Structure Plan

Lots 7, 65, 66 and 67 View Street, Beeliar
City of Cockburn
(WAPC ref SPN 2215)

1 October 2019
Version 03

STEWART URBAN PLANNING

ENDORSEMENT OF STRUCTURE PLAN

This structure plan is prepared under the provisions of the City of Cockburn Town Planning Scheme No.3.

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

3 October 2019 Date

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

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

M. Wieclaw Witness

4 October 2019 Date

3 October 2029 Date of Expiry

TABLE OF AMENDMENTS

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

EXECUTIVE SUMMARY

This Structure Plan applies to Lots 7, 65, 66 and 67 View Street, Beeliar.

The site has an area of 1.6189 hectares and is located 6.5 kilometres west of Cockburn Central and 9.5 kilometres south-south-east of Fremantle.

The Structure Plan site is zoned 'Development' under the City of Cockburn Town Planning Scheme No.3 ('TPS3').

The purpose of this Structure Plan is to facilitate the subdivision and development of the site for residential purposes, together with Public Open Space.

An approved Structure Plan applies to the adjoining land to the east, being Lots 97 to 102 View Street, Beeliar. The proposed Structure Plan has been designed to integrate with the approved Structure Plan for the land to the east.

The Structure Plan has been prepared in consultation with the City of Cockburn.

Table 1: Summary of Structure Plan

Item	Data
Total area covered by the Structure Plan	1.6189 hectares
Area of each land use proposed: • Residential	 1.1464 hectares
Total estimated lot yield	30
Estimated number of dwellings	30
Estimated residential density: • Per residential site hectare • Per gross urban hectare	21 26 dwellings per hectare 19 dwellings per hectare
Estimated population • At 2.5 persons per dwelling	 75 people
Estimated area and percentage of site given over to: • Local Parks	Number / Area / % 1 / 1,311m² / 8.1%

TABLE OF CONTENTS

PART 1 IMPLEMENTATION

1. Structure Plan Area

This Structure Plan shall apply to Lots 7, 65, 66 and 67 View Street, Beeliar, being the land contained within the inner edge of the line denoting the Structure Plan boundary on the Structure Plan map (**Plan 1).**

2. Operation

This Structure Plan shall have effect from the day it is approved by the Western Australian Planning Commission.

3. Staging

The land within the Structure Plan is proposed to be developed in a single stage.

4. Subdivision and Development Requirements

4.1 Land Use, Zones and Reserves

The Structure Plan map (**Plan 1**) depicts the Zones and Reserves applicable within the Structure Plan area. The permissibility of land uses within the Structure Plan area shall be in accordance with the corresponding Zones and Reserves under the City of Cockburn Town Planning Scheme No.3 ('TPS3').

4.2 Residential Density

The residential density applicable to the Structure Plan area is depicted on the Structure Plan map (**Plan 1**).

The estimated residential density of the Structure Plan is:

- 19 dwellings per gross urban hectare; and
- 26 dwellings per residential site hectare.

4.3 Public Open Space

The Structure Plan (**Plan 1**) depicts an area of 1,311m² as Public Open Space, being equivalent to 8.1% of the site's gross area.

The requirement for 10% Public Open Space shall be achieved by the shortfall of 1.9% (308m²) being provided as cash-in-lieu in accordance with the provisions of the Planning and Development Act. Pursuant to Clause 3.6.2 of WAPC 'Development Control Policy 2.3 – Public Open Space in Residential Areas', it is intended cash-in-lieu funds be spent on development of the Public Open Space depicted in the Structure Plan.

The final design of the Public Open Space will be subject to detailed engineering, drainage and landscaping.

4.4 Uniform Fencing

Uniform fencing shall be provided to all boundaries abutting the Public Open Space in accordance with the provisions of Local Planning Policy 5.7 – Uniform Fencing.

4.5 Local Development Plan

A Local Development Plan shall be prepared for lots adjacent to the Public Open Space to ensure dwelling design achieves surveillance of the Public Open Space and street by addressing dwelling orientation and fencing.

4.6 Interface with Adjoining Land

The Structure Plan makes provision for future road and service connections to the adjoining land to the north, east and south.

The proposed roads running east-west straddle the common boundary between the Structure Plan and adjacent land to the north and south. Until such time as the abutting land to the north and south is subdivided, the proposed roads shall be constructed within the road reserves contained within the Structure Plan area, including construction of the road carriageway and verge to one side only.

To service future residential lots, View Street will be required to be upgraded (or alternatively a contribution made) from a rural road to a residential road.

The Structure Plan relies upon implementation of the approved Structure Plan to the east for the purpose of connecting proposed roads to Watson Road. It is intended that implementation of the Structure Plan will occur upon completion of subdivision works for the adjoining land.

4.7 Medium Density Housing Standards

The provisions of 'Local Planning Policy 1.16 – Single House Standards for Medium Density Housing in the Development Zone' shall apply to this Structure Plan.

4.8 Hazards and Separation Areas

This Structure Plan is accompanied by a Bushfire Management Plan, including a Bushfire Hazard Level ('BAL') Assessment. The subdivision and development of the Structure Plan area shall be undertaken in accordance with the recommendations of the Bushfire Management Plan.

5. Development Contributions

The Structure Plan is located within Development Contribution Area 4 ('DCA4') and Development Contribution Area 13 ('DCA13') under TPS3. Developer contributions toward community and standard infrastructure will be required to be made to the City of Cockburn in accordance with the provisions of TPS3, pursuant to a condition of subdivision or development approval.

PART 2 EXPLANATORY REPORT

1.0 Planning Background

1.1 Introduction

This Structure Plan has been prepared to guide the subdivision and development of Lots 7, 65, 66 and 67 View Street, Beeliar ('site') in a coordinated manner.

The Structure Plan has been designed having regard to the prevailing site conditions and constraints, the requirements of land owners with respect to retention of existing dwellings, and the findings of various technical reports accompanying this report.

1.2 Land Description

Location

The site is situated in the locality of Beeliar, in the City of Cockburn ('City'), approximately 6.5 kilometres west of Cockburn Central and 9.5 kilometres south-south-east of Fremantle.

Refer **Figure 1 – Regional Location**.

The site is within the street block bound by View Street to the west, Howe Street to the north, Watson Road to the east and East Churchill Avenue to the south. Stock Road is approximately 100 metres to the west, while South Coogee Primary School and Beeliar Town Centre are approximately 750 metres to the north-east.

Refer **Figure 2 – Local Location**.

Land Use

From the early 1960's the locality was progressively developed with small-scale market gardens and single houses. This pattern of land use continued until the mid 1990's, when a large residential subdivision was constructed to the east of Watson Road. Single house lots were created along the south side of Howe Street in the early 2000's, with residential subdivision commencing north of Howe Street from about 2010. Lot 94 Watson Road was subdivided in 2015 resulting in the creation of Corella Close to the north-east of the subject site. The abutting land to the east is vacant while established homes occupy the adjoining land to the north and south, as well as to the west on the opposite side of View Street.

The four existing lots that comprise the subject site are each occupied by an existing dwelling fronting View Street. A small-scale domestic market garden occupies the balance of the southern-most lot (Lot 65). The remainder of the site is vacant.

Refer **Figure 3 – Aerial Photograph**.

Site Area

The site comprises four existing lots (three of 4,047m² and one of 4,048m²) each with a frontage to View Street of 32.19 metres. The site has a total area of 1.6189 hectares with a frontage to View Street of 128.76 metres.

Refer **Figure 4 – Site Plan**.

Legal Description

Table 3: Existing Lot Details

Lot	Plan	Certificate of Title		Address	Land Owner
		Volume	Folio		
7	33008	2523	264	32 View Street	Garrick Crabbe
67	3562	1288	112	36 View Street	Lorna and Voli Klepec
66	3562	1097	408	38 View Street	Beverley, Phillip and Graham Swift
65	3562	1550	523	40 View Street	Marija and Vlatko Garbin

1.3 Planning Framework

Metropolitan Region Scheme

The site is zoned Urban under the Metropolitan Region Scheme. No part of the land abuts or is directly affected by any MRS reserves. Stock Road to the west is reserved as a Primary Regional Road under the MRS.

Refer **Figure 5 – MRS Zoning Map**

South Metropolitan Peel Sub-Regional Planning Framework

In March 2018, the State Government adopted the Perth and Peel @ 3.5 million suite of strategic planning documents to guide the growth and development of the Perth and Peel regions for the next 30 years. The site is within the South Metropolitan Peel Sub-Region of Perth and Peel @ 3.5 million. Under the South Metropolitan Peel Sub Regional Planning Framework, the City has been assigned an urban infill dwelling target of 14,680 dwellings by 2050.

The Structure Plan will assist the local government to meet this target, as it provides for the site to be subdivided into a minimum of 30 single house lots in accordance with the provisions of the Residential Design Codes with respect to land coded R25.

State Planning Policies

State Planning Policy 3.7 - Planning in Bushfire Prone Areas

State Planning Policy 3.7 – Planning in Bushfire Prone Areas ('SPP3.7') applies to land within a Bushfire Prone Area.

The western portion of the site is within a Bushfire Prone Area declared under the Fire and Emergency Services Act, as depicted on the Department of Fire and Emergency Services ('DFES') Map of Bush Fire Prone Areas

The Structure Plan is accompanied by a Bushfire Management Plan ('BMP') prepared in accordance with SPP3.7. The BMP includes a Bushfire Attack Level ('BAL') Assessment. The BMP concludes that the subdivision and development of the site in accordance with the Structure Plan is capable of achieving BAL-29 or lower, with required Asset Protection Zones wholly located within POS and roads within the site.

State Planning Policy 5.4 – Road and Rail Transport Noise and Freight Considerations in Land Use Planning

State Planning Policy 5.4 ('SPP5.4') applies to noise-sensitive development proposals in the vicinity of major road and rail transport infrastructure, and seeks to:

- *protect people from unreasonable levels of transport noise by establishing a standardised set of criteria to be used in the assessment of proposals;*
- *protect major transport corridors and freight operations from incompatible urban encroachment;*
- *encourage best-practice design and construction standards for new development proposals and new or redeveloped transport infrastructure proposals.*

The site is located 100 metres to the east of Stock Road, which is reserved as a Primary Regional Road under the MRS. An Acoustic Assessment has been undertaken to determine if future residents within the Structure Plan are likely to be affected by excessive levels of traffic noise, and if so, whether sound attenuation measures will be required to be incorporated into the Structure Plan and / or any subsequent subdivision and development proposals. The level of traffic noise recorded at the site was found to be under the noise target levels established by SPP5.4 and for this reason, the Acoustic Assessment concludes that no specific noise attenuation measures are required to be implemented.

Development Control Policies

The WAPC has adopted various Development Control Policies relevant to the Structure Plan and its subsequent subdivision and development, including:

- Development Control Policy 1.1 – Subdivision of Land (General Principles);
- Development Control Policy 1.7 – General Road Planning;
- Development Control Policy 2.2 – Residential Subdivision;
- Development Control Policy 2.3 – Public Open Space in Residential Areas; and
- Development Control Policy 2.6 – Residential Road Planning.

Consideration has been given to the relevant provisions of the above-described Development Control Policies in the process of preparing this Structure Plan.

Liveable Neighbourhoods

Liveable Neighbourhoods is an operational policy of the WAPC that guides the structure planning and subdivision of greenfield and large urban infill sites to promote the development of sustainable communities. The Structure Plan is consistent with the objectives and requirements of the relevant design elements contained within *Liveable Neighbourhoods*, including:

- Community Design;
- Movement;
- Lot Layout;
- Public Parkland;
- Water Management; and
- Utilities.

The Structure Plan proposes an efficient design that incorporates a permeable road network and linear open space system that integrates with the design of approved structure plans over adjoining land within the street block. The design has been informed by the technical reports attached to this Structure Plan and will facilitate infill development in an area with existing infrastructure capacity.

Town Planning Scheme

Zoning

The site is zoned 'Development' under City of Cockburn TPS3. The purpose of the Development zone is to facilitate the development of land in a coordinated manner in accordance with a comprehensive Structure Plan. The permissibility of land uses and applicable dwelling density code for land within the Development zone is determined by reference to an adopted Structure Plan.

Refer **Figure 6 – TPS3 Zoning Map**

Special Control Areas

Special Control Areas under TPS3 include:

- Development Areas; and
- Development Contribution Areas.

Development Areas

The site is located within Development Area 4 – Yangebup ('DA4'). Land within a Development Area is required to comply with Table 9 of TPS3, which contains the following provision applicable to DA4:

> *An approved Structure Plan together with all approved amendments shall be given due regard in the assessment of applications for subdivision and development in accordance with clause 27(1) of the Deemed Provisions.*

The subdivision and development of land within DA4 is generally to be in accordance with any approved Structure Plan for the land.

Development Contribution Areas

The purpose of a Development Contribution Area ('DCA') under TPS3 is to:

a) *provide for the equitable sharing of the costs of infrastructure and administrative costs between owners;*
b) *ensure that the cost contributions are reasonably required as a result of the subdivision and development of land in the development contribution area; and*
c) *coordinate the timely provision of infrastructure.*

TPS3 states that a Development Contribution Plan ('DCP') is required to be prepared for each DCA and that an owner of land must make a cost contribution in accordance with the applicable DCP, with costs to be paid at the time of subdivision or development (whichever occurs first).

The site is located within the following DCA's under TPS3:

- Development Contribution Area 4 – Yangebup West ('DCA4'); and
- Development Contribution Area 13 – Community Infrastructure ('DCA13').

DCA4 requires that a contribution be made toward the cost of constructing Beeliar Drive between Stock Road and Spearwood Avenue, while DCA13 requires that a contribution be made toward regional community infrastructure on a suburb-by-suburb basis, pursuant to the adopted DCP's for each DCA. The following contribution rates currently apply (reviewed annually).

Table 4: Development Contribution Requirements

Development Contribution Area	Development Contribution Rate
DCA4 – Yangebup West	$31,537.16 per hectare of land
DCA13 – Community Infrastructure	$3,907.84 per lot / dwelling

Structure Plans

The site is not presently subject to an adopted Structure Plan. Structure Plans have been adopted for other land within the street block bound by View Street, Howe Street, Watson Road and East Churchill Avenue.

Table 5: Surrounding Structure Plans

Structure Plan	Status
Lots 91, 500, 501 & 1 to 5 Howe Street	Adopted 10 June 2010
Lot 94 Watson Road	Adopted 10 April 2014
Lot 95 Watson Road	Adopted 15 March 2016
Lots 97 to 102 Watson Road	Adopted 20 February 2018

Refer **Figure 7 – Adopted Structure Plans**

Local Planning Policies

The City of Cockburn has adopted a number of Local Planning Policies pursuant to TPS3 that are relevant to the Structure Plan and subsequent subdivision and development of the land, including the following:

- Local Planning Policy 1.16 – Single House Standards for Medium Density Housing in the Development Zone;
- Local Planning Policy 5.1 – Pubic Open Space;
- Local Planning Policy 5.7 – Uniform Fencing;
- Local Planning Policy 5.12 – Retaining Walls; and
- Local Planning Policy 5.15 – Access Street Road Reserve & Pavement Standards.

Consideration has been given to the relevant provisions of the above-described Local Planning Policies in the process of preparing this Structure Plan.

2.0 Site Conditions and Constraints

2.1 Biodiversity and Vegetation

As a result of historic and current land uses, the majority of the site has been cleared of all native vegetation. Remnant vegetation in the form of scattered shrubs remains over the central and eastern portions of Lot 66, while a number of mature trees have been planted around the curtilage of the existing dwellings on Lots 65 and 67. There is no riparian vegetation on the site.

A review of desk-top mapping (nationalmap.gov.au) confirms that the site is not known to contain any:

- Threatened and Priority Fauna;
- Threatened and Priority Flora; or
- Threatened Ecological Communities.

The site is not within an Environmentally Sensitive Area declared under Part 5 of the Environmental Protection Act. Accordingly, pursuant to the Environmental Protection (Clearing of Native Vegetation) Regulations, a permit is not required to clear native vegetation for the purpose of constructing a building or other structure, provided the clearing does not exceed 5 hectares, is to the extent necessary and does not involve riparian vegetation. For these reasons, a permit is not required to clear any native vegetation that may exist on the site.

2.2 Landform and Soils

Topography

The site rises gently from its north-east and south-west corners toward a ridge line running diagonally through the site. The natural ground level of the site at its north-east corner is 24 metres AHD while the south-west corner of the site has a natural level of 26 metres AHD. The highest point of the ridge line is located at the site's south-east corner where the natural level is 30 metres AHD. The ridge falls slightly toward the site's north-west corner where the natural ground level is 29 metres AHD.

Further details of site levels can be found in the attached Feature Survey.

Soils

The site is situated on an elevated limestone ridge with sandy soils and is not within an area where there is a risk of Acid Sulphate Soils occurring,

2.3 Groundwater and Surface Water

According to the Perth Groundwater Atlas published by the Department of Water and Environment Regulation ('DWER'), the depth of groundwater in the locality is 1 metre AHD. With a natural ground level ranging from 26 to 30 metres AHD, the depth to groundwater ranges from 25 to 29 metres below the site's ground level.

The DWER has granted a Groundwater Licence to the owners of Lot 65 for an allocation of 5,000 kilolitres of water per annum. The Groundwater Licence expires on 11 May 2019 (Licence No.68063). The site is not within a declared Public Drinking Water Source Area and there are no surface water features occurring on the site.

Refer **Figure 8 – Perth Groundwater Atlas**

2.4 Bushfire Hazard

The western portion of the site is within a declared Bushfire Prone Area. The attached BMP concludes that development of the site in accordance with the Structure Plan is capable of achieving BAL-29 or lower, with required Asset Protection Zones located entirely within the boundaries of the subject site.

2.5 Heritage

Aboriginal Heritage

A search of the Department of Aboriginal Affairs 'Register of Aboriginal Heritage Sites' confirms the site is not within a known place of Aboriginal heritage significance.

Heritage

A search of the State Heritage Office 'Register of Heritage Places' confirms the site does not contain or form part of any place listed on the State Register of Heritage Places under the Heritage of Western Australia Act. The site does not contain any place included in the City's Municipal Inventory or Heritage List.

2.6 Traffic Noise

The site is located 100 metres to the east of Stock Road. According to traffic data published by Main Roads, Stock Road near Beeliar Drive carried an average of 22,300 vehicles per weekday in 2016/2017, with 12% recorded as truck movements.

An Acoustic Assessment has been undertaken to determine if future residents within the Structure Plan are likely to be affected by excessive levels of noise generated by vehicles on Stock Road. The level of traffic noise recorded at the site was found to be under the noise target levels established by SPP5.4. For this reason, the Acoustic Assessment concludes that no specific noise attenuation measures are required to be implemented within the Structure Plan area.

2.7 Services

The site is able to be connected to all required services, as described in the attached Civil Engineering Report, including sewer, water, power, gas and communications. Sewer will be extended south from the corner of View Street and Howe Street, while all other services are presently within View Street abutting the site. It is anticipated that all services have adequate capacity to meet demand from the proposed lots that will be developed following approval of the Structure Plan. Landowners / developers will be required to coordinate and share the cost of any sewerage network extensions required to service higher density development.

2.8 Summary of Constraints and Opportunities

As evident from the above, there are no significant constraints that will prevent or restrict the opportunity for the site to be subdivided and developed for medium density housing in accordance with this Structure Plan.

3.0 Structure Plan

3.1 Land Use and Density

This Structure Plan has been prepared to facilitate the subdivision and development of the site for medium density housing.

The Structure Plan will allow the site to be subdivided into a minimum of 30 single house lots in accordance with the provisions of the Residential Design Codes with respect to land coded R25. Part 1 of this Structure Plan confirms that the provisions of 'Local Planning Policy 1.16 – Single House Standards for Medium Density Housing in the Development Zone' shall apply to the Structure Plan area. The Structure Plan is designed to ensure that all proposed lots have direct frontage to either View Street or the proposed roads within the site.

3.2 Road Layout

The Structure Plan proposes a road layout that maximises connectivity to abutting land to the east and north.

Refer **Figure 9 – Structure Plan Connectivity**.

The Structure Plan proposes two east-west roads running from the approved Structure Plan area to the east fronting Watson Road. These roads will connect to a north-south road running parallel to View Street. Provision is made for the new north-south road to continue in a northerly direction through the adjoining land to the north, where a future road connection to View Street can be established.

All road reserve widths depicted on the Structure Plan are consistent with City of Cockburn requirements and the width of roads proposed over the abutting land to the east. This ensures a seamless transition across both Structure Plan areas upon completion of road works.

The proposed roads running east-west straddle the common boundary between the Structure Plan and adjacent land to the north and south. Until such time as the abutting land is subdivided, the proposed roads will be constructed within the road reserves contained within the Structure Plan area. The width of the road reserves depicted within the Structure Plan area are sufficient to accommodate construction of the road carriageway and a verge to one side only, with the other verge to be established within the abutting land at the time of subdivision.

The attached Traffic Impact Assessment demonstrates that all existing and proposed roads are capable of accommodating the amount of traffic expected to be generated by the Structure Plan, without any requirement to widen or upgrade existing roads.

3.3 Public Open Space

The Structure Plan proposes a linear area of Public Open Space running parallel to the site's eastern boundary. It is intended that the POS will connect to the future linear POS network proposed to the north of the site (refer Figure 10).

The POS will front a proposed local road within the approved Structure Plan to the east, while the western boundary of the POS will abut the rear boundary of single house lots proposed by this Structure Plan. It is envisaged these lots will have a finished ground level higher than the POS, with a retaining wall along the western side of the POS. Part 1 of this Structure Plan confirms that Uniform Fencing shall be provided to all residential lot boundaries abutting the Public Open Space in accordance with the provisions of 'Local Planning Policy 5.7 – Uniform Fencing.'

The proposed POS has an area of 1,311m², being equivalent to 8.1% of the site's gross area. The shortfall of 1.9% (308m²) is proposed to be provided as cash-in-lieu. Pursuant to Clause 3.6.2 of WAPC 'Development Control Policy 2.3 – Public Open Space in Residential Areas', it is intended that cash-in-lieu funds be spent on the physical development of the proposed POS.

A Landscape Concept Plan has been prepared to demonstrate the intended finished quality and design of the POS. The detailed design of the POS will be subject to engineering and drainage requirements and the approval of the City of Cockburn.

Table 6: Public Open Space Schedule

Public Open Space Schedule		
Total Site Area (ha)		**1.6189 ha**
Deductions	Nil	
Gross Subdividable Area		**1.6189 ha**
Public Open Space		
POS Required	10%	0.1619 ha
POS Provided • Restricted POS • Unrestricted POS	 Nil 0.1311 ha	 0.1311 ha
Total POS Provided	**8.1%**	**0.1311 ha**
Balance as Cash-in-Lieu – Physical Development of POS Refer Clause 3.6.2 of WAPC Development Control Policy 2.3	1.9%	0.0308 ha

3.4 Civil Engineering

Earthworks, Levels and Retaining Walls

The attached Civil Engineering Report provides an indication of the design levels that are intended to be achieved when the site is subdivided in accordance with this Structure Plan. The site will be cleared and earthworks undertaken to achieve the desired levels, with clean fill imported (as required) to achieve suitable geotechnical conditions for construction of roads and houses.

The preliminary design levels also take into account the likely finished level of the approved subdivision over the land to the east. Design levels will be refined and reviewed as development progresses over the adjoining land.

The attached Civil Engineering Report depicts the location of retaining walls, which are required to achieve level sites. Retaining walls are also proposed along the western edge of the POS. The retaining wall on the western edge of the POS is intended to elevate the adjacent lots so that they overlook the POS and obtain an outlook toward the east. The retaining wall will have a height of approximately 0.9 metres at its northern end, increasing to a height of approximately 1.2 metres toward the southern part of the POS, before decreasing to a height of 0.75 metres at the southern end of the POS.

Drainage

Appendix A of the Civil Engineering Report incorporates a Stormwater Management Strategy for the Structure Plan. The Strategy proposes the installation of two 'stormtech cells' (or similar) within the proposed POS. The Landscape Concept Plan takes into consideration the location of the 'stormtech cells' in the POS.

