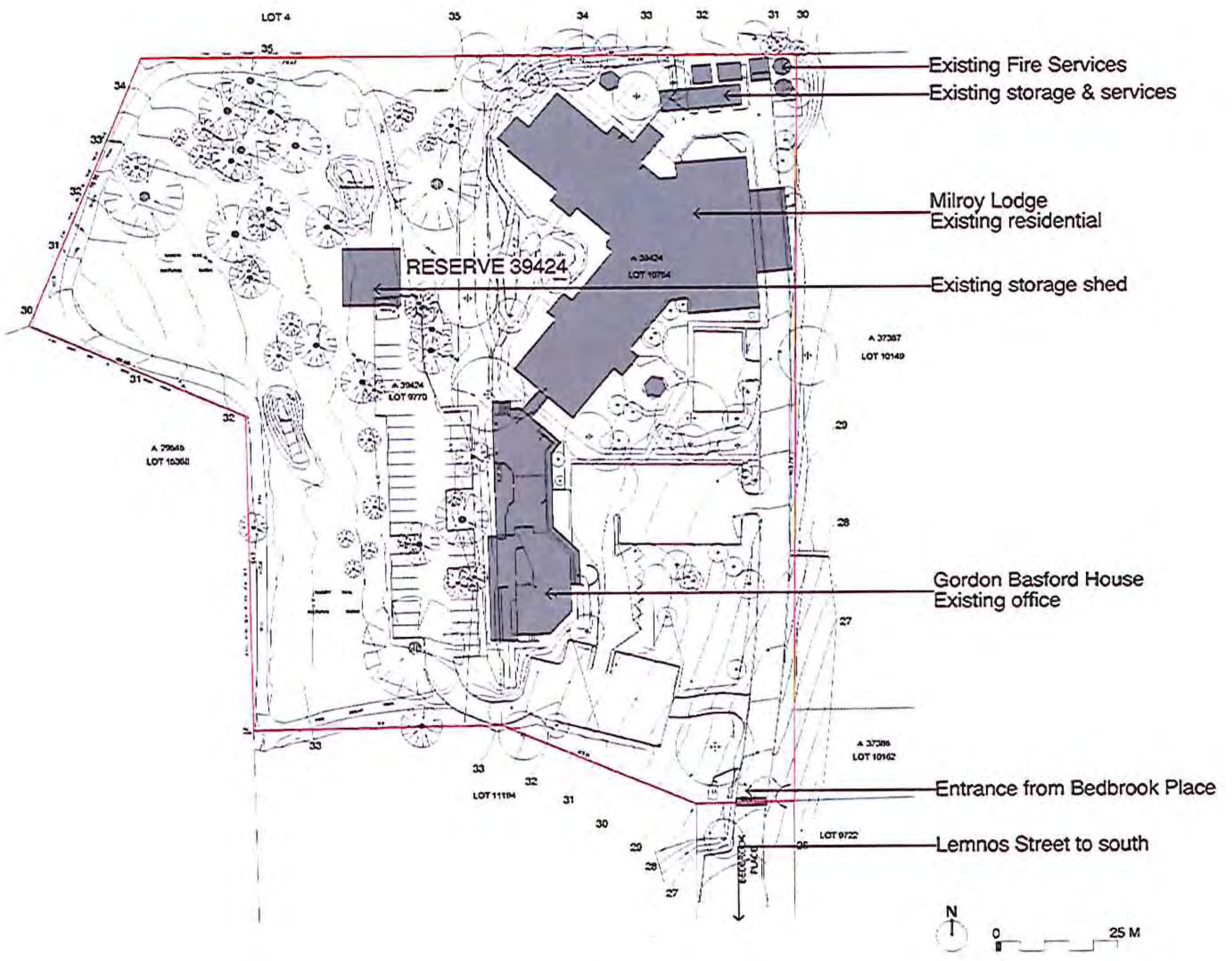
6.5 SERVICES

The existing Site is fully serviced including:

Water Potable	Water Corporation metropolitan connection
Fire Service	Dedicated onsite infrastructure
Sewerage drainage	Water Corporation metropolitan connection
Stormwater Drainage	Comprehensive drainage services stormwater exist for onsite retention.
Information Technology	Current standards ICT connections in place.

6.6 EXISTING DEVELOPMENT DIAGRAM

This diagram illustrates existing Site development:



7 SUBMISSION INFORMATION

7.1 DEVELOPMENT CULTURE

The existing development of the Site provides an association with the planted landscape and natural world.

Future development will augment this association and maintain a tranquil and restorative quality in the integrated landscape as a promotion a lifestyle that complements the CCWA culture.

7.2 ENVIRONMENT & ECOLOGY

An environmental survey has been undertaken for the Site in the form of:

- A Habitat Mapping Assessment survey and report was initially undertaken in January 2013.
- A follow-up survey for the Graceful Sun Moth during the GSM flying and breeding season March 2013.

Associated reports accompany the ODP submission as ATTACHMENT B.

CCWA is making a referral of the environmental survey to the Commonwealth Government agency SEWPaC.

7.3 MAXIMUM BUILDING HEIGHTS

This submission includes a request that the City of Nedlands use its discretionary power to approve the setting of the Maximum Building Height for the Site as follows:

TPS2 clause 5.11 typically restricts the construction of non-residential developments to three stories in addition to parking. It also restricts the highest point of a building to 10m, normally measured from the mean natural ground level around the base of the building. However, it also notes that the maximum height can alternatively be measured relative to such other level determined by Council.

This submission notes that both the topography and use of the Site render the set heights within TPS2 clause 5.11 not supportive of the sustainable future development.

The overall development plan proposes to:

- Optimise the planted landscape
- Contain building development footprint
- Appropriately locate building and civil development
- Sustainably integrate new with existing development

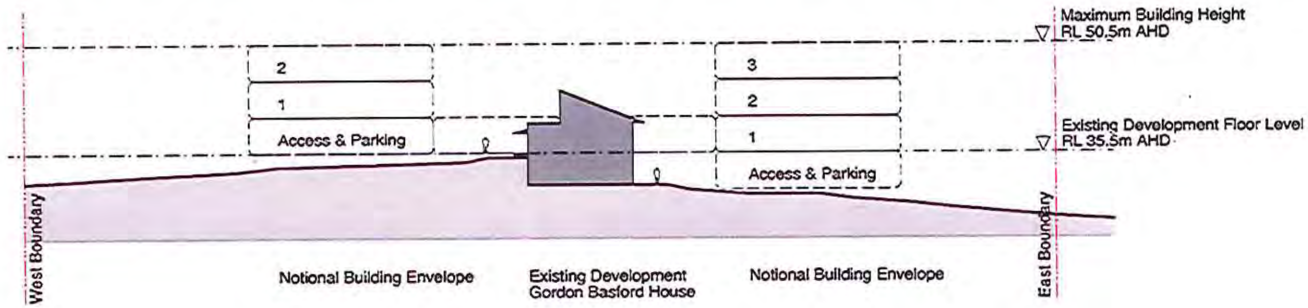
The achieve this, the overall development plan proposes the setting of a Maximum Building Height that enables:

- development to relate to existing built floor levels to facilitate integration of existing with new

- development to concentrate in decentralised forms with controlled footprints through moderate rise structures

Given the topography and existing development of the Site, it is proposed a Maximum Building Height be approved as a Site wide RL rather than a localised datum based calculation.

This diagram illustrates the proposed Maximum Building Height (excluding plant and equipment) as an extension of the ridge based existing floor level and with recognition of the difference in level between the eastern and western plateaus of the Site.



7.4 VEGETATION & LANDSCAPE

Along with a comprehensive fire management plan, it is proposed to integrate the vegetated landscape with development through both the practical retention and augmentation of native vegetation and planting generally. Landscape design will aim to create opportunities for health and wellbeing with spaces for walks, outlooks, recreation and contemplation.

Should development include the removal of native trees, it is proposed that there be an equal or greater re-provision of native trees on the site.

Given the outcomes of the two environmental surveys, the landscape proposals will therefore also aim to protect, maintain and improve the viability of habitats, ecological communities, flora and fauna, and genetic diversity adjacent to the biodiversity corridors. Landscape design is therefore seen as an important tool to create opportunities for native fauna to return and to utilise the habitat which has now been mapped and assessed as having potential to support endangered species.

The landscape strategy and for the Site will aim to:

- minimise building footprints to retain native vegetation and open space
- retain as much native flora as practical
- regenerate and replant with local native species to encourage biodiversity
- use an integrated and holistic landscape approach in the design
- create opportunities for health and wellbeing with spaces for outlooks, recreation and contemplation
- manage a landscape which is aligned to the values of the CCWA

8 SUMMARY

The CCWA occupy the Site under Crown ownership and is subject to a conditional Management Order, which notes that the Reserve is to be utilised for the designated purpose of "Accommodation for Country Cancer and Leukaemia Patients, Cancer Related Programs and Services, and Cancer Council of Western Australia Administrative Staff". This use and restrictive occupancy is to be maintained.

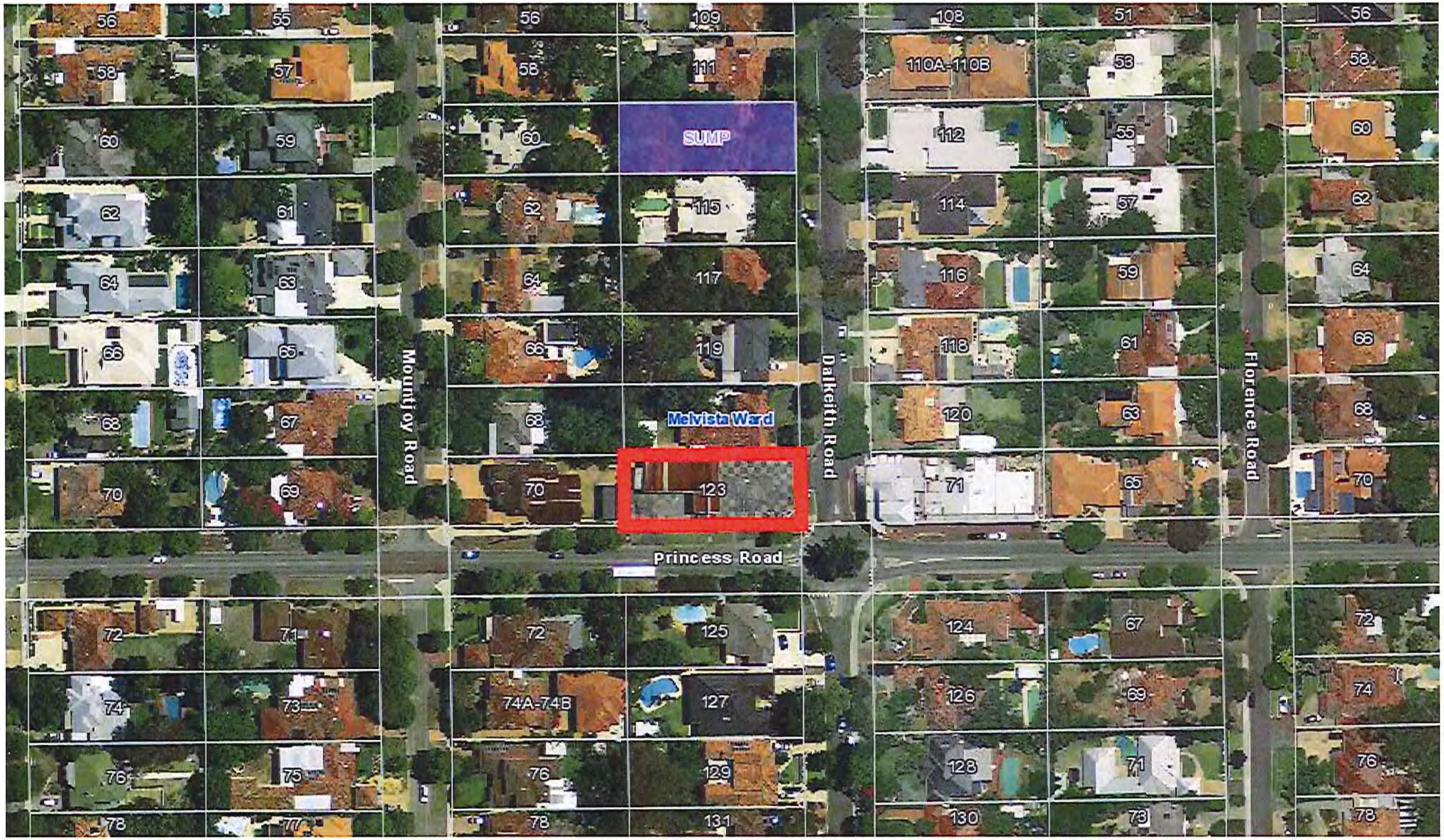
Development form is intended generally as set out in the Outline Development Plan Diagram with a Maximum Building Height (excluding plant and equipment for built development is 50.5m AHD.

The CCWA Bedbrook Place Site presents an opportunity for the symbiotic long-term development of a distinctive bushland place and a West Australian non-profit health organisation.

Towards this, the Outline Development Plan includes:

- an integrated planted and built landscape to consolidate and augment existing and to inform proposed development
- a site wide common maximum building height that facilitates a reduction in building development footprint through moderate rise development

Document End



City of Nedlands	The City of Nedlands accepts no responsibility for the accuracy of this image or the results of any actions taken when using this image	**PD 37.13 – Attachment 1** Locality Map	1:1593	N

CITY OF NEDLANDS

TOWN PLANNING SCHEME NO.2

AMENDMENT NO.XX

PLANNING AND DEVELOPMENT ACT, 2005 (AS AMENDED)
RESOLUTION DECIDING TO AMEND A LOCAL PLANNING SCHEME

CITY OF NEDLANDS

TOWN PLANNING SCHEME NO.2 – AMENDMENT NO.XX

Resolved that the Council, in pursuance of Section 75 of the Planning and Development Act 2005 (as amended) amend the above Local Planning Scheme by:

Rezoning Lot 289 (No.123) Corner Dalkeith and Princess Roads, Dalkeith from "Service Station" to Residential and apply an "Additional Use" to the site with the following details to be inserted into Schedule 1 – Additional Uses:

	Lot No.	Street	Zone	Additional Use Permitted
	289	Corner Dalkeith and Princess Roads	Residential	• Three (3) Single or Grouped Dwellings; • Dwellings shall comply with the relevant provisions of the Residential Design Codes as they would normally apply to the ultimate density to which the site is developed.

Dated this________day of_______20_____

____

CHIEF EXECUTIVE OFFICER

SCHEME AMENDMENT REPORT

1. LOCAL AUTHORITY	:	CITY OF NEDLANDS
2. DESCRIPTION OF LOCAL PLANNING SCHEME	:	TOWN PLANNING SCHEME NO.2
3. TYPE OF SCHEME	:	DISTRICT ZONING SCHEME
4. SERIAL NUMBER FOR AMENDEMENT	:	XX
5. PROPOSAL	:	**Rezoning Lot 289 (No.123) Corner Dalkeith and Princess Roads, Dalkeith from "Service Station" to Residential and apply an "Additional Use" to the site to permit the development of up to three dwellings on the property.**

REPORT

Introduction

This rezoning seeks to facilitate the removal of an existing "Service Station" use whilst allowing for the redevelopment of the site for residential purposes. The Amendment will provide the City of Nedlands with a surety as to what can, and will be developed over the site ensuring that it meets with Council's objectives and the community's vision for the area.

The following report provides an overview of the site characteristics, the local context, findings of preliminary investigations and explains the rationale of the scheme amendment proposal.

Site Description and Details

Lot 289 (No.123) Dalkeith Road, Dalkeith is registered in the ownership of Anne Venoutsos, Holbrook Gardens, Carine.

The site is formally described as:

- Lot 289 on Deposited Plan 3668, Certificate of Title Volume 769, Folio 1.

There are no notifications registered on the title. Refer **Appendix 1** – Certificate of Title.

The site has a total area of 1,011m^2.

Location

The site is located in the suburb of Dalkeith and has frontages to both Dalkeith and Princess Roads. The site has a traditional frontage to Dalkeith Road and a long side frontage to Princess Road (refer Location Plan and Aerial Photograph).

The site has existing access points to both Dalkeith and Princess Roads. There is a triple-width crossover to Dalkeith Road and two double-width crossovers to Princess Road.

Existing and Historical Landuse

It is known that the site has operated as a service station since at least the late 1950's.