FIGURES

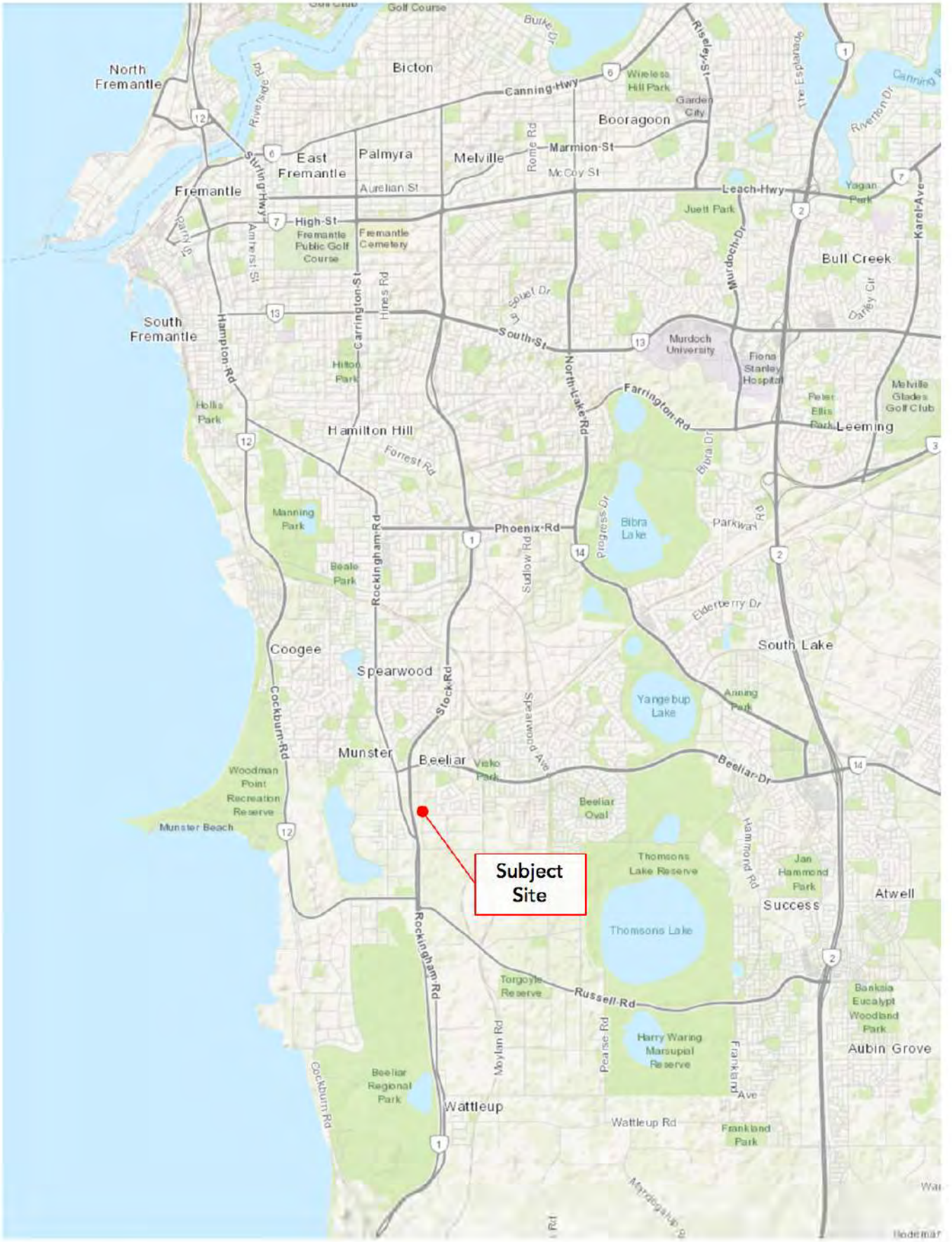


Figure 1
Regional Location

STEWART URBAN PLANNING

Reference	0049
Project	Local Structure Plan
Location	Lots 7, 65, 66 & 67 View Street, Beeliar
Date	31 January 2019
Scale	NTS
Map Source	Landgate

Figure 2
Local Location

STEWART URBAN PLANNING

Reference	0049
Project	Local Structure Plan
Location	Lots 7, 65, 66 & 67 View Street, Beeliar
Date	31 January 2019
Scale	NTS
Map Source	NearMap

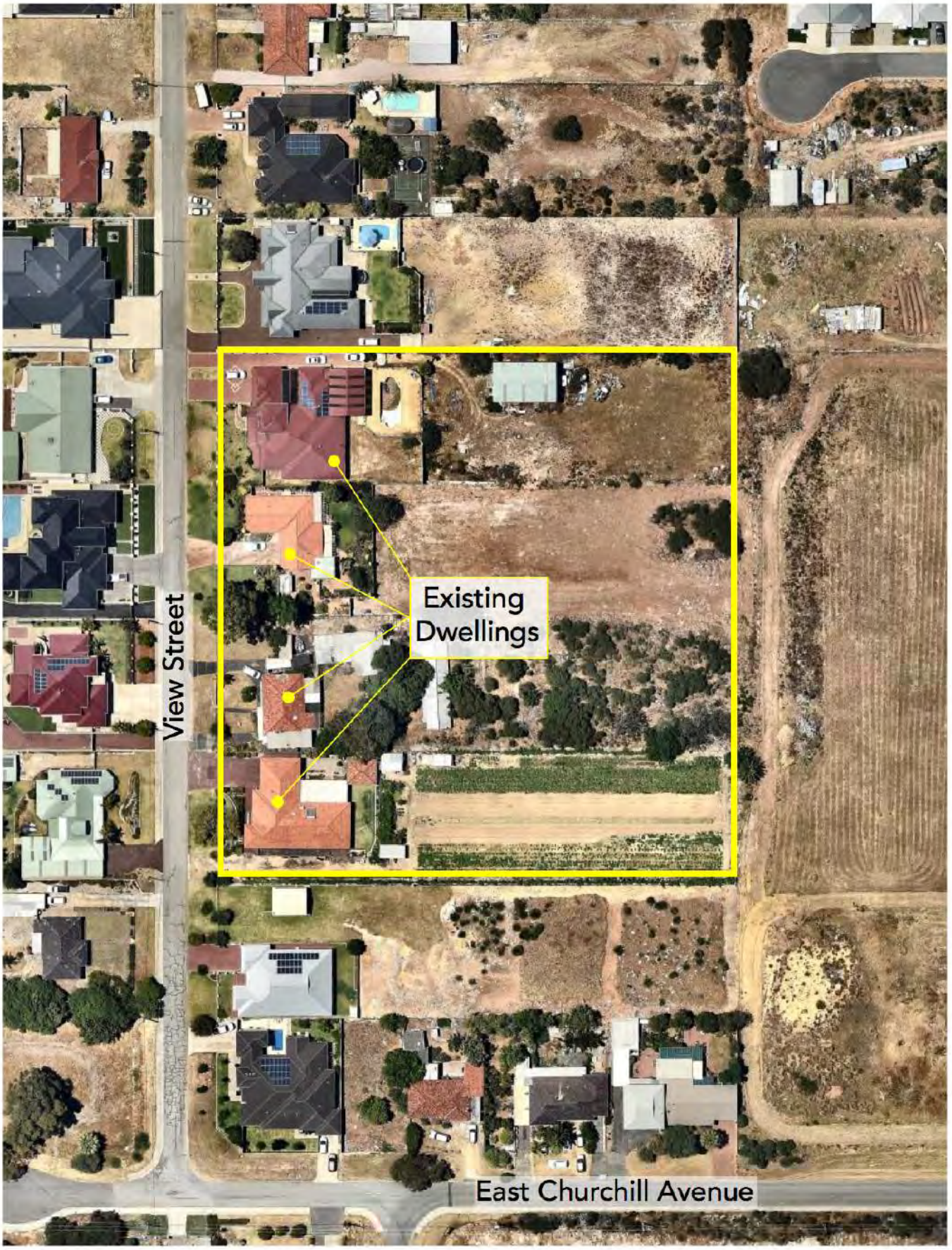


Figure 3
Aerial Photograph

STEWART URBAN PLANNING

Reference	0049
Project	Local Structure Plan
Location	Lots 7, 65, 66 & 67 View Street, Beeliar
Date	31 January 2019
Scale	NTS
Map Source	NearMap

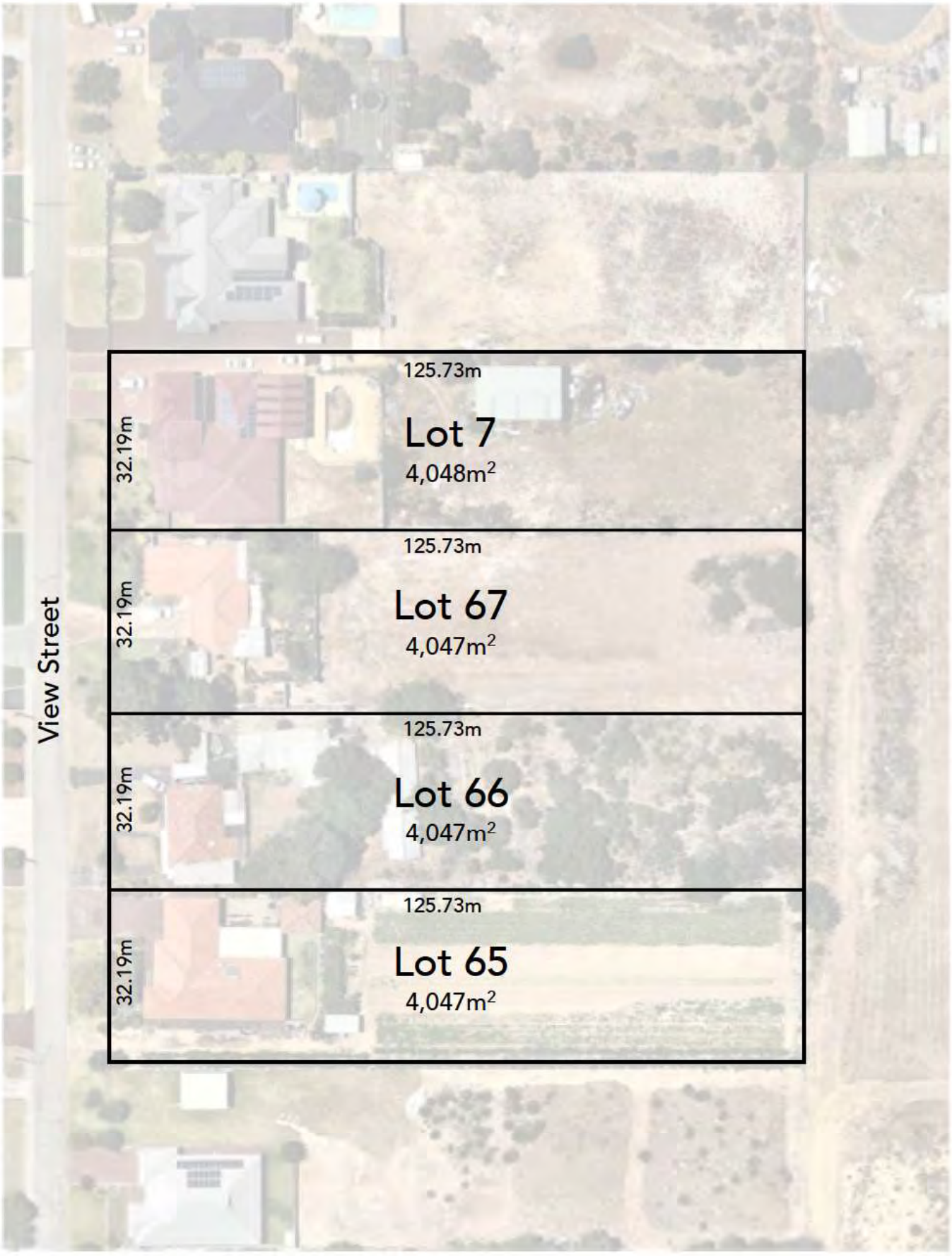


Figure 4
Site Plan

STEWART URBAN PLANNING

Reference	0049
Project	Local Structure Plan
Location	Lots 7, 65, 66 & 67 View Street, Beeliar
Date	31 January 2019
Scale	NTS
Map Source	NearMap

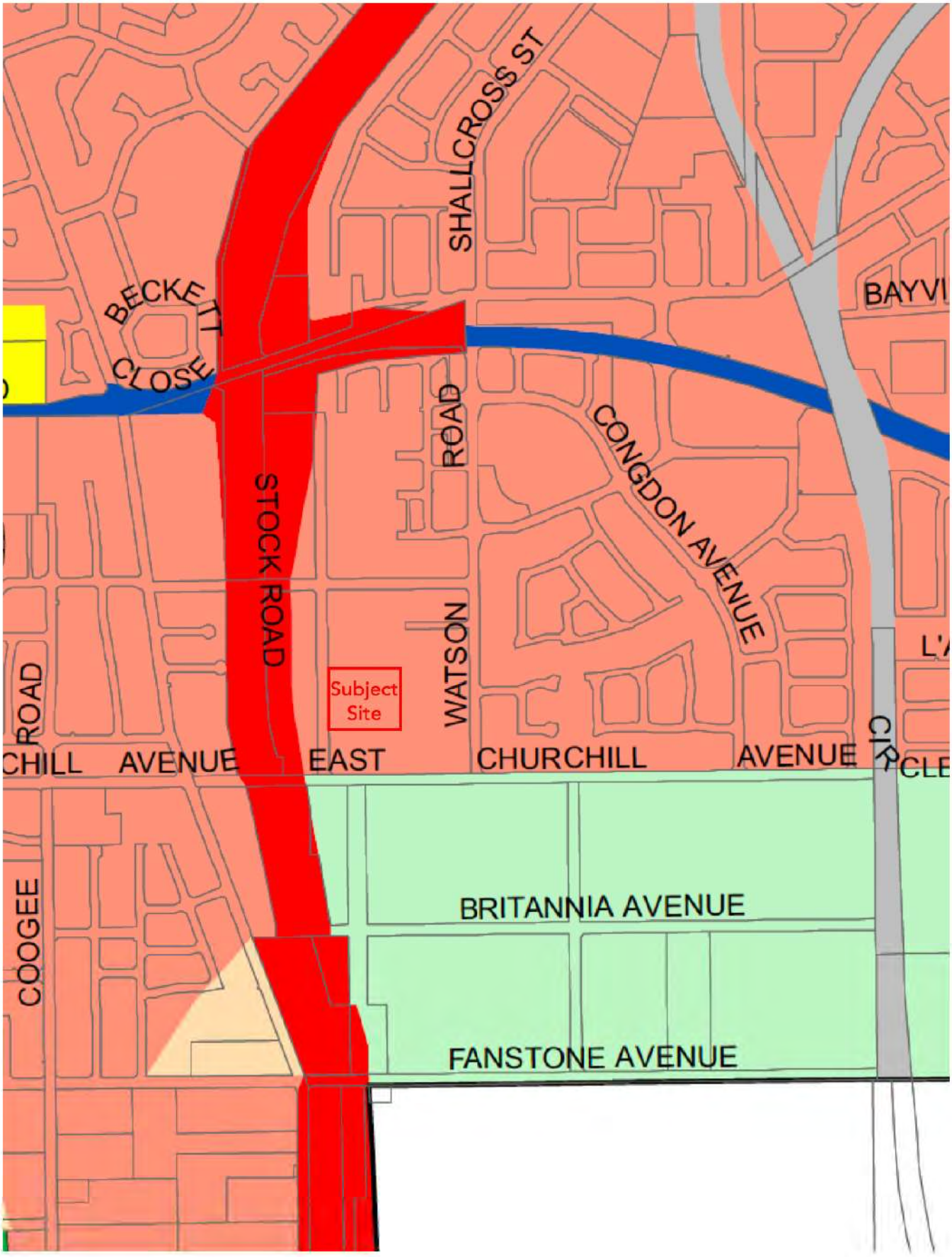


Figure 5
MRS Zoning Map

STEWART URBAN PLANNING

Reference	0049
Project	Local Structure Plan
Location	Lots 7, 65, 66 & 67 View Street, Beeliar
Date	31 January 2019
Scale	NTS
Map Source	Department of Planning, Lands & Heritage

Figure 6

LPS3 Zoning Map

STEWART URBAN PLANNING

Reference	0049
Project	Local Structure Plan
Location	Lots 7, 65, 66 & 67 View Street, Beeliar
Date	31 January 2019
Scale	NTS
Map Source	City of Cockburn

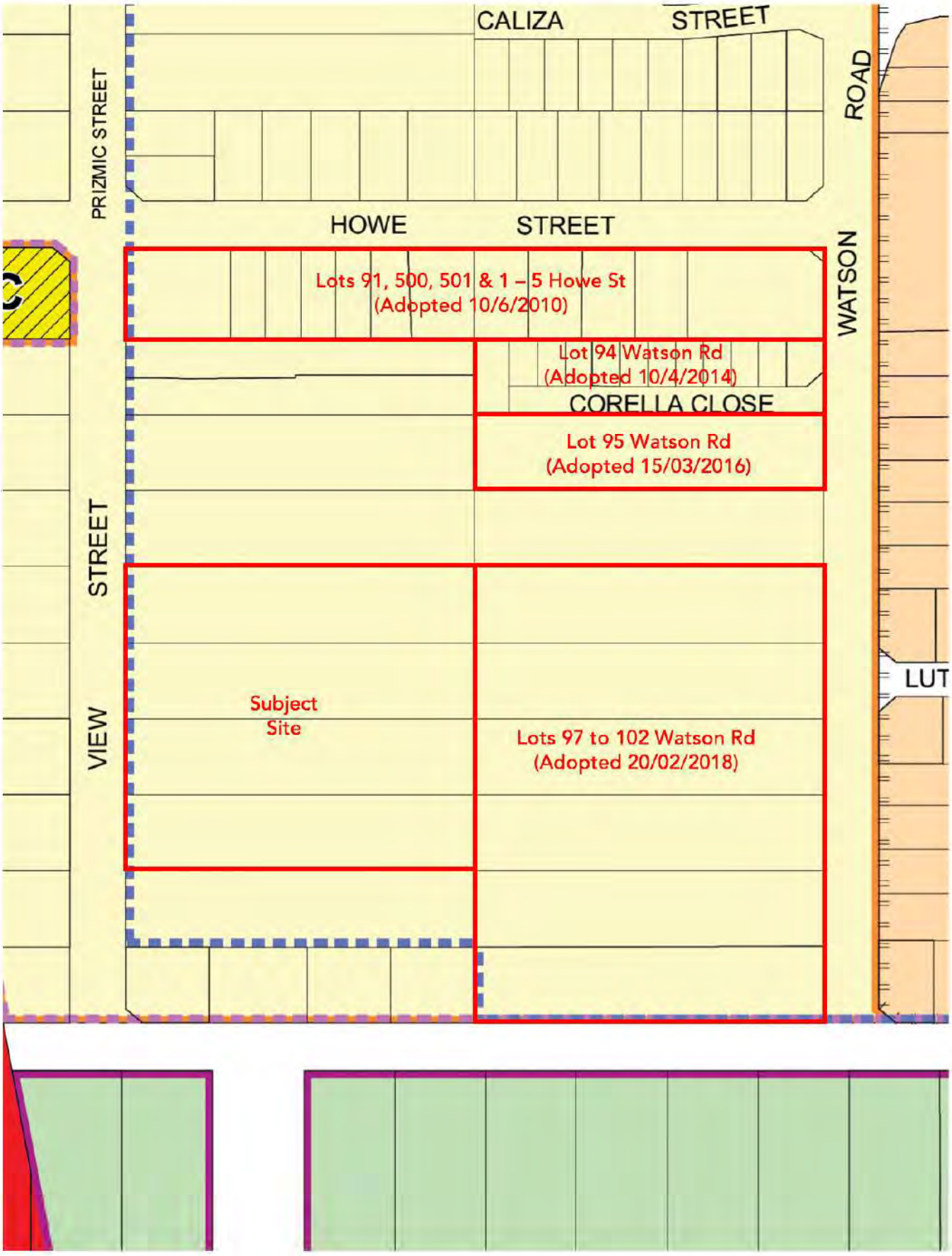


Figure 7
Adopted Structure Plans

STEWART URBAN PLANNING

Reference	0049
Project	Local Structure Plan
Location	Lots 7, 65, 66 & 67 View Street, Beeliar
Date	31 January 2019
Scale	NTS
Map Source	City of Cockburn

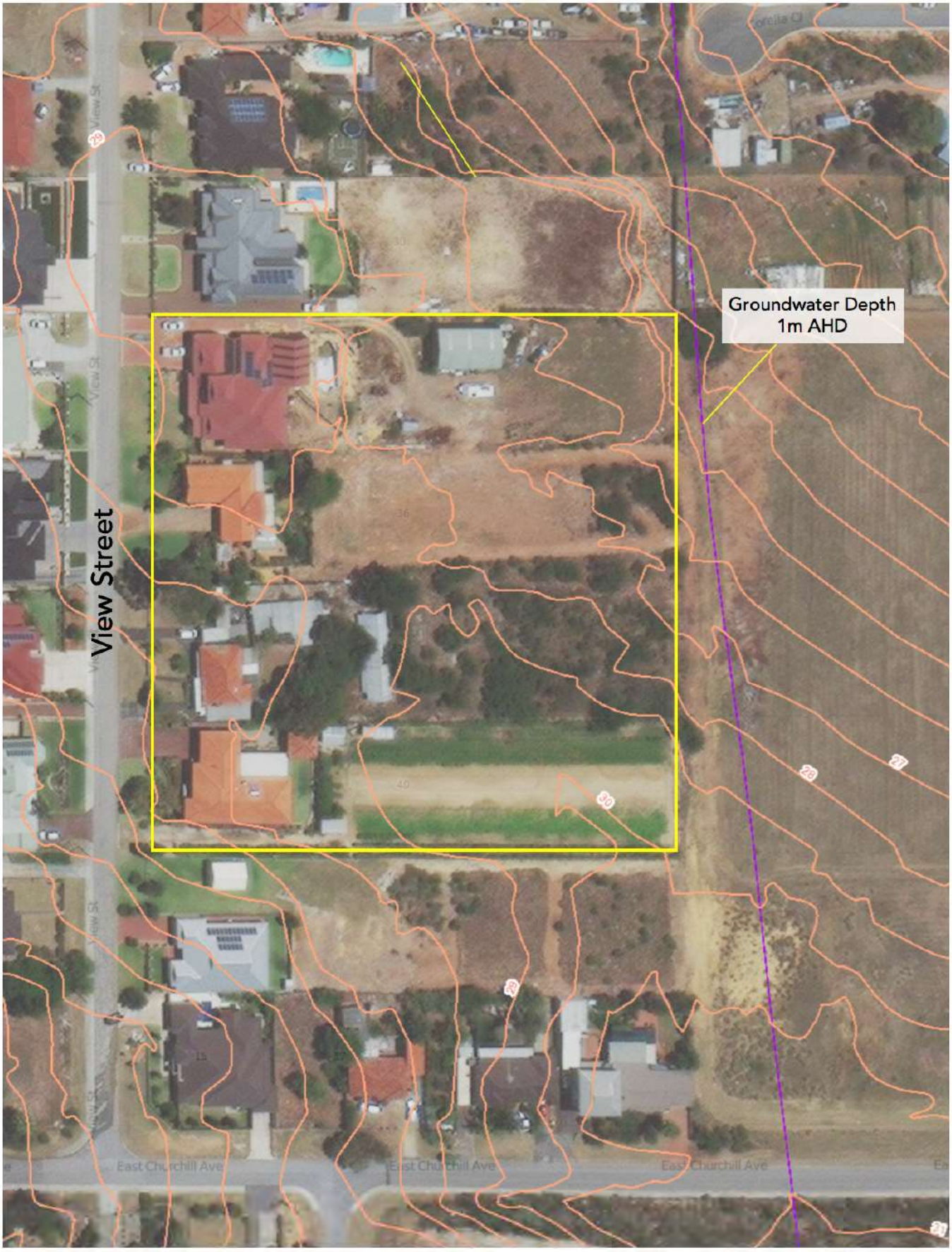
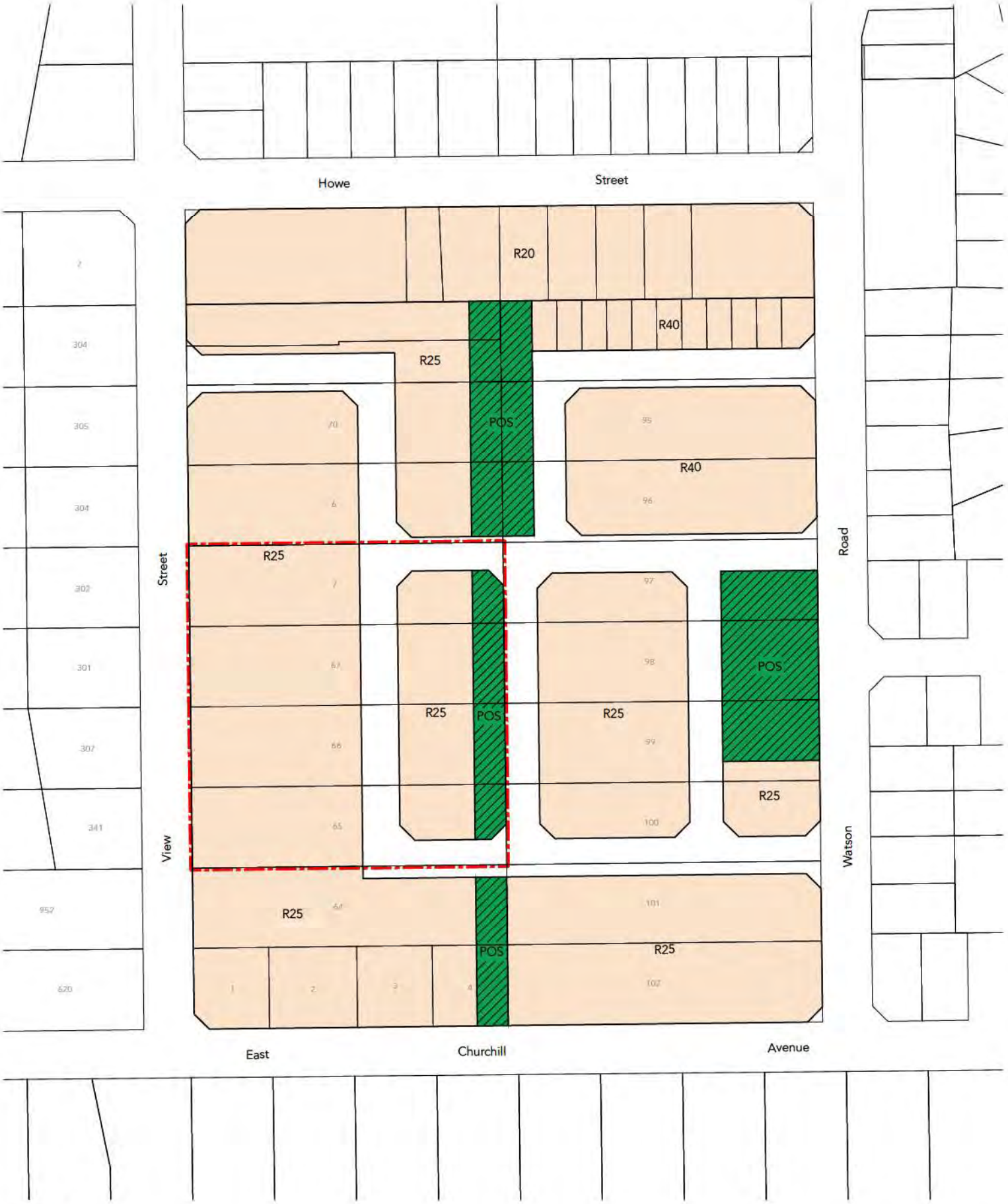


Figure 8

Perth Groundwater Atlas

STEWART URBAN PLANNING

Reference	0049
Project	Local Structure Plan
Location	Lots 7, 65, 66 & 67 View Street, Beeliar
Date	31 January 2019
Scale	NTS
Map Source	Dep't of Water & Environment Regulation



Legend

Local Scheme Reserves

- Parks and Recreation
- Local Road

Local Scheme Zones

- Residential
- Structure Plan Boundary

Local Structure Plan

Lots 7, 65, 66, & 67 View St. Beeliar

Drawing Number:	02	Project	Local Structure Plan
Revision:	D	Job Reference:	0049
Projection:	MGA50	Date:	20 September 2019
Scale:	1:2000 @ A4		

STEWART URBAN PLANNING

TECHNICAL APPENDICES

Appendix 1 – Feature Survey

01	30/08/2018	EXTRA DISTANCE SHOWN (LOT 66)	B.K.	-	
REV	DATE	REVISION DETAILS	DWN	CHK	

BROOK MARSH LICENSED SURVEYORS
P.O. BOX 91 GOSNELLS 6990

DRAWN	JOB NUMBER
B.K.	18188
SURVEYED	DATE
G.H./D.C.	8/08/2018
CONTOUR INTERVAL	SCALE
0.25m	1:200
DATUM	CO-ORD SYS.
A.H.D.	PCG94

0 1 2 3 4 5 10 METRES

LEVEL AND FEATURE SURVEY OF
LOTS 65, 66 AND 67 ON P3562 AND LOT 7 ON DP33008
VIEW STREET, BEELIAR

SHEET 1 of 2

CLIENT
PERITAS GROUP

REV. 01

DRAWING FILE: 18188 LF PCG94 REV01 - Drawing001

A1

67
P3562
404.7m²
66
P3562
404.7m²
65
P3562
404.7m²
64
P3562
99
P3562
100
P3562
VIEW STREET
125.73 C/T DIST
32.19 C/T DIST
PERPENDICULAR FROM FRONT BOUNDARY TO END OF BRICK WALL
38.36m
PERPENDICULAR FROM FRONT BOUNDARY TO REAR OF BRICK RETAINING WALL
39.45m
EXISTING BUILDING
SHED
GARAGE
CONCRETE
BRICK RETAINING WALL
LIMESTONE PILLAR RETAINING WALL
COLORBOND FENCE ON TOP
MANY TREES
BANK TOP
BANK BOTTOM
TREE LINE
LEGEND
TREE (LARGER SYMBOL DENOTES LARGER CANOPY)
GRASS TREE
DIAL BEFORE YOU DIG

01	30/08/2018	EXTRA DISTANCE SHOWN (LOT 65)	B.K.	-	
REV	DATE	REVISION DETAILS	DWN	CHK	

BROOK MARSH PTY LTD LICENSED SURVEYORS
P.O. BOX 91 GOSNELLS 6990

DRAWN	JOB NUMBER
B.K.	18188
SURVEYED	DATE
G.H./D.C.	8/06/2018
CONTOUR INTERVAL	SCALE
0.25m	1:200
DATUM	CO-ORD SYS
A.H.D.	PCG94

METRES

LEVEL AND FEATURE SURVEY OF
LOTS 65, 66 AND 67 ON P3562 AND LOT 7 ON DP33008
VIEW STREET, BEELIAR

SHEET 2 of 2

CLIENT
PERITAS GROUP

REV.
01

DRAWING FILE: 18188 LF PCG94 REV01 - Drawing002

A1

Appendix 2 – Acoustic Assessment

Enquiries: Michael Ferguson
michael@gabriels.net.au
Ph: (08) 9474 5966
23rd October 2018

Project No.: 18-066C

STEWART URBAN PLANNING
123 Aberdeen Street
Northbridge WA 6003

Attention: Alan Stewart

VIEW STREET, BEELIAR
PROPOSED SUBDIVISION

STATE PLANNING POLICY 5.4 SCREENING ASSESSMENT

1. INTRODUCTION

On behalf of Stewart Urban Planning, Gabriels Hearne Farrell Pty Ltd has been requested to prepare a screening assessment for the proposed subdivision on View Street, Beeliar. This assessment was undertaken in accordance with the State Planning Policy 5.4 - *"Road and Rail Transport and Freight Considerations in Land Use Planning"*. The purpose of this screen assessment was to provide initial feedback on the noise levels present at the proposed subdivision lots in accordance with the guidelines Noise Target and Noise Limit.

2. PROPOSED SITE & MONITOR LOCATION

The proposed subdivision on View Street is as follows:

Image 01 – Aerial Imagery of Proposed Subdivision & Logger Location

The location of the long term noise level monitor can be seen in the inset image, placed in the front yard of 36 View St.

In addition to the long term monitoring, 15 minute data was simultaneously collected at a ground height of 1.5m as well as 4.5m, to simulate any potential first floor receiver positions.

3. CRITERIA

The State Planning Policy 5.4 - *"Road and Rail Transport Noise and Freight Considerations in Land Use Planning"*, establishes criteria in terms of an Outdoor Noise Levels.

Outdoor Noise Level Criteria		
Time of Day	**Noise Target**	**Noise Limit**
Day - 16 Hour (6am to 10pm)	L_{Aeq}(day) = 55 dB	L_{Aeq}(day) = 60 dB
Night - 8 Hour (10pm to 6am)	L_{Aeq}(night) = 50 dB	L_{Aeq}(night) = 55 dB

Table 01 –SPP 5.4 Outdoor Noise Level Criteria

The above levels are for average external noise levels (L_{Aeq}) measured over the whole of the day or night period. The 5 dB difference between the target and limit is referred to as the margin. Where noise levels fall either within this margin or above the Limit, the State Planning Policy 5.4 (SPP) requires the developer to implement noise mitigation measures with a view to achieving the noise target in at least one outdoor living area, if this is not practical, at least within the Margin.

4. WEATHER CONDITIONS

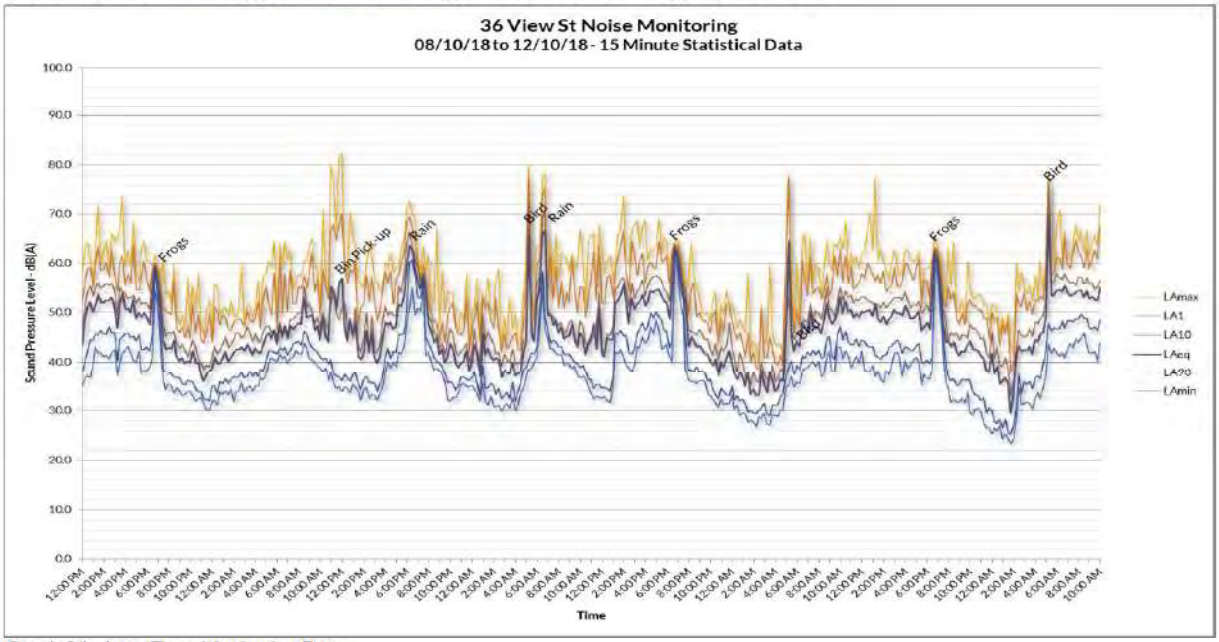
During the monitoring period the meteorological information was as follows:

METEOROLOGICAL CONDITIONS - BASED ON PERTH MONITORING STATION												
	Temp			**9am Wind**			**3pm Wind**			**Max Wind Gust**		
Date / Day	**Min** °C	**Max** °C	**Rain** mm	**Dir**	**Spd** Km/h	**RH** %	**Dir**	**Spd** Km/h	**RH** %	**Time**	**Dir**	**Spd** Km/h
18/10/18 - Monday	13.1	26.7	0	ESE	9	65	SE	4	46	19:04	SSE	28
19/10/18 - Tuesday	14.9	29.7	0	ENE	13	55	ESE	15	31	09:52	NE	33
20/10/18 - Wednesday	16.8	27.6	4.8	E	11	58	W	13	44	00:48	ENE	30
21/10/18 - Thursday	13.9	24.1	0.2	NNW	9	68	WNW	13	49	12:20	WNW	28
22/10/18 - Friday	17.0	20.3	0.2	SW	13	75	W	11	69	09:48	SW	28

Table 02 –Meteorological Conditions during Monitoring Period

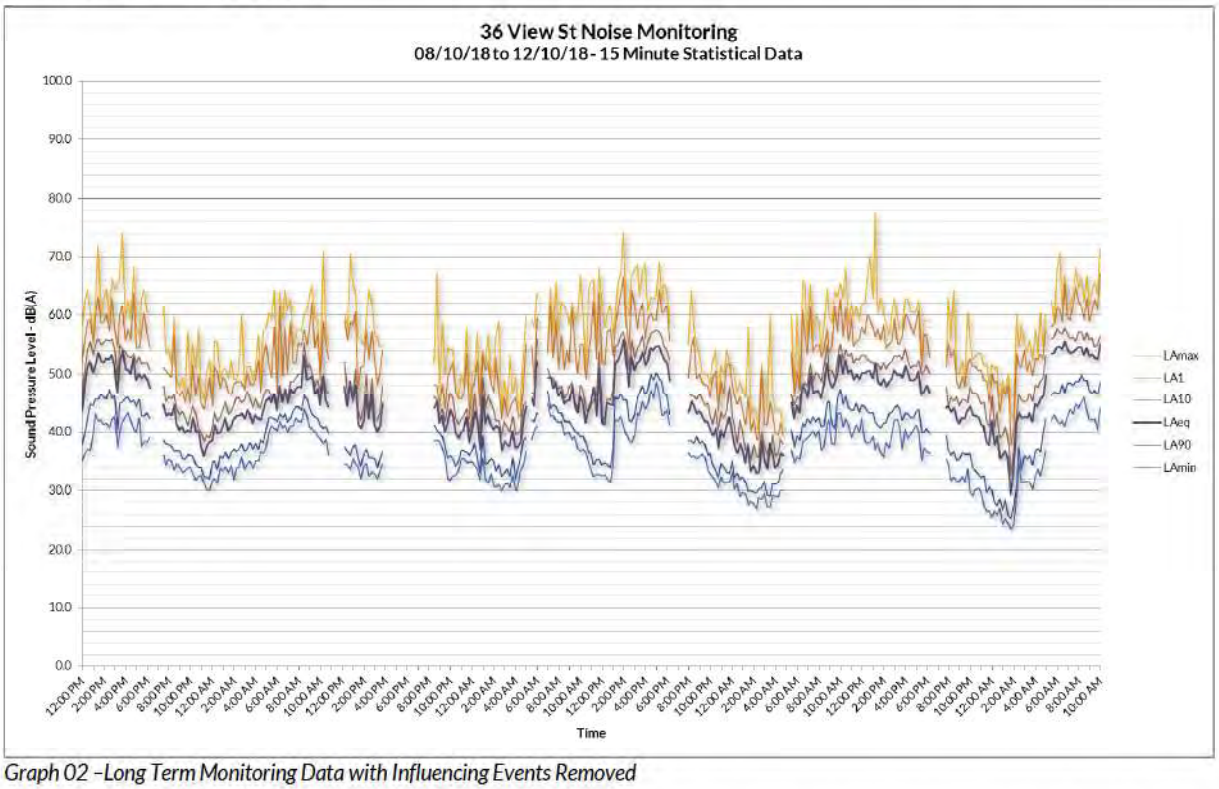
5. NOISE MONITORING DATA

The results of the long term monitoring can be seen in the graph below:



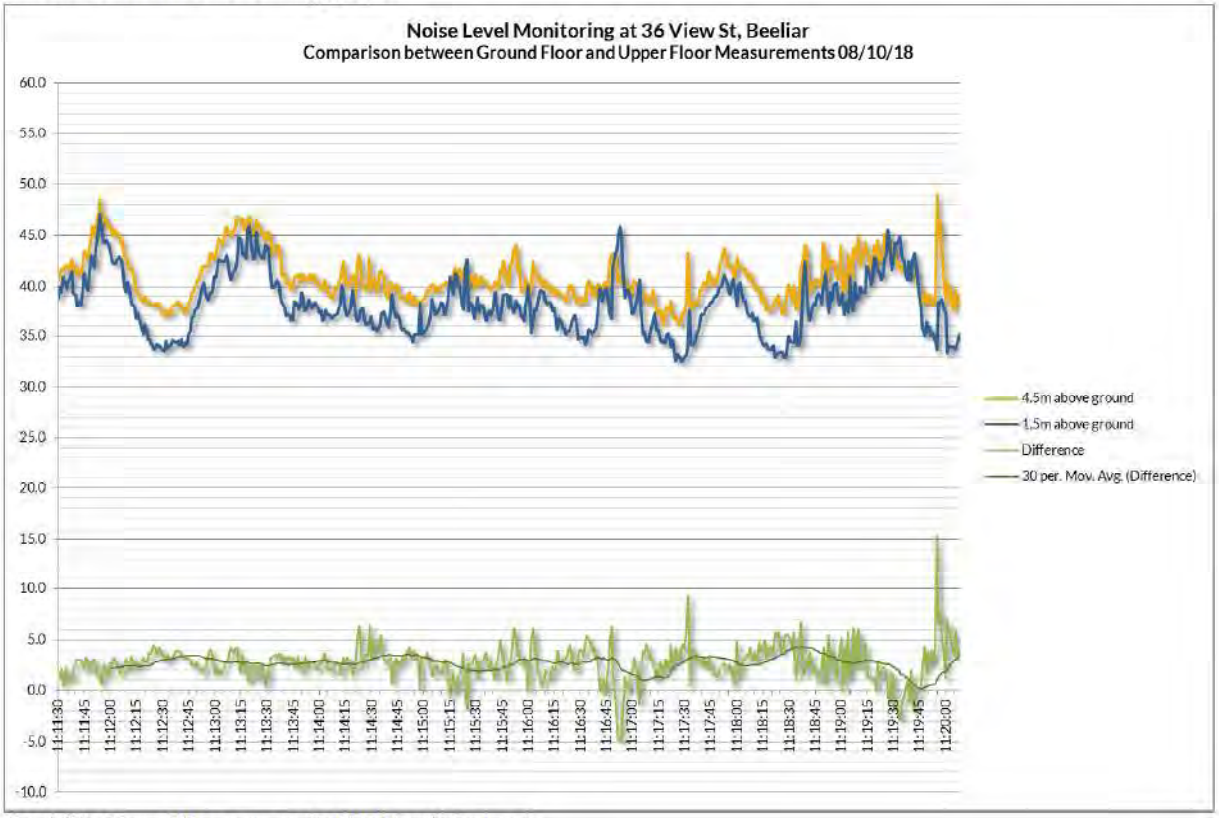
Graph 01 –Long Term Monitoring Data

It can be seen in the above graph that there were some instances where frogs, birds and rain noise are influencing the monitored noise level. These have been since removed in the averaging calculations, as seen in the following graph:



Graph 02 –Long Term Monitoring Data with Influencing Events Removed

The results of the measurements undertaken and ground level compared to potential first floor levels can be seen in the following graph:



Graph 03 –Ground Floor compared to First Floor Noise Levels

6. RESULTS OF MONITORING & CONCLUSION

The results of these measurements are as follows:

- L_{Aeq} (day) Ground Floor 48.9 dB(A)
- L_{Aeq} (night) Ground Floor 41.9 dB(A)

Allowing for an average increase in noise level of + 2.7 dB(A) at the first floor receiver positions the results are as follows:

- L_{Aeq} (day) First Floor 51.6 dB(A)
- L_{Aeq} (night) First Floor 44.6 dB(A)

In accordance with the SPP 5.4 Guidelines an allowance for the increase in future traffic volumes must also be taken into account. Therefore a + 2 dB(A) increase is applied to the above calculated noise levels:

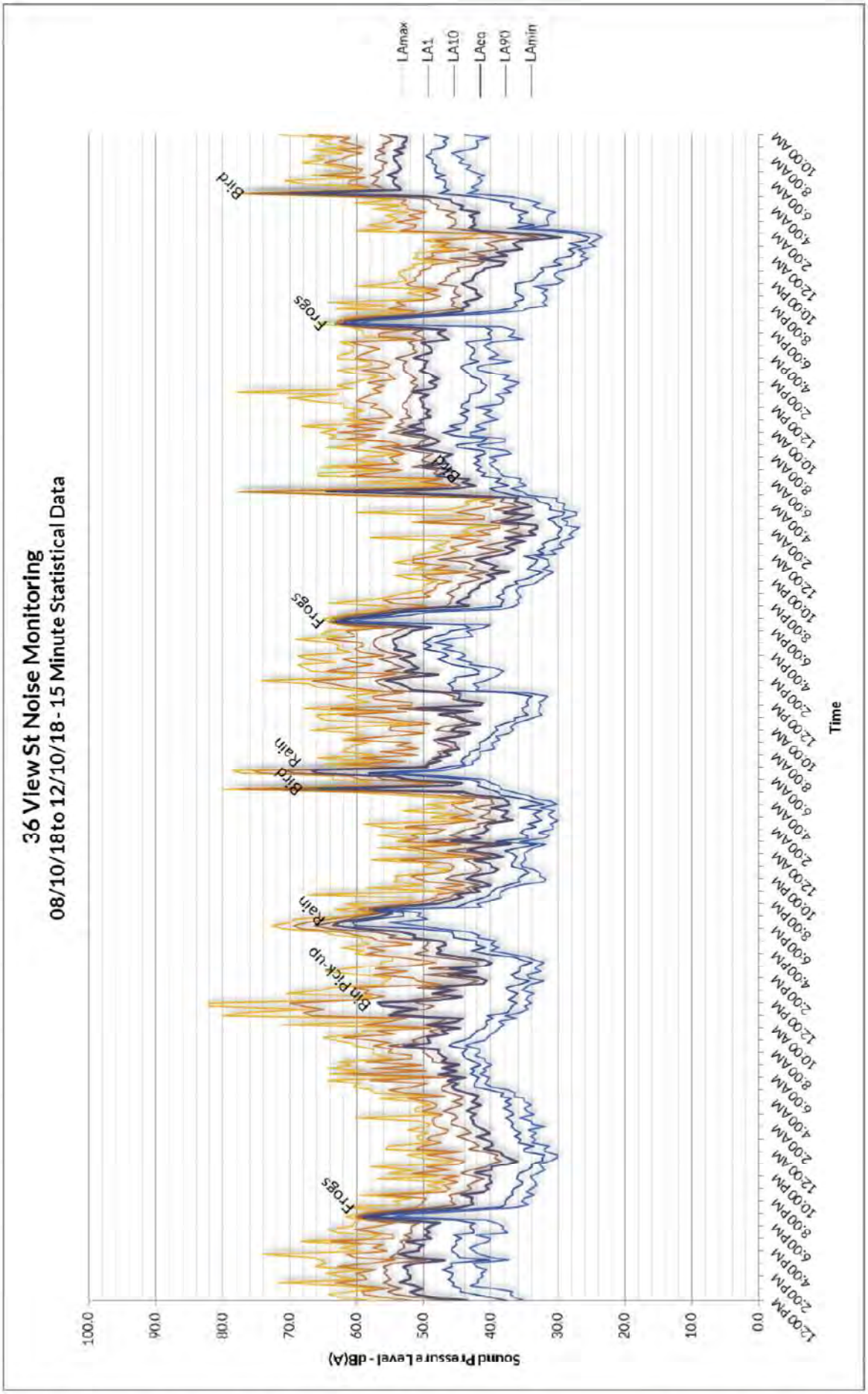
- L_{Aeq} (day) Ground Floor 50.9 dB(A)
- L_{Aeq} (night) Ground Floor 43.9 dB(A)
- L_{Aeq} (day) First Floor 53.6 dB(A)
- L_{Aeq} (night) First Floor 46.6 dB(A)

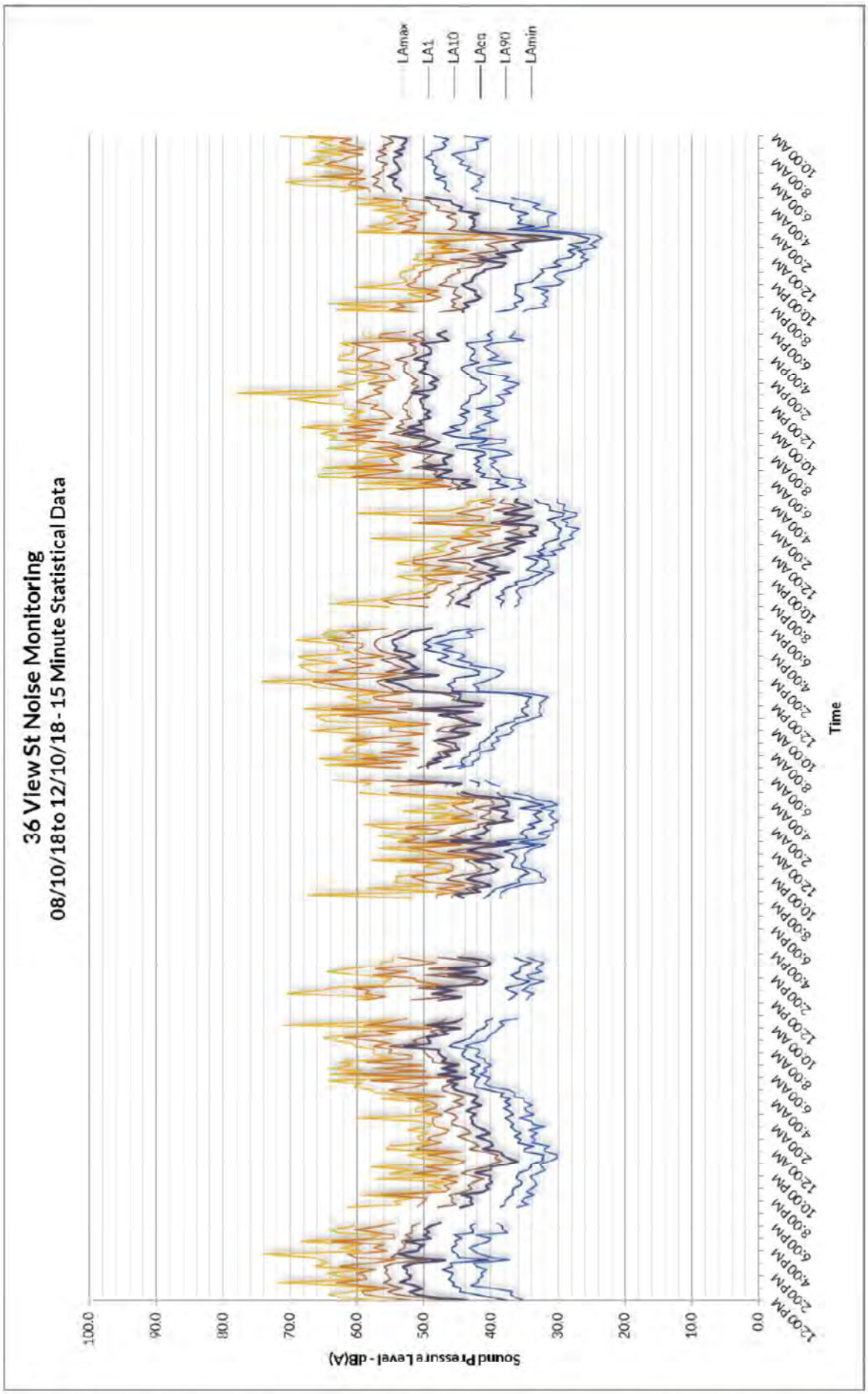
The above results are below the Noise Target within the State Planning Policy 5.4 of less than 55 dB(A) for outdoor areas. Due to this there is no further acoustic consideration required beyond typical residential construction.