The current owners of the service station have been operating the business from the site for almost 20 years.

Surrounding Land Use and Development

The local area is generally characterised by low density single residential development, although it is noted that the immediate residential area accommodates a number of additional use sites that permit the development of two senior persons dwellings on each of the affected lots.

A small area of commercial/retail development is located on the lot to the east of the subject site on the north eastern corner of Dalkeith and Princess Roads.

Planning Framework

Current Zoning

Under the City's Town Planning Scheme No.2 the subject site is classified as "Service Station" zone.

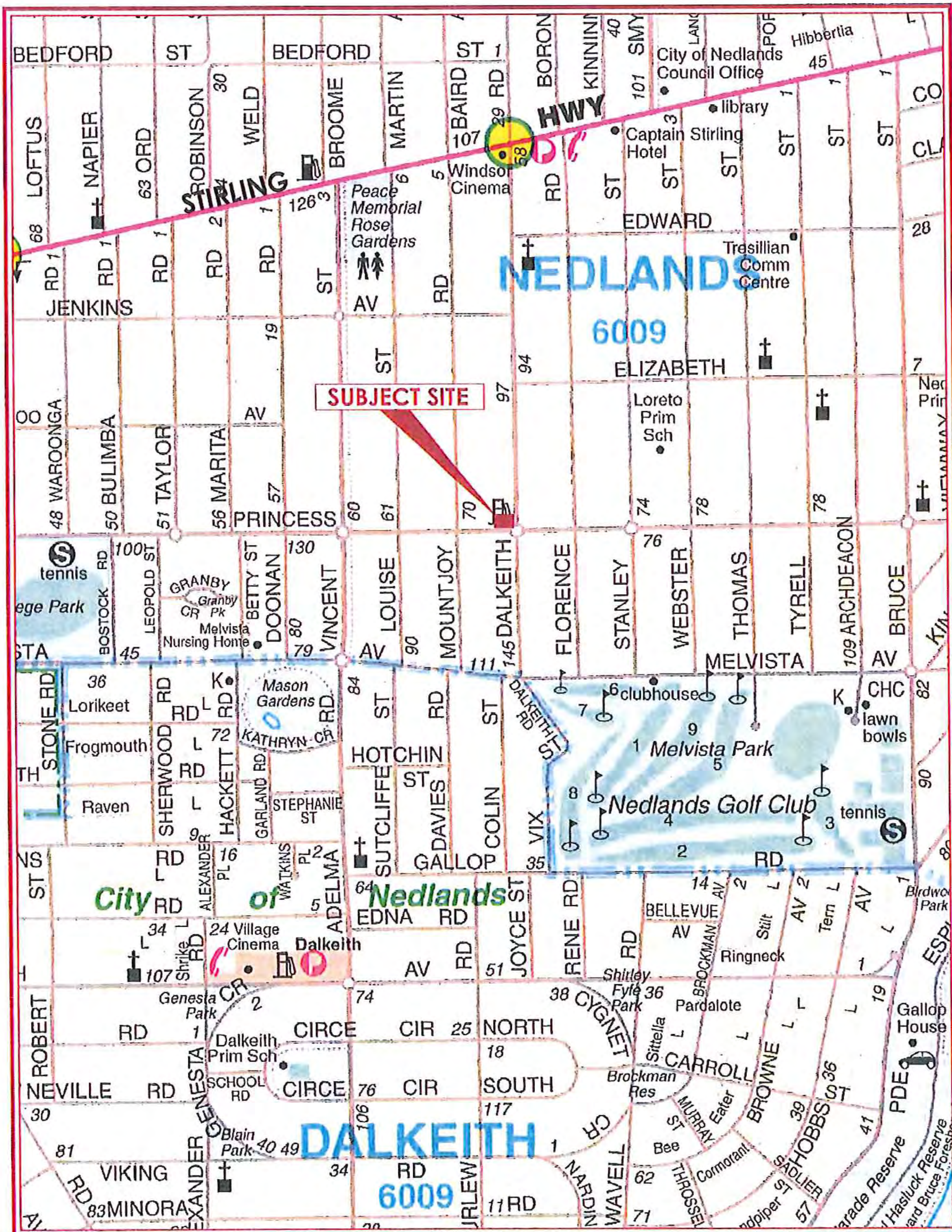
The "Service Station" use is defined by the Scheme as follows:

> *"Means land and buildings used for the supply of petroleum products and automotive accessories and for carrying out greasing, tyre repairs, and minor mechanical repairs to motor vehicles but does not include panel beating, spray painting, major repairs or wrecking, and may include a roadhouse in a predominantly rural area."*

Future Zoning

It is understood that the City's Draft Local Planning Scheme No.3 (LPS No.3) has been prepared and forwarded to the Western Australian Planning Commission for the Minister's consent to advertise.

The proposed zoning of the site under Draft LPS No.3 is not yet known given the Draft Scheme has not yet been released for public consideration. However, it is expected that in accordance with current State requirements and directions that the zones within the Draft Scheme will be rationalised. It is expected that the "Service Station" zone will not be included within LSP No.3 and that the site may be classified as a commercial/retail zone or, more likely, be zoned "Residential" with an additional use of "Service Station".



NORTH

0 50 100 150 200 250m
SCALE 1:10,000 (A4)

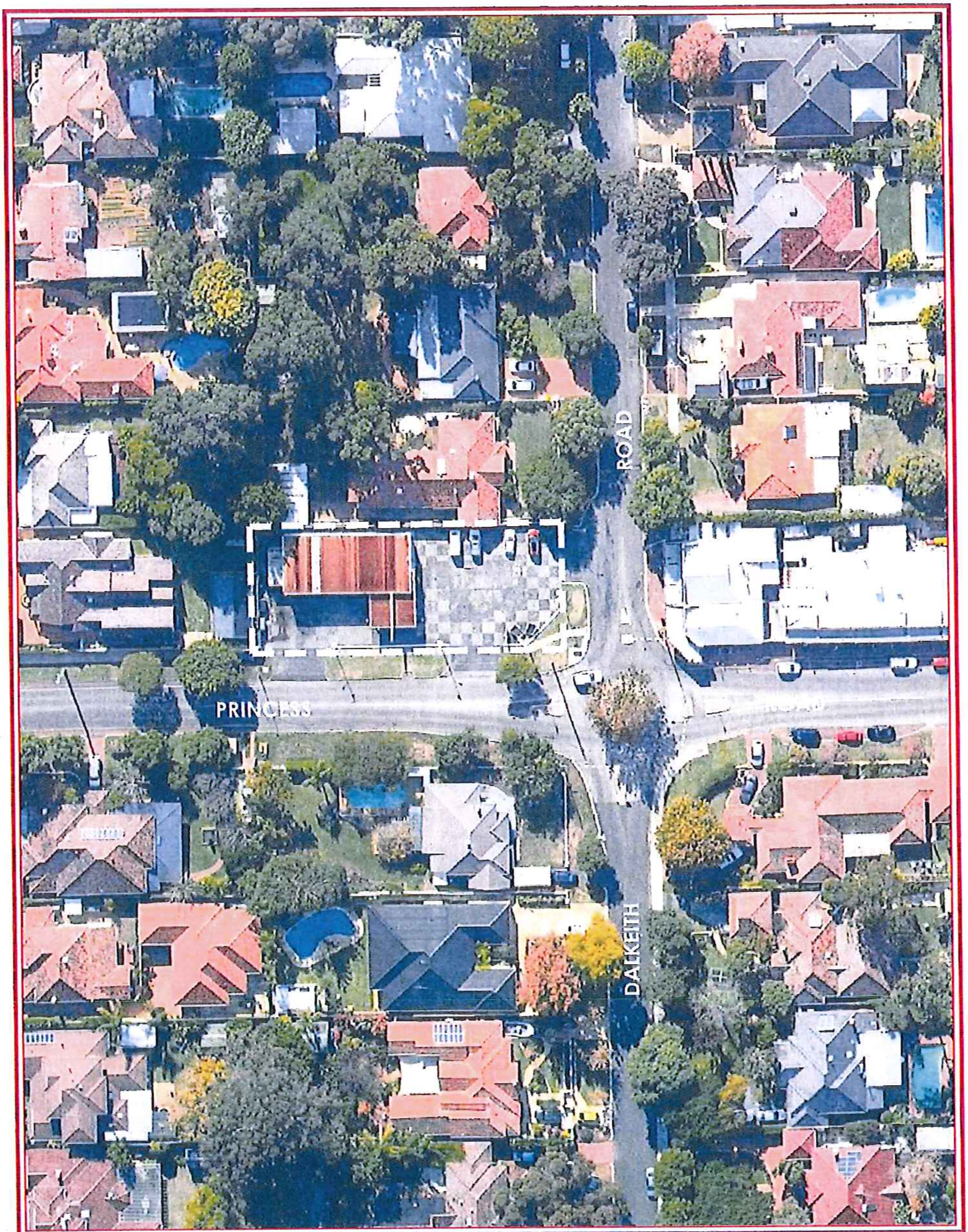
LOCATION PLAN

LOT 289 (123) PRINCESS ROAD, NEDLANDS

burgess design group
TOWN PLANNING + URBAN DESIGN
PO Box 8779, Perth Business Centre 6849
www.burgessdesigngroup.com.au
P (08) 9328 6411
F (08) 9328 4062

Plan No: VIS NED 7-01 L
Date: 08.01.13
Planner: MS

CITY OF NEDLANDS



NORTH

0 10 20 30 40 50m

SCALE 1:1000 (A4)

AERIAL PHOTOGRAPH

LOT 289 (123) PRINCESS ROAD, NEDLANDS

burgess design group
TOWN PLANNING + URBAN DESIGN
PO Box 8779, Perth Business Centre 6849
www.burgessdesigngroup.com.au
P (08) 9328 6411
F (08) 9328 4062

Plan No: VTS NED 7-01 A
Date: 08.01.13
Planner: MS

CITY OF NEDLANDS

Given advice from the Department of Planning that Draft LSP No.3 has not yet been fully assessed, there is no real understanding of the timing of the new Scheme and as such the landowner wishes to commence Scheme amendment proceedings in regards to the subject property at this time.

Proposal

The Amendment seeks to rezone the land from its current "Service Station" zoning to a base "Residential" zone to reflect the zoning of adjoining properties. In addition the Amendment seeks to provide additional development potential beyond what would normally be permitted under the existing prevailing density code of adjoining/surrounding lots.

Under the prevailing Residential R10 density code the site would only be capable of accommodating one (1) dwelling. This Amendment seeks to provide additional development potential for the site to permit an additional two (2) dwellings to be developed, thus permitting a total of three (3) dwellings over the site.

It is proposed that the potential for additional dwellings on the site be provided via an "Additional Use" as has been the preference by the City in the past.

In this instance the City may consider it more suitable to simply rezone the site to "Residential" and apply a site specific density code of R30. This would certainly represent the most simple and elegant solution for the ultimate development of the site and would be acceptable to the existing landowner. However, as a starting point, this Amendment has been prepared to reflect Council's previous practices where additional development potential has been applied to individual properties.

It is noted that there may be some concern by Council that this could be considered a "spot rezoning", but given the site specific circumstances of this proposal, it is considered that it can be justified and would not represent any precedent for other spot rezoning/recodings in the area.

Justification

The subject site accommodates a service station that has been operating since at least the late 1950's. It is accepted that the service station has undoubtedly contributed to the convenience of the local community during its time of operation. However, for the reasons outlined below the owner is forced to close the existing business and is now seeking an Amendment to the Scheme to allow the redevelopment of the site for other purposes.

Economic

The landowner/business operator has reached a point where he is now considering retirement and has taken the opportunity to investigate the options for the sale of the site and the associated business. These investigations, including advice from a number of business brokers, have found that the sale of the site and ongoing business at an acceptable price will be very difficult, if not impossible.

The value of the land, at current prices, makes the purchase of both the site and the business beyond the reach of any sole operator. The annual turnover from the business is sufficient for an owner/operator but does not allow for an investor/manager arrangement. Furthermore, the larger petrol companies have shown no interest in the site due to the low volumes of passing traffic and their need to subsidise fuel sales with large areas and volumes of sales of convenience goods.

Landuse

The potential for the site to accommodate some form of commercial/retail floorspace (or mixed-use development) has been investigated by both the Council and the existing landowner. It is understood that a study undertaken by the City indicated that the site may be suitable to form part of a local commercial hub but it is noted that the landowners enquiries have raised questions as to the viability of additional commercial floorspace in the area.

This proposed Amendment therefore seeks to rezone the site from its current 'Service Station' zoning to a 'Residential' zoning. The proposed Additional Use to permit the construction of additional dwellings is sought to offset the financial costs of remediating the site and to provide some benefit to the existing landowner for not being able to sell the business as an ongoing concern.

It is considered that there are sufficient planning grounds upon which Council may consider supporting an increased residential coding on the basis that removing an undesirable use from a predominantly residential area would be a benefit to the community. It is further noted that the existing service station represents a higher intensity landuse than that of the generally surrounding low density residential development, and that the development of the site at a slightly higher residential density, should be acceptable to the local community given its historical use and potential to continue operating as a 'Service Station' indefinitely.

It is also understood that Council's investigations have found a significant shortage of smaller lots and housing choice in Dalkeith and the broader Nedlands area.

In light of the above the owner is seeking Council's support to permit the development of the lot for residential purposes up to a maximum equivalent density of R30 (three dwellings).

It is accepted that the service station has operated for a considerable period of time with limited negative effects on the amenity of adjoining properties and the immediate locality and that is generally due to the low-key nature of the service station run by the current owner. It is however considered that the removal of the service station use would be of benefit to the immediately adjoining properties. It is also noted that if the site is on-sold with the existing 'Service Station' zoning in place there is the possibility that the site could be redeveloped for a much more intensive service station than the low-key one currently operating from the site.

Traffic

The site obviously generates a significant level of vehicle movements over and above those that would be expected from purely residential development. As an operating service station (smaller station) the traffic volumes can be in the order of 500 to 1500 vehicle movements per day. The use of the site for residential purposes at a density of R30 (three dwellings) would likely generate a range of 5 - 6.5 vehicle trips per dwelling, per day.

Environment

The rezoning of the site and its subsequent redevelopment for residential purposes will also require the decommissioning of the existing underground petrol storage tanks. The removal of these tanks provides an environmental benefit to the whole community. It is accepted that petrol storage tanks are constructed and maintained to extremely high standards to avoid any contamination but the removal of the tanks from the site lays to rest any possibility of future leakage and or contamination from the site.

Lot Size & Housing Choice

The studies undertaken by Council's Planning Services as part of the Scheme review have determined that there is a significant shortage of housing and lot choice in the City. These studies have also indicated a significant proportion of aged persons in the City over the metropolitan average. It is expected that as the population of the City continues to age there will be an increasing demand by existing residents of the area for smaller more manageable lots and dwellings. The closure of the service station and rezoning of the site represents an opportunity, albeit a minor one, to add to the housing and lot-size choice in the Dalkeith area.

Conclusions

The subject site has accommodated a service station use for over 50 years and has provided a convenience service to the residents of Dalkeith in that time. The landowner is now wishing to retire and has spent considerable time and resources attempting to sell the site and the business as an ongoing concern.

The changing economics of the retail petrol and vehicle servicing business have left the current owner with little option but to close the business, remediate the site and seek its subsequent sale. The cost of remediation of the site and the inability to sell the business as a going concern leaves the landowner in an unenviable financial position given the years that he has put into the business.

It is considered that the rezoning of the site and its subsequent redevelopment for residential purposes provides a number of benefits to the City of Nedlands and the surrounding community:

- Removal of a landuse with the potential to generate significantly higher traffic movements than that of surrounding low-density residential landuses;
- Developing the land for residential purposes to compliment the immediately adjoining properties and remove an existing non-complimentary landuse;
- The decommissioning of the existing underground petrol storage tanks and thus the removal of any potential for future environmental contamination; and
- The provision of additional opportunities to increase the housing and lot choice in the City of Nedlands.