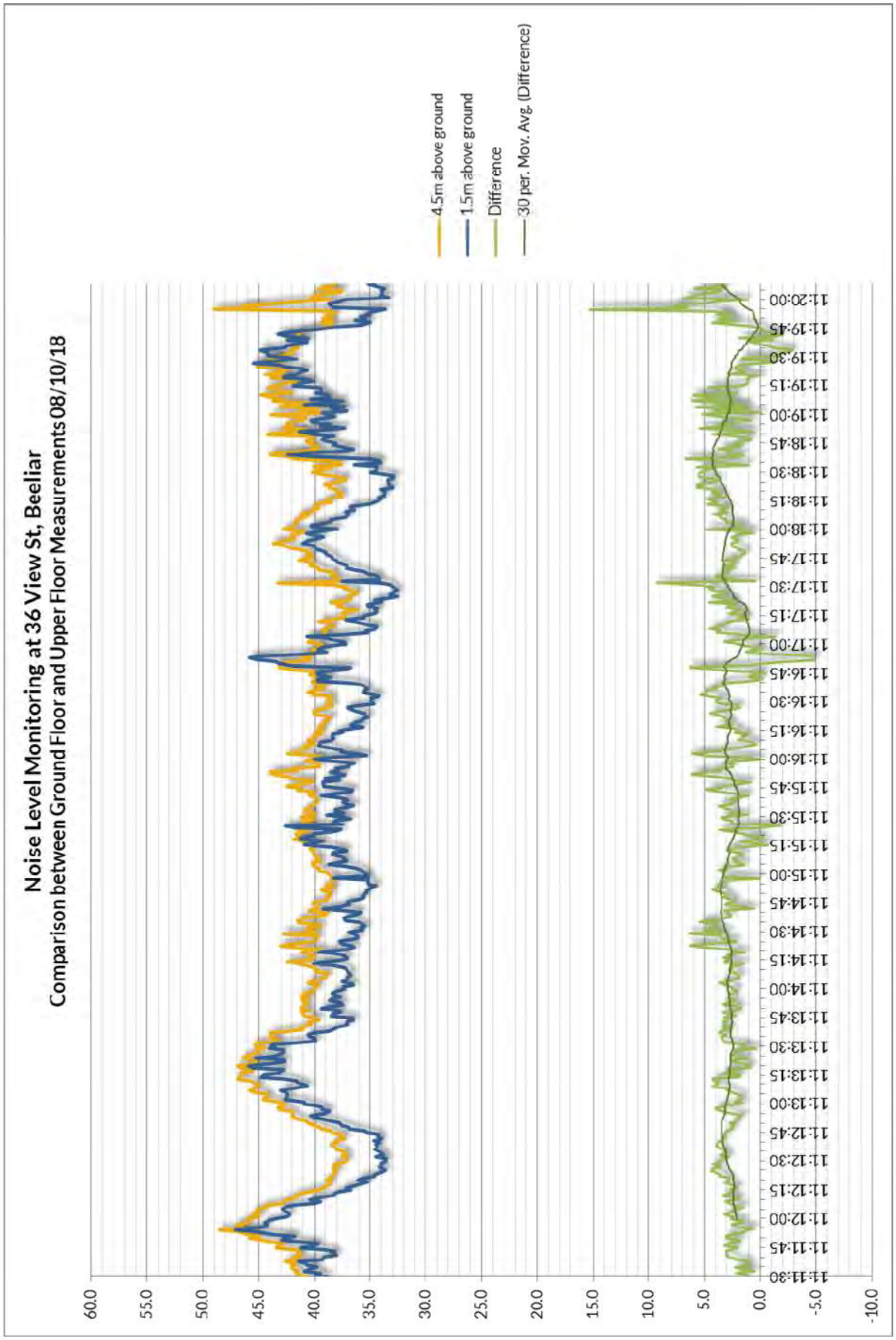
Hopefully the information contained within this report is clear, however if you have any further queries regarding any of this please contact the undersigned on 9474 5966.

Michael Ferguson
Associate Director *B.IntArch(Hons) M.A.A.S.*

GABRIELS HEARNE FARRELL PTY LTD
Member Firm – Association of Australasian Acoustical Consultants
A Unit 3 / 2 Hardy St South Perth WA 6151 P (08) 9474 5966
E michael@gabriels.net.au W gabriels.net.au M 0423 880 388


36 View St Noise Monitoring
08/10/18to 12/10/18 - 15 Minute Statistical Data
LAmax
LA1
LA10
LAeq
LA90
LAmin
Bird
Frogs
Bird
Frogs
Bird
Rain
Rain
Rain
Bin Pick-up
Frogs
Sound Pressure Level - dB(A)
100.0
90.0
80.0
70.0
60.0
50.0
40.0
30.0
20.0
10.0
0.0
Time


36 View St Noise Monitoring
08/10/18to 12/10/18 - 15 Minute Statistical Data
LAmax
LA1
LA10
LAeq
LA90
LAmin
Sound Pressure Level - dB(A)
100.0
90.0
80.0
70.0
60.0
50.0
40.0
30.0
20.0
10.0
0.0
Time


Noise Level Monitoring at 36 View St, Beeliar
Comparison between Ground Floor and Upper Floor Measurements 08/10/18
4.5m above ground
1.5m above ground
Difference
30 per. Mov. Avg. (Difference)
60.0
55.0
50.0
45.0
40.0
35.0
30.0
25.0
20.0
15.0
10.0
5.0
0.0
-5.0
-10.0
11:20:00
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11:12:45
11:12:30
11:12:15
11:12:00
11:11:45
11:11:30

Appendix 3 – Bushfire Management Plan

ecological AUSTRALIA

Bushfire Management Plan

Lots 7, 65, 66 & 67 View St, Beeliar

Prepared for
Peritas Civil Pty Ltd

10 October 2018

DOCUMENT TRACKING

Item	Detail
Project Name	Bushfire Management Plan, Lots 7, 65, 66 & 67 View St, Beeliar
Project Number	18PER-11429
Project Manager	Daniel Panickar Level 1, 235 St Georges Terrace Perth WA 6000
Prepared by	Stephen Moore
Reviewed by	Daniel Panickar (BPAD37802-L2)
Approved by	Daniel Panickar (BPAD37802-L2)
Status	DRAFT
Version Number	V2
Last saved on	10 October 2018

This report should be cited as 'Eco Logical Australia, October 2018. *Bushfire Management Plan, Lots 7, 65, 66 & 67 View St, Beeliar.* Prepared for Peritas Civil Pty Ltd.'

Contents

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1 Introduction

1.1 Proposal details

Eco Logical Australia (ELA) was commissioned by Peritas Civil Pty Ltd to prepare a Bushfire Management Plan (BMP) to support a Local Structure Plan for Lots 7, 65, 66 & 67 View St, Beeliar (hereafter referred to as the subject site; **Figure 1**). Importantly, development of the subject site will only be undertaken once land to the east is developed and provides direct vehicular access onto Watson Road. This adjacent development has been recently approved (WAPC approval reference number 155966).

The subject site is partially within a designated bushfire prone area as per the *Western Australia State Map of Bush Fire Prone Areas* (DFES 2018; **Figure 2**), which triggers bushfire planning requirements under *State Planning Policy 3.7 Planning in Bushfire Prone Areas* (SPP 3.7; WAPC 2015) and reporting to accompany submission of the Structure Plan in accordance with the associated *Guidelines for Planning in Bushfire Prone Areas v 1.3* (the Guidelines; WAPC 2017).

This assessment has been prepared by ELA Bushfire Consultant, Stephen Moore and quality assurance undertaken by ELA Senior Bushfire Consultant, Daniel Panickar (FPAA BPAD Level 2 Certified Practitioner No. BPAD37802-L2).

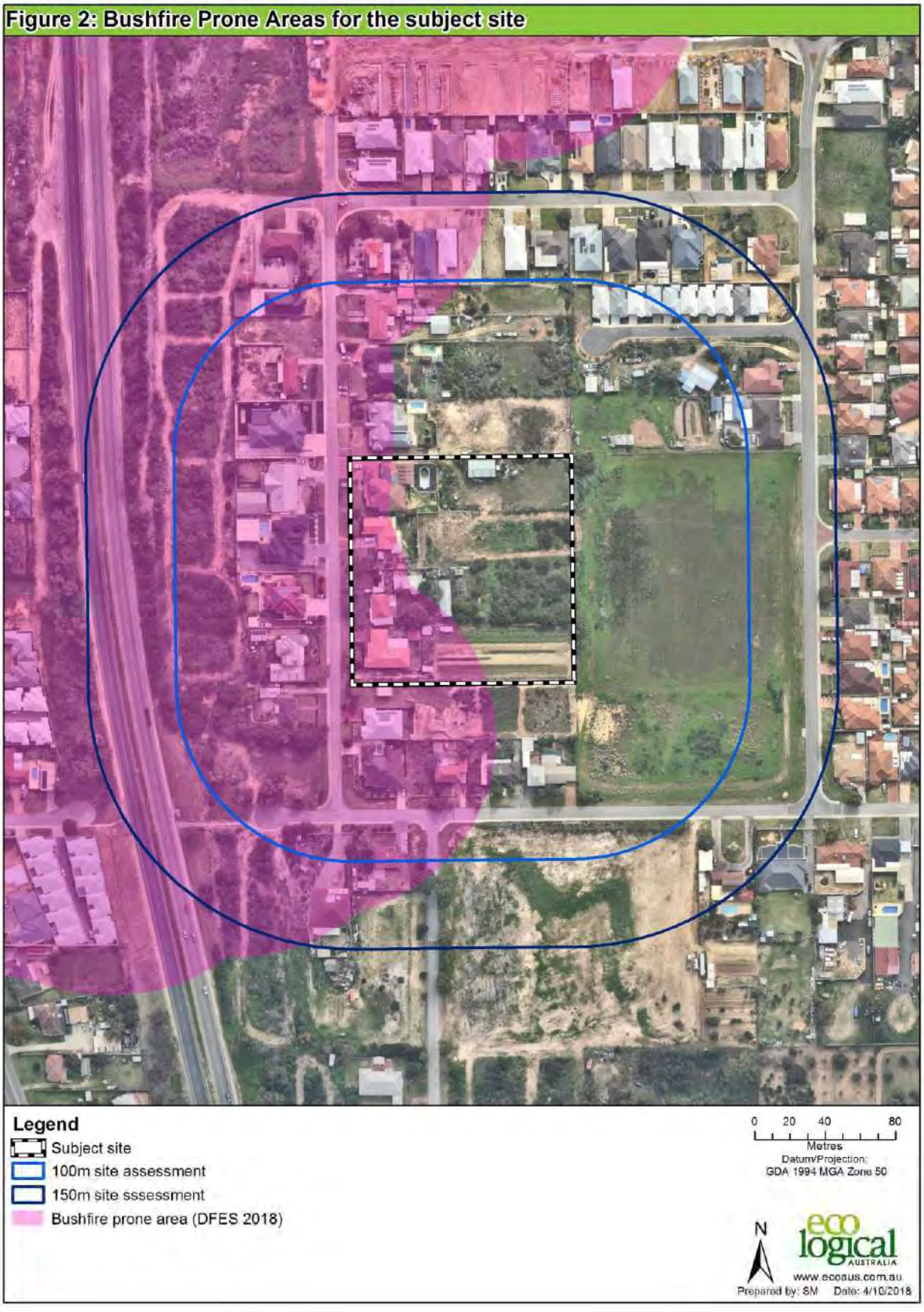
1.2 Purpose and application of the plan

The primary purpose of this BMP is to act as a technical supporting document to inform planning assessment.

This BMP is also designed to provide guidance on how to plan for and manage the bushfire risk to the subject site through implementation of a range of bushfire management measures in accordance with the Guidelines.

Figure 1: Site overview

Figure 2: Bushfire Prone Areas for the subject site



1.3 Environmental Considerations

Some bushfire prone areas also have high biodiversity values. SPP 3.7 policy objective 5.4 recognises the need to consider bushfire risk management measures alongside environmental, biodiversity and conservation values.

Any relevant environmental issues will be assessed during the Local Structure Plan process and any required environmental approvals will be obtained prior to commencement of works.

No revegetation is proposed within the development, however if this changes, it will be addressed in future BMPs. The proposed Pedestrian Access Way and Public Open Space will be landscaped with native low fuel species in accordance with bushfire planning requirements.

2 Bushfire Assessment Results

2.1 Assessment inputs

The following section is a consideration of spatial bushfire risk and has been used to inform the bushfire assessment in this report.

2.1.1 General

The subject site is located in the City of Cockburn, located east of Stock Road, and is bound by:

- Established low density residential homes, recent medium density Homes and Howe Street to the north;
- Undeveloped land and Watson Road to the east;
- Established low density residential homes and East Churchill Avenue to the south; and
- Established low density residential homes and View Street to the west.

Visual assessment of the surrounding vegetation within the assessment area did not identify any recent fire scars and fire history was not able to be determined. Accumulation of vegetative matter over time, combined with the moderate to high risk of ignition associated with high levels of public access and proximity to urban areas would potentially facilitate a bushfire occurrence in this area.

2.1.2 Vegetation classification

Vegetation within the subject site and surrounding 150 m (the assessment area) was assessed in accordance with the Guidelines and AS 3959-2009 *Construction of Buildings in Bushfire Prone Areas* (SA 2009) with regard given to the *Visual guide for bushfire risk assessment in Western Australia* (DoP 2016). The site inspection was undertaken on 26 September 2018.

The following vegetation classes and exclusions were identified within the assessment area as depicted in and listed below:

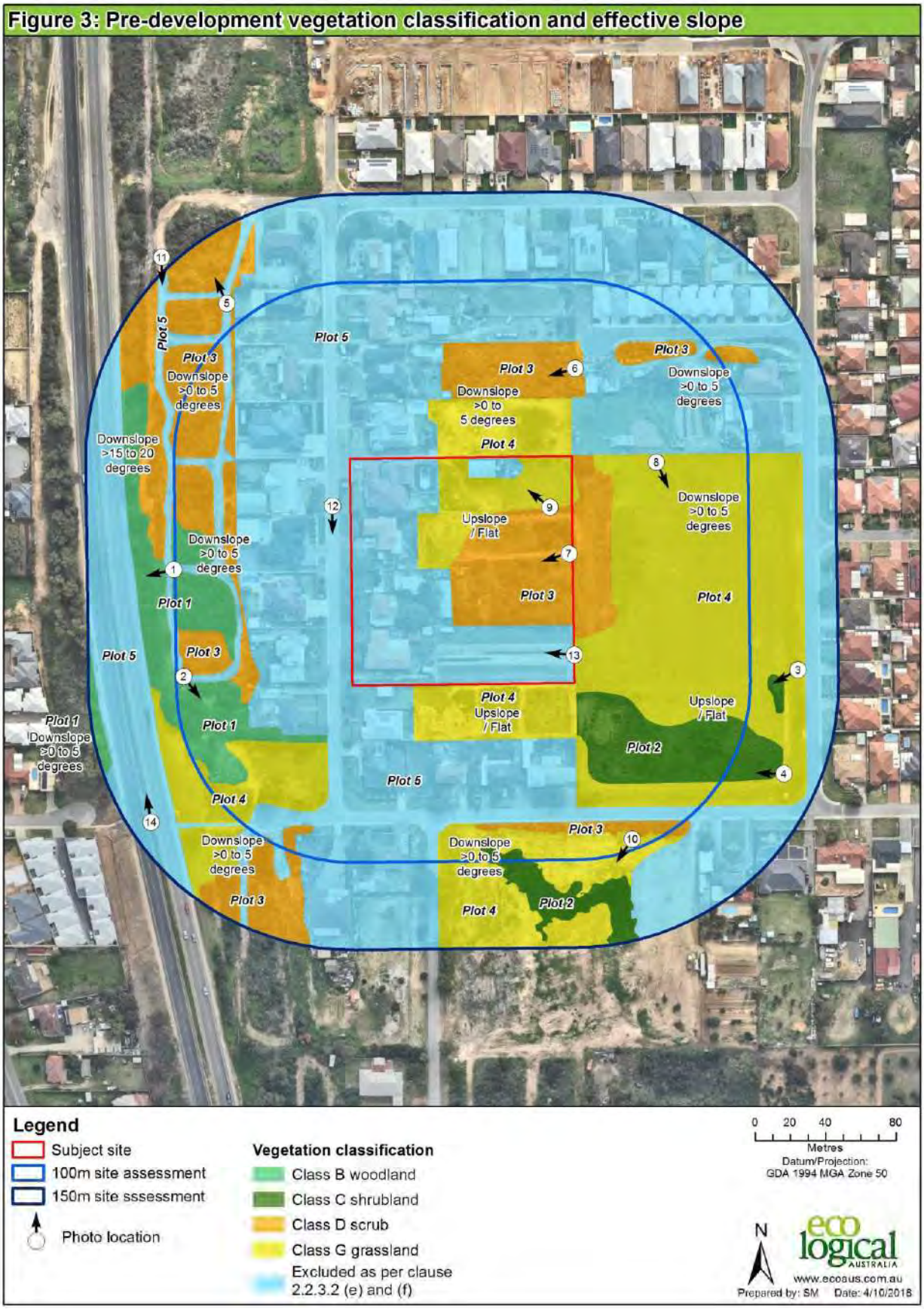
- Class B woodland;
- Class C shrubland;
- Class D scrub;
- Class G grassland; and
- Exclusions as per clause 2.2.3.2 (e) and (f) (i.e. non-vegetated areas and low-threat vegetation).

Photographs relating to each vegetation type are included in **Appendix A**.

2.1.3 Topography and slope under vegetation

Effective slope under vegetation was assessed for a distance of 150 m from the subject site in accordance with the Guidelines and AS 3959-2009. Slope under classified vegetation was assessed as upslope / flat within the subject site, downslope >0 to 5 degrees north and east of the subject site, upslope / flat adjacent to the subject site to the south increasing to downslope >0 to 5 degrees south of East Churchill Avenue, downslope >0 to 5 degrees west of the subject site increasing to downslope >15 to 20 degrees and downslope >0 to 5 degrees west of Stock Road (**Figure 3**).

Figure 3: Pre-development vegetation classification and effective slope



2.2 Assessment outputs

A BHL assessment has been undertaken in accordance with SPP 3.7, the Guidelines and the bushfire assessment inputs in **Section 2.1**.

2.2.1 Bushfire Hazard Level (BHL) assessment

All land located within 150 m of the classified vegetation depicted in **Figure 3** is considered bushfire prone and is subject to a BHL assessment in accordance with AS 3959-2009.

Pre-development BHLs have been assessed for the subject site in accordance with the methodology contained within the Guidelines and incorporates the following factors:

- Vegetation class; and
- Slope under classified vegetation.

Table 1 contains a summary of the BHL assessment for each vegetation class or exclusion. All land within 100 m of Extreme and Moderate BHLs has also been mapped as a Moderate hazard as per the Guidelines, and the final result is depicted in **Figure 4**.

Table 1: Bushfire Hazard Level (BHL) Assessment

Plot	Vegetation Classification	Effective Slope	Bushfire Hazard Level
1	Class B woodland	Downslope >0 to 5 degrees	Extreme
2	Class B woodland	Downslope >15 to 20 degrees	Extreme
3	Class C shrubland	Upslope / flat	Moderate
4	Class C shrubland	Downslope >0 to 5 degrees	Moderate
5	Class D scrub	Upslope / flat	Extreme
6	Class D scrub	Downslope >0 to 5 degrees	Extreme
7	Class D scrub	Downslope >15 to 20 degrees	Extreme
8	Class G grassland	Upslope / flat	Moderate
9	Class G grassland	Downslope >0 to 5 degrees	Moderate
10	Excluded as per clause 2.2.3.2 (e) & (f)	N/A	Low

Clearing and revegetation will be undertaken within the subject site for development purposes, and consequently the pre-development BHLs are subject to change. A post-development BHL assessment is provided in **Figure 5** based on expected changes to vegetation within the subject site.

Figure 4: Pre-development BHL assessment

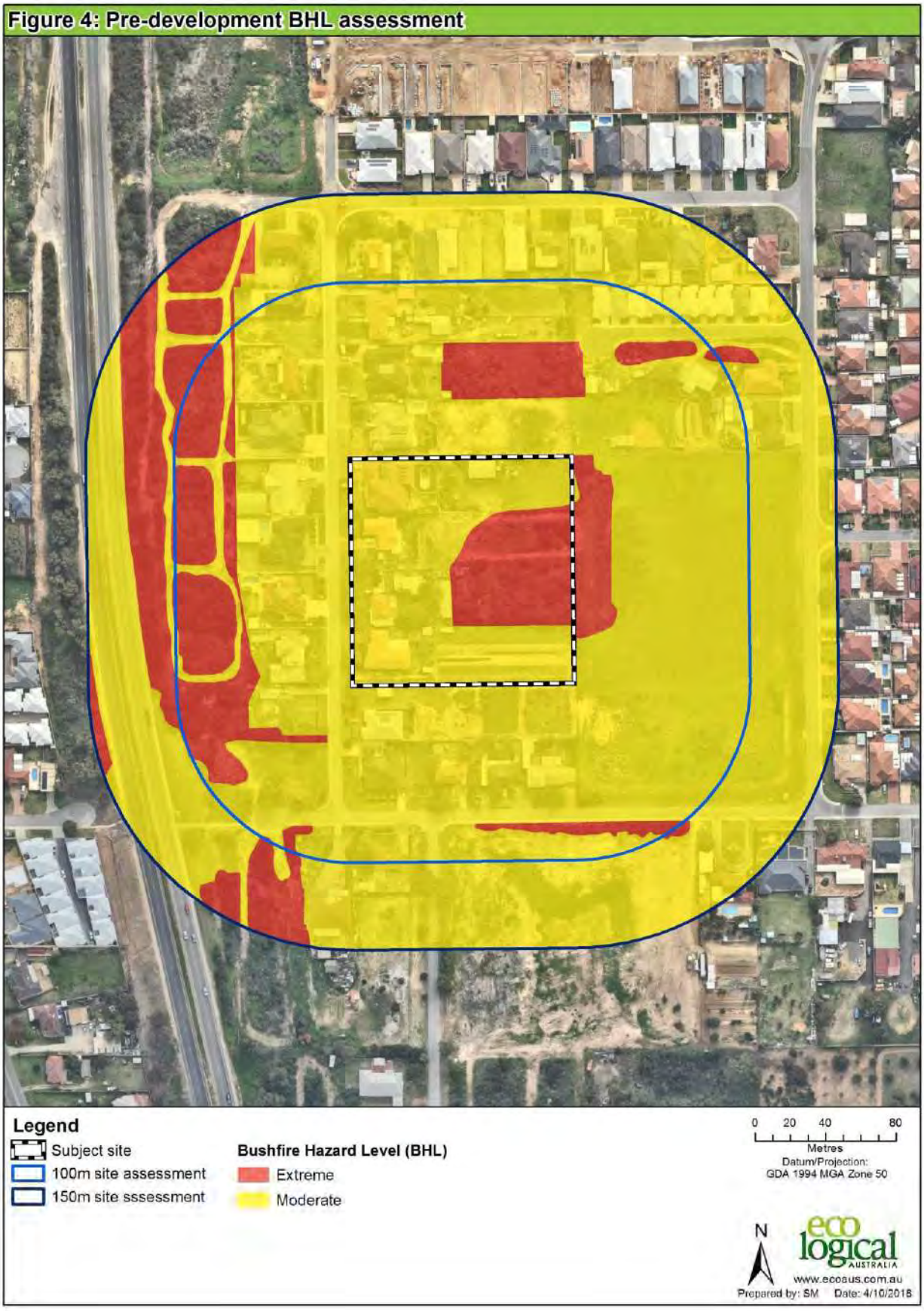
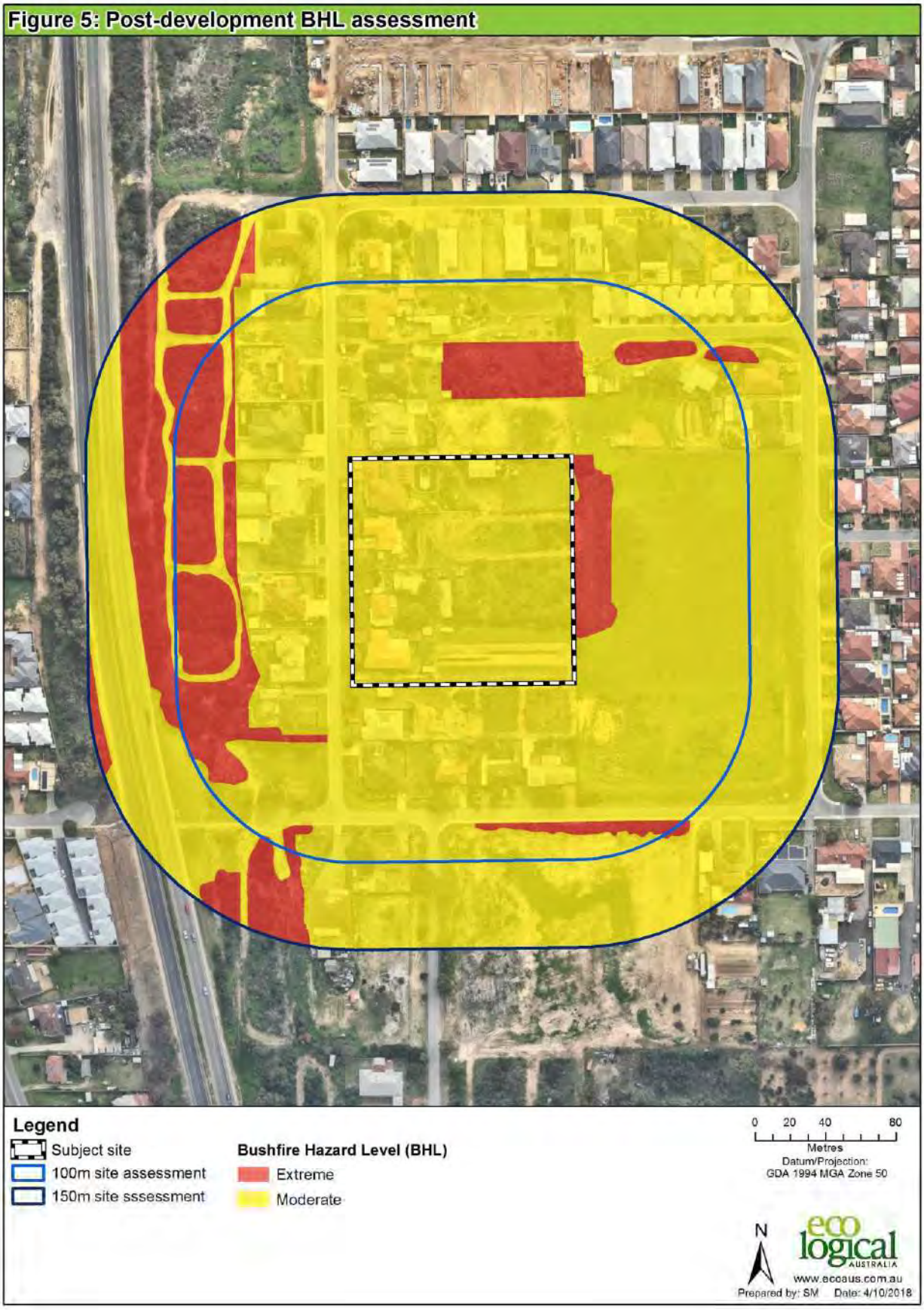


Figure 5: Post-development BHL assessment



3 Identification of Bushfire Hazard issues

The on-site vegetation extent is proposed to be cleared to enable development of a significant urban built footprint amongst areas of landscaped/managed Public Open Space (POS) and various easements. Therefore, for the purposes of strategic level planning, ELA does not consider the current on-site vegetation extent to be a bushfire hazard issue post-development, since these hazards can be managed through a staged clearing process, adequate separation of future built assets from classified vegetation, and ongoing fuel management that can be undertaken in and around individual development stages.

On the basis of the above information, ELA considers that the bushfire hazards within and adjacent to the subject site and the associated bushfire risk is readily manageable through standard management responses and compliance with acceptable solutions outlined in the Guidelines and AS 3959-2009. These management measures will need to be factored into the development design as early as possible to ensure a suitable, compliant and effective bushfire management outcome is achieved to ensure protection of future life and property assets.

Demonstration of compliance with the relevant requirements of SPP 3.7, the Guidelines and AS 3959-2009 at future planning stages will also depend on the developer's ability to coordinate the timing and staging of clearing and development works within the subject site with those developments proposed on adjacent landholdings in the aim of avoiding bushfire impacts from temporary retained vegetation.

4 Assessment against the Bushfire Protection Criteria

4.1 Compliance

The proposed Structure Plan is required to comply with policy measures 6.2 and 6.3 of SPP 3.7 and the Guidelines. Implementation of this BMP is expected to meet objectives 5.1 - 5.4 of SPP 3.7.

Bushfire management measures have been devised for the proposed development in accordance with Guideline acceptable solutions to meet compliance with bushfire protection criteria.

The 'acceptable solutions assessment' is provided below to assess the proposed bushfire management measures against each bushfire protection criteria in accordance with the Guidelines. The assessment demonstrates that the proposed measures meet the intent of each element of the bushfire protection criteria. **Figure 6** depicts bushfire management strategies where necessary.

Table 2: Summary of solutions used to achieve bushfire performance criteria

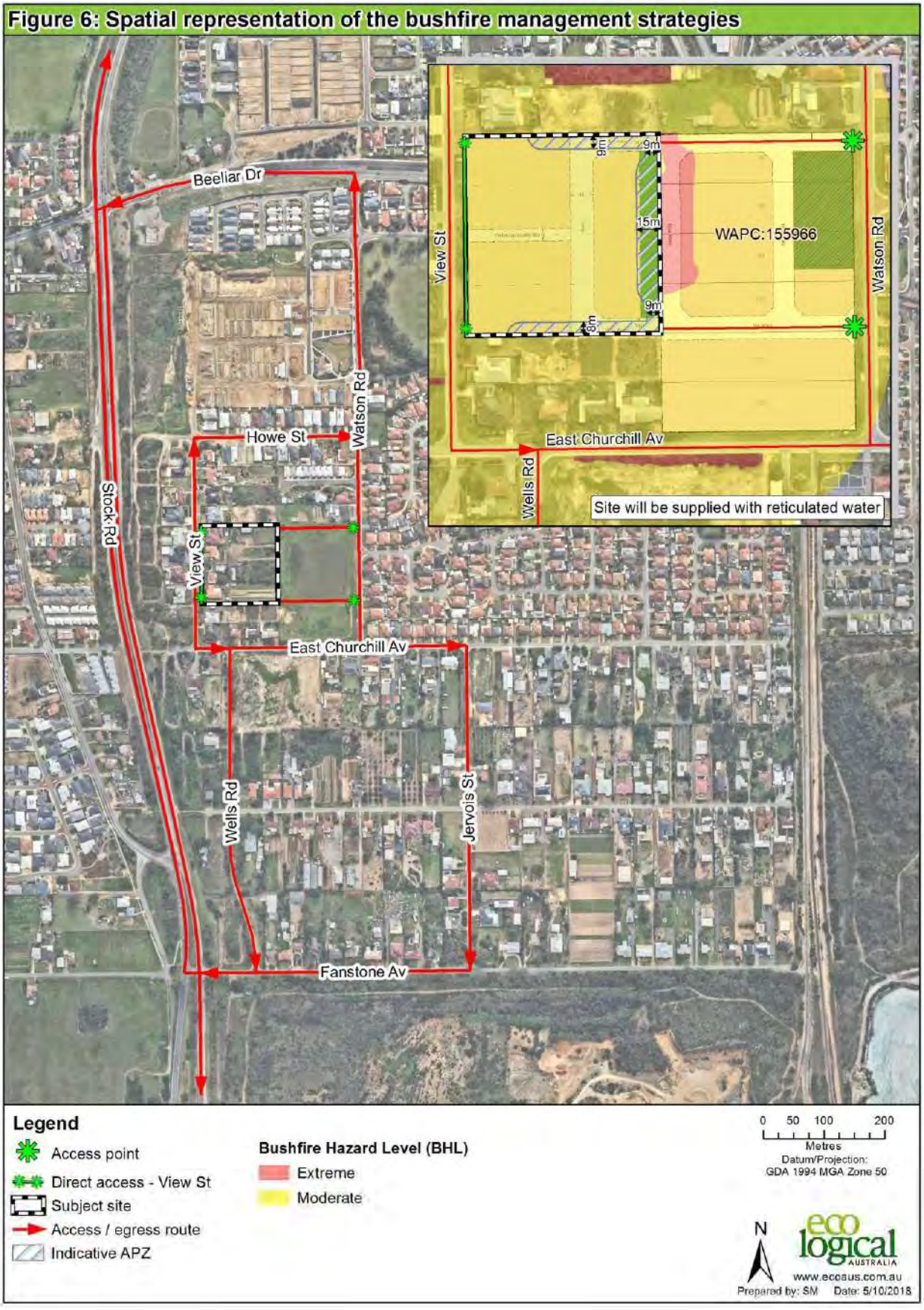
Bushfire Performance Criteria	AS	PS	N/A	Proposed bushfire management strategies
Element 1: Location A1.1 Development location	☒	☐	☐	Post-development, all buildings within the subject site will be situated in areas subject to BHLs of moderate (refer to **Figure 6**). The proposed development is considered to be compliant with A1.1.
Element 2: Siting and design of development A2.1 Asset Protection Zone (APZ)	☒	☐	☐	As the lot layout is currently unconfirmed, APZs are unable to be prescribed at this level of planning. APZs will be defined in BMPs supporting future planning applications to ensure that all future lots will be subject to a BAL rating of BAL-29 or lower. **Figure 6** demonstrates that APZs are able to be accommodated within road reserves, maintained Public Open Space areas, lot setbacks etc.
Element 3: Vehicular access A3.1 Two access routes	☒	☐	☐	There are currently two vehicular access points within the proposed subject site and direct access to View Street along the western boundary that join the existing road network (refer to **Figure 6**). Development of the subject site will only be undertaken once land to the east is developed and provides direct vehicular access onto Watson Road. This adjacent development has been recently approved (WAPC approval reference number 155966).

Bushfire Performance Criteria	AS	PS	N/A	Proposed bushfire management strategies
				The proposed development will be compliant with A3.1 on completion of adjacent development.
Element 3: Vehicular access A3.2 Public Road	☒	☐	☐	The internal roads within the subject site will ensure that access and egress by civilians and emergency services can be undertaken in a safe manner. These roads allow for regular passing and turn-around areas. Internal roads within the subject site area subject to a prior development, WAPC approval reference number 155966. All public roads will comply with vehicular access requirements (refer to **Appendix C**).
Element 3: Vehicular access A3.3 Cul-de-sac	☐	☐	☒	No cul-de-sacs are proposed as part of the development.
Element 3: Vehicular access A3.4 Battle-axe	☐	☐	☒	No battle-axe lots are proposed as part of the development.
Element 3: Vehicular access A3.5 Private Driveway longer than 50 m	☐	☐	☒	No private driveways longer than 50 m are proposed as part of the development.
Element 3: Vehicular access A3.6 Emergency Access way	☐	☐	☒	No emergency access way routes are proposed or required as part of the development.
Element 3: Vehicular access A3.7 Fire-service access route	☐	☐	☒	No fire service access routes are proposed or required as part of the development.
Element 3: Vehicular access A3.8 Firebreak width	☒	☐	☐	There are currently 3 m wide firebreaks around the perimeter of the existing lots, over 4,047 m^2, within the subject site that comply with the current City of Cockburn Fire Control Notice. Future BMPs, to support subsequent planning applications, will address this requirement in greater detail. The proposed development is considered to be compliant with A3.8.
Element 4: Water A4.1 Reticulated areas	☒	☐	☐	The subject site will be connected to a reticulated water supply. The proposed development is considered to be compliant with A4.1. A4.2 and A4.3 are not applicable to this proposed development.

4.2 Additional management strategies

Future demonstration of compliance with the relevant requirements of SPP 3.7, the Guidelines and AS 3959-2009 will depend on the developer's ability to coordinate the timing of development works within the subject site. Updated BMPs will be prepared to support subsequent planning applications where relevant and will contain re-assessments of bushfire risk including Bushfire Attack Level assessments etc.

Figure 6: Spatial representation of the bushfire management strategies



5 Responsibilities for Implementation and Management of Bushfire Measures

Implementation of the BMP applies to Peritas Civil Pty Ltd, the City of Cockburn, and future landowners to ensure bushfire management measures are adopted and implemented on an ongoing basis. This BMP has been prepared as a strategic guide to demonstrate how development compliance will be delivered at future planning stages in accordance with the Guidelines. In this respect, management measures documented in **Section 4**, where applicable, will be incorporated into development design as early as possible and confirmed through subdivision design. Therefore, aside from the revision of this BMP or preparation of a BMP addendum to accompany future subdivision applications, there are no further items to implement, enforce or review at this stage of the planning process.

The revised BMP or addendum to this BMP is required to meet the relevant commitments outlined in this strategic level BMP, address the relevant requirements of SPP 3.7 (i.e. Policy Measure 6.4) and demonstrate in detail how the proposed development will incorporate the relevant acceptable solutions to meet the performance requirements of the Guidelines.

6 Conclusion

In the author's professional opinion, the bushfire protection requirements listed in this assessment provide an adequate standard of bushfire protection for the proposed development. As such, the proposed development is consistent with the aim and objectives of SPP 3.7 and associated guidelines and is recommended for approval.

Daniel Panickar
Senior Bushfire Consultant
FPAA BPAD Certified Practitioner
No. BPAD37802-L2

References

Department of Fire and Emergency Services (DFES). 2018. *Map of Bush Fire Prone Areas*, [Online], Government of Western Australia, available from: http://www.dfes.wa.gov.au/regulationandcompliance/bushfireproneareas/Pages/default.aspx

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Western Australian Planning Commission (WAPC). 2015. *State Planning Policy 3.7 Planning in Bushfire Prone Areas*. WAPC, Perth.

Western Australian Planning Commission (WAPC). 2017. *Guidelines for Planning in Bushfire Prone Areas Version 1.3 (including appendices)*. WAPC, Perth.

Appendix A Plates

Plot	Photo ID	Photo and vegetation class
1	1	 **Class B woodland**
1	2	 **Class B woodland**

Plot	Photo ID	Photo and vegetation class
2	3	 **Class C shrubland (vegetation less than 2 m in height)**
2	4	 **Class C shrubland (vegetation less than 2 m in height)**

Plot	Photo ID	Photo and vegetation class
3	5	 **Class D scrub**
3	6	 **Class D scrub**

Plot	Photo ID	Photo and vegetation class
3	7	 **Class D scrub**
4	8	 **Class G grassland**

Plot	Photo ID	Photo and vegetation class
4	9	 **Class G grassland**
4	10	 **Class G grassland**

Plot	Photo ID	Photo and vegetation class
5	11	 **Excluded under 2.2.3.2 (e) and (f)**
5	12	 **Excluded under 2.2.3.2 (e) and (f)**

Plot	Photo ID	Photo and vegetation class
5	13	 **Excluded under 2.2.3.2 (e) and (f)**
5	14	 **Excluded under 2.2.3.2 (e) and (f)**

Appendix B Standards for Asset Protection Zones

The following standards have been extracted from the *Guidelines for Planning in Bushfire Prone Areas v 1.3* (WAPC 2017).

Every habitable building is to be surrounded by, and every proposed lot can achieve, an APZ depicted on submitted plans, which meets the following requirements:

a. Width: Measured from any external wall or supporting post or column of the proposed building, and of sufficient size to ensure the potential radiant heat impact of a fire does not exceed 29kW/m² (BAL 29) in all circumstances.

b. Location: the APZ should be contained solely within the boundaries of the lot on which a building is situated, except in instances where the neighbouring lot or lots will be managed in a low-fuel state on an ongoing basis, in perpetuity (see explanatory notes).

c. Management: the APZ is managed in accordance with the requirements of '*Standards for Asset Protection Zones*' (below):

- Fences: within the APZ are constructed from non-combustible materials (e.g. iron, brick, limestone, metal post and wire). It is recommended that solid or slatted non-combustible perimeter fences are used
- Objects: within 10 metres of a building, combustible objects must not be located close to the vulnerable parts of the building i.e. windows and doors
- Fine Fuel load: combustible dead vegetation matter less than 6 millimetres in thickness reduced to and maintained at an average of two tonnes per hectare
- Trees (> 5 metres in height): trunks at maturity should be a minimum distance of 6 metres from all elevations of the building, branches at maturity should not touch or overhang the building, lower branches should be removed to a height of 2 metres above the ground and or surface vegetation, canopy cover should be less than 15% with tree canopies at maturity well spread to at least 5 metres apart as to not form a continuous canopy (**Figure 7**).

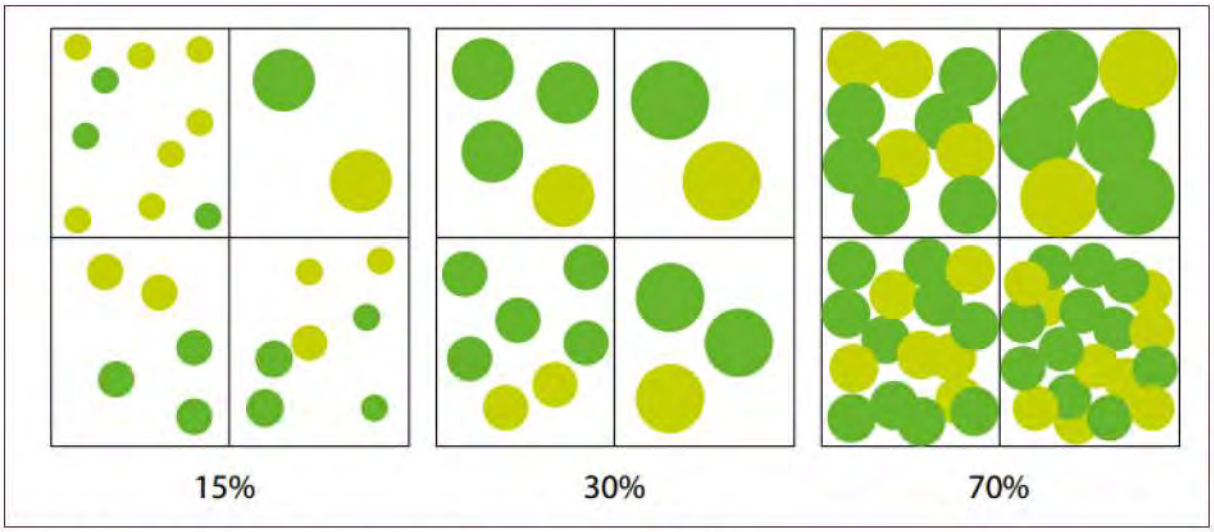


Figure 7: Illustrated tree canopy cover projection (WAPC 2017)

- **Shrubs (0.5 metres to 5 metres in height):** should not be located under trees or within 3 metres of buildings, should not be planted in clumps greater than 5m2 in area, clumps of shrubs should be separated from each other and any exposed window or door by at least 10 metres. Shrubs greater than 5 metres in height are to be treated as trees
- **Ground covers (<0.5 metres in height):** can be planted under trees but must be properly maintained to remove dead plant material and any parts within 2 metres of a structure, but 3 metres from windows or doors if greater than 100 millimetres in height. Ground covers greater than 0.5 metres in height are to be treated as shrubs
- **Grass:** should be managed to maintain a height of 100 millimetres or less.

Additional notes

The Asset Protection Zone (APZ) is an area surrounding a building that is managed to reduce the bushfire hazard to an acceptable level. Hazard separation in the form of using subdivision design elements or excluded and low threat vegetation adjacent to the lot may be used to reduce the dimensions of the APZ within the lot.

The APZ should be contained solely within the boundaries of the lot on which the building is situated, except in instances where the neighbouring lot or lots will be managed in a low-fuel state on an ongoing basis, in perpetuity. The APZ may include public roads, waterways, footpaths, buildings, rocky outcrops, golf courses, maintained parkland as well as cultivated gardens in an urban context, but does not include grassland or vegetation on a neighbouring rural lot, farmland, wetland reserves and unmanaged public reserves.