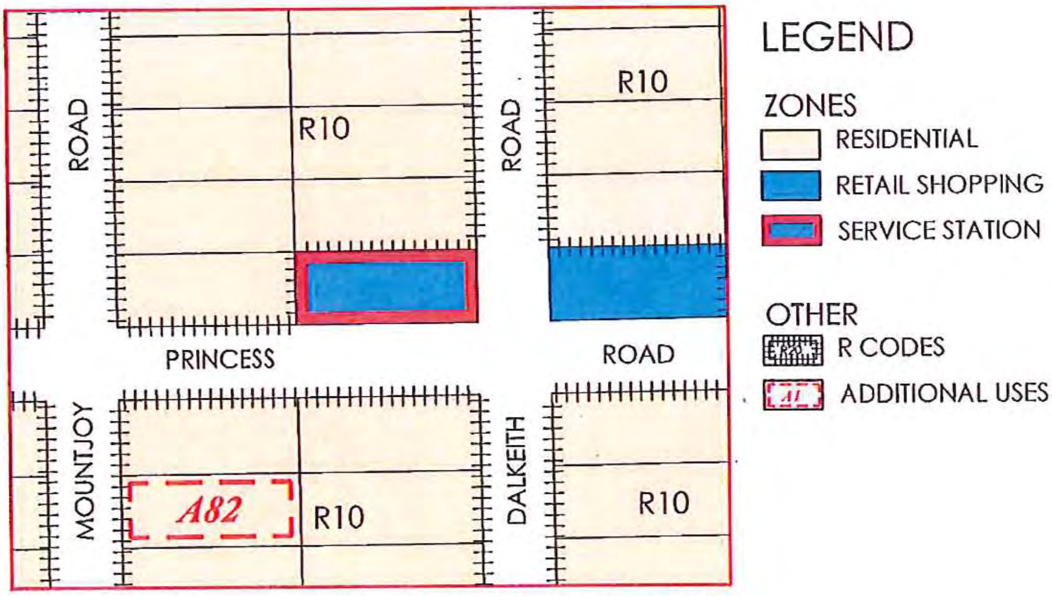
PLANNING AND DEVELOPMENT ACT, 2005 (AS AMENDED)

CITY OF NEDLANDS
TOWN PLANNING SCHEME NO.2 – AMENDMENT NO.XX

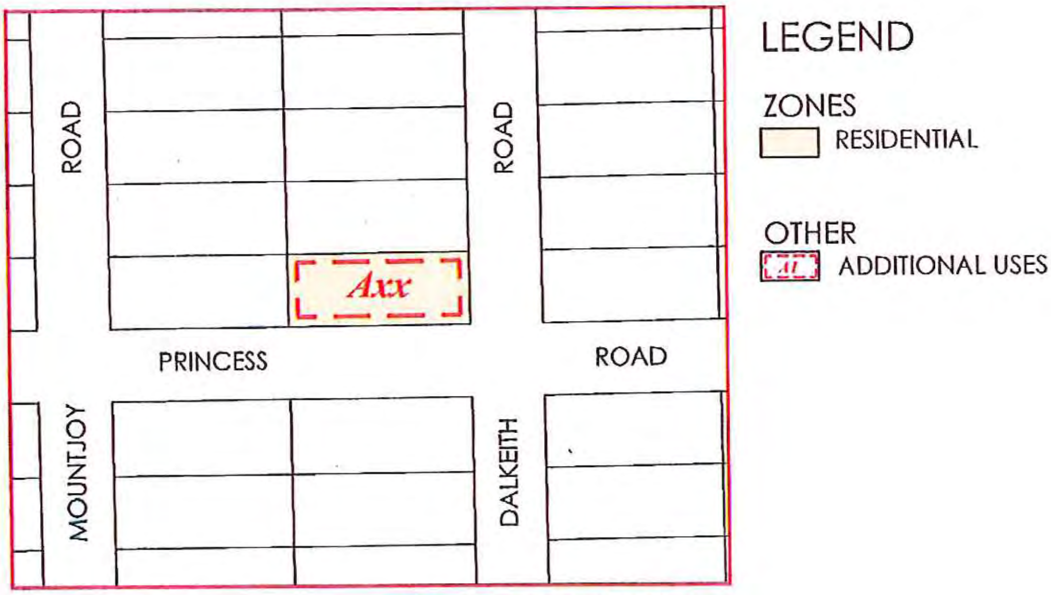
The Council of the City of Nedlands, under and by virtue of the powers conferred upon it in that behalf by the Planning and Development Act, 2005 (as amended), hereby amends the above Local Planning Scheme by:

Rezoning Lot 289 (No.123) Corner Dalkeith and Princess Roads, Dalkeith from "Service Station" to Residential and apply an "Additional Use" to the site with the following to be inserted into Schedule 1 – Additional Uses:

	Lot No.	Street	Zone	Additional Use Permitted
	289	Corner Dalkeith and Princess Roads	Residential	• Three (3) Single or Grouped Dwellings; • Dwellings shall comply with the relevant provisions of the Residential Design Codes as they would normally apply to the ultimate density to which the site is developed.



EXISTING ZONING



PROPOSED ZONING

PROPOSED AMENDMENT No.xx

TOWN PLANNING SCHEME No.2

LOT 289 (123) PRINCESS ROAD, NEDLANDS

NORTH

Date: 08.01.13
Plan No: VIS NED 7-01 Z

0 20 40 60 80 100m
SCALE 1:2000 (A4)

CITY OF NEDLANDS

RESOLUTION TO AMEND SCHEME

Adopted by resolution of the Council of the City of Nedlands at the Ordinary Meeting of the Council held on the_________day of_________.

____

CHIEF EXECUTIVE OFFICER

____

MAYOR

RESOLUTION TO ADOPT AMENDMENT TO SCHEME

Adopted by resolution of the Council of the City of Swan at the Ordinary Meeting of the Council held on the _________day of _________

(a) That the amendment to the Scheme be adopted with/without modification, or

(b) That it does not wish to proceed with the amendment to the Scheme

The Common Seal of the City of Swan was hereunto affixed by authority of a resolution of the Council in the presence of:

____

CHIEF EXECUTIVE OFFICER

____

MAYOR

Recommended/Submitted for Final Approval:

____

DELEGATED UNDER S.16 OF THE PLANNING AND DEVELOPMENT ACT (2005)

Date:_____________

Final Approval Granted:

____

CHIEF EXECUTIVE OFFICER

Date:_____________

Appendix 1
Certificate of Title

REGISTER NUMBER	
289/P3668	
DUPLICATE EDITION	DATE DUPLICATE ISSUED
N/A	N/A

WESTERN AUSTRALIA

RECORD OF CERTIFICATE OF TITLE

UNDER THE TRANSFER OF LAND ACT 1893

VOLUME 769 FOLIO 1

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 289 ON PLAN 3668

REGISTERED PROPRIETOR:
(FIRST SCHEDULE)

ANNE VENOUTSOS OF 2 HOLBROOK GARDENS, CARINE

(T G899477) REGISTERED 11 SEPTEMBER 1998

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

1. G899478 MORTGAGE TO NATIONAL AUSTRALIA BANK LTD REGISTERED 11.9.1998.

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:	769-1 (289/P3668).
PREVIOUS TITLE:	768-198.
PROPERTY STREET ADDRESS:	123 DALKEITH RD, NEDLANDS.
LOCAL GOVERNMENT AREA:	CITY OF NEDLANDS.

bl Rw
INDEXED.

TRANSFER 1429 VOL. 768 , FOL. 198
1927.
5225/1949 2211/35 35 968/40
1951 57 6514/55
3237/55 1112/55
1949/48

REGISTER BOOK.

Vol. 769 Fol. 1

WESTERN AUSTRALIA.

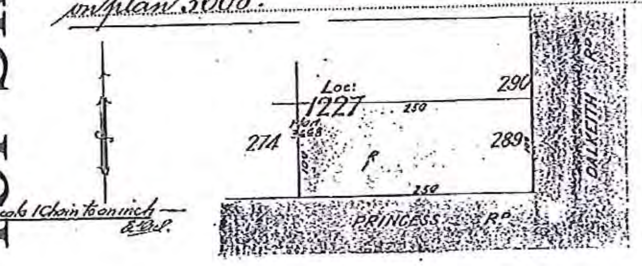
Certificate ORIGINAL of Title

CT 0769 0001 F

under "The Transfer of Land Act, 1893" (Sch. 5, 56 Vic., 14.)

Ernest Edward Davies of Forrest Avenue, East Perth, Commonwealth Public Servant,

is now the sole proprietor of an estate in fee simple in possession subject to the easements and encumbrances notified hereunder in ALL that piece of land delineated and coloured green on the map hereon, containing one rood or thereabouts, being portion of Swan Location 1227 and being Lot 289 on plan 3668.



Dated the twentysecond day of February One thousand nine hundred and twenty-one

Registrar of Titles.

Transfer 4295/1929 Transferred to Frederick William Stephen of 43 Bruce Street Nedlands Builder. Registered 18th April 1929 at 12.36 o'c

ASSISTANT REGISTRAR OF TITLES

56 Vic No 14 Sec 157
Application 2919/1945. On the 19th April 1945 Frederick William Stephen died and on the 13th June probate of his will was granted to Catherine Munro Stephen of 70 Mountjoy Road, Nedlands Widow the executrix therein named

26th November 1946 ASSISTANT REGISTRAR OF TITLES

Application 4189/1947.
Transfer 11166/1945 Transferred to Catherine Munro Stephen of 70 Mountjoy Road Nedlands widow Registered 12th December 1945

ASSISTANT REGISTRAR OF TITLES

4th December 1947. ASSISTANT REGISTRAR OF TITLES

Application 4190/1947. On the 16th March 1947 Catherine Munro Stephen died and on the 18th April 1947 probate of her will was granted to Doreen Stephen of 70 Mountjoy Road, Nedlands, Spinster, the executrix therein named.

4th December 1947. ASSISTANT REGISTRAR OF TITLES.

Transfer 17413/1947 Transferred to Katherine Munro Jarvis of Hudds ill Road, Upper Swan, Married Woman Winifred Stephen and Doreen Stephen, both of 70 Mountjoy Road Nedlands Spinsters as tenants in common in equal shares. Registered 4th December 1947 at 12.45 o'c

REGISTRAR OF TITLES.

Transfer 6961/1959 to Ampol Petroleum Limited of Strawberry Hill Adelaide Terrace, Perth. Registered 18th May 1959 at 11.23 o'c

ASSISTANT REGISTRAR OF TITLES

Application C440514. On 13-1-1982 the proprietor changed its name to Ampol Limited, and its address is now 220 Saint George's Terrace, Perth.

20th October 1982.

FOR FURTHER ENTRIES SEE PAGE 5 OF 6 PAGES
For encumbrances and other matters affecting the land see back.

EASEMENTS AND ENCUMBRANCES REFERRED TO.

WITHDRAWN

Caveat 708/1931. Lodged 2-6-1931 at 12.15 o'c. A. Bartnall

Withdrawal 1227/1934 of Caveat 708/1931. Lodged 18-12-1934 at 10.15 o'c.

Instrument stamped £1.7.6
Mortgage 466/1935 Frederick William Stephen to The Commercial Bank of Australia Limited. Registered 2nd February 1935 at 10.10 o'clock

DISCHARGED

A. Bartnall
ASSISTANT REGISTRAR OF TITLES

Discharge 1492/1935 of Mortgage 466/1935. Registered 17th April 1935 at 10.50 o'c.

Instrument stamped £1.17.6.
Mortgage 1981/1935. Frederick William Stephen to Louisa Gillion Toms of 26 Glenroyd Street Mount Lawley Widow. Registered 17th April 1935 at

DISCHARGED

Mortgage 1981/1935 only
Application 4794/1955. On the 21st March 1955 Louisa Gillion Toms, the Mortgagee died and on the 16th May 1955 Probate of her Will was granted to The West Australian Trustee Executor and Agency Company Limited of 135 Saint George's Terrace, Perth and Veronica Louisa Armstrong of 26 Glenroyd Street, Mount Lawley, Married Woman, the Executors therein named.
27th October 1955 ASSISTANT REGISTRAR OF TITLES

Discharge 4158/1959 of Mortgage 1981/1935. Registered 18th May 1959 at 11.23 o'c

ASSISTANT REGISTRAR OF TITLES.

Mortgage G899478 to National Australia Bank Ltd. Registered 11th September 1998 at 8.19 hrs.

REGISTRAR OF TITLES WESTERN AUSTRALIA

CERTIFICATE OF TITLE.

Registered Vol.................Fol.................

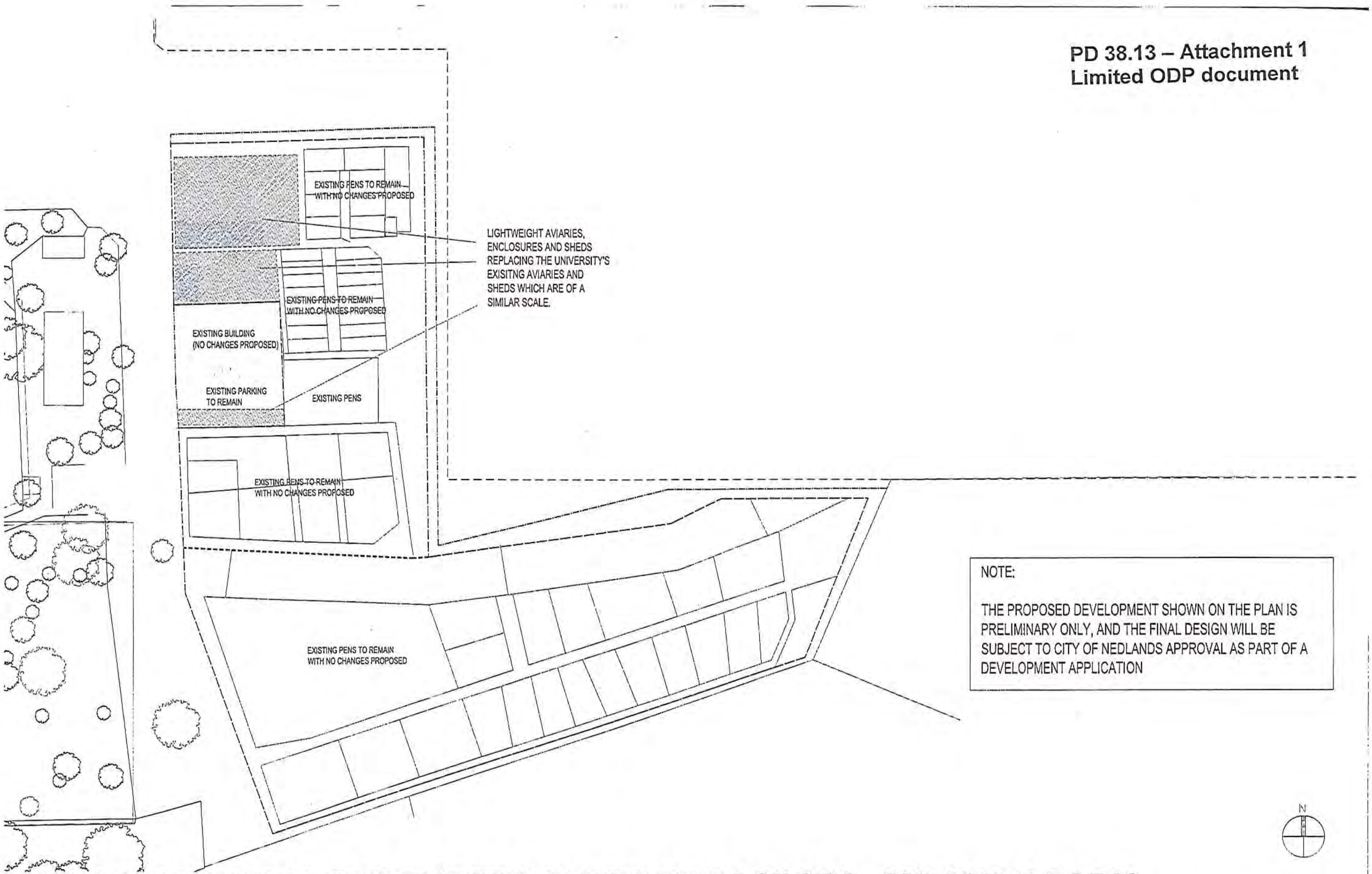
Transfer G899477 to Anne Venoutsos of 2 Holbrook Gardens, Carine. Registered 11th September 1998 at 8.19 hrs.