Appendix C Vehicular access technical requirements (WAPC 2017)

Technical requirements	Public road	Cul-de-sac	Private driveway	Emergency access way	Fire service access route
Minimum trafficable surface (m)	6*	6	4	6*	6*
Horizontal distance (m)	6	6	6	6	6
Vertical clearance (m)	4.5	N/A	4.5	4.5	4.5
Maximum grade <50 m	1 in 10	1 in 10	1 in 10	1 in 10	1 in 10
Minimum weight capacity (t)	15	15	15	15	15
Maximum crossfall	1 in 33	1 in 33	1 in 33	1 in 33	1 in 33
Curves minimum inner radius	8.5	8.5	8.5	8.5	8.5

* Refer to E3.2 Public roads: Trafficable surface

ecological AUSTRALIA

ISO 14001 Environmental Management

AS/NZS 4801:2001 Occupational Health and Safety Management

ISO 9001 Quality Management

HEAD OFFICE
Suite 2, Level 3
668-672 Old Princes Highway
Sutherland NSW 2232
T 02 8536 8600
F 02 9542 5622

CANBERRA
Level 2
11 London Circuit
Canberra ACT 2601
T 02 6103 0145
F 02 9542 5622

COFFS HARBOUR
22 Ray McCarthy Drive
Coffs Harbour NSW 2450
T 02 6651 5484
F 02 6651 6890

PERTH
Level 1, Bishop's See
235 St Georges Terrace
Perth WA 6000
T 08 9227 1070
F 02 9542 5622

MELBOURNE
Level 1, 436 Johnston St
Abbotsford, VIC 3076
T 1300 646 131

SYDNEY
Suite 1, Level 1
101 Sussex Street
Sydney NSW 2000
T 02 8536 8650
F 02 9542 5622

NEWCASTLE
Suites 28 & 29, Level 7
19 Bolton Street
Newcastle NSW 2300
T 02 4910 0125
F 02 9542 5622

ARMIDALE
92 Taylor Street
Armidale NSW 2350
T 02 8081 2685
F 02 9542 5622

WOLLONGONG
Suite 204, Level 2
62 Moore Street
Austinmer NSW 2515
T 02 4201 2200
F 02 9542 5622

BRISBANE
Suite 1, Level 3
471 Adelaide Street
Brisbane QLD 4000
T 07 3503 7192

HUSKISSON
Unit 1, 51 Owen Street
Huskisson NSW 2540
T 02 4201 2264
F 02 9542 5622

NAROOMA
5/20 Canty Street
Narooma NSW 2546
T 02 4302 1266
F 02 9542 5622

MUDGEE
Unit 1, Level 1
79 Market Street
Mudgee NSW 2850
T 02 4302 1234
F 02 6372 9230

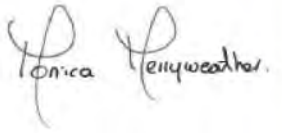
GOSFORD
Suite 5, Baker One
1-5 Baker Street
Gosford NSW 2250
T 02 4302 1221
F 02 9542 5622

ADELAIDE
2, 70 Pirie Street
Adelaide SA 5000
T 08 8470 6650
F 02 9542 5622

1300 646 131
www.ecoaus.com.au

Appendix 4 – Civil Engineering Report

Project Name:	LOTS 7, 65, 66 & 67 VIEW ST, BEELIAR ENGINEERING SERVICES REPORT
Project Nº:	PC18012
Revision	1
Date:	January 2019

Prepared by:	Monica Merryweather
Position:	Civil Engineer
Signed:	
Date:	16/01/2019

Approved by:	Enzo Biagioni-Froudist
Position:	Principal, Civil
Signed:	
Date:	16/01/2019

Revision	Description	Author	Checked	Approved	Date
0	First Issue	MM	EB		19/12/2018
1	Comments Added	MM	EB		16/01/2019
2	WAPC Comments Added	MM	EB		12/09/2019

Recipients are responsible for eliminating all superseded documents in their possession.

Peritas Group Pty Ltd
ABN: 56 165 417 407
74 Goodwood Parade
Burswood WA 6100

PO Box 134,
Burswood WA 6100

Telephone: +61 8 63369299

Facsimile: +61 8 63369288
Internet: www.peritasgroup.com.au

CONTENTS

Page No

1.0 INTRODUCTION

Peritas have been engaged by the owners of Lots 7, 65, 66 and 67 View Street, Beeliar, to provide an assessment of site conditions and availability of services for the proposed residential subdivision of the land generally in accordance with the Local Structure Plan (LSP) prepared by Stewart Urban Planning.

1.1 Background

The proposed site is located within the suburb of Beeliar, within City of Cockburn, WA. The site is identified as Lots 7, 65, 66 & 67 View Street, and comprises a total area of approximately 1.62 ha.

Figure 1 – Location Plan

1.2 Proposed Site

The site is currently occupied. The four lots (7, 65, 66 & 67) have been previously developed and four residential dwellings are within the site. Two existing dwellings are proposed to be retained in the short term, however, it is expected that all dwellings and structures will ultimately be demolished and the partly vegetated gardens with grasses and shrubs, with occasional small trees will be cleared.

Refer Figure 2 on the following page for an aerial view of the site.

Figure 2. Aerial Site Photo

2.0 PLANNING STATUS

2.1 Local Structure Plan

Refer to Figure 3 below to Proposed Local Structure Plan.

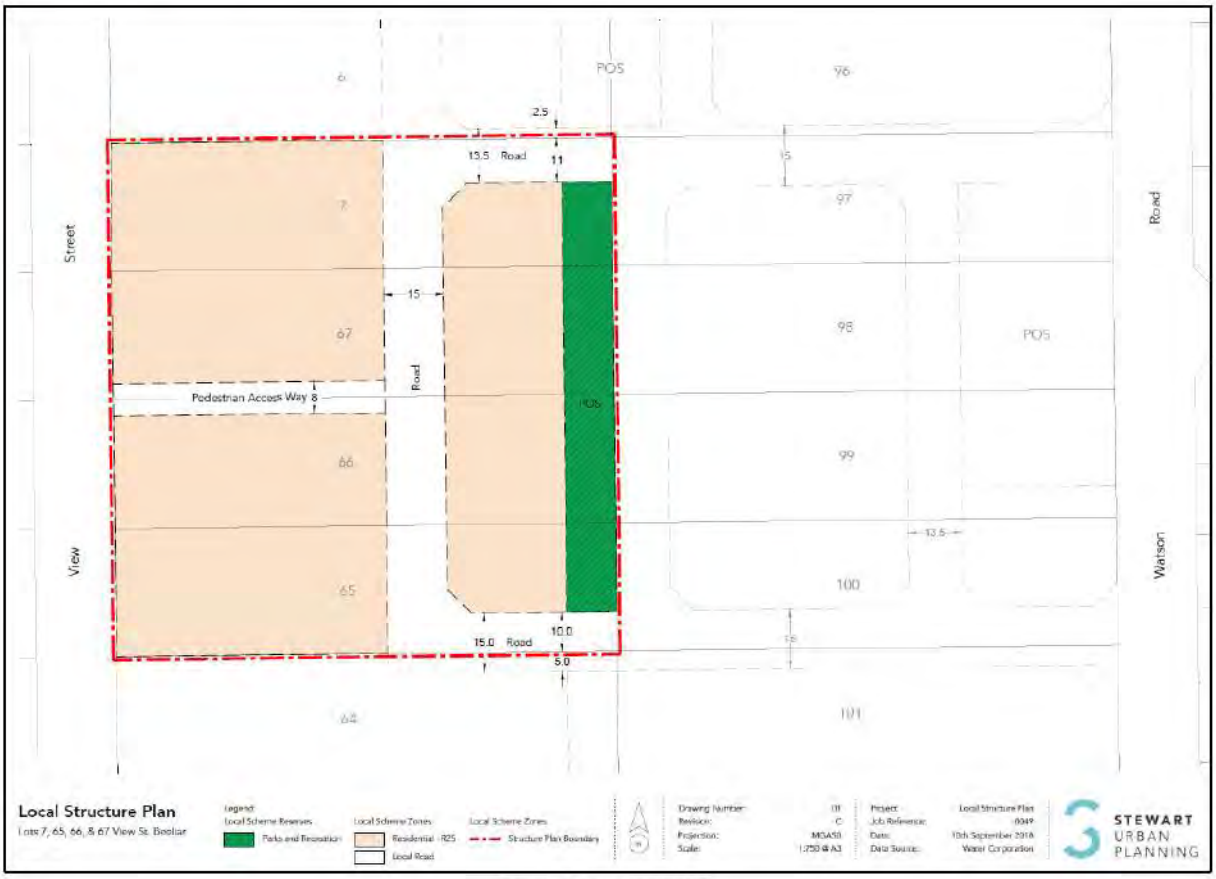


Figure 3. Proposed LSP

3.0 ENVIRONMENTAL AND GROUND CONDITIONS

3.1 Topography

The western part of the site is occupied by four dwellings fronting View Street, with associated driveways and infrastructure, and the eastern part of the site comprises grasses and light vegetation including shrubs and small to medium sized trees. The site elevation varies between 29 m AHD to 26m AHD, with an average grade of 1 in 15 across the site. Refer to Figure 4 below.

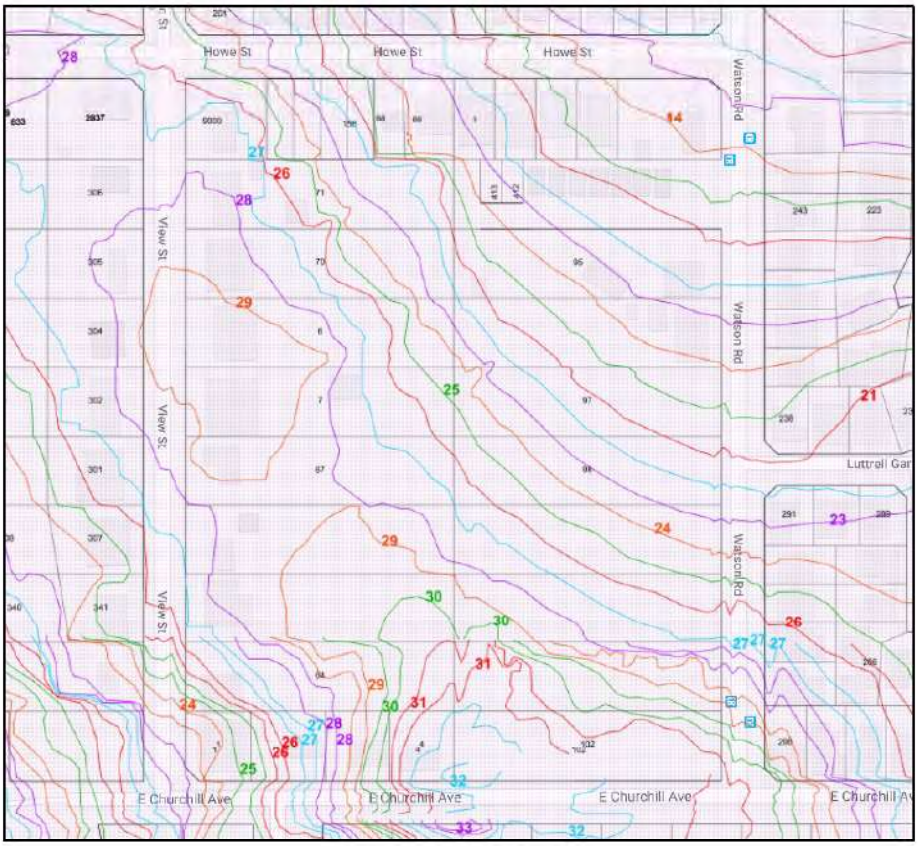


Figure 4. Site Topography

3.2 Acid Sulphates Soils

The site is classified as no known Acid Sulphate Soils (ASS) disturbance risk occurring less than 3m from surface.

3.3 Site Geology

Published geological mapping indicates the shallow subsurface conditions beneath the site comprise limestone.

A formal pre-development geotechnical investigation will need to be carried out to determine existing shallow ground conditions, including presence and strength of rock.

3.4 Groundwater conditions

Based on information from the Perth Groundwater Atlas, the historical maximum groundwater level beneath the site varies between RL 1 m AHD and RL 2 m AHD. This results of a clearance of greater than 24 m between the historical maximum groundwater levels and existing site surface levels.

Figure 5 - Groundwater contours (existing)

4.0 STORMWATER MANAGEMENT & FINISHED LEVELS

4.1 Urban Water Management Plan (UWMP)

An Urban Water Management Plan (UWMP) will need to be prepared and approved prior to the development of the site.

4.2 Stormwater Management Strategy

Peritas has prepared a proposed stormwater management strategy. Please refer Appendix A for proposed stormwater management strategy. Please note the proposed stormwater management strategy includes the following assumptions:

- The catchment does not include the proposed lot areas within the LSP area. City of Cockburn (CoC) has advised that all residential lots are required to retain the 20 yr rain event on site with overflow on to the road.
- Run off Coefficient (C) for Road Reserve Area is 0.9
- Soakage rate is 1 m/day which will be confirmed by results of geotechnical field investigation
- The system is designed to retain the 5 yr rain event.
- The overflow from the system will flow to the existing Radonich Park as the proposed LSP area is within the catchment. See Appendix B attached.

4.3 Proposed Design Levels and Retaining Walls

Peritas has prepared preliminary design finished levels and retaining wall layout for the proposed lots within the proposed LSP area which is identified as Appendix C.

5.0 SERVICES AND INFRASTRUCTURE

5.1 Sewerage

Preliminary information from Water Corporation of WA indicates that there is a reticulated service network in the area. The proposed development is likely to be serviced by an extension from the existing sewer main (150DN) from the corner of View Street and Howe Street, south along View Street (lowest connection point IL. 22.31), to the site.

Refer to the Water Corporation sewerage supply network map below.

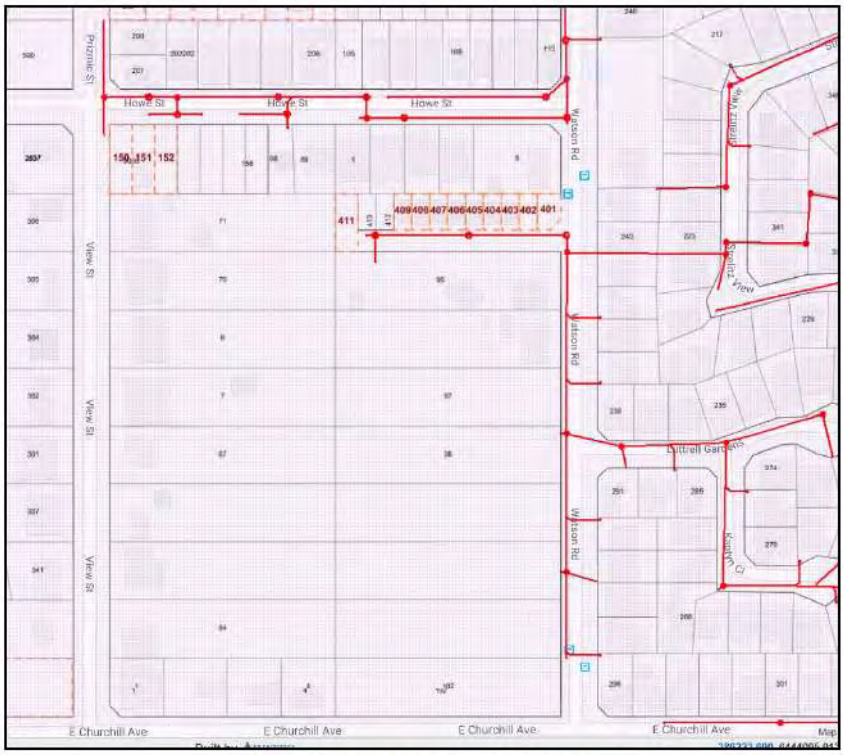


Figure 6. Existing Sewer Network

5.2 Water Supply

It is anticipated that the proposed development will be serviced by existing water supply networks on the perimeter of the site, primarily from the main along View St.

This water main will have adequate capacity to service the site from the west side frontage. Refer to the Water Corporation water supply network map below.

Figure 7. Existing Water Reticulation

5.3 Power

It is anticipated that the proposed development will be served by underground power and that this system will connect to the existing overhead/underground network located in adjoining roads. Standard Western Power development conditions will apply and it is anticipated that the network has adequate capacity for the site power requirements.

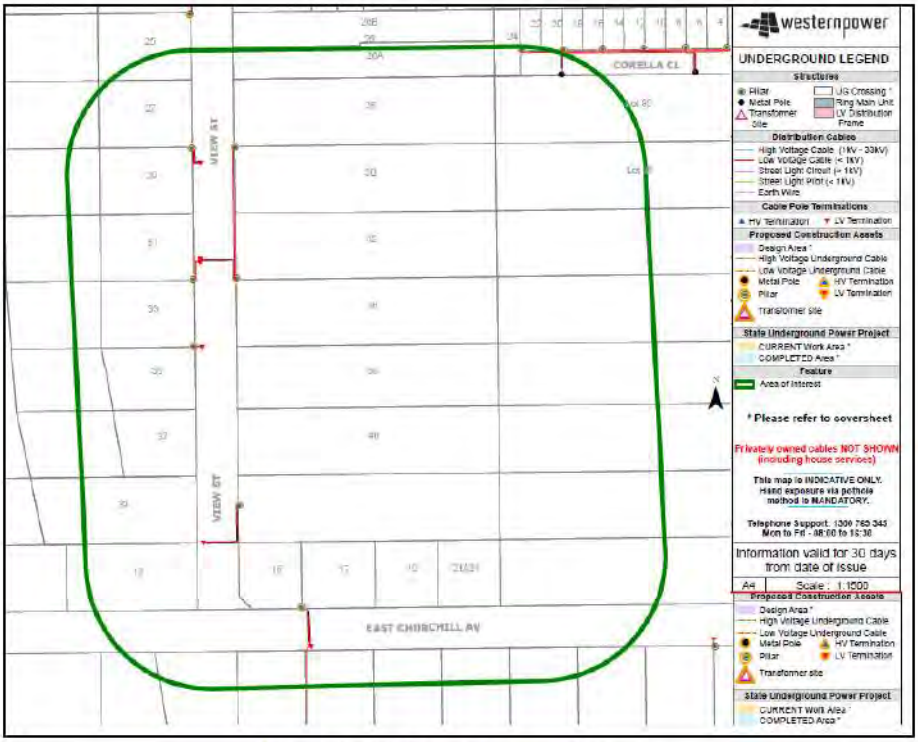


Figure 8. Existing underground power.

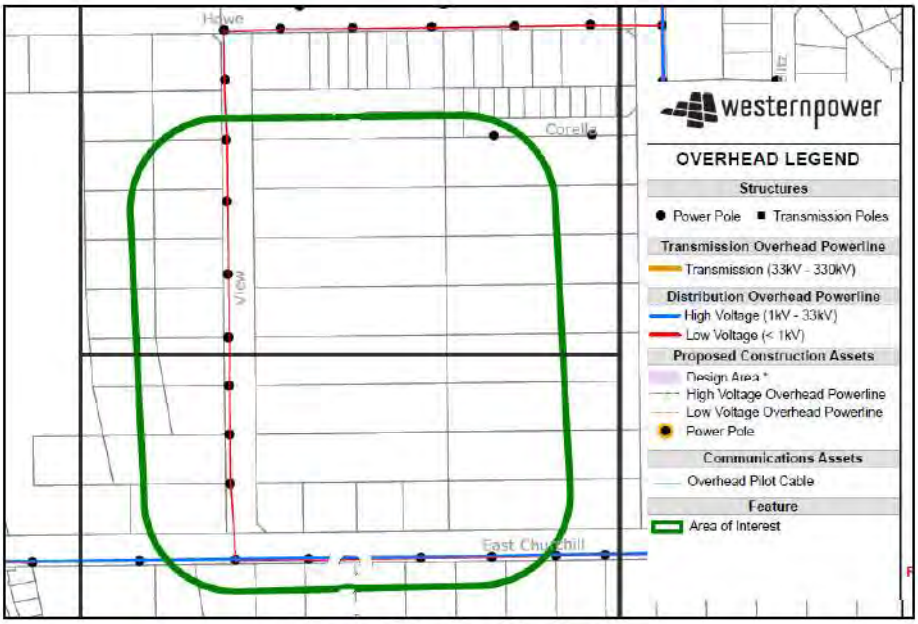


Figure 9 – Existing overhead power

5.4 Gas

ATCo Gas as-constructed records indicate that reticulated gas services are available in the surrounding road network. It is anticipated that this network has sufficient capacity to service the proposed LSP area with reticulated gas services from the existing mains.

Existing networks in the vicinity includes DN100PVC medium pressure main along View Street.

5.5 Telecommunications

Information from NBNCo and Telstra indicates there is a service network within the area servicing the LSP area. All lots within the vicinity of the proposed subdivision development are served with Telecommunication services and it

It is anticipated that the existing network has adequate capacity to serve the proposed LSP area.

The proposed LSP area may be serviced by connection to this network at locations convenient and appropriate to the siting of the proposed school buildings to be determined by the DOET and their consultants.

6.0 DESIGN REQUIREMENTS

A design level(s) for the site has not been established and will be required to determine final fill levels.
Whilst general levels to the perimeter of the site have been determined by the road design and construction, the removal of the existing vegetation and trees are to be carefully monitored to ensure that all deleterious material is removed and the subgrade is compacted ready to accept fill.

7.0 WORKS & REPORTING REQUIRED – TIMING & COST

7.1 Planning, Design & UWMP

- A subdivision application needs to be prepared following approval of this LSP.
- Roads and services need to be designed and constructed.
- A UWMP needs to be prepared and approved.

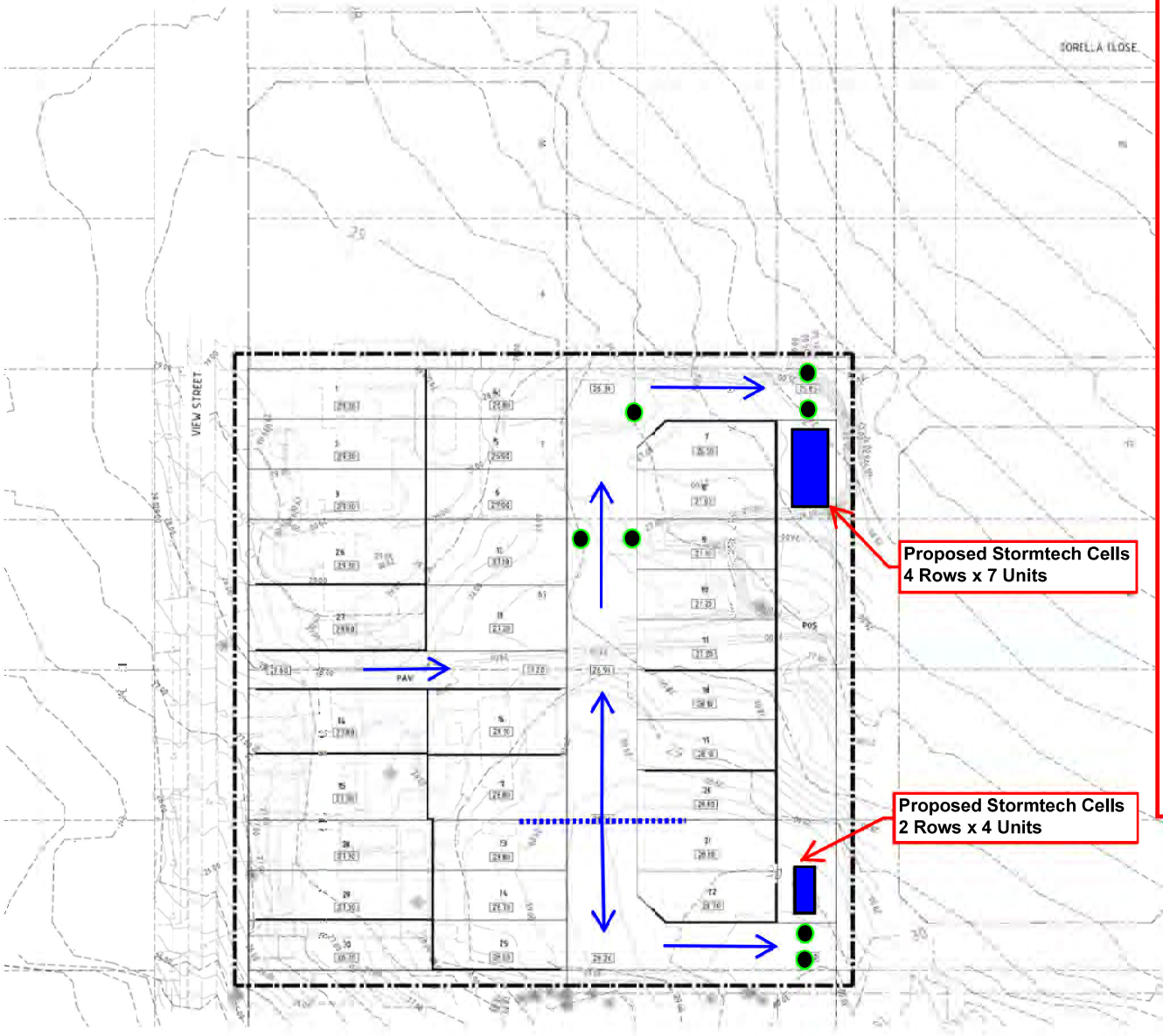
7.2 Earthworks

- Design - A design level(s) for the site to be established. Preliminary design finished levels are indicated in Appendix C.
  It should be noted that design finished levels shown in Appendix C are preliminary only at this stage and are subject to change based on detailed design.
- Earthworks
  - Clearing of site, earthworks to design level and compaction of facilities area.
- Reporting
  - A site classification A over the area of the proposed facilities within the site is required.
  - A geotechnical assessment prior to and post earthworks is to be undertaken.

7.3 Roadworks & Servicing

- Roads & Servicing (External)
- Roads and services have been in place for approximately 3 years. Cost reimbursements are required.
- Extension of existing services is required for selected services (**refer to previous section 5**).

Appendix A - Stormwater Management Strategy



LEGEND & CALCULATIONS

Catchment A (Road Reserve and Footpath Reserve)
Area = 2,650 sqm C = 0.9 Soakage Rate = 1m/day
Storage Required (5 yr event) Critical Time = 6hrs
Min. 64.2 cum required
Allow for Storage/Soakage of 5 (1.05m x 1.20m) soakwells
Use 4 Rows of 7 Units Stormtech SC-740 or simillar
TOTAL SOTRAGE VOL Provided = 72.1 cum

Catchment B (Road Reserve)
Area = 950 sqm C = 0.9
Storage Required (5 yr event) Critical Time = 3hrs
Min. 21.9 cum required
Allow for Storage/Soakage of 2 (1.05m x 1.20m) soakwells
Use 2 Rows of 4 Units Stormtech SC-740 or simillar
TOTAL SOTRAGE VOL Provided 22.9 cum

Proposed Design Overland Water Flow Path

Proposed SEP/GGP/JP Soakwell (1.05 m x 1.20 m)

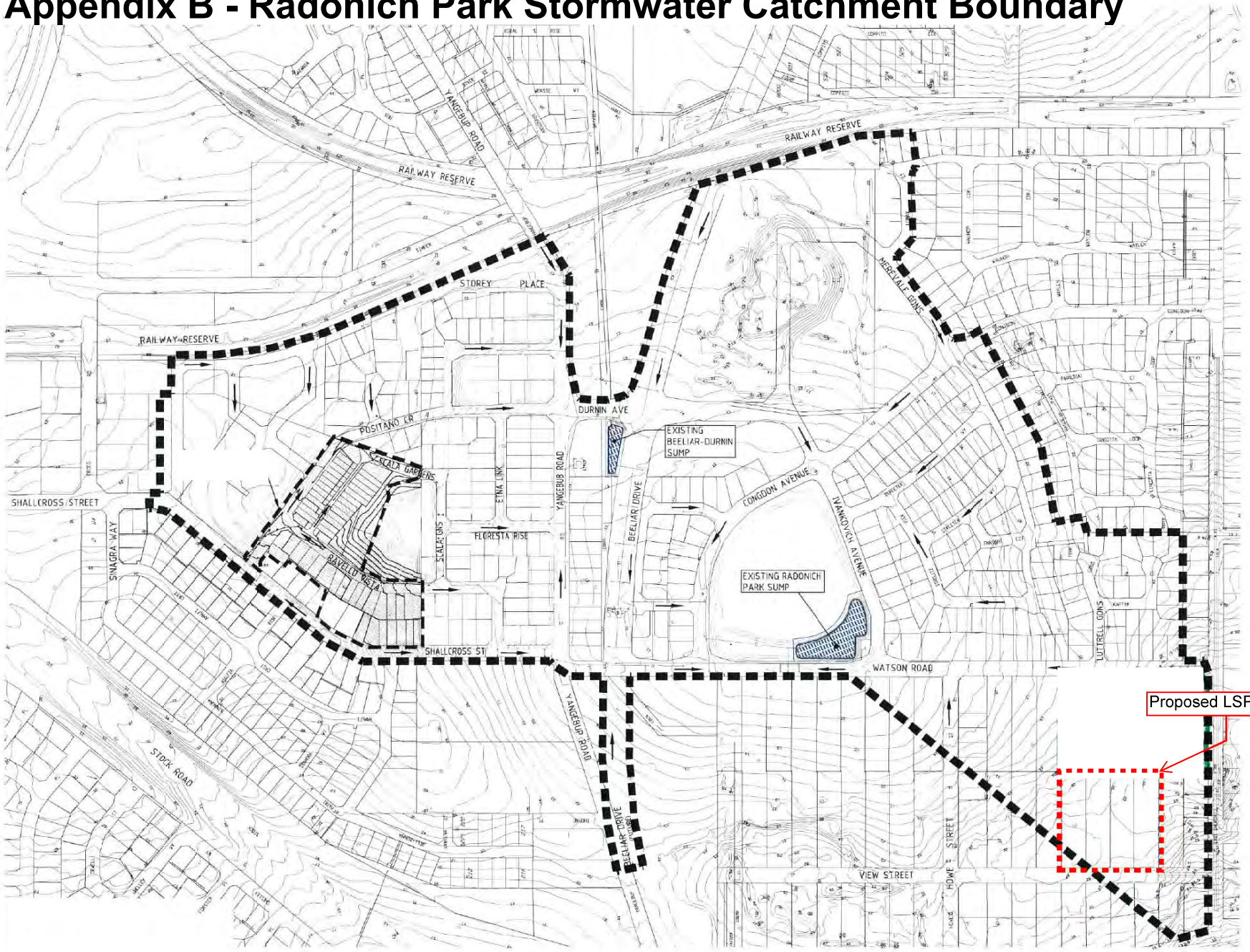
Proposed RCP Network

Proposed Stomrtech Cells (or Similar) Location

Note:
No allowance has been made for stomrwater discharge of Proposed Lots. CoC Requires each lot to manage stormwater (up to 20yr event) on site with overflow to the road.

Overflow to discharge in to existing Radonich Park

Appendix B - Radonich Park Stormwater Catchment Boundary



DRAINAGE LEGEND

- CATCHMENT AREA
- 1 IN 5 YEAR INUNDATION LEVELS
- FLOW ARROW
- PROPOSED DRAINAGE PIPE, JUNCTION PIT & SIDE ENTRY PIT
- EXISTING DRAINAGE PIPE, JUNCTION PIT & SIDE ENTRY PIT
- FUTURE DRAINAGE PIPE, JUNCTION PIT & SIDE ENTRY PIT
- EXISTING SURFACE CONTOURS

1:2500

A	SWW	ISSUED FOR APPROVAL

CLIENT: SURELAND PROPERTY GROUP AND M & S DROPULICH

DEVELOPMENT ENGINEERING CONSULTANTS
SUITE 3, 123A COLIN ST, WEST PERTH, 6005, WESTERN AUSTRALIA
Ph: (08) 9481 1900
Fax: (08) 9481 1700

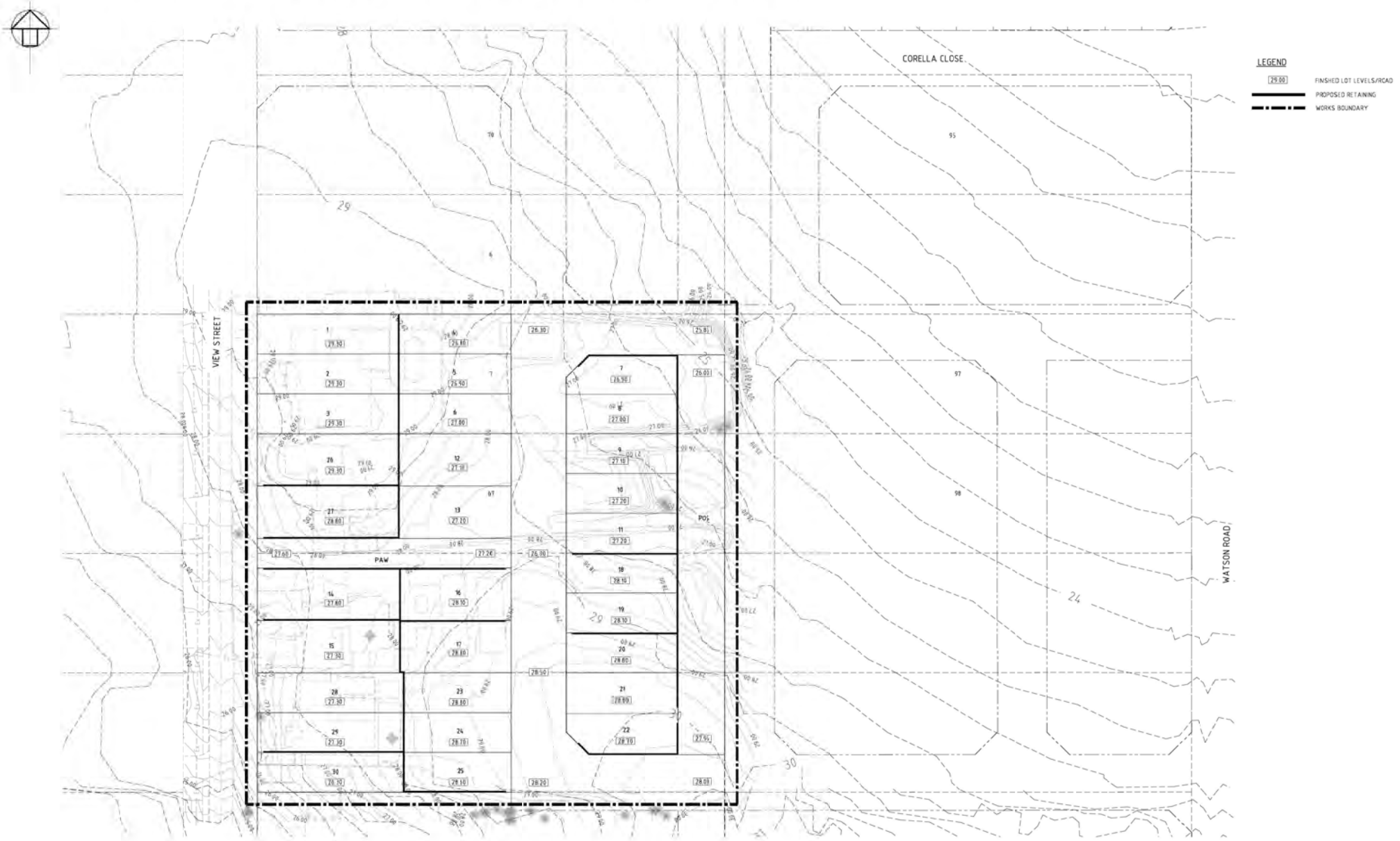
PROJECT: LOTS 9006 & 9007 SHALLCROSS STREET YANGEBUP
W.A.P.C. No. - 150488, 150182 & 151768

DRAWING: 1 IN 5 YEAR EVENT PLAN

SCALE	DRAWN	CHECK	REV No.
1:2500	SWW	SRA	A
DATE: 12/10/15	DESIGNED: SRA	APPROVED: SRA	

PROJECT NUMBER: YBPSURO1 U06
DRAWING NUMBER:

Appendix C - Design Levels and Retaining Wall Layout



Appendix 5 – Traffic Impact Assessment

Traffic Impact Assessment

Lot 7, 65, 66 & 67 View Street, Beeliar Local Structure Plan (WAPC ref SPN 2215)

CW1048900

Prepared for

Peritas Group

18 September 2018

Cardno

Contact Information

Cardno (WA) Pty Ltd
ABN 77 009 119 000

11 Harvest Terrace
West Perth WA 6005
Australia

www.cardno.com
Phone +61 8 9273 3888
Fax +61 8 9486 8664

Document Information

Prepared for	Peritas Group
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Job Reference	CW1048900
Date	18 September 2018
Version Number	C

Author(s):

Brian Sii
Traffic Engineer

Effective Date 18/09/2018

Approved By:

Scott Lambie
Team Leader – Traffic Engineering

Date Approved 18/09/2018

Document History

Version	Effective Date	Description of Revision	Prepared by	Reviewed by
A	3/10/2018	Draft	BS	EH / SJL
B	30/10/2018	For Issue	BS	EH / SJL
C	18/09/2019	For Issue	BS	SJL

Table of Contents

Appendices

Tables

Figures

1 Introduction

1.1 Background

Cardno was commissioned by Peritas Group to prepare a Transport Impact Assessment for the proposed Local Structure Plan (LSP) located at Lot 7, 65, 66 & 67 View Street, Beeliar, in the City of Cockburn ('the LSP' or 'the Site').

This report has been prepared in accordance with the Western Australian Planning Commission (WAPC) *Transport Impact Assessment Guidelines Volume 2 – Planning Schemes, Structure Plans & Activity Centre Plans (2016)*. Specifically, this report aims to assess the operations of the proposed development internally, its connections to the adjacent road network, with a focus on the traffic generation and access arrangements.

1.2 Site Location and Description

The LSP is located at Lot 7, 65, 66 & 67 View Street, Beeliar within the City of Cockburn and covers a gross area of approximately 1.6 hectares (ha), which is proposed to be subdivided into 30 single dwelling residential lots. The land within the LSP is currently made up of several existing residential lots. The location of the LSP is shown in **Figure 1-1**.

Figure 1-1 Location of the LSP

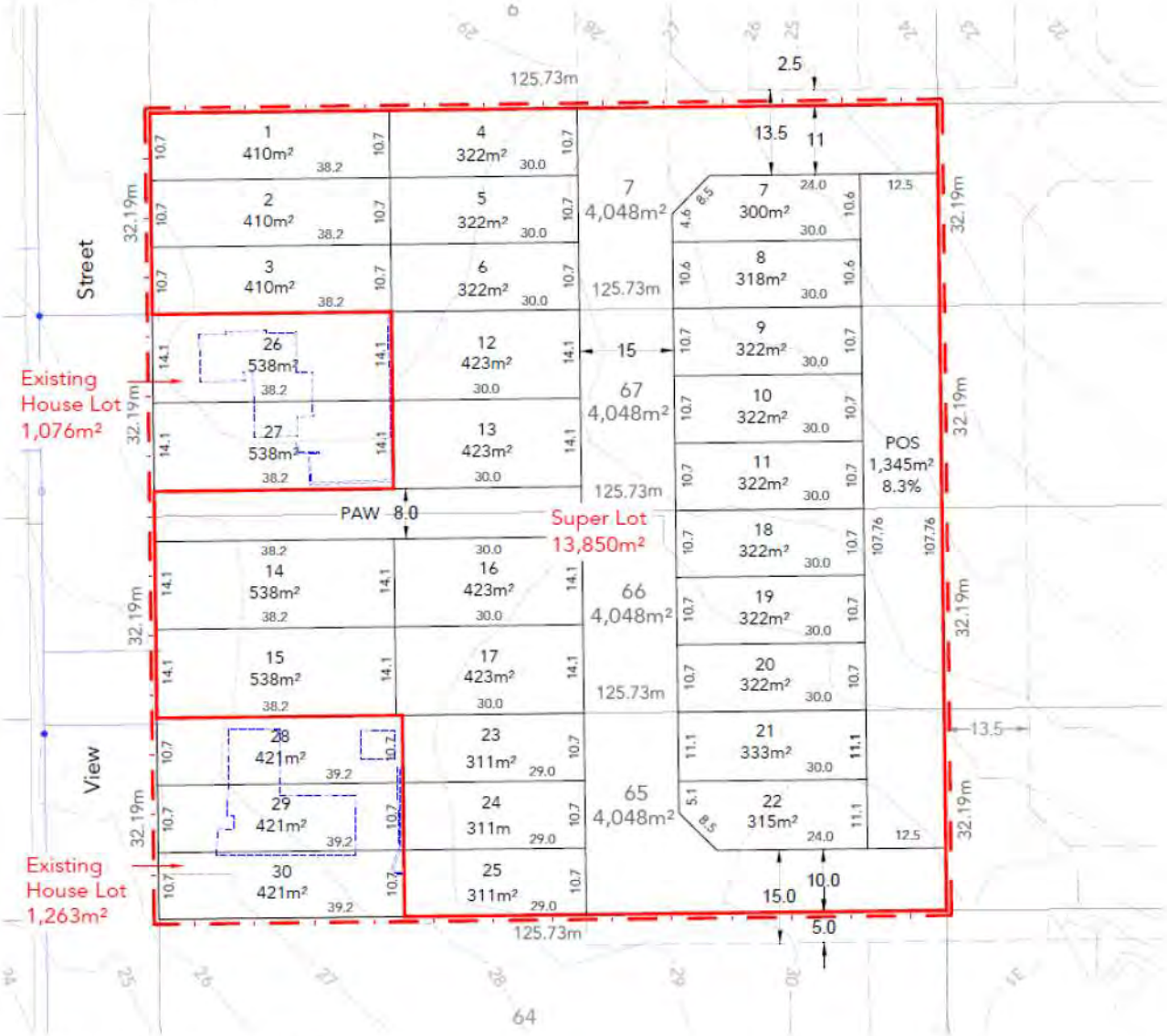
Source: Nearmap, 2018

2 Structure Plan Proposal

2.1 Proposed Land Uses

The LSP is expected to comprise 30 single dwelling residential lots, a public access way and public open space as shown in **Figure 2-1**.

Figure 2-1 LSP Layout



Source: Stewart Urban Planning, 2018

2.2 Existing Access Arrangement

The LSP area is currently occupied by residential lots where separate individual access is provided for each residential lot along View Street.

2.3 Proposed Access Arrangement

The internal road network within the LSP is proposed to be connected to the future road network within the adjacent subdivisions. These roads will provide the LSP with access to the existing roads, View Street to the west and Watson Road to the east.

Figure 2-2 LSP Access Arrangement

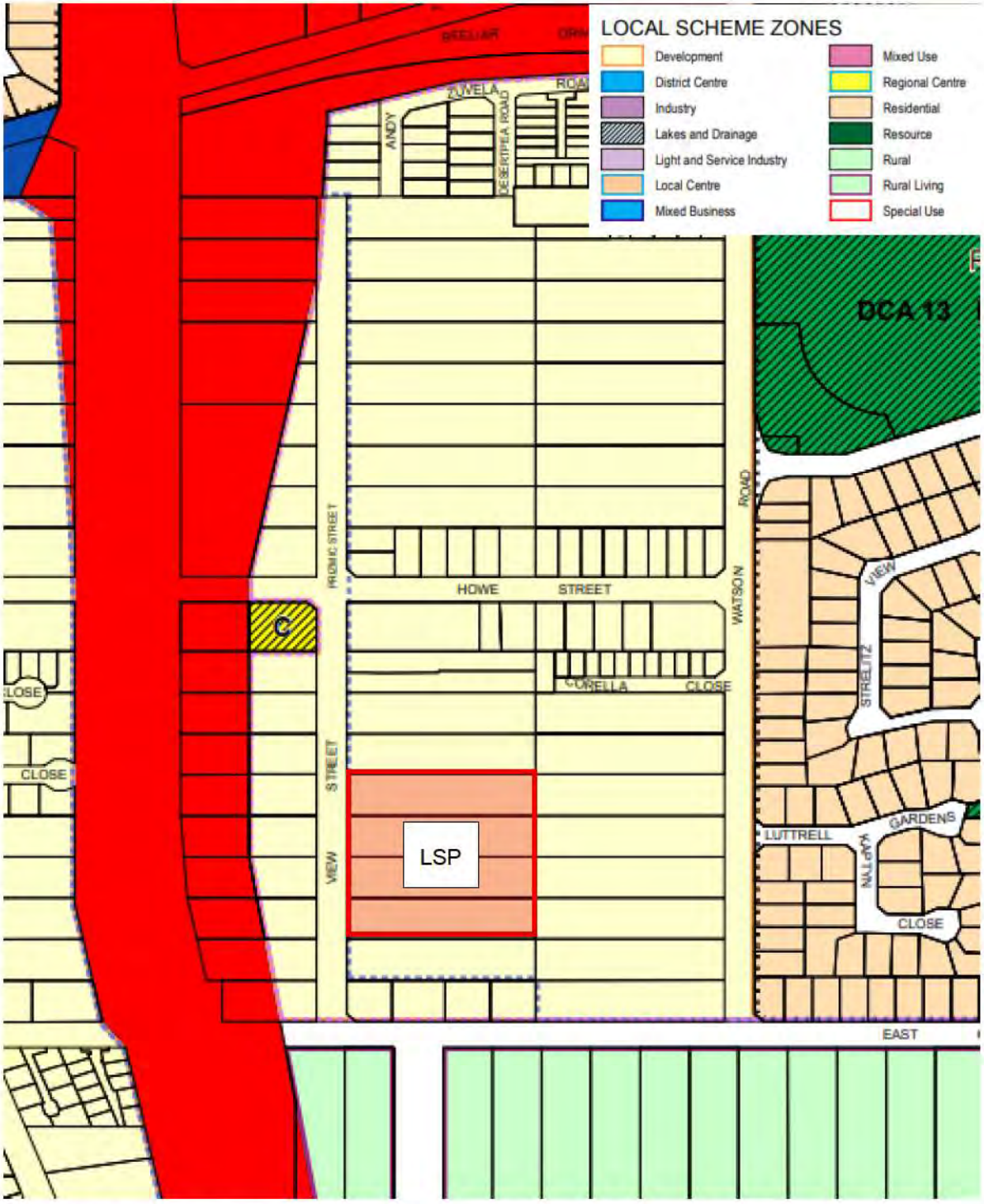
Source: Stewart Urban Planning, 2018

3 Existing Situation

3.1 Existing Land Uses

As shown in **Figure 3-1**, the land use within the LSP is currently zoned as 'Development'. The land uses within the surrounding are of the Site is also zoned as 'Development'. Land uses further to the east is zoned as 'Residential', with 'Rural Living' further to the south.

Figure 3-1 Local Planning Scheme Zoning



Source: City of Cockburn, Town Planning Scheme No.3, Munster Locality Map

3.2 Existing Land Use Trip Generation

The existing Site currently consists of 4 residential dwellings. Traffic generation rates for the land uses were sourced from *RTA Guide to Traffic Generating Developments V2.2*. The trip generation of the existing Site is shown in Trip Generation of the Existing Site **Table 3-1**.

Table 3-1 Trip Generation of the Existing Site

Land Use	Generation Unit	Trip Generation Rate (Peak Hour)	Directional Split	Peak Hour Trip Generation	
				IN	OUT
Dwelling Houses	4 dwelling	0.85 trip per dwelling	50% IN 50% OUT	2*	2*

** rounded to the nearest whole number*

3.3 Existing Road Network

The existing road network in the vicinity of the LSP is shown in **Figure 3-2**.

Figure 3-2 Existing Road Network

Source: MRWA Road Information Mapping System, 2018

Table 3-2 Road Network Description

Road Name	Road Hierarchy	Jurisdiction	Road Network			
			No. of Lanes	No. of Footpaths	Pavement Width (m)	Posted Speed Limit (km/h)
View Street	Access Road	Local Govt.	2	1	6.0	50
Watson Road	Local Distributor	Local Govt.	2	1	7.0	50
East Churchill Avenue	Access Road	Local Govt.	2	1	6.4	50

3.4 Existing Traffic Volume

Existing weekday traffic volumes were obtained from the *City of Cockburn Intramap Traffic Counts* and *MRWA Traffic Map*. The traffic data are summarised in **Table 3-3**.

Table 3-3 Existing Weekday Traffic volume

Location	Year	Daily Traffic Volume (two-way)
Watson Road (north of Luttrell Gardens)*	2018	1,112
East Churchill Avenue (east of Wells Road)*	2015	705
Stock Road (south of Beeliar Drive)**	2016	24,955
Beeliar Drive (east of Stock Road)**	2013	13,384

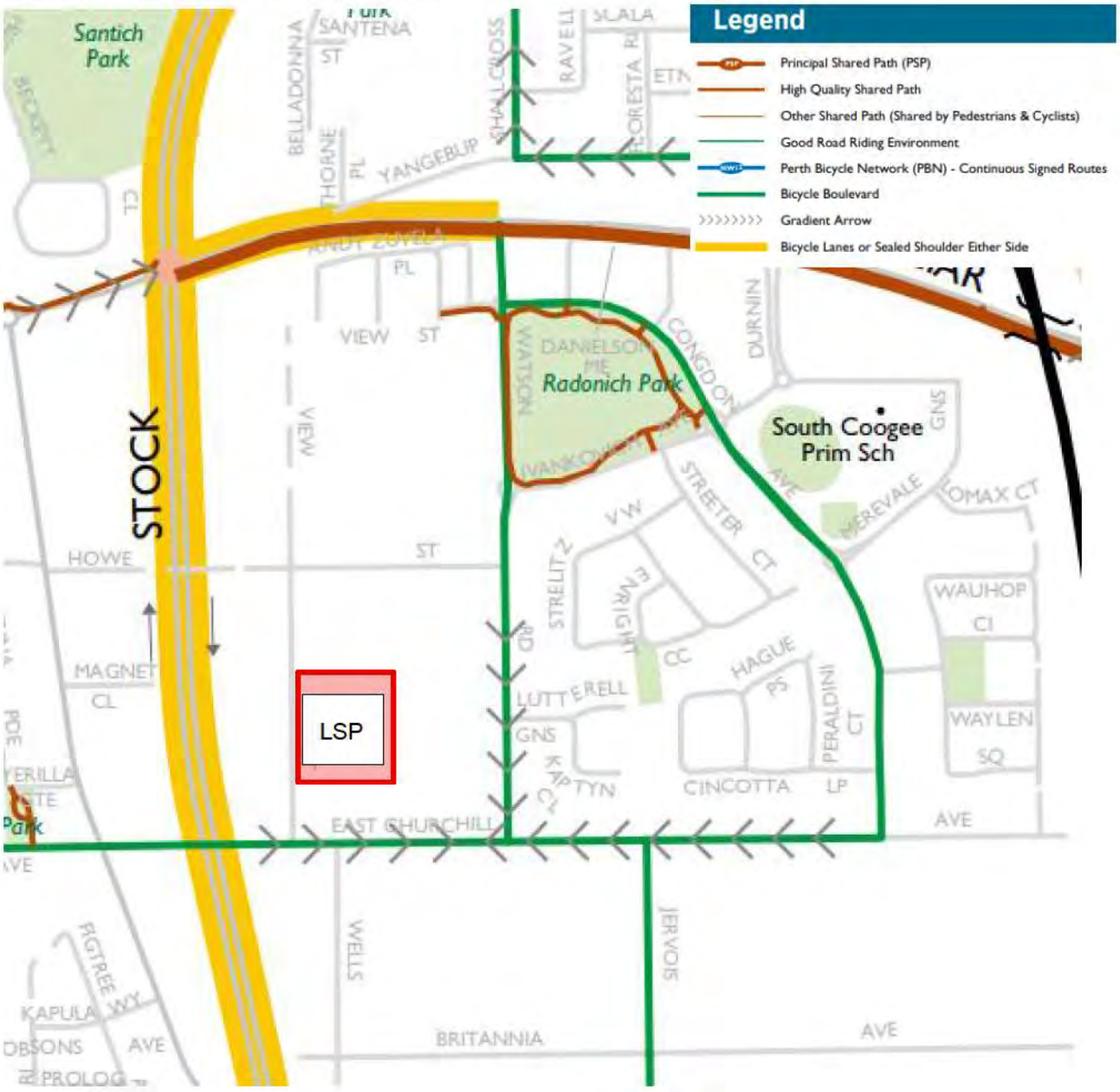
Source: **City of Cockburn Intramap*
**MRWA Traffic Map*

3.5 Existing Pedestrian/ Cycle Network

According to *Department of Transport, Cockburn and Rockingham: Perth bike map*, bicycle lanes are available along Stock Road. High quality shared paths are presented along Beeliar Drive. In addition, East Churchill Avenue and Watson Road are both marked as having a good road riding environment. Overall, despite the lack of dedicated cycling facilities along the frontage roads, the low traffic volumes and vehicle speed within the surrounding area provides a good cycling environment.