CERTIFICATE OF TITLE

VOL 769 FOL 1

Finalisation of Scheme Amendment No. 200

ID	Summary	Administration Comment
1	• No objection.	• Noted.
2	• No objection.	• Noted.
3	• No objection.	• Noted.
4	• No objection. • Concern about site contamination. • Who is liable for any damage to surrounding properties during construction? • Will development application be advertised?	• Noted. • In 2008 an assessment detected no Hydrocarbons. The site was reported to Department of Environment and Conservation in 2011 as part of a previous proposal and it was found that the site did not meet the minimum standard to be considered to be a contaminated site. With no further evidence the site is classified as 'report not substantiated'. The issues of contamination will be addressed again at subdivision/development application stage. • This scheme amendment does not include any construction. • Development applications will be advertised as per the requirements of the Residential Design Codes, the City of Nedlands Town Planning Scheme No.2 and standard procedures.



NOTE:

THE PROPOSED DEVELOPMENT SHOWN ON THE PLAN IS PRELIMINARY ONLY, AND THE FINAL DESIGN WILL BE SUBJECT TO CITY OF NEDLANDS APPROVAL AS PART OF A DEVELOPMENT APPLICATION

UWA BIOLOGICAL RESOURCES SUPPORT FACILITY - SHENTON PARK

Indicative Future Development

Scale 1:500 @ A1 / 1:1000 @ A3

0 10m 20m 30m 40m 50m

14 12 2012

Hames Sharley

DD125 42513

PD 38.13 – Attachment 2
Indicative future development diagram

CLE
TOWN PLANNING + DESIGN

THE UNIVERSITY OF WESTERN AUSTRALIA
BIOLOGICAL RESOURCES SUPPORT FACILITY
LIMITED OUTLINE DEVELOPMENT PLAN

THE UNIVERSITY OF
WESTERN AUSTRALIA

NOVEMBER 2012

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THE UNIVERSITY OF WESTERN AUSTRALIA BIOLOGICAL RESOURCES SUPPORT FACILITY

LIMITED OUTLINE DEVELOPMENT PLAN

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Project No. 778Rep328B

November 2012

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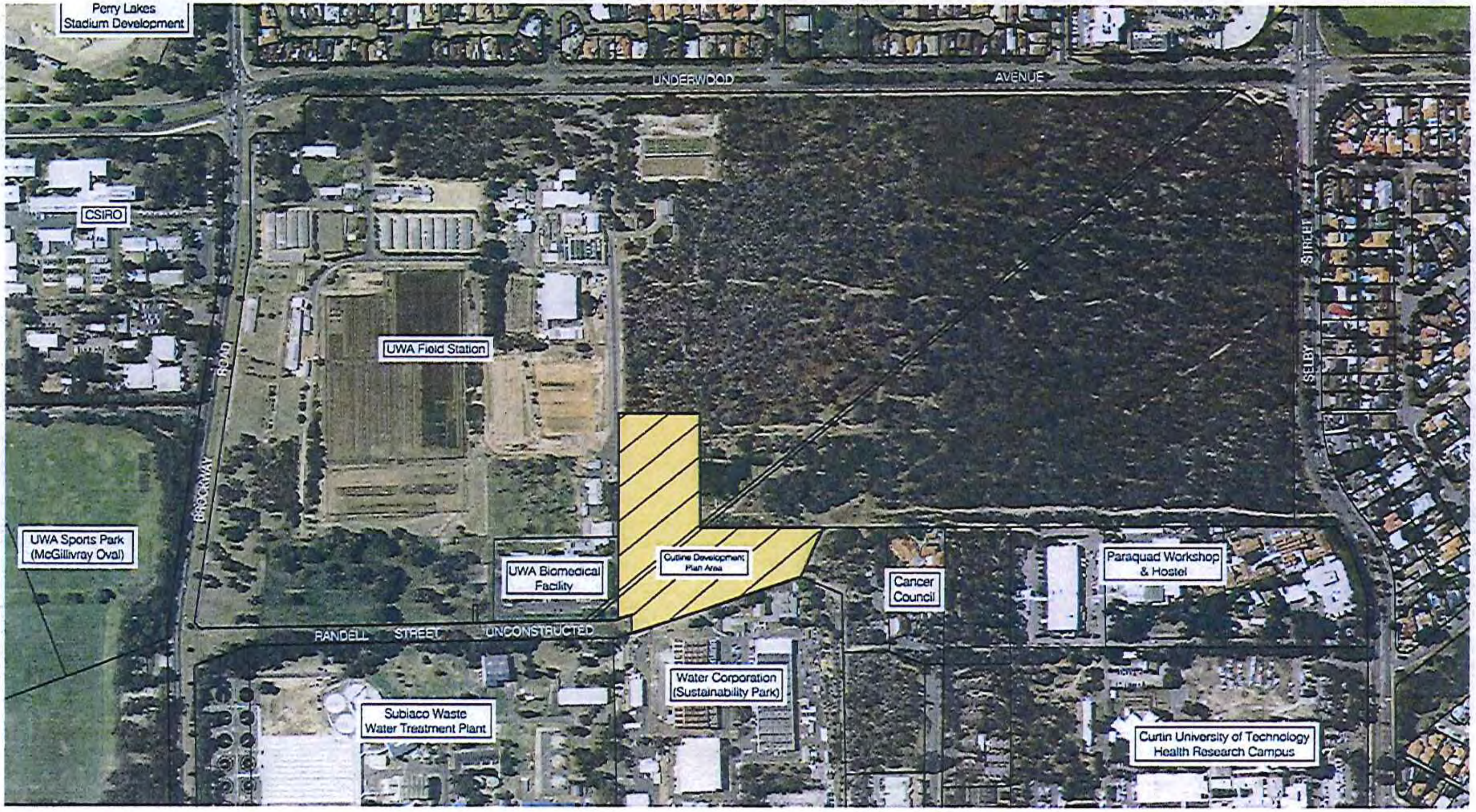
TABLE OF CONTENTS

LIST OF FIGURES



Plan Ref: 778-322-02

Figure 1: Site Context

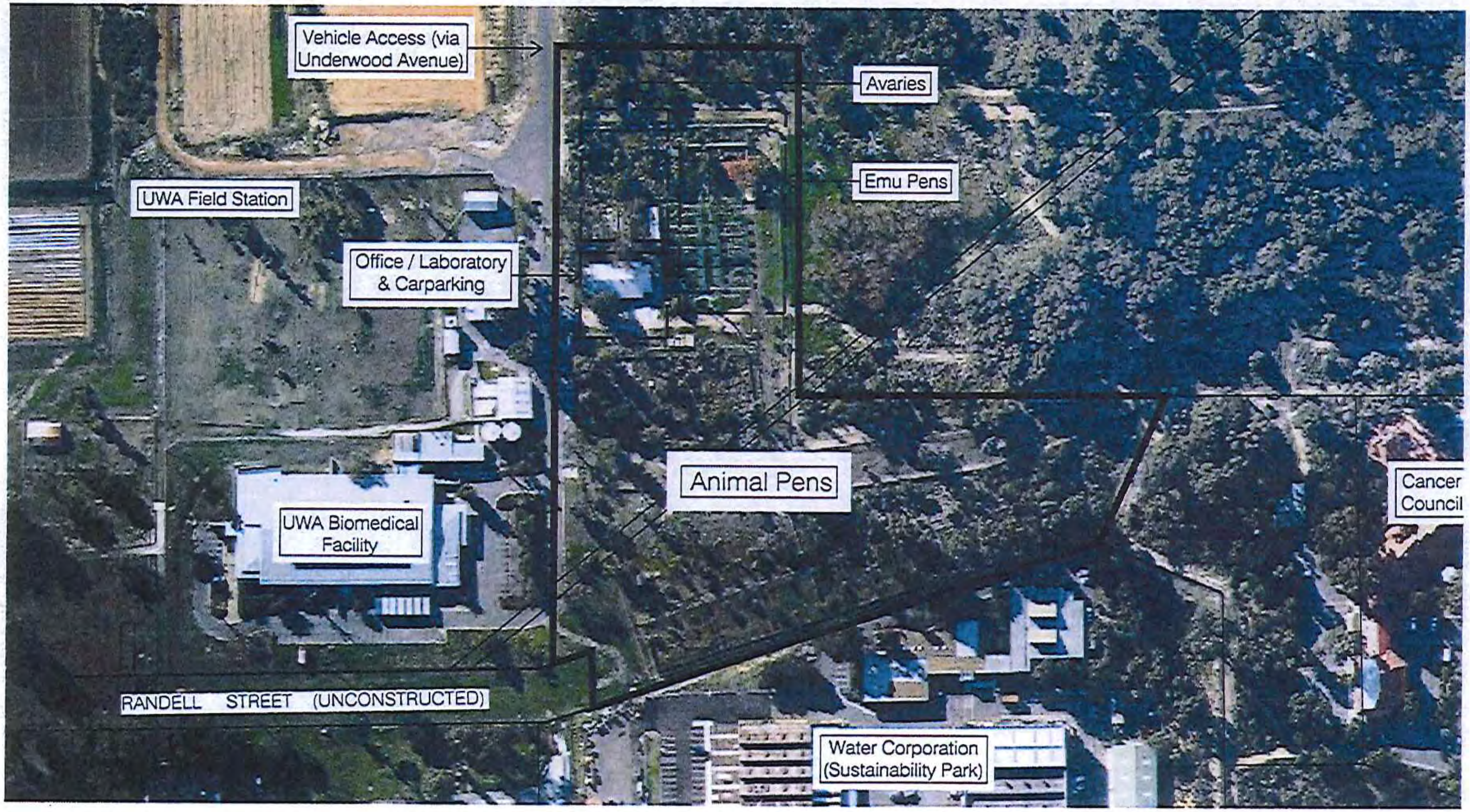
1.0 PART ONE: BACKGROUND

1.1 Introduction

The Biological Resources Support Facility Limited Outline Development Plan (ODP) has been prepared and lodged on behalf of The University of Western Australia, in accordance with Section 3.8 of the City of Nedlands Town Planning Scheme No. 2.

Prepared over a portion of Lots 4 and 105 Underwood Avenue, Nedlands, this Limited ODP provides the planning framework that will allow the University to carry out upgrades to the Biological Resources Support Facility amenities and structures.

The ODP will allow for the University to undertake some minor works to the Biological Resources Support Facility, including upgrading and the replacement of existing buildings. These works will provide for the continuation of the existing education and research activities undertaken onsite, and will not result in any intensification in the use or significant increase in current staff numbers.



Plan Ref: 778-320-02

Figure 2: Existing Biological Resources Support Facility

1.2 Subject Land

The ODP area covers The University of Western Australia's Biological Resources Support Facility, and is approximately 3 hectares, covering a portion of Lots 4 and 105 Underwood Avenue, Shenton Park adjoining the southern boundary (refer Figure 1). The proposed upgrade to the Biological Resources Support Facility is occurring entirely within the boundary of the existing Biological Resources Support Facility, with there being no expansion to the site.

The Biological Resources Support Facility is primarily used for research into Australian native animals and birds, but also carries out other agricultural research relating to general farming livestock. A number of animal pens, emu pens and bird aviaries relating Biological Resources Support Facility currently exist in the ODP area, along with a central office, laboratory and car parking area (refer Figure 2).

Located to the west of the ODP area is the UWA Biomedical Research Facility and Field Station site, which is used by the (UWA) Schools of Agriculture and Biology for a range of agricultural research and education pursuits. The Field Station encompasses a number of associated buildings, research facilities and agricultural fields.

The north-eastern portion of Lot 4, adjoining the intersection of Underwood Avenue and Selby Street, is subject to a subdivision approval issued by the Western Australian Planning Commission on 8 September 2010 (WAPC ref: 112907) which allows for the creation of 163 single residential lots, 2 mixed use lots, 3.1 hectares of public open space and 13.9 hectares of land for conservation purposes. This subdivision has also received approval from the State Minister for the Environment on 14 July 2010.

The land to the south of the Limited ODP area is owned by the Water Corporation and accommodates the Subiaco Waste Water Treatment Plant (SWWTP). The ODP area falls within a 5ODU line that is associated with the SWWTP operations. The ODP allows for the continuation of the existing use, as no odour sensitive uses are proposed as part of the ODP.

Vehicle access to the ODP area is from an existing sealed driveway off Underwood Avenue. The Randell Street road reserve (presently unconstructed) leads to the south-western most corner of the ODP area.

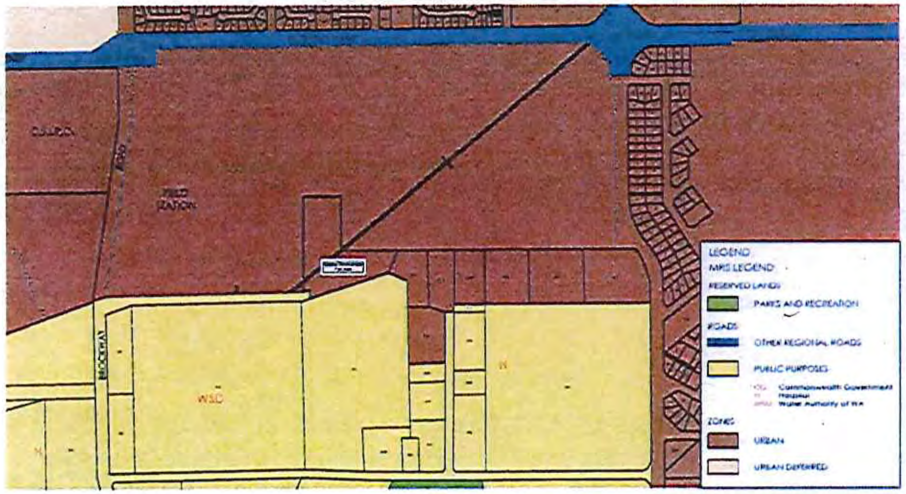
1.3 Land Ownership

The land comprises of two separate lots, being a portion of Lots 4 and 105

This land is legally described as:

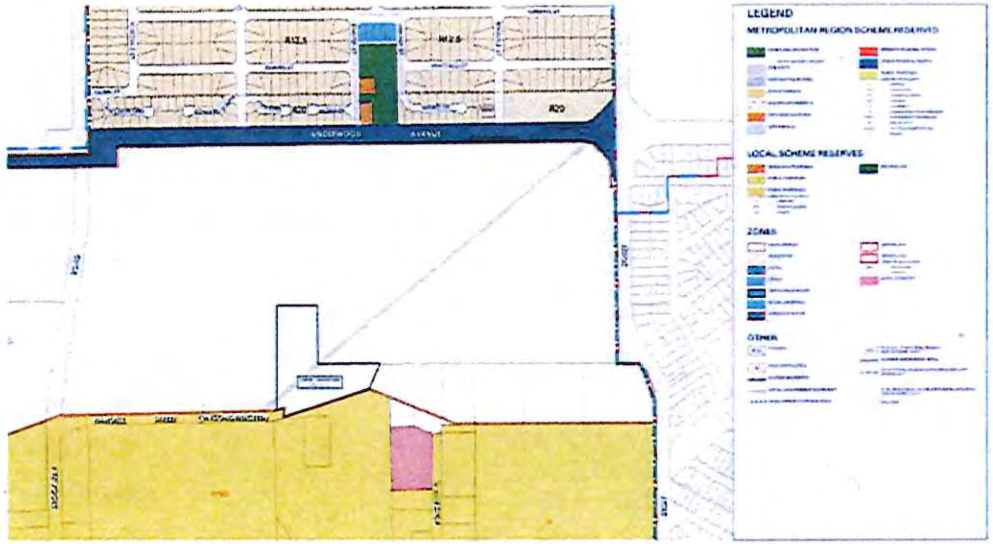
Lot Number	Plan	Volume	Folio	Area of Lot within ODP
Lot 4	16978	2220	995	29,387m^2
Lot 105	31553	2219	814	587m^2

Lots 4 and 105 are owned by The University of Western Australia.



Plan Ref: 778-325A-02

Figure 3: **Metropolitan Region Scheme**



Plan Ref: 778-324A-02

Figure 4: **Town Planning Scheme**

THE UNIVERSITY OF WESTERN AUSTRALIA

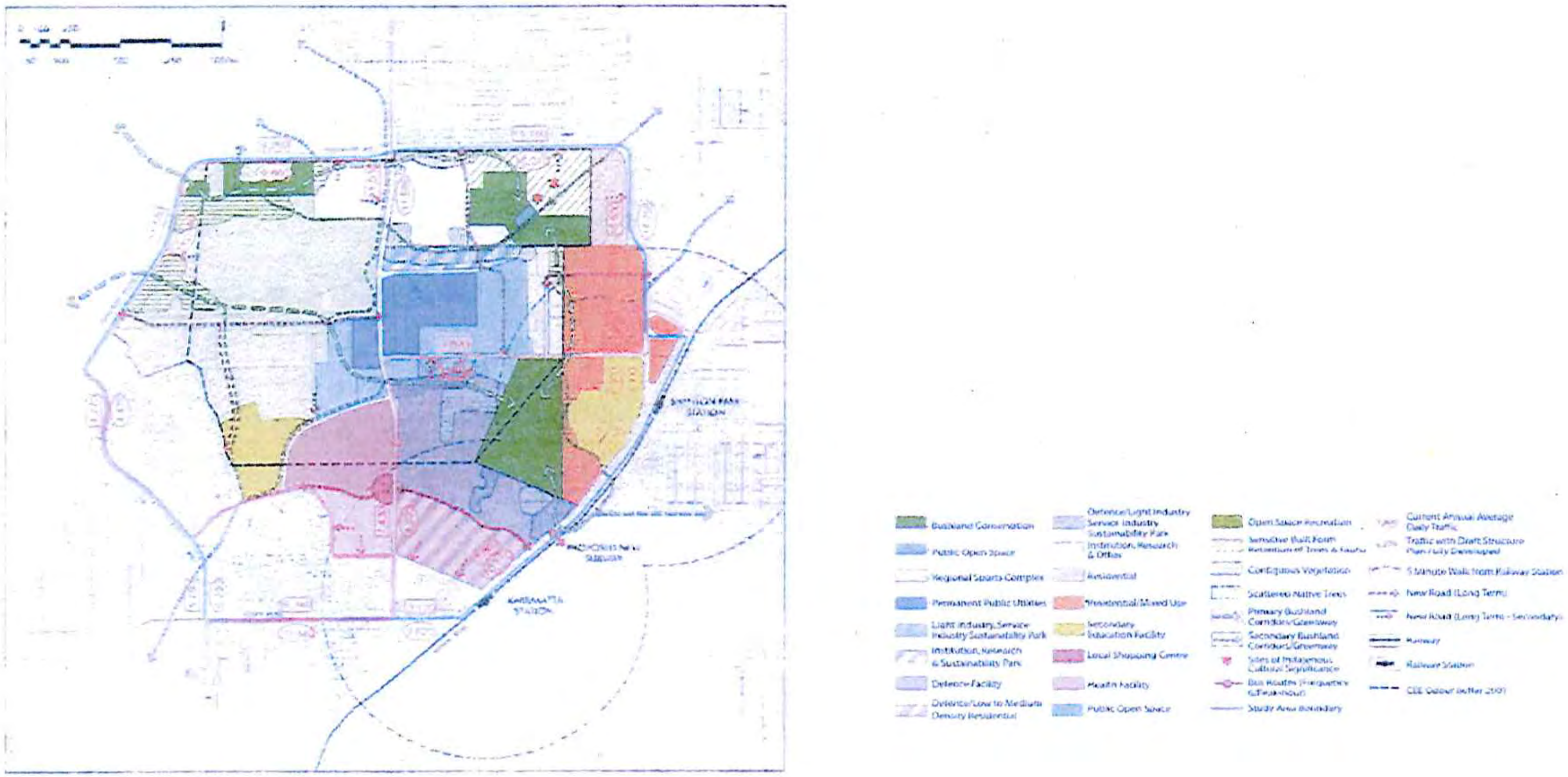
1.4 Planning Schemes

The land within the limited ODP area is zoned 'Urban' under the Metropolitan Region Scheme (refer Figure 3) and 'Development' under the City of Nedlands Town Planning Scheme No. 2 (refer Figure 4).

For any land zoned 'Development', clause 3.8.2 of Town Planning Scheme No. 2 requires an ODP to be prepared and submitted "as the basis for approval of subdivision and development applications." An ODP is to be endorsed by both the City of Nedlands and the Western Australian Planning Commission in order to take effect.

This Limited ODP will provide the context and framework for subsequent development proposed to the Biological Resources Support Facility, allowing for its continued operation, including expected upgrades to some of its current facilities.

Two other limited ODP's have been prepared and approved within the 'Development' zone over land owned by the University: the Biomedical Research Facility discussed in Section 1.6 below and the Hockey Limited ODP approved by the City of Nedlands on 27 September 2011 and by the WAPC on 21 June 2012.



Plan Ref: 778-327-02

Figure 5: Shenton Park Structure Plan

1.5 Shenton Park Structure Plan

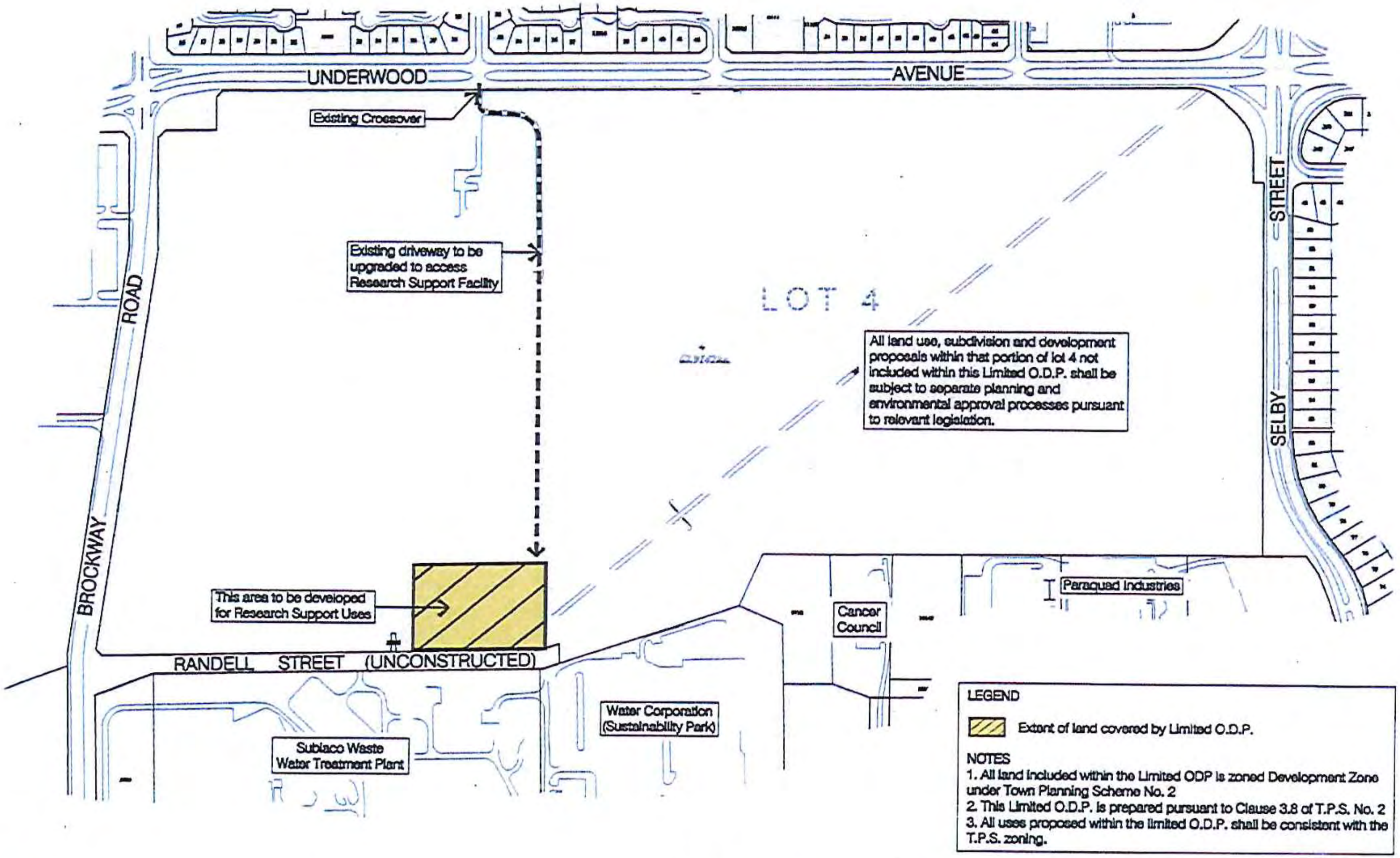
The Shenton Park Structure Plan was prepared by the Western Australian Planning Commission in 2004, and provides a land use framework for the broader Shenton Park / Mt Claremont area.

The Structure Plan covers the UWA Biological Resources Support Facility and adjacent Field Station landholdings, and also includes the UWA Sports Park, the AK Reserve (Perry Lakes), the John XXIII playing fields and the Water Corporation Waste Water Treatment Plant (refer Figure 5).

In preparing the Structure Plan, extensive consultation was undertaken, including a workshop which involved a number of authorities (government and service) and stakeholders. The Shenton Park Structure Plan was also publicly advertised, and while never formally adopted, due to this high level of engagement, it is recognised as an important guiding document for the area that has been the basis for subsequent planning in the area.

The key outcome of the Structure Plan, as it related to the Limited ODP, is that the land to the north and east of the Subiaco Waster Water Treatment Plant (SWWTP) is identified for "Institutions, Research and Other" land uses. It was acknowledged that this land was unsuitable for any residential, retail or similarly sensitive development due to it being affected by odour associated with the SWWTP operations.

The Limited ODP is consistent with the land use direction set by the Shenton Park Structure Plan, retaining this land for university research and education purposes. This reflects the continuation of the Biological Resources Support Facility's activities, which are highly complementary and are closely related to the agricultural research and education activities carried out within the adjacent Field Station land.



Plan Ref: 778-58

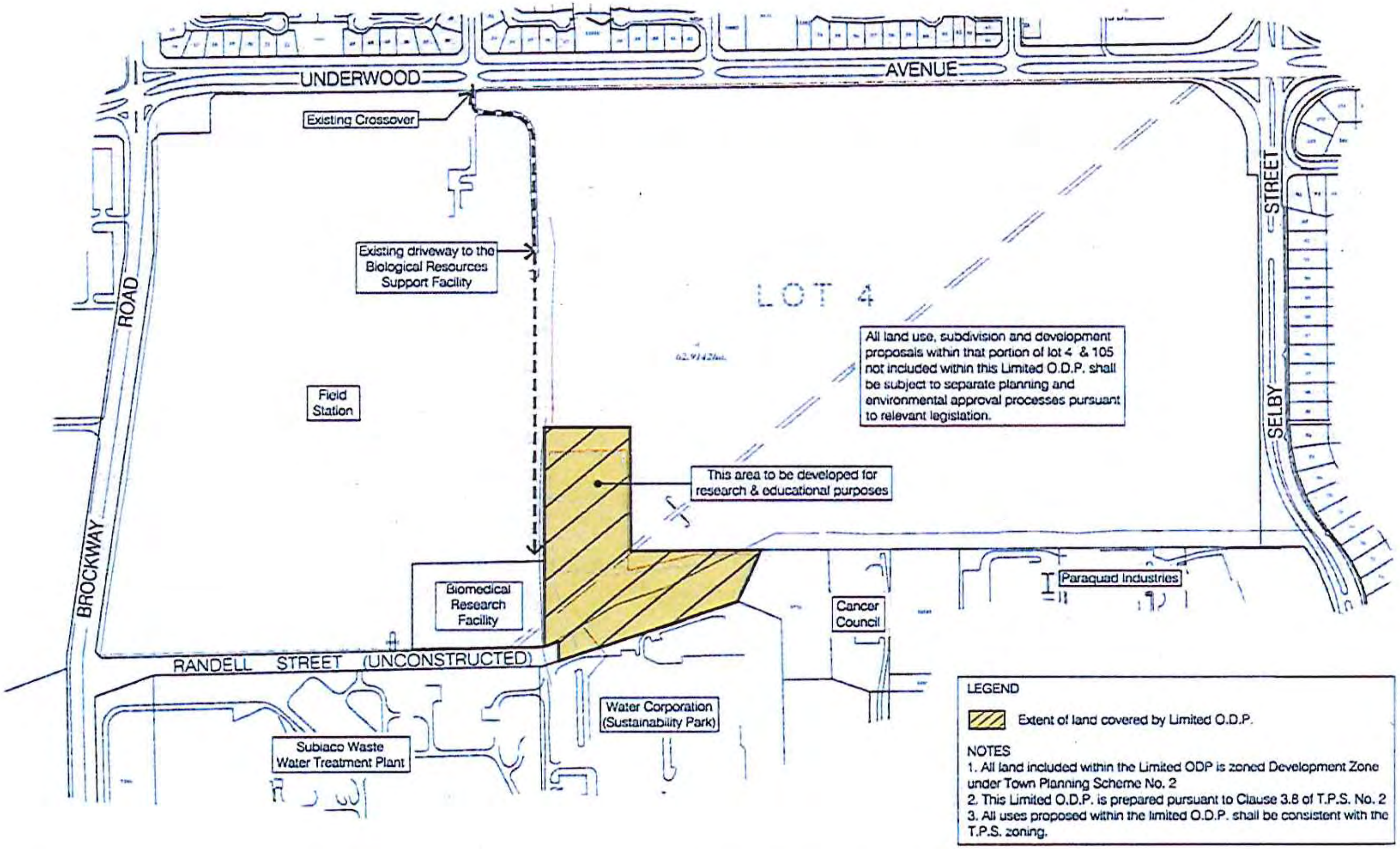
Figure 6: Lot 4 (Limited) Outline Development Plan 2004 - Biomedical Research Facility

1.6 Lot 4 (Limited) Outline Development Plan 2004 - Biomedical Research Facility

The Lot 4 (Limited) Outline Development Plan covers a 1.25 hectare portion of Lot 4, located immediately west of the Biological Resources Support Facility (refer Figure 6).

In a similar fashion to the Biological Resources Support Facility Limited ODP, the purpose of the Lot 4 (Limited) ODP was to put in place the planning framework required under the City of Nedlands Town Planning Scheme, which then facilitated the development of a new research facility for use by the University.

The Biomedical Research Facility has subsequently obtained the appropriate approvals from the City of Nedlands, and has been constructed. It is being used for medical and agricultural research and education purposes by the University.



Plan Ref: 778-319A

Figure 7: Proposed Biological Resources Support Facility Limited Outline Development Plan

2.0 PART TWO: BIOLOGICAL RESOURCES SUPPORT FACILITY LIMITED OUTLINE DEVELOPMENT PLAN

2.1 Land Use and Development

The Limited ODP, covering the 3ha existing Biological Resources Support Facility, allows for an upgrade to the existing facilities and a continuation of the existing education and research into native animals and birds. All works and development are minor, and will be carried out within the existing footprint of the Biological Resources Support Facility.

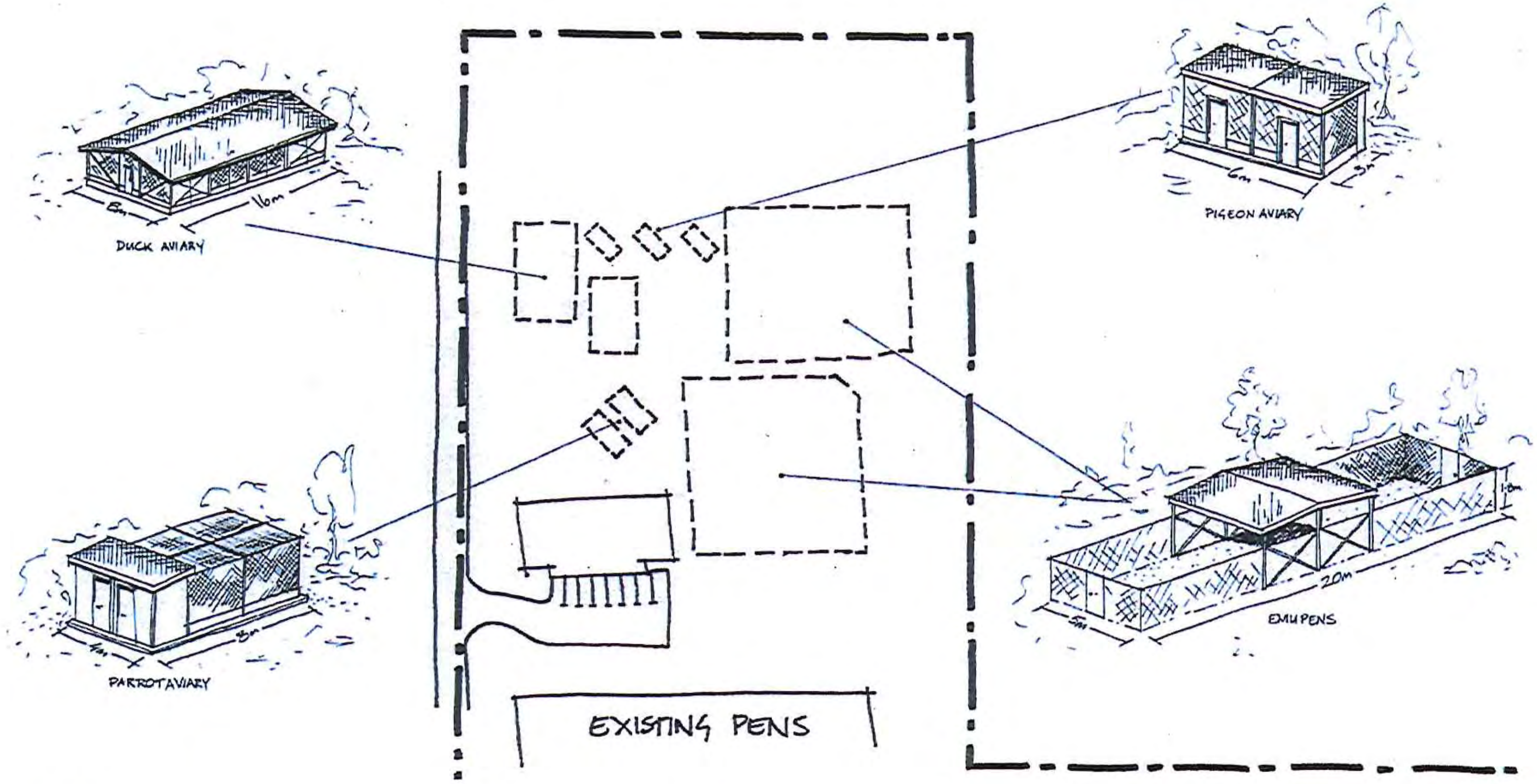
The Limited ODP does not proposed to extend the Biological Resources Support Facility from its currently identified boundary (refer Figure 7).

Presently the Biological Resources Support Facility comprises of one central building that provides University staff and students with laboratory and office space, along with basic supporting amenities. A number of larger animal pens are located to the south of this building, with smaller animal pens and bird aviaries to the east and north. An informal car parking area is located adjacent to the central building.

The site is generally cleared, and has long been subject to animal grazing and rearing.

The Limited ODP allows for the upgrade or replacement of existing animal pens and aviaries. Figure 8 indicatively demonstrates the type and scale of the structures that are proposed. However, in order to obtain development approval for these minor structures, an endorsed ODP is required to be in place, due to the 'Development' zoning of the site under the Town of Nedlands Town Planning Scheme. It shall be noted that the detail, layout and design of these structures will be confirmed at Development Application stage and the images shown in Figure 8 are indicative only and will be subject to change at detailed design stage.

The primary purpose of this Limited ODP is to provide this statutory planning framework, required under the City of Nedlands Scheme, to allow the University to upgrade and replace the necessary structures associated with the Biological Resources Support Facility. Once in place, this framework will allow the Biological Resources Support Facility to undertake any other future works associated with its education and research activity, for the overall betterment of the facility, subject to Council development approval.



Plan Ref: 778-330-01

Figure 8: Conceptual Diagrams of Potential Upgrades to the Biological Resources Support Facility

2.2 Vehicle Access

Vehicle access to the Biological Resources Support Facility will continue to be provided via the existing driveway (private road) and vehicle network from Underwood Avenue. This internal road to the site is sealed and generally measures 5.5 metres in width, and was upgraded as part of recent Field Station Facility construction works and the proposed works will not result in additional traffic and therefore generate no further need for upgrades. These works were in accordance with the Lot 4 (Limited) Outline Development Plan, discussed above in Section 1.6 of this report.

There are no new roads proposed as part of the Limited ODP, with the Biological Resources Support Facility to continue operating in its current form, with no significant intensification of its activities.

2.3 Parking

Vehicle parking is provided in front of the central building, at the entry to the Biological Resources Support Facility, with 8 - 10 bays being ample parking for the staff and students. Additional parking opportunities are provided within the adjacent Field Station site, if required.

The Limited ODP does not propose to intensify the activities of the Biological Resources Support Facility, or increase current staff and student numbers.

Presently only two staff members are located and work from the Biological Resources Support Facility, with students visiting and working from the site as required, with these student numbers rarely exceeding 5 onsite at any one time. With the student and staff levels at the Biological Resources Support Facility being generally a maximum of 7, car parking provision is ample, with there being adequate space for 8-10 vehicles, allowing for visitor parking.

Given there is no intensification of use or development the Limited ODP does not propose any additional parking, with it being the responsibility of future development proposals to demonstrate parking provision, in accordance with applicable City of Nedlands Town Planning Scheme and Policy requirements.

2.4 Services

The Limited ODP Area has ready access to all necessary services, including water power, sewer and telecommunications.

Any new development that results from the Limited ODP will be provided with all the necessary access to service infrastructure, if and when required, with details to be provided as part of development applications.

All drainage will be retained onsite as currently occurs.

3.0 CONCLUSION

This Limited ODP has been prepared in accordance with the City of Nedlands Town Planning Scheme requirements, to enable the University to undertake necessary development and upgrades to its Biological Resources Support Facility. Any proposal will be subject to the development approval process, in accordance with any relevant Scheme and Policy requirements.

The Limited ODP allows for the upgrade and replacement of existing facilities and will not change the land use activities currently undertaken onsite, retaining these as research and education associated with the Biological Resources Support Facility, nor does it propose to extend the Facility's identified boundary or intensify the use.

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Venue Noise Management Assessment

The Naked Fig Cafe

278 Marine Parade, Swanbourne

Reference: 13012343-01.docx

Prepared for:
City of Nedlands

Report: 13012343-01 Draft.docx

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Position:	Project Director
Verified	Terry George
Date:	24 July 2013

Table of Contents

List of Figures

Appendices

1 INTRODUCTION

The Naked Fig Cafe is a community cafe operating within a residential area (refer *Figure 1.1* for locality). Its locality necessitates a set of noise management operational guidelines, which must be adhered to for compliance. The City of Nedlands commissioned Lloyd George Acoustics to conduct onsite observations of the Naked Fig café operations to verify compliance against its Noise Management Plan (NMP).

The planned period of onsite attendances was between the months of February and July 2013. This report summarises the observations and commentary of onsite attendance over a 5 month period (February 2013 to June 2013).

Figure 1.1 - Site Locality - Swanbourne

Appendix A contains the Noise Management Plan prepared in 2012 by Herring Storer Acoustics, and is referenced frequently throughout this report.

Appendix B contains a description of some of the terminology used throughout this report.

2 NOISE MANAGEMENT PLAN REQUIREMENTS

The primary reference for compliance was the Noise Management Plan, Feb 2012 (NMP) attached in *Appendix A*.

In summary, the NMP defines five modes of operation for the venue, each with a set of requirements to ensure compliance with the *Environmental Protection (Noise) Regulations 1997* (Noise Regulations). With reference to *Figure 2.1*, the five modes are:

- MODE 0: No Live music, DJ or piped music
- MODE 1: Live music/DJ at Location 1
- MODE 2: Live music/DJ at Location 2
- MODE 3: Live music/DJ at Location 3
- MODE 4: Amplified "piped" music through in-house system only

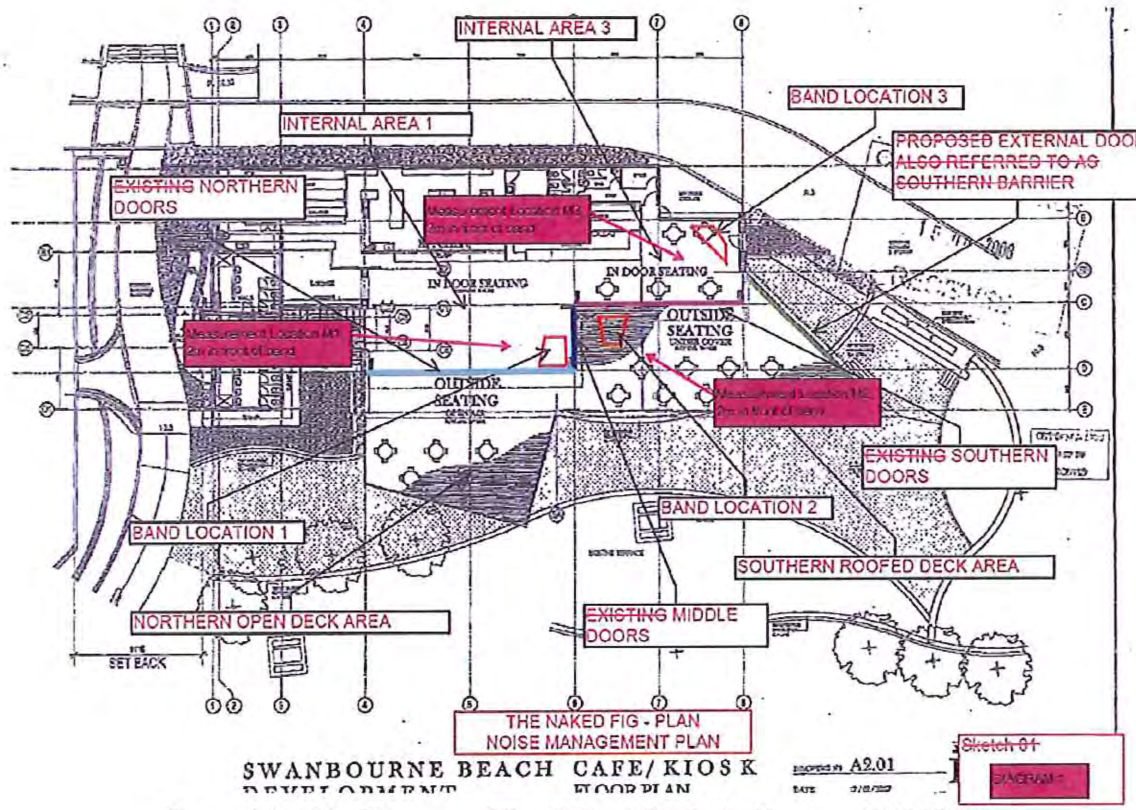


Figure 2.1 - Site Diagram of the Naked Fig Cafe (Source: NMP 2012)

3 METHODOLOGY

Monitoring the venue consisted of periodic site visits with the view to achieve a set of observational notes and noise measurements (where applicable) over the prescribed time period. After each visit, a brief email report was provided to the City of Nedlands for consideration.

Each site report contained details of operations observed and typically summarised the following points:

- Mode of operation;
- Bi-fold doors configuration;
- Staff operations;
- Patron seating and movement;
- Noise at nearest residence;
- Large Group Bookings observations;
- Compliance remarks; and
- General comments.

Where noise level measurements were taken during site visits, a hand held Rion Type NA-28 sound level meter was used. This meter holds current laboratory certificates of calibration that are available upon request. The equipment was also field calibrated before and after measurements and found to be within +/- 0.5 dB.

4 RESULTS

A summary of each site visit and report is provided in *Table 4.1*. Note that observation times range from 1 hour to 3 hours. In general, large group bookings were observed for longer periods. The table provides only a summary of visits and are discussed in greater detail in later sections.

Table 4.1 – Summary of Site Visits

Observation Date	Time	Visit Duration	Mode of Operation	Noise at Residence	Group Booking	Observed Staff Checking	NMP Compliance
Thurs 21 Feb	21:00 to 22:15	1:15	4	N	N	N	Y
Sat 2 Mar	11:30 to 12:30	1:00	4	N	N	N	Y
Sat 23 Mar	21:00 to 22:15	1:15	3	Y	Y	Y	N
Sat 6 April	10:00 to 11:00	1:00	4	N	N	N	Y
Sat 6 April	21:00 to 00:15	3:15	2&4	N	Y	N	Y
Tues 9 Apr	20:45 to 21:45	1:00	1&4	N	N	N	Y
Fri 26 Apr	19:00 to 22:00	3:00	4	N	N	N	Y
Wed 15 May	14:30 to 16:00	1:30	4	N	N	N	Y
Fri 24 May	20:30 to 21:45	1:15	4	N	N	N	Y
Sun 26 May	15:30 to 16:30	1:00	4	N	N	N	Y
Wed 5 June	18:30 to 20:00	1:30	4	N	N	N	Y
Sat 8 June	19:30 to 22:30	3:00	4&3	N	Y	N	Y

The results are further presented in detail, with respect to the guidelines of operation defined in the NMP. Specifically, the sections following discuss each of the five modes of operation with reference to applicable visits.

4.1 Mode 0: No Live Music, DJ or Piped Music

MODE 0: No Live Music, DJ or piped music		
Time of Day	Requirements	
	Doors	Sound level limit (LAS10)
7am - 10pm Mon-Sat OR 9am - 7pm Sun/Pub Hols	N/A	N/A
Other times	External bi fold doors closed (as defined in Diagram 1)	N/A

Figure 4.1 - Mode 0 Operational Requirements - (source: NMP Feb 2012 Table 4.1)

The cafe was generally not observed during Mode 0 operations. As such few comments can be made in terms of complying to the requirements prescribed in the NMP.

4.2 Mode 1: Live Music/DJ in Band Location 1

MODE 1: Live Music/DJ at Location 1		
Time of Day	Requirements	
	Doors	Sound level limit (LAS10)
7am - 10pm Mon-Sat OR 9am - 7pm Sun/Pub Hols	External bi fold doors closed (as defined in Diagram 1)	81 dB @ measurement location M1
Other times	NOT ALLOWED	

Figure 4.2 - Mode 1 Operational Requirements - (source: NMP Feb 2012 Table 4.2)

The cafe was observed to be in Mode 1 on one (1) occasion on Tuesday 9th of April 2013. At this visit it was observed that the live music was of a solo nature, and that the Bi-fold doors were configured correctly, with the External Doors closed and only the Northern Doors open.

No staff measurement using the in-house meter was observed to have taken place, but may have been made during set up. No music was audible at the nearest residence.

The solo/background nature of the music was compliant with Section 7 of the NMP, as was the additional, indoor facing speaker used by the musician.

The musician ceased playing at 9pm, which is compliant with the 10pm curfew defined in the NMP.

The cafe has a regular musician (sitar player) in this location every Tuesday evening.

4.3 Mode 2: Live Music/DJ at Location 2

MODE 2: Live Music/DJ at Location 2		
Time of Day	Requirements	
	Doors	Sound level limit (LAS10)
7am - 10pm Mon-Sat OR 9am - 7pm Sun/Pub Hols	External bi fold doors closed (as defined in Diagram 1)	79 dB @ measurement location M2
Other times	NOT ALLOWED	

Figure 4.3 - Mode 2 Operational Requirements - (source: NMP Feb 2012 Table 4.3)

The cafe was observed to be in Mode 2 on one (1) occasion on Saturday 6th of April 2013. It was observed that the live music consisted of a trio of musicians playing soft background music and moving around the venue to different tables. The nature of the music was soft and infrequent, with the musicians observed taking 5-15 minute breaks between songs.

Bi-fold doors were configured with the External Doors closed for most of the observation period. Three panels of the External Doors were open between 9:00pm and 9:40pm. It is possible that they were opened by patrons. If the live music had been of a more consistent nature (both in location and continuity) this may have presented an issue.

No staff measurement using the in-house meter was observed to have taken place, but may have been made during set up. No music was audible at the nearest residence.

The solo/background nature of the music was compliant with Section 7 of the NMP, no amplification through speakers was observed.

The music was observed to cease playing before the 10pm curfew, which is compliant with the NMP.

4.4 Mode 3: Live Music/DJ at Band Location 3

MODE 3: Live Music/DJ at Location 3		
Time of Day	Requirements	
	Doors	Sound level limit (LAS10)
7am - 10pm Mon-Sat OR 9am - 7pm Sun/Pub Hols	External bi-fold doors closed (as defined in Diagram 1)	85 dB @ measurement location M3
Other times	External bi-fold doors closed (as defined in Diagram 1) Southern internal bi-folds must all be shut except for 2 middle northern section access doors	82 dB @ measurement location M3

Figure 4.4 - Mode 3 Operational Requirements - (source: NMP Feb 2012 Table 4.4)

On two (2) occasions the cafe was observed to be operating in Mode 3. Both visits were on Saturday evenings when the cafe also had group bookings, which is discussed further in *Section 4.6*. During both visit times, it was observed that the music played in this area was from a DJ, who had an additional set of speakers.

The bi-fold doors were configured correctly at both visits, though regular use by patrons of the southern exit door was noted throughout both evenings. The use of this door is observed to be most prevalent during group bookings

On the visit of March 23rd 2013, it was observed that the patrons were utilising the dance floor area upon arrival and continued to do so through most of the period observed. The DJ was thus playing music past 10:00pm, which required extra measures from staff. The music at this visit was clearly audible from the residence and a staff member was observed to check these measurements at 10:03pm. Despite this check, the music from the venue was observed to still be audible at the street up until 10:15pm (end of observation period).

No staff measurement inside the venue was noted during the visit of March 23rd. It is understood that a noise complaint was received by the City of Nedlands on that evening, reporting audible bass and music.

The evening of Saturday 8th June 2013 was observed to be quieter, with the dance floor area not in use before the end of the observation period (10:30pm). No street level checks were made by staff, but music was not playing at 10:00pm therefore it was not warranted according to the NMP.

In general, the noise complaint potential for operational Mode 3 is higher, given the larger number of patrons from group bookings, dance/bass nature of music, and use of the southern door.

During these evenings, the cafe continued to serve patrons in the northern restaurant area, and operated in Mode 4 at these locations (in-house amplified background music) up to 10:00pm.

In summary, compliance with the NMP during Mode 3 operation is most critically dependent on staff operations. Procedures such as checking and reducing levels promptly at 10:00pm and ensuring the bi-fold doors are configured correctly are essential to managing noise levels. It should be reiterated that staff are not observed to be regularly monitoring the noise levels at location M3.

4.5 Mode 4: Amplified "piped" music through in house system only

MODE 4: Amplified "piped" music through in-house system only		
Time of Day	Requirements	
	Doors	Sound level limit (LAS10)
7am - 10pm Mon-Sat OR 9am - 7pm Sun/Pub Hols	All bi-folds open	Internal speakers: 82 dB @ measurement location M1 Internal speakers: 85 dB @ measurement location M3 External speakers: 79 dB @ measurement location M2
	All bi-folds closed	Internal speakers: 84e dB @ measurement location M1 Internal speakers: 87 dB @ measurement location M3 External speakers: 79 dB @ measurement location M2
Other times	All bi-folds open	Internal speakers Location 1: NOT ALLOWED Internal speakers: 80 dB @ measurement location M3 External speakers: NOT ALLOWED
	All bi-folds closed	Internal speakers Location 1: NOT ALLOWED Internal speakers: 82 dB @ measurement location M3 External speakers: NOT ALLOWED

Figure 4.5 - Mode 4 Operational Requirements - (source: NMP Feb 2012 Table 4.5)

The cafe was observed mostly to be operating in Mode 4, and was observed to be doing so on eleven (11) separate occasions. The music played through the zoned system was at all times observed to be background in nature, which is compliant with the NMP.

Overall, each time the cafe has been in Mode 4, compliance has been achieved against the requirements in the NMP. There are minor aspects to the NMP that are often observed to be neglected such as staff measurements at prescribed locations. However, given that no music noise from the venue is audible at the nearest residence on these occasions, compliance with the Noise Regulations is being achieved regardless.

It should be noted that the cafe tends to run more speakers when there are more patrons and this tends to be during the day time hours of operation. The use of external speakers primarily occurs during these times and this is also dependant on weather conditions.

4.6 Group Bookings

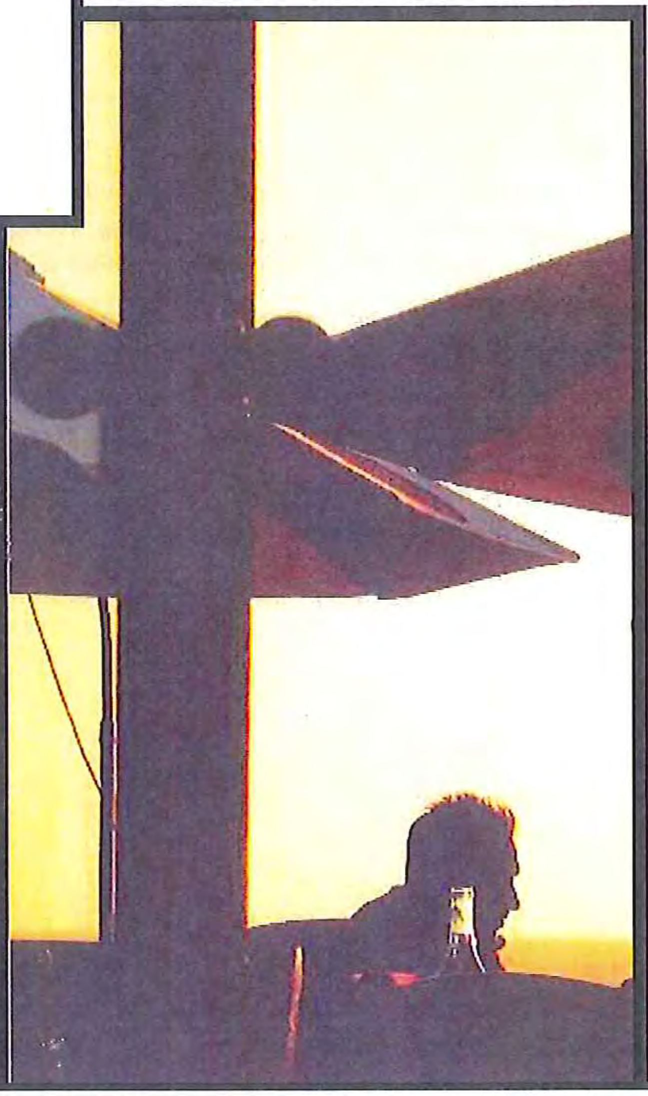
The Naked Fig is often used for group bookings and functions, and as such an additional section exists in the NMP to address compliance on these occasions. A total of three (3) group bookings were observed, and often for extended periods, providing several noteworthy points on the operations of the cafe and also the surrounding locality.

The NMP defines the need to control crowds dispersing from group booking. Only one of the three events observed finished during the observation period and all patrons left the venue quietly and in small groups. It was observed however that the general public and neighbouring venues during this time may often be the source of noise at the residences nearby. For example, on the evening of April 6th 2013, a group booking was in session at the cafe but was not creating any noise from music. However, the neighbouring Swanbourne Surf Life Saving Club also had a function in session, which was playing dance music that was clearly audible at the nearest residence up until 12:15am. On the same evening, at 10:50pm a group of youths gathered in 3 vehicles on the street in front of the nearest residence, with their conversation being clearly audible. Hence, it is worth noting that at times, noise in the locality surrounding the cafe is often present and outside the control of the venue.

Another point to mention is the use of the southern emergency exit door. This is a single-hinged, glass door that was observed to be used primarily during group bookings. As the rest of the cafe is separated from the booked area during these evenings, this door becomes the nearest exit for function goers. The effect of opening this door during live music performance (Mode 3) is a significant increase in audibility at the nearest residences. On one occasion (March 23rd 2013) the door was observed to be propped open by a patron and music was audible for several minutes before the door was closed by a staff member. In general, despite attempts of staff control, it was observed to be used at all times, even after 10pm. The use of this door is not addressed in the NMP and as such cannot be directly addressed for compliance, but is a source of noise leakage.

Appendix A

NOISE MANAGEMENT PLAN FEBRUARY 2012



The Naked Fig Cafe

Noise Management Plan

278 Marine Pde, Swanbourne

February 2012

CONTENTS

INTRODUCTION

The Naked Fig Cafe is a thriving community cafe that operates within a residential area. As such there are a set of noise management guidelines that must be adhered in order to comply with Environmental Protection (Noise) Regulations 1997.

This document sets out the requirements to be implemented by the cafe operator and their staff that will ensure compliance with noise regulations. Paragraphs 1 - 3 and 8 - 8 deal with general operating conditions of operation to ensure compliance

Paragraph 4 defines five modes of operation. Should the operator or staff be unsure of what is required it is suggested that they refer to the heading under the relevant mode, namely:

- Mode 0 No Live music, DJ or piped music
- Mode 1 Live music/ DJ location 1
- Mode 2 Live music / DJ location 2
- Mode 3 Live music/ DJ location 3
- Mode 4 Amplified "piped" music through in-house system only

Extensive noise modeling has been conducted by Herring Storer Acoustics to give surety that the cafe will comply with Environmental Protection (Noise) Regulations 1997 so long as the guidelines in this plan are followed. The noise levels are based on the Herring Storer Acoustics technical report reference number 13945-2-08197-04 dated 2 December 2011 .

1 OPENING HOURS

Table 1:

Approved opening hours of the cafe are:

i) Core hours:

a) Sunday 7am to 10pm
b) Monday to Thursday 7am to 10pm
c) Friday and Saturday 7am to 12 midnight
d) New Year's Eve 7am to 1am the following day.

ii) Extended hours

a) Sunday 6.30am to 10pm
b) Monday to Thursday 6.30am to 11pm
c) Friday and Saturday 6.30am to 12 midnight
d) New Year's Eve 6.30am to 1am the following day

iii) If any substantiated complaints are received in respect to the extended hours, approval for the extended hours will be rescinded and the hours of operation will revert to the core hours.

Advice Note 1: With regard to condition 2, substantiation of complaints will be determined by the City of Nedlands after an officer/s of the City has attended the site and has verified that the approved Noise Management Plan dated February 2012 has not been complied with and/or any noise or disturbance arising from the cafe has exceeded noise levels regulated by the Environmental Protection (Noise) Regulations 1997.

It is agreed that customers will be ushered out of the building at or before the closing time of the cafe.

No drinks orders are to be taken within 30 minutes of closing time and no food orders are to be taken within 60 minutes of closing time.

2 STAFF INDUCTION

As an integral part of staff induction, staff will be made aware of the requirements of this Noise Management Plan and what their responsibilities are to ensure that the Naked Fig complies with this Plan at all times.

3 BI FOLD DOOR OPERATION

There are four sets of bi-fold doors that will be utilised to ensure noise levels comply with noise regulations. The doors are designated as: *Northern, Middle, Southern* and *External*. Their locations are noted in Diagram 1. Doors are to be operated as indicated under the Modes of Operation in Paragraph 4 below.

4 MODES OF OPERATION

The Naked Fig operates under one of five modes of operation at a time. These modes of operation ensure compliance with noise regulations and define noise levels and door configurations as set out below:

4.1 Mode 0: No Live music, DJ or piped music

Table 4.1 details the requirements under conditions where no live music, DJ or piped music is present.

Table 4.1:

MODE 0: No Live Music, DJ or piped music		
Time of Day	Requirements	
	Doors	Sound level limit (LAS10)
7am - 10pm Mon-Sat OR 9am - 7pm Sun/Pub Hols	N/A	N/A
Other times	External bi fold doors closed (as defined in Diagram 1)	N/A

4.2 Mode 1: Live music/ DJ in Band Location 1

Table 4.2 details the requirements when live music/DJ is to occur in Band Location 1.

Table 4.2:

MODE 1: Live Music/DJ at Location 1		
Time of Day	Requirements	
	Doors	Sound level limit (LAS10)
7am - 10pm Mon-Sat OR 9am - 7pm Sun/Pub Hols	External bi fold doors closed (as defined in Diagram 1)	81 dB @ measurement location M1
Other times	NOT ALLOWED	

4.3 Mode 2: Live music/ DJ in Band Location 2

Table 4.3 details the requirements when live music/DJ is to occur in Band Location 2. Note additional requirements in Paragraph 7 below regarding entertainment type limitations at this location.

Table 4.3:

MODE 2: Live Music/DJ at Location 2		
Time of Day	**Requirements**	
	Doors	**Sound level limit (LAS10)**
7am - 10pm Mon-Sat **OR** **9am - 7pm Sun/Pub Hols**	External bi fold doors closed (as defined in Diagram 1)	79 dB @ measurement location M2
Other times	NOT ALLOWED	

4.4 Mode 3: Live music/ DJ in Band Location 3

Table 4.4 details the requirements when live music/DJ to occur in Band Location 3. Note additional requirements in Paragraph 7 below regarding entertainment type limitations at this location.

Table 4.4:

MODE 3: Live Music/DJ at Location 3		
Time of Day	**Requirements**	
	Doors	**Sound level limit (LAS10)**
7am - 10pm Mon-Sat **OR** **9am - 7pm Sun/Pub Hols**	External bi-fold doors closed (as defined in Diagram 1)	85 dB @ measurement location M3
Other times	External bi-fold doors closed (as defined in Diagram 1) Southern internal bi-folds must all be shut except for 2 middle northern section access doors	82 dB @ measurement location M3

4.5 Mode 4: Amplified "piped" music through in house system only

Amplified "piped" music or other sources shall pass only through the zoned in-house amplification system installed on the premises. Additional speakers are not to be used. The zoned system enables different areas of the cafe to have independent volume controls from other areas.

Internal speakers include all in-house speakers located in the area within the bi-fold doors.

External speakers include those servicing both the covered and uncovered outdoor areas.

Table 4.5 sets out limits of music levels that will ensure compliance with the noise regulations, **however for patron comfort it is recommended that piped music levels do not exceed 70 dB(A) wherever patrons are located.**

External speakers are to be turned off at 9.50pm each evening. Visual reminders are programmed into the POS screens that remind staff to turn off the outside speakers at 9.50pm.

Table 4.5:

MODE 4: Amplified "piped" music through in-house system only		
Time of Day	Requirements	
	Doors	Sound level limit (LAS10)
7am - 10pm Mon-Sat OR 9am - 7pm Sun/Pub Hols	All bi-folds open	Internal speakers: 82 dB @ measurement location M1 Internal speakers: 85 dB @ measurement location M3 External speakers: 79 dB @ measurement location M2
	All bi-folds closed	Internal speakers: 84e dB @ measurement location M1 Internal speakers: 87 dB @ measurement location M3 External speakers: 79 dB @ measurement location M2
Other times	All bi-folds open	Internal speakers Location 1: NOT ALLOWED Internal speakers: 80 dB @

		measurement location M3 External speakers: NOT ALLOWED
	All bi-folds closed	Internal speakers Location 1: NOT ALLOWED Internal speakers: 82 dB @ measurement location M3 External speakers: NOT ALLOWED

5 MEASUREMENT OF SOUND LEVELS

Sound measurements made by staff are to be with the in-house sound level meter. This meter has been verified against an officially calibrated meter. Duty mangers of the cafe will be inducted in how to correctly measure the noise produced by the cafe and will include the following:

- Measurements will be made from pre-specified spots on the floor in front of each of the Band Locations 1, 2 and 3 with the measurement microphone and music / amplification pointing towards each other.
- The measurement is to be made over at least a one minute period that is representative of the music being played. Excluding noise from other sources (eg patrons, aircraft etc), the average maximum level should be obtained by watching the meter output. The dB(A) reading so obtained is to be compared against the limits set in Paragraph 4.

6 STAFF PROCEDURE TO DOUBLE-CHECK COMPLIANCE AT 10PM WHEN AMPLIFIED MUSIC BEING PLAYED IN LOCATION 3

At the commencement of any Large Group Booking , or at 10pm, a Cafe staff member will walk over to the neighbouring residence. If music is audible at the residence, then the following actions will be taken: either,

1. All panels to be closed on the southern doors; and/ or
2. The volume of the in-house system (and additional speakers, if present) will be turned down.

After carrying out the above, the audibility of the band/DJ will be re-checked and if band noise is still discernable, then:

1. The volume will be reduced further.

7 TYPES OF LIVE MUSIC ALLOWED

The type of live or DJ music to be played at the Naked Fig is to be background in nature where bass content from guitars, drums or other instruments is limited. Brass instruments, if played at all, must also be maintained as background rather than featured as soloists any time during a live music set.

Location Limitations

Location 1
Live or DJ entertainment may incorporate a pair of additional speakers in front of the live performance area and facing indoors.

Location 2
Live or DJ music must go through the in-house amplification system.

Location 3
Prior to 10 pm live or DJ entertainment may include a pair of additional speakers in front of the live entertainment area and facing indoors.

If live music is to be played after 10pm, there are a number of additional conditions that must be adhered to:

- bi-fold doors must be configured as stated in Table 4.4.
- Any amplified music must go through the in-house amplification system only. Musicians are not permitted to have any independent amplified speakers and additional monitoring (if required) can only be provided by way of ear pieces
- Singers and musicians must also be informed that their solos are to be background in nature so as not to add significantly to the unamplified sound in the venue. (eg opera, brass instrument solos etc are not permitted after 10pm)

7.1 Speeches

If speeches occurring on the Southern Roofed Deck area are to be amplified they are to utilise the in-house amplification system only. After 10pm speeches shall not be broadcast through the external speakers.

8 GROUP BOOKINGS

Large group bookings require management to ensure residents are not impacted by undue noise from the cafe. The measures that the cafe will put in place to manage the noise that may come from larger group bookings are:

- encouraging bookings to book shuttle buses from the cafe
- notifying customers that it is quiet residential area as they leave the building and monitoring to ensure that the noise is kept to a minimum
- Dispersing crowds of customers outside the premises and encouraging them to stay inside the building or leave the area quickly and quietly
- Ensuring amplified speeches only occur from Band Location 3 (see Diagram 1)
- Encouraging non amplified speeches to occur before 10pm

- Ensuring the external doors are closed whenever there are large group bookings located in the Southern Roofed Deck

9 GENERAL SITE NOISE MANAGEMENT

To ensure residents' amenity is maintained, delivery trucks will be directed to make deliveries at the following times:

Table 9:

Type	Time
Rubbish	After 8:00am
Bread	After 6:15am (Mon - Thur) After 7:15am (Fri - Sun but only Van)
Milk	After 8:00am
Fruit and Vegetables	After 9:00am

Prior to opening and closing times, any staff and or ancillary service persons shall operate quietly so as not to disturb residents

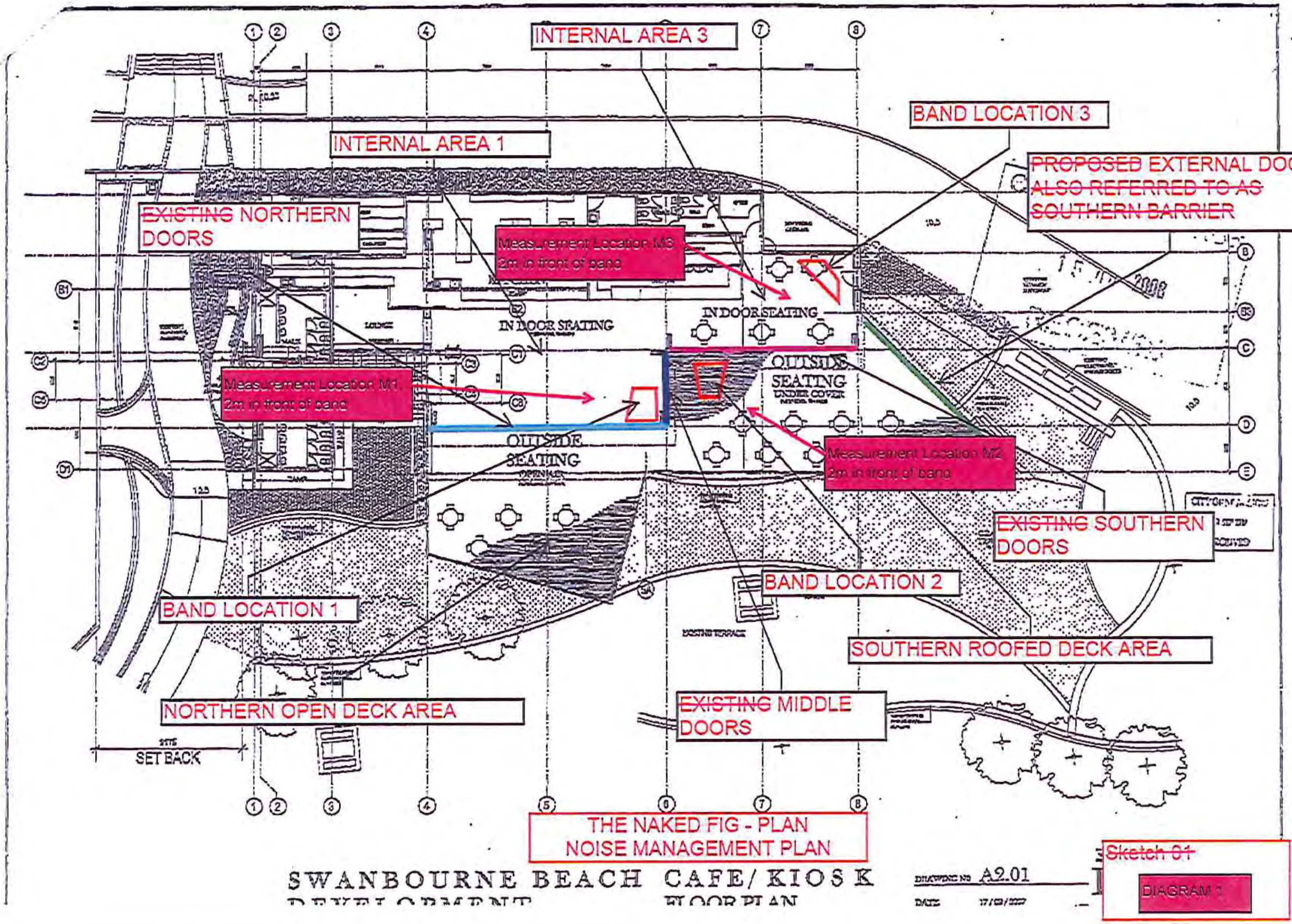
Glass recycling waste will only be transferred into the external bins between the hours of 9am and 9pm.

10 FUTURE CHANGES

Complaints made to the Naked Fig shall be recorded and made available to the City of Nedlands on request.

A report on the operation and effectiveness of this Noise Management Plan shall be prepared by a recognised acoustic consultant on request of the City of Nedlands, and shall include verification of predicted noise levels.

In the event any significant changes are proposed to this Management Plan, the amended plan will be submitted to the City of Nedlands for assessment and approval (taking into account the requirements of the Development Approval condition relating to the Development).



INTERNAL AREA 3
BAND LOCATION 3
INTERNAL AREA 1
~~PROPOSED~~ EXTERNAL DOORS
~~ALSO REFERRED TO AS~~
~~SOUTHERN BARRIER~~
~~EXISTING~~ NORTHERN DOORS
Measurement Location M3
2m in front of band
IN DOOR SEATING
IN DOOR SEATING
OUTSIDE SEATING UNDER COVER
Measurement Location M1
2m in front of band
OUTSIDE SEATING
Measurement Location M2
2m in front of band
~~EXISTING~~ SOUTHERN DOORS
BAND LOCATION 2
BAND LOCATION 1
SOUTHERN ROOFED DECK AREA
NORTHERN OPEN DECK AREA
~~EXISTING~~ MIDDLE DOORS
SET BACK
THE NAKED FIG - PLAN
NOISE MANAGEMENT PLAN
~~Sketch 01~~
DIAGRAM 1
SWANBOURNE BEACH CAFE/ KIOSK
A2.01

Appendix B

Terminology

The following is an explanation of the terminology used throughout this report.

Decibel (dB)

The decibel is the unit that describes the sound pressure and sound power levels of a noise source. It is a logarithmic scale referenced to the threshold of hearing.

A-Weighting

An A-weighted noise level has been filtered in such a way as to represent the way in which the human ear perceives sound. This weighting reflects the fact that the human ear is not as sensitive to lower frequencies as it is to higher frequencies. An A-weighted sound level is described as L_A dB.

Sound Power Level (L_w)

Under normal conditions, a given sound source will radiate the same amount of energy, irrespective of its surroundings, being the sound power level. This is similar to a 1kW electric heater always radiating 1kW of heat. The sound power level of a noise source cannot be directly measured using a sound level meter but is calculated based on measured sound pressure levels at known distances. Noise modelling incorporates source sound power levels as part of the input data.

Sound Pressure Level (L_p)

The sound pressure level of a noise source is dependent upon its surroundings, being influenced by distance, ground absorption, topography, meteorological conditions etc and is what the human ear actually hears. Using the electric heater analogy above, the heat will vary depending upon where the heater is located, just as the sound pressure level will vary depending on the surroundings. Noise modelling predicts the sound pressure level from the sound power levels taking into account ground absorption, barrier effects, distance etc.

L_{ASlow}

This is the noise level in decibels, obtained using the A frequency weighting and the S time weighting as specified in AS1259.1-1990. Unless assessing modulation, all measurements use the slow time weighting characteristic.

L_{AFast}

This is the noise level in decibels, obtained using the A frequency weighting and the F time weighting as specified in AS1259.1-1990. This is used when assessing the presence of modulation only.

L_{APeak}

This is the maximum reading in decibels using the A frequency weighting and P time weighting AS1259.1-1990.

L_{Amax}

An L_{Amax} level is the maximum A-weighted noise level during a particular measurement.

L_{A1}

An L_{A1} level is the A-weighted noise level which is exceeded for one percent of the measurement period and is considered to represent the average of the maximum noise levels measured.

L_{A10}

An L_{A10} level is the A-weighted noise level which is exceeded for 10 percent of the measurement period and is considered to represent the "*intrusive*" noise level.

L_{Aeq}

The equivalent steady state A-weighted sound level ("equal energy") in decibels which, in a specified time period, contains the same acoustic energy as the time-varying level during the same period. It is considered to represent the "average" noise level.

L_{A90}

An L_{A90} level is the A-weighted noise level which is exceeded for 90 percent of the measurement period and is considered to represent the "*background*" noise level.

One-Third-Octave Band

Means a band of frequencies spanning one-third of an octave and having a centre frequency between 25 Hz and 20 000 Hz inclusive.

L_{Amax} assigned level

Means an assigned level which, measured as a $L_{A\,Slow}$ value, is not to be exceeded at any time.

L_{A1} assigned level

Means an assigned level which, measured as a $L_{A\,Slow}$ value, is not to be exceeded for more than 1% of the representative assessment period.

L_{A10} assigned level

Means an assigned level which, measured as a $L_{A\,Slow}$ value, is not to be exceeded for more than 10% of the representative assessment period.

Tonal Noise

A tonal noise source can be described as a source that has a distinctive noise emission in one or more frequencies. An example would be whining or droning. The quantitative definition of tonality is:

the presence in the noise emission of tonal characteristics where the difference between -

(a) the A-weighted sound pressure level in any one-third octave band; and

(b) the arithmetic average of the A-weighted sound pressure levels in the 2 adjacent one-third octave bands, is greater than 3 dB when the sound pressure levels are determined as $L_{Aeq,T}$ levels where the time period T is greater than 10% of the representative assessment period, or greater than 8 dB at any time when the sound pressure levels are determined as $L_{A\ Slow}$ levels.

This is relatively common in most noise sources.

Modulating Noise

A modulating source is regular, cyclic and audible and is present for at least 10% of the measurement period. The quantitative definition of tonality is:

a variation in the emission of noise that —

(a) is more than 3 dB $L_{A\ Fast}$ or is more than 3 dB $L_{A\ Fast}$ in any one-third octave band;

(b) is present for at least 10% of the representative.

Impulsive Noise

An impulsive noise source has a short-term banging, clunking or explosive sound. The quantitative definition of tonality is:

a variation in the emission of a noise where the difference between $L_{A\ peak}$ and $L_{A\ Max\ slow}$ is more than 15 dB when determined for a single representative event;

Major Road

Is a road with an estimated average daily traffic count of more than 15,000 vehicles.

Secondary / Minor Road

Is a road with an estimated average daily traffic count of between 6,000 and 15,000 vehicles.

Influencing factor

$$
\begin{aligned}
&= \frac{1}{10}(\%\,\text{Type A}_{100} + \%\,\text{Type A}_{450}) + \frac{1}{20}(\%\,\text{Type B}_{100} + \%\,\text{Type B}_{450}) \\
&\textit{where:} \\
&\%\,\text{Type A}_{100} = \text{the percentage of industrial land within} \\
&\qquad\qquad\quad \text{a100m radius of the premises receiving the noise} \\
&\%\text{TypeA}_{450} = \text{the percentage of industrial land within} \\
&\qquad\qquad\quad \text{a 450m radius of the premises receiving the noise} \\
&\%\,\text{Type B}_{100} = \text{the percentage of commercial land within} \\
&\qquad\qquad\quad \text{a100m radius of the premises receiving the noise} \\
&\%\text{TypeB}_{450} = \text{the percentage of commercial land within} \\
&\qquad\qquad\quad \text{a 450m radius of the premises receiving the noise} \\
&+ \text{Traffic Factor (maximum of 6 dB)} \\
&= 2 \text{ for each secondary road within 100m} \\
&= 2 \text{ for each major road within 450m} \\
&= 6 \text{ for each major road within 100m}
\end{aligned}
$$

Representative Assessment Period

Means a period of time not less than 15 minutes, and not exceeding four hours, determined by an inspector or authorised person to be appropriate for the assessment of a noise emission, having regard to the type and nature of the noise emission.

Background Noise

Background noise or residual noise is the noise level from sources other than the source of concern. When measuring environmental noise, residual sound is often a problem. One reason is that regulations often require that the noise from different types of sources be dealt with separately. This separation, e.g. of traffic noise from industrial noise, is often difficult to accomplish in practice. Another reason is that the measurements are normally carried out outdoors. Wind-induced noise, directly on the microphone and indirectly on trees, buildings, etc., may also affect the result. The character of these noise sources can make it difficult or even impossible to carry out any corrections.

Ambient Noise

Means the level of noise from all sources, including background noise from near and far and the source of interest.

Specific Noise

Relates to the component of the ambient noise that is of interest. This can be referred to as the noise of concern or the noise of interest.

Satisfactory Design Sound Level

The level of noise that has been found to be acceptable by most people for the environment in question and also to be not intrusive.

Maximum Design Sound Level

The level of noise above which most people occupying the space start to become dissatisfied with the level of noise.

Reverberation Time

Of an enclosure, for a sound of a given frequency or frequency band, the time that would be required for the reverberantly decaying sound pressure level in the enclosure to decrease by 60 decibels.

RMS

The root mean square level. This is used to represent the average level of a wave form such as vibration.

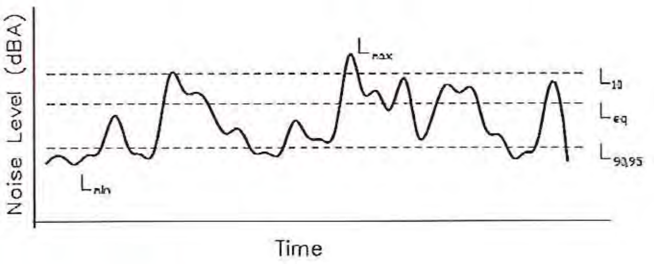
Vibration Velocity Level

The RMS velocity of a vibration source over a specified time period. Units are mm/s.

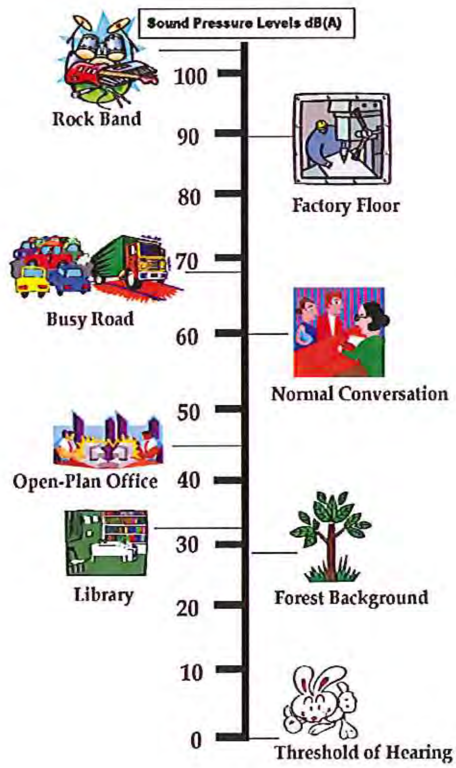
Peak Velocity

Level of vibration velocity measured as a non root mean square (r.m.s.) quantity in millimetres per second (mm/s).

Chart of Noise Level Descriptors



Typical Noise Levels



PD40.13 – Attachment 2
Site Diagram of Naked Fig Cafe