Footpaths are also provided along View Street, Watson Road and East Churchill Avenue, providing a safe walking environment for the pedestrians.

Figure 3-3 Bicycle Map in the vicinity of the LSP

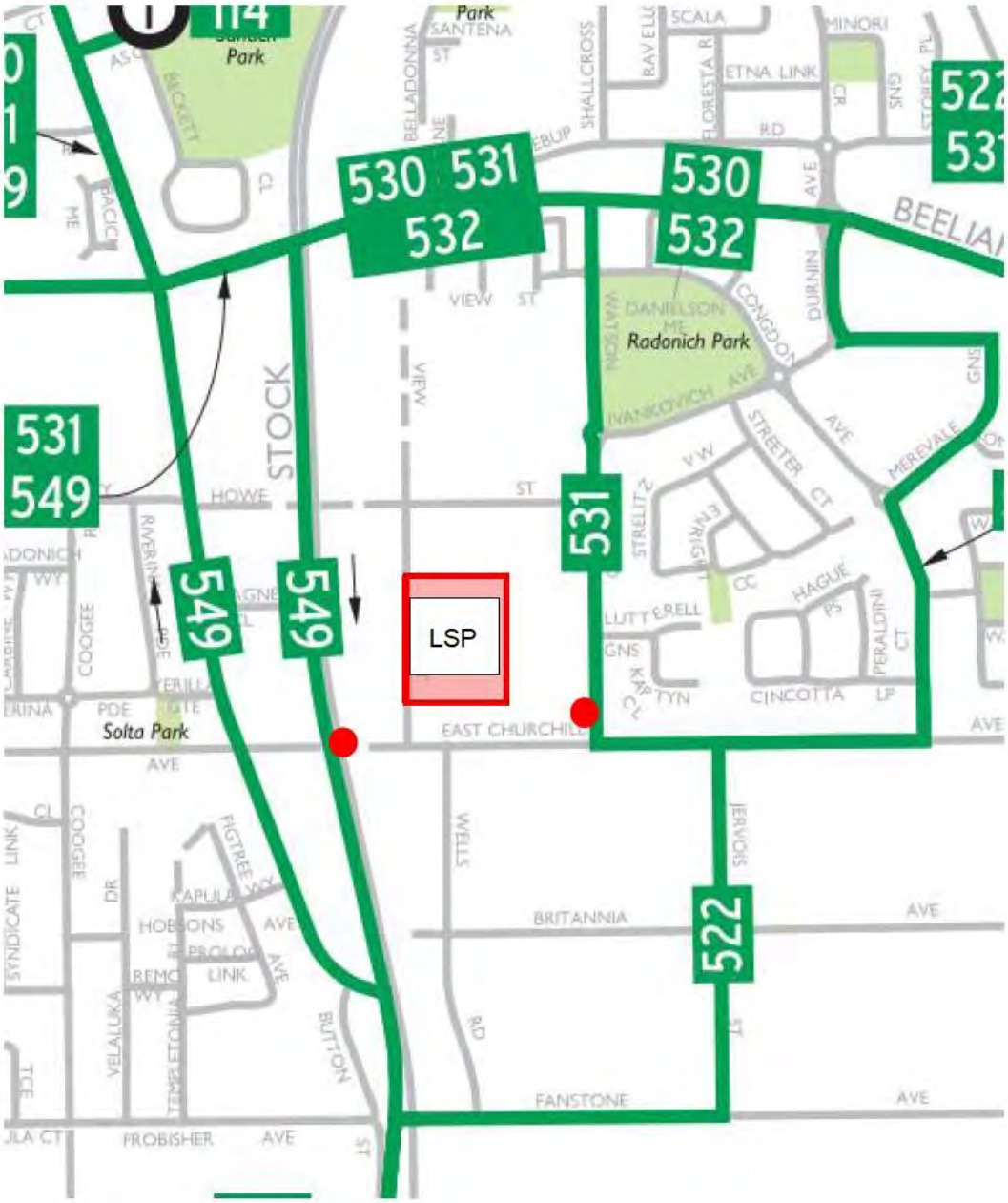


Source: Perth Bike Map: Cockburn and Rockingham

3.6 Existing Public Transport Service

The nearest bus stop is located approximately 150m southwest of the LSP, along Stock Road. This bus stop is currently servicing Bus Route 549 (southbound). Another bus stop is located approximately 200m south east of the LSP, along Watson Road, servicing Bus route 531. **Figure 3-4** shows the public bus routes in the vicinity of the LSP and location of the bus stops are indicated with red circles.

Figure 3-4 Public Bus Routes in the Vicinity of the LSP



Source: Transperth, 2018

4 Proposed Internal Transport Networks

4.1 Changes to Existing Internal Road Network

The proposed internal road network of the LSP is shown below:

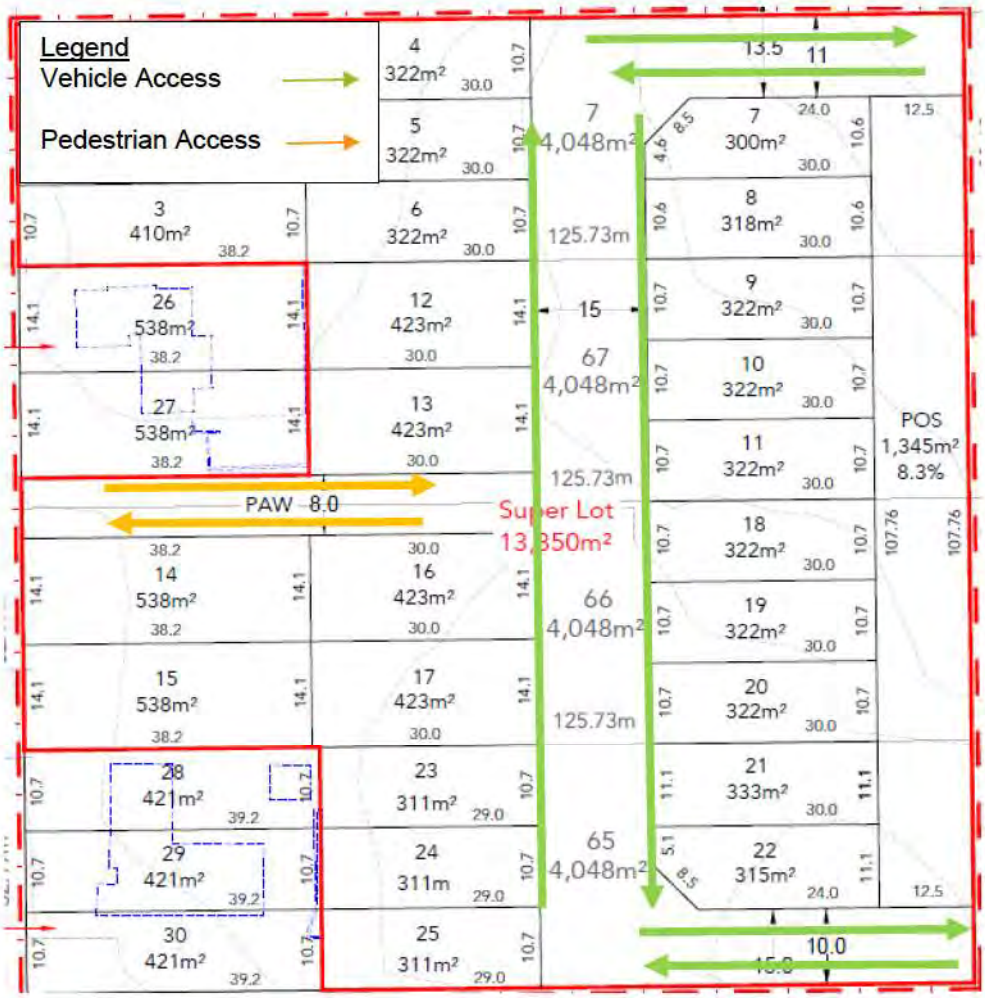
- New access roads within the LSP providing vehicle access to the residential dwellings in the centre of the LSP.
- These new access roads will connect to the proposed roads indicated in **Figure 2-2** which provides connections to the existing road network.
- Pedestrian access way connecting between new access road and View Street, providing pedestrian access from the LSP onto View Street.

4.2 Internal Road Network

The new access roads within the LSP proposed to have road reserve width of 15m, classifying them as Access Street C within the *Department of Planning Liveable Neighbourhoods Guiding Document*. However, the northern access road is proposed to have a road reserve width of 13.5m. The reduced width can be justified by the verge being unlikely to accommodate numerous underground services due to POS located on the eastern boundary of the LSP and limited adjacent residential properties. According to *Department of Planning Liveable Neighbourhoods Guiding Document*, the verge adjacent to park may be reduced to 1.0m when fronting a public parkland, thus further justifying the reduce road reserve width

The pedestrian access way is proposed to be 8m wide. The proposed internal road network is shown in **Figure 4-1**.

Figure 4-1 Proposed Internal Road Network



Source: Stewart Urban Planning, 2018

4.3 Structure Plan Access Arrangements

Proposed access to the LSP is via the new proposed access roads as shown in **Figure 2-2**. The LSP will be accessible from View Street and Watson Road.

4.4 Pedestrian/Cycle Network

Pedestrian footpaths will be provided on all access streets, linking to the surrounding path network, in accordance with the requirements of *Liveable Neighbourhoods*.

4.5 Public Transport Network

There are no changes proposed to pedestrian and cycling network within the LSP.

5 Changes to External Transport Network

5.1 External Road Network

According the *City of Cockburn* website, no major roadworks are identified in the vicinity of the LSP in the near future.

5.2 Pedestrian/ Cycle Network

According the *City of Cockburn* website, no major changes to the pedestrian and cycle networks are identified in the vicinity of the LSP in the near future.

5.3 Public Transport Network

Cardno has contacted the Public Transport Authority and was advised that there will not be any changes to the public transport network and bus services in the vicinity of the LSP in the near future.

6 Integration with Surrounding Area

6.1 Surrounding Attractors / Generators

The LSP is proposed as a residential area. The main attractors of the LSP is expected to be the 'Beeliar Village' commercial centre and South Coogee Primary School located approximately 750m northeast of the LSP.

6.2 Proposed Changes to Surrounding Land Uses

According the *City of Cockburn* website, there are no major proposed land use changes to the surrounding of the LSP in the near future.

6.3 Travel Desire Lines between the Structure Plan and Surrounding Land Uses

The main travel desire lines between the LSP and the surrounds will be likely via the Beeliar Drive, to the north of the LSP and Stock Road / Rockingham Road to the east of the LSP.

The traffic generation of the LSP is not expected to have significant impact on the existing road network. The existing road network will be able to cater for the travel desire lines between the LSP and the surrounding land uses.

7 Analysis of Transport Network

7.1 LSP Traffic Generation Estimation

The traffic generation of the proposed development within the LSP is calculated by sourcing the trip generation rate suggested in *RTA Guide to Traffic Generating Developments V2.2.* The directional distribution of the land use has been sourced from the *Institute of Transportation Engineering (ITE) "Trip Generation" 10th Ed.*

Table 7-1 and **Table 7-2** represents the trip generation rate and the estimated trip generation of the proposed development.

Table 7-1 Trip Generation Rate and Directional Distribution

Land Use	Source	Daily Trip Generation Rate	Peak Hour Trip Generation Rate		AM Directional Distribution		PM Directional Distribution	
			AM	PM	IN	OUT	IN	OUT
Single Dwelling	RTA V2.2 / ITE 210	9.44 trips / dwelling	0.85 trips	0.85 trips	26%	74%	64%	36%

Table 7-2 Estimated Trip Generation of the Proposed Development

Land Use	Yield	Trip Generation					
		AM Peak		PM Peak		Daily Traffic	
		IN	OUT	IN	OUT	IN	OUT
Single Dwelling	30 dwellings	7	19	17	9	142	142
		26		**26**		**284**	

7.2 LSP Traffic Distribution

For the purpose of robust assessment, it is assumed that the traffic generated by the LSP will be distributed evenly onto Beeliar Drive and Stock Road. Vehicles traveling to the north and south are expected to be distributed onto Stock Road while eastbound vehicles are expected to be distributed onto Beeliar Drive.

The estimated daily traffic generated by the proposed development is calculated by sourcing the rate suggested in *Institute of Transportation Engineering (ITE) "Trip Generation" 10th Ed.*

Figure 7-1 shows the estimated daily traffic generated by the LSP distributed onto surrounding roads.

Figure 7-1 Estimated Daily Traffic Volume and Distribution

7.3 Extent of Analysis

According to the *WAPC Transport Impact Assessment Guidelines, Vol.2 – Planning Schemes, Structure Plans and Activity Centre Plans, Clause 10.11.2: "The area to be analysed for the road network is generally to be all those sections of road where the structure plan traffic would be likely to increase traffic on any lane by more than 100 vehicles per hour. This threshold equates to around 10 per cent of the mid-block capacity of an urban arterial lane (Austroads GTM Part 3), that is, the level at which the traffic increase may have a material impact."*

As shown in **Section 7.1,** the LSP is estimated to generate 26 vehicle trips (distributed over inbound and outbound) during the peak hours. Additionally, considering the high density of the surrounding road network (Stock Road & Beeliar Drive), the traffic generated by the LSP will be less than 1% of the existing peak hour traffic on the surrounding road network.

Therefore, the LSP is not expect to warrant further intersection assessments and analysis as the impacts from the Site generated traffic is considered to be negligible.

8 Conclusion and Summary

This Traffic Impact Assessment outlines the transport aspects of the proposed LSP for Lot 7, 65, 66 & 67 View Street, Beeliar, including the operations of the proposed development internally, connections to the adjacent road network, traffic generation and access arrangements.

The following conclusions have been made in regard to the proposed LSP:

- The proposed LSP consists of 30 residential dwellings.
- The LSP is estimated to generate approximately 26 vehicle trips during both AM and PM peak.
- The traffic generated by the LSP is not expected to have significant impact to the surrounding road network.
- The LSP benefits from good public transport, pedestrian and cycling facilities in the vicinity of the LSP.

APPENDIX

A

WAPC CHECKLIST

Item	Provided	Comments/Proposals
Summary		
Introduction/Background	Included in Section 1	
Structure plan proposal	Included in Section 2	
regional context	Included in Section 1	
proposed land uses	Included in Section 2	
table of land uses and quantities	Included in Section 2	
major attractors/generators	N/A	
specific issues	N/A	
Existing situation		
existing land uses within structure plan	Included in Section 3	
existing land uses within 800 metres of structure plan area	Included in Section 3	
existing road network within structure plan area	Included in Section 3	
existing pedestrian/cycle networks within structure plan area	Included in Section 3	
existing public transport services within structure plan area	Included in Section 3	
existing road network within 2 (or 5) km of structure plan area	Included in Section 3	
traffic flows on roads within structure plan area (PM and/or AM peak hours)	N/A	
traffic flows on roads within 2 (or 5) km of structure plan area (AM and/or PM peak hours)	Included in Section 3	
existing pedestrian/cycle networks within 800m of structure plan area	Included in Section 3	
existing public transport services within 800m of structure plan area	Included in Section 3	
Proposed internal transport networks		
changes/additions to existing road network or proposed new road network	N/A	
road reservation widths	Included in Section 4	
road cross-sections & speed limits	Included in Section 4	
intersection controls	N/A	
pedestrian/cycle networks and crossing facilities	Included in Section 4	
public transport routes	Included in Section 4	
Changes to external transport networks		
road network	Included in Section 5	
intersection controls	Included in Section 5	
pedestrian/cycle networks and crossing facilities	Included in Section 5	
public transport services	Included in Section 5	
Integration with surrounding area		

trip attractors/generators within 800 metres	Included in Section 6	
proposed changes to land uses within 800 metres	Included in Section 6	
travel desire lines from structure plan to these attractors/generators	Included in Section 6	
adequacy of external transport networks	Included in Section 7	
deficiencies in external transport networks	N/A	
remedial measures to address deficiencies	N/A	
Analysis of internal transport networks		
assessment year(s) and time period(s)	N/A	
structure plan generated traffic	Included in Section 7	
extraneous (through) traffic	Included in Section 7	
design traffic flows (ie. total traffic)	Included in Section 7	
road cross-sections	N/A	
intersection controls	N/A	
access strategy	N/A	
pedestrian / cycle networks	N/A	
safe routes to schools	N/A	
pedestrian permeability & efficiency	N/A	
access to public transport	N/A	
Analysis of external transport networks		
extent of analysis	Included in Section 7	
base flows for assessment year(s)	N/A	
total traffic flows	N/A	
road cross-sections	N/A	
intersection layouts & controls	N/A	
pedestrian/cycle networks	N/A	
Conclusions	Included in Section 8	

APPENDIX

B

PROPOSED STRUCTURE PLAN

About Cardno

Cardno is a professional infrastructure and environmental services company, with expertise in the development and improvement of physical and social infrastructure for communities around the world. Cardno's team includes leading professionals who plan, design, manage and deliver sustainable projects and community programs. Cardno is an international company listed on the Australian Securities Exchange [ASX:CDD].

Contact

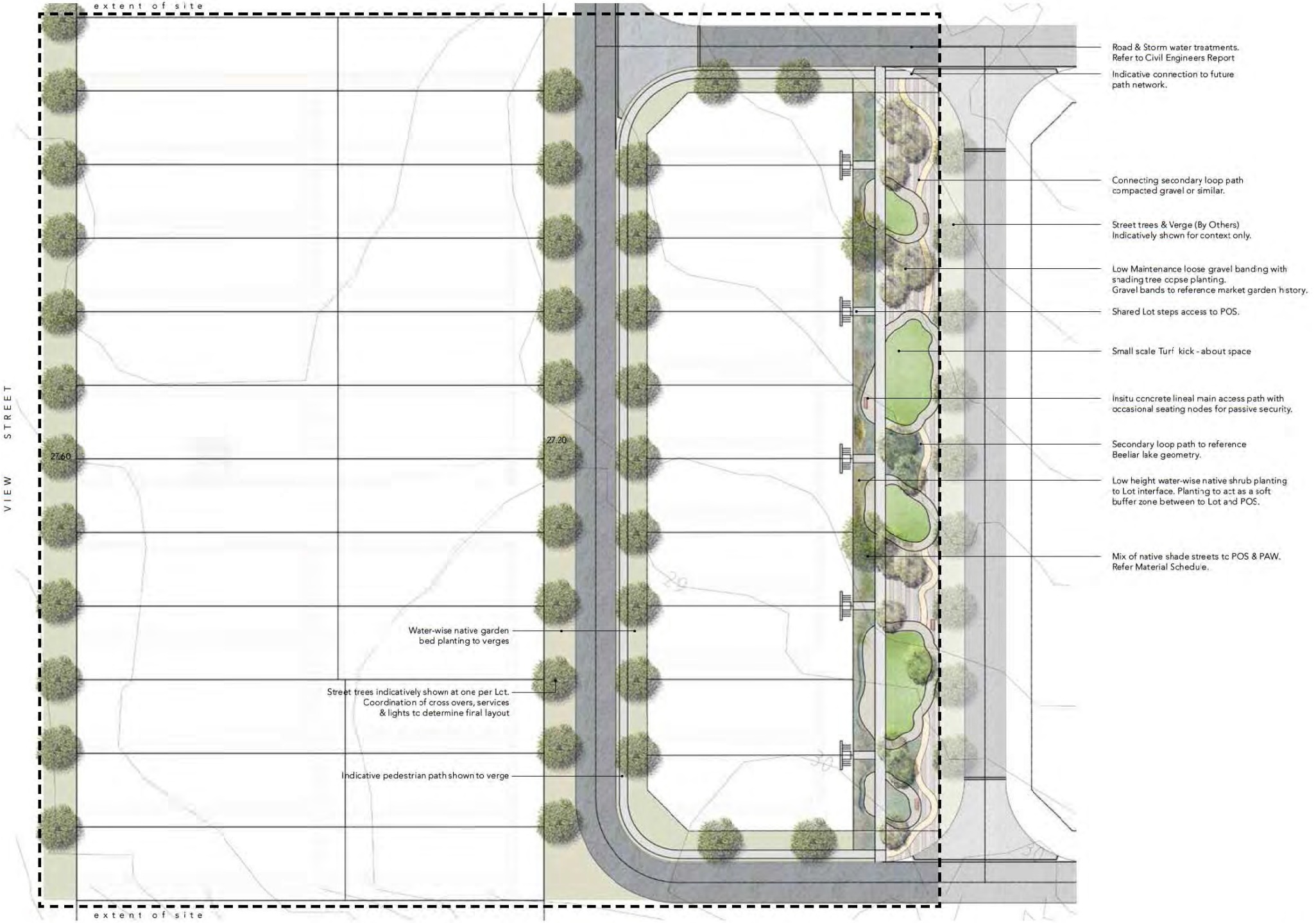
11 Harvest Terrace
West Perth WA 6005
Australia

Phone +61 8 9273 3888
Fax +61 8 9486 8664

Web Address
www.cardno.com

Cardno

Appendix 6 – Landscape Concept Plan



REALM studios

View St. Beeliar

LSP Masterplan

N

Client:
Peritas Group

Date:
18.02.2019

Scale:
1:500 @ A3

Dwg/Rev:
L01C

LANDSCAPE LANGUAGE

The landscape design language layers the found natural forms (organic Beeliar Lake wetland network) and former cultural uses (market gardens) horizontal and vertical grids - to generate a synthesis of two influences.

MATERIAL PALETTE

Compacted Fines
Secondary Paths

Two Tone Gravel

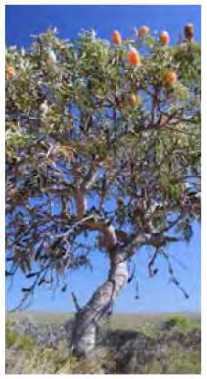
Grey Concrete - Path Network

Coloured Concrete
POS / PAW Nodes

PLANTING PALETTE

Allocasuarina fraseriana

Eucalyptus todtiana



Banksia grandis

Melaleuca lanceolata

Templetonia retusa

Chamelaucium uncinatum

Hakea bucculenta

Ricinocarpus glaucus

Banksia dallanneyi

Scaevola nitida

Adenanthos cuneatus

Acacia lasiocarpa

REALM studios

View St. Beeliar

LSP Palette

Client:
Peritas Group

Date:
18.09.2019

Scale
1:500 @ A3

Dwg/Rev:
L02